Missing Linkages:

Restoring Connectivity to the California Landscape

Kevin Crooks

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November 2, 2000
San Diego Zoo, San Diego, California

Project Steering Committee:

Kevin Crooks, Ph.D., University of Wisconsin, Madison
M.A. Sanjayan, Ph.D., The Nature Conservancy
Paul Spitler, California Wilderness Coalition
Rich Hunter, Talon Associates
Kristeen Penrod, South Coast Wildlands

Proceedings written and compiled by Kristeen Penrod, South Coast Wildlands
Missing Linkages GIS Analyst and Cartographer, Rich Hunter, Talon Associates
Statewide Analysis, Matt Merrifield, The Nature Conservancy

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SPONSORS

The *Missing Linkages* conference was cosponsored by the California Wilderness Coalition, The Nature Conservancy, the Biological Resource Division of the United States Geological Survey, the Center for Reproduction of Endangered Species, and California State Parks. Together these organizations represent a wealth of expertise in conservation issues, including biological assessments, reserve design, land acquisition and preservation, active land management, and reintroduction programs for endangered species.

Missing Linkages is overseen by a steering committee and staff including Paul Spitler, Executive Director, California Wilderness Coalition; Dr. Kevin Crooks, Department of Wildlife Ecology, University of Wisconsin, Madison; Dr. M.A. Sanjayan, Director of Conservation Science, The Nature Conservancy; Rich Hunter, GIS Conservation Planner, Talon Associates; and Kristeen Penrod, Executive Director, South Coast Wildlands Project.

The California Wilderness Coalition (CWC) is a statewide organization whose mission is to protect California's remaining wilderness. CWC has initiated and led numerous statewide and regional wilderness campaigns to gather support for the preservation of California's wildlands. Website address: http://www.calwild.org

The Nature Conservancy (TNC) is a national organization whose mission is to preserve the plants, animals and natural communities that represent the diversity of life on earth by protecting the land and water they need to survive. TNC has a keen interest in connectivity and relies on protecting entire functional landscapes as a strategy for conserving biodiversity. Website address: http://www.tnc.org

The Biological Resources Division (BRD) is the research arm of the United States Geological Survey. BRD conducts studies and inventories of wildlife habitat throughout the United States. BRD enters into partnerships with scientific collaborators to produce high-quality scientific information and ensures the information's application to real problems. Website address: http://www.usgs.gov

The Center for Reproduction of Endangered Species (CRES) is the research department of the Zoological Society of San Diego. Since its founding in 1975, CRES scientists have worked to acquire knowledge vital for the conservation of the world's plant and animal communities, both locally and abroad. The Ecology and Applied Conservation Division of CRES is devoted specifically to the conservation of

endangered species in their native habitats. Website address: http://www.sandiegozoo.org/conservation

California State Parks manages and conducts research on over one hundred publicly owned parks and preserves in the state. Many plant and wildlife species rely on these parklands for all or a portion of their life cycle. Active grant programs that may aid in the protection of linkages identified at the conference include the Land and Water Conservation Fund, Habitat Conservation Fund, and 2000 Park Bonds Act. Website address: http://www.cal-parks.ca.gov

1.0 INTRODUCTION

Nature needs room to move. For many species to persist and for communities to withstand environmental disturbances such as fire or climate change, isolated nature preserves simply will not suffice. Habitat fragmentation reduces, often irreversibly, the permeability of the landscape to its native flora and fauna. In California, urban sprawl, roads, and other anthropogenic forces are carving up habitat into ever-smaller fragments. Maintaining connectivity between the remaining natural areas and minimizing further fragmentation is crucial to the long-term viability of California's natural heritage. If selected carefully and managed properly, habitat linkages and wildlife corridors – which can range from a large intact ranch bridging two protected areas to narrow riparian corridors or highway underpasses – can significantly contribute to both the viability of individual species but also to the integrity of the natural community.

Until recently there has been little coordinated statewide effort in California to systematically identify, study, and protect wildlife corridors. In some cases, local or regional reviews have been completed and the results documented. In other cases, the location of critical corridors remains hidden in the archives of "local knowledge" and therefore does not influence public policy and private land conservation initiatives. Access to the best information is crucial and despite advances in conservation planning, there is still no forum for interested parties to share information about wildlife corridors. Thus, many linkages are being severed simply because their existence is unknown.

To address this problem we began working with several partners (California State Parks, United States Geological Survey, San Diego Zoo) to convene a conference to bring together experts who had on-the-ground familiarity with habitat corridors. The conference was held in November 2000 at the San Diego Zoo, and its success was entirely attributable to the diverse mix of agency staff, conservationists, and university scientists who attended and worked together to delineate the State's most important linkages, along with pertinent annotations for each linkage.

The results of this gathering, presented here, not only provides scientific credibility to all our collective efforts to maintain a network of interconnected public and private conservation areas throughout the state but also guidance on where future conservation might be directed. While we caution that these results are at a coarse scale and should not supplant fine resolution planning necessary to determine the exact location and design of individual corridors, we nevertheless assert that the information provided here is unprecedented in its scope and detail.

It is likely that in the coming few decades, the establishment of major new protected areas in California will become increasingly rare. Thus, keeping existing wild places connected is the only rational means of maintaining enough accessible habitat for many species that call California home. Further, with regional climate change looming, community expansion or range shifts can only occur if some measure of landscape permeability is maintained. We hope that our collective efforts presented here provide a necessary first step for maintaining connectivity to an increasingly fragmented California landscape.

M. A. Sanjayan, Ph.D.
Director of Conservation Science
The Nature Conservancy of California

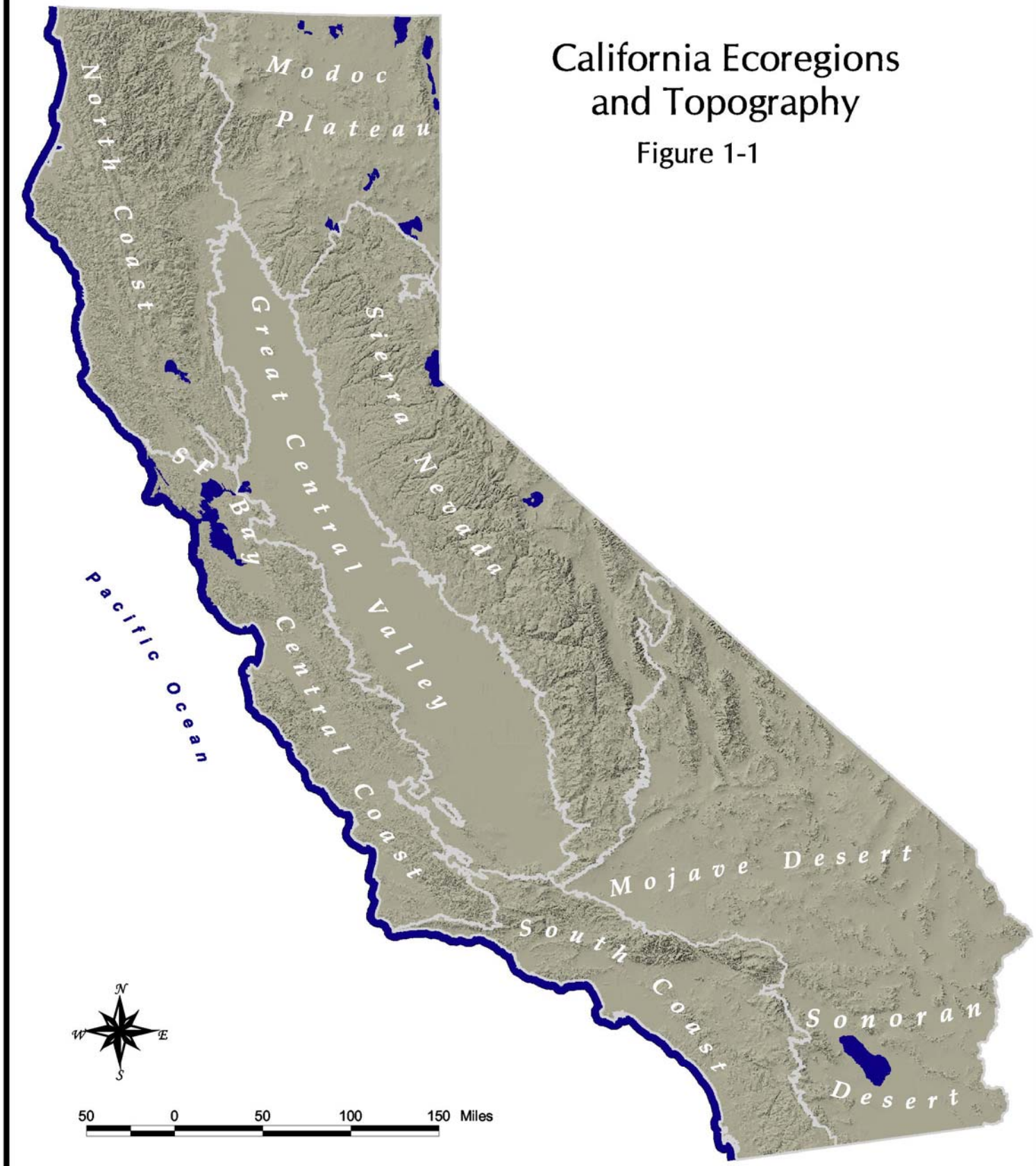
Paul Spitler
Executive Director
California Wilderness Coalition

1.1 MISSION AND GOALS

The primary goal of the *Missing Linkages: Restoring Connectivity to the California Landscape* conference was to bring together land managers and planners, conservationists, and top scientists from each ecoregion in the state to identify the location of, and threats to the most important movement corridors for California's wildlife. The mission of *Missing Linkages* was to raise the awareness level of the need for protecting and restoring connectivity; this can be accomplished through advocacy, education, planning, and bringing together key stakeholders to work towards implementation. The conference was held on November 2, 2000 at the San Diego Zoo, San Diego,

California Ecoregions and Topography

Figure 1-1



California (Appendix A, *Conference Agenda*). *Missing Linkages* was a tremendous success with one hundred and sixty scientists, conservationists, land managers, and planners in attendance. Participants delineated over three hundred linkages throughout the state.

1.2 CONFERENCE STRUCTURE

Missing Linkages was a one-day event that was divided into two sessions. The first session was a series of presentations about the importance of corridors by renowned conservationists. This information-sharing session informed conference participants about the importance of, and the latest research in corridor protection, and set the stage for the following section. The second section was a hands-on working session. The state was divided into eight ecoregions: North Coast, Bay Area, Central Coast, South Coast, Central Valley, Modoc Plateau & Cascades, Sierra Nevada, and Mojave & Sonoran Deserts (Figure 1-1, *California Regions and Topography*). Each ecoregional team was provided with a series of base maps detailing landownership, road density, land cover, and log sheets. Conference participants shared their knowledge in their ecoregion of expertise by marking the locations of important movement corridors and providing detailed information on each linkage identified. Participants also worked with adjacent ecoregions to ensure habitat connectivity throughout the state. The proceedings have been organized in a similar structure to the conference, arranged by ecoregion, with a statewide overview of California's *Missing Linkages.*

1.3 KEYNOTE ADDRESSES

THE ROLE OF ZOOLOGICAL INSTITUTIONS IN CONSERVATION

ALAN DIXSON
Director, Center for Reproduction of Endangered Species, Zoological Society of San Diego, San Diego Zoo, San Diego, California.

Abstract: The Zoological Society of San Diego has developed a superlative collection of animals and plants; many of them are extremely rare, and all of us are privileged to work in this unique environment. Beyond our gates, however, the plight of these animals and plants is steadily worsening as the human population increases and exploits the earth's resources. There are now six billion people in the world, and every minute a further 260 babies are born. Within the lifetime of these children, the human population is going to double. This is a terrifying prospect. All of us who are concerned with conservation, maintenance of biodiversity, sustainable use of resources, and the quality of life cannot ignore the problems created by uncontrolled human reproduction.

As habitats are destroyed and species are lost, those of us who work in zoological institutions have several important responsibilities. We must continue to do everything possible to maintain self-sustaining populations of endangered species in captivity; we must also study their biology and bank genetic material, particularly from the most endangered forms. Our zoological collections also represent a powerful educational tool; for children, in particular, there is no substitute for seeing animals and plants in the living state. Then there is the responsibility to study endangered species in the wild and to help conserve their natural habitats. In this latter regard, I am delighted that the Zoological Society's Board of Trustees has approved the creation of a postdoctoral fellowship program, specifically for field research on endangered species and ecosystems. These posts will provide gifted young scientists from the United States and abroad with opportunities to carry out field projects in collaboration with workers at CRES and in our Curatorial, Veterinary, and Education Departments. In this way we shall increase our efforts to prevent the extinction of endangered species, and we shall help to train the next generation of biologists who will act as ambassadors for the Society in the broader world of conservation science. As testament to the urgency of wildlife conservation here at home, we currently have postdoctoral fellows carrying out research programs on bighorn sheep, California condors, and southern California reptiles.

In light of increasing habitat fragmentation both here and abroad, planning for conservation must take into account wildlife movement between and among metapopulations through corridor protection and restoration. We are pleased that this effort is being undertaken to identify key habitat linkages here in California. The work of the Missing Linkages Conference will take a major

step toward delineating statewide corridors crucial to sustaining California's unique and increasingly threatened natural areas. Together with our conservation partners, we look forward to the day when the importance of habitat linkages is better understood and appreciated as a critical component of the planning and maintenance of wildlife reserves throughout our state.

IS CONNECTIVITY NECESSARY?

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Abstract: The fate of isolated habitat remnants has been one of the most active research areas in conservation biology. Based on hundreds of such studies, the evidence is clear: isolated remnants suffer predictable, cumulative losses of species; this is one of the strongest generalizations in the field of ecology. Therefore, it is self-evident that isolation is harmful. It follows that connectivity should be maintained or restored wherever possible. The detailed architecture of landscape linkages is not as important as we might imagine. Mammals, at least, are smarter than we think, and they learn over time where the safe areas of connectivity exist, and this knowledge spreads in species in a fashion similar to cultural transmission.

In other words, "wildlands integrity" or "wildlands intimacy" should be our goal. This requires large, undisturbed core areas, the maintenance of keystone interactors, including large carnivores (ecological governors), and connectivity to maintain ecologically effective populations of these key species. In the absence of large carnivores and other keystone (or foundation) species, species diversity declines.

Connectivity also includes the concept of stepping stone reserves for pollinators, seed dispersers, and other flying species such as birds, bats, and insects.

Regarding the design of protected area networks, history dictates that we plan for the worst possible scenario (e.g., regarding build-out and changes in technology). We must also plan for species, such as wolves and grizzly bears, that have been extirpated and that should be allowed to return. If it scares us to think in these terms, it is probably a good idea.

DOCUMENTING THE CONSERVATION VALUE OF CORRIDORS

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Abstract: Skeptics have questioned the empirical evidence that corridors provide landscape connectivity. We reviewed published studies that empirically addressed whether corridors enhance population viability of species in habitat patches connected by corridors. The most meritorious studies followed one of two approaches.

Mansergh and Scotts (1989) provided the best example of the experimental approach. They studied two subpopulations of a rare species, the mountain pygmy-possum (*Burramys parvus*), restricted to alpine rocky screes in Australia. One subpopulation enjoyed an intact landscape, whereas the formerly contiguous habitat of the second subpopulation had been fragmented by a ski development and an associated road. The fragmented area exhibited skewed sex ratios and lower survival rates than the intact area. After construction of a corridor, however, the population structure and survival rates in the ski resort changed to those observed in the undisturbed area. The study was not replicated, consisting of a single treated; and a single control landscape. Nonetheless, by collecting data on both treatment and control areas before and after manipulation, they made strong inferences regarding the effects of this particular corridor, though they cannot make inferences about the utility of corridors in general. The experimental approach is superior to observing the demographic conditions in various landscapes because of the tendency (in most

landscapes) for corridor presence to be correlated with other variables, such as patch size, that can confound the analysis.

Because there is general agreement that landscape connectivity enhances population viability, the second approach is to observe whether individual animals in fragmented landscapes use corridors to move from patch to patch, and that in a landscape without corridors such movements would occur too rarely to influence the population. Of 17 studies of animal movements, Suckling (1984) and Beier (1995) provided strongest inferences because they focused on dispersing juveniles, reported the fraction of dispersers using corridors, and explicitly documented a lack of movement through the matrix. Beier, working on *Puma concolor* in southern California, found that five of nine dispersers found and successfully used corridors, that all three potential corridors were found and traversed by at least one disperser, and that no inter-patch movements occurred via the urban matrix.

Studies of animal use of corridors should focus on fragmentation-sensitive species that need corridors (rather than easily-studied species of no management concern), on dispersing juveniles, and on the real landscapes that are the subject of decisions on corridor preservation. We found limited value in studies that merely documented animal presence in corridors, rather than movement through corridors, and in those that failed to compare movement rates through corridors to movement rates through the matrix.

We found no empirical evidence for the hypothesized negative impacts of conservation corridors. Despite the shortcomings of many studies, the preponderance of evidence is that corridors facilitate travel by a great many species.

GOALS OF THE MISSING LINKAGES CONFERENCE

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Abstract: The purpose of the *Missing Linkages* conference is to convene scientists, lands managers, and conservationists from throughout California to plan for regional habitat connectivity issues. The conference will consist of ecoregional break-out sessions, allowing participants to share local knowledge and expertise in order to identify the primary landscape linkages and connectivity choke-points within each ecoregion in the state; ecoregional chairs have been chosen to help facilitate this process. Each ecoregional team will have base maps (topographic maps, road density models, land cover depictions) to help participants identify key linkages; each linkage identified will be labeled directly on the maps. Additionally, for each linkage, a Linkage Description Form will be completed to record the linkage identification (ID) number, linkage name, linkage type, key species or ecological processes considered, immediacy of threat to connectivity, feasibility of conservation opportunity, and other supporting information, materials, and citations. The resulting maps and description logs from all ecoregions will be compiled to assess and prioritize the key linkages throughout the state. We hope that this forum will help facilitate communication, coordination, and concentration on regional connectivity issues in California.

1.4 EVALUATING THE DATA

Ecoregional team members labeled the linkages directly onto 1:250,000 scale base maps. This information was digitized, imported into ArcView GIS and linked to ecoregional databases created from the data gathered at the conference. The ecoregional maps produced were then joined to generate a statewide map of California's *Missing Linkages*. Map identification numbers (Map ID#s) referenced in the text correspond with the *Missing Linkages* map for that ecoregion.

Conference participants provided information on specific linkages by completing linkage description log sheets for each linkage identified (Appendix B, *Identifying the Linkages*). The log sheets completed, were sorted by ecoregion and have been provided on a CD, located in the front cover, *Linkage Description Log Sheets*. Information gathered from the log sheets has been analyzed separately by ecoregion, and collectively for the state.

Participants specified the type of linkage (e.g. Landscape Linkage, Connectivity Choke-Point, Missing Link); this information was evaluated to determine the relative number of linkages

identified for each linkage type. Linkage types were defined on the linkage description log sheet as:

- Landscape Linkage = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between different sections of the landscape (taken from Soulé and Terborgh 1999). These linkages are not necessarily constricted (yet), but are essential to maintain connectivity function in the ecoregion. These may include habitat linkages, riparian corridors, etc.
- Connectivity Choke-Point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas"). Choke-points are essential to maintain landscape-level connectivity, but are particularly in danger of losing connectivity function. An example of a connectivity choke-point is a narrow peninsula of habitat, surrounded by a human-dominated matrix, that connects larger habitat blocks. Another example would be an underpass under a major roadway that is critical to allow animal movement between habitat blocks.
- Missing Link = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadway, etc.), but based on location one that is critical to restore connectivity function. For example, a missing link might be a critical section of a major highway that bisects two larger habitat blocks but that is currently impermeable to animal movement.

Participants listed the key species and/or ecological processes used to identify each linkage. Key species and/or ecological processes have been listed for each ecoregion and compiled for the state. In addition, the percent of linkages identified by each taxonomic group was calculated.

Conference participants provided information on land cover and habitat types for each linkage; a brief description of the primary habitat types identified has been provided in the ecoregional summaries. In addition, significant blocks of publicly owned habitat (state parks, national forest, etc.) and military lands have been listed for each ecoregion.

Ecoregional team members documented the most significant barriers to animal movement (e.g. roads, dams) and the primary features that facilitate wildlife passage in each linkage. Conference participants recorded if the linkage required restoration to reestablish connectivity function; they listed the primary restoration needs (e.g. exotic species eradication, habitat restoration, underpass enhancement) and identified the habitat types in need of restoration (e.g. riparian, coastal sage scrub, forest). This information was evaluated to determine the primary barriers, linkage features, and restoration needs.

Participants ranked the overall threat to connectivity function for each linkage from one to five, with one being no threat/secure, and five being severe threat/loss imminent. This information was evaluated to determine the number of linkages ranked for each category. Participants also identified and ranked specific threats to each linkage on the linkage description log sheets. This information was analyzed to determine the percent of linkages affected by each threat. The weighted average (average rank score number of linkages affected) was also calculated to find out the severity of each threat.

Ecoregional team members scored the overall feasibility of conserving each linkage from one to five, with one being not feasible, and five being a good opportunity. This information was also evaluated to determine how many of the linkages were ranked for each category. Scores for the overall degree of threat and the feasibility of conserving the linkage were compared to identify the top-ranked linkages in each ecoregion. A brief description has been provided for the top-ranked linkages.

Participants identified whether there were willing sellers, local support, and/or the potential for agency acquisition. They also recorded if the habitat linkage was part of a formal conservation plan. The information on willing sellers and agency acquisition was evaluated to determine the percent of linkages with either classification; they were then compared to identify those linkages with both willing sellers and opportunities for agency acquisition. Other opportunities listed to restore habitat connectivity (e.g. conservation easements, formal conservation plans) were summarized.

Documentation referencing specific linkages is listed in the ecoregional summaries and, when possible, included in Appendix C, *Connectivity References*. Conference participants also provided some site-specific maps that highlight one or more linkages; these are provided in the ecoregional summaries and are cross-referenced with Map ID#s depicted on the *Missing Linkages* ecoregional maps.

Decision rules were developed for prioritizing the linkages statewide. This involved calculating information on (1) Conservation opportunity, (2) Presence of target species, (3) Overall threat, and (4) Existence of documentation. Data for Conservation opportunity, Presence of target species, and Overall threat were each normalized with quantile breaks to create three different classification fields. If there was existing documentation for the linkage, it received three additional points. Scores for each were then added and the linkages classified into three broad categories: high (score 10-12), medium (score 7-9), and low priority (score = 6). A statewide map has been generated to graphically display the results of this analysis. The results were then summarized in tabular format. For more detailed information on the methodology for this analysis please refer to Appendix D, *Statewide Analysis*.

We draw attention to some limitations in the data gathering process to aid in the interpretation of the results:

- Not all studies documenting the importance of habitat connectivity in the state were referenced on the log sheets.
- Some linkages have multiple arrows on the ecoregional and statewide maps with one corresponding data sheet and linkage ID#, whereas a few linkages were drawn as a single arrow but represent multiple choke-points.
- There were variances in the representation of the arrows. Some were drawn from the boundaries of one protected area to another, while others were drawn without regard for political boundaries.
- There were differences in criteria between and among ecoregions; participants had different perceptions of what constitutes a severe threat (e.g. expanding vs. existing urbanization).
- There were differences in how participants interpreted the type of linkage: Missing Link, Choke-Point or Landscape Linkage.
- There was a disparity across individual linkages in terms of available information (e.g. willing sellers, restoration needs, scientific documentation). In addition, for some linkages, participants completing the log sheets might not have been aware of all existing information.

1.5 A NOTE FROM THE SPONSORS

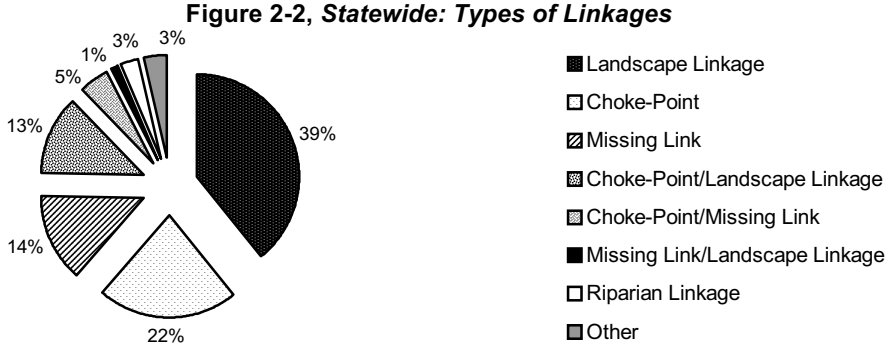
We acknowledge that this is the first step in a long process of restoring and/or protecting habitat connectivity across the California landscape. Because the conference was limited to 160 participants, not all the key players and stakeholders in the state were present. Therefore, not every habitat linkage in the state is represented herein. Future iterations of the maps generated will be required and additional data will need to be gathered. We do not yet understand all there is to know about habitat connectivity in California and recognize that it is impossible to lay the biological foundation for statewide connectivity in a day. However, we feel that *Missing Linkages* was a tremendously productive first step. Recommendations for future steps include:

- Follow-up workshops in each ecoregion to further refine linkage identifications and descriptions
- Connectivity planning workshops for specific high priority linkages
- Meetings with key decision-makers to discuss implementation strategies
- Producing and publishing articles in mainstream media to educate the public on the role of corridors in conservation and the need for corridor protection
- Conducting follow-up research to gather supporting documentation and the additional data (e.g., radio-telemetry studies, corridor studies, road-kill data) necessary to substantiate the need for full protection of the linkages identified
- Further research on connectivity for under-represented taxonomic groups
- Seeking scientific peer review of proceedings and other products
- Working to protect and restore habitat linkages to ensure the persistence of California's native flora and fauna

Missing Linkages was an opportunity for a number of stakeholders to work cooperatively on habitat connectivity issues throughout the state; it proved to be an extremely productive event. We would like to thank the ecoregional chairs and conference participants for their enthusiasm and dedication to the task of identifying California's *Missing Linkages* (Appendix E, *Ecoregional Chairs & Conference Participants*). The proceedings will be used for an ambitious campaign designed to heighten the awareness of wildlife movement and habitat connectivity issues, and to gain protection for important corridors. The proceedings will be broadly distributed to land managers and planners, regional and statewide decision-makers, policy-makers, scientists, conservation advocates and the media.

A total of 232 linkage description log sheets were completed for the state, though some log sheets represent multiple linkages (Figure 2-1, *Statewide: Missing Linkages*). Of the linkages, 39% (90/232) were recognized as Landscape Linkages[1], 22% (51/232) were considered connectivity Choke-Points[2], and 14% (32/232) were determined to be Missing Links[3]. Scientists also identified other types of linkages; 13% (29/232) were considered Choke-Points[2] and Landscape Linkages[1], 5% (11/232) were recorded as Choke-Points[2] and Missing Links[3], <1% (2/232) were listed as Missing Links[3] and Landscape Linkages[1], 3% (7/232) were identified as Riparian Linkages, and 3% (8/232) were defined as other linkages types (Figure 2-2, *Statewide: Types of Linkages*).

Figure 2-2, *Statewide: Types of Linkages*

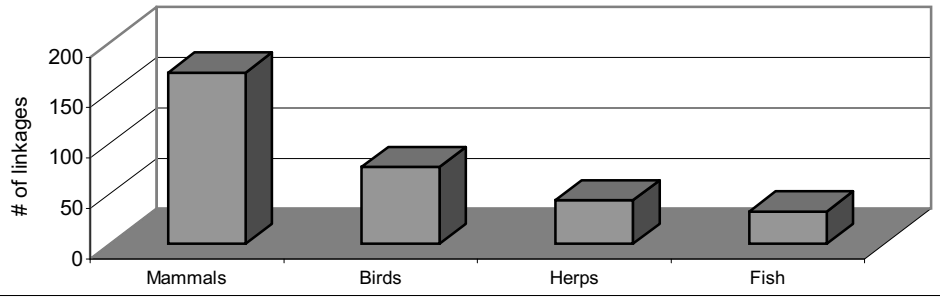


Participants identified numerous key species as habitat connectivity indicators. Some were recognized as key species in almost all ecoregions, while some were only identified for particular ecoregions (Table 2-1, *Key Species Used to Identify the Linkages*). Both single and multiple key species were used in identifying the linkages, though mammals were by far the most widely used taxonomic group. Mammals were recognized as key species in 73% (170/232) of the linkages, 33% (76/232) used birds, 14% (32/232) used fish, and 19% (43/232) used amphibians and/or reptiles (Figure 2-3, *Statewide: Taxonomic Groups Used to Identify the Linkages*). Mammalian carnivores were recognized as key species in 52%

[1] Landscape Linkage = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between difference sections of the landscape.
[2] Choke-Point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas").
[3] Missing Link = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function.

(120/232) of the linkages.

Figure 2-3, *Statewide: Taxonomic Groups Used to Identify the Linkages*



California's Missing Linkages:

Restoring Connectivity to the California Landscape

Figure 2-1

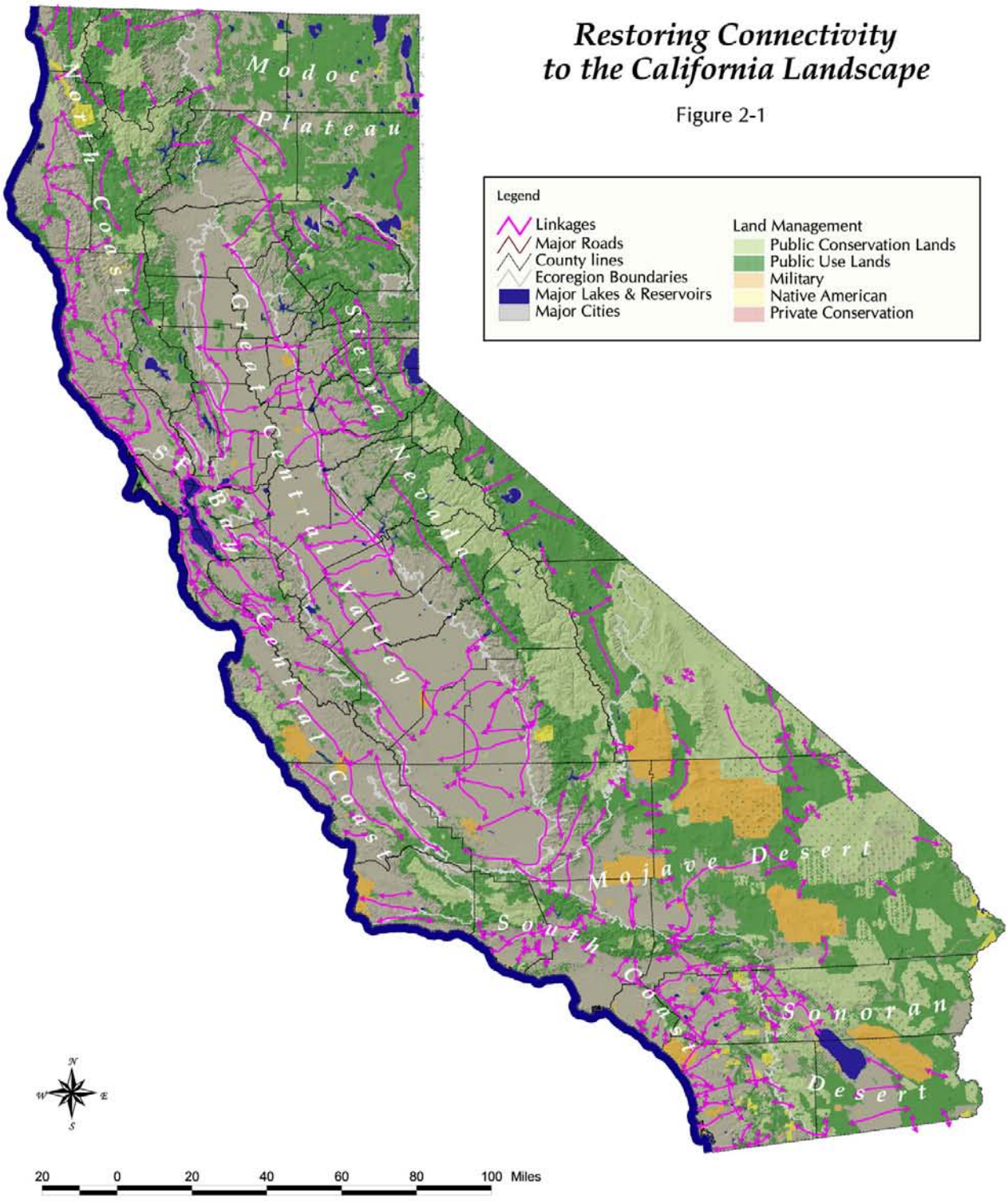


Table 2-1, *Key Species Used to Identify the Linkages*

Taxonomic Group/Species	*North Coast*	*Bay Area*	*Central Coast*	*South Coast*	*Central Valley*	*Modoc Cascades*	*Sierra Nevada*	*Mojave Sonoran*
MAMMALS								
Pine marten (*Martes americana*)	X					X		
Pacific fisher (*M. pennanti*)	X					X	X	
Wolverine (*Gulo gulo*)	X					X		
Grizzly bear (*Ursus arctos*)								X
Black bear (*Ursus americanus*)	X		X	X				X
Gray wolf (*Canis lupus*)	X					X		
Gray fox (*Urocyon cinereoargenteus*)		X	X	X			X	
Coyote (*Canis latrans*)		X	X	X			X	X
San Joaquin kit fox (*Vulpes macrotis mytica*)		X	X		X			
Kit fox (*Vulpes macrotis*)								X
Mountain lion (*Felis concolor*)	X	X	X	X		X	X	X
Bobcat (*Lynx rufus*)	X	X	X	X			X	X
Tule elk (*Cervus elaphus nannoides*)		X	X		X			
Pronghorn antelope (*Antilocapra americana*)						X		
Bighorn sheep (*Ovis canadensis*)				X		X	X	X
Mule deer (*Odocoileus hemionus*)	X	X	X			X	X	X
River otter (*Lutra canadensis*)	X				X			
Mink (*Mustela vison*)							X	
Beaver (*Castor canadensis*)					X			
Ringtail (*Bassariscus astutus*)	X				X			
Badger (*Taxidea taxus*)				X				
Riparian brush rabbit (*Sylvilagus bachmani riparius*)					X			
Mohave ground squirrel (*Spermophilus mohavensis*)				X				X
Buena Vista Lake shrew					X			

(*Sorex ornatus relictus*)								
Taxonomic Group/Species	***North Coast***	***Bay Area***	***Central Coast***	***South Coast***	***Central Valley***	***Modoc Cascades***	***Sierra Nevada***	***Mojave Sonoran***
Wood rat (*Neotoma* spp.)					X			
Short-nosed kangaroo rat (*Dipodomys nitratoides brevinasus*)					X			
Tipton's kangaroo rat (*D. nitratoides nitratoides*)					X			
Fresno kangaroo rat (*D. nitratoides exilis*)					X			
San Bernardino kangaroo rat (*D. merriami parvus*)				X				
Giant kangaroo rat (*D. ingens*)					X			
Kangaroo rat (*Dipodomys* spp.)							X	
Los Angeles pocket mouse (*Perognathus longimembris brevianus*)				X				
San Joaquin pocket mouse (*P. inornatus*)					X			
Salt marsh harvest mouse (*Reithrodontomys raviventris*)					X			
Harvest mouse (*Reithrodontomys* spp.)		X						
BIRDS								
Bald eagle (*Haliaeetus leucocephalus*)								X
Golden eagle (*Aquila chrysaetos*)		X		X				X
Peregrine falcon (*Falco peregrinus*)								X
Swainson's hawk (*Buteo swainsoni*)					X		X	
California condor (*Gymnogyps californianus*)		X						
Marbled murrelet (*Brachyramphus marmoratus*)	X	X						
Spotted owl (*Strix occidentalis*)	X		X			X	X	
Burrowing owl (*Speotyto cunicularia*)		X						
Falcon (*Falco* spp.)	X							
Goshawk (*Accipiter gentiles*)	X							
Sage grouse (*Centrocercus urophasianus*)						X		
Acorn woodpecker (*Melanerpes formicivorus*)	X							
Le Conte's thrasher				X	X			

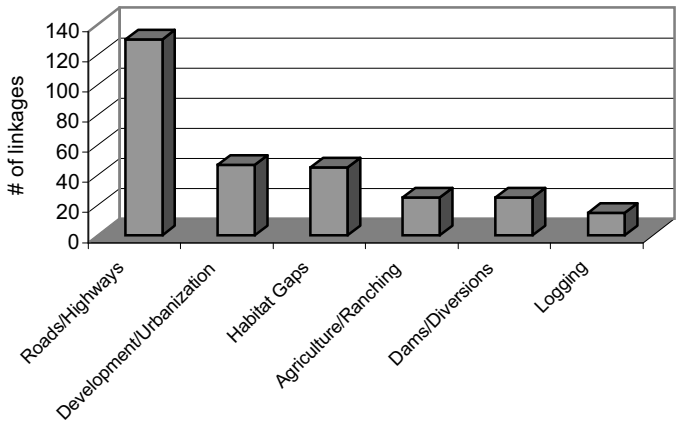
(*Toxostoma lecontei*)								
Least Bell's vireo (*Vireo bellii pusillus*)				X				X
Taxonomic Group/Species	***North Coast***	***Bay Area***	***Central Coast***	***South Coast***	***Central Valley***	***Modoc Cascades***	***Sierra Nevada***	***Mojave Sonoran***
Western yellow-billed cuckoo (*Coccyzus americanus*)					X			
Coastal California gnatcatcher (*Polioptila californica californica*)				X				
Southwestern willow flycatcher (*Empidonax traillii extimus*)				X				X
Willow flycatcher (*E. traillii*)						X		
Snowy plover (*Charadrius alexandrinus nivosus*)	X			X				X
Least tern *(Sterna antillarum browni*)				X				
Clapper rail (*Rallus longirostris*)		X						
Black rail (*Laterallus jamaicensis*)					X			
Aleutian Canadian goose (*Branta canadensis leucopareia*	X							
FISH								
*Chinook salmon (*Oncorhynchus tshawytscha*)*		X			X			
Coho salmon (*Oncorhynchus kisutch*)	X							
Southern steelhead trout (*Oncorhynchus mykiss*)	X	X	X	X	X			
Three-spined stickleback (*Gasterosteus aculeatus*)				X				
Santa Ana sucker (*Catostomus santaanae*)				X				
Delta smelt (*Hypomesus transpacificus*)					X			
REPTILES & AMPHIBIANS								
*Desert tortoise (*Gopherus agassizii*)*				X				X
Alameda whipsnake (*Masticophis lateralis euryxanthus*)		X						
Blunt-nosed leopard lizard (*Gambelia silus*)					X			
Flat-tailed horned lizard (*Phrynosoma mcallii*)								X
Desert fringe-toed lizard (*Uma* spp.)								X
Southwestern pond turtle (*Clemmys marmorata*)		X		X				
California tiger salamander		X						

(*Ambystoma tigrinum californiense*)								
Western spadefoot toad (*Scaphiopus hammondii*)				X				
Taxonomic Group/Species	***North Coast***	***Bay Area***	***Central Coast***	***South Coast***	***Central Valley***	***Modoc Cascades***	***Sierra Nevada***	***Mojave Sonoran***
Arroyo southwestern toad (*Bufo microscaphus californicus*)				X				X
Red-legged frog (*Rana aurora draytonii*)		X	X					
Yellow-legged frog (*Rana* spp.)		X						
INVERTEBRATES								
Fairy shrimp (*Streptocephalus* & *Branchinecta* spp.)					X			
Quino checkerspot butterfly (*Euphydryas editha quino*)				X				

The primary features identified that facilitate wildlife movement included contiguous or semi-contiguous habitat, underpasses, culverts, bridges, and riparian habitat. Riparian habitat and/or waterways were cited as the primary connectivity conduit in 39% (91/232) of the linkages. Semi-contiguous or contiguous habitat was listed as facilitating animal movement in 28% (66/232) of the linkages. Underpasses, culverts, and/or bridges were listed as the principal linkage features in 22% (51/232) of the linkages identified.

The primary barriers to animal movement identified in the state varied (Figure 2-4, *Statewide: Primary Barriers to Wildlife Movement*), though no barriers were listed for 42 of the linkages identified. The majority of barriers identified are associated with the extensive road network. In fact, 57% (132/232) of the linkages listed roads and/or highways as the major impediment to wildlife passage. Existing rural and/or urban development were identified as barriers in 21% (48/232) of the linkages. Habitat gaps were listed as barriers to wildlife movement in 20% (46/232) of the linkages. Agriculture and/or ranching were listed as impediments to movement in 11% (25/232) of the linkages. Dams, diversions, channelization and/or aqueducts were listed as obstacles to movement in 11% (26/232) of the linkages. Intensive logging and/or clearcut areas were listed as barriers in 6% (15/232) of the linkages. Other barriers identified included off-road vehicles, wind turbines, mining operations, railroads, and ski resorts.

Figure 2-4, *Statewide: Primary Barriers to Wildlife Movement*



Note: Graph depicts the number of linkages affected by the primary barriers identified for the state (similar categories were combined).

Twenty-four different types of threats to habitat connectivity were recognized for the state. The primary threats identified included urbanization, roads, agriculture, invasive species, logging, and water diversions. Other threats listed included vineyards, grazing, recreation, mining, off-road vehicles, military, border fencing, flow regime, railroads, habitat conversion, petrol extraction, wind turbines, harbor development, fuel breaks, wild horses, water quality, domestic dogs, and power lines (Figure 2-5, *Statewide: Threats to Connectivity*). Urbanization threatened 61% (141/232) of the linkages identified, 60% (84/141) of which were ranked as severely threatened (rank = four or five). Roads jeopardized 41% (94/232) of the linkages identified, 52% (49/94) of which were ranked as severely threatened. Agriculture threatened 25% (58/232) of the linkages recognized, 43% (25/58) of which were ranked as severely threatened. Invasive species endangered 15% (35/232) of the linkages identified, 31% (11/35) of which were ranked as severely threatened. Logging threatened 9%

(22/232) of the linkages, 73% (16/22) of which were ranked as severely threatened. Water diversions threatened 9% (21/232) of the linkages recognized, 67% (14/21) of which were ranked as severely threatened. A number of threats to connectivity were identified for the state, though the average severity of the threat and the number of linkages affected varied (Figure 2-6, *Statewide: Severity of Threats*). Figure 2-6, average severity of each threat among linkages, reveals similar trends as Figure 2-5, the number of linkages impacted by each threat. The primary threats to connectivity also varied by ecoregion (Figure 2-7, *Statewide: Primary Threats to Connectivity*).

Figure 2-5, *Statewide: Threats to Connectivity*

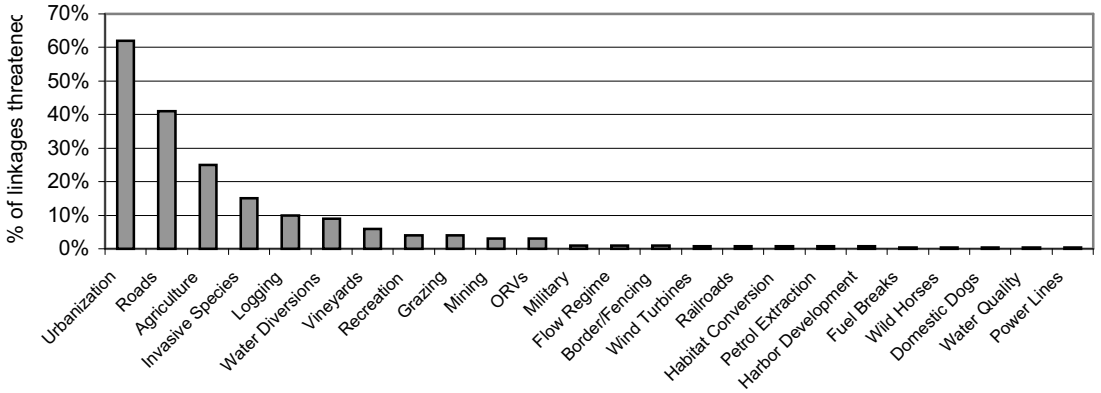
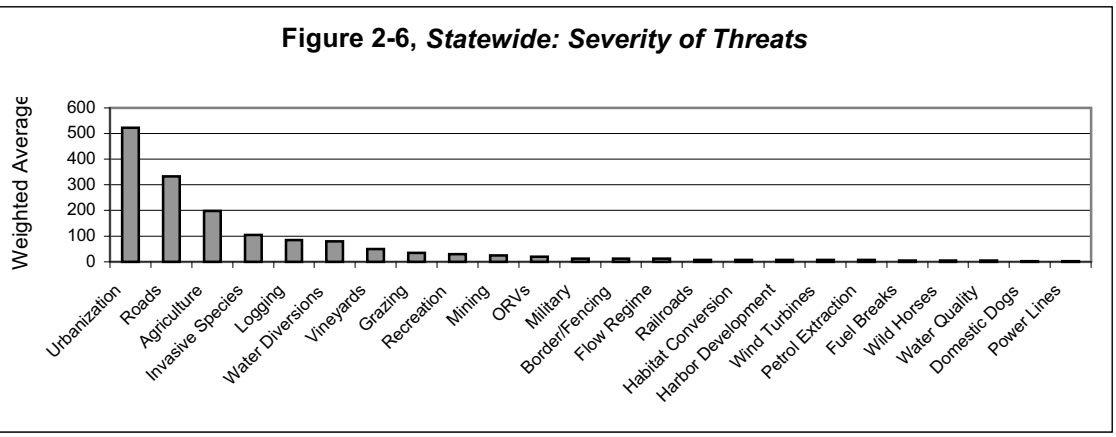
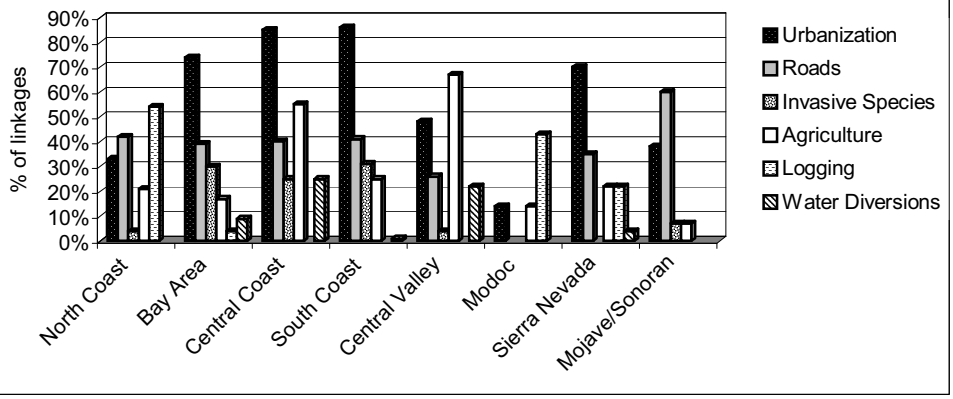


Figure 2-6, *Statewide: Severity of Threats*



Note: The above graph depicts the weighted average of each threat identified for the state. Weighted average = average rank × the number of linkages affected. The severity of each threat was ranked from one to five (one = not severe, five = extremely severe).

Figure 2-7, *Statewide: Primary Threats to Connectivity*

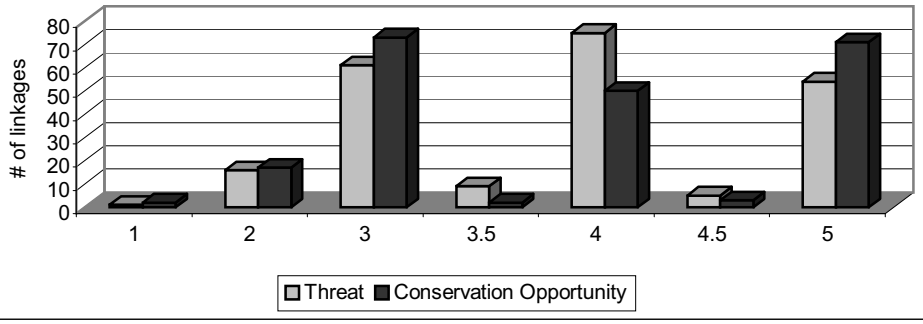


Note: The above graph depicts the percent of linkages affected by the primary threats to connectivity by ecoregion.

Numerous types of threats and barriers were identified by participants that preclude or limit wildlife movement to varying degrees. The consensus was, certain types of barriers may be relatively permeable to some extent, for some species, but as these linkages become more constricted, and less natural, they become less permeable to more and more species.

Conference participants scored the feasibility of conserving the linkage and ranked the overall degree of threat to connectivity (Figure 2-8, *Statewide: Ranking the Priorities*). Statewide, ecoregional team members ranked 55% (127/232) of the linkages as high priorities with good opportunities for conservation (rank = four or five). Overall, 59% (136/232) of the linkages identified were ranked as severely threatened (rank = four or five).

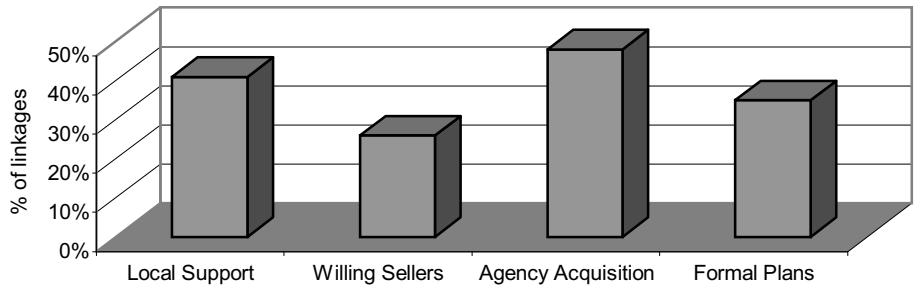
Figure 2-8, *Statewide: Ranking the Priorities*



Note: The above graph compares the number of linkages ranked for each category. Overall threat (one = no threat/secure, five = severe threat/loss imminent), and the feasibility of conserving the linkage (one = not feasible, five = good opportunity).

For each linkage, ecoregional team members also identified whether there was local support for protection, willing sellers, potential for agency acquisition, and whether the linkage was part of a formal conservation plan (Figure 2-9, *Statewide: Linkage Opportunities*). Participants indicated that there was local support for 42% (98/232) of the linkages, and 27% (62/232) of the linkages were identified as having willing sellers in all or a portion of the linkage. Ecoregional team members suggested that potential exists for agency acquisition in 48% (112/232) of the linkages, 41% (46/112) of these linkages were identified as having willing sellers. Finally, 36% (83/232) of the linkages were identified as part of formal conservation plans.

Figure 2-9, *Statewide: Linkage Opportunities*



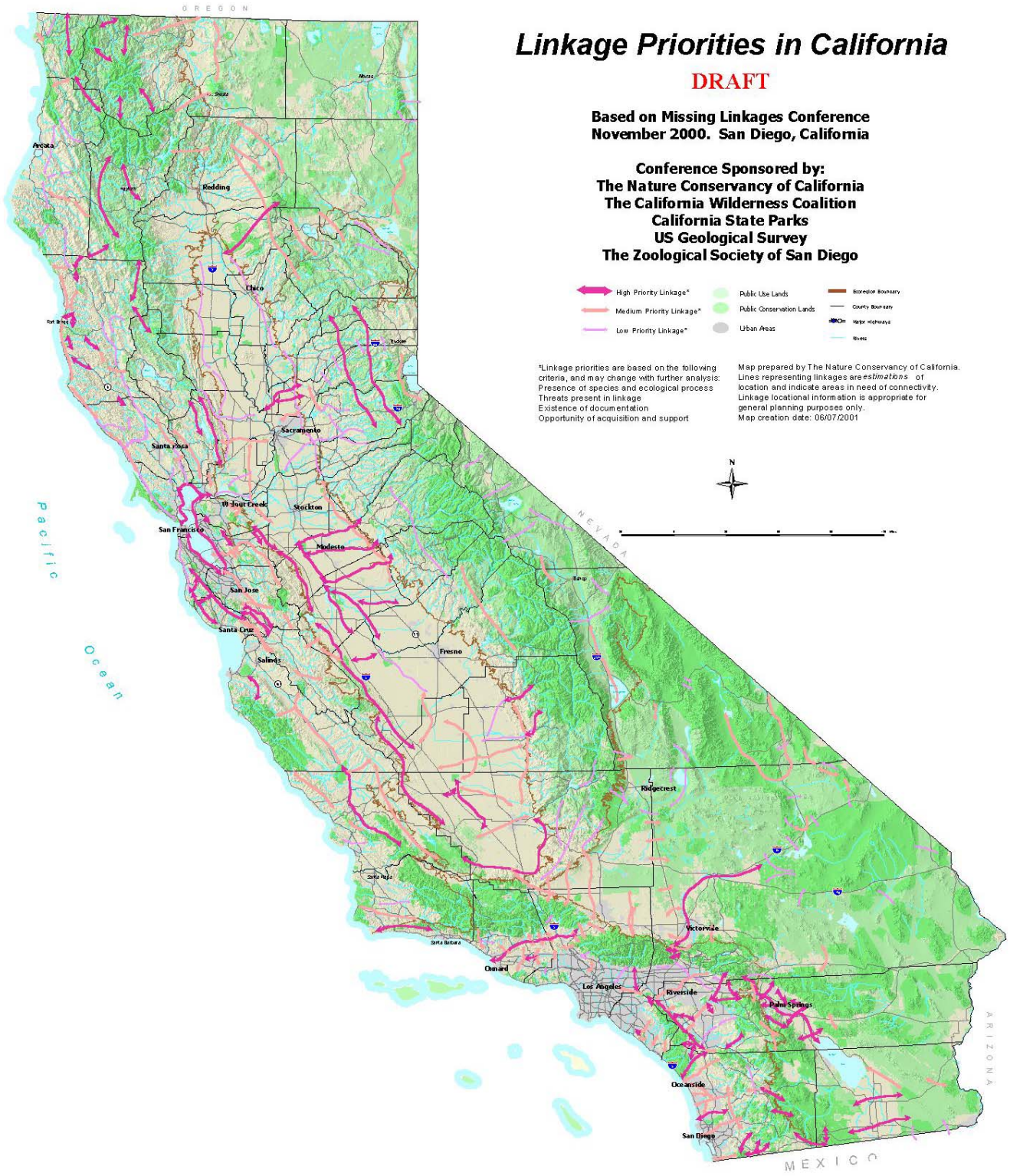
Note: The above graph depicts the percent of linkages identified as having local support, willing sellers, potential for agency acquisition, and existing or proposed formal conservation plans.

Participants suggested a number of different opportunities for protecting and/or restoring habitat connectivity; options in the conservation toolbox included:

- Cooperative agreements
- Conservation easements
- Habitat restoration of movement corridors
- Land Acquisition (public and private)
- Coordination among state and federal agencies, and non-governmental organizations
- Formal conservation plans – Natural Communities Conservation Plans, Multi-Species Habitat Conservation Plans, etc.
- Informal conservation plans
- Habitat Conservation Plans
- Resource Management Plans
- Landowner incentives
- Mitigation banking
- Design and/or enhancement of underpasses
- Department of the Interior – Land Retirement Program

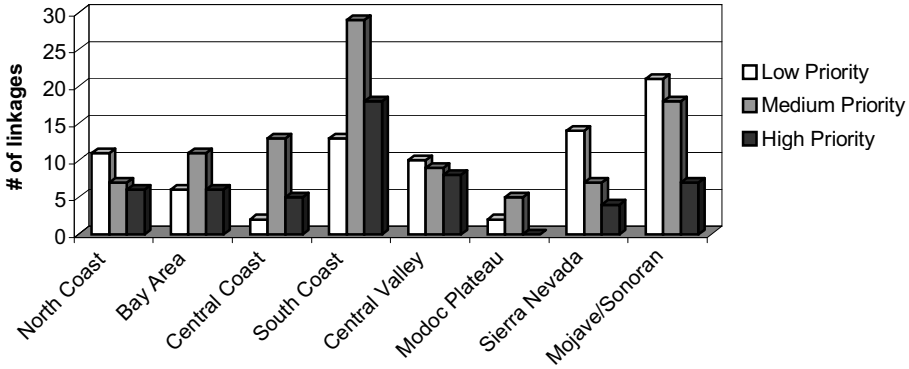
Figure 2-10, *Linkage Priorities in California*, was the result of a statewide analysis designed to prioritize the habitat linkages identified at the *Missing Linkages* conference. The results were based on data taken from four different classes (conservation opportunity, target species, overall threat, and presence of documentation) in the statewide database. Ecoregional team members drew 323 arrows on the base maps provided at the conference, though only 232 Linkage Description Log sheets were completed. Therefore, linkages with multiple arrows on the ecoregional and statewide maps were represented as unique spatial features for GIS mapping purposes. Overall, 23% (54/232) of the linkages were ranked as high priorities (score 10-12), 43% (99/232) were ranked medium (score 7-9), and 34% (79/232) were ranked as low priorities (score ≤-26, *Results of Statewide Analysis*, displays the priority rank for each linkage, while Table 2-3 summaries the results of the analysis by ecoregion.

Of the 232 linkage description log sheets completed, 24 were for the North Coast, 23 for the Bay Area, 20 for the Central Coast, 60 for the South Coast, 27 for the Central Valley, 7 for the Modoc Plateau and Cascades, 25 for the Sierra Nevada, and 46 for the Mojave and


OREGON
Arcata
Redding
Chico
Sacramento
Santa Rosa
Walnut Creek
Stockton
San Francisco
Modesto
San Jose
Santa Cruz
Salinas
Fresno
Ridgecrest
Victorville
Oxnard
Los Angeles
Riverside
Palm Springs
Oceanside
San Diego
NEVADA
ARIZONA
MEXICO
Pacific
Ocean
Linkage Priorities in California
DRAFT
Based on Missing Linkages Conference
November 2000. San Diego, California
Conference Sponsored by:
The Nature Conservancy of California
The California Wilderness Coalition
California State Parks
US Geological Survey
The Zoological Society of San Diego
High Priority Linkage*
Medium Priority Linkage*
Low Priority Linkage*
Public Use Lands
Public Conservation Lands
Urban Areas
Ecoregion Boundary
County Boundary
Major Highways
Rivers
*Linkage priorities are based on the following criteria, and may change with further analysis:
Presence of species and ecological process
Threats present in linkage
Existence of documentation
Opportunity of acquisition and support
Map prepared by The Nature Conservancy of California.
Lines representing linkages are estimations of location and indicate areas in need of connectivity.
Linkage locational information is appropriate for general planning purposes only.
Map creation date: 06/07/2001
N

Sonoran Deserts. Figure 2-11, *Ecoregional Priorities* depicts the number of linkages ranked for each category by ecoregion.

Figure 2-11, *Ecoregional Priorities*



Note: Graph depicts the number of linkages ranked for each category by ecoregion.

Table 2-2, *Results of Statewide Analysis*					
OCCURANCES	**MAP_ID**	**LINKAGE NAME**	**LINKAGE TYPE**	**SCORE**	**RANK**
1	NC01	Humboldt Redwoods-Kings Range/Lost Coast	Landscape linkage	6	Low
1	NC02	Humboldt to Headwaters	Landscape linkage	6	Low
1	NC03	Redwood N.P. & S.P.-Klamath-Siskiyou N.F.	Landscape linkage	5	Low
1	NC04	Redwood N.P. -Headwaters	Choke-point, Missing Link	6	Low
2	NC05	South Fork Eel Riversource	Landscape Linkage, Choke-point	10	High
5	NC06	Mendocino Redwood Circle	Landscape linkage	11	High
1	NC07	South Fork Eel	Landscape Linkage, Missing Link	5	Low
2	NC08	Red Mountain -Sinkyone	Missing Link	9	Medium
4	NC09	Coastal Prairie and Wetlands	Landscape linkage	9	Medium
2	NC10	Yolla Bolly - Snow Mountain Wilderness	Landscape linkage	10	High
1	NC11	Red Mountain - Yolla Bolly	Landscape linkage	11	High
2	NC12	Grizzly Creek to Six Rivers	Missing Link	7	Medium
2	NC13	Headwaters - Boa (Iaqua?) Creek Butte	Stepping Stone	6	Low
1	NC14	Redwood N.P. - Lacks Creek	Landscape linkage	5	Low
1	NC15	Jackson State - Sanhedrin (MNF)	Choke-point, Missing Link	5	Low
2	NC16	Montgomery Woods - Mayacamas	Missing Link	9	Medium
2	NC17	N. Sonoma Coast - Lake Sonoma	Landscape linkage	5	Low
2	NC18	Blue Creek/RNP/Hoopa/Six Rivers	Missing Link	6	Low
9	NC19	Klamath-Siskiyou/North-South	Landscape linkage	10	High
3	NC20	Klamath-Siskiyou - Cascades	Landscape linkage	9	Medium
1	NC21	Lake Sonoma - Cooley Ranch	Landscape linkage	10	High
1	NC22	South Fore Eel - Ten Mile River Mouth	Landscape linkage	9	Medium
1	NC23	Lake Earl - Jed Smith	Landscape linkage	8	Medium
2	NC24	Russian River Riparian Corridor	Landscape linkage	6	Low
1	BA01	Pleasanton Ridge - Las Trampas	Choke-point, Missing Link	12	High
1	BA02	Caldecott Corridor	Choke-point, Missing Link	11	High
1	BA03	Altamont Hills	Choke-point	12	High
2	BA04	Vargas Plateau - Nile Canyon	Choke-point, Missing Link	7	Medium
1	BA05	Sugar Loaf Mtn. - Benecia	Landscape Linkage, Choke-point	9	Medium
1	BA06	Sonoma Mtn.- Maycumas Mtn	Landscape Linkage, Choke-point	9	Medium
1	BA07	Sonoma Mtn.- Burdell Mtn.	Choke-point	6	Low
4	BA08	Santa Cruz Mountains	Landscape Linkage	10	High
1	BA09	Pajaro River	Landscape Linkage	4	Low
1	BA10	Santa Cruz Mtn.- Hamilton Mtn.	Choke-point	9	Medium
1	BA11	Maycumas - Mark West	Landscape Linkage	7	Medium
1	BA12	Santa Cruz Mtns - Gavilan	Landscape Linkage, Choke-point	8	Medium
2	BA13	Clayton Ridge-Mt Diablo-Black Diamond-Concord	Missing Link, Choke-point	8	Medium
3	BA14	Coastal Wetlands for Pacific Flyway	Landscape Linkage, stepping s	6	Low
2	BA15	Blue Ridge - Berryessa Natural Area	Landscape Linkage	11	High
4	BA16	Bay Wetlands	linkages, stepping stones	10	High
1	BA17	North South Cross Delta	Landscape Linkage	8	Medium
1	BA18	Suisun-San Pablo Bay Connection	Choke-point	6	Low
1	BA19	Alameda Creek Watershed	Missing Link, Choke-point	8	Medium

OCCURANCES	MAP_ID	LINKAGE NAME	LINKAGE TYPE	SCORE	RANK
1	BA20	Coyote Creek	Landscape Linkage, Choke-point	7	Medium
1	BA21	Napa River	Landscape Linkage	8	Medium
1	BA22	Russian River	Landscape Linkage	5	Low
1	BA23	Sonoma Creek	Landscape Linkage	6	Low
1	CC01	Santa Cruz - Mt. Hamilton	Landscape Linkage, Choke-point	9	Medium
1	CC02	Highway 152 - Pacheco Pass	Landscape Linkage	9	Medium
1	CC03	Santa Luciz - Gabilan, Ventana Wilderness	Choke point	8	Medium
1	CC04	Fort Ord - Ventana	Missing Link	10	High
1	CC05	Los Padres - Hearst Castle	Landscape Linkage	7	Medium
1	CC06	Cuesta Grade	Landscape Linkage, Missing Link	9	Medium
1	CC07	Montana de Oro - Bald Mountain	Landscape Linkage, Choke-point	6	Low
1	CC08	Via San Antonio -Vandenberg/Sedgewick	Landscape Linkage, Choke-point	6	Low
1	CC09	Santa Ynez River	Choke-point, riparian corridor	8	Medium
1	CC10	Gaviota Coast	Landscape Linkage, Choke-point	10	High
1	CC11	Casitas	Choke-point	8	Medium
1	CC12	S. Diablo - Carizzo	Landscape Linkage	9	Medium
1	CC13	S Luis Reservoir - Pinoche Hills	Landscape Linkage	8	Medium
1	CC14	Hollister - S Luis Reservoir & Pinoche Hills	Landscape Linkage	7	Medium
1	CC15	Pinoche Valley - Hwy 25 corridor	Landscape Linkage	8	Medium
1	CC16	Camp Roberts	Choke-point	8	Medium
1	CC17	Salinas River Riparian Corridor	Landscape Linkage	9	Medium
1	CC18	Uvas Creek	Choke-Point	11	High
1	CC19	Llagas Creek	Missing Link	10	High
1	CC20	Lower N. Salinas River	Landscape Linkage	10	High
1	SC01	Penasquitos Cyn & Carmel Mtn Preserve	Choke-point	10	High
1	SC02	San Diego River	Choke-point	9	Medium
1	SC03	San Diequito River	Choke-point, main corridor	7	Medium
1	SC04	San Luis Rey	Choke-point	9	Medium
1	SC05	Santa Ysabel Valley	Landscape Linkage	9	Medium
1	SC06	San Diego Foothill Corridor	Landscape Linkage	7	Medium
2	SC07	Carlsbad Watershed	Choke-point	8	Medium
3	SC08	Otay Mountain - Cleveland National Forest	Landscape Linkage	10	High
1	SC09	Cuyamaca - Palomar	Landscape Linkage	6	Low
1	SC10	Tijuanna - Otay	Choke-point	9	Medium
1	SC11	San Diequito - Penasquitos	Choke-point	7	Medium
2	SC12	Santa Margarita - Pechanga	Landscape Linkage, Choke-point	10	High
3	SC13	San Jacinto - Santa Rosa	Landscape Linkage	7	Medium
1	SC14	Ventura - Ojai	Choke-point	4	Low
1	SC15	Liberty Canyon - Hwy 101	Choke-point	6	Low
1	SC16	Conejo Grade	Choke-point	4	Low
1	SC17	Somis: Las Posas Hills - South Mountain	Missing Link	7	Medium
1	SC18	Alamos Canyon (Simi - Moorpark)	Landscape Linkage, Choke-point	7	Medium
1	SC19	Tierra Rejada - Santa Rosa Valley	Landscape Linkage, Choke-point	10	High
1	SC20	Simi Hills - Tierra Rejada	Landscape Linkage, Choke-point	7	Medium
1	SC21	Santa Susana Pass	Choke-point	8	Medium

OCCURANCES	MAP_ID	LINKAGE NAME	LINKAGE TYPE	SCORE	RANK
3	SC22	Santa Clara River - Hwy 126 North-South	Landscape Linkage	9	Medium
1	SC23	Ventura - Santa Paula	Missing Link	7	Medium
1	SC24	Hwy 5 - Newhall Pass	Landscape Linkage, Choke-point	7	Medium
1	SC25	Castaic Hwy 5 Undercrossing	Choke-point	5	Low
3	SC26	Soledad Canyon - Mint Canyon	Choke-point	8	Medium
1	SC27	Angeles - Verdugo Mountains	Missing Link	6	Low
1	SC28	Griffith Park - Verdugo Hills	Missing Link	8	Medium
1	SC29	San Gabriel River	Missing Link	6	Low
1	SC30	Puente Chino Hills	Choke-point	9	Medium
1	SC31	Puente-San Jose-San Gabriel	Missing Link, Choke-point	11	High
2	SC32	Cajon Pass	Landscape Linkage, Choke-point	11	High
1	SC33	Saddleback Butte	Landscape Linkage	8	Medium
1	SC34	Lytle Creek Drainage	Landscape Linkage, Choke-point	6	Low
1	SC35	Santa Ana River	Landscape Linkage	8	Medium
1	SC36	San Timoteo Canyon	Landscape Linkage	6	Low
1	SC37	Etiwanda	Choke-point	6	Low
1	SC38	Oak Valley	Landscape Linkage, Choke-point	11	High
1	SC39	Crafton	Landscape Linkage, Choke-point	6	Low
1	SC40	Lakeview	Landscape Linkage	11	High
1	SC41	San Jacinto - Badlands	Landscape Linkage	10	High
1	SC42	San Gorgonio Pass	Landscape Linkage, Choke-point	11	High
1	SC43	Coal Canyon	Choke-point	10	High
1	SC44	Corona - Temecula Foothills	constrained/urban encroachmen	12	High
1	SC45	Bedford Canyon	Choke-point	9	Medium
1	SC46	Gavilin Hills-Santa Ana Mountains	Missing Link, Choke-point	10	High
1	SC47	Bonita Creek	Choke-point	10	High
1	SC48	El Toro Linkage	Missing Link	9	Medium
1	SC49	Laguna Canyon Wilderness Park - Aliso Canyon	Choke-point	9	Medium
1	SC50	Oso Creek	Choke-point	7	Medium
1	SC51	Cristianitos	Landscape Linkage	8	Medium
1	SC52	Gavilan Plateau	Landscape Linkage	10	High
1	SC53	San Jacinto River	Landscape Linkage	8	Medium
2	SC54	De Luz - Sandia Creek	riparian w/ agriculture	11	High
1	SC55	Tenaja	Landscape Linkage	7	Medium
1	SC56	Pechanga Corridor	Landscape Linkage	8	Medium
1	SC57	Palomar - San Jacinto	Landscape Linkage	10	High
1	SC58	Tucalota Creek	Choke-point	5	Low
1	SC59	Hemet	Landscape Linkage	5	Low
1	SC60	Santa Clara River	Landscape Linkage	12	High
1	CV01	Kern River	Choke-point	9	Medium
1	CV02	South End San Joaquin Valley	Landscape Linkage	10	High
1	CV03	Lost Hills - Semitropic Ridge	Missing Link	10	High
1	CV04	Pozo Creek	Missing Link	7	Medium
1	CV05	Hwy 43 - Garces Highway	Missing Link	9	Medium
1	CV06	Deer Creek - Sand Ridge	Missing Link, Choke-point	9	Medium

OCCURANCES	MAP_ID	LINKAGE NAME	LINKAGE TYPE	SCORE	RANK
1	CV07	Kern Refuge - Semitropic Ridge	Missing Link	12	High
4	CV08	Carrizo Plain - W. San Joaquin Valley	Landscape Linkage, Choke-point	12	High
1	CV09	Southeastern Foothills	Landscape Linkage	8	Medium
1	CV10	Tule River	Landscape Linkage, Choke-point	6	Low
1	CV11	Outside Creek - Elk Bayou	Choke-point	5	Low
1	CV12	Kings River	Choke-point	4	Low
1	CV13	Fresno Slough		6	Low
1	CV14	St Johns River - Cross Creek		6	Low
1	CV15	NASL - SR 41	Missing Link	9	Medium
1	CV16	Fresno - Sacramento	Landscape Linkage	9	Medium
1	CV17	West Fresno County	Missing Link	11	High
3	CV18	Madera - Merced linkage	Choke-point, Missing Link	11	High
4	CV19	Lower San Joaquin River	Missing Link	11	High
4	CV20	Sacramento Valley Grasslands	Landscape Linkage	5	Low
1	CV21	Grizzly - Cache Slough	Landscape Linkage	4	Low
1	CV22	Putah Creek	Landscape Linkage	8	Medium
1	CV23	Dry Creek - Natomas E Main Drain - American Ri	Choke-point	7	Medium
2	CV24	Bear River - Coon Creek - Auburn Ravine	Landscape Linkage	10	High
1	CV25	Cosummes River -Mather	Landscape Linkage	4	Low
1	CV26	Valley Crossing	Landscape Linkage	4	Low
1	CV27	Cache Creek - Bear Valley	Landscape Linkage	4	Low
1	MP01	Lassen - Shasta Old Forest	Landscape Linkage, Choke-point	7	Medium
1	MP02	West Lassen - Fisher	Landscape Linkage, Choke-point	9	Medium
1	MP03	Great Basin Riparian	Missing Link	8	Medium
2	MP04	Surprise Valley Bighorn Sheep	Landscape Linkage	5	Low
1	MP05	Fountain Fire	Missing Link	7	Medium
1	MP06	CA - OR Cascades Link	Landscape Linkage	9	Medium
1	MP07	Last Chance	riparian linkage	6	Low
1	SN01	North Fork Tule	riparian	10	High
1	SN02	St. Johns - Cottonwood - Cross Creek	riparian	12	High
1	SN03	Kings River	riparian	8	Medium
1	SN04	Outside Creek - Elk Bayou	riparian	5	Low
1	SN05	N-S Oak woodland in El Dorado	Choke-point	6	Low
1	SN06	Placer County Oak Woodlands	Missing Link	8	Medium
3	SN07	Upper Cosumnes River	Landscape Linkage	5	Low
3	SN08	E. Sierra - White Mountains	Landscape Linkage	6	Low
1	SN09	E. Sierra - Owen's Gorge	Landscape Linkage	7	Medium
3	SN10	Southern Sierra Checkerboard	Landscape Linkage	6	Low
2	SN11	El Dorado - Tahoe N.F. Checkerboard	Missing Link	10	High
4	SN12	Interstate 80 Corridor	Choke-point	6	Low
1	SN13	Tahoe - Shoreline	Missing Link	7	Medium
2	SN14	Lake Almanor	Missing Link	7	Medium
1	SN15	Stanislaus National Forest Recovery	recovery	5	Low
1	SN16	Yosemite - Kings Canyon	Landscape Linkage	8	Medium
1	SN17	Southern Sierra	Choke-point	7	Medium

OCCURANCES	MAP_ID	LINKAGE NAME	LINKAGE TYPE	SCORE	RANK
1	SN18	Area of Special Concern	relict habitat	4	Low
1	SN19	White Mountains - Inyo Mountains	Landscape Linkage	4	Low
1	SN20	White Mountains - Benton Range/Mono Lake	Landscape Linkage	6	Low
1	SN21	Owens Valley	Landscape Linkage	5	Low
1	SN22	Sierra Nevada - Coso Hills	Landscape Linkage, Choke-point	6	Low
1	SN23	Southern Sierra - Chalk Hills	Landscape Linkage	4	Low
1	SN24	South Fork Kern River	riparian	5	Low
1	SN25	Lassen Foothills	Landscape Linkage	10	High
1	DE01	San Gorgonio Crk/Whitewater River/San Gorgonio	Landscape Linkage	9	Medium
2	DE02	Coachella Valley Preserve	Landscape Linkage	11	High
1	DE03	Shavers Valley	Landscape Linkage	7	Medium
2	DE04	Algodones Dune System	Missing Link	5	Low
1	DE05	Algodones Sand Source	Missing Link	8	Medium
2	DE06	Peninsular - Borrego	Landscape Linkage	11	High
2	DE07	Border - Interstate 8	Missing Link	10	High
1	DE08	Morango Valley	Landscape Linkage, Choke-point	5	Low
6	DE09	East West - Imperial - Coachella Valley	Missing Link	11	High
1	DE10	North Santa Rosa - San Jacinto	Choke-point	12	High
1	DE11	East Chocolate - Colorado River	Landscape Linkage, Choke-point	8	Medium
3	DE12	San Gabriels - Tehachapi	Missing Link	8	Medium
1	DE13	Big Rock Creek	Choke-point	7	Medium
6	DE14	395 South of Ridgecrest	Choke-point	9	Medium
1	DE15	Summit Valley	Landscape Linkage	7	Medium
1	DE16	Mojave River - Barstow/Camp Cady	Landscape Linkage	11	High
1	DE17	Clark Mountains	Choke-point	5	Low
1	DE18	Mesquite - Kingston Mountains	Landscape Linkage	5	Low
1	DE19	Interstate 15 - Soda Mountains	Choke-point	5	Low
1	DE20	Silurian Hills - Avawatz Mountains	Landscape Linkage	6	Low
1	DE21	Soda - Avawatz Mountains	Landscape Linkage	6	Low
1	DE22	Mojave Preserve Unit	Choke-point	5	Low
2	DE23	Cady Mountain Potential Core Area	Landscape Linkage	6	Low
1	DE24	Bristol Mountain - MACAGCI	Choke-point	5	Low
1	DE25	Clipper Mountain - Old Womans Mountain	Choke-point	5	Low
1	DE26	Piute Valley E - W	Landscape Linkage	4	Low
1	DE27	Joshua Tree	Landscape Linkage, Choke-point	7	Medium
1	DE28	Granite Mountains - San Bernardino Mtns	Landscape Linkage	7	Medium
1	DE29	Slate Range Crossing	Choke-point	4	Low
2	DE30	Emmigrant Pass	Choke-point	6	Low
1	DE31	Freeman Junction ?	Choke-point	5	Low
1	DE32	Sierra - Coso	Choke-point	7	Medium
1	DE33	Resting Springs	Choke-point	5	Low
1	DE34	Poison Canyon	Choke-point	4	Low
1	DE35	East Searles Valley	Landscape Linkage	5	Low
1	DE36	West Searles Valley	Missing Link	6	Low
1	DE37	Owens Lake	Missing Link	9	Medium

OCCURANCES	MAP_ID	LINKAGE NAME	LINKAGE TYPE	SCORE	RANK
1	DE38	Amargosa River	Landscape Linkage	7	Medium
1	DE39	Dumont Dunes	Other - sand source	6	Low
1	DE40	Panamint Dunes	Other - sand source	6	Low
1	DE41	Darwin Falls	Landscape Linkage, Choke-point	7	Medium
1	DE42	Avawatz Mountains -Silurian Hills	Landscape Linkage	7	Medium
1	DE43	Kingston - Nopah	Landscape Linkage	8	Medium
1	DE44	Kingston - Mesquite	Choke-point	8	Medium
1	DE45	Mesquite - Clark	Landscape Linkage	8	Medium
1	DE46	Whitewater River	Landscape Linkage	12	High

Table 2-3, *Ecoregional Summary of Statewide Analysis*

Ecoregion	Low Priority Linkages	Medium Priority Linkages	High Priority Linkages	Total Linkages
North Coast	11	7	6	**24**
Bay Area	6	11	6	**23**
Central Coast	2	13	5	**20**
South Coast	13	29	18	**60**
Central Valley	10	9	8	**27**
Modoc Plateau & Cascades	2	5	0	**7**
Sierra Nevada	14	7	4	**25**
Mojave & Sonoran Deserts	21	18	7	**46**
Total for State	**79**	**99**	**54**	**232**

3.0 NORTH COAST ECOREGION

The North Coast ecoregion is roughly bound by the Siskiyou Mountains to the north, the Cascade Ranges and the Sacramento Valley to the east, the Russian River to the south, with the Pacific Ocean forming the distinct western boundary (Figure 1-1, *California Regions and Topography*). The primary regional vegetation types are conifer forest, mixed evergreen forest, foothill woodland, mixed chaparral, coastal scrub, and grassland.

Mixed coniferous forests of the Pacific Northwest extend into the two northernmost coastal counties of the region: Del Norte and Humboldt. Here species such as western yew (*Taxus brevifolia*), western hemlock (*Tsuga heterophylla*), Douglas fir (*Pseudotsuga menzeisii*), Sitka spruce (*Picea sitchensis*), grand fir (*Abies grandis*), Port Orford cedar (*Chamaecyparis lawsoniana*) and redwoods (*Sequoia* spp.) are found together in a mixed conifer forest.

Further south along the coast, redwood forests are the dominant habitat type, occurring as far south as Santa Cruz, located in the Central Coast ecoregion. Mixed evergreen forest is a transitional community, between the moisture-loving conifer forests of the coast and the more xeric inland plant communities. Ancient forests were once extensive in the region, but the majority have been logged or developed. Still, remnant patches of these ancient forests persist, and many other areas are now again exhibiting late seral forest characteristics.

Inland, mixed evergreen forests fade out and foothill woodland becomes the dominant habitat type on the slopes of the northern Coast Ranges. Along the interior stream courses of coastal and foothill country are rich riparian communities with cottonwood (*Populus* spp.), white alder (*Alnus rhombifolia*), dogwood (*Cornus nuttallii*) and big-leaf maple (*Acer macrophyllum*). Other habitat types in the region include coastal prairie and estuarine communities, an important habitat for migratory birds on the Pacific Flyway.

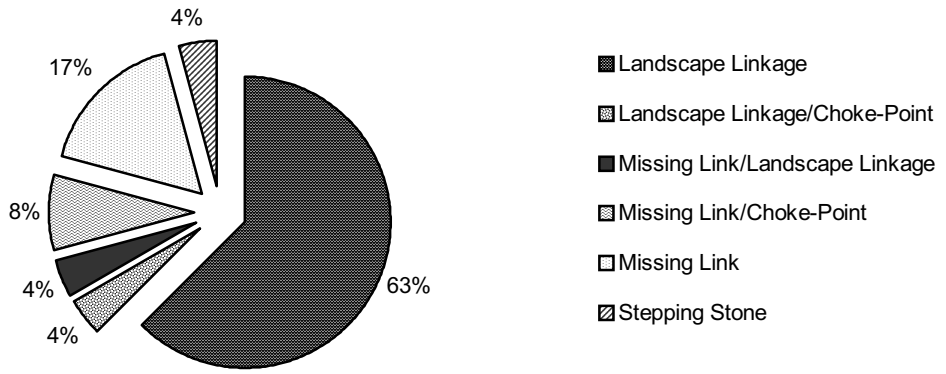
A large portion of the ecoregion is publicly owned. National forests in the region include: Siskiyou, Six Rivers, Klamath, Shasta-Trinity, Mendocino, and Rogue River. Redwood National and State Parks are other publicly owned lands in the ecoregion. The Bureau of Land Management and California State Parks manage additional publicly owned land in the region. The majority of the Coast Ranges and coastal areas are privately owned.

A total of 24 habitat linkages were identified for the region (Figure 3-1, *North Coast: Missing Linkages*). Of the linkages identified, 63% (15/24) were considered Landscape Linkages[1], 17% (4/24) were determined to be Missing Links[2], and 4% (1/24) were identified as Stepping-Stones. Scientists identified some of the linkages as having multiple linkage types: 4% (1/24)

[1] Landscape Linkage = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between different sections of the landscape.
[2] Missing Link = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function.

were considered Choke-Points[3] and Landscape Linkages[1], 4% (1/24) were considered Missing Links[2] and Landscape Linkages[1], and 8% (2/24) were recognized as Missing Links[2] and Choke-Points[3] (Figure 3-2, *North Coast: Types of Linkages*).

Figure 3-2, *North Coast: Types of Linkages*

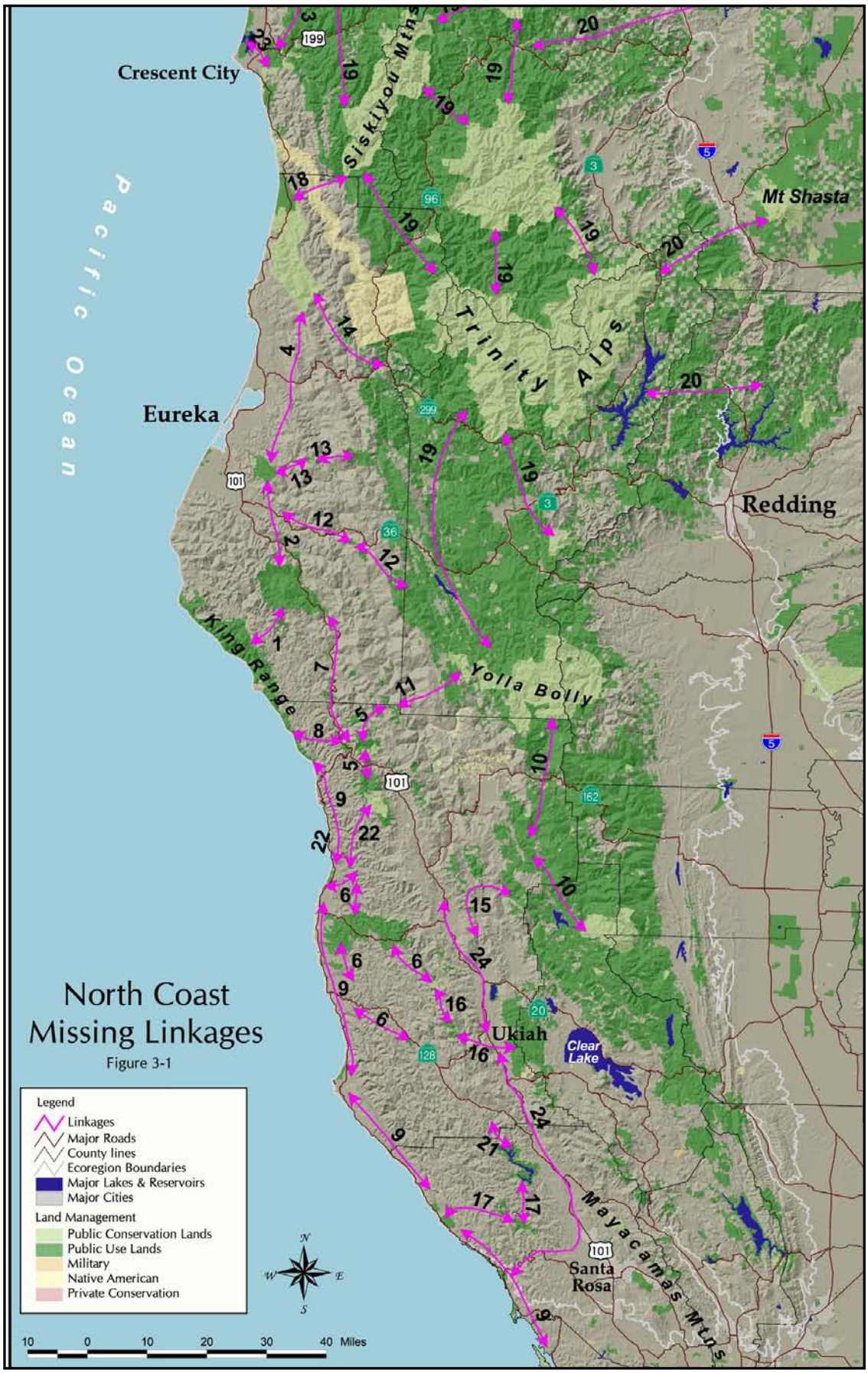


The key species used to identify the linkages belonged to a few taxonomic groups. Mammals recognized as key species included pine marten (*Martes americana*), Pacific fisher (*M. pennanti*), wolverine (*Gulo gulo*), black bear (*Ursus americanus*), gray wolf (*Canis lupus*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), mule deer (*Odocoileus hemionus*), river otter (*Lutra canadensis*), and ringtail (*Bassariscus astutus*). Birds listed as key species included marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis caurina*), falcon (*Falco* spp.), goshawk (*Accipiter gentiles*), acorn woodpecker (*Melanerpes formicivorus*), snowy plover (*Charadrius alexandrinus nivosus*), and Aleutian Canadian goose (*Branta canadensis leucopareia*). Fish identified as key species included Coho salmon (*Oncorhynchus kisutch*) and southern steelhead trout (*Oncorhynchus mykiss*). Both single and multiple key species were used in identifying the linkages; 58% (14/24) recognized mammals as key species, 46% (11/24) used birds and 33% (8/24) used fish. Mammalian carnivores were recognized as key species in 50% (12/24) of the linkages.

Existing features that facilitate animal movement in the ecoregion are varied. Some are large contiguous parcels of habitat, others, stepping-stones consisting of either remnant patches of old growth or second-growth forests. In some of the linkages, ridge-tops were identified as connectivity conduits between watersheds. Riparian corridors were also recognized as important linkage features in the region. However, some riparian corridors were identified as Choke-Points[3] where underpasses at major highway crossings provide the only passage.

The primary barriers to animal movement in the region also varied. Habitat gaps due to logging were identified as barriers in 50% (12/24) of the linkages. Roads have fragmented habitat at multiple scales, from roads associated with extractive activities, such as logging, to major highways; Highways 101, 5, and 299 were specifically mentioned as major barriers. Rural residential and ranching operations, and the associated roads, fences and development

[3] Choke-Point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas").

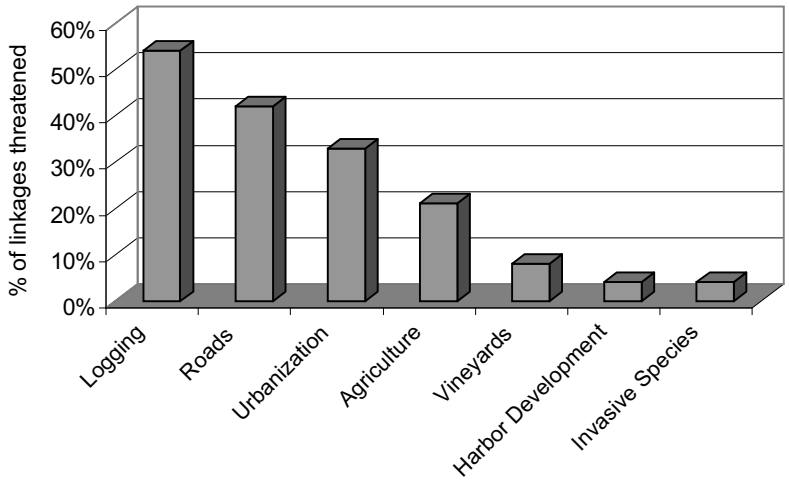

Crescent City
Eureka
Redding
Mt Shasta
Ukiah
Clear Lake
Santa Rosa
Pacific Ocean
Siskiyou Mtns
Trinity Alps
King Range
Yolla Bolly
Mayacamas Mtns
North Coast
Missing Linkages
Figure 3-1
Legend
Linkages
Major Roads
County lines
Ecoregion Boundaries
Major Lakes & Reservoirs
Major Cities
Land Management
Public Conservation Lands
Public Use Lands
Military
Native American
Private Conservation
N
W
E
S
10 0 10 20 30 40 Miles

were also identified as impediments to wildlife passage. Dams, culverts and river down cutting were the principal barriers identified for the riparian habitat linkages.

Habitat types identified in need of restoration included forest, chaparral, grassland, riparian, and wetland. Of the linkages identified, 38% (9/24) listed forest restoration as a need to re-establish connectivity, while 4% (1/24) mentioned improved forestry practice and retention of second growth forest. In a few of the linkages, road closures were identified as a central component of restoring connectivity. In some of the riparian linkages, land practices such as river down cutting and cattle grazing were listed as issues that need to be addressed. Participants felt that plans for restoring habitat linkages need to be developed, implemented, and monitored for use by target species.

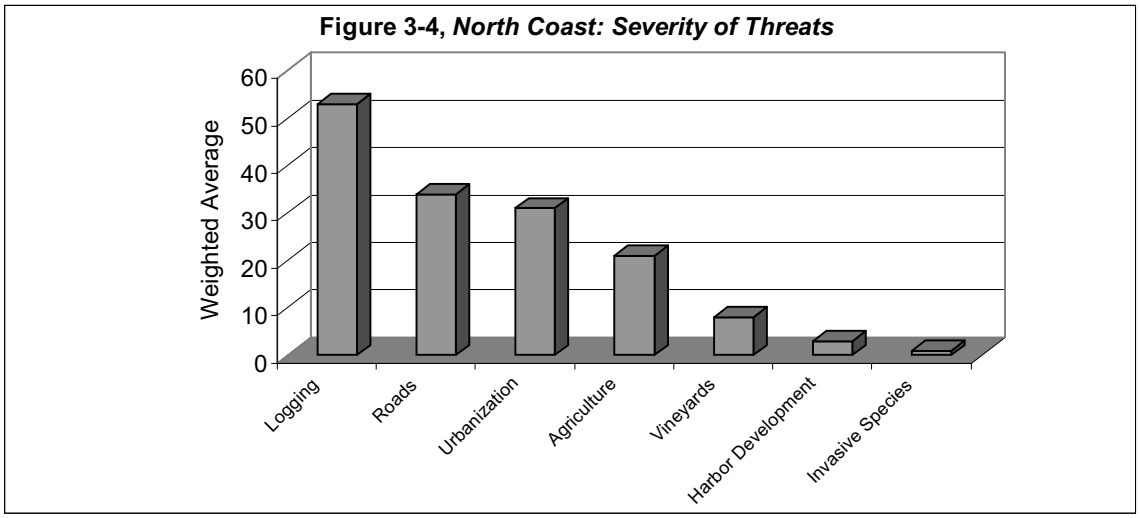
The primary threats to connectivity identified in the ecoregion included logging, roads, urbanization, and agriculture; other acknowledged threats included vineyard expansion, harbor development, and invasive species (Figure 3-3, *North Coast: Threats to Connectivity*). Of the linkages identified 67% (16/24) are owned, all or in part,

Figure 3-3, *North Coast: Threats to Connectivity*



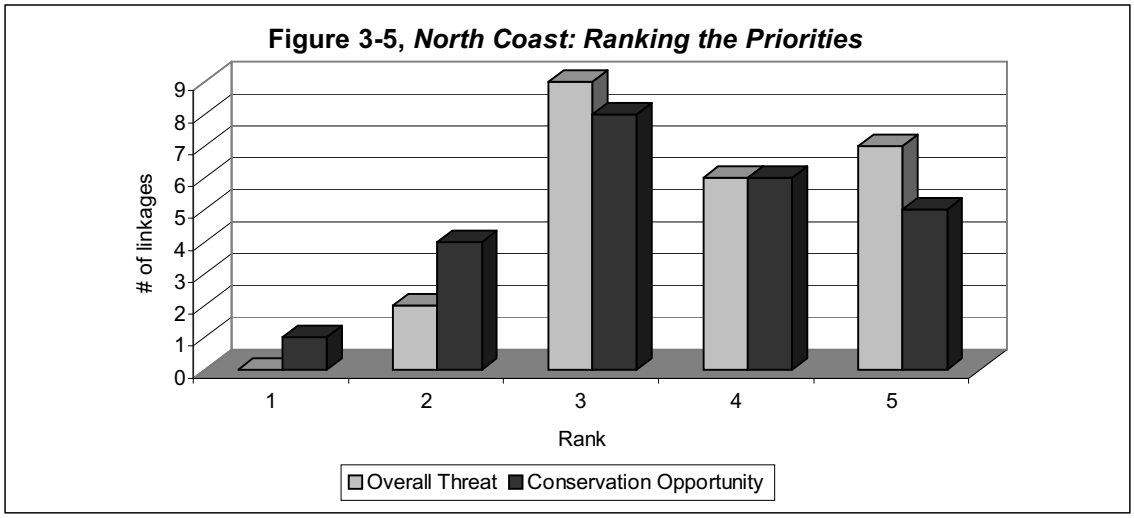
by industrial timber companies. Overall, 54% (13/24) of the linkages are threatened to some degree by logging, 77% (10/13) of which were ranked as severely threatened (rank = four or five). Roads jeopardized 42% (10/24) of the linkages identified, 40% (4/10) of which were ranked as severely threatened. Urbanization threatened 33% (8/24) of the linkages identified, 50% (4/8) of which were ranked as severely threatened. Agriculture was listed as a threat to connectivity in 21% of the linkages identified, 80% (4/5) of which were listed as severely threatened. Vineyards were identified as a threat in 8% (2/24) of the linkages, while harbor development and invasive species were listed as a threat in 4% (1/24) of the linkages. A number of threats to habitat connectivity were identified for the region, though the average severity of the threat and the number of linkages affected varied. The weighted average (average rank × number of linkages affected) was calculated for each threat identified to determine the severity of each threat in the region (Figure 3-4, *North Coast: Severity of Threats*). Figure 3-4, average severity of each threat among linkages, reveals similar trends as Figure 3-3, the number of linkages impacted by each threat.

Figure 3-4, *North Coast: Severity of Threats*



Note: The above graph depicts the weighted average of each threat identified. Weighted average = average rank × number of linkages affected. The severity of each threat was ranked from one to five (one = not severe, five = extremely severe).

Figure 3-5, *North Coast: Ranking the Priorities*

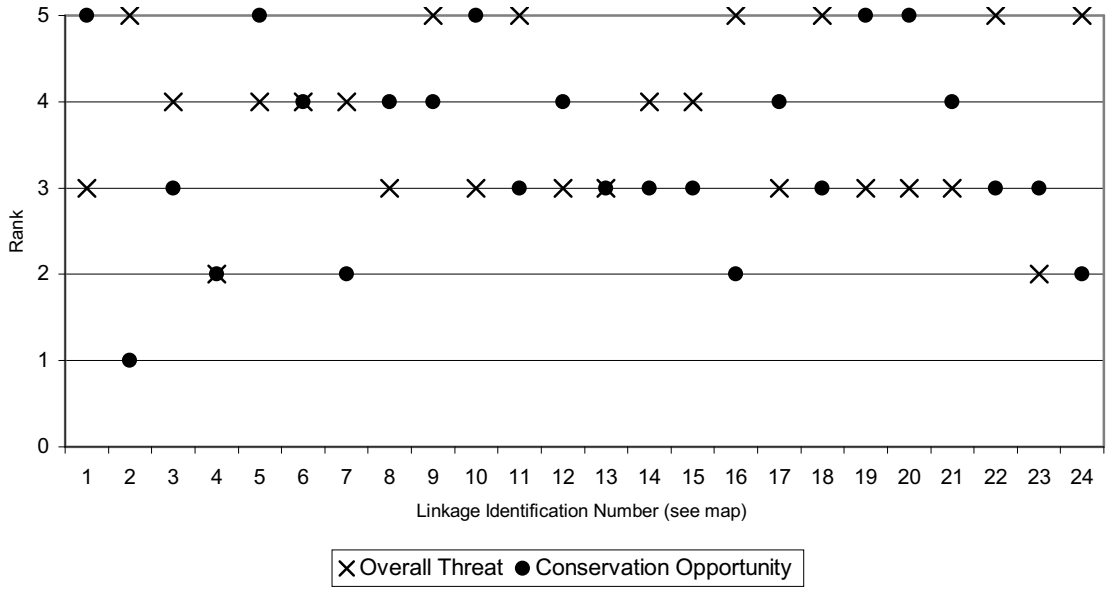


Note: Graph compares the number of linkages ranked for overall threat and conservation opportunity.

Conference participants also scored the feasibility of conserving the linkage and ranked the overall threat to connectivity (Figure 3-5, *North Coast: Ranking the Priorities*). Scientists ranked 46% (11/24) of the linkages as high priorities with good opportunities for conservation (rank = four or five), 45% (5/11) of which were ranked five (Figure 3-1, *North Coast Missing Linkages,* Map ID#s 1, 5, 10, 19, 20). These included the Humboldt Redwoods-Kings Range/Lost Coast linkage (Map ID# 1), South Fork Eel Riversource linkage (Map ID# 5), Yolla Bolly – Snow Mountain Wilderness linkage (Map ID# 10), Klamath/Siskiyou-North/South linkage (Map ID#19), and the Klamath/Siskiyou – Cascades linkage (Map/ID#20); all of which were identified as Landscape Linkages[1]. The overall threat to these linkages was ranked moderately (rank = three), with the exception of the South Fork Eel Riversource, where the overall degree of threat was ranked as four. Brief descriptions are provided below for the top ranked conservation opportunities. Overall, 54% (13/24) of the linkages identified were ranked as severely threatened (Figure 3-5, *North Coast: Ranking the Priorities*). A

comparison of how individual linkages were ranked is depicted in Figure 3-6, *North Coast: Degree of Threat and Conservation Opportunities*.

Figure 3-6, *North Coast: Degree of Threat & Conservation Opportunities*



Note: The above graph compares how each linkage was ranked for overall threat (one = no threat/secure, five = severe threat/ loss imminent) and the feasibility of conserving the linkage (one = not feasible, five = good opportunity).

The Humboldt Redwoods-Kings Range/Lost Coast linkage (Figure 3-1, *North Coast: Missing Linkages,* Map/ID# 1) was identified as a Landscape Linkage[1]. Participants identified the linkage as providing ancient forest connectivity for forest carnivores and salmon, from the Humboldt Redwoods to the Kings Range/Lost Coast area. Landownership in the linkage was listed as both public and private. Publicly owned land is administered by the Bureau of Land Management and California State Parks, while privately owned land is managed by ranchers and industrial timber companies. The area has been subject to timber harvest, but maintained in large blocks of contiguous forest. Timber harvest and sub-division were the primary threats identified. Participants indicated that the linkage is part of an existing, non-formal conservation plan and that the potential exists for agency acquisition (Figure 3-7, *Gilham Butte: Connecting Humboldt Redwoods State Park and the BLM Kings Range Conservation Area*). Please refer to the corresponding Linkage Description Log sheet for more specific information.

The South Fork Eel Riversource linkage (Figure 3-1, *North Coast: Missing Linkages,* Map ID# 5) was identified as a Landscape Linkage[1] providing old growth forest connectivity for the northern spotted owl and spawning grounds for coho salmon. This linkage was described as a mixed evergreen old growth forest consisting of species such as Douglas fir, tanoak and madrone. The linkage contains an area identified in the Northern Spotted Owl Recovery Plan, including a twenty-pair recovery area. This linkage is managed under the Northwest Forest Plan and is directed by the Bureau of Land Management (1995) Resource Management Plan. Highway 101 was named as the most significant barrier to movement. Acquisition of private inholdings and the creation of wildlife over/underpasses were both

identified as opportunities for restoring connectivity. Participants identified this linkage as part of the California Wild Heritage Campaign, which includes areas proposed as Wilderness, and Wild and Scenic Rivers (Figure 3-8, *Potential Wild River in Northwestern California, the South Fork Eel Riversource*). Participants indicated that there are currently gaps in public ownership and opportunities for collaboration among federal, state, and private entities to negotiate with willing sellers. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The Yolla Bolly to Snow Mountain linkage (Figure 3-1, *North Coast: Missing Linkages,* Map ID# 10) was identified as a Landscape Linkage[1]. This linkage was also identified as part of the California Wild Heritage Campaign (Figure 3-9, *California Wild Heritage Campaign: Potential Wilderness and Wild Rivers, Citizen's Inventory, Northwestern California*). The linkage was recognized as providing connectivity for numerous key species including, the Pacific fisher, mountain lion, northern spotted owl, goshawk, steelhead, and the primary prey of mountain lion, mule deer. This linkage is also managed under the Northwest Forest Plan and directed by the Bureau of Land Management (1995) Resource Management Plan. Clearcuts and roads were recognized as the primary impediments to wildlife movement, while riparian habitat and deep canyons were listed as the primary linkage features. Please refer to the corresponding Linkage Description Log sheet for more specific information.

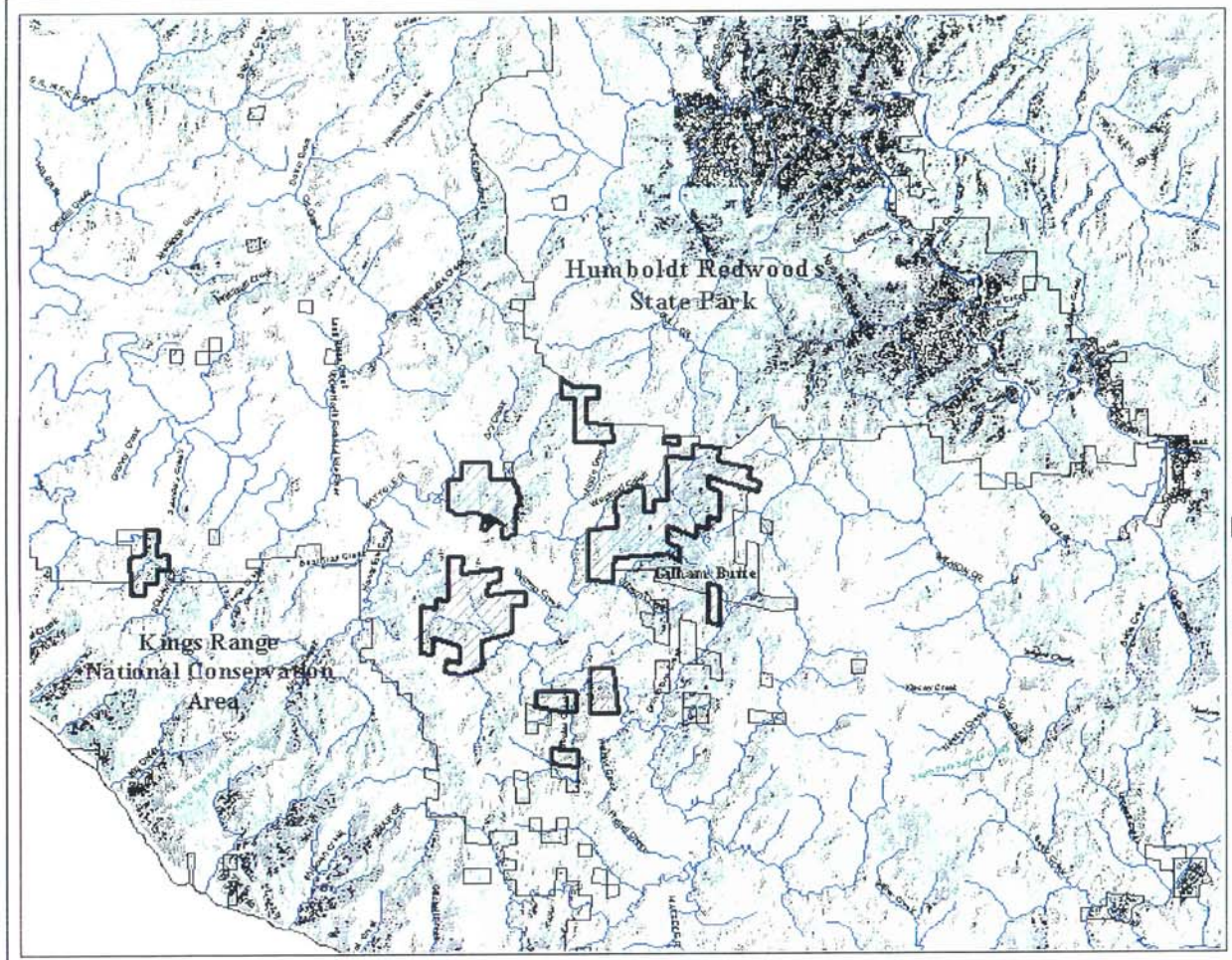
Both the Klamath-Siskiyou/North-South linkage and the Klamath-Siskiyou-Cascades linkage were identified as Landscape Linkages[1] (Figure 3-1, *North Coast: Missing Linkages,* Map ID#s 19 & 20). The importance of both of these linkages has been documented in the Klamath-Siskiyou Conservation Assessment (Noss and Strittholt 1999). This is a comprehensive conservation plan covering the entire Klamath-Siskiyou ecosystem of Oregon and California; roughly half of the North Coast ecoregion is covered in the study area (Figure 3-10, *Klamath-Siskiyou Ownership*).

Noss and Strittholt (1999) used the Pacific fisher as the primary focal species for their analysis. Road density was also assessed to determine habitat suitability for other large carnivores, all of which require large core habitat, with connectivity between subpopulations. The study also examined special elements such as listed species, old growth forest, serpentine geology, watersheds free of the Port Orford Cedar disease, and watersheds with strong salmon runs (Noss and Strittholt 1999).

The primary threats identified for these two linkages (Map ID#s 19 & 20) included logging and roads, while road closures and forest restoration were specified as restoration priorities. The primary barriers identified were intense logging and major highways; Interstate 5 was listed for the Klamath-Siskiyou-Cascades linkage, and Highway 299 was mentioned for the Klamath-Siskiyou/North-South linkage. Roadless areas have been mapped for the Klamath Siskiyou region (Figure 3-11, *Klamath Siskiyou Roadless Areas Prioritization*). Please refer to the corresponding Linkage Description Log sheets for more specific information.

The Klamath Siskiyou Conservation Assessment provides additional documentation for a number of the linkages identified at the *Missing Linkages* conference. Figure 3-12, *Klamath Siskiyou Proposed Reserve Design Phase I & II*, coincides with linkages 10, 11, 12, 18, 19, and 20 in Figure 3-1, *North Coast: Missing Linkages*.

Gilham Butte:
Connecting Humboldt Redwoods State Park and the BLM King Range Conservation Area



This map shows public and private lands within the potential Gilham Butte Ancient Forest Core Reserve Network, based on tree size information generated from 1994 classified generalized Wildlife Habitat Relationship (WHR) model. The Gilham Bute area provides a link for local wildlife movement between Humboldt Redwood State Park and King Range National Recreation Area.

Legend

- Rivers & Streams (1:100K)
- Public Ownership Boundary
- Eel River Saw Mill Property
- Very Large Trees - >36in
- Large Trees - 24-36in
- Medium Trees - 11-24in
- Other

This map was produced by:
LEGACY
The Landscape Connection
Post Office Box 59
Arcata, California 95518
(707)826-9408
email: legacy@legacy-tlc.org
Curtice Jacoby, Christine Klein, Sarah Balster

Figure 3-7, *Gilham Butte: Connecting Humboldt Redwoods State Park and the BLM Kings Range Conservation Area*

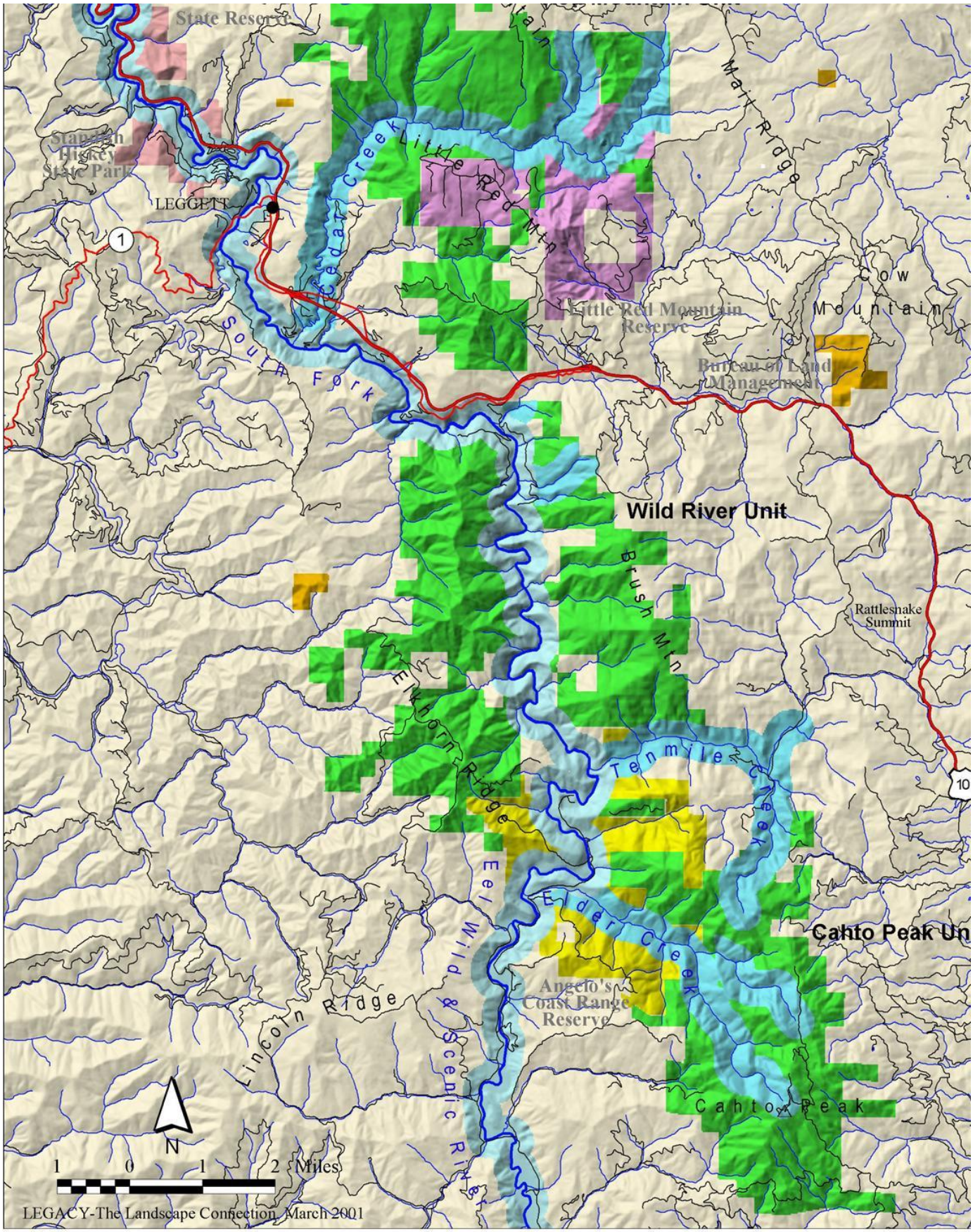


Figure 3-8, Potential Wild River in Northwestern California, the South Fork Eel Riversource

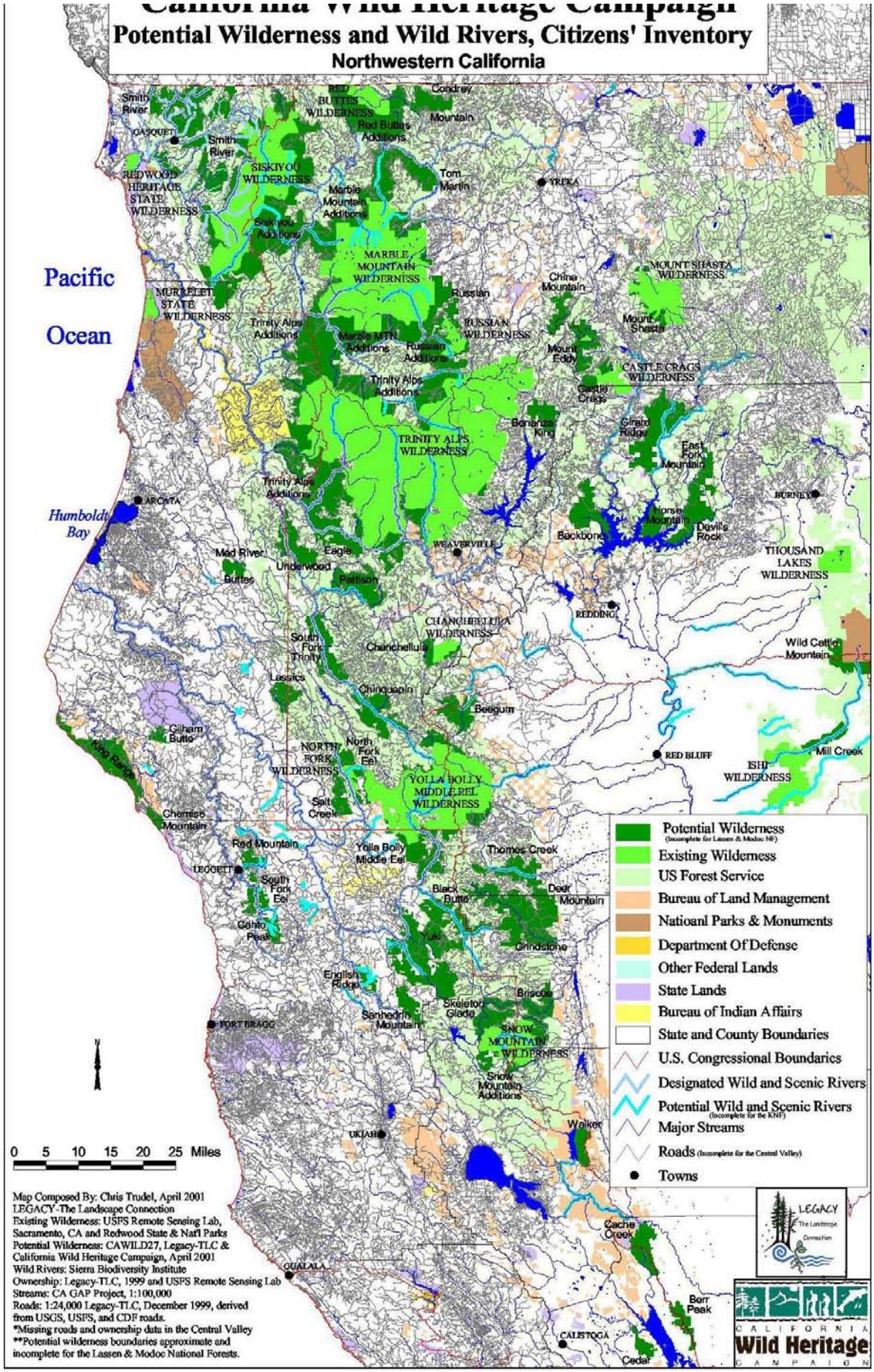


Figure 3-10, California Wild Heritage Campaign: Potential Wilderness and Wild Rivers, Citizen's Inventory, Northwestern California

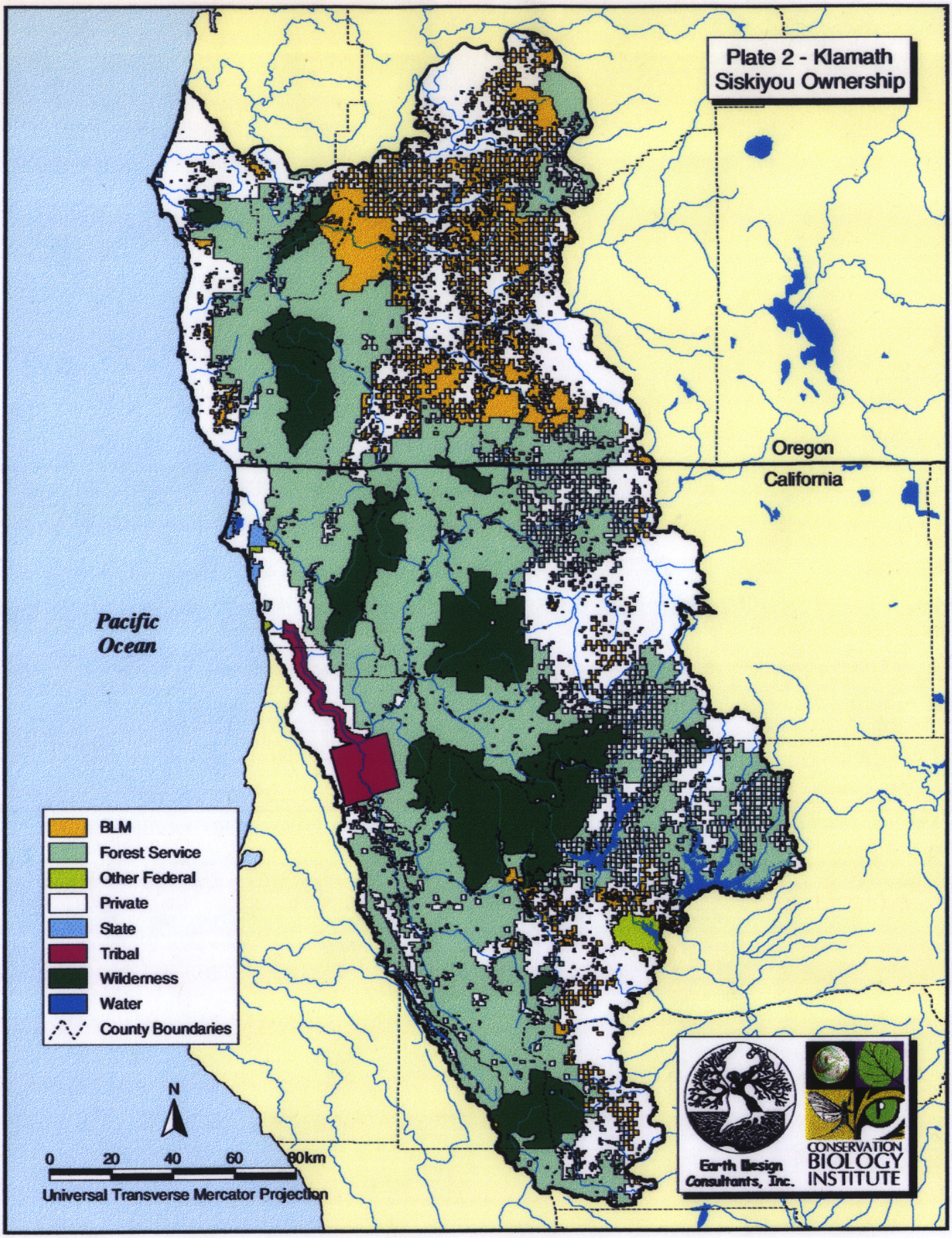


Plate 2 - Klamath
Siskiyou Ownership
Oregon
California
Pacific
Ocean
BLM
Forest Service
Other Federal
Private
State
Tribal
Wilderness
Water
County Boundaries
N
0
20
40
60
80km
Universal Transverse Mercator Projection
Earth Design
Consultants, Inc.
CONSERVATION
BIOLOGY
INSTITUTE

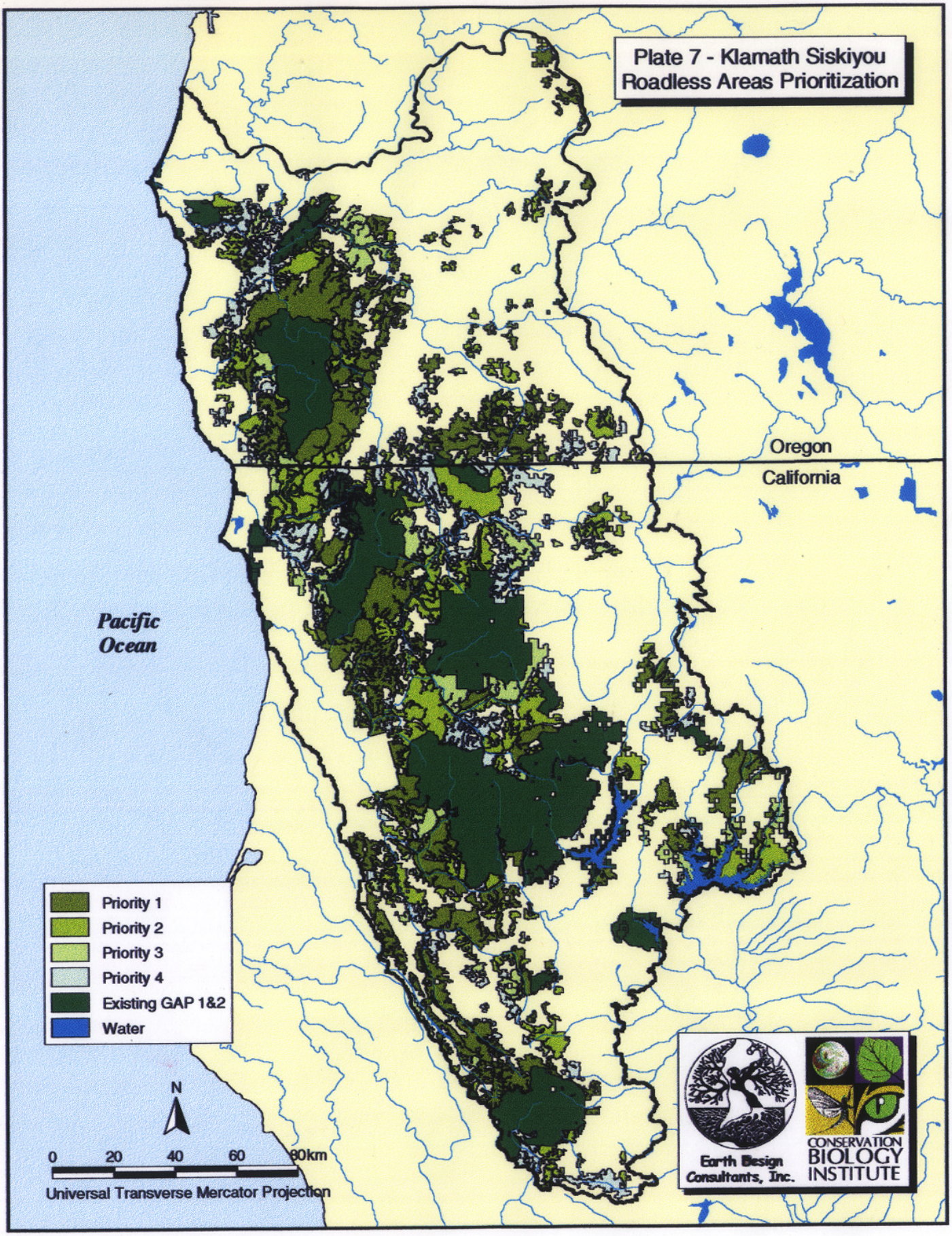


Plate 7 - Klamath Siskiyou
Roadless Areas Prioritization
Oregon
California
Pacific
Ocean
Priority 1
Priority 2
Priority 3
Priority 4
Existing GAP 1&2
Water
N
0
20
40
60
80km
Universal Transverse Mercator Projection
Earth Design
Consultants, Inc.
CONSERVATION
BIOLOGY
INSTITUTE

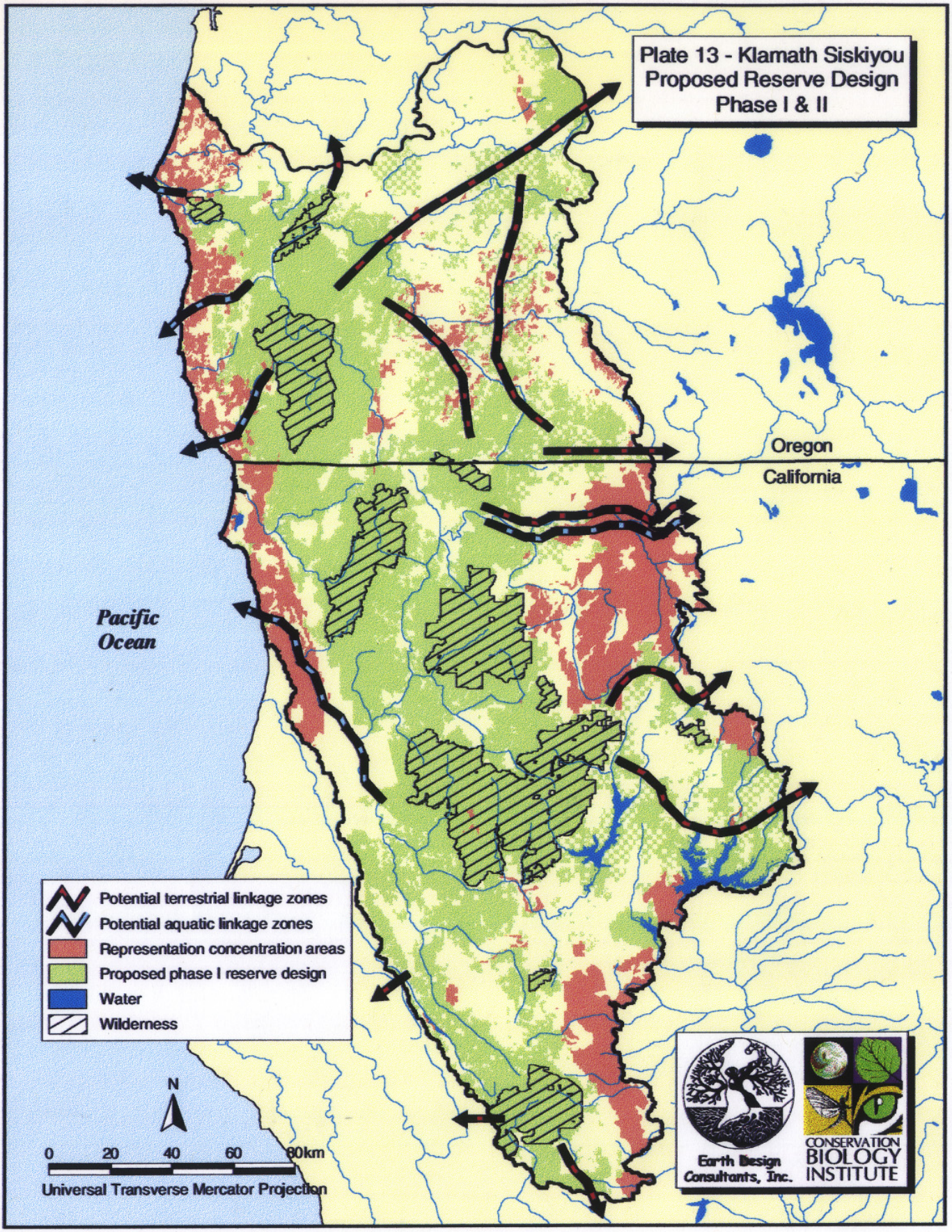


Plate 13 - Klamath Siskiyou
Proposed Reserve Design
Phase I & II
Oregon
California
Pacific
Ocean
Potential terrestrial linkage zones
Potential aquatic linkage zones
Representation concentration areas
Proposed phase I reserve design
Water
Wilderness
N
0
20
40
60
80km
Universal Transverse Mercator Projection
Earth Design
Consultants, Inc.
CONSERVATION
BIOLOGY
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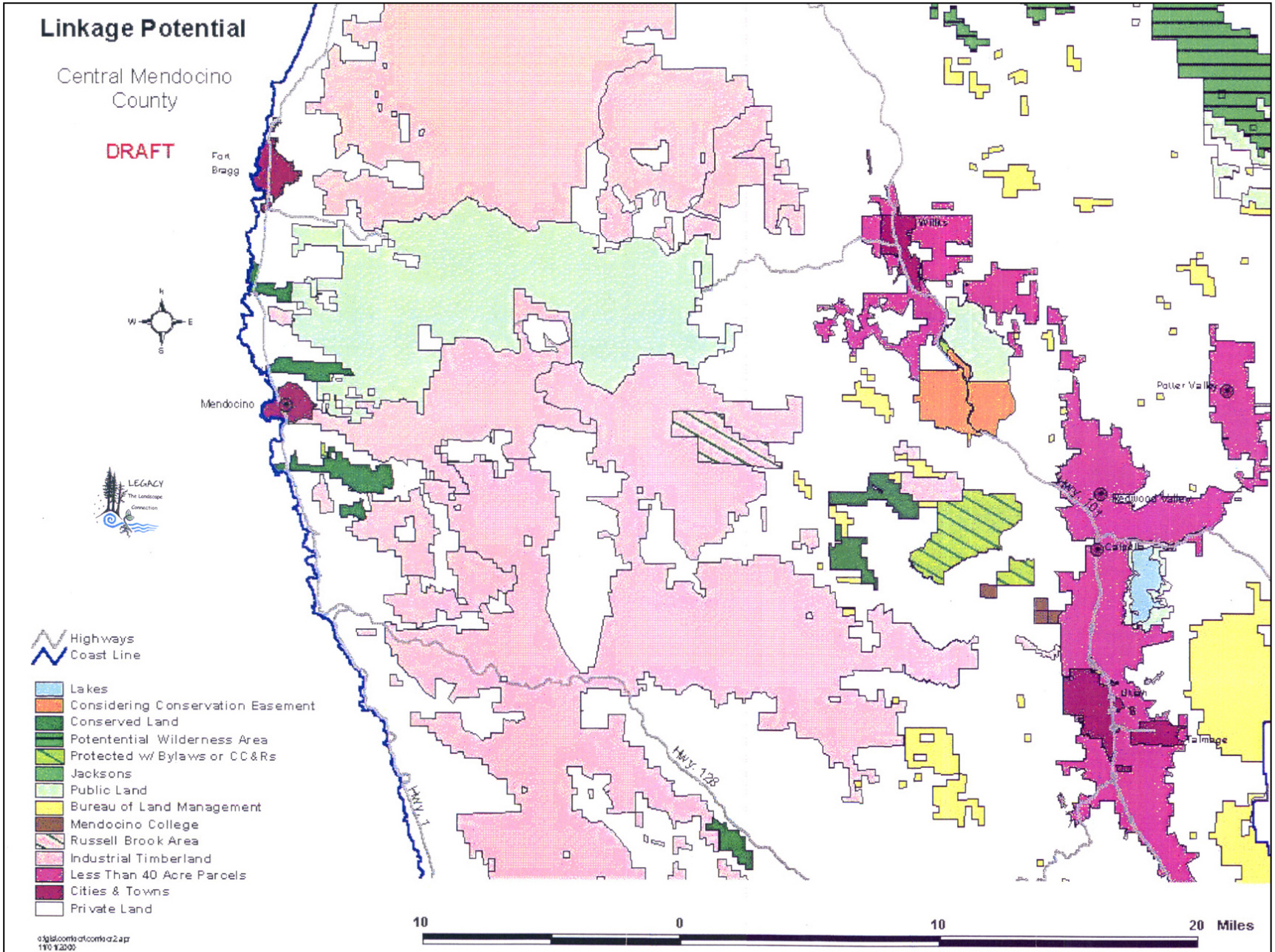


Figure 3-13, *Linkage Potential Central Mendocino County*

Participants from Legacy: The Landscape Connection, provided Figure 3-13, *Linkage Potential Central Mendocino County*. This map provides additional documentation for a number of linkages identified at the conference (Figure 3-1, *North Coast: Missing Linkages,* Map ID#s 6, 9, 15, and 16).

Documentation referenced for some of the linkages included (see Appendix C, *Connectivity References*, for complete citation, if provided):

- Arcata Bureau of Land Managemet/Ukiah District Sustained Yield Environmental Impact Statement
- Resource Management Plan, Bureau of Land Management
- California Natural Diversity Database
- Non-Industrial Timber Management Plan
- Mendocino National Forest Resource Management Plan
- Northwest Forest Plan
- Interagency Scientific Committee on Spotted Owl for Northwest Forest Plan
- Redwood Sciences Lab data for Larabee Buttes
- Klamath-Siskiyou Conservation Assessment, Noss and Strittholt
- Timber harvest plans
- Documentation of bird use

Participants indicated that 38% (9/24) of the linkages have willing sellers in all or a portion of the linkage. Potential exists for agency acquisition in 42% (10/24) of the linkages, 50% (5/10) of which were identified as having willing sellers (Figure 3-1, *North Coast: Missing Linkages,* Map ID#'s 1, 5, 6, 18, & 21). In addition, 60% (3/5) of the top ranked conservation opportunities (Map ID#'s 1, 5, & 10) were noted as having willing sellers, 67% (2/3) of which have the potential for agency acquisition (Map ID#'s 1 & 5). Other opportunities identified to secure or restore connectivity function included developing landowner incentives for conservation easements, designating Wilderness areas, formal conservation plans, working with federal and state agencies on management directives, and purchasing key tracts of cut-over land from industrial timber companies.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Redwoods to the Sea
Ecoregion: North Coast
Map Name/ID#: 1

Key contact for this linkage (optional) Ruskin Hartley
Telephone #: 415/362-2352
Email: rhartley@savetheredwoods.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Ancient forest connectivity: Humboldt Redwoods to King Range/Lost Coast. Key species: salmon, forest carnivores.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Timber harvest	4
Sub-division	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 [5]
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support for improved stewardship. Agency acquisition: BLM, State Parks. Part of non-formal conservation plan.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Forest restoration, watershed restoration

5. Provide brief description of the linkage:

Major Habitat Types: Ancient forest: Redwood and Doug fir

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): forest

Major landowners: BLM, State Parks, large private ranches, industrial timber (Pacific Lumber)

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): timber harvest areas

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Area has been subject to timber harvest, but maintained in large land owner blocks with contiguous forest cover .

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Studies to evaluate species movement in area.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Humboldt to Headwaters
Ecoregion: North Coast
Map Name/ID#: 2

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

]	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	1	Other potential choke-point & missing link

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Ancient redwood forest connectivity

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Timber harvest	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Land ownership primarily Pacific Lumber, under Headwaters HCP/SYP

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Improved forestry, restoration

5. Provide brief description of the linkage:

Major Habitat Types: Redwood forest

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): forest land

Major landowners: Pacific Lumber/Maxam

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): forest management, Hwy 101

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): forest cover, Redwood “lesser cathedral groves”, limited protection under HCP/SYP

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): evaluate and document

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: Landowner is problematic

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Redwood NP & SP – Klamath Siskiyou NF
Ecoregion: North Coast
Map Name/ID#: 3

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Ancient redwood forest

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Roads	4
Timber harvest	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

Existing public ownership

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Redwood forest and other forest types

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Forest

Major landowners: Redwood National Park, National Forest, Private industrial timber lands

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Forest cover, riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Design it, evaluate its success, purchase it

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Redwood NP - Headwaters
Ecoregion: North Coast
Map Name/ID#: 4

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Late seral redwood forest ecosystem and related species (e.g. marbled murrelet)

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Stepping stones would be created with land owner incentives.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Late seral forest and related legacy attributes are missing as are many dependent species.

5. Provide brief description of the linkage:

Major Habitat Types: Redwood forest

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): industrial forest land, Ag, rural, urban

Major landowners: Simpson Timber, PALCO, many private landowners

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): clearcuts and lack of legacy elements like large old trees for nesting, large logs and snags, and clear, cold sediment-free streams.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): remnant late seral patches

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): grow back late seral habitats and monitor use by keystone species

9. What scientific documentation is available demonstrating the value of the linkage? Marbled murrelet work

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: South Fork Eel Riversource
Ecoregion: North Coast
Map Name/ID#: 5

Key contact for this linkage (optional) Steven Day
Telephone #: 707/272-1323
Email: maprap@humboldt.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Northern spotted owl – 20 pr recovery area in the defunct State Owl Recovery Plan, coho salmon spawning, mixed evergreen old growth forest

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Roadway US 101	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
] willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Need wildlife overpass between BLM and CDFG Wildlife Conservation Board at Red Mountain to BLM South Fork Eel University of CA Berkeley Angelo Reserve and BLM Cahto Peak, potential for Arcata BLM acquisition (see attached map).

What are the most important restoration needs (describe types of habitat, degree of restoration needed): acquire private inholdings, particularly Miller Investments (560 acres), and other small parcels in the "wild" segment of State & Federal Wild & Scenic River. Buffer all around pristine Elder Creek Watershed.

5. Provide brief description of the linkage:

Major Habitat Types: Mixed evergreen old growth forest: Douglas fir, Tanoak, Madrone

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM, State Department of Fish and Game, UC Berkeley, Mendocino Redwoods Company (L.P.), Hawthorne Investments (G.P.)

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): US Hwy 101 (four lanes)

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): "Wild" Wild & Scenic River corridor

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Design it

9. What scientific documentation is available demonstrating the value of the linkage? Arcata BLM/Ukiah District Sustained Yield Unit 13 EIS, 1981 and Resource Management Plan EIS 1995.

10. Other information: See South Fork Eel Riversource Potential Wilderness Area map and Mendocino Linkage Potential draft map produced by Legacy: The Landscape Connection.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Mendocino Redwood Circle
Ecoregion: North Coast
Map Name/ID#: 6

Key contact for this linkage (optional) Rixanne Wehren
Telephone #: 707/937-2709
Email: coastgis@mcn.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Second growth redwood forest nearing late seral stage and extensive esturaries. Coho salmon, spotted owl, ghost martens, wolverines, and fishers.

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | [4] | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
logging	5
Rural subdivisions	3
vineyards	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | [4] | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency) 1
] willing land sellers
part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Large private landowners/Ranchers working on conservation easements. Cambell Group timber inholdings being downsized. Mendocino Redwood Company open to conservation easements. State Parks and/or Wildlife Conservation Board potential for agency acquisition.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Redwood forest regrowth, landslide stabilization, migration hazards (culverts & dams), sediment minimization, riparian restoration.

5. Provide brief description of the linkage:

Major Habitat Types: Redwood forest, coastal prairie, grasslands, oak woodlands, fir forest, mixed coniferous

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural vegetation, very little Ag

Major landowners: Industrial timber, ranchers, State, BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Hwy 101, logged over areas, river downcutting, dams (not most significant

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterways, riparian habitat, ridgetops connecting watersheds, highway bridges underpass areas

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Identifying concerned landowners, who might be willing sellers or willing to negotiate and record conservation easements.

9. What scientific documentation is available demonstrating the value of the linkage? The California Natural Diversity Database

Also, see Linkage Potential: Central Mendocino County draft map produced by Legacy: The Landscape Connection.

10. Other information: Industrial timber owners are beginning to sell off some parcels. If some of these could be acquired it would contribute to already existing stepping stones.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: South Fork Eel
Ecoregion: North Coast
Map Name/ID#: 7

Key contact for this linkage (optional) Ruskin Hartley
Telephone #: 415/362-2352
Email: rhartley@savetheredwoods.org

1. Linkage Type (check one)

]	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Ancient redwood forest and aquatics

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Timber harvest	4
Roads	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Existing public ownership: BLM, DFG, and University of CA Berkeley.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Streams, aquatics, forest

5. Provide brief description of the linkage:

Major Habitat Types: Redwood forest and mixed evergreen

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Forest, aquatics

Major landowners: State Parks, BLM, Industrial timberland

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Hwy 101

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterway, riparian habitat and adjacent forest cover

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): design, evaluate, purchase, study, etc.

9. What scientific documentation is available demonstrating the value of the linkage? Much

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Red Mountain - Sinkyone
Ecoregion: North Coast
Map Name/ID#: 8

Key contact for this linkage (optional) Steven Day
Telephone #: 707/272-1323
Email: maprap@humboldt.net

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Marten, bear, falcon, north spotted owl

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Roadways	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: Piercy Creek landowner, Demmick Family, practices forestry standards commensurate with Institute for Sustainable Forestry, so "friendly" to conservation.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Land slide \ stabilization via in-stream structures to restore thalwag natural variation.

5. Provide brief description of the linkage:

Major Habitat Types: mixed evergreen forest

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: BLM, Demmick Family, CA Department of Parks and Recreation

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in habitat cover: small gaps in old growth, good second growth

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Existing Hwy 101 underpass at double span bridge, mile marker 100, located at the confluence of McCoy Creek with South Fork Eel River.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage, negotiate conservation easements, assist Non-industrial Timber Management Plan =NTMP

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Coastal Prairie and Wetlands
Ecoregion: North Coast
Map Name/ID#: 9

Key contact for this linkage (optional) Rixanne Wehren
Telephone #: 707/937-2709
Email: coastgis@mcn.org

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Pacific Flyway for migratory birds, local bird hunting grounds, small mammals. Estuaries important for several marine species and anadromous salmonids. River otters, snowy plovers, Mendocino paintbrush.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Residential development	5+
Harbor development	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: land trusts. Agency acquisition: State Parks, Coastal Conservancy, Wildlife Conservation Board.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Protection, acquisition, wetlands restoration, water quality monitoring, stormwater treatment.

5. Provide brief description of the linkage:

Major Habitat Types: Coastal prairie, grasslands, salt marsh, mud flats, estuary

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation fragmented by residences and residential roads, commercial development in harbors.

Major landowners: small landowners, some ranches

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): residences, residential roads, farmed headlands, commercial harbors

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Flyover, some State Parks, open grazing land

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): document habitat types, large ranches, willing landowners

9. What scientific documentation is available demonstrating the value of the linkage?

See Linkage Potential: Central Mendocino County draft map produced by Legacy: The Landscape Connection

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Yolla Bolly –Snow Mtn. Wilderness Area
Ecoregion: North Coast
Map Name/ID#: 10

Key contact for this linkage (optional) Ryan Henson
Telephone #: 530/474-4808
Email: ryan@calwild.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion, pacific fisher, northern spotted owl, goshawk, steelhead, mule deer, ringtail, acorn woodpecker

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Logging of old growth	3
Roads	3
Invasive plants	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 [5]
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
1 Agency acquisition (which agency)
] willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Proposed Wilderness on Eden Creek, Sanhedrin Peak, Thatcher Creek/Ridge. Small parcels wilderness inholdings

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Road de-commissioning, grassland and chaparral restoration

5. Provide brief description of the linkage:

Major Habitat Types: Serpentine endemics, oak woodlands, grasslands, riparian woodland, foothill woodland, coast range montane, Ancient Shasta red fir.

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, industrial timber

Major landowners: Forest Service, BLM, Private Timber (Louisiana Pacific)

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): gaps in habitat cover, roads, clearcuts

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): riparian, deep canyons

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): detailed road inventory

9. What scientific documentation is available demonstrating the value of the linkage? Resource Management Plan 1995, managed under NW Forest Plan, Mendocino National Forest, BLM – Ukiah/Arcata Field Office

10. Other information: Only National Forest not bisected by paved road. Logging history not long so not a lot of roads. Logging first began here in the 1970's. The best information available is on places that were logged.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Red Mountain – Yolla Bolly
Ecoregion: North Coast
Map Name/ID#: 11

Key contact for this linkage (optional) Steven Day
Telephone #: 707/272-1323
Email: maprap@humboldt.net

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

mountain lion, fisher, marten, falcon

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Logging	5
Agriculture	5
Roads	3 (recoverable)

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Arcata BLM, Priority II lands for acquisition in RMP for falcon.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Forest restoration

5. Provide brief description of the linkage:

Major Habitat Types: mixed evergreen, grassland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, minimal rural residential

Major landowners: BLM, Private, State Lands Commission, Tri-County

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): fragmentation of mature forest, not paved but some roads

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): continual habitat coverage

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): parcel scale land ownership analysis, identify willing sellers or landowners open to conservation easements.

9. What scientific documentation is available demonstrating the value of the linkage? Interagency Scientific Committee on Spotted owl, NW Forest Plan

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Grizzly Creek – Six Rivers
Ecoregion: North Coast
Map Name/ID#: 12

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1]	Landscape Linkage	1]	Connectivity Choke-Point
	Missing Link		Other stepping stone link

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Links late seral redwood and late seral Douglas fir forests (east to west) along Van Duzen River, Larabee Buttes over into Mad River drainage of Six Rivers National Forest.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1]	Local support (who)	1	willing land sellers
	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): BLM, State Parks

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Enlarge the stepping stones and add new ones as they become available.

5. Provide brief description of the linkage:

Major Habitat Types: Redwood Forest, Douglas Fir forest

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural vegetation, rural residential, industrial timber lands.

Major landowners: Industrial timber lands (PALCO), private landowners (small), ranches

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): gaps in habitat cover, roads, distance between stepping stones

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): stepping stones of intact late seral forests in relatively pristine conditions

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): data on species residency/use

9. What scientific documentation is available demonstrating the value of the linkage? Data on bird, bat, small vertebrates is available for the primary patches. Redwood Sciences Lab has data for Larabee Buttes.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Headwaters –Iagua Creek Butte
Ecoregion: North Coast
Map Name/ID#: 13

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

"ghost marten", northern spotted owl

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Timber harvest	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Maintain the stepping stone nature of the linkage

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Redwood & Douglas fir forests

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: Private (Pacific Lumber Company), BLM, State

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in habitat cover

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Redwood National Park – Lacks Creek
Ecoregion: North Coast
Map Name/ID#: 14

Key contact for this linkage (optional) Howard Sakai
Telephone #: 707/822-7611 ext. 5270
Email: howard_sakai@nps.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mature second-growth forests exist. This is an important linkage for forest carnivores and riparian obligate species. This section belongs to private landowners whose purpose is to log the timber.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Logging	4.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
] willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Existing forest practice, rules of 100 feet or less buffers along existing watercourses. Perhaps, landowners would be willing to expand the buffer strips.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Prevent buffer (corridor) from being logged.

5. Provide brief description of the linkage:

Major Habitat Types: second-growth Douglas fir

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Simpson Timber Company

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): None as long as forest isn't harvested

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): continual habitat coverage, riparian habitats

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Purchase or acquire conservation easement from landowner.

9. What scientific documentation is available demonstrating the value of the linkage? Few studies conducted

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Jackson State - Sanhedrin
Ecoregion: North Coast
Map Name/ID#: 15

Key contact for this linkage (optional) Linda Gray
Telephone #: 707/468-8228
Email: lgray@pacific.net

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	4.5
Subdivisions	4.5
Roads	4.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Potential agency acquisition: BLM Brushy Mountain = English Ridge and Willis Ridge. This area would complete a linkage from Mendocino National Forest proposed Wilderness area (Sanhedrin) to the coast through Jackson State Forest. Proposed Wilderness includes some BLM parcels. Also, eligible segments for additions to Wild and Scenic River.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Not sure

5. Provide brief description of the linkage:

Major Habitat Types: oak woodland, mixed evergreen, grasslands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM, Private landowners

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? North Coast Linkage Potential: Central Mendocino County draft map produced by Legacy: The Landscape Connection

10. Other information: Contact Ryan Henson, California Wild Heritage Campaign, for more information

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Montgomery Woods - Mayacamas
Ecoregion: North Coast
Map Name/ID#: 16

Key contact for this linkage (optional) Linda Gray
Telephone #: 707/468-8228
Email: lgray@pacific.net

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	5
Agriculture	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	]	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Perhaps, industrial timber companies would be willing to sell some key parcels. Some ridges cross Hwy 101, south of Ukiah and are not currently intended for vineyards or sub-divisions.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Forest regeneration

5. Provide brief description of the linkage:

Major Habitat Types: Redwood forest, oak woodland, mixed evergreen, grassland, savannah, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, logged over land, Ag land, rural residential.

Major landowners: BLM, Mendocino Redwoods Company, Private owners

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Fences, Hwy 101

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Not sure

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Contacting private landowners regarding their willingness to sell or conservation easements.

9. What scientific documentation is available demonstrating the value of the linkage? California Natural Diversity Database

Also, North Coast Linkage Potential: Central Mendocino County draft map produced by Legacy: The Landscape Connection.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: N. Sonoma Coast –Lake Sonoma
Ecoregion: North Coast
Map Name/ID#: 17

Key contact for this linkage (optional) Rixanne Wehren
Telephone #: 707/937-2709
Email: coastgis@mcn.org

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Coast – inland connection. Salt Point State Park to Armstrong Woods State Park to Lake Sonoma. Large mammals, late seral conifers, oak woodlands.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Ranch land conversion to vineyards	5
Rural subdivisions	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from land trusts: Sonoma County Open Space District, Sonoma Land Trust. Potential agency acquisition: State Parks.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Protection and riparian enhancement.

5. Provide brief description of the linkage:

Major Habitat Types: coastal prairie, mixed coniferous, oak woodlands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, some rural residential

Major landowners: large ranches

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Still open country, some rural roads .

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): open country

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Documentation of habitat, conservation design.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Blue Creek/RNP/Hoopa/Six Rivers
Ecoregion: North Coast
Map Name/ID#: 18

Key contact for this linkage (optional) Howard Sakai
Telephone #: 707/464-6101 ext.5270
Email: howard_sakai@nps.gov

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Pine marten (Humboldt subspecies) connection to coastal habitat. This linkage is to establish stepping stone type connectors.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Logging	4.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Potential agency acquisition: USFS or Redwood National Park.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Second-growth conifer retention

5. Provide brief description of the linkage:

Major Habitat Types: Redwood – Douglas fir conifer

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: Simpson Timber Company, Hoopa Indian Reservation, Six Rivers National Forest

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Missing corridor potential is high if second-growth forest is logged.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Intact forest canopy and riparian habitat.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage, needs research.

9. What scientific documentation is available demonstrating the value of the linkage? None known

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Klamath-Siskiyou/North-South
Ecoregion: North Coast
Map Name/ID#: 19

Key contact for this linkage (optional) Robert Brothers
Telephone #: 707/825-8582
Email: bobcat@mind.net

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Late-succession species (northern spotted owl), wolves, mid-large carnivores

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure 2 [3] Moderate threat 4 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Logging	2
Roads	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible 2 3 Moderate Opportunity 4 [5] Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
1 Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: WWF, SREP, CBF, KFA, NEC.

Conservation Plan: Klamath-Siskiyou Conservation Assessment (Noss and Strittholt 1999).

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Road closures

5. Provide brief description of the linkage:

Major Habitat Types: Old growth

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: 90% Forest Service

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Clearcuts, roads, Hwy 299

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? Klamath-Siskiyou Conservation Assessment (Noss and Strittholt 1999).

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Klamath-Siskiyou-Cascades
Ecoregion: North Coast
Map Name/ID#: 20

Key contact for this linkage (optional) Robert Brothers
Telephone #: 707/825-8582
Email: bobcat@mind.net

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Late succession species (northern spotted owls), wolves, mid-large carnivores

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Logging	2
Roads	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 [5]
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
1 Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: WWF, SREP, CBF, KFA, NEC

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Bridges/tunnels crossing Interstate 5.

5. Provide brief description of the linkage:

Major Habitat Types: Old growth

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Industrial timber land

Major landowners: 90% Forest Service

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Interstate 5, gaps in habitat cover (clearcuts)

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? Klamath-Siskiyou Conservation Assessment (Noss and Strittholt 1999).

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Lake Sonoma – Cooley Ranch
Ecoregion: North Coast
Map Name/ID#: 21

Key contact for this linkage (optional) Rixanne Wehren
Telephone #: 707/937-2709
Email: coastgis@mcn.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion, bobcat, salmon, deer, oak woodlands, mixed conifers, and riparian habitats.

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure 2 [3] Moderate threat 4 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Rural subdivision	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible 2 3 Moderate Opportunity [4] 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: land trusts. Willing sellers: Cooley Ranch is open to acquisition or conservation easements. Potential for agency acquisition: Sonoma County Open Space District.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Protect oak woodlands.

5. Provide brief description of the linkage:

Major Habitat Types: Oak woodland, mixed conifer, prairie, riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: Robert Cooley, ranches

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Still open country.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Open country, riparian habitat, streams.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Cooley Ranch is well documented by Adina Merenlende, UC Berkeley. Needs purchaser.

Corridor to Lake Sonoma needs analysis of habitat, design, conservation plan, and purchase.

9. What scientific documentation is available demonstrating the value of the linkage? See work by Adina Merenlender and Colin Brooks at UC Berkeley Extension Service at Hopland Field Station.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: South Fork Eel – Ten Mile River Mouth
Ecoregion: North Coast
Map Name/ID#: 22

Key contact for this linkage (optional) Steven Day
Telephone #: 707/272-1323
Email: mprap@humboldt.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Ten Mile River mouth is the last undeveloped estuary in Mendocino County.

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Logging	5
Roads	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
1 Agency acquisition (which agency)
] willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Reforestation

5. Provide brief description of the linkage:

Major Habitat Types: Mixed evergreen, Redwood forest

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, industrial forest

Major landowners: Hawthorne Investment Group and Mendocino Redwoods Company

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in habitat cover and logging roads.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat and connecting ridgetops

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Landowner analysis, conservation easements

9. What scientific documentation is available demonstrating the value of the linkage? Timber Harvest Plans

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Lake Earl – Jed Smith
Ecoregion: North Coast
Map Name/ID#: 23

Key contact for this linkage (optional) Rick Rayburn
Telephone #: 916/653-6725
Email: rrayb@parks.ca.gov

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Bobcat and coho salmon. Jordan Creek links Lake Earl and Talawa.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Grazing	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who) 1 willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Potential agency acquisition: Department of Parks and Recreation or Department of Fish and Game.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Removal of cattle, restoration of large productive riparian area.

5. Provide brief description of the linkage:

Major Habitat Types: Riparian, grassland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag land

Major landowners: Ferguson Ranch

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Hwy 101, fences, topo gentle slope

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Lake Earl – wetland, riparian habitat in protected status link to Jed Smith pasture.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): No existing population information regarding small mammals.

9. What scientific documentation is available demonstrating the value of the linkage? Good information exists for bird use, including the Aleutian Canadian Goose.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Russian River Riparian Corridor
Ecoregion: North Coast
Map Name/ID#: 24

Key contact for this linkage (optional) Linda Gray
Telephone #: 707/468-8228
Email: lgray@pacific.net

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Salmon migration

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	5
Agriculture	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who) 1 willing land sellers
1 Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian restoration: vegetation, large woody debris, deep pools

5. Provide brief description of the linkage:

Major Habitat Types: River and riparian vegetation

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Urban, Ag, Rural residential

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): River downcutting creating vertical barriers to upstream migration.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage.

9. What scientific documentation is available demonstrating the value of the linkage? Not sure

10. Other information:

4.0 BAY AREA ECOREGION

The Bay Area ecoregion is roughly bound by Cold Spring Mountain and Clear Lake to the north, the Central Valley to the east, the Gabilan Range to the south, with the Pacific Ocean forming the western boundary (Figure 1-1, *California Regions and Topography*). The hydrological system of the region is complex; multiple rivers and streams flow into the bay area from the Coast and Diablo Ranges, and through the Central Valley from the Sierra Ranges, mixing with the Pacific Ocean to form San Francisco, Grizzly, Honker, Suisun, San Pablo, Drakes, Half Moon, Bodega, and Tomales Bays, and Abbot and Bolinas Lagoons .

The intricacy and magnitude of water in the region create a variety of habitat types, including: mixed coniferous forest, bay forest, oak woodland, redwood forest, chaparral, coastal scrub, riparian woodland, coastal prairie, serpentine outcrop, freshwater marsh, coastal wetlands and lagoons.

The mixed coniferous forests of the ecoregion are limited in distribution. Yellow pine (*Pinus ponderosa*) is the dominant tree in this community; other species that may be present are Coulter pine (*P. coulteri*), Pacific madrone (*Arbutus menziesii*), canyon live oak (*Quercus chrysolepis*), and black oak (*Q. kelloggii*).

Forests dominated by California bay (*Umbellularia californica*) occupy exposed coastal slopes and ridges on scattered sites around San Francisco Bay. Oak trees may also be present in this community, including valley oak (*Quercus lobata*), canyon live oak (*Q. chrysolepis*), and black oak (*Q. kelloggii*). The understory is sparse but may include woolly-leaf manzanita (*Arctostaphylos tomentosa*) and ceanothus (*Ceanothus* spp.).

Along the coastal zone, redwood forests occur in scattered groves. Coast redwood (*Sequoia sempervirens*) is the dominant species in this community. Other trees characteristic of this community are big leaf maple (*Acer macrophyllum*), Douglas fir (*Pseudotsuga menziesii*), and coast rhododendron (*Rhododendron macrophyllum*).

Chaparral occurs primarily on steep north-facing slopes, while coastal sage scrub occupies south-facing slopes at lower elevations. Typical shrubs of the chaparral are chamise (*Adenostoma fasciculatum*), mountain mahogany (*Cercocarpus betuloides*), ceanothus (*Ceanothus* sp.), toyon (*Heteromeles arbutifolia*), and scrub oak (*Quercus berberidifolia*). Characteristic species of coastal sage scrub are coastal sagebrush (*Artemisia californica*), purple sage (*Salvia leucophylla*), black sage (*S. mellifera*), laurel sumac (*Malosma laurina*), and various species of buckwheat (*Eriogonum* spp.).

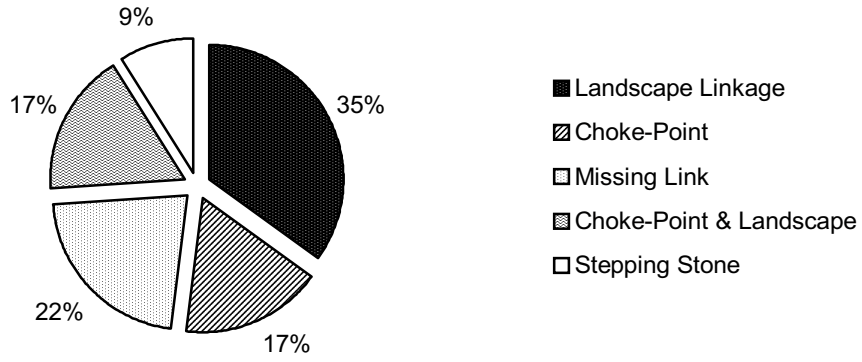
Riparian communities of the region include both scrub and woodland habitats. A number of different willow species occur including black willow (*S. gooddingii*), sandbar willow (*S. hindsiana*), and arroyo willow (*S. lasiolepsis*). Western sycamore (*Platanus racemosa*) and cottonwood (*Populus fremontii*) may be present in more structurally complex riparian communities in the region. Coast live oak (*Quercus agrifolia*) riparian forests also occur with an understory of greenbark ceanothus (*Ceanothus spinosus*) and mugwort (*Artemisia douglasiana*).

Coastal prairie habitat dominated by perennial bunchgrasses may exist on the marine terraces of the region. Typical species in this community are red fescue (*F. rubra*), California sea pink (*Armeria maritima californica*), and the non-native tall fescue (*Festuca arundinacea*).

Coastal salt marsh habitat exists along the margins of the bays, lagoons, and estuaries of the region. Typical species in this community are salt-tolerant plants such as saltgrass (*Distichlis spicata*), maritime plantain (*Plantago maritima*), pickleweed (*Salicornia virginica*), and cordgrass (*Spartina foliosa*).

Though much of the region is privately owned, scattered habitat still exists on numerous patches of publicly owned land. There are six State Parks, including Mt. Tamalpais, Annadel, Tomales Bay, Samuel P. Taylor, Sugarloaf Ridge, and Mt. Diablo. Other protected areas include: San Pablo and San Francisco Bay National Wildlife Refuges, Point Reyes National Seashore, Muir Woods National Monument, miscellaneous Games Refuges, Wildlife Areas, State Reserves, forests, recreation areas, and regional parks, along with some military lands in the region.

Figure 4-2, *Bay Area: Types of Linkages*



A total of 23 habitat linkages were identified for the region (Figure 4-1, *Bay Area: Missing Linkages*). Of the linkages identified, 35% (8/23) were considered Landscape Linkages[1], 17% (4/23) were recognized as Choke-Points[2], and 22% (5/23) were determined to be Missing Links[3]. Scientists also identified other types of linkages; 17% (4/23) were recorded as Choke-Points[2] and Landscape Linkages[1], and 9% (2/23) were considered Stepping-Stones (Figure 4-2, *Bay Area: Types of Linkages*).

The key species used to identify the linkages, or those indicative of connectivity in the region included species from many taxonomic groups. Mammals listed as key species included mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), San Joaquin kit fox (*Vulpes macrotis mytica*), mule deer (*Odocoileus*

[1] Landscape Linkage = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between different sections of the landscape.
[2] Choke-Point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas").
[3] Missing Link = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function.


San Francisco Bay Area
Missing Linkages
Figure 4-1
Legend
Linkages
Major Roads
County lines
Ecoregion Boundaries
Major Lakes & Reservoirs
Major Cities
Land Management
Public Conservation Lands
Public Use Lands
Military
Native American
Private Conservation
10 0 10 20 30 40 Miles
N
S
E
W
Pacific Ocean
Santa Rosa
Napa
San Francisco
San Jose
Santa Cruz
Russian River Valley
Mayacamas Mountains
Santa Cruz Mountains
Diablo Range

hemionus), tule elk (*Cervus elaphus nannoides*), harvest mouse (*Reithrodontomys* spp.), and various species of bats. Birds specified as key species included golden eagle (*Aquila chrysaetos*), California condor (*Gymnogyps californianus*), burrowing owl (*Speotyto cunicularia*), marbled murrelet (*Brachyramphus marmoratus*), clapper rail (*Rallus longirostris*), and various shorebirds and waterfowl. Reptiles and amphibians identified as key species included Alameda whipsnake (*Masticophis lateralis euryxanthus*), western pond turtle (*Clemmys marmorata*), California tiger salamander (*Ambystoma tigrinum californiense*), red-legged frog (*Rana aurora draytonii*), and yellow-legged frog (*Rana* spp.). Fish recognized as key species included Chinook salmon (*Oncorhynchus tshawytscha*), and southern steelhead trout (*Oncorhynchus mykiss*). Both single and multiple key species were used in identifying the linkages; 61% (14/23) of the linkages recognized mammals as key species, 43% (10/23) used birds, 30% (7/23) used amphibians or reptiles, and 30% (7/23) used fish. Mammalian carnivores were recognized as key species in 43% (10/23) of the linkages.

The primary features identified as facilitating animal movement in the region included waterways, riparian corridors, contiguous or semi-contiguous habitat, and undercrossings or bridges. Riparian habitat or waterways were identified as connectivity conduits in 57% (13/23) of the linkages. A number of rivers, creeks and wetlands were specifically named as important linkages, including: the Napa, Russian, and Pajaro Rivers, the Delta, Suison and San Pablo Bays, the Alameda, Coyote and Sonoma Creeks, and the Bay Wetlands. Underpasses and culverts were also identified as linkage features in the region.

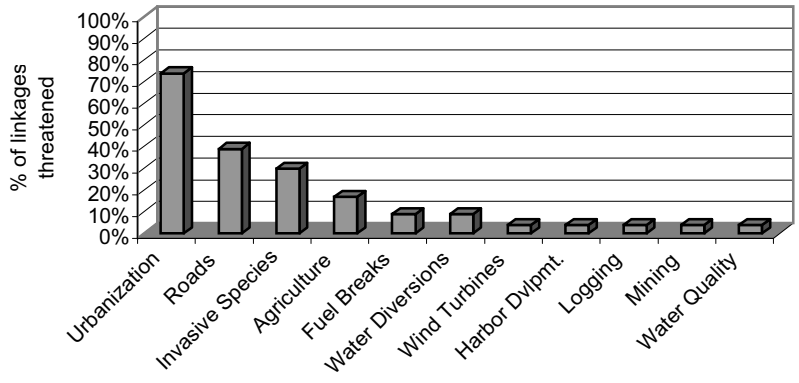
The primary barriers to animal movement in the region were varied, though no barriers were specified for two of the linkages identified. In some of the linkages, gaps in habitat cover were named as barriers, largely due to urban encroachment, logging, vineyards, and wind turbine development. Dams, diversions, stream channelization and the California Aqueduct were identified as obstacles to movement in some of the linkages associated with waterways. Specific dams identified as barriers included: Coyote, Del Salle, Calvera, and San Antonio. Highways and roads were identified as barriers to passage in a number of linkages; Highways 24, 80, 101, 580, & 680, and Dublin Canyon, Niles Canyon and Eden Canyon Roads were specifically mentioned.

Habitat types identified in need of restoration included wetland, riparian, grassland, oak woodland and mixed coniferous forest. In wetland communities, the eradication of exotic plants and mitten crabs, and habitat restoration were all identified as priorities. Instream habitat improvements, habitat restoration, and small dam removals were named as restoration needs for the linkages associated with riparian communities. Moving management away from a flood-control approach toward a habitat-floodplain approach was also specifically mentioned. The conversion of portions of agricultural land to historic oak woodlands for functional connectivity was also identified as a restoration need, as was reforestation of mixed coniferous forest. Retrofitting underpasses was also proposed for restoring connectivity. In 43% (10/23) of the linkages, no restoration needs were specified. Participants concurred that plans for restoring habitat linkages needed to be developed, implemented, and monitored for use by target species.

The primary threats identified in the ecoregion included urbanization and roads; other threats mentioned included invasive species, agriculture, fuel breaks, water diversions, wind turbines, harbor development, logging, mining, and water quality (Figure 4-3, *Bay Area:*

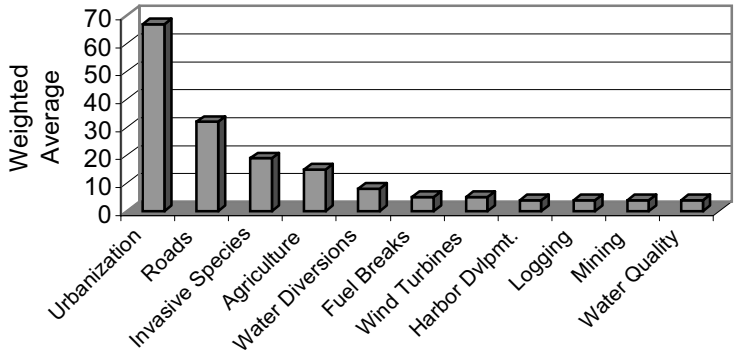
Threats to Connectivity). Urbanization threatened 74% (17/23) of the linkages,

Figure 4-3, *Bay Area: Threats to Connectivity*



59% (10/17) of which were ranked as severely threatened (rank = four or five). Roads jeopardized 39% (9/23) of the linkages recognized, 33% (3/9) of which were ranked as severely threatened (rank = four or five). Invasive species endangered 30% (7/23) of the linkages identified, 14% (1/7) of which were ranked as severely threatened (rank = four or five). Of the linkages, 17% (4/23) were threatened to some degree by agriculture; 9% (2/23) were threatened by water diversions and fuel breaks, while wind turbines, harbor development, mining, water quality, and logging each threaten 4% (1/23) of the linkages. A number of threats to connectivity were identified for the region, though the average severity of the threat and the number of linkages affected varied. The weighted average (average rank × number of linkages affected) was calculated for each threat identified to determine the severity of each threat in the region (Figure 4-4, *Bay Area: Severity of Threats*). Figure 4-4, average severity of each threat among linkages, reveals similar trends as Figure 4-3, the number of linkages affected by each threat.

Figure 4-4, *Bay Area: Severity of Threats*

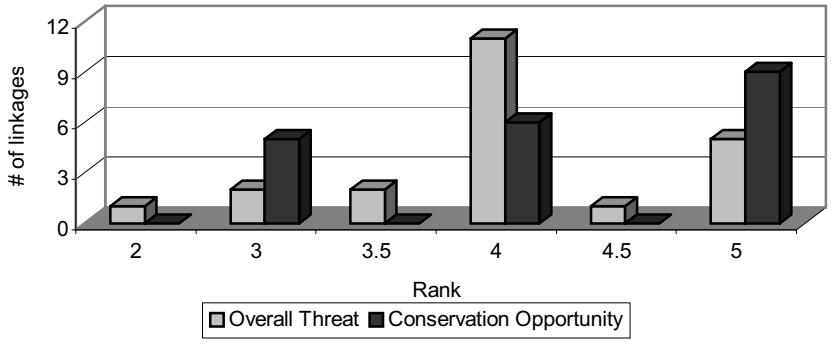


Note: The above graph depicts the weighted average of each threat identified. Weighted average = average rank × number of linkages affected. The severity of each threat was ranked from one to five (one = not severe, five = extremely severe).

Conference participants also scored the feasibility of conserving the linkage and ranked the overall degree of threat (Figure 4-5, *Bay Area: Ranking the Priorities*). Scientists ranked 65% (15/23) of the linkages as high priorities with good opportunities for conservation (rank = four or five), 87% (13/15) of which were ranked as severely threatened (rank = four or five). Overall, 74% (17/23) of the linkages identified were ranked as severely threatened (rank =

four or five). Of the linkages, 39% (9/23) were identified as the highest conservation opportunities (rank = five), 78% (7/9) of which ranked as severely threatened (rank = four or five). Overall, 17% (4/23) of the linkages were ranked five for each category (Figure 4-1, *Bay Area: Missing Linkages*, Map ID#s 3, 10, 12 & 16). These included two Choke-Points[2] (the Altamont Hills linkage Map ID# 3 and the Santa Cruz Mountain-Hamilton Mountain linkage Map ID #10), one Choke-Point[2] and

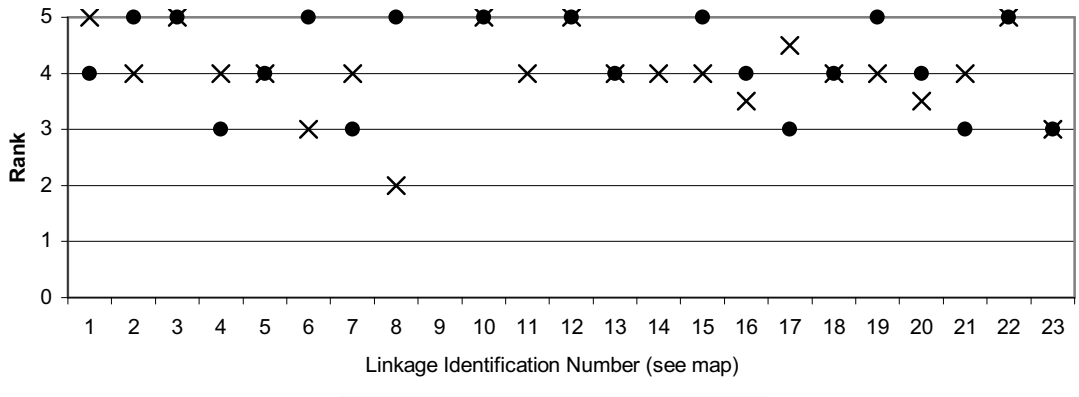
Figure 4-5, *Bay Area: Ranking the Priorities*



Note: Graph compares the number of linkages ranked for overall threat and conservation opportunity. No linkages were ranked a one for either category.

Landscape linkage[1] (the Santa Cruz Mountains - Gavilan linkage Map ID# 12), and one Stepping-Stone (the Bay Wetlands linkage Map ID# 16). Brief descriptions are provided below for the top ranked linkages (threat and conservation opportunity = 5). A comparison of how individual linkages were ranked is depicted in Figure 4-6, *Bay Area: Degree of Threat and Conservation Opportunities*.

Figure 4-6, Bay Area: Degree of Threat & Conservation Opportunities



Note: The above graph compares how each linkage was ranked for overall threat (one = no threat/secure, five = severe threat/loss imminent) and the feasibility of conserving the linkage (one = not feasible, five = good opportunity). Note: one linkage was not ranked for either category, and two were not ranked for conservation opportunity.

The Altamont Hills linkage (Figure 4-1, *Bay Area: Missing Linkages*, Map ID# 3) was identified as a connectivity Choke-Point[2]. This linkage was identified as providing habitat connectivity for San Joaquin kit fox, golden eagle, burrowing owl, California condor, and California tiger salamander. Three sensitive or listed plants were also identified: palmate-bracted bird's beak

(*Cordylanthus palmatus*), large-flowered fiddleneck (*Amsinckia grandiflora*), and big tarplant (*Hemizonia* spp.). Annual grassland and rocky outcrops were the primary habitat types named for this linkage. Specific threats identified included urbanization, invasion by exotic plants, and wind turbine development. Numerous barriers were mentioned for this linkage: Interstate 580, Altamont Hills wind turbine development, development and expansion of Los Vaqueros Reservoir, the California Aqueduct, and loss of habitat from development in Brentwood, Antioch, Tracy Hills, and South Schulte. Maintaining adequate habitat cover at the Greenville Road crossing was named as a restoration priority. Major landowners specified for this linkage included CalTrans and Altamont Landfill, which has proposed an expansion. Participants indicated that there are willing sellers in the linkage as well as the potential for acquisition through Alameda County, Livermore, and East Bay Regional Park District. Additional documentation for this linkage can be found in compliance studies conducted for the Altamont Wind Turbine Development, and the East Bay Regional Park District's kit fox monitoring data. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The Santa Cruz Mountains – Hamilton Mountains linkage (Figure 4-1, *Bay Area: Missing Linkages*, Map ID# 10) was identified as a connectivity Choke-Point[2]. This linkage was identified as providing habitat connectivity for mountain lion, bobcat, coyote, and other mammals. Habitat types specified for the linkage included riparian, oak woodland, seasonal wetlands, and serpentine outcrops, though land cover was identified as both natural vegetation and irrigated agriculture. Urbanization was named as the primary threat to the linkage, with Highway 101, scattered subdivisions, and gaps in habitat cover listed as the primary impediments to wildlife movement. Numerous paths in the Coyote Valley were said to facilitate animal movement. Landownership in the linkage was listed as private, including land owned by The Nature Conservancy and Cysco Systems. Participants indicated that The Nature Conservancy is working with Santa Clara County Open Space Authority to protect land in this linkage. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The Santa Cruz Mountains - Gavilan linkage (Figure 4-1, *Bay Area: Missing Linkages,* Map ID# 12) was identified primarily as a Choke-Point[2] but as a secondary Landscape Linkage[1]. Key species used to identify this linkage were mountain lion and other medium to large mammals. Residential development, Highway 101 expansion, and agriculture were identified as the primary threats to connectivity, with Highway 101 and gaps in habitat cover named as the most significant barriers. Underpasses and riparian corridors were listed as the primary linkage features. Restoration needs identified included converting portions of agricultural land to historic habitat types, such as riparian and oak woodlands. Landownership in this linkage was listed as primarily private, specifically mentioned were Sargent and Castro Valley Ranches. Participants indicated that this linkage is part of The Nature Conservancy's Santa Cruz Project. Please refer to the corresponding Linkage Description Log Sheet for more specific information.

The Bay Wetlands linkage (Figure 4-1, *Bay Area: Missing Linkages,* Map ID# 16) was identified as a Stepping-Stone linkage. This linkage was recognized as providing habitat connectivity for waterfowl and shorebirds on the Pacific Flyway, and numerous other species. The primary community types listed were tidal wetland, seasonal wetland, upland and submerged wetland. Urbanization and exotic plants were identified as the primary threats to

habitat connectivity, while the major impediment listed was the loss of wetland habitat; only 10% of the historic wetlands remain. Landownership in the linkage was listed as private, with Cargill as the largest landowner. Participants indicated that there is local support for this linkage, and that potential exists for agency acquisition through the United States Fish and Wildlife Service, California Department of Fish and Game, California State Coastal Conservancy, and the San Francisco Bay Joint Venture, which includes twenty-five different agencies. Please refer to the corresponding Linkage Description Log sheet for more specific information.

Documentation referenced for some of the linkages included (see Appendix C, *Connectivity References*, for complete citation, if provided):

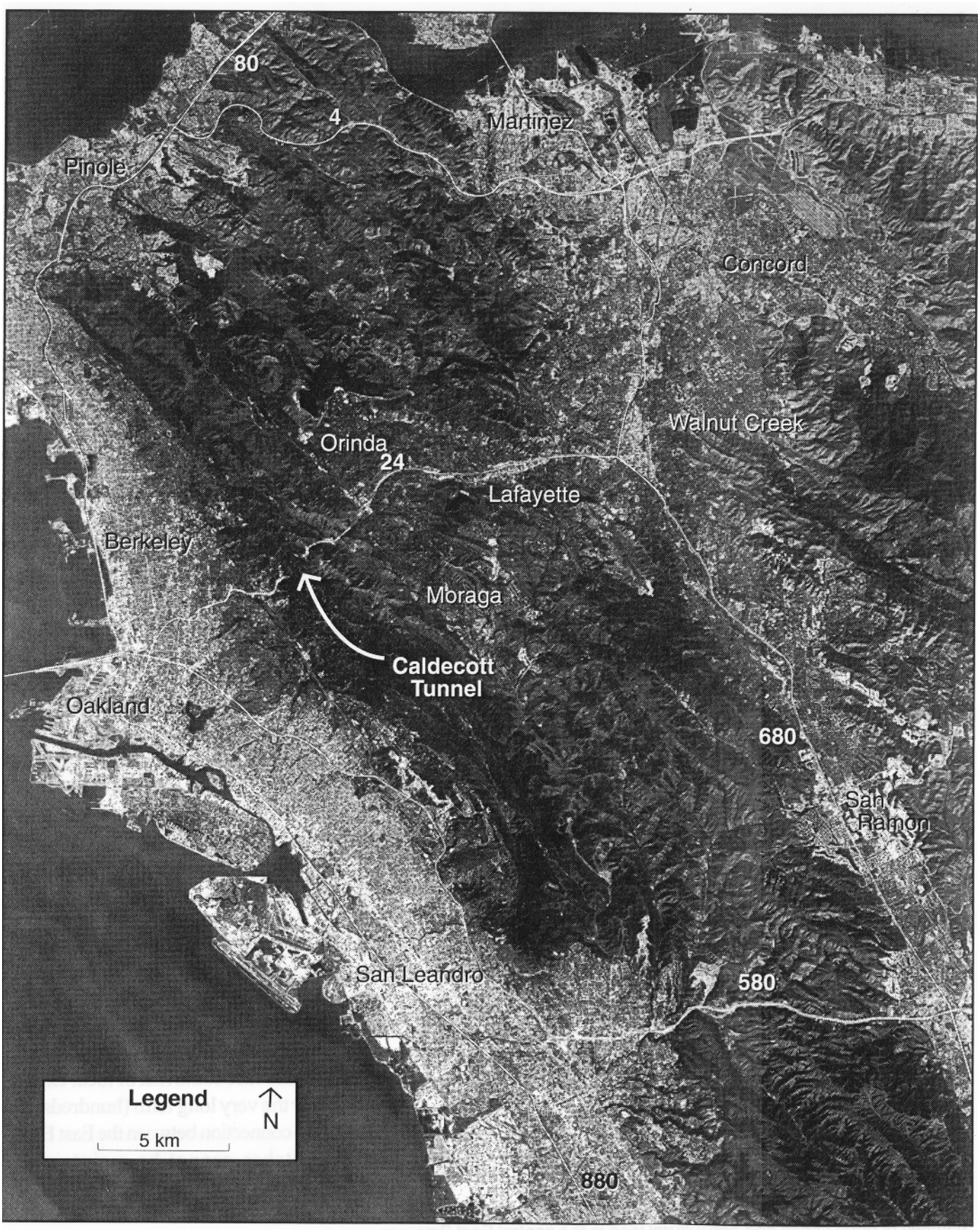
- Master Plan for the East Bay Regional Park District
- East County Pilot Study Technical Report: Biological, Land Use, and Economic Information Considered by the East County Pilot Study Task Force, Jones and Stokes Associates
- East County Pilot Study Task Force Report: Consensus Recommendations for Improving Biological Resource Conservation
- Altamont Wind Turbine Development Environmental Impact Report
- Natural History of the Santa Cruz Mountains, John Hunter Thomas
- Resource Management Plan for the Caldecott Wildlife Corridor, Reg Barrett
- Sonoma Development Center Sonoma-Mayacamas Mountains Corridor Study, Jodi Hilty, University of California, Berkeley
- Calaveras Ridge Corridor Study
- Alameda-Contra Costa Biodiversity Working Group
- Sonoma Ecology Center data (macroinvertebrates, stream flow, physical measurements, etc.)
- University of California, Davis studies on vegetation, wildlife, fire
- CalFed studies
- California Department of Fish and Game fisheries
- Habitat Goals Project report

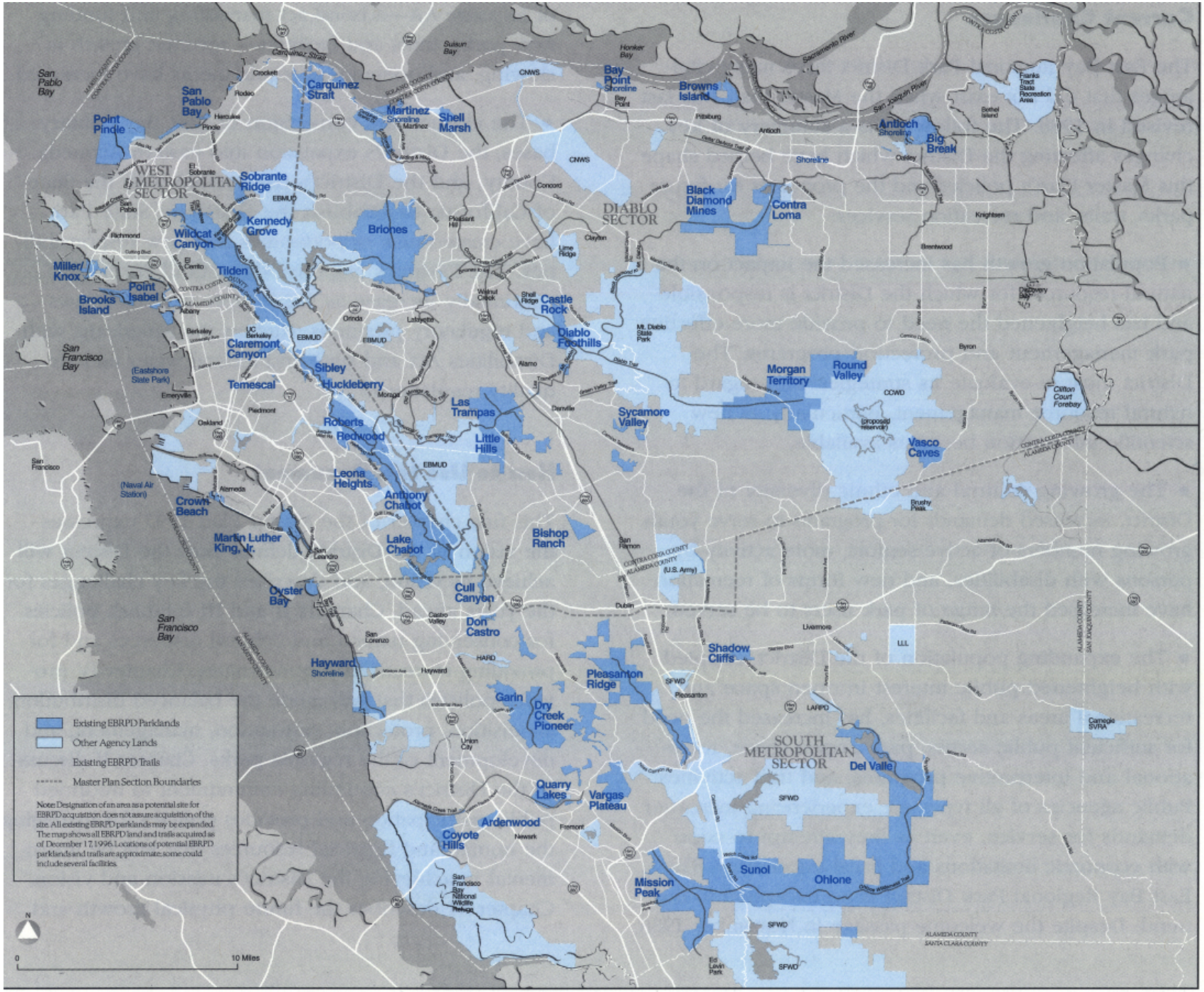
Ecoregional team members also provided GIS-based maps and satellite images for some of the linkages. A visible spectrum satellite image was provided for the Caldecott Wildlife Corridor (Figure 4-7), which corresponds with Map ID# 2 in Figure 4-1, *Bay Area: Missing* Linkages. A landownership map was also provided for this linkage; copies are available upon request. Please refer to the corresponding Linkage Description Log sheet for more specific information.

Conference participants from East Bay Regional Park District provided a copy of their Master Plan for the District (1997) and other technical reports. Figure 4-8, *East Bay Regional Park District Parklands, Other Protected Agency Lands, and Trail Network* provides additional evidence on the importance of a number of the linkages recorded south of Suisun Bay and east of San Francisco Bay, including two of the conservation priorities (Figure 4-1, *Bay Area: Missing Linkages,* Map ID#s 3 & 16).

Figure 4-9, *Publicly Owned Undeveloped Land and Conservation Easements in Eastern Alameda and Contra Costa Counties*, provides more detail for linkages 1, 3, 4, 13, and 19 (Figure 4-1, *Bay Area: Missing Linkages*). Please refer to the corresponding Linkage Description Log sheets for more specific information.

Participants indicated that there is potential for agency acquisition in 52% (12/23) of the linkages, 33% (4/12) of which were identified as having willing sellers (Figure 4-1, *Bay Area: Missing Linkages,* Map/ID#'s 1, 3, 12 & 19); all of these ranked as high priorities for conservation (rank = four or five). Other opportunities identified to secure or restore connectivity function included conservation easements, acquisition of land through numerous local and national land trusts, conservancies, and agencies including, Regional and State Parks, other federal and state agencies, and the Tri-County planning area which encompasses numerous cities.


80
4
Martinez
Pinole
Concord
Walnut Creek
Orinda
24
Lafayette
Berkeley
Moraga
Caldecott
Tunnel
Oakland
680
San
Ramon
San Leandro
580
880
Legend
N
5 km


WEST METROPOLITAN SECTOR
DIABLO SECTOR
SOUTH METROPOLITAN SECTOR
San Pablo Bay
San Francisco Bay
Suisun Bay
Carquinez Strait
Point Pinole
San Pablo Bay
Martinez Shoreline
Shell Marsh
Bay Point Shoreline
Browns Island
Antioch Shoreline
Big Break
Sobrante Ridge
Kennedy Grove
Wildcat Canyon
Miller/ Knox
Point Isabel
Brooks Island
Tilden
Briones
Black Diamond Mines
Contra Loma
Castle Rock
Diablo Foothills
Claremont Canyon
Sibley
Huckleberry
Temescal
Las Trampas
Roberts
Redwood
Little Hills
Leona Heights
Anthony Chabot
Lake Chabot
Crown Beach
Martin Luther King, Jr.
Oyster Bay
Cull Canyon
Don Castro
Hayward Shoreline
Garin
Dry Creek Pioneer
Pleasanton Ridge
Bishop Ranch
Shadow Cliffs
Morgan Territory
Round Valley
Sycamore Valley
Vasco Caves
Quarry Lakes
Vargas Plateau
Ardenwood
Coyote Hills
Mission Peak
Sunol
Ohlone
Del Valle
Existing EBRPD Parklands
Other Agency Lands
Existing EBRPD Trails
Master Plan Section Boundaries
Note: Designation of an area as a potential site for EBRPD acquisition does not assure acquisition of the site. All existing EBRPD parklands may be expanded. The map shows all EBRPD land and trails acquired as of December 17, 1996. Locations of potential EBRPD parklands and trails are approximate; some could include several facilities.
N
0
10 Miles

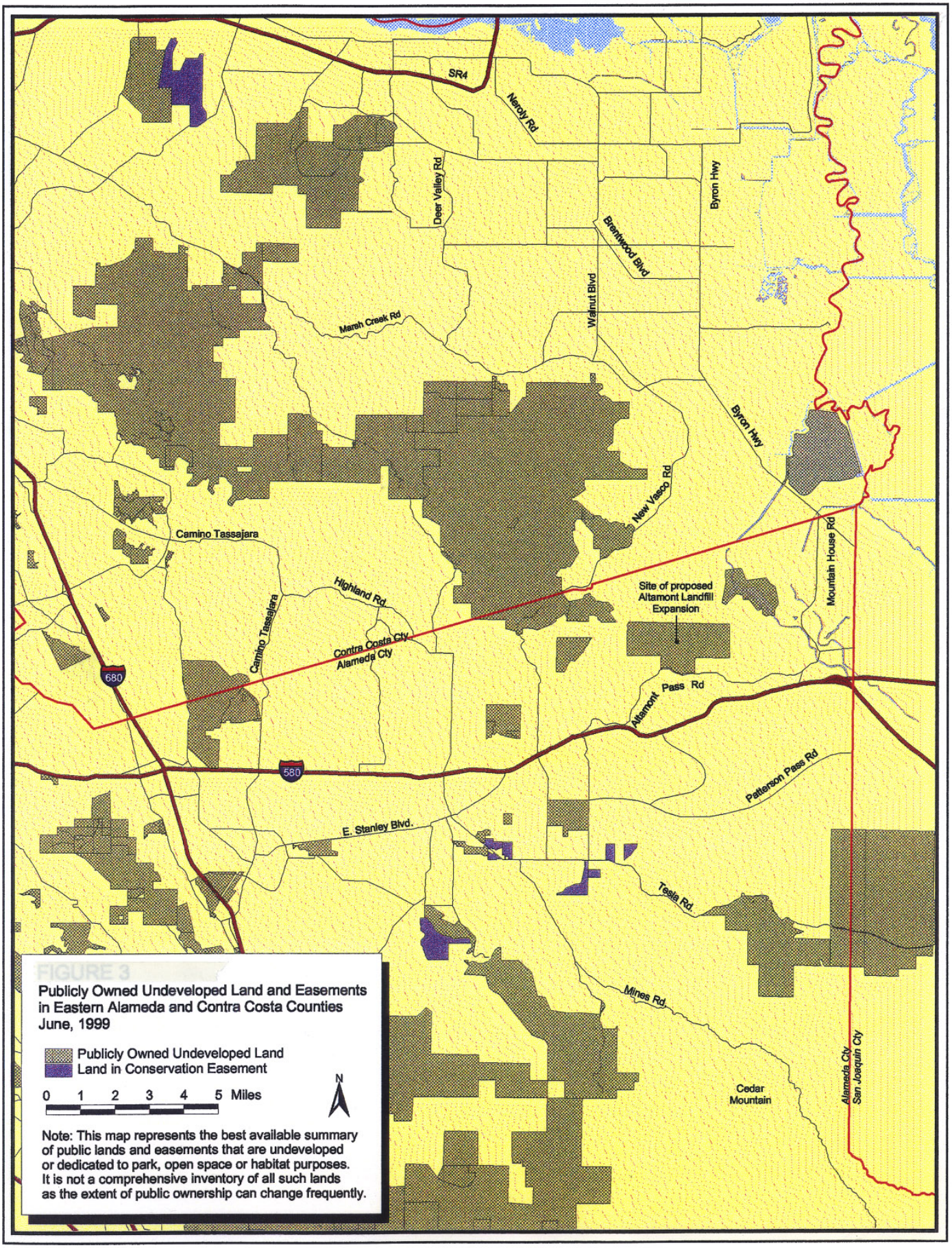


FIGURE 3

Publicly Owned Undeveloped Land and Easements in Eastern Alameda and Contra Costa Counties June, 1999

Publicly Owned Undeveloped Land
Land in Conservation Easement

0 1 2 3 4 5 Miles

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Note: This map represents the best available summary of public lands and easements that are undeveloped or dedicated to park, open space or habitat purposes. It is not a comprehensive inventory of all such lands as the extent of public ownership can change frequently.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Pleasanton Ridge – Las Trampas
Ecoregion: Bay Area
Map Name/ID#: 1

Key contact for this linkage (optional) Brad Olson
Telephone #: 510/594-2622
Email: bolson@ebparks.org

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Carnivores/mammals – mountain lion, bobcat, coyote, deer

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Roads	3
Urbanization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Potential agency acquisition: City of Dublin, Alameda County, EBRPD. Formal conservation plan to be developed.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Cover at undercrossings

5. Provide brief description of the linkage:

Major Habitat Types: Oak/Bay woodland, grassland and riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: EBRPD, private, CalTrans

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Choke-point at Eden Canyon and Schafer Ranch undercrossings of Interstate 580, plus Dublin Canyon Road. Missing Link for small terrestrial vertebrates.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat, underpasses/bridges, cross drainages

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage and potential usage by both carnivores and mammals.

9. What scientific documentation is available demonstrating the value of the linkage? Reg Barret, UC Berkeley. Alameda-Contra Costa Biodiversity working group

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Caldecott Corridor
Ecoregion: Bay Area
Map Name/ID#: 2

Key contact for this linkage (optional) Brad Olson
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Carnivores/mammals – mountain lion, bobcat, coyote, gray fox, deer

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
Exotic plants	3
Domestic Dogs	3
Fuel Break Clearing	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Acquisition complete, Caldecott Corridor Study to be adopted. Connection in three agency ownership, however, home owner activities to reduce fuel loads threatens cover and passage.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Removal of exotic vegetation, control feral cats and dogs

5. Provide brief description of the linkage:

Major Habitat Types: Oak/Bay woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: EBRPD, EBMUD, City of Oakland, Private, CalTrans

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Hwy 24, Choke-point 2500' wide ridge above Caldecott Tunnel.

Missing link for small terrestrial vertebrates.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

Contact Reg Barrett, UC Berkeley

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Altamont Hills
Ecoregion: Bay Area
Map Name/ID#: 3

Key contact for this linkage (optional) Brad Olson
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	]	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox, golden eagle, potential California condor habitat, burrowing owls, CA tiger salamander, plus palmate-bracted bird's beak, Large flowered fiddleneck, big tarplant

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	4
Exotic Plants	2
Wind Turbine Development	5 (for raptors)

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency) 1		part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Willing sellers primarily private land, agency acquisition: Alameda County, Livermore, EBRPD

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Maintain adequate habitat cover at Greenville Road crossing.

5. Provide brief description of the linkage:

Major Habitat Types: Annual grassland, Rocky outcrops

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: Private, Altamont Landfill, CalTrans

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Interstate 580 (lack of grade separated crossings) choke-point undercrossing at Greenville Road. Altamont Hills Wind Turbine development, development and expansion of Los Vaqueros Reservoir, loss of habitat from major developments in Brentwood and Antioch. Also, Mountain House Development, Tracy Hills, South Schuite and California Aqueduct.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat, dirt road, continual habitat coverage, underpasses/bridges

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Development management regimes for kit fox, golden eagle, burrowing owl, CTS and other grassland dependent species to increase productivity and long-term viability of species (ie. Genetics, predation, sex-ratio, mortality rate).

9. What scientific documentation is available demonstrating the value of the linkage? Compliance studies on Altamont Wind Turbine Development, EBRPD kit fox monitoring data

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Vargas Plateau – Nile Canyon
Ecoregion: Bay Area
Map Name/ID#: 4

Key contact for this linkage (optional) Brad Olson
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

"Mountain lion", isolation of small vertebrates (herps), moderate size carnivores. Loss of habitat to the southeast with open space to the northwest

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Highways/roads	5
Exotic plants	5
Residential development	2.5
Quarry	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): The existing conditions already prohibit movement of animals – restricted to Alameda Creek.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Need to retrofit Niles Canyon Road and I-680 for animal movement. Restore movement pathways under and over extremely busy roads.

5. Provide brief description of the linkage:

Major Habitat Types: Dense oak woodlands, drainages, ponds, non-native grasslands, riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: San Francisco Water District, Large landowners

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads in two places creating a triangular fragment. Choke-point at Niles Canyon Road and 680 impassable creating an island of habitat. Missing Link connecting Vargas Plateau with Mission Peak and Sunol/SFWD and Pleasanton Ridge.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Alameda Creek – degraded riparian, presence of natural habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Can/do animals (small, med, large) successfully move across both I-680 and Niles Canyon? To understand its current function as undeveloped but "isolated" open space as a corridor from open space to open space (north and south). Open space north of Niles Canyon and open space south of I-680.

9. What scientific documentation is available demonstrating the value of the linkage? None that I'm aware of.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Sugarloaf Mountain - Benecia
Ecoregion: Bay Area
Map Name/ID#: 5

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link

] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Upland species, predators, small mammals

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	4
Highway	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Tricity-County Planning Area

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Oak woodland, grassland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: PG&E, Watershed

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Urban encroachment along I-80 and Route-80

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Ridges, riparian, limited undercrossings

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): value of corridor to PG&E land to south

9. What scientific documentation is available demonstrating the value of the linkage? Tricity-County studies

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Sonoma Mountain – Maycumas Mountains
Ecoregion: Bay Area
Map Name/ID#: 6

Key contact for this linkage (optional) Sonoma Ecology Center
Telephone #: 707/996-0712
Email: sec@vom.com

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Carnivores, representative cross section of Sonoma Valley

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	3
Highway	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 [5]
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
] Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support – SEC, part of SEC conservation plan. Currently, much of the land is owned by the State (Sonoma Development Center) which is slated to close in 5+ years.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): highway underpass choke-point

5. Provide brief description of the linkage:

Major Habitat Types: Redwood, oak woodland, grassland, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, low density housing

Major landowners: State (SDC), Regional Parks, various private land owners

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Road 5 x 5 culvert = non functional to facilitate wildlife movement.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Upland habitat, riparian habitat, two underpass points on difference creeks and roads.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Specific directions to CalTrans to design underpasses with mitigation money. Movement to assure long-term conservation of SDC land.

9. What scientific documentation is available demonstrating the value of the linkage? Jodi Hilty Pilot Study; see compilation of data

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Sonoma Mountain – Burdell Mountain
Ecoregion: Bay Area
Map Name/ID#: 7

Key contact for this linkage (optional) John Woodbury
Telephone #: 510/654-6591
Email: drjohnw@ix.netcom.com

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Upland terrestrial species – mammalian carnivores – mountain lion, bobcat

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	3
Roadways	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from City of Petaluma, Sonoma County Regional Parks, but unwilling landowner(s) on Sonoma Mountain.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Oak woodland, grassland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag to north (until Sonoma Mountain) and grazed lands to south.

Major landowners: City of Petaluma

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadway, Hwy 101

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Unknown

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Determine any existing features for movement and their use.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Cruz Mountains
Ecoregion: Bay Area
Map Name/ID#: 8

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

]	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

The Santa Cruz mountains are a unique mountain range. While much of this range has been protected, many of the sites are not contiguous. There is still some logging going on in these hills and development of estate lots may become a problem. Special habitats that occur within the SC Mountains are old growth Doug fir and Redwood. Marbled murrelet and Sand Hill crane habitat occur there and red-legged frog. Anadromous fish are found throughout.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	3
Exotic plants	2
Logging	4
Roads	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from Mid Peninsula Open Space District and post (Peninsula Open Space Trust) and Trust for Public Land. Potential agency acquisition exists through State Parks.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian, coastal grasslands, old growth preservation.

5. Provide brief description of the linkage:

Major Habitat Types: Mixed conifer, coastal scrub, redwood, riparian, grassland, sand hills

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation and rural

residential

Major landowners: Logging companies, State Parks, and historic ranches

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads, water quality, mining in sand hills, development, logging, exotics

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat and continual habitat coverage

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Habitat use by marbled murrelet, distribution and protection of marbled murrelet habiat, effects of logging second growth on marbled murrelet.

9. What scientific documentation is available demonstrating the value of the linkage?

John Hunter Thomas, Natural History of the Santa Cruz Mountains

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Pajaro River
Ecoregion: Bay Area
Map Name/ID#: 9

Key contact for this linkage (optional) Robin Cox
Telephone #:
Email: rcox@tnc.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: S. Coyote Valley –Santa Cruz/Hamilton Mtns
Ecoregion: Bay Area
Map Name/ID#: 10

Key contact for this linkage (optional) John Woodbury
Telephone #: 510/654-6591
Email: drjohnw@ix.netcom.com

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion, bobcat, coyote, and other mammals

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from Santa Clara County Open Space Authority, southern Coyote Valley is designated as San Jose. The Nature Conservancy is acquiring land with open space authorities.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: irrigated Ag, riparian, oak woodland, serpentine, seasonal wetland complex on both sides

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: (The Nature Conservancy) all private, Cysco Systems

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 101, scattered rural subdivisions/houses, gaps in habitat

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Animals can currently cross the Coyote Valley in numerous ways, but none are optimal.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Determining the best routes for habitat enhancement

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Maycumas – Mark West
Ecoregion: Bay Area
Map Name/ID#: 11

Key contact for this linkage (optional) Andrea McKenzie
Telephone #: Sonoma Ag and Open Space
Email:

1. Linkage Type (check one)

]	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain range continuity for long-term animal and plant movement

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Grapes	5
Roads	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: oak woodland, grassland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Agriculture (grapes) and natural vegetation

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): roads, conversion of land to grapes

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Habitat coverage

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Possibility of conserving linkage needs to be researched

9. What scientific documentation is available demonstrating the value of the linkage? Sonoma Ag and Open Space looked at GIS model to assess risk of development.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Cruz Mountain - Gavilan
Ecoregion: Bay Area
Map Name/ID#: 12

Key contact for this linkage: Elizabeth Gray/Rick Hopkins
Telephone #: 408/226-5754, 408/227-1204
Email: egray@tnc.org, Hopkins8@pacbell.net

1. Linkage Type (check one)

] Landscape Linkage (secondary)] Connectivity Choke-Point (primary)
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion, med-large mammals

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Development-residential	5
101 expansion	5
Ag current use	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)] willing land sellers
] Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from private landowners, potential for The Nature Conservancy and SCCOSA acquisition, part of TNC Santa Cruz Project, deal with Cysco in the works

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Conversion of Ag lands; riparian and oak woodland

5. Provide brief description of the linkage:

Major Habitat Types: chaparral, redwood, oak woodland, mixed conifer, serpentine, grassland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, Ag

Major landowners: private ranches; Sargent/Castro Valley ranches

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 101, gaps in habitat cover

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): riparian underpasses (unknown usage)

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): All of the above.

9. What scientific documentation is available demonstrating the value of the linkage? Only professional opinion.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Clayton Rdge-Mt. Diablo-Blk Diamond-Concord NWS Key contact for this linkage: B. Olson, J. Woodbury
Ecoregion: Bay Area Telephone #: 510/544-2622
Map Name/ID#: 13 Email: bolson@ebparks.org

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Alameda whip snake corridor between Mt Diable and Black Diamond Mines, and Golden eagle, mountain lion and Tule elk between Black Diamond and Concord NWS.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	5
Increase of traffic on roads	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Concord NWS closure/resuse – willing land seller

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Creating new linkages across roadways.

5. Provide brief description of the linkage:

Major Habitat Types: annual grassland, chaparral, oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: EBRPD, US Navy, State Parks & Recreation

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads and fencing at Concord NWS. Choke points: Marsh Creek Rd, Kirker Pass Rd, Bailey Rd. Missing Link: need public lands between Mt. Diablo and Black Diamond and Concord Weapons Naval Weapons Station.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): riparian habitat, dirt road, continual habitat coverage, underpasses/bridges

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Coastal Wetlands for Pacific Flyway
Ecoregion: Bay Area
Map Name/ID#: 14

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other stepping-stone for coastal migration

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Waterfowl, shorebirds, raptors and salmonid entrance to rivers

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Rural development	5
Harbor development	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: coastal prairie, coastal wetlands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: Many

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Not barriers to movement since they can swim or fly, but the important connectivity issue is preserving coastal habitat up and down the coast as stepping-stones for migration.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Blue Ridge- Berryessa Natural Area
Ecoregion: Bay Area
Map Name/ID#: 15

Key contact for this linkage (optional) John Woodbury
Telephone #:
Email:

1. Linkage Type (check one)

]	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion, golden eagle, numerous other species

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Vineyard development	5
Rural estates	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): An active working group is coordinating efforts to connect existing protected areas. Potential agency acquisiton: DFG, BLM, Napa Land Trust, American Land Trust, Conservation Fund

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: oak woodland, chaparral, riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): grazing

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): The threat of fragmentation.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? Various UC Davis studies have been done on vegetation, wildlife, role of fire.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Bay Wetlands
Ecoregion: Bay Area
Map Name/ID#: 16

Key contact for this linkage (optional) John Steere
Telephone #: 510/286-6767
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other combination of linkages & stepping stones

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Refer to Habitat Goals Project report for full discussion . Numerous waterfowl, shorebirds, harvest mouse, etc.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	5
Exotic Plants	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency) 1		part of formal conservation plan (which one)

Other opportunities and details (or information from check items): SF Bay Joint Venture includes 25+ agencies working together. Potential agency acquisition: USFWS, CDFG and Coastal Conservancy. Willing sellers: Cargill Salt Ponds?

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Spartina densiflora control

5. Provide brief description of the linkage:

Major Habitat Types: Tidal wetland, seasonal wetland, upland, submerged wetland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Diked for Ag in North Bay.

Major landowners: Cargill is the big one in the South Bay

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): The Bay is an important stepping stone on the Pacific Flyway. The major impediment is the limited size of remaining wetlands (10% of historical extent).

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): *Spartina* control research

9. What scientific documentation is available demonstrating the value of the linkage?

Habitat Goals Project report

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: North-South Cross Delta
Ecoregion: Bay Area
Map Name/ID#: 17

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

]	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Migratory birds, passerines, bats, aquatic/semi-aquatic vertebrates

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5

No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 [5]

Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Many parcels

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Tying patches together.

5. Provide brief description of the linkage:

Major Habitat Types: Freshwater marsh, riparian, oak/cottonwood/willow

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag, natural vegetation

Major landowners: Corps, DFG, etc.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Shoreline conversions and levees

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterways

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document movement

9. What scientific documentation is available demonstrating the value of the linkage? CalFed Studies

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Suisun – San Pablo Bay
Ecoregion: Bay Area
Map Name/ID#: 18

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

clapper rail, sm harvest mice, marsh dependant wildlife

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	4.5	5
No threat/secure		Moderate threat			Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Industry-development	4.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Connection may be made to refinery rehabilitations or changes.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Need marsh habitat between Suisun and San Pablo Bay

5. Provide brief description of the linkage:

Major Habitat Types: open water, tidal marsh, brackish

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): commerical

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Shoreline development

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): marsh

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Movement rates, techniques to restore.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Alameda Creek Watershed
Ecoregion: Bay Area
Map Name/ID#: 19

Key contact for this linkage: Brad Olson, Pete Alexander
Telephone #: 510/544-2622
Email: bolson@ebparks.org

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Steelhead and other native fisheries, western pond turtles, foothill yellow-legged frog, California red-legged frog

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	[4]	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	3
Exotic species	2
Water quality	4
Water diversions	4

4. Score the feasibility of linkage as a conservation priority (circle one):

[1]	2	3	[4]	5
Not feasible (large dam removal)		Moderate Opportunity	(instream habitat improvements)	Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agencies: EBRPD, SFWD, Alameda County, Livermoore, Pleasanton. Formal plan being developed.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Small dam removal, BART barrier, water quality protection, maintenance of minimum flow, watershed riparian restoration.

5. Provide brief description of the linkage:

Major Habitat Types: Riparian and watershed of grass, oak savannah, scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: EBRPD, SFWD, M3 Ranch and other private lands

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Dams, water diversions

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterway, riparian habitat, underpasses/bridges. Choke points: instream dams, diversions, channelized stretches. Missing link: Dams at DelValle, San Antonio, Calaveras Reservoirs

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): How to restore and maintain instream habitat for native fisheries.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Coyote Creek
Ecoregion: Bay Area
Map Name/ID#: 20

Key contact for this linkage (optional) John Woodbury
Telephone #: 510/654-6591
Email: drjohnw@ix.netcom.com

1. Linkage Type (check one)

] Landscape Linkage (primary)] Connectivity Choke-Point (secondary)
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Salmon

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 [4] 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 [5]
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Santa Clara County Open Space Authority, City of San Jose, Santa Clara County – potential acquisition. Much of the creek has protected banks. The creek is a contiguous riparian corridor from the bay to near Morgan Hill, then up into the Hamilton Ranges.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): The flood control approach is changing to a habitat floodplain approach – this needs to continue.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): mix of riparian habitat, urban park, flood control berms

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Water quality and dam at Coyote Reservoir.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterway and riparian habitat.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Napa River
Ecoregion: Bay Area
Map Name/ID#: 21

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Anadromous fish, marsh dependent species

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 3.5 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	3.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who) 1 willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: Service, etc.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Maintain emergent wetlands along river.

5. Provide brief description of the linkage:

Major Habitat Types: Open water, emergent wetlands, marsh

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, marsh

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Channelization

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterway

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document movement

9. What scientific documentation is available demonstrating the value of the linkage? Fish and Game Fisheries

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Russian River
Ecoregion: Bay Area
Map Name/ID#: 22

Key contact for this linkage (optional) Circuit Riders, Inc
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Salmon, riparian corridor

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Channelization	4
Exotic Plants	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Riparian

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in vegetation

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Sonoma Creek
Ecoregion: Bay Area
Map Name/ID#: 23

Key contact for this linkage (optional) Sonoma Ecology Center
Telephone #: 707/996-0712
Email: sec@vom.com

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Steelhead. A river.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	4
Invasive Plants	3
Invasive animals	3 (non-native mitten crabs are invading)

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
1 Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support through Sonoma Ecology Center.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Residential, flood plains, riparian vegetation

Major landowners: Varied

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads, gaps in coverage, high density development along creek

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Existing riparian habitat.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Study ways to enhance its value as riparian habitat. A stepping stone habitat between mountain ranges and conservation of the linkage.

9. What scientific documentation is available demonstrating the value of the linkage? Sonoma Ecology Center collects an array of data ranging from macroinvertebrates, stream flow and physical measurements, to other research.

10. Other information:

5.0 CENTRAL COAST ECOREGION

The Central Coast ecoregion is roughly bound by the Santa Cruz Mountains and the Santa Clara Valley to the north, the Central Valley and the Tehachapi Mountains to the east, the Santa Ynez Mountains to the south, with the Pacific Ocean forming the western boundary (Figure 1-1, *California Regions and Topography*). The primary habitat types of the region are mixed coniferous forest, oak woodland, chaparral, coastal sage scrub, grassland and riparian.

A number of trees are found in the mixed coniferous forest of the Central Coast ecoregion; many are California endemics, which are restricted in distribution. Characteristic conifers in the region include Bishop pine (*Pinus muricata*), Monterey Pine (*P. radiata*), yellow pine (*P. ponderosa*), knobcone pine (*P. attenuata*), Monterey cypress (*Cupressus macrocarpa*), pygmy cypress (*C. pygmaea*) and Santa Lucia fir (*Abies bracteata*).

Different types of oak woodlands are scattered throughout the region. Valley oak (*Quercus lobata*) woodland occurs in well-drained valley bottoms and may intergrade with blue oak (*Q. douglasii*) woodland on drier slopes. Black oak (*Q. kelloggii*) woodlands also occur in the region and may be associated with stands of yellow pine. Interior live oak (*Q. wislizenii*) woodland occupies steep, north-facing slopes and may intergrade with chaparral on drier sites or redwood (*Sequoia sempervirens*) forest on more mesic sites. Coast live oak (*Q. agrifolia*) woodlands are also present in the region.

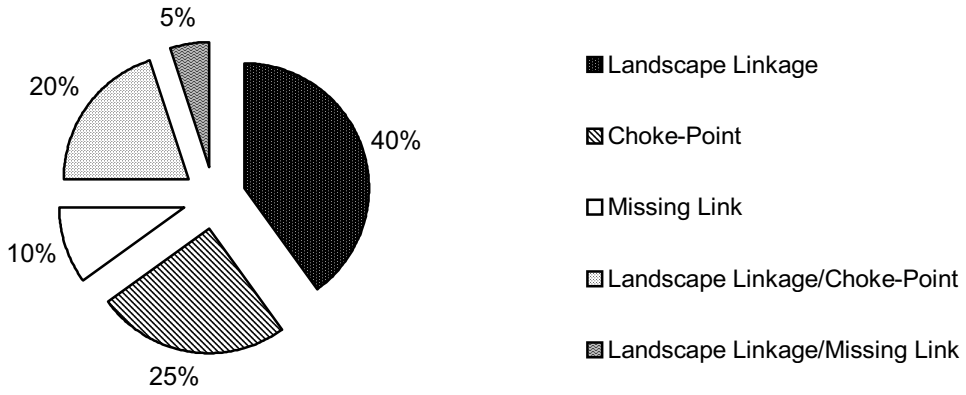
Chaparral may intergrade with the conifers of the region on more mesic sites, and with coastal sage scrub near the coast. Typical species of the chaparral include manzanita (*Arctostaphylos* spp.), chamise (*Adenostoma fasciculatum*), and ceanothus (*Ceanothus* spp.). Coastal sage scrub usually occurs on south-facing slopes; characteristic species include California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), monkey flower (*Mimulus* spp.) and lupine (*Lupinus* spp.).

Riparian habitats in the region are varied. Some are dominated by species such as sycamore (*Platanus racemosa*) and cottonwood (*Populus fremontii*), with an understory of mulefat (*Baccharis glutinosa*) and various species of willow (*Salix* spp.). Others may be dominated by alder (*Alnus rhombifolia*) or coast live oak (*Quercus agrifolia*).

A number of publicly owned lands exist in the region. Los Padres is the only national forest, though it encompasses a significant amount of land in the southern portion of the region, and a disjunct area in the central part of the region near the coast. There are numerous State Parks in the region, including Morro Bay, Montana De Oro, Julie Pfeiffer Burns, Hastings Natural History, H.W. Coe, Big Basin Redwoods, Portola, Buttano, Henry Cowell Redwoods, and Pfeiffer-Big Sur. The La Purisima Mission State Historic Park, Point Lobos State Reserve, Pinnacles National Monument, and the Hearst San Simeon State Historic Monument are other publicly owned lands. There are also scattered pieces of land administered by the Bureau of Land Management. In addition, the military occupies significant blocks of land including Fort Ord, Vandenberg Air Force Base, Camp Roberts, and Hunter Liggett.

A total of 20 habitat linkages were identified for the region (Figure 5-1, *Central Coast: Missing Linkages*). Of the linkages 40% (8/20) identified were considered Landscape

Figure 5-2, *Central Coast: Types of Linkages*



Linkages[1], 25% (5/20) were recognized as Choke-Points[2], and 10% (2/20) were considered Missing Links[3]. Scientists also identified other types of linkages; 20% (4/20) were recognized as Landscape Linkages[1] and Choke-Points[2], and 5% (1/20) were recorded as Landscape Linkages[1] and Missing Links[3] (Figure 5-2, *Central Coast: Types of Linkages*).

The key species used to identify the linkages belonged to a number of different taxonomic groups. Mammals identified as key species included mountain lion (*Felis concolor*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), kit fox (*Vulpes macrotis*), mule deer (*Odocoileus hemionus*), and tule elk (*Cervus elaphus nannoides*). Birds listed as key species included spotted owl (*Strix occidentalis*), riparian-associated birds and neotropical migratory birds. One amphibian was listed as a key species, the red-legged frog (*Rana aurora*). One fish was also acknowledged as a key species, the southern steelhead trout(*Oncorhynchus mykiss*). Both single and multiple key species were used in identifying the linkages; 95% (19/20) of the linkages recognized mammals as key species, 30% (6/20) used birds, 30% (6/20) used fish, and 5% (1/20) used amphibians. Mammalian carnivores were recognized as key species in 90% 18/20) of the linkages.

The primary features identified as facilitating animal movement in the region included waterways, riparian habitat, undeveloped flood plains, contiguous habitat, bridges, and underpasses. Riparian habitat was listed as facilitating animal movement in 65% (13/20) of the linkages. The Salinas River, Santa Ynez River, Uvas Creek, Llagas Creek, and San Antonio Creek were specifically mentioned as linkage features. Of the linkages listed, 30% (6/20) identified underpasses or bridges as the primary conduit for connectivity.

The primary barriers to wildlife passage in the region varied, though no barriers exist in 15% (3/20) of the linkages identified. Roads were the primary impediment recognized. In fact, 55% (11/20) of the linkages listed highways and/or roads as the principal barriers to animal

[1] Landscape Linkage = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between different sections of the landscape.
[2] Choke-Point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas").
[3] Missing Link = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function.

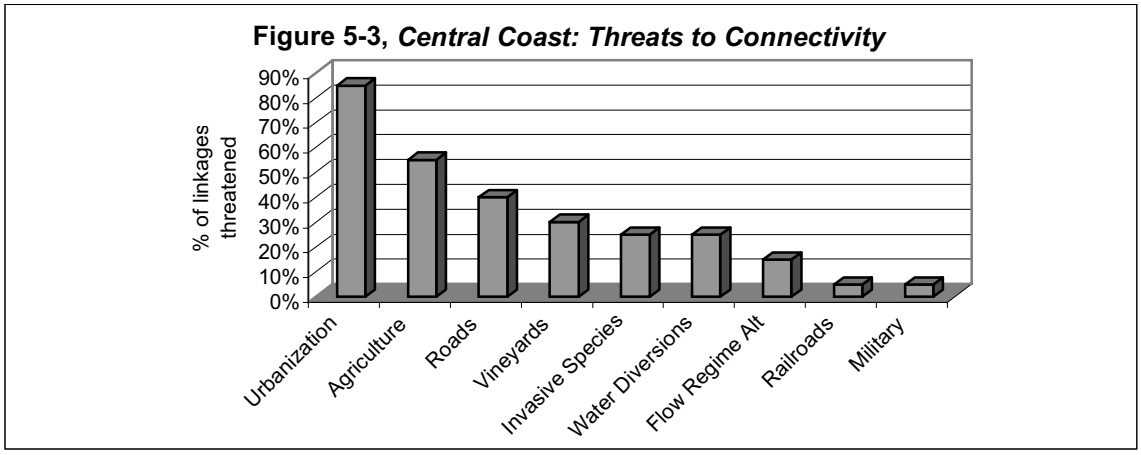

Central Coast
Missing Linkages
Figure 5-1
Santa Cruz Mtns
Santa Cruz
Monterey Bay
Gilroy
Gavilan Range
Diablo Range
Salinas Valley
Santa Lucia Mountains
Big Sur
Pacific Ocean
Morro Bay
San Luis Obispo
Fresno
Carrizo Plain
Sierra Madre
Point Conception
Santa Barbara
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Legend
Linkages
Major Roads
County lines
Ecoregion Boundaries
Major Lakes & Reservoirs
Major Cities
Land Management
Public Conservation Lands
Public Use Lands
Military
Native American
Private Conservation
N
W
E
S
10 0 10 20 30 40 Miles

movement. Highways 41, 46, 101, and 152 were specifically mentioned as barriers; Highway 101 was listed as an obstacle to wildlife migration in 30% (6/20) of the linkages. Of the linkages identified, 35% (7/20) listed gaps in habitat cover as the primary barrier, while 25% (5/20) of the linkages listed dams and culverts as the main obstruction. Sand and gravel operations, railroad crossings, grazing, and small towns were also identified as barriers to wildlife movement in the region.

Habitat types identified in need of restoration included riparian, oak woodland, alluvial fan sage scrub, chaparral, coastal sage scrub, and grassland. Riparian restoration was identified as a need in 70% (14/20) of the linkages. The eradication of invasive species was listed as a priority in 10% (2/20) of the linkages. Range management was identified as a need in 10% (2/20) of the linkages. Overall, participants felt that plans for restoring connectivity should be designed, implemented, and monitored for use by target species.

The primary threats to connectivity identified in the region included urbanization, agriculture and roads; other threats included vineyards, invasive species, water diversions, flow regime alterations, railroads, and the military (Figure 5-3, *Central Coast: Threats to Connectivity*). Urbanization threatened 85% (17/20) of the linkages recognized, 47% (8/17) of which were ranked as severely threatened. Agriculture threatened 55% (11/20) of the linkages, 27% (3/11) of which were ranked as severely threatened. Roads endangered 40% (8/20) of the linkages, 88% (7/8) of which were ranked as severely threatened. Vineyards jeopardized 30% (6/20) of the linkages, 83% (5/6) of which were ranked as severely threatened. Water diversions and invasive species each endangered 25% (5/20) of the linkages, flow regimes threatened 15% (3/20), and railroads and the military each threatened 5% (1/20) of the linkages identified.

Figure 5-3, *Central Coast: Threats to Connectivity*

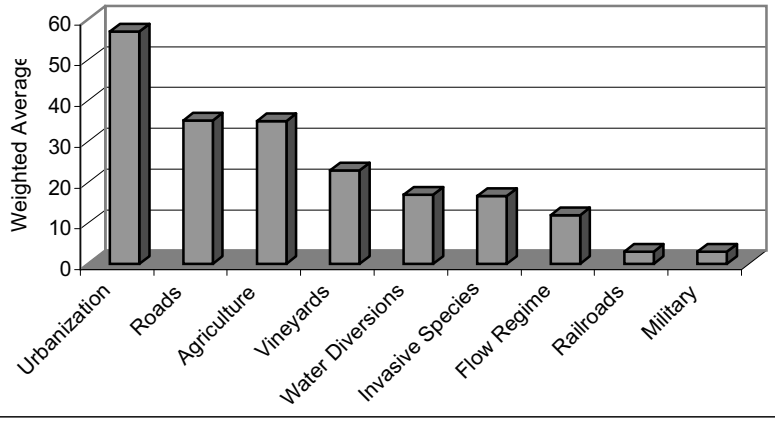


A number of threats to connectivity were identified for the region, though the average severity of the threat and the number of linkages affected varied. The weighted average (average rank × number of linkages affected) was calculated for each threat identified to determine the severity of each threat in the region (Figure 5-4, *Central Coast: Severity of Threats*). Figure 5-4, average severity of each threat among linkages, reveals a slightly different trend than Figure 5-3, the number of linkages affected by each threat.

Conference participants also scored the feasibility of conserving the linkage and ranked the overall degree of threat to connectivity (Figure 5-5, *Central Coast: Ranking the Priorities*). Ecoregional team members ranked 65% (13/20) of the linkages as high priorities with good

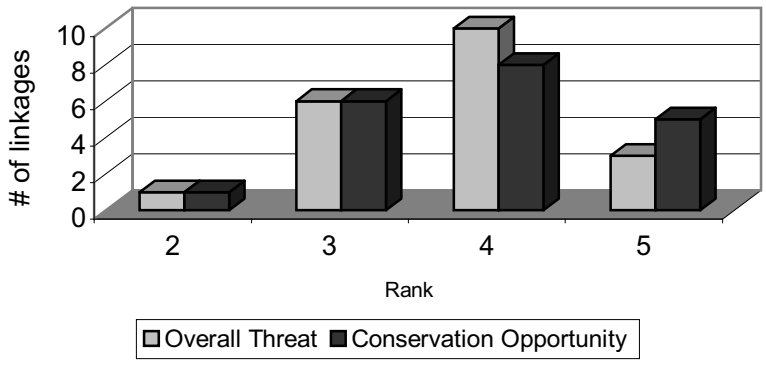
opportunities for conservation (rank = four or five), 46% (6/13) of which were ranked as severely threatened (Figure 5-1, *Central Coast: Missing Linkages,* Map ID#s 1, 3, 7, 15, 18,

Figure 5-4, *Central Coast: Severity of Threats*



Note: The above graph depicts the weighted average of each threat identified. Weighted average = average rank × number of linkages affected. The severity of each threat was ranked from one to five (one = not severe, five = extremely severe).

Figure 5-5, *Central Coast: Ranking the Priorities*



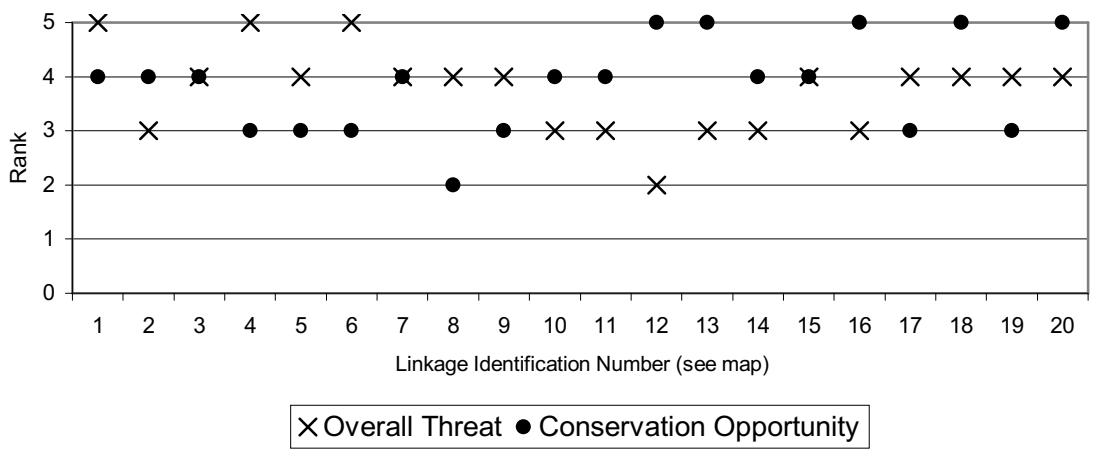
Note: Graph compares the number of linkages ranked for overall threat and conservation opportunity.

and 20). Overall, 65% (13/20) of the linkages identified were ranked as severely threatened (rank = four or five). Of the linkages, 25% (5/20) were ranked as the highest conservation opportunities (rank = five), 40% (2/5) of which were ranked as severely threatened (rank = four). These included one Choke-Point[2] (the Uvas Creek linkage Map ID# 18), and one Landscape Linkage[1] (the Lower North Salinas River Map ID# 20). A brief description of each of the top-ranked linkages (conservation opportunity = five, threat = four) is provided below. A comparison of how individual linkages were ranked is depicted in Figure 5-6, *Central Coast: Degree of Threat and Conservation Opportunities*).

The Uvas Creek linkage (Figure 5-1, *Central Coast: Missing Linkages,* Map ID# 18) was identified as a connectivity Choke-Point[2], linking the headwaters of Uvas Creek to the Pajaro River. This linkage was recognized as providing habitat connectivity for large and small mammals, southern steelhead, and neotropical migratory birds. Habitat types listed for the linkage included valley foothill riparian forest, woodland, and scrub. The primary barriers listed for the linkage included a dam, insufficient flow, and gaps in cover; the primary linkage

features included waterways, bridges, and fairly intact habitat. Numerous threats were identified, including water diversions, flow regime alterations, urbanization,

Figure 5-6, *Central Coast: Degree of Threat & Conservation Opportunities*



Note: The above graph compares how each linkage was ranked for overall threat (one = no threat/secure, five = severe threat/loss imminent) and the feasibility of conserving the linkage (one = not feasible, five = good opportunity).

agriculture, and invasive species. Several studies were cited that document the importance of this linkage. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The Lower North Salinas River linkage (Figure 5-1, *Central Coast: Missing Linkages,* Map ID# 20) was recognized as a Landscape Linkage[1]. This linkage was identified as providing habitat connectivity for large and small mammals, southern steelhead, and neotropical migratory birds. Habitat types listed for the linkage included valley foothill riparian forest, woodland, and scrub. The primary barriers listed for the linkage included a dam, insufficient flow, and gaps in cover. The primary linkage features recognized included contiguous riparian habitat and a bridge. Numerous threats were identified, including water diversions, flow regime, urbanization, agriculture and invasive species. Several references were cited that document the importance of this linkage. Please refer to the corresponding Linkage Description Log sheet for more specific information.

Scientific documentation or other literature cited for some of the linkages included (see Appendix C, *Connectivity References*, for complete citation, if provided):

- Riparian Habitat Joint Venture. 2000. Version 1.0 the riparian bird conservation plan: a strategy for reversing the decline of riparian associated birds in California.
- California Partners in Flight, http://www.prbo.org/CPIF/Riparian/riparian/html.
- History and status of steelhead in California coastal drainages south of San Francisco Bay, Titus, et al.
- Atlas of Breeding Birds of Monterey County, Roberson et al.
- National Park Service, Gaviota Coast Feasibility Study
- Santa Barbara County Gaviota Coast Resource Study
- United States Fish and Wildlife Service Recovery Plans
- Los Banos Grandes Project

Ecoregional team members indicated that 30% (6/20) of the linkages have willing sellers in all or a portion of the linkage. Potential exists for agency acquisition on 30% (6/20) of the linkages, 83% (5/6) of which were identified as having willing sellers (Figure 5-1, *Central Coast: Missing Linkages,* Map ID#s 1, 2, 10, 12 & 14). Participants indicated that 45% (9/20) of the linkages are part of conservation plans. Other opportunities identified to secure or restore connectivity included conservation easements, salmonid restoration programs, the design and/or enhancement of highway underpasses, Habitat Conservation Plans, public and private conservation plans, and coordination among various federal and state agencies.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Cruz – Mt. Hamilton
Ecoregion: Central Coast
Map Name/ID#: 1

Key contact for this linkage: M. Korpos, R. Hopkins, E. Gray
Telephone #: 831/768-9800, 408/227-1204, 408/226-5754
Email: calipuma@hotmail.com, hopkins8@pacbell.net, egray@tnc.org

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other Choked-Landscape Linkage

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Residential Development	5
Highway Expansion	5
Ag – current use	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local landowners are willing to sell easements. The Nature Conservancy and Open Space Authority actively working on acquisition. Part of Mt. Hamilton/Santa Cruz Mt. Project at The Nature Conservancy. Deals with Cisco in the works.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian and oak woodland restoration, address overgrazing issue, pursue need for highway underpasses for movement.

5. Provide brief description of the linkage:

Major Habitat Types: oak woodland, mixed conifer, serpentine grasslands, chaparral, redwood interface

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation and Ag

Major landowners: Private, large parcels, Sargent, Castro Valley Ranch

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadways and gaps in cover.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat in certain areas; couple of underpasses – unknown usage.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): All of the above.

9. What scientific documentation is available demonstrating the value of the linkage? Professional opinion, see contact names.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Highway 152 – Pacheco Pass
Ecoregion: Central Coast
Map Name/ID#: 2

Key contact for this linkage (optional) E. Gray, R. Hopkins
Telephone #:
Email: egray@tnc.org, hopkins8@pacbell.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point (potential because of highway)
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Cougars, med-large carnivores

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | [3] Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Roadway expansion Route 152	5
High Development	3
Exotic invasion	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | [4] | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency) 1
] willing land sellers
part of formal conservation plan (which one)

Other opportunities and details (or information from check items): The Nature Conservancy is working here – Mt. Hamilton Project. Caltrans sensitive design of highway/advocacy groups put pressure.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Over/underpass designs; overgrazing needs to be addressed; riparian restoration above and below Pacheco Pass.

5. Provide brief description of the linkage:

Major Habitat Types: oak woodlands, grasslands, chaparral, riverine, aquatic, riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: Private, some State

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 152 expansion

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): A few underpasses of unknown usage; good habitat coverage on each side.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Study of use of underpasses, we need more knowledge. Best design of highway crossings, incidental observation. Begin collecting road mortality data. CalTrans needs input from other agencies/groups to encourage this practice (I work for CT and this is so important).

9. What scientific documentation is available demonstrating the value of the linkage? Research conducted by Rick Hopkins.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Lucia-Gabilan, Ventana Wilderness
Ecoregion: Central Coast
Map Name/ID#: 3

Key contact for this linkage (optional) Verna Jigour
Telephone #: 408/246-4425
Email: vjigour@aol.com

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Cougar

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Land Development – Residential	4
Other Agriculture	3
Vineyards	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Ventana Wildlands Project in process of developing conservation plan.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Landscape cover restoration, steelhead/riparian habitat enhancement, under/overpasses that work, sand/gravel operations removal, water diversion problems.

5. Provide brief description of the linkage:

Major Habitat Types: Agricultural, grasslands, scrub/oak woodlands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag 70%, Residential expansion, some natural areas on far edges, connects to Ventana/Pinnacles.

Major landowners: Private, Spreckels

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 101, gaps in habitat cover, sand/gravel operations

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): not developed yet

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkages, design of successful/usable under/overpasses.

9. What scientific documentation is available demonstrating the value of the linkage? Information on steelhead through DFG, USFS, local sources (still lacking some).

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Fort Ord - Ventana
Ecoregion: Central Coast
Map Name/ID#: 4

Key contact for this linkage (optional) Verna Jigour
Telephone #: 408/246-4425
Email: vjigour@aol.com

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Coyote, bear, bobcat, mountain lion

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Vineyards	3
Roadways	5
Agriculture	3
Urbanization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from Cal State Morro Bay, BLM.

Potential acquisition through BLM, CSUMB

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Safe road crossings, cover restoration.

5. Provide brief description of the linkage:

Major Habitat Types: maritime chaparral, other chaparral, native grasslands, oak woodlands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Rural residential, Ag, University use, Research areas, State Parks.

Major landowners: Public/Private

Other: CSUMB – Hastings Research Reserve

BLM
State Parks

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads and gaps in cover.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Possibly bridges over Salinas.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Good design of linkage and document usage.

9. What scientific documentation is available demonstrating the value of the linkage? Refer to BLM and CSUMB

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Los Padres Connector – Hearst Castle
Ecoregion: Central Coast
Map Name/ID#: 5

Key contact for this linkage (optional) Maeton Freel
Telephone #: 805/961-5764
Email: mfreel@fs.fed.us

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion, bear, spotted owl, red-legged frog

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Development – Hearst	4
Exotic Invasion	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 2.5 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
1 Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support through County, Coastal Commission, USFS, Greenspace and maybe The Nature Conservancy. Maybe potential for agency acquisition.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Grazing impacts and riparian restoration

5. Provide brief description of the linkage:

Major Habitat Types: oak woodland, grassland, riparian corridors, coastal grasslands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag, recreation, town, natural vegetation.

Major landowners: State Parks, Hearst Corporation

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in habitat cover, Hwy 41 & 46, other than that, not much.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): No development so far, but….. Intact riparian areas.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Documentation of species using the area.

9. What scientific documentation is available demonstrating the value of the linkage? Hard to get access. Presence of focal species north and south of corridor.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Cuesta Grade North
Ecoregion: Central Coast
Map Name/ID#: 6

Key contact for this linkage (optional) Maeton Freel
Telephone #: 805/961-5764
Email: mfreel@fs.fed.us

1. Linkage Type (check one)

]	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion, black bear, deer herd, grey fox, bobcat

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Highway 101	5
S. P. Railway	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Redesign of Highway 101 crossing at Cuesta Grade (underpass).

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Habitat ok, access barrier at Highway 101

5. Provide brief description of the linkage:

Major Habitat Types: mixed chaparral with scattered conifers

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: USFS (core lands), CalTrans Hwy 101 R-O-W

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 101 crossing and railroad crossing

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document linkage usage and success of modification to Hwy crossing.

9. What scientific documentation is available demonstrating the value of the linkage? Numerous records of road kills of both mountain lion and black bear.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Montana de Oro – Bald Mountain
Ecoregion: Central Coast
Map Name/ID#: 7

Key contact for this linkage (optional) John Gallo
Telephone #: 805/971-6052
Email: gallo@conceptioncoast.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point (at Highway 101)
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Oak forest; coastal habitats, a guess that mountain lions use it but no verification

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	3
Agriculture	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): I would ask my contacts at San Luis Obispo about this.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Connection.

5. Provide brief description of the linkage:

Major Habitat Types: oak woodlands, coastal sage scrub, grassland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation (majority), some Ag, some residential.

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 101, open area that is east of Highway 101

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage west of Highway 101

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Talk with residents to see if mountain lions are indeed present. Document use of crossing.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Antonio – Vandenberg/Sedgewick
Ecoregion: Central Coast
Map Name/ID#: 8

Key contact for this linkage (optional) John Gallo
Telephone #: 805/971-6052
Email: gallo@conceptioncoast.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point (at Hwy 101 Santa Maria)
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion; riparian habitat; oak habitat

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Vineyards	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Willow riparian; oak woodland; little coastal sage scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag; major threat of vineyard expansion.

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Crossing Hwy 101, just south of 101

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): San Antonio Creek waterway; Purissima Hills

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Examine habitat quality; document use of linkage.

9. What scientific documentation is available demonstrating the value of the linkage? None yet, some to come soon.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Ynez River
Ecoregion: Central Coast
Map Name/ID#: 9

Key contact for this linkage (optional) Ethan Inlander
Telephone #: 805/687-2073
Email: inlander@conceptioncoast.org

1. Linkage Type (check one)

1 Landscape Linkage] Connectivity Choke-Point
1 Missing Link] Other riparian/river corridor

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Steelhead, riparian birds

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 [4] 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	3
Urbanization	3
Water Diversions	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 [3] 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
] Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Santa Barbara County Water Agency

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Dam removal, fish ladders, riparian restoration and setbacks.

5. Provide brief description of the linkage:

Major Habitat Types: Valley riparian habitat, estuary

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, Ag, Rural Residential

Major landowners: Vandenberg Air Force Base, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Bradbury Dam low flow of water. Choke-points at Bradbury and Gilbraltor Dams

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Water release

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Riparian setbacks with willing land owners. Who are they? Sufficient water releases. How much?

9. What scientific documentation is available demonstrating the value of the linkage? Contact Matt Stoecker or Nick Ferrell at Conception Coast Project 805/687-2073

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Gaviota Coast
Ecoregion: Central Coast
Map Name/ID#: 10

Key contact for this linkage (optional) Ethan Inlander
Telephone #: 805/687-2073
Email: inlander@conceptioncoast.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point (Route 101, the Gaviota Pass)
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large carnivores, representative coastal habitat, steelhead

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Roadways	4
Development	3
Agriculture	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 [4] 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: Los Padres National Forest, CA Parks. Conservation plans: NPS Gaviota Coast Feasibility Study, Santa Barbara County Gaviota Coast Resources Study.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Overpass/underpass on Hwy 101 at Gaviota Pass. Riparian restoration, culverts on all creeks where 101 crosses them.

5. Provide brief description of the linkage:

Major Habitat Types: Chaparral, exposed sandstone, riparian (willows, etc)

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural vegetation, grazed, agriculture

Major landowners: Private, Oil

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 101, its culverts are not fish friendly. Also, it is difficult for large carnivores to cross 101 at Gaviota Pass.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Streams

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Where along the pass should overpass/underpass be engineered? What streams should be prioritized for culvert retrofit for steelhead.

9. What scientific documentation is available demonstrating the value of the linkage?

Conception Coast Project analysis will be done in late 2001.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Casitas
Ecoregion: Central Coast
Map Name/ID#: 11

Key contact for this linkage (optional) Morgan Wehtje
Telephone #: 805/491-3551
Email: mwehtje@dfg2.ca.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mammals – medium to large, diurnal movement

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Roadways	5
Agriculture	2
Development	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Conservation gaps landowners. Improve highway for wildlife crossing.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Decrease speed, undercrossings, etc.

5. Provide brief description of the linkage:

Major Habitat Types: scrub oak, annual grassland, aquatic

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: Bureau of Reclamation, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadway

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Water access – drainages.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Roadkill data (species, age class, time of day, month, time of year).

9. What scientific documentation is available demonstrating the value of the linkage? Anecdotal

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: South Diablo - Carizzo
Ecoregion: Central Coast
Map Name/ID#: 12

Key contact for this linkage (optional) Robin Cox
Telephone #: 415/281-0461
Email: rcox@tnc.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Core area that links public lands. Large mammal wildlife movement: mountain lion, kit fox. Global warming, fire.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Rural Residential Development	4
Conversion to Vineyards	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Part of The Nature Conservancy ecoregional plan.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): restoration of selected riparian corridors.

5. Provide brief description of the linkage:

Major Habitat Types: Oak woodland, grasslands, Diablan scrub, perennial streams

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM, ranchers, The Nature Conservancy

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Linakges largely intact, but potential for fragmentation high and eminent.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Intact uplands, lots of drainage corridors.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Landownership, identification of large, connected ranches.

9. What scientific documentation is available demonstrating the value of the linkage? Lots of anecdotal. USFWS Kit Fox Recovery Plan

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: S. Luis Reservoir – Pinoche Hills
Ecoregion: Central Coast
Map Name/ID#: 13

Key contact for this linkage (optional) R. Hopkins, E. Gray
Telephone #:
Email: hopkins8@pacbell.net, egray@tnc.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

kit fox, cougar, other medium to large carnivores, Tule elk

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | [3] Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Reservoir Expansion	2 (Los Banos Grandes – on hold)
Development	3
Road Expansion	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | [5] Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): May become part of TNC Mt. Hamilton Project.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Sycamore alluvial riparian, oak woodland

5. Provide brief description of the linkage:

Major Habitat Types: grasslands, riparian woodland, mixed oak woodland, savanna

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural (85%) Ag (15% or less)

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): None at the moment.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage, moderate to high quality riparian corridors.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): All of the above.

9. What scientific documentation is available demonstrating the value of the linkage? None. Possible gray literature on kit fox as part of Los Banos Grandes project.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Hollister – Quien Sabe Valley
Ecoregion: Central Coast
Map Name/ID#: 14

Key contact for this linkage (optional) E. Gray, R. Hopkins
Telephone #:
Email: egray@tnc.org, hopkins8@pacbell.net

1. Linkage Type (check one)

] Landscape Linkage (East) 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Kit fox, cougar, other carnivores. Connection of two mountain ranges (Santa Cruz corridor #1 to Diablo Range Corridor # 12 and #13).

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Development	2
Vineyards	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)] willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): The Nature Conservancy Mt. Hamilton Project.

County wide HCP in progress.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian

restoration, grazing management.

5. Provide brief description of the linkage:

Major Habitat Types: chaparral, valley oak woodland, mixed oak woodland, grassland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): None.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat, continual habitat coverage.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): All of the above.

9. What scientific documentation is available demonstrating the value of the linkage? None.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Pinoche Valley – Hwy 25 Corridor
Ecoregion: Central Coast
Map Name/ID#: 15

Key contact for this linkage (optional) E. Gray, R. Hopkins
Telephone #:
Email: egray@tnc.org, hopkins8@pacbell.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Carnivores. Intermountain connection

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Vineyards	4
Development	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
1 Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Acquisition through TNC Mt. Hamilton Project. San Benito County HCP in progress.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Riparian/oak restoration

5. Provide brief description of the linkage:

Major Habitat Types: mixed oak woodlands, valley oak woodlands, grassland, riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Some vineyards, mostly natural vegetation.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Mostly natural vegetation, riparian corridors.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): All of the above.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Camp Roberts
Ecoregion: Central Coast
Map Name/ID#: 16

Key contact for this linkage (optional) Verna Jigour
Telephone #: 408/246-4425
Email: vjigour@aol.com

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

kit fox, Tule elk

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Roadways	4
Military Activity	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Ventana Wildlands Projects

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Road crossings

5. Provide brief description of the linkage:

Major Habitat Types: Non-native grasslands, oak woodlands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, grazing lands and other Ag.

Major landowners: Military

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadways, minor gaps in cover.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): More of less continuous cover.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document, Design

9. What scientific documentation is available demonstrating the value of the linkage? Kit fox point occurrences.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Salinas River Riparian Corridor
Ecoregion: Central Coast
Map Name/ID#: 17

Key contact for this linkage (optional) Robin Cox
Telephone #:
Email: rcox@tnc.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other Highway 101

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | [4] | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urban/Rural Expansion	2
Ranching/Ag Conversion	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | [3] Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): TNC designing a site plan in San Luis and Monterey Counties

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Arundo and tamarisk control.

5. Provide brief description of the linkage:

Major Habitat Types: riparian forest, grasslands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Many

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 101, railroad, small towns

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Broad, undeveloped floodplain.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Landownership patterns, design.

9. What scientific documentation is available demonstrating the value of the linkage? TNC is working on a design with a Packard Grant.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Uvas Creek, headwaters (including Little Arthur & Bodfish Crs) to Junction w/ Pajaro R.
Ecoregion: Central Coast
Map Name/ID#: 18

Key contact for this linkage (optional) Verna Jigour
Telephone #: 408/246-4425
Email: vjigour@aol.com

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Population recovery "stepping stone" and/or "migratory stopover" habitat for neotropical migratory bird species; and connectivity for steelhead with headwaters spawning and rearing habitats. Movement linkage for large and small mammals?

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
Exotic Pest Plant Encroachment	3
Flow Regime Alterations	4
Agriculture, related flood control	5
Channelization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	?	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): As part of the Pajaro R. watershed this tributary has received some evaluation via ongoing planning processes. At least one ongoing project funded by CDFG-funded salmonid restoration program for Pajaro. Status of planning efforts relevant to Uvas is unknown. Perhaps the Garlic Festival could begin raising funds for habitat purchase and restoration?

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian woodland/forest and associated aquatic habitats are most important target habitats, but this is partly dependent on flow, which is regulated by the dam at Uvas Reservoir. Urban creekside habitat restoration (through Gilroy) could work synergistically with provision for riparian zone through downstream ag lands. Landscape-level watershed restoration efforts targeting annual grasslands could increase available water.

5. Provide brief description of the linkage:

Major Habitat Types: Valley/foothill riparian forest, woodland and scrub resting and potential breeding niches for neotropical migrants; migration corridor for steelhead traveling to/from historic headwaters spawning and rearing habitats in eastern slopes of Santa Cruz Mountains.

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Human-constrained natural vegetation along the creek margins for most of its length; suburban and rural residential and agricultural land cover.

Major landowners: Residents of Gilroy and Morgan Hill, the City of Gilroy (site of the annual Garlic Festival) and agricultural land owners.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Historic removal/degradation of riparian floodplain vegetation has reduced resting/breeding niches for neotropical migrants. This creek flows through outskirts of Gilroy where its width becomes particularly constrained. The site of the annual Garlic Festival spans Uvas Creek, though this could lead to future funding opportunities, mentioned above. Downstream riparian habitats have been largely removed through ag lands. Insufficient flow (due to dam) and gaps in habitat cover, resulting in increased water temperatures, hamper steelhead migration.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterway, bridges, including under Hwy 101, relatively intact riparian habitat downstream of Uvas Reservoir, as well as along Little Arthur an dparts of Bodfish Cr., until it approaches town.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use by neotropical migrants, including relationships with other nearby riparian areas, such as Llagas and Coyote Creeks. Evaluate feasibility of restoring steelhead migratory function.

9. What scientific documentation is available demonstrating the value of the linkage? Unglish: Condor 39: 39-40: 4 eggs Bell's vireo collected in this vicinity in 1932. Field Notes vol. 51, No. 4, p. 924 documents the siting of a mated pair of Least Bell's Vireo "near Gilroy" (during 1997 spring migration). Riparian Habitat Joint Venture. 2000. Version 1.0 the riparian bird conservation plan: a strategy for reversing the decline of riparian associated birds in California. California Partners in Flight. http://www.prbo.org/CPIF/Riparian/riparian/html. Titus, R. G., D. C. Erman, and W. M. Snider. History and status of steelhead in California coastal drainages south of San Francisco Bay. CDFG. Sacramento. In preparation. (July 21, 1999 Draft Manuscript) Titus noted that the historic data on this tributary was "currently being reviewed" at the time the manuscript was printed.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Llagas Creek, headwaters to Junction with Pajaro R. Key contact for this linkage (optional) Verna Jigour
Ecoregion: Central Coast Telephone #: 408/246-4425
Map Name/ID#: 19 Email: vjigour@aol.com

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Population recovery "stepping stone" and/or "migratory stopover" habitat for neotropical migratory bird species; and connectivity for steelhead with headwaters spawning and rearing habitats. Movement linkage for large and small mammals?

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Flow Regime alterations	4
Agriculture, related flood control	5
Urbanization	5
Exotic pest plant encroachment	3
Channelization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	**?**	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: Pajaro R. working groups. As part of the Pajaro R. watershed this tributary has received some evaluation via ongoing planning processes. At least one ongoing project funded by CDFG-funded salmonid restoration program for Pajaro. Status of planning efforts to Llagas is unknown.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian woodland/forest and associated aquatic habitats are most important target habitats, but this is partly dependent on flow, which is regulated by the dam at Chesbro reservoir. Urban creekside habitat restoration (through Gilroy) could work synergistically with provision for riparian zone through downstream ag lands. Point and nonpoint-source water pollution mitigation would help! Landscape-level watershed restoration efforts targeting annual grasslands could increase available water.

5. Provide brief description of the linkage:

Major Habitat Types: Valley/foothill riparian forest, woodland and scrub resting and potential breeding niches for neotropical migrants; migration corridor for steelhead traveling to/from historic headwaters spawning and rearing habitats in eastern slopes of Santa Cruz Mountains.

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Human-constrained natural vegetation along the creek margins for part of its length; suburban residential (City of Gilroy), agricultural and rural residential land cover.

Major landowners: Residents of Gilroy and Morgan Hill, and agricultural land owners.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Historic removal/degradation of riparian floodplain vegetation has reduced resting/breeding niches for neotropical migrants. This creek flows through the town of Gilroy where its width becomes particularly constrained. Downstream riparian habitats have been largely removed through ag lands. Insufficient flow (due to dam) and gaps in habitat cover, resulting in increased water temperatures, hamper steelhead migration.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterway, bridges, including under Hwy 101.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use by neotropical migratory bird species, especially in relation to nearby Uvas Cr., as well as more distant riparian areas, such as Coyote Creek. Evaluate feasibility of restoring steelhead migratory function, compare to Uvas Cr.

9. What scientific documentation is available demonstrating the value of the linkage?

Unglish: Condor 39: 39-40: 4 eggs Bell's vireo collected in this vicinity in 1932.

Field Notes vol. 51, No. 4, p. 924 documents the siting of a mated pair of Least Bell's Vireo "near Gilroy" (during 1997 spring migration).

Titus, R. G., D. C. Erman, and W. M. Snider. History and status of steelhead in California coastal drainages south of San Francisco Bay. CDFG. Sacramento. In preparation. (July 21, 1999 Draft Manuscript) Titus noted that the historic data on this tributary was "currently being reviewed" at the time the manuscript was printed.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Lower N. Salinas River (San Ardo north to mouth
Ecoregion: Central Coast
Map Name/ID#: 20

Key contact for this linkage (optional) V. Jigour
Telephone #: 408/246-4425
Email: vjigour@aol.com

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Steelhead connectivity and "stepping stone" and/or "migratory stopover" habitat for neotropical migratory bird species. Potential movement linkage for large and small mammals between the Diablo and Santa Lucia Ranges, with restoration of riparian habitats along associated tributaries.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Flow regime alterations	4
Agriculture, related flood control	5
Land Development	4
Exotic pest plant encroachment	5
Channelization	3
Impaired estuary function due to channelization at mouth	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) **?** willing land sellers
1 Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: Watershed Institute @CSUMB. Watershed Institute has promoted setback levees as a means to allow natural floodplain expansion. Salinas Valley has extremely low gradient – easy to flood much of the valley. No doubt that historical pattern is what made it so rich. But flow alterations limit the degree to which native riparian vegetation can recolonize, while also promoting the proliferation of exotic pest plants such as Arundo donax or Tamarix sp., which further choke the flows and alter habitat structure. Landscape-scale watershed restoration efforts could increase the amount of water available for ecological, as well as human needs.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian

woodland/forest and associated aquatic habitats are most important target habitats, but as mentioned above, this is dependent on flow. Landscape-level watershed restoration efforts targeting annual grasslands could increase available water.

5. Provide brief description of the linkage:

Major Habitat Types: migration corridor for steelhead traveling to/from headwaters spawning areas such as Arroyo Seco and tributaries in San Luis Obispo Co.; valley riparian forest, woodland and scrub resting and potential breeding niches for neotropical migrants.

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Human-constrained natural vegetation along the river margins for most of its length, agricultural, rural and suburban residential land cover.

Major landowners: Agricultural interests, various public agencies at former Fort Ord.

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Insufficient flow (due to dams and diversions) and gaps in habitat cover resulting increased water temperatures hamper steelhead migration. Historic removal/degradation of riparian floodplain vegetation has reduced breeding niches for neotropical migrants, as well as limiting riparian habitat connectivity between the Salinas River and adjacent mountain range drainages for other terrestrial species.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): More or less continuous riparian habitat, bridges

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): 1) Document use by neotropical migratory bird species (e.g., RHJV doesn't indicate data on this area, though they discuss it in the report). 2) Evaluate historic distribution of riparian habitat "stringers", which may have provided connectivity for earthbound species such as mammals and amphibians, between the Santa Lucia and Diablo Ranges via the Salinas River. Compare historic riparian habitat distributions with potential wildlife viability and/or movement studies to determine potential restoration targets. Any restoration initiatives will likely require incentives for farmers. 3) Model the potential increases in available water possible through large-scale watershed restoration efforts. Most critical need for steelhead is to restore historic flow dynamics to the degree feasible. This would also help fend off exotic plant invasions, which compromise breeding/resting niches for neotropical migrants. As a side bar, the Monterey County Water Resources Agency fails to resolve sea-water intrusion problems at the mouth, the State may finally follow-up on its promise of adjudication, the issue being the need to let more water reach the mouth. Several recent MCWRA planning/engineering initiatives toward that end have apparently died their rightful (in my humble opinion) deaths. 4) Long-range research priorities might include evaluation of alternative water storage strategies so that connectivity for steelhead may someday be restored past the existing Nacimiento, San Antonio (Monterey County), and Salinas Dams (San Luis Obispo Co.).

9. What scientific documentation is available demonstrating the value of the linkage?

Roberson, Don and Chris Tenney, Eds. 1993. Atlas of Breeding Birds of Monterey County. Monterey Peninsula Audubon Society. 436pp.

RHJV (Riparian Habitat Joint Venture). 2000. Version 1.0 The riparian bird conservation plan: a strategy for reversing the decline of riparian associated birds in California. California Partners in Flight. http://www.prbo.org/CPIF/Riparian/Riparian.html.

Titus, R. G., D. C. Erman, and W. M. Snider. History and status of steelhead in California coastal drainages south of San Francisco Bay. California Department of Fish and Game. Sacramento. In preparation. (July 21, 1999 Draft Manuscript).

10. Other information:

6.0 SOUTH COAST ECOREGION

The South Coast ecoregion is roughly bound by the Sierra Madre Mountains and Tehachapi Mountains to the north, the Antelope Valley, Little San Bernardino Mountains, Coachella Valley, and Imperial Valley to the east; Baja to the south, with the Pacific ocean forming the western boundary (Figure 1-1, *California Regions and Topography*). The primary regional community types are mixed evergreen forest, oak woodland, chaparral, coastal sage scrub, grassland, riparian woodland, and alluvial fan sage scrub.

Mixed evergreen forest is found at higher elevations in the mountains of the region. Yellow pine (*Pinus ponderosa*) and Jeffrey pine (*P. jeffreyi*) are the most abundant conifers of the Transverse and Peninsular Ranges. Other tree species characteristic of this community are Douglas fir (*Pseudotsuga macrocarpa*), knobcone pine (*Pinus attenuata*), Coulter pine (*P. coulteri*), incense cedar (*Calocedrus decurrens*), and at higher elevations, white fir (*Abies concolor*) and sugar pine (*Pinus lambertiana*).

Oak woodlands occur in wide valleys, on north-facing slopes, in canyons and along streams. There are a number of oak species in the region; including coast live oak (*Quercus agrifolia*), valley oak (*Q. lobata*), canyon live oak (*Q. chrysolepis*), Engelmann oak (*Q. engelmannii*), interior live oak (*Q. wislizenii*) and black oak (*Q. kelloggii*). Coast live oak is the most abundant member of the genus in the region.

Chaparral occurs primarily on north-facing slopes, while coastal sage scrub occupies south-facing slopes at lower elevations. Characteristic shrub species of chaparral are chamise (*Adenostoma fasciculatum*), mountain mahogany (*Cercocarpus betuloides*), ceanothus (*Ceanothus* sp.), toyon (*Heteromeles arbutifolia*), and scrub oak (*Quercus berberidifolia*). Coastal sage scrub is a diverse community comprised of aromatic shrubs and subshrubs, such as coastal sagebrush (*Artemisia californica*), purple sage (*Salvia leucophylla*), black sage (*S. mellifera*), woolly blue curls (*Trichostema lanatum*), sporadic laurel sumac (*Malosma laurina*) and Mexican elderberry trees (*Sambucus mexicana*).

The grasslands of the region are found primarily on valley floors and moderately sloping hills. This habitat type once consisted of native perennial bunchgrasses, herbs and forbs; introduced Mediterranean annual grasses now largely dominate this community in the region.

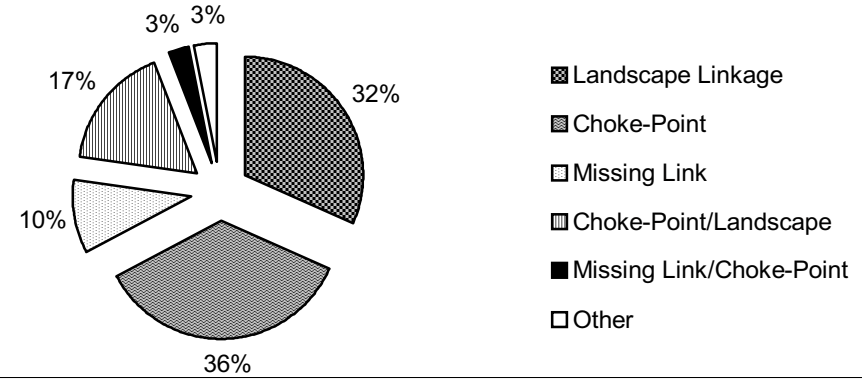
Riparian woodlands are found along perennial and intermittent streams. Typical species of the riparian woodlands of the region are cottonwood (*Populus* spp.), alder (*Alnus* spp.), Western sycamore (*Platanus racemosa*), numerous willow species (*Salix* spp.), and mule fat (*Baccharis salicifolia*). Alluvial fan sage scrub is another habitat type associated with water; characteristic species here include scale broom (*Lepidospartum* spp.), prickly pear (*Opuntia* spp.), laurel sumac (*Malosma laurina*), and yucca (*Yucca whipplei*).

Though much of the region is privately owned, there are numerous patches of publicly owned land and open space in the region. The South Coast ecoregion has four National

Forests including the entire Angeles, San Bernardino, and Cleveland, and a portion of the Los Padres. There are eight State Parks in the region including Point Mugu, Malibu Creek, Topanga, Placentia Canyon, Chino Hills, Mt. San Jacinto, Palomar Mountain, and Border Field. There are also scattered pieces of land managed by the Bureau of Land Management. The National Park Service manages the Santa Monica Mountains National Recreation Area. Other publicly owned land includes the Santa Rosa State Game Refuge, and the Otay Mountain Cooperative Land and Wildlife Management Area. In addition, the military manages two significant blocks of land including: Camp Pendleton, which is the largest piece of undeveloped coastal habitat in the region, and Miramar Naval Air Station.

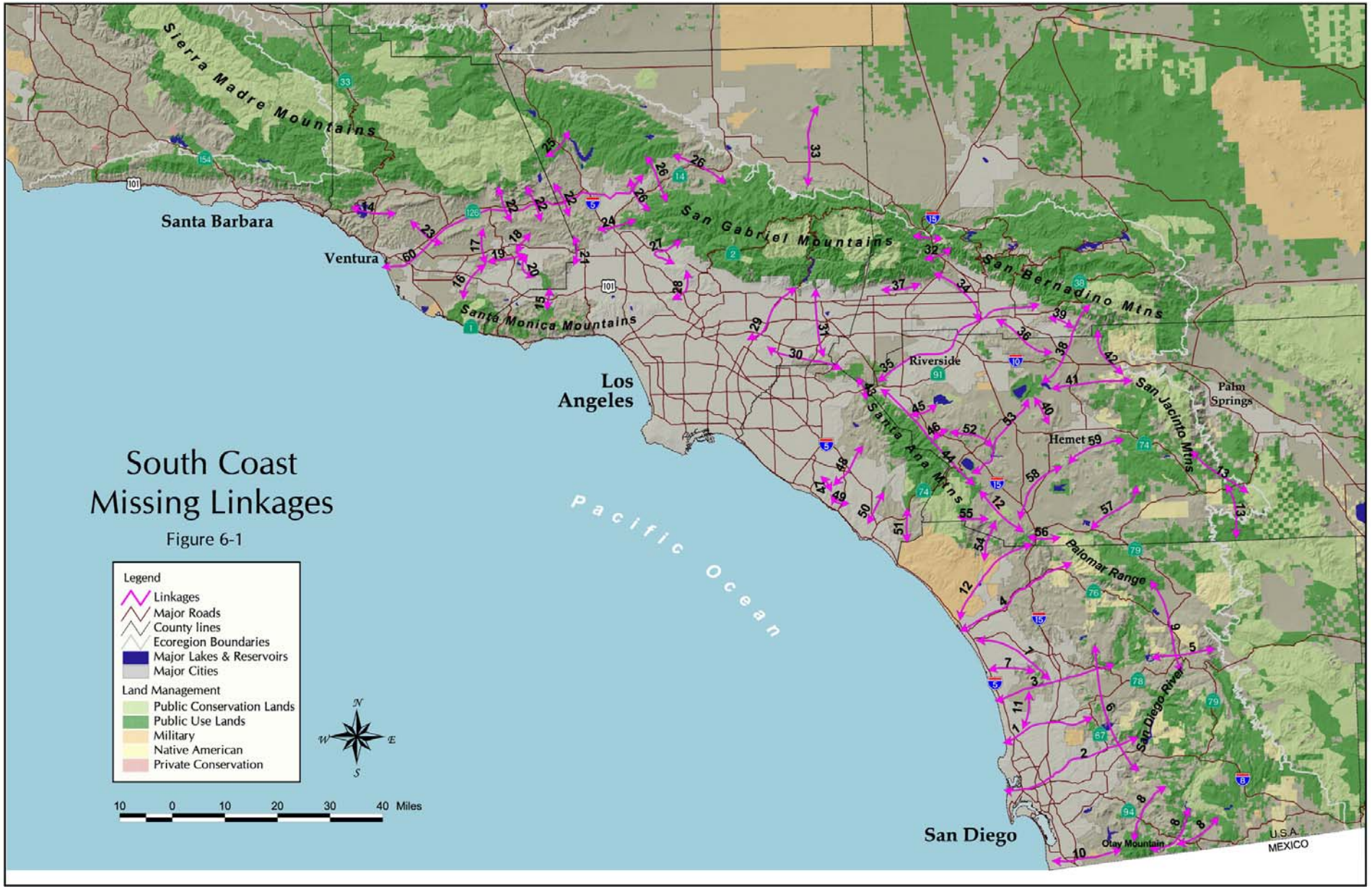
A total of 60 habitat linkages were identified for the region (Figure 6-1, *South Coast: Missing Linkages*). Of the linkages identified, 32% (19/60) were considered Landscape Linkages[1], 36% (21/60) were recognized as Choke-Points[2], and 10% (6/60) were determined to be Missing Links[3]. Scientists also identified other types of linkages; 3% (2/60) were considered Missing Links[3] and Choke-Points[2], 17% (10/60) were recorded as Choke-Points[2] and Landscape Linkages[1], and 3% (2/60) were defined as other linkage types (Figure 6-2, *South Coast: Types of Linkages*).

Figure 6-2, *South Coast: Types of Linkages*



The key species used to identify the linkages belonged to a number of taxonomic groups. Mammals recognized as key species included mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), black bear (*Ursus americanus*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), bighorn sheep (*Ovis canadensis*), mule deer (*Odocoileus hemionus*), badger (*Taxidea taxus*), Mojave ground squirrel (*Spermophilus mohavensis*), San Bernardino kangaroo rat (*Dipodomys merriami parvus*), and Los Angeles pocket mouse (*Perognathus longimembris brevianus*). Birds listed as key species included golden eagle (*Aquila chrysaetos*), Le Conte's thrasher (*Toxostoma lecontei*), least Bell's vireo (*Vireo bellii pusillus*), coastal California gnatcatcher (*Polioptila californica californica*), southwestern willow flycatcher (*Empidonax traillii extimus*), least tern (*Sterna antillarum browni*), snowy plover (*Charadrius*

[1] Landscape Linkage = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between different sections of the landscape.
[2] Choke-Point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas").
[3] Missing Link = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadway, etc.), but based on location one that is critical to restore connectivity function.


South Coast
Missing Linkages
Figure 6-1
Legend
Linkages
Major Roads
County lines
Ecoregion Boundaries
Major Lakes & Reservoirs
Major Cities
Land Management
Public Conservation Lands
Public Use Lands
Military
Native American
Private Conservation
10 0 10 20 30 40 Miles
N
W
E
S
Sierra Madre Mountains
Santa Barbara
Ventura
Santa Monica Mountains
Los Angeles
San Gabriel Mountains
San Bernadino Mtns
Riverside
Palm Springs
Hemet
San Jacinto Mtns
Santa Ana Mtns
Palomar Range
San Diego River
San Diego
Otay Mountain
U.S.A.
MEXICO
Pacific Ocean

alexandrinus nivosus), and other migratory birds. Fish recognized as key species included three-spined stickleback (*Gasterosteus aculeatus*), southern steelhead (*Oncorhynchus mykiss*), and Santa Ana sucker (*Catostomus santaanae*). Reptiles and amphibians listed as key species included desert tortoise (*Gopherus agassizii*), southwestern pond turtle (*Clemmys marmorata*), western spadefoot toad (*Scaphiopus hammondii*), and arroyo southwestern toad (*Bufo microscaphus californicus*). The quino checkerspot butterfly (*Euphydryas editha quino*) was the only invertebrate listed as a key species. Both single and multiple key species were used in identifying the linkages; 82% (49/60) of the linkages recognized mammals as key species, 27% (16/60) used birds, 12% (7/60) used amphibians or reptiles, and 8% (5/60) used fish. Mammalian carnivores were recognized as key species in 78% (47/60) of the linkages.

The primary features identified as facilitating animal movement in the region included waterways, flood-control channels, riparian corridors, contiguous or semi-contiguous habitat, underpasses, and culverts. Remnants of riparian habitat are vital connections in this heavily modified region. In fact, 48% (29/60) of the linkages identified are associated with waterways. Riparian linkages specifically mentioned included the Ventura, Santa Clara, and Santa Clarita Rivers, San Gorgonio, Oso, San Juan and San Marcos Creeks, and Temescal Wash. In a region with such an extensive road network, underpasses and culverts have also become critical movement corridors; 35% (21/60) of the linkages identified in the region are associated with underpasses or culverts.

The primary barriers to animal movement in the region are varied, though no barriers were listed for nine of the linkages identified. The majority of barriers listed are associated with the extensive road network. In fact, 67% (40/60) of the linkages listed roads or highways as the primary impediment to movement. Specific highways mentioned as major barriers to wildlife passage included 2, 5, 8, 10, 14, 15, 23, 33, 56, 60, 66, 67, 79, 91, 101, 118, 126, 138, 210, 261, and 805. In some of the linkages, conversion of natural habitat to agriculture or urban land uses has created gaps in cover, which was identified as a barrier for habitat specialists. In some of the riparian linkages, dams, diversions, and stream channelization were identified as obstacles to movement.

Habitat types identified in need of restoration included oak woodland, walnut woodland, coastal sage scrub, riparian, vernal pool, and alluvial fan sage scrub. The eradication of invasive species was named as a restoration priority in 23% (14/60) of the linkages; some of the targets mentioned included giant reed (*Arundo donax*), thistles (*Centaurea* spp. & *Silybum* spp.), and brown-headed cowbird (*Molothrus ater*). Restoring portions of agricultural land to historic habitat types for functional connectivity was identified as a priority in 12% (7/60) of the linkages. Underpass design and installation, as well as enhancement of existing underpasses, were identified as additional restoration needs. Participants did not list any restoration needs for 25% (15/60) of the linkages, and it was specified that 5% (3/59) of the linkages require no restoration. Overall, participants felt that restoration projects designed to reestablish habitat connectivity should be monitored for use by target species.

The primary threats to connectivity identified in the ecoregion included urbanization, roads, invasive species, and agriculture; other acknowledged threats included recreation, border fencing, off-road vehicles, grazing, railroads, mining, and water diversions (Figure 6-3, *South Coast: Threats to Connectivity*). Urbanization threatened 85% (51/60) of the linkages

identified, 63% (32/51) of which were ranked as severely threatened (rank = four or five). Roads jeopardized 40% (24/60) of the linkages recognized, 58% (14/24) of which were ranked as severely threatened. Invasive species endangered 30% (18/60) of the linkages identified, 33% (6/18) of which were ranked as severely threatened. Of the linkages, 25% (15/60) listed agriculture as a threat to habitat connectivity, 40% (6/15) of

Figure 6-3, *South Coast: Threats to Connectivity*

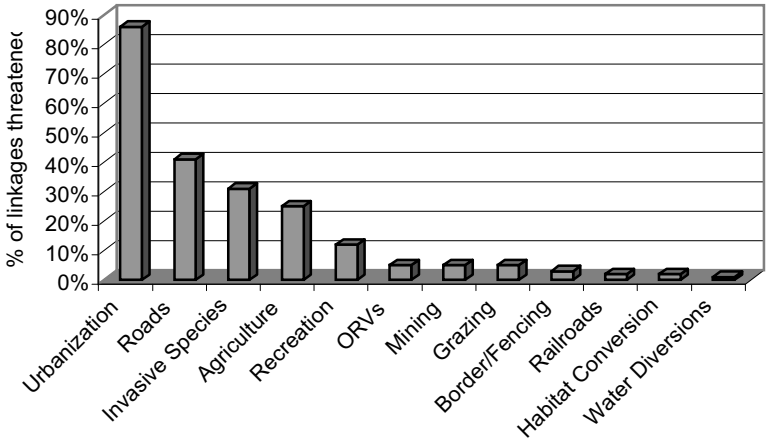
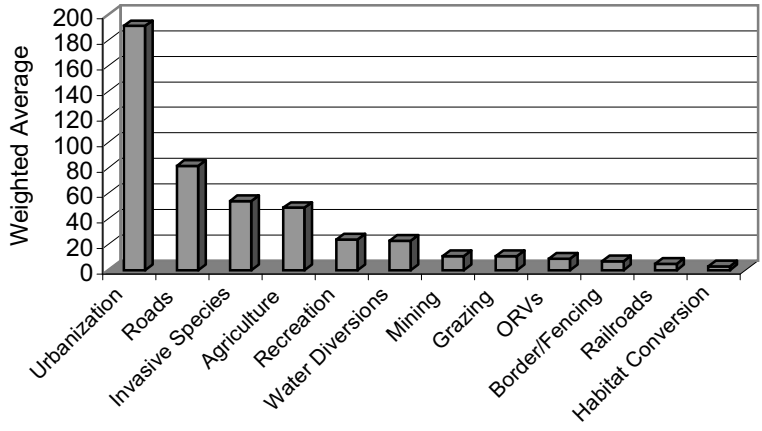


Figure 6-4, *South Coast: Severity of Threats*



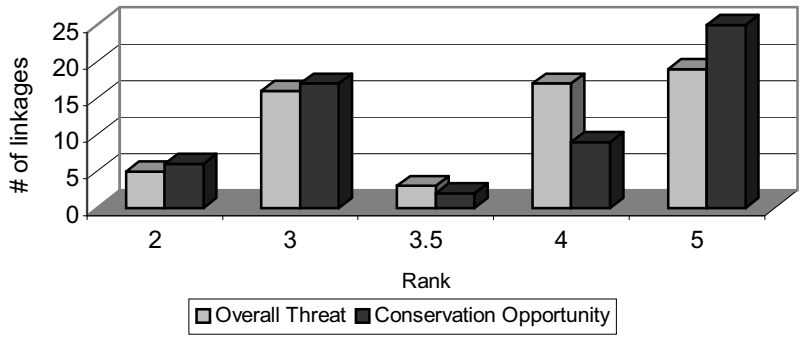
Note: The above graph depicts the weighted average of each threat identified. Weighted average = average rank × number of linkages affected. The severity of each threat was ranked from one to five (one = not severe, five = extremely severe).

which were ranked as severely threatened. A number of threats to habitat connectivity were identified for the region, though the average severity of the threat and the number of linkages affected varied. Figure 6-4, *South Coast: Severity of Threats* was constructed by calculating the average rank of each threat and multiplying it by the number of linkages affected. Figure 6-4, average severity of each threat among linkages, reveals similar trends as Figure 6-3, the number of linkages impacted by each threat.

Conference participants also scored the feasibility of conserving the linkage and ranked the overall degree of threat to connectivity (Figure 6-5, *South Coast: Ranking the Priorities*). Participants ranked 57% (34/60) of the linkages as high priorities with good opportunities for

conservation (rank = four or five), 28% (17/60) of which were ranked as severely threatened (Figure 6-1, *South Coast: Missing Linkages,* Map ID#s 1, 11, 18, 19, 20, 24, 31, 32, 40, 41, 42, 43, 44, 46, 52, 53, 60). Overall, 60% (36/60) of the linkages identified were ranked as severely threatened (rank = four or five).

Figure 6-5, *South Coast: Ranking the Priorities*



Note: Graph compares the number of linkages ranked for overall threat and conservation opportunity. No linkages were ranked one for either category.

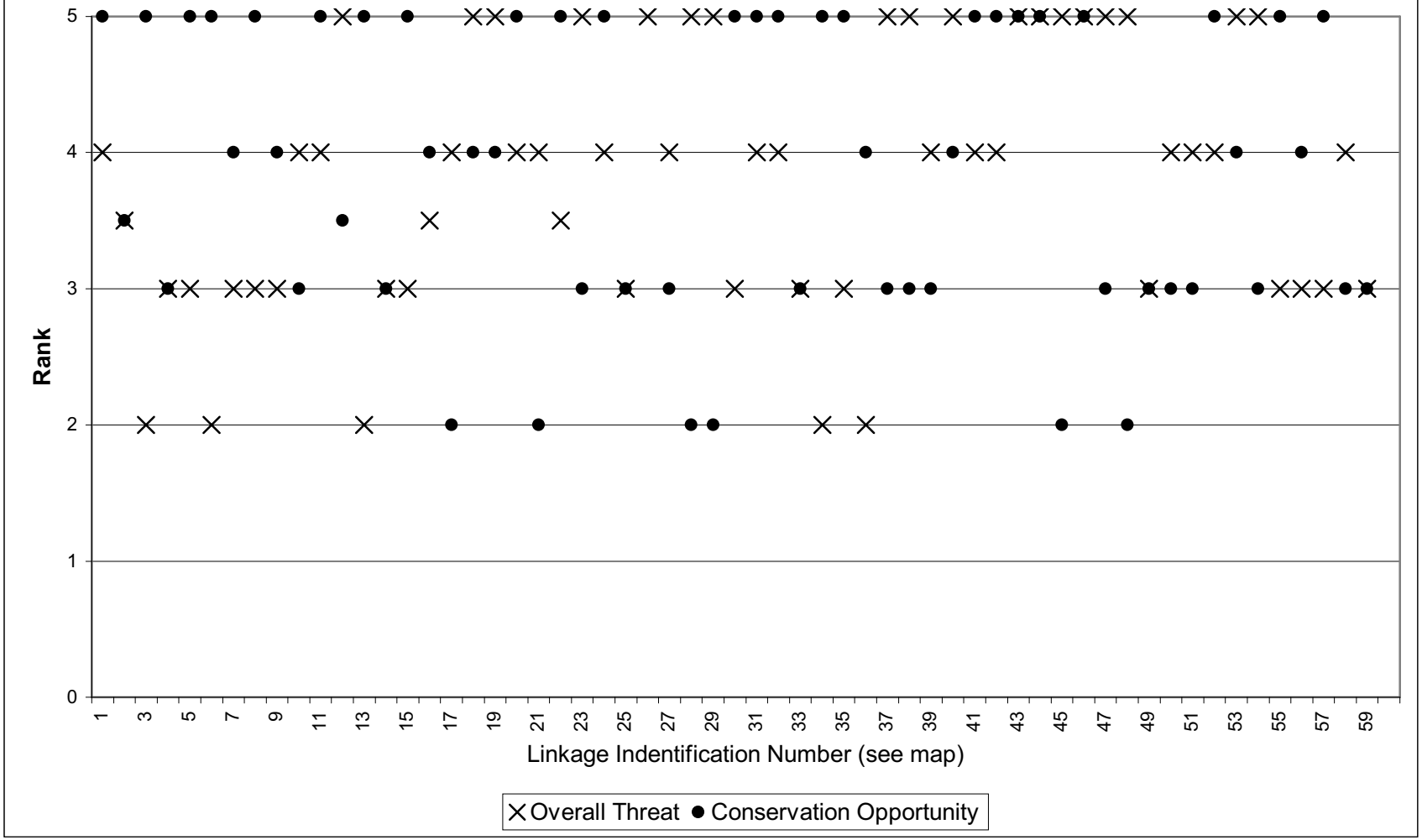
Of the linkages, 42% (25/609) were identified as high conservation opportunities (rank = five), 16% (4/25) of which ranked as imminently threatened (rank = five) (Figure 6-1, *South Coast: Missing Linkages,* Map ID#s 43, 44, 46 & 60). These included one Landscape Linkage[1] (the Santa Clara River linkage Map ID# 60), one Choke-Point[2] (the Coal Canyon linkage Map ID# 43), one Constrained Urban Encroachment linkage (the Corona-Temecula Foothills linkage Map ID# 44), and one Missing Link[3]/Choke-Point[2] (the Gavilan Hills-Santa Ana Mountains linkage Map ID# 46). A brief description of each of the top-ranked (threat & conservation opportunity = 5) linkages are provided below. A comparison of how individual linkages were ranked is depicted in Figure 6-6, *South Coast: Degree of Threat and Conservation Opportunities*.

The Santa Clara River linkage (Figure 6-1, *South Coast: Missing Linkages,* Map ID# 60) was identified as a Landscape Linkage[1]. This linkage was recognized as providing connectivity for fish and bird species. The primary plant communities listed for the linkage were riparian woodland and scrub. Numerous barriers were identified which limit wildlife movement including gaps in cover, gravel mining, roads, and a sand bar which blocks steelhead migration upstream. However, no dams are present on the Santa Clara River. Participants indicated that there are willing sellers in this linkage and that potential exists for agency acquisition. This linkage was identified as part of a conservation plan developed by The Nature Conservancy. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The Coal Canyon linkage (Figure 6-1, *South Coast: Missing Linkages,* Map ID# 43) was identified as a connectivity Choke- Point[2], linking the Puente Hills to the Santa Ana Mountains. This linkage was identified as providing habitat connectivity for mountain lion, bobcat, coyote, and mule deer. Habitat types identified in the linkage included chaparral, coastal sage scrub, Tecate cypress, and annual grassland. The primary barrier identified for this linkage is the 91 freeway, though an underpass under the 91 freeway was listed as the

primary linkage feature. Urbanization was the only listed threat. The importance of this linkage is documented in studies conducted by Beier and Barrett (1993), and Haas and Crooks (1999). This linkage was given the highest ranks for priority and threat, yet this linkage has been conserved and is now owned by California State Parks. Please refer to the corresponding Linkage Description Log sheet for more specific information.

Figure 6-6, *South Coast: Degree of Threat & Conservation Opportunities*



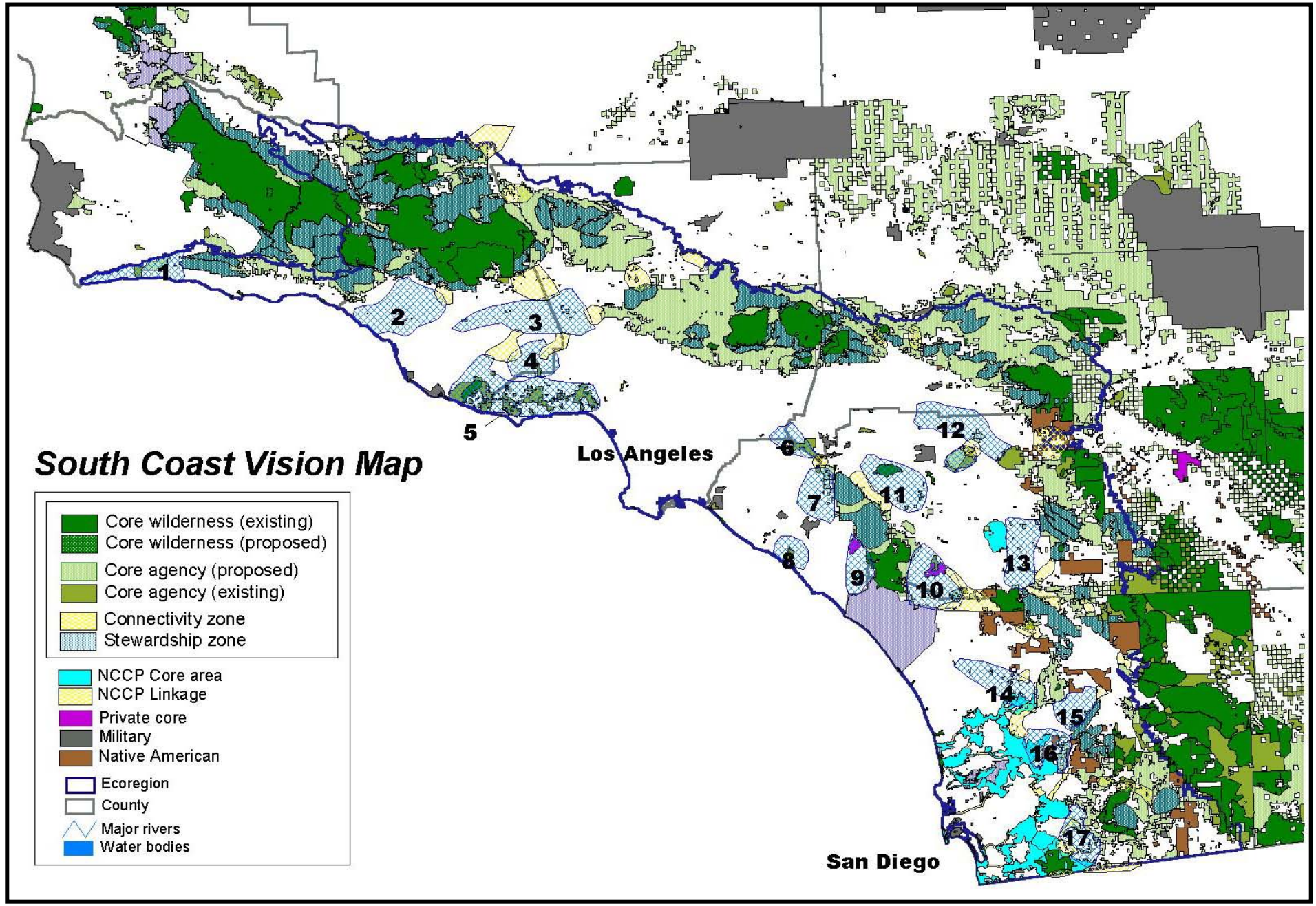
Note: The above graph compares how each linkage was ranked for overall threat (one = no threat/secure, five = severe threat/loss imminent) and the feasibility of conserving the linkage (one = not feasible, five = good opportunity).

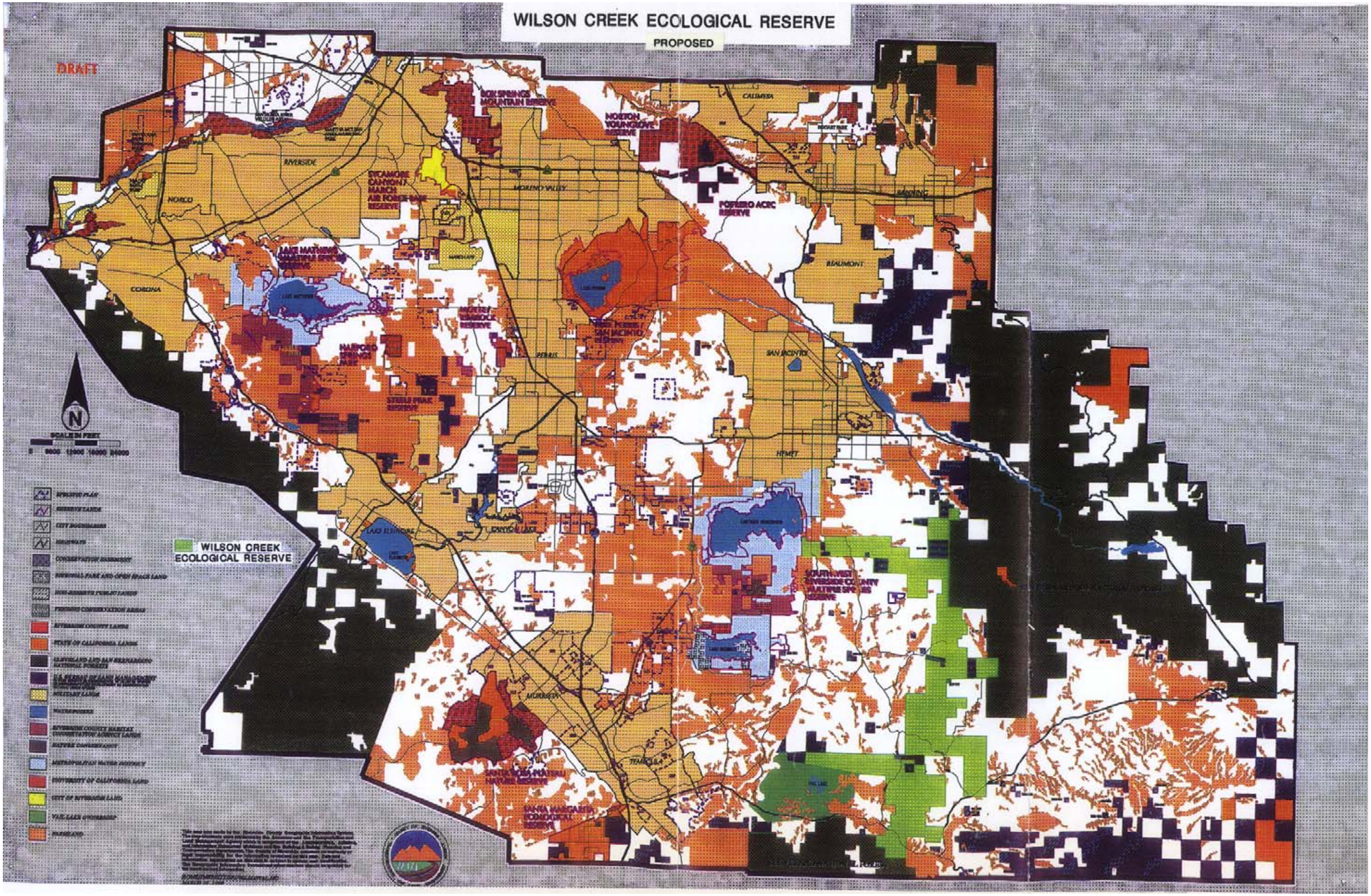
The Corona-Temecula Foothills linkage (Figure 6-1, *South Coast: Missing Linkages,* Map ID# 44) was identified as a Constrained/Urban Encroachment linkage. This linkage was identified as providing habitat connectivity for carnivores, obligate coastal sage scrub species, least Bell's vireo, southwestern willow flycatcher, and the southwestern pond turtle. The principal threats identified included urbanization, agriculture, roads, flood control, and mining. The primary impediments identified were gaps in habitat cover along the foothills of the Santa Ana Mountains due to urban development; semi-continual habitat coverage was named as the primary linkage feature. Landownership in the linkage was identified as private. The linkage was recognized as part of a Natural Communities Conservation Plan. Participants indicated that potential exists for agency acquisition through the National Forest Service. The importance of this linkage is documented in studies conducted by Dr. Paul Beier, Dr. Kevin Crooks, and Dr. Robert Fisher. Please refer to the Linkage Description Log sheet for more specific information.

The Gavilan Hills – Santa Ana Mountains linkage (Figure 6-1, *South Coast: Missing Linkage,* Map ID# 46) was identified as a connectivity Choke-Point and a Missing Link. Key species used to identify this linkage included mountain lion, bobcat, badger, and mule deer. Development was the primary threat identified. The main obstacle to wildlife movement was Highway 15, while riparian habitat, orange groves, and chaparral habitat were named as the primary linkage features. Restoring portions of agricultural land to historic habitat types was named as a need in order to restore functional connectivity. Ownership in the linkage was identified as private. Participants indicated that potential exists for agency acquisition through Riverside County Transportation and Land Management Agency. Please refer to the corresponding Linkage Description Log Sheet for more specific information.

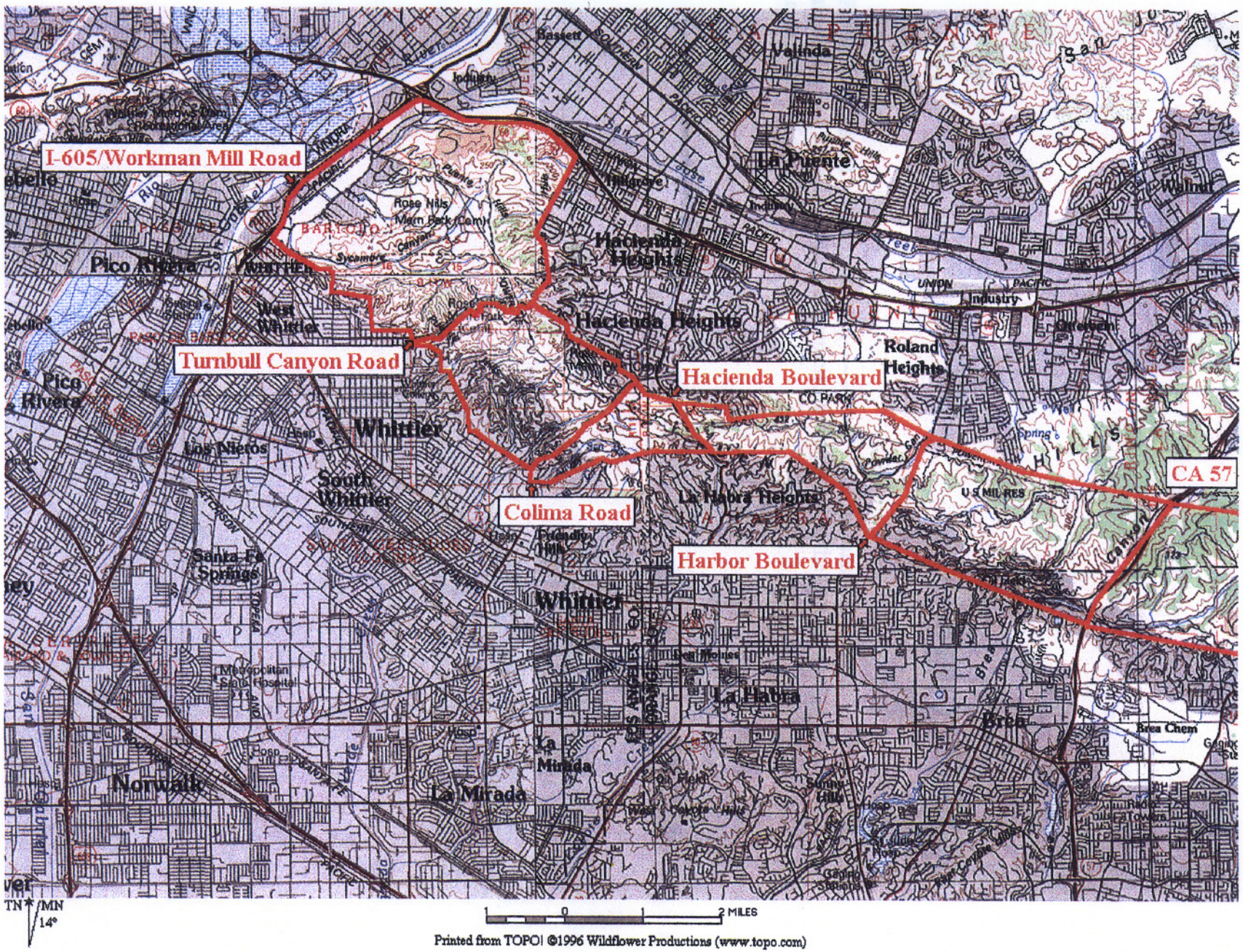
Scientific documentation referenced for some of the linkages included (see Appendix C, *Connectivity References*, for complete citation, if available):

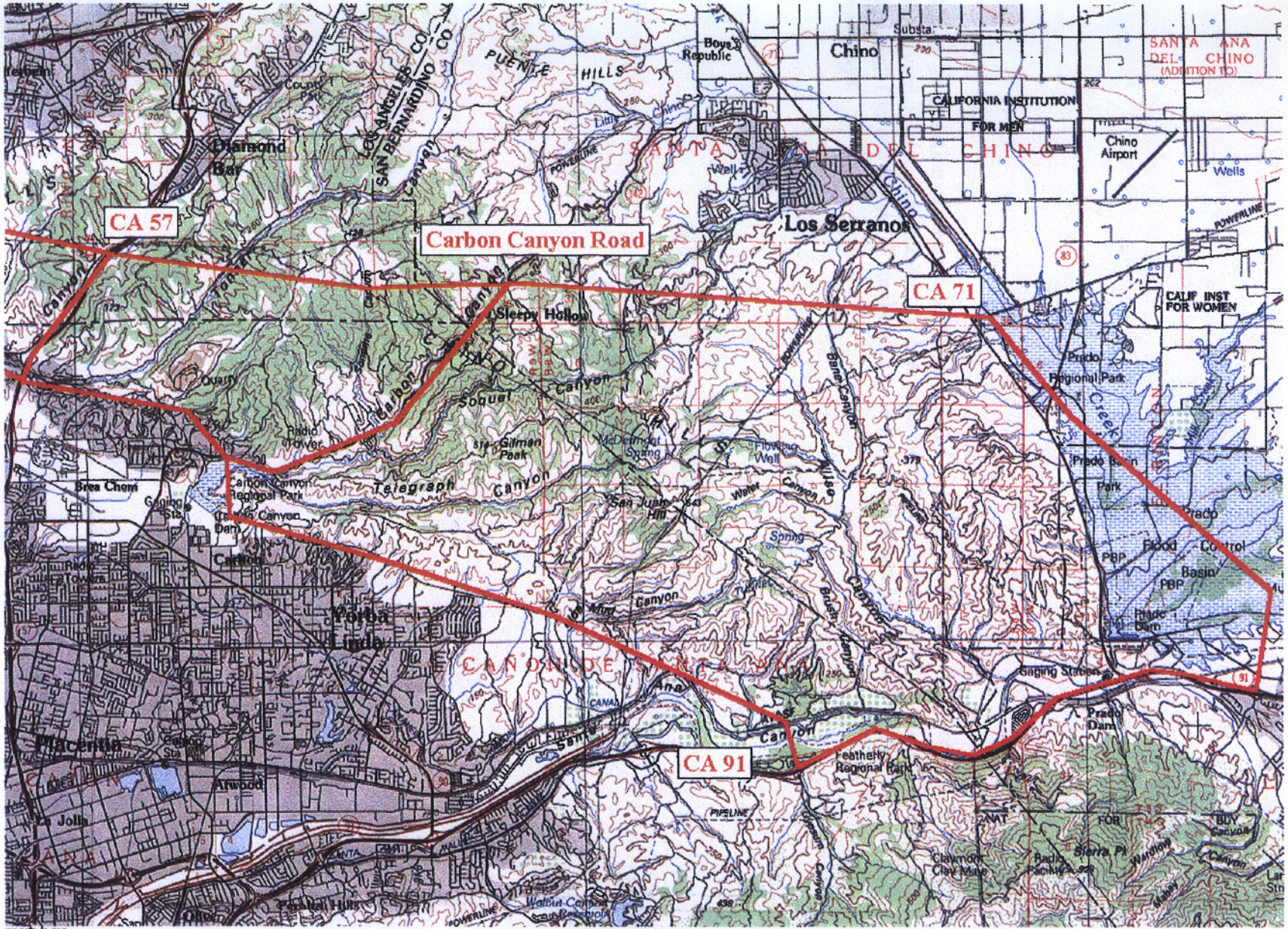
- The Cougar in the Santa Ana Mountain Range, Paul Beier
- Wildlife Use of Underpasses and Culvert Crossings Beneath Highways in Southern California, Sandy Ng, California State University Northridge, Masters Thesis
- Critical Wildlife Corridor/Habitat Linkage Areas Between the Santa Susana Mountains, the Simi Hills, and the Santa Monica Mountains, Paul Edelman
- Distribution and Status of Carnivores in the Santa Monica Mountains, California: Preliminary Results from Radio Telemetry and Remote Camera Surveys, Sauvajot et al.
- Carnivore Abundance and Distribution Throughout the Puente Chino Hills, Haas & Crooks
- California Wildlands Project: A Vision for Wild California, South Coast Regional Report, Rich Hunter
- Baseline Biodiversity Survey for the Tenaja Corridor and Southern Santa Ana Mountains, Fisher & Crooks
- Santa Clara River Watershed Plan
- Audubon Christmas Bird Count
- Los Angeles County Breeding Bird Atlas
- Prado Dam EIS/EIR
- Orange County Natural Communities Conservation Plan

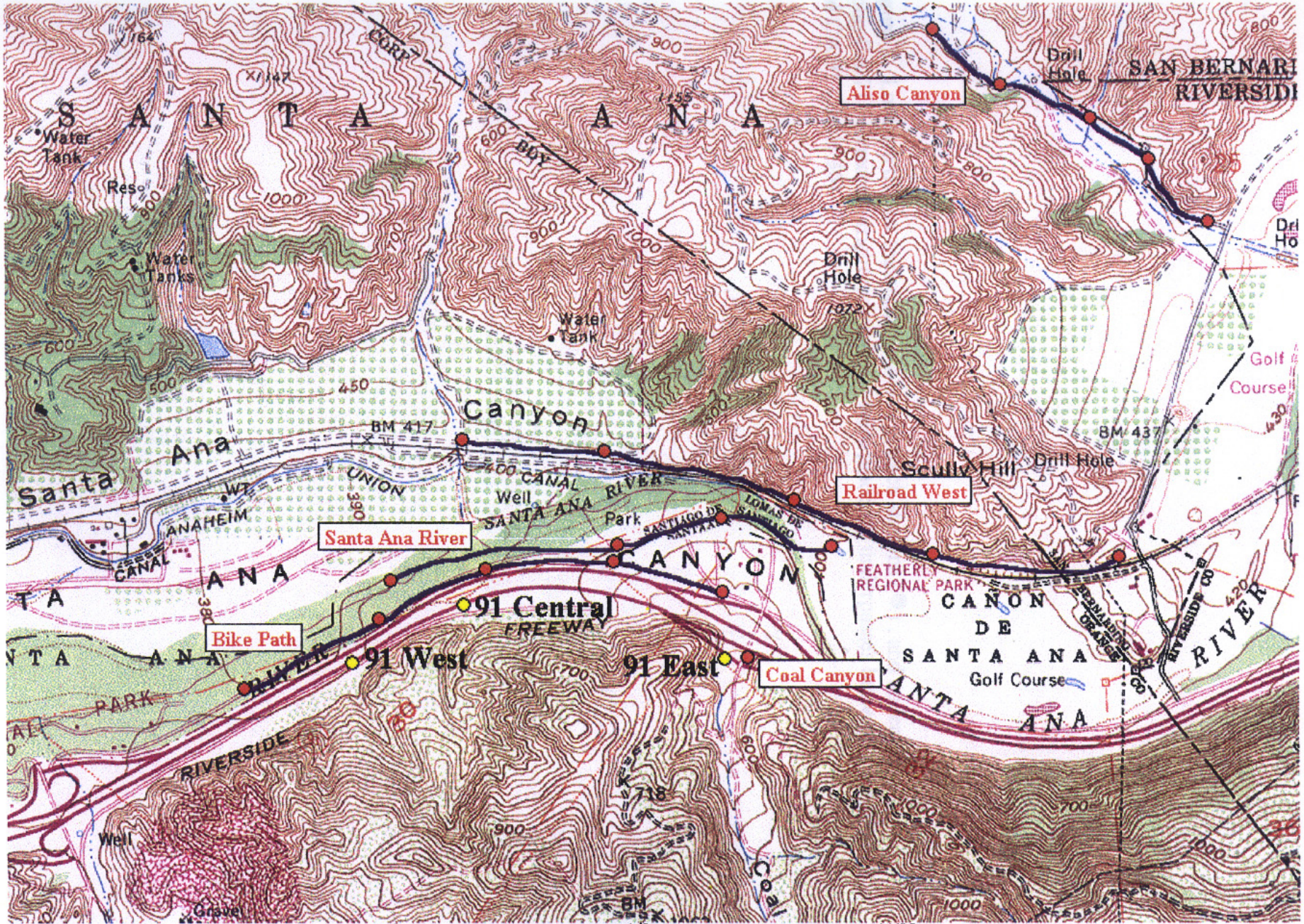

South Coast Vision Map
Core wilderness (existing)
Core wilderness (proposed)
Core agency (proposed)
Core agency (existing)
Connectivity zone
Stewardship zone
NCCP Core area
NCCP Linkage
Private core
Military
Native American
Ecoregion
County
Major rivers
Water bodies
Los Angeles
San Diego
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

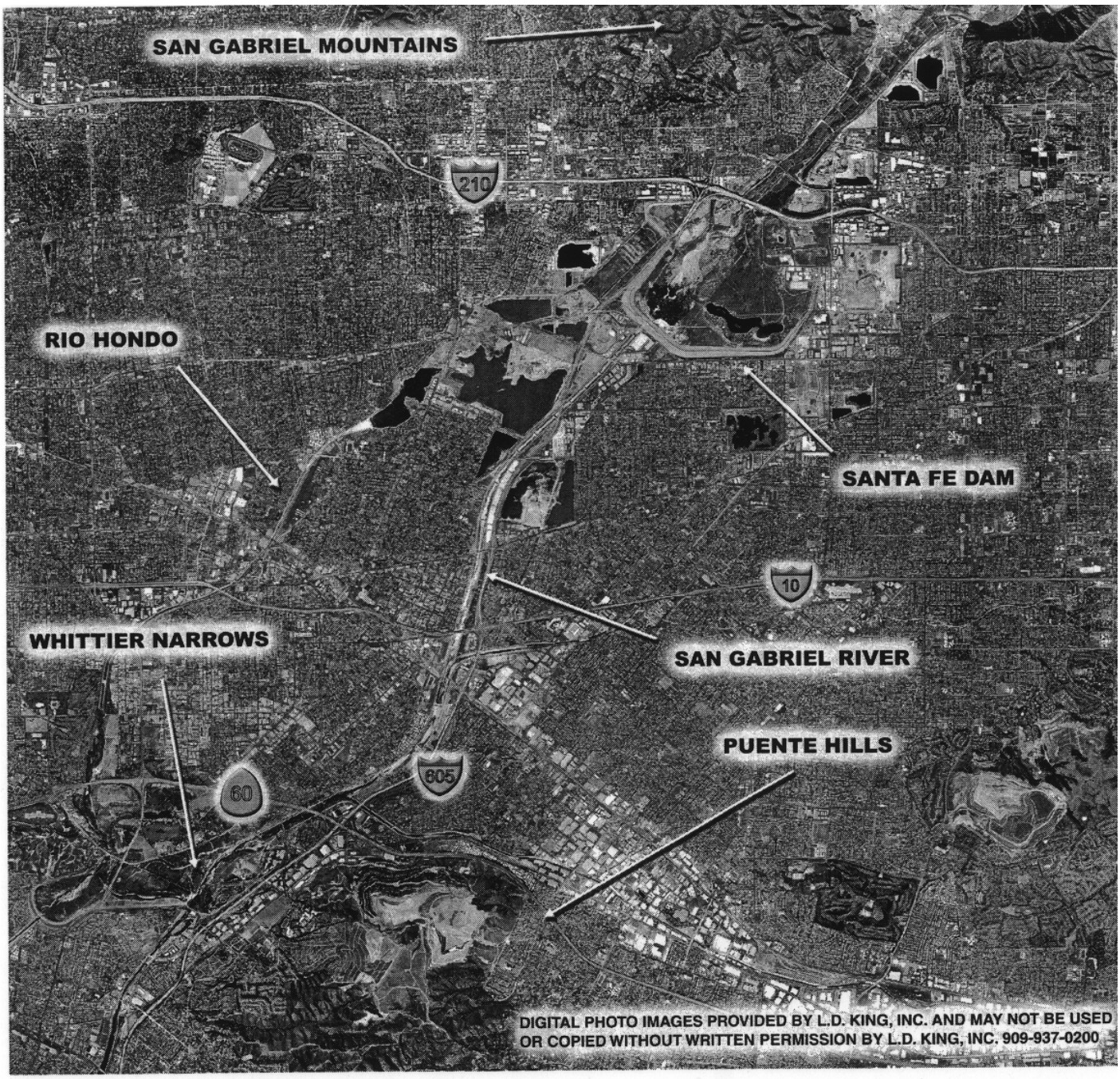


WILSON CREEK ECOLOGICAL RESERVE
PROPOSED
DRAFT
WILSON CREEK ECOLOGICAL RESERVE
RIVERSIDE
NORCO
CORONA
MORENO VALLEY
PERRIS
SAN JACINTO
HEMET
BEAUMONT
CALIMESA
TEMECULA
N









1 IN = Approximately 8200 FT

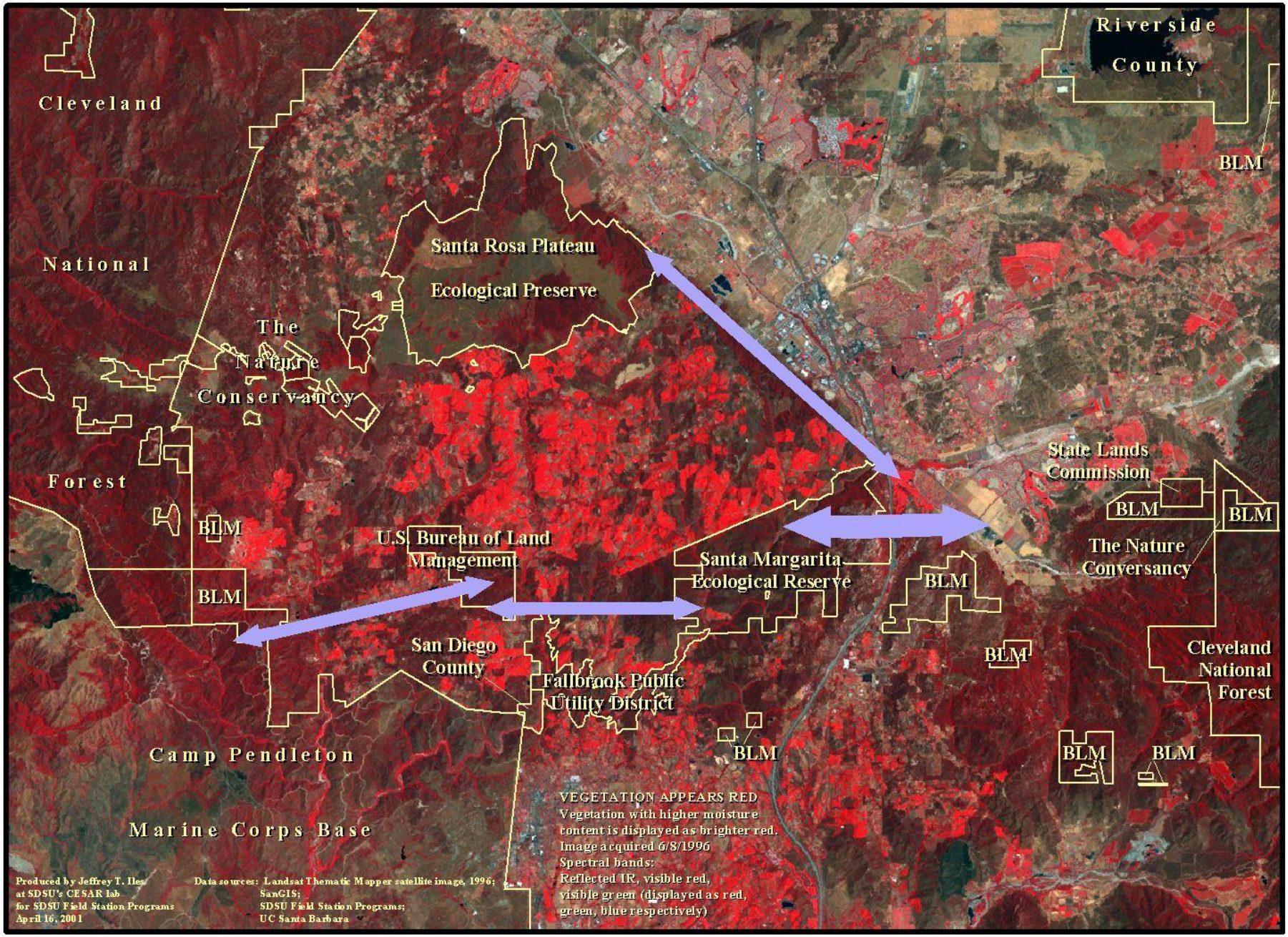


Figure 6-12, Satellite Image of the Santa Ana-Palomar Mountains Choke-Point

- San Diego County Multiple Species Conservation Plan
- Riverside County Multiple Species Conservation Plan
- Wilson Creek Conservation Bank
- Carlsbad Habitat Management Plan
- Road kill data
- Santa Margarita Ecological Reserve research projects

Ecoregional team members provided GIS-based maps and aerial photos for some of the linkages. Of the linkages recorded, 32% (19/59) coincided with connectivity zones depicted in Figure 6-7, *South Coast Vision Map,* (Figure 6-1, *South Coast: Missing Linkages,* Map ID#s 6, 8, 12, 15, 16, 22, 24, 25, 26, 32, 38, 42, 43, 44, 45, 46, 55, 56, 57). In the analysis (Hunter 1999), connectivity zones were identified as "the largest habitat linkages necessary for large mammalian carnivore survival throughout the region." In addition, 32% (19/59) of the linkages (Figure 6-1, *South Coast: Missing Linkages,* Map ID#s 5, 9, 12, 14, 17, 18, 19, 20, 21, 23, 30, 36, 47, 48, 49, 51, 52, 54, 59) correspond with areas identified as stewardship zones (Figure 6-7, *South Coast Vision Map*). Stewardship zones were designated to indicate areas of mixed landownership with high habitat value. All three of the top ranked conservation priorities (Figure 6-1, *South Coast: Missing Linkages,* Map ID#s 43, 44, 46) were depicted as connectivity zones in Figure 6-7, *South Coast Vision Map* (Hunter 1999). Please refer to the corresponding Linkage Description Log sheets for these linkages for more specific information.

A site-specific map was also provided for the Wilson Creek Conservation Bank; this linkage would essentially connect the Palomar and San Jacinto Mountain Ranges through a Landscape Linkage[1] (Figure 6-1, *South Coast: Missing Linkages,* Map ID# 57) depicted in Figure 6-8, *Wilson Creek Ecological Reserve Proposed*. The Palomar and San Jacinto Mountains are part of the Cleveland and San Bernardino National Forests respectively. This linkage was identified as providing habitat connectivity for mountain lion, bobcat, coastal California gnatcatcher, quino checkerspot butterfly, and raptors. Please refer to the corresponding Linkage Description Log sheet for more specific information.

Haas and Crooks (1999) documented carnivore movement throughout the Puente/Chino Hills in seven distinct study areas separated by major roads (Figure 6-9a, *Western Study Area;* Figure 6-9b, *Eastern Study Area*); the majority of the study areas were listed as a single connectivity Choke-Point[2] at the conference (Figure 6-1, *South Coast: Missing Linkages,* Map ID# 30). Wildlife usage of the Coal Canyon Biological Corridor (Beier 1993) was further documented in their study (Figure 6-10, *Location of scat transects, track stations, and underpasses along California 91. Remotely–triggered cameras were placed at the 91 East and 91 West underpasses)*. The Coal Canyon Biological Corridor was considered a separate connectivity Choke Point[2] (Figure 6-1, *South Coast: Missing Linkages,* Map ID# 43). Please refer to the corresponding Linkage Description Log sheets for these linkages for more specific information.

An aerial photo was provided documenting a Missing Link[3] (Figure 6-1, *South Coast: Missing Linkages,* Map ID# 29) between the Puente Hills and the San Gabriel Mountains, Figure 6-11, *Aerial Photo of Region in the Vicinity of the San Gabriel River* (Brown et al. 2000). The area depicted in the south central portion of the aerial photo was the western terminus of the

Haas and Crooks (1999) study area in the Puente/Chino Hills. Please refer to the Linkage Description Log sheet for more specific information.

Figure 6-12, *Satellite Image of the Santa Ana-Palomar Mountains Choke-Point*, highlights the need for habitat connectivity between two significant mountain ranges in the region. The image provides additional documentation for a number of linkages identified at the conference (Figure 6-1, *South Coast: Missing Linkages,* Map ID#s 12, 44, 54, 55, & 56). A site-specific, habitat connectivity planning workshop took place at the Santa Margarita Ecological Reserve, since the *Missing Linkages* conference. Please refer to the corresponding Linkage Description Log sheets for more specific information.

Ecoregional team members indicated that 37% (22/60) of the linkages have willing sellers in all or a portion of the linkage. Potential exists for agency acquisition in 57% (34/60) of the linkages, 44% (15/34) of which were identified as having willing sellers. Overall, 28% (17/60) were noted as having willing sellers (Figure 6-1, *South Coast: Missing Linkages,* Map/ID#'s 3, 5, 6, 7, 8, 13, 19, 20, 22, 24, 30, 36, 40, 41, 53, 57 & 60), 82% (14/17) of which have the potential for agency acquisition. Other opportunities identified to secure or restore habitat connectivity included landowner incentives for conservation easements, acquisition through local and national land trusts and conservancies, formal conservation plans, mitigation banks, the enhancement of underpasses, and coordination among various federal and state agencies.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Penasquitos
Ecoregion: South Coast
Map Name/ID#: 1

Key contact for this linkage (optional) Mike Wells
Telephone #: 858/755-9749
Email: mwells@aznet.net

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large carnivores, deer

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Recreation	3
Urbanization	4
Exotic Plants	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: Fish and Game, City of San Diego. Sorrento Valley Road.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Exotic plants, hydrology.

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub, southern mixed chaparral, riparian, mixed chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Urban

Major landowners: State Parks, City, County, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): I-5, 805, 56, Black Mountain Road, Sorrento Valley Road, I-15, 67, Carmel Mountain Road.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterway, canyons, underpasses.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Evaluate success of passage.

9. What scientific documentation is available demonstrating the value of the linkage? Tracking Team, State Parks, Sierra Hayden, Kevin Crooks, Robert Fisher with Ted Case.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Diego River
Ecoregion: South Coast
Map Name/ID#: 2

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large carnivores, deer, steelhead

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	3.5	4	5
No threat/secure		Moderate threat			Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
Exotic Plants	2
Commercial	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	3.5	4	5
Not feasible		Moderate Opportunity			Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquistion: County, City. Part of MSHCP.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Exotic plants, sand mining

5. Provide brief description of the linkage:

Major Habitat Types: riparian, CSM, open water, coastal sage scrub, chaparral, oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural, Urban, Commercial, Industry, Agriculture.

Major landowners: City, County, Water District, USFS

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads, highways, sand mining, urbanization

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): waterways, underpasses

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Dieguito River
Ecoregion: South Coast
Map Name/ID#: 3

Key contact for this linkage: SDR Valley Land Conservancy
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large carnivores, deer
key link missing between area 3 and 5, main corridor

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Exotic Plants	2
Agriculture	2
Recreation	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: JPA, Fish and Game, City of SD. Part of MSCP River Park. Puchase of San Felipe Ranch (East of Volcan Mt) key link to provide continuous corridor to Anza Borrego (price $ 8-9 million)

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Exotic plants, restoration of Ag lands.

5. Provide brief description of the linkage:

Major Habitat Types: CSM, riparian, open water, coastal sage scrub, chaparral, oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural, Urban, Industrial, Ag

Major landowners: San Felipe Ranch ($8-9 million), Rutherford Ranch

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads, highways, agriculture

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterways, underpasses

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Luis Rey
Ecoregion: South Coast
Map Name/ID#: 4

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large carnivores, deer, steelhead

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
Exotic Plants	2
Agriculture	4
Human Use	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: Fish and Game. Part of MSHCP.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Exotic control, habitat restoration.

5. Provide brief description of the linkage:

Major Habitat Types: riparian, csm, open water, coastal sage scrub, chaparral, oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads, highways, sand mining, urbanization

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterways, underpasses

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use.

9. What scientific documentation is available demonstrating the value of the linkage? Bonnie Peterson?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Ysabel Valley
Ecoregion: South Coast
Map Name/ID#: 5

Key contact for this linkage (optional) Trish Smith
Telephone #: 714/832-5435
Email: trish_smith@tnc.org

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

mountain lion, badger, bobcat, deer

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Rural Development	2
Roads	2
Grazing/Ag	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 [5]
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)] willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): TNC acquiring land in valley with assistance from DFG/WCB.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Good quality habitat exists already.

5. Provide brief description of the linkage:

Major Habitat Types: Engelmann oak woodland, native grassland, wet meadow, riparian woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Cauzza, Edwards, Tulloch, Comminas

Other: CNF, Mesa Grands and Santa Ysabel Indian Reservation

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads, topo (link to desert – topo impediment?)

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage and evaluate its success.

9. What scientific documentation is available demonstrating the value of the linkage? TBD (Ask TNC)

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Diego Foothill Corridor
Ecoregion: South Coast
Map Name/ID#: 6

Key contact for this linkage (optional) David Lawhead
Telephone #: 858/467-4211
Email: dlawhead@dfg.ca.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large carnivores, coastal sage scrub species

3. Score the overall degree of threat to connectivity function (circle one):

1 — No threat/secure
2
3 — Moderate threat
4
5 — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	4 (Ramona Lakeside, in particular)

4. Score the feasibility of linkage as a conservation priority (circle one):

1 — Not feasible
2
3 — Moderate Opportunity
4
5 — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Portion of linkage north of San Vicente to be acquired in near future by Sate (1200 acres).

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Restoration and exotic removal in Ramona grasslands.

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage, chaparral, non-native grassland, riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Urban, Natural Vegetation, Rural Residential, Grazing/Ag.

Major landowners: City of San Diego, CDFG, City of Poway, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): I-8 in Lakeside, urbanization.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage over most of linkage currently. Bridge over Chocolate Canyon allows some terrestrial movement under I-8.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage.

9. What scientific documentation is available demonstrating the value of the linkage? None currently.

10. Other information: Community group in Ramona is working to conserve linkage in the Santa Maria Valley.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Carlsbad Watershed
Ecoregion: South Coast
Map Name/ID#: 7

Key contact for this linkage (optional) Christina Simokat
Telephone #: 760/845-3501
Email: batiquitos@juno.com

1. Linkage Type (check one)

1 Landscape Linkage] Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

gnatcatcher, least tern, snowy plover – endangered species
coastal sage scrub, salt marsh habitat

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
Exotic Plants	4
Roadways	3 (increasing)
Loss of Waterways/Dams	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 [4] 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)] willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Carlsbad Watershed Network, Batiquitos Lagoon Foundation, Canyons Network, Sierra Club.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub, salt marsh

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Urban, Residential, Golf Course

Major landowners: CDFG, Private landowners

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadways, housing, developments

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): San Marcos Creek

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Purchase, design and improve linkage east of Batiquitos Lagoon.

9. What scientific documentation is available demonstrating the value of the linkage? MSCP and Carlsbad Habitat Management Plan.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Otay Mountain – Cleveland N.F.
Ecoregion: South Coast
Map Name/ID#: 8

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large mammals, arroyo toad, golden eagle, mule deer, smaller wildlife, birds (including CAGN)

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | [3] Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Roadways (Hwy 94, new Border crossing)	4
Agriculture	3
Fencing	5
Urbanization	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | [5] Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub, chaparral, grasslands, riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Native Vegetation, Rural Residential

Major landowners: County, BLM, Forest Service, Private landowner

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadway, some topography issues, border (fencing).

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Mostly contiguous habitat, some creeks.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use, acquisition.

9. What scientific documentation is available demonstrating the value of the linkage? MSCP EIR

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Cuyamaca - Palomar
Ecoregion: South Coast
Map Name/ID#: 9

Key contact for this linkage (optional) Trish Smith
Telephone #: 714/832-5435
Email: pvstnc@pacbell.net

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

migratory birds, mountain lion, SKR?, deer, large mammals

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Ag/Grazing	3
Rural Residential	3
Roads	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 [4] 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who) 1 willing land sellers
1 Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Reduction of grazing pressure would allow restoration of grasslands and riparian areas.

5. Provide brief description of the linkage:

Major Habitat Types: grassland, riparian, oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag, Natural Vegetation

Major landowners: Vista Irrigation District, Cauzza

Other: Mesa Grande Indian Reservation, CNF

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Tijuanna - Otay
Ecoregion: South Coast
Map Name/ID#: 10

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large carnivores

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Border Fence	2
Hwy	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Acquisition, habitat restoration.

5. Provide brief description of the linkage:

Major Habitat Types: CSM, riparian, coastal sage scrub, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Urban, Ag, Rurual Residential

Major landowners: State, City, Navy, USFWS

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 5, border fence.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): waterways, underpass

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use.

9. What scientific documentation is available demonstrating the value of the linkage? Surveys for International Wastewater Treatment Plant

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Diequito - Penasquitos
Ecoregion: South Coast
Map Name/ID#: 11

Key contact for this linkage (optional) L. Justice, G. Smith
Telephone #: 858/755-0328, 619/299-1741
Email: bluemoondesins@ixpres.com, conservation@sierraclub.org

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Movement from key core Penasquitos Canyon, Carmel Mt. Preserve to San Diequitos River.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
Exotic Plants	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Part of Pacific Highland Plan, FUA Plan.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Habitat greatly intact, edge effects from development, moderately to severe. Impacted by roads, fences, underpass/overpass needed.

5. Provide brief description of the linkage:

Major Habitat Types: coastal scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Rural Residential, Former Farmland

Major landowners: Local small ranch owners to Pardee Corporation.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in habitat cover due to previous farming, fences from current privately owned land, roads, Hwy 56, development.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Dirt roads, habitat coverage, waterways.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Margarita - Pechanga
Ecoregion: South Coast
Map Name/ID#: 12

Key contact for this linkage (optional) Sedra Shapiro
Telephone #: 619/594-5386
Email: sshapiro@sciences.sdsu.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

mountain lion, carnivores, deer, riparian ecosystem

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5
Exotic Plants	4
Agriculture	5
Roadways	5
Overall decreased habitat	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 3.5 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
1 Agency acquisition (which agency)
] willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: Fallbrook Land Conservancy, Santa Margarita Ecological Reserve (SDSU), TNC, BLM, DFG. Unknown if in W. Riverside County MSHCP and unincorporated North San Diego County Plan in development.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Agricultural restoration – abandoned avocado groves. Fencing an dunder/over passes for freeways/roads, I-15 overpass.

5. Provide brief description of the linkage:

Major Habitat Types: riparian, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Diminishing Natural Vegetation

Major landowners: Major = BLM, National Forest (Cleveland), consortia of landowners who manage open areas (e.g.

Skinner, Santa Margarita, Santa Rosa Plateau), water districts – Fallbrook, Rainbow, Rancho, private landowners.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Interstate 15

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Undeveloped private lands, topography (riparian areas), underpasses/bridges (man made linkages).

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Distinction – answer what is needed with regard to information and research. Document use and evaluate success, design enhancements. Purchase lands to fill out core areas, put funds into improving dangerous corridor choke-points (e.g. fencing, creating under/overpasses).

9. What scientific documentation is available demonstrating the value of the linkage? Paul Beier, Robert Fisher, Chris Haas work. Also, some of the core areas have research (Santa Margarita Ecological Reserve has 40+ research projects year 2000. You also need land zoning and planning information, particularly on the west slope of Palomar Mountains (Pala Rd).

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Jacinto – Santa Rosa
Ecoregion: South Coast
Map Name/ID#: 13

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

bighorn, mountain lion, black bear

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	2
Recreation – OHV	2
Rural Residential	1

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)] willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: pine forest, pinyon-juniper woodland, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag, Rural Residential

Major landowners: Indian Reservation, USFS, Private, State Parks

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 74

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Dry continual habitat.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Hwy 33 between Ventura & Ojai
Ecoregion: South Coast
Map Name/ID#: 14

Key contact for this linkage: Ojai Land Conservancy/USFWS Ventura
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Large mammals – mountain lion, bobcat, deer

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: Ojai Land Conservation. Agency acquisition: WCB only. Private lands on either side of 33; development encroachment from Ventura and Oak View.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Unknown

5. Provide brief description of the linkage:

Major Habitat Types: oak woodland, coastal sage scrub, chaparral, riparian along Uta River

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Historic oil drilling; ranchlands; rural residential; some light industrial along 33.

Major landowners: Private adjacent to 33

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Hwy 33 and encroaching development along 33.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): No known highway crossings. Riparian along Ventura River perpendicular to corridor.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Determine degree of threat and utilization and importance to wildlife.

9. What scientific documentation is available demonstrating the value of the linkage? Unknown

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Liberty Canyon – Hwy 101
Ecoregion: South Coast
Map Name/ID#: 15

Key contact for this linkage (optional) Paul Edelman
Telephone #: 310/589-3200 ext. 128
Email: edelman@smmc.ca.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Large Santa Monica Mountains mammals: deer, bobcat, mountain lion, badgers, fox

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: Agoura Hills. Agency acquisition:

Santa Monica Mountains Conservancy, National Park Service

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: chaparral, coastal sage scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Rural Residential

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 101

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Dirt underpasses

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? Sandy Ng, Masters Thesis Cal State Northridge, Wildlife Use of Underpasses and Culvert Crossings Beneath Highways in Southern California.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Conejo Grade
Ecoregion: South Coast
Map Name/ID#: 16

Key contact for this linkage: Denise Kamradt, Ray Sauvajot
Telephone #: 805/370-2337
Email: denise_kamradt@nps.gov, ray_sauvajot@nps.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

mountain lion, bobcat

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	3.5	4	5
No threat/secure		Moderate threat			Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization/Development	3.5
Roadways	4
Habitat Change	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): COSCA, MRCA

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: chaparral, cactus scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): US 101, fences, agriculture, development, developed County Park

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Cattle underpass under 101 Freeway, native vegetation, vegetation cover

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Purchase land north and south of US 101 linking to existing parkland (State Parks/NPS on south, Wildwood Park, Thousand Oaks COSCA on north).

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Somis: Las Posas Hills – South Mtn.
Ecoregion: South Coast
Map Name/ID#: 17

Key contact for this linkage (optional) Wendy Millet, TNC
Telephone #:
Email: wmillet@tnc.org

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Large mammals

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	4
Roads	4
Rural/Urban Development	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Callegues Creek Watershed Plan (Coastal Conservancy), The Nature Conservancy activities

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Lots of existing agriculture and development threats, roadways expansion of 118

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub, grassland, oak woodland, riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Agriculture

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Agriculture, rural development, Highway 118

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Existing habitat and open space, limited existing development (existing agriculture)

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Utilization by wildlife. Feasibility/cost to protect and restore.

9. What scientific documentation is available demonstrating the value of the linkage? Geogra[hic location only – no hard data.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Alamos Canyon (Simi –Moorepark)
Ecoregion: South Coast
Map Name/ID#: 18

Key contact for this linkage (optional) Paul Edelman
Telephone #: 310/589-3200 ext. 128
Email: edelman@smmc.ca.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Large southern California mammals: mountain lion, bobcat, gray fox, badger, deer

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: Santa Monica Mountains Conservancy

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: grassland, southern willow scrub, mix coastal sage scrub and chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation: north side, Rural Residential: south side

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 118

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Underpasses – riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? Sandy Ng, Masters Thesis Cal State Northridge, Wildlife Use of Underpasses and Culvert Crossings Beneath Highways in Southern California

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Tierra Rejada – Santa Rosa Valley
Ecoregion: South Coast
Map Name/ID#: 19

Key contact for this linkage (optional) Paul Edelman
Telephone #: 310/589-3200 ext. 128
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

All Simi Hills mammals: fox, mountain lion, bobcat, herps and birds

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
1 Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: Conejo Open Space Conservation.

Agency acquisition: Santa Mountains Mountains Conservancy. Part of The Nature Conservancy 1990

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub, annual grassland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 23, agriculture, development along Santa Rosa Valley Road

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Wide open habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? NPS – Santa Monica Mountains National Recreation Study – Sandy NG, Cal State Northridge, Wildlife Use of Underpasses and Culvert Crossings Beneath Highways in Southern California.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Simi Hills – Tierra Rejada
Ecoregion: South Coast
Map Name/ID#: 20

Key contact for this linkage (optional) Paul Edelman
Telephone #: 310/589-3200 ext. 128
Email: edelman@smmc.ca.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

All Simi Hills mammals: mountain lion, gray fox, bobcat, deer, birds and herps

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support and potential agency acquisition: Santa Monica Mountains Conservancy and Conejo Open Space Conservation Authority (COSCA). Part of TNC 1990 plan.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

None needed

5. Provide brief description of the linkage:

Major Habitat Types: coast live oak woodland, non-native grassland, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Portion by Callegus Water District, Ventura County Sheriffs Department

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Olson Road – 4 lanes

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Lack of lighting, good topography, wide swath of habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Susana Pass
Ecoregion: South Coast
Map Name/ID#: 21

Key contact for this linkage (optional) Paul Edelman
Telephone #: 310/589-3200 ext. 128
Email: edelman@smmc.ca.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Large mammal movement (mountain lion, bobcat, deer, gray fox). Several studies indicate movement - frequent roadkill.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Roadway	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): If improvements to the 118 freeway are planned, they should include underpass construction.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Underpass to facilitate movement and preservation and restoration on either side of 118

5. Provide brief description of the linkage:

Major Habitat Types: scrubland – coastal sage scrub and chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation except the 118

Major landowners: CalTrans, Private ?

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): 6 lane 118 Highway and lack of adjacent cover

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat across highway

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Consultation with CalTrans to facilitate movement in underpass and acquisition of adjacent lands.

9. What scientific documentation is available demonstrating the value of the linkage? Santa Susana Mountains Wildlife Corridor Movement Dissertation, The Nature Conservancy report (Paul Edelman)

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Susana Pass
Ecoregion: South Coast
Map Name/ID#: 21

Key contact for this linkage (optional) Paul Edelman
Telephone #: 310/589-3200 ext. 128
Email: edelman@smmc.ca.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

All Santa Susana Mountains mammals (large and small), herps and birds

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: Santa Monica Mountains Conservancy. Part of The Nature Conservancy Corridor Plan

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: chaparral, rocky outcrops

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): 118 Freeway

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): 118 Freeway – 15 x 15 underpass, natural on both sides. Rocky Peak overpass – rural residential.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? 1990 The Nature Conservancy Study

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Clara River – Hwy 126 N-S
Ecoregion: South Coast
Map Name/ID#: 22

Key contact for this linkage (optional) Paul Edelman
Telephone #: 310/589-3200 ext. 128
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

All Los Padres and Santa Susana Mountains mammals: mountain lion, bobcat, coyote, deer, gray fox, etc.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 3.5 4 5

No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5

Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: City of Santa Clarita and Ventura County. Agency Acquisition: SMMC, TNC. Part of Santa Clara River Watershed Plan, SMMC Acquisition Work Program

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: non-native grassland, Venturan coastal sage scrub, riparian scrub, mulefat scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag, some cities

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Expanded Hwy 126 – lack of large enough culverts. Widened 126 from 4 to 6 lanes with only two culverts: one at Piru Creek and the other at San Martinez Grande Creek.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? The Nature Conservancy is compiling information with CalTrans

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Ventura – Santa Paula
Ecoregion: South Coast
Map Name/ID#: 23

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large carnivores – mountain lion, bobcat

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Development	5
Agriculture	5
Roads	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Public support for ag/open space

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Agricultural lands to habitat.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag, some residential

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): 126 Freeway, expansion of Santa Paula and Ventura – conversion to urban/suburban

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Analysis of connectivity, work with public/landowners for protection

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: I-5 – Newhall Pass
Ecoregion: South Coast
Map Name/ID#: 24

Key contact for this linkage (optional) Paul Edelman
Telephone #: 310/589-3200 ext. 128
Email: edelman@smmc.ca.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

All San Gabriel Mountains mammals – mountain lion, bobcat, gray fox, deer, coyote, and black bear

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: City of Santa Clarita. Part of The Nature Conservancy 1990 study

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: oak woodland, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Two highways – SR–14 and I-5

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Los Pinetos SR-14 undercrossing – disturbed coast live oak woodland, Gavin Canyon I-5 crossing – disturbed coast live oak woodland, I-5 Weldon Canyon overpass – roadcut with buckwheat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Castaic I-5 Undercrossing
Ecoregion: South Coast
Map Name/ID#: 25

Key contact for this linkage (optional) Paul Edelman
Telephone #: 310/589-3200 ext. 128
Email: edelman@smmc.ca.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

All Los Padres National Forest mammals

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: City of Santa Clarita. Agency acquisition: Santa Monica Mountains Conservancy

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

None needed.

5. Provide brief description of the linkage:

Major Habitat Types: Alluvial fan sage scrub and riparian scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 126 and I-5

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat, underpasses/bridges

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Soledad Canyon – Mint Canyon
Ecoregion: South Coast
Map Name/ID#: 26

Key contact for this linkage (optional): M. Dohrn, P. Edelman
Telephone #: 818/957-6044, 310/589-3200 ext 128
Email: quinospt@earthlink.net, edelman@smmc.ca.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Large mammals, three-spine stickleback, southwestern willow flycatcher, western spadefoot

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Development/Urbanization	4
Roadways (14 expansion)	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): City of Santa Clarita supports. Agency acquisition: SMMC.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): coastal sage scrub, riparian, vernal pools

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub, oak woodland, chaparral, riparian (three-spine stickleback, sw willow flycatcher, arroyo toad)

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): 75% Natural Vegetation, 5% Urban, 10% Ag, 10% Rural Residential

Major landowners: Private, City of Santa Clarita

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 14

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Santa Clarita River, Angeles and Los Padres National Forests

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Overpass linkages, identify land management

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Angeles – Verdugo Mountains
Ecoregion: South Coast
Map Name/ID#: 27

Key contact for this linkage (optional) Scott Harris - CDFG
Telephone #: 818/360-8140
Email: spharris@dfg.ca.gov

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Habitat connectivity in general

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	3
Roads	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): CalTrans consultation. Part of Significant Ecological Area, County of Los Angeles.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Need underpass

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub, chaparral, coast live oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Rural Residential, Highway

Major landowners: City of LA, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 5 and 14

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): None

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Evaluate opportunities for underpass construction

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Griffith Park – Verdugo Hills
Ecoregion: South Coast
Map Name/ID#: 28

Key contact for this linkage (optional) Paul Edelman
Telephone #: 310/589-3200 ext 128
Email: edelman@smmc.ca.gov

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Large mammal connectivity – mountain lion, bobcat, coyote, gray fox, etc.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Already blocked by development / Interstate 5	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Los Angeles River preservation activities; local interest in maintaining and restoring connectivity.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Development removal and restoration will be needed.

5. Provide brief description of the linkage:

Major Habitat Types: chaparral of Griffith Park and Verdugo Hills

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Urban, freeway

Major landowners: Private adjacent to public (LA City, etc.)

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Interstate 5, existing development in Glendale

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Distance is not too long, LA River restoration may provide opportunities.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Do animals use area? Costs, feasibility study

9. What scientific documentation is available demonstrating the value of the linkage? Geographic

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Gabriel River
Ecoregion: South Coast
Map Name/ID#: 29

Key contact for this linkage: P. Edelman, C. Haas, D. Cooper
Telephone #: 310/589-3200 ext 128, 909/597-6411
Email: edelman@smmc.ca.gov, cdhaas@prodigy.net

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

river channel

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5
Roadways	5
Channelization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Partly owned by Corps of Engineers (Santa Fe Dam).

Potential for agency acquisition: San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy. Part of SGLLARMC Plan and San Gabriel River Master Plan – Department of Public Works

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Alluvial fan sage scrub, dam removal, conversion of Ag lands to habitat, gravel pit mine reclamation and restoration

5. Provide brief description of the linkage:

Major Habitat Types: Alluvial fan sage scrub, river channel

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Urban

Major landowners: City

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Recreation, Roadways (Rt. 60, I-10, I-210), Dams

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterway

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage

9. What scientific documentation is available demonstrating the value of the linkage? Reconnecting the San Gabriel Valley – Cal Poly Pomona Study.

10. Other information: San Gabriel Mountains Regional Conservancy very active with current planning activities

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Puente Chino Hills
Ecoregion: South Coast
Map Name/ID#: 30

Key contact for this linkage (optional) Chris Haas
Telephone #: 909/597-6411
Email: cdhaas@prodigy.net

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

bobcat, coyote, mule deer, mountain lion

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Roadways	4
Urbanization	4
Recreation	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency) 1		part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Wildlife Corridor Conservation Authority, Mountains Recreation and Conservation Authority.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Fencing along roadways and underpasses.

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub, chaparral, walnut woodland, oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Urban

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadways, conversion of habitat - urbanization

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): open space – continual habitat coverage, culverts/bridges

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Evaluate carnivore movement at choke-points.

9. What scientific documentation is available demonstrating the value of the linkage? Chris Haas, Lisa Lyren and Dan Cooper – Masters Theses

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Puente – San Jose – San Gabriels
Ecoregion: South Coast
Map Name/ID#: 31

Key contact for this linkage (optional) Steve Nelson
Telephone #: 949/753-7001
Email: snelson@pcrnet.com

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Larger, mobile mammalian predators; raptors and songbirds; limited fur bearers

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	4
Exotic Plants	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Wildlife Corridor Conservation Authority supports. Part of LA County SEA/General Plan

What are the most important restoration needs (describe types of habitat, degree of restoration needed): oak and walnut woodlands; riparian forest; coastal sage scrub

5. Provide brief description of the linkage:

Major Habitat Types: "Archipelago" of undeveloped hills complexes supporting woodlands, shrublands and grasslands.

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Extensive livestock grazing, Natural Vegetation

Major landowners: Cities and County parkland; Forest Lawn; CSPTU (Cal Poly); private parties

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Freeways and urban development now separate the "islands"; these are the most serious barriers.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Probably at grade crossings of roads/highways; possibly some undercrossings; limited movement along watershed drainages; over flight.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Identify undercrossings that are now and/or can be enhanced and used by wildlife.

9. What scientific documentation is available demonstrating the value of the linkage? Chris Haas Masters Thesis, Audubon Christmas Bird Counts and mountain lion sightings at Bonelli Regional Park

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Cajon Pass
Ecoregion: South Coast
Map Name/ID#: 32

Key contact for this linkage (optional) Steve Loe
Telephone #: 909/884-6634 ext 3131
Email: sloe@fs.fed.us

1. Linkage Type (check one)

]	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion, black bear, bobcat, mule deer, badger, reptiles, rodents. I-15 barrier – 8 lane freeway. Links San Gabriel Mountains to San Bernardino Mountains (two of largest core areas in ecoregion) Highway 138 improvements is threat.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	4.5	5
No threat/secure		Moderate threat			Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Freeway and Railroad Expansion	5
Exotic Plants	3
Bullet Train to Vegas	4
Urbanization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: Audubon. Agency acquisition: USFS. Need to coordinate closely with railroads, CalTrans and Federal Highways to insure linkages (bridges/underpasses) are maintained or installed with improvement, coordinate with SB County Planning Department.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Ongoing Arundo control, Cleghorn Canyon bridge is the best linkage, but the mouth of the canyon is private. Greatest need for purchase in the pass. Private land in Crowder Canyon (Highway 138) is critical inholding affecting N-S movement to San Gabriels to San Bernardino Mtns.

5. Provide brief description of the linkage:

Major Habitat Types: chaparral, valley foothill riparian, alluvial fan sage scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: USFS, SB County Flood Control, San Bernardino County Museum, CalTrans, San Bernardino County Parks

Other: Railroad right-of-ways

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): I-15, old route 66, Highway 138. Need to insure underpasses and bridges are maintained.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Cleghorn bridge is the most direct and largest underpass. Capable for all species. Undeveloped private land on west of freeway at mouth of Cleghorn needs to be protected. Seven or so additional large culverts or underpasses exist which are also important to maintain. Highway 138 currently being upgraded so movement corridors need to be built into project.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): None needed, value known.

9. What scientific documentation is available demonstrating the value of the linkage? Documented movement of lions, bear, bobcat, and coyote.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Saddleback Butte
Ecoregion: South Coast
Map Name/ID#: 33

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Major drainage off of north slope of San Gabriel Mountains/USFS drains north into Mojave Desert to Saddleback Buttes State Park. Mountain lion has been observed near Saddleback Butte State Park, also this area is within Desert tortoise/Mojave ground squirrel/LeConte's thrasher habitat.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Road Widening/Building	2
Urbanization	2
Agriculture	2
Flood Control Maintenance	2
Off Road Vehicles	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Needs to be evaluated, land use planning critical before urbanization hits here.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Restore Big Rock Creek under Route 138 crossing.

5. Provide brief description of the linkage:

Major Habitat Types: scattered cottonwoods, alluvial scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Mostly natural vegetation with scattered homes, orchards, and roads.

Major landowners: Unknown- BLM, LA County, Private, State Parks???

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Home construction, roadway development, flood control, agriculture

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Major drainage with underpass beneath Highway 138 which is proposed for widening by CalTrans.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Needs documentation of use, landownership, size of core habitats to the north especially.

9. What scientific documentation is available demonstrating the value of the linkage? Unknown, possible sources: W. Mojave Plan, State Parks, USFS, LA County Breeding Bird Atlas

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Lytle Creek Drainage
Ecoregion: South Coast
Map Name/ID#: 34

Key contact for this linkage (optional) Steve Montgomery
Telephone #: 858/274-6511
Email: sjmbiocn@aduc.com

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
] Other Constrained

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Major river/alluvial system

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | [2] | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Gravel Mining	3
Roads	2.5
Urbanization	1.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | [5] Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: conservation community. Agency Acquisition: San Bernardino County?, Museum, HCP. Owned by Water Conservation Agencies. Restoration of Alluvial fan scrub habitat by mining companies. Need areas deeper sand for SB k-rats, LA pocket mouse, etc.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Deep mining pits need to be sediment filled and non-pit areas should be restored.

5. Provide brief description of the linkage:

Major Habitat Types: disturbed alluvial fan scrub, sage scrub, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Mining Ops

Major landowners: Water Conservation District, Mining Companies, others

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadways, mining operations (deep open pits filled with water could impede movement), and in a sense completely unvegetated open ground.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Sandy washes, some riparian, various types of habitat that are interconnected (not covered by houses), though habitats are heavily disturbed.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): How does this alluvial system connect to Santa Ana River system? Assessment of areas of primary curtailment/narrowness, and areas needing habitat management.

9. What scientific documentation is available demonstrating the value of the linkage? Unknown

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Ana River
Ecoregion: South Coast
Map Name/ID#: 35

Key contact for this linkage (optional) Robin Maloney-Rames
Telephone #: 714/817-0585
Email: rmaloney@dfg.ca.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
] Other Constrained

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Santa Ana sucker, least Bell's vireo, sw willow flycatcher, SB k-rat. Alluvial processes – open space for flood control – serves as linear linkage – conflicts with flood control/water conservation/mining/recreation/invasive species: Arundo, cowbirds.

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Arundo	5
Flood Control	5
Water Conservation	5
Mining	4
Recreation	3
Urbanization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Regulatory protection mitigation opportunities, watershed planning, water quality.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Arundo removal, cowbird removal, revegetation, resolve conflicts with flood control and water conservation.

5. Provide brief description of the linkage:

Major Habitat Types: RAFSS - willow

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Riparian scrub

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Lack of vegetation, lack of associated upland habitat, channelization, creation of lakes and ponds, year-round source of water/urban runoff.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Lack of information on predator movement.

9. What scientific documentation is available demonstrating the value of the linkage? Santa Ana River Mainstem, Prado Dam EIS/EIR, 7 Oaks Dam

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Timoteo Canyon
Ecoregion: South Coast
Map Name/ID#: 36

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

River/alluvial plain

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	2
Exotic Plants	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency) 1
] willing land sellers
part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Major choke-point due to concrete lining and urbanization for mile stretch adjacent to Santa Ana River. Acquisition, exotic control, restoration of choke-points most important needs in priority order.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Etiwanda
Ecoregion: South Coast
Map Name/ID#: 37

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

alluvial fan

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	5
Flood Control	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: Bureau of Reclamation. Entire alluvial fan along base of mountains threatened hindering E to W movement of alluvial fan species as well as N to S movements from Santa Ana River to National Forest.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Acquisition

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Oak Valley
Ecoregion: South Coast
Map Name/ID#: 38

Key contact for this linkage (optional) Geary Hund
Telephone #: 909/940-5617
Email: gearyh@pc.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

mountain lion, black bear, stream course – major wash

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: State Parks, Fish and Game.

Part of Western Riverside County MSHCP. One approved Specific Plan creates a choke point and potential barrier.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Restoration of habitat minimal; primarily wildland. Enhance undercrossing.

5. Provide brief description of the linkage:

Major Habitat Types: grassland, sage scrub, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Various private, Riverside County, Norton Younglove is core habitat

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Existing and impending development adjacent to Interstate 10.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Undercrossings at I-10 good habitat coverage.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Camera and/or telemetry of wide ranging species.

9. What scientific documentation is available demonstrating the value of the linkage? Little. Several Fish and Game bear, lion incidents. Potentially roadkill.

10. Other information: Very important connection between low elevation reserves and San Bernardino Mountains. Potential acquisitions as part of Riverside County MSHCP. Potential establishment of State Park at northern end. Area at I-10 has approved Specific Plan on south side of highway. Urgent action needed!

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Crafton
Ecoregion: South Coast
Map Name/ID#: 39

Key contact for this linkage (optional) Geary Hund
Telephone #: 909/940-5617
Email: gearyh@pe.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link

] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
1 Agency acquisition (which agency)

] willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Lakeview
Ecoregion: South Coast
Map Name/ID#: 40

Key contact for this linkage (optional) Geary Hund
Telephone #: 909/940-5617
Email: gearyh@pe.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

deer, bobcat, coyote, coastal California gnatcatcher, etc.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5

No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5

Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)] willing land sellers
1 Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Part of Western Riverside County MSHCP. Need to work with county agencies soon to ensure preservation.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Primarily agriculture lands in linkage – some native vegetation with continuation of Ag would work.

5. Provide brief description of the linkage:

Major Habitat Types: grassland, sage scrub, chaparral, alkali flat (in core areas)

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag

Major landowners: Needs research – private in linkage, Fish and Game, State Parks core habitat to the north

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in native vegetation, Highway two lane at grade, possibly four land in future, Ag land.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Agriculture lands – relatively low road impediment

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Purchase conservation easements or fee title ownerships

9. What scientific documentation is available demonstrating the value of the linkage? Road kill data.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Jacinto - Badlands
Ecoregion: South Coast
Map Name/ID#: 41

Key contact for this linkage (optional) Geary Hund
Telephone #: 909/940-5617
Email: gearyh@pe.net

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

coyote, bobcat, deer, river bed

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)] willing land sellers
] Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local Support: County. Agency acquisition: USFWS, CA State Parks, Fish and Game (potential). Part of Riverside County MSHCP. One of several conservation alternatives includes connection.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Some limited restoration of native vegetation in portions of agriculture areas, otherwise minimal.

5. Provide brief description of the linkage:

Major Habitat Types: grassland, sage scrub, wetland, alkali flat

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag

Major landowners: Private, Indian Reservation, some Fish and Game

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): potential development, gaps in cover

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): ag lands and wildland

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): telemetry, cameras of medium bodied and large animals

9. What scientific documentation is available demonstrating the value of the linkage? Little, possibly some road kill.

10. Other information: Major linkage across environmental gradient, topography 1800 – 10,000 feet.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Gorgonio Pass
Ecoregion: South Coast
Map Name/ID#: 42

Key contact for this linkage (optional) Steve Loe
Telephone #: 909/884-6634 ext. 3131
Email: sloe@fs.fed.us

1. Linkage Type (check one)

]	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion, badger, bobcat, black bear, reptiles and rodents. Major link between San Bernardino and San Jacinto Mountains (two of the largest cores in ecoregion). San Gorgonio Creek is important link also to the desert from the coast with many desert/coastal species intergrade and genetic continuum.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Development/Urbanization	4
Sand and Gravel Mining	4
I-10 Improvements	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Audubon, Wildlands Conservancy, FS support. Needs to be included in the Riverside MSHCP and General Plan. City of Banning needs to be coordinated with. Need to coordinate protection efforts with Morongo Indian Tribe, City of Banning. Need to coordinate with Coachella Valley MSHCP to insure continuous linkage coastal side to desert.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Need to restore sand and gravel mined areas. Need to make sure I-10 underpass is maintained as natural.

5. Provide brief description of the linkage:

Major Habitat Types: desert scrub, alluvial sage scrub, mesquite catclaw, riparian, desert riparian, valley foothill riparian, desert scrub, chaparral.

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: USFS, Morongo Indian Tribe, City of Banning, CalTrans, Mining Companies, Riverside County Flood Control

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Sand and gravel mines in the stream bottom. Can be rehabbed when mining complete. Development encroaching slowly. I-10 Freeway crossing is not as good as it could be due to low height.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): San Gorgonio Creek is important use area and links SB Mountains to San Jacinto Mountains, coast to desert. Underpass at I-10 freeway is critical and quality as crossing needs to be maintained.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Documentation of the importance to San Bernardino and San Jacinto Mountains and biodiversity/evolutionary importance of the desert-coastal linkage.

9. What scientific documentation is available demonstrating the value of the linkage? Personal knowledge of large mammal movement (coyote, fox, bobcat, mountain lion)

10. Other information: Secondary linkage between San Bernardino Mountains and Redlands Badlands along with Singleton Road connection.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Coal Canyon
Ecoregion: South Coast
Map Name/ID#: 43

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

mountain lion, bobcat, deer, coyote

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Already conserved.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Dirt roads are present may be removed – underpass to 91 freeway to be restored, removing existing paved road – revegetation, enhacement of underpass.

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub, chaparral, Tecate Cypress, annual grasslands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Urban

Major landowners: State of California

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Underpass of the 91 freeway, chain link fencing

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Underpass to the 91 freeway

9. What scientific documentation is available demonstrating the value of the linkage? None needed, already documented.

10. Other information: Documentation by Paul Beier, Kevin Crooks

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Corona - Temecula
Ecoregion: South Coast
Map Name/ID#: 44

Key contact for this linkage (optional) Lisa Lyren, Chris Haas
Telephone #: 909/597-6411
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other constrained/urban encroachemt

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Carnivores, obligate coastal sage scrub breeding birds, least Bell's vireo, southwestern pond turtles, sw willow flycatcher. This linkage is the area that runs parallel to the 15 freeway.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5
Agriculture	2
Roadway	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: Forest Service. Part of NCCP.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage, grasslands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Urban, Natural Vegetation, and Ag/Rural Residential equal.

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in habitat cover.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage for a majority of the area. Although, urban development at the base of the Santa Ana Mountains is creeping eastwards towards I-15 "fingers" of development, creating habitat patches alongside the freeway.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use and purchase.

9. What scientific documentation is available demonstrating the value of the linkage? Santa Ana Mountain connectivity study conducted by Crooks et al., Paul Beier mountain lion study.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Bedford Canyon
Ecoregion: South Coast
Map Name/ID#: 45

Key contact for this linkage (optional) Ron Baxter
Telephone #: 909/776-0480
Email: cnlmbax@aol.com

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

mountain lion, deer

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Potentially part of Riverside Co. MSHCP??

Development in area could fund corridor as mitigation.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Will need

restoration to natural from citrus agriculture.

5. Provide brief description of the linkage:

Major Habitat Types: sage scrub, chaparral, citrus ag

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Interstate 15, proposed industrial park

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Wide canyon alluvium supporting citrus – could be restored.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? Consulting reports – Cleveland N.F.

10. Other information: Is one of two remaining corridors connecting Cleveland National Forest to Lake Matthews/Gavilan Plateau.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Gavilan Hills – Santa Ana Mountains
Ecoregion: South Coast
Map Name/ID#: 46

Key contact for this linkage (optional) TLMA Riverside County
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

deer, bobcat, cougar, badger

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Development	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Riverside County Transportation and Land Management Area. TLMA – Riverside County Agency, applied for grant to obtain linkage – did not get it.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Restoration of orange groves to native sage scrub.

5. Provide brief description of the linkage:

Major Habitat Types: sage scrub, orange groves, sage scrub, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Ag Natural

Major landowners: Farmer

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): I-15 fwy

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian orange trees chaparral

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): To purchase it.

9. What scientific documentation is available demonstrating the value of the linkage? Cougar study

10. Other information: This is the last remaining connection across the I-15 south of the 91 Fwy.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Bonita Creek
Ecoregion: South Coast
Map Name/ID#: 47

Key contact for this linkage (optional) Will Miller
Telephone #: 760/431-9440
Email: William_b_miller@fws.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

coyote, deer, song birds
watershed connectivity - ecological processes

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Pending Clean Water Act 404 permit – special area management plan for San Diego Creek Watershed.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Broaden buffer and restore connectivity to Upper Newport Back Bay, riparian restoration.

5. Provide brief description of the linkage:

Major Habitat Types: riparian drainage

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation fragmented by roadways and adjoined by development

Major landowners: The Irvine Company

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadway obstruction, but there are existing culverts.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Relatively good riparian corridor between Upper Newport Back Bay and NCCP. Orange County Reserve in the San Joaquin Hills.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Buffer and underpass design concepts.

9. What scientific documentation is available demonstrating the value of the linkage? Functional assessment for Army Corps of Engineers Special Area Management Plan.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: El Toro Linkage
Ecoregion: South Coast
Map Name/ID#: 48

Key contact for this linkage (optional) S. George
Telephone #: 714/525-9180
Email: 233geo@home.com

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Area characterized by extensive agricultural fields, industrial developments, and housing tracts. Remotely-censored cameras under the 5 Fwy detected movement by coyotes.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5
Agriculture	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Airport Alternative Re-Use Plan for El Toro Marine Base supposedly incorporates a wildlife corridor.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Area has been used for agriculture and cattle grazing and is severely trampled (grasses only). Scrub oak and coastal sage communities characterize the intact habitat.

5. Provide brief description of the linkage:

Major Habitat Types: mixed oak woodland, coastal sage scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Industrial, Residential, and Ag – no natural vegetation, possibly native grasses.

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads, freeways, ag fields, gaps in cover (acres)

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Some underpasses beneath freeways and toll roads. Some toll roads have no undercrossings (TR 261).

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Need more data on current use, major restoration efforts, possibly acquiring land (ag fields) – perhaps a passage through fields.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Aliso Cyn–Laguna Cyn Wilderness
Ecoregion: South Coast
Map Name/ID#: 49

Key contact for this linkage (optional) County Parks
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

coastal California gnatcatcher, bobcat, deer

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Roads	4
Mountain Bikes	3
Exotic weeds	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Part of Orange County NCCP.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Fencing from Toll Road, more structure to toll road restoration

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub, riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Re-veg, Laguna Canyon Road, ruderal land (grazed).

Major landowners: County Parks

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Laguna Canyon Road

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Toll Road undercrossing

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): To design

9. What scientific documentation is available demonstrating the value of the linkage? Orange County NCCP panel of scientists

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Oso Creek
Ecoregion: South Coast
Map Name/ID#: 50

Key contact for this linkage (optional) Will Miller
Telephone #: 760/431-9440
Email: William_b_miller@fws.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Reserve design concept to link open space in coastal Orange County to southern sub-region. Maintain – bobcat, coyote and songbirds in costal O.C..

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5
Exotic Plants	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Part of Orange County NCCP. Tenuous but last opportunity to connect coastal Orange County with southern O.C. open space.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Eliminate channelization of San Juan Creek, eradicate Arundo.

5. Provide brief description of the linkage:

Major Habitat Types: riparian drainage connecting non-native grasslands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Urban

Major landowners: Unknown – possibly homeowners association and O.C.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Channelization of San Juan Creek and urban, residential development.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Connection of Oso Creek with San Juan Creek

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Whether this area supports wildlife movement between central O.C. and San Joaquin Hills.

9. What scientific documentation is available demonstrating the value of the linkage? None.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Cristianitos
Ecoregion: South Coast
Map Name/ID#: 51

Key contact for this linkage (optional) Annie Hoecker
Telephone #: 760/431-9440
Email: anne_hoecker@fws.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

mountain lion, bobcat, coyote

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Housing Development (Talega)	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support: Endangered Habitats League, CDF. One land owner: Rancho Mission Viejo. Part of pending subregional NCCP. Largely dependent on outcome of Foothill Transportation Corridor (toll road). Area is currently contiguous.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Coastal sage scrub, chaparral, riparian. There is some exotic invasion, thistle in particular.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Rancho Mission Viejo

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Not many barriers exist. However, housing development is currently being constructed in Talega Valley (just west of the connection.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian corridor, natural landscape.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): We need information on effective wildlife crossings if the proposed toll road is built.

9. What scientific documentation is available demonstrating the value of the linkage? Paul Beier, 1995

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Gavilan Plateau
Ecoregion: South Coast
Map Name/ID#: 52

Key contact for this linkage (optional) Ron Baxter
Telephone #: 909/776-0480
Email: cnlmbax@aol.com

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

coastal California gnatcatcher, quino checkerspot butterfly, deer, mountain lion, SKR

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
ORV	5
Exotics	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who) 1 willing land sellers
1 Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Part of Riverside County MSHCP? Serves as link between Lake Matthews Multi Species Reserve Steele Peak ACEC Kabian Park Regional Park

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Control exotic grasses and wildfire in Riversidian sage scrub areas.

5. Provide brief description of the linkage:

Major Habitat Types: Coastal sage scrub, chaparral, some juniper woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Mostly semi-natural

Major landowners: Private/large parcels

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Still fairly intact, ORV damage and impacts increasing rapidly.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Edison Road, Temescal Wash in a portion, mostly contiguous habitat.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Surveys of large mammal use, quino checkerspot butterfly habitat evaluation.

9. What scientific documentation is available demonstrating the value of the linkage? Mostly pre-development studies.

10. Other information: Connects three existing conservation blocks.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Jacinto River
Ecoregion: South Coast
Map Name/ID#: 53

Key contact for this linkage (optional) Geary Hund
Telephone #: 909/940-5617
Email: gearyh@pe.net

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

coyote, rare plants, major river course

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	3
Channelization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)] willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Potential acquisition: State and Federal, USFWS, State Parks, Fish and Game.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Deluz – Sandia Creek
Ecoregion: South Coast
Map Name/ID#: 54

Key contact for this linkage (optional) Chris Haas
Telephone #: 909/597-6411
Email: cdhaas@prodigy.net

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other riparian with agriculture

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain lion, bobcat, deer, arroyo toad

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Avocado orchards	5
Ranch Development	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Exotic removal.

5. Provide brief description of the linkage:

Major Habitat Types: riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag, Rural Residential

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Avocado groves

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage from Santa Margarita River – Cleveland National Forest – Santa Rosa Plateau.

9. What scientific documentation is available demonstrating the value of the linkage? Fisher and Crooks – Santa Ana Connectivity Study

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Tenaja
Ecoregion: South Coast
Map Name/ID#: 55

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

]	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large carnivores, follows watershed corridor, topography – large core areas

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
5 Acre Ranch Development	4
Road Improvements	4
Exotic Species	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: The Nature Conservancy. Part of Tenaja Corridor/MSHCP in Riverside County.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Exotic species removal, ie fish and amphibians, non-native grasses.

5. Provide brief description of the linkage:

Major Habitat Types: chaparral, riparian, oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Rural Residential

Major landowners: The Nature Conservancy, County of Riverside, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Ranch fencing, paved roads, sharp corners where protected acreage is a 90 degree turn.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat, underpasses, dirt roads, topography.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document the effectiveness of corridor, complete purchase of land.

9. What scientific documentation is available demonstrating the value of the linkage? SDSU finished a two year study of the corridor.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Pechanga Corridor
Ecoregion: South Coast
Map Name/ID#: 56

Key contact for this linkage (optional) Chris Haas
Telephone #: 909/597-6411
Email: cdhaas@prodigy.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

mountain lion, deer, bobcat

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure 2 3 Moderate threat 4 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Freeway widening	2
Ranch Development	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible 2 3 Moderate Opportunity 4 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: BLM, National Forest.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Overpass / underpass along I-15; fencing along freeway.

5. Provide brief description of the linkage:

Major Habitat Types: Chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag, Rural Residential

Major landowners: Private, BLM, National Forest, SDSU

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Freeway, Avocado groves.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Underpasses/bridges, continual habitat coverage.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Radio telemetry to document crossing locations, road kill surveys.

9. What scientific documentation is available demonstrating the value of the linkage? Paul Beier, mountain lion study. Fish and Crooks, Santa Ana Connectivity Study.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Cleveland – San Bernardino
Ecoregion: South Coast
Map Name/ID#: 57

Key contact for this linkage (optional) Robin Maloney-Rames
Telephone #: 714/817-0585
Email: rmaloney@dfg.ca.gov

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

large predators – bobcat, mountain lion. Also, gnatcatcher, quino checkerspot, raptors

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Tamarisk	3
Agriculture	2
Rural Residential	1
Roads	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 [5]
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)] willing land sellers
] Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Part of Western Riverside County MSHCP.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Control of invasives.

5. Provide brief description of the linkage:

Major Habitat Types: chaparral, coastal sage scrub, riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Rural Residential

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): SR – 79, Development of Vail Lake

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat, continuous open space, agricultural areas.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document wildlife movement.

9. What scientific documentation is available demonstrating the value of the linkage? Wilson Creek Conservation Bank

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Tucalota Creek
Ecoregion: South Coast
Map Name/ID#: 58

Key contact for this linkage: Center for Natural Lands Mgt.
Telephone #: 760/731-7790
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

riparian corridor, vernal pool, gnatcatcher, LA pocket mouse

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Housing Development	5
Human Recreation	4
Exotic Plants	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Formal plan: under negotiation. Center for Natural Lands Management (Bella Vista Par)

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Extensive riparian restoration.

5. Provide brief description of the linkage:

Major Habitat Types: riparian, sage scrub, vernal pool

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural prior to development and surrounded by agriculture.

Major landowners: Pacific Bay Properties

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Housing development.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): To document use.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Hemet
Ecoregion: South Coast
Map Name/ID#: 59

Key contact for this linkage (optional) Robin Maloney-Rames
Telephone #: 714/817-0585
Email: rmaloney@dfg.ca.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Connecting San Bernardino National Forest (N-S) with core reserves (E-W). Eastside Reservoir – Cactus Valley – Vernal pools, alkali flat.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	3
Agriculture	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Potential for CDFG acquisition. Part of Western Riverside MSHCP. Mitigation from SR-74.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Revegetation

5. Provide brief description of the linkage:

Major Habitat Types: coastal sage scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads, development

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Santa Clara River
Ecoregion: South Coast
Map Name/ID#: 60

Key contact for this linkage (optional) Wendy Millett
Telephone #: 310/540-6409
Email: wmillet@tnc.org

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Fish, birds

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)] willing land sellers
] Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian habitat restoration

5. Provide brief description of the linkage:

Major Habitat Types: riparian woodland and scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: numerous private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in cover – gravel mining, roads, sand bar at lagoon blocks steelhead movement upstream.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat, no dams

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? The Nature Conservancy site plan

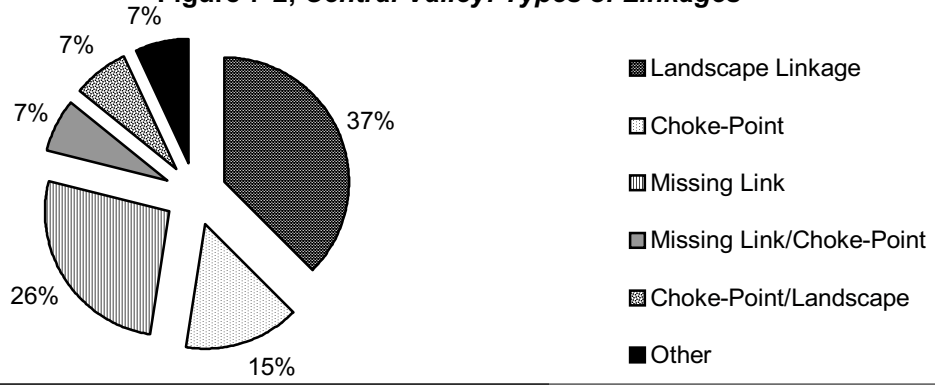
10. Other information:

7.0 CENTRAL VALLEY ECOREGION

The Central Valley ecoregion is roughly bound by the Cascade Ranges to the north, the Sierra Nevada to the east, the Tehachapi Mountains to the south, with the Coast and Diablo Ranges forming the western boundary (Figure 1-1, *California Regions and Topography*). Multiple rivers and streams flow into the valley from the Klamath, Cascades, Coast, Diablo and Sierra Nevada Ranges.

The primary regional community types are freshwater marsh, riparian woodland, oak savanna, valley grassland, vernal pool, dunes and alkali scrub. The freshwater marsh community consists of emergent vegetation such as tule (*Scirpus* spp.), rushes (*Juncus* spp.) and cattails (*Typha* spp.), with a floating bed sub-community consisting of duckweed (*Lemna* spp.). The riparian woodlands are comprised of species such as cottonwood (*Populus* spp.), Western sycamore (*Platanus racemosa*), and willows (*Salix* spp.). The vast valley grasslands were once made up of perennial bunchgrasses (*Nasella* spp.), intermingling with a mosaic of valley oak (*Quercus lobata*) and blue oak (*Q. douglasii*) savannas. Valley grasslands typically surround vernal pools containing plant species such as orcutt grass (*Orcuttia* spp.) and button celery (*Eryngium* spp.). Salt grass (*Distichlis spicata*), pickleweed (*Salicornia* spp.) and saltbush (*Atriplex* spp.) are characteristic species in the alkali scrub habitat.

Figure 7-2, *Central Valley: Types of Linkages*



Though much of the region is privately owned, scattered habitat still exists on patches of publicly owned land. The Central Valley is home to ten National Wildlife Refuges including Sacramento, Delevan, Colusa, Sutter, Kesterson, San Luis, Merced, Pixley, Gray Lodge and the Kern refuge. Large blocks of land are operated by the military, including: Beale, Mather, Travis and Castle Air Force Bases; Lemoore Naval Air Station; and Elk Hills military base. There are also pockets of land managed by the Bureau of Land Management, California State Parks, and the Army Corps of Engineers.

A total of 27 habitat linkages were identified for the region (Figure 7-1, *Central Valley: Missing Linkages*). Of the linkages identified, 37% (10/27) were considered Landscape Linkages[1],

[1] Landscape Linkage = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between different sections of the landscape.

15% (4/27) were recognized as Choke-Points[2], and 26% (7/27) were determined to be Missing Links[3]. Scientists also identified other types of linkages; 7% (2/27) were considered Missing Links[3] and Choke-Points[2], 7% (2/27) were recorded as Choke-Points[2] and Landscape Linkages[1], and 7% (2/27) had no defined linkage type (Figure 7-2, *Central Valley: Types of Linkages*).

The key species used to identify the linkages belonged to a number of taxonomic groups. Mammals recognized as key species included the San Joaquin kit fox (*Vulpes macrotis mytica*), river otter (*Lutra canadensis*), beaver (*Castor canadensis*), ringtail (*Bassariscus astutus*), tule elk (*Cervus elaphus nannoides*), riparian brush rabbit (*Sylvilagus bachmani riparius*), Buena Vista Lake shrew (*Sorex ornatus relictus*), wood rat (*Neotoma* spp.), short-nosed kangaroo rat (*Dipodomys nitratoides brevinasus*), Tipton's kangaroo rat (*D. nitratoides nitratoides*), Fresno kangaroo rat (*D. nitratoides exilis*), giant kangaroo rat (*D. ingens*), San Joaquin pocket mouse (*Perognathus inornatus*), and salt marsh harvest mouse (*Reithrodontomys raviventris*). Birds identified as key species included Swainson's hawk (*Buteo swainsoni*), Le Conte's thrasher (*Toxostoma lecontei*), black rail (*Laterallus jamaicensis*), western yellow-billed cuckoo (*Coccyzus americanus*), and colonial nesting and migratory bird species. One reptile, the blunt-nosed leopard lizard (*Gambelia silus*), was listed as a key species. Fish listed as key species included Chinook salmon (*Oncorhynchus tshawytscha*), southern steelhead trout (*Oncorhynchus mykiss*), and Delta smelt (*Hypomesus transpacificus*). Crustaceans recognized as key species included two types of fairy shrimp (*Streptocephalus* spp. & *Branchinecta* spp.). Both single and multiple key species were used in identifying the linkages; 78% (21/27) of the linkages recognized mammals as key species, 44% (12/27) used birds, 30% (8/27) used amphibians and reptiles, and 4% (1/27) used fish. Mammalian carnivores were recognized as key species in 56% (15/27) of the linkages.

The primary features identified as facilitating animal movement in the region included waterways, riparian corridors, flood control channels, contiguous habitat, and upland habitat on levees. In an ecoregion so heavily modified, waterways have become critical movement corridors. In fact, 44% (12/27) of the linkages identified in the region are associated with rivers and streams. The Kern, Tule, Kings, Bear, Consumnes, St. Johns, and Lower San Joaquin Rivers were named as important linkages, along with numerous streams. Underpasses and culverts were also identified as linkage features in the region.

The primary barriers to animal movement in the region are varied, though no barriers were listed for eight of the linkages identified. In some linkages, gaps in cover were identified as barriers primarily due to the conversion of habitat to agriculture, and/or urban land uses. Water impoundments, diversions, and stream channelization were identified as obstacles to movement in some of the linkages associated with waterways. Highways and roads were also identified as barriers; Highways 5, 12, 58, 46, 33, 580, 205, 12, and 65 were specifically mentioned as major impediments to wildlife movement.

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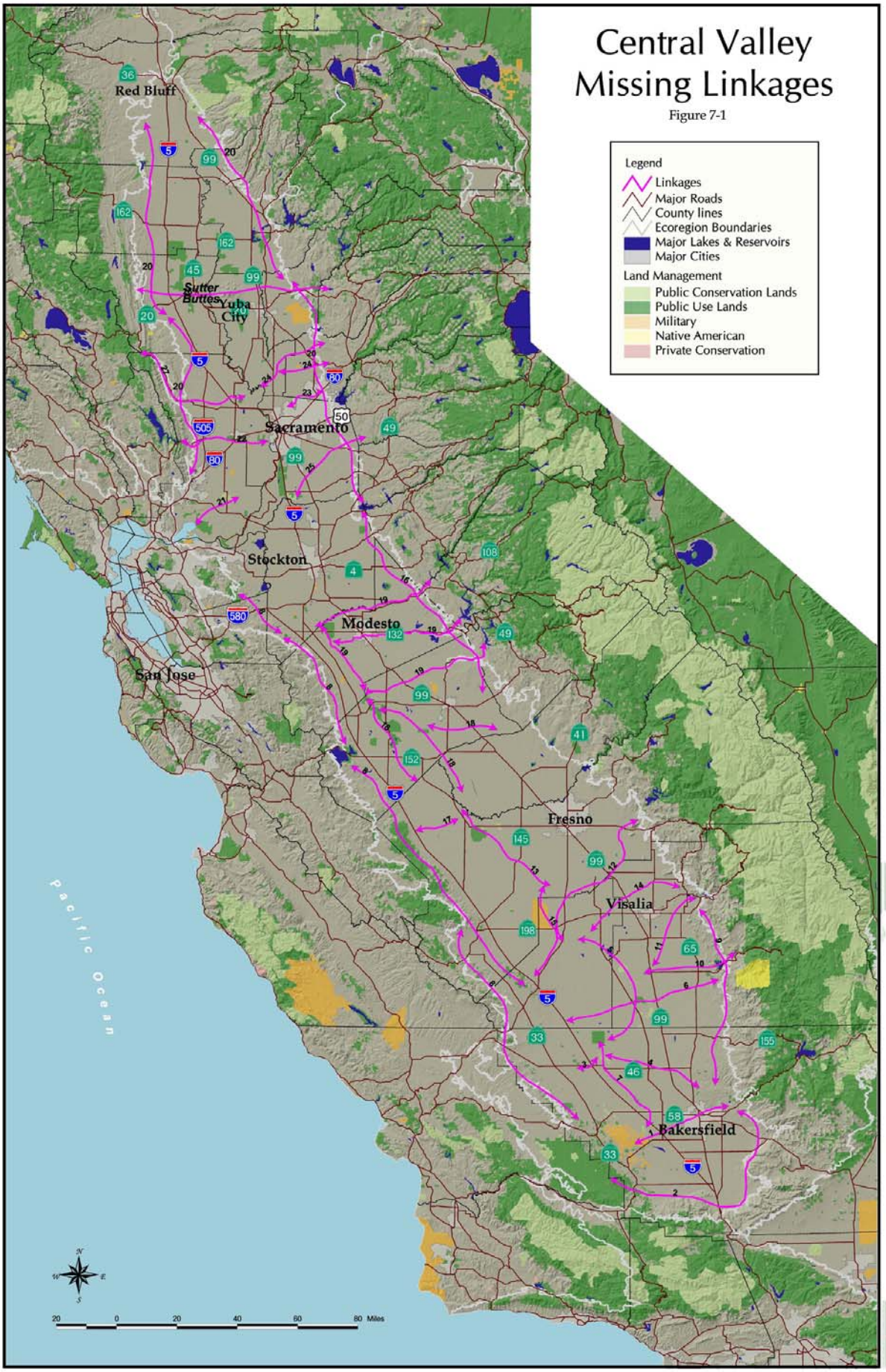
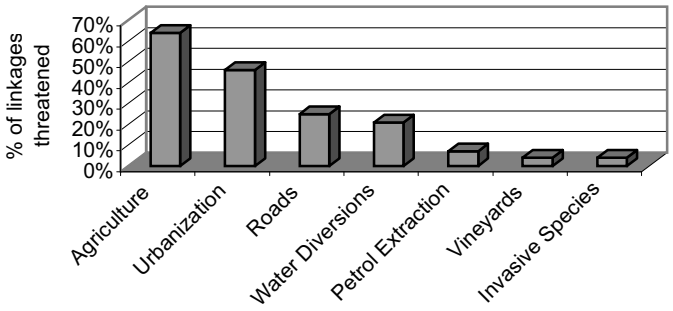
[2] Choke-Point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas").

[3] Missing Link = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function.


Central Valley
Missing Linkages
Figure 7-1
Legend
Linkages
Major Roads
County lines
Ecoregion Boundaries
Major Lakes & Reservoirs
Major Cities
Land Management
Public Conservation Lands
Public Use Lands
Military
Native American
Private Conservation
Red Bluff
Sutter Buttes
Yuba City
Sacramento
Stockton
Modesto
San Jose
Fresno
Visalia
Bakersfield
Pacific Ocean
20 0 20 40 60 80 Miles

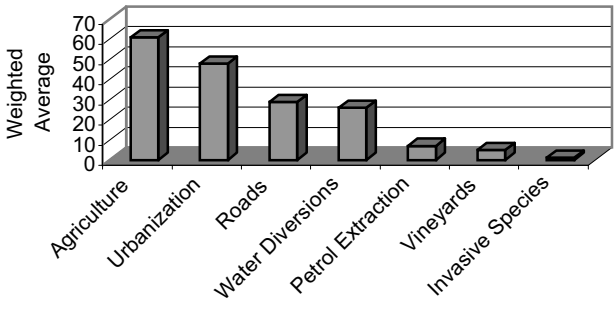
Habitat types identified in need of restoration included grassland, riparian, and saltbush scrub communities. Restoration of portions of agricultural land to historic habitat types for functional connectivity was identified as a priority in 19% (5/59) of the linkages. Restoring the natural disturbance regime in riparian systems was also mentioned, as well as exotic plant eradication, stream bank stabilization and instream habitat restoration for aquatic species and neotropical migratory birds. In 33% (9/27) of the linkages, no restoration needs were specified. In general, participants felt plans for restoring connectivity in the region should be developed, implemented, and monitored for use by target species.

Figure 7-3, *Central Valley: Threats to Connectivity*



The primary threats to connectivity identified for the ecoregion included urbanization and agriculture; other threats included roads, water diversions, petroleum extraction, vineyard expansion, and invasive species (Figure 7-3, *Central Valley: Threats to Connectivity*). Agriculture threatened 67% (18/27) of the linkages to some degree, 44% (8/18) of which were ranked as severely threatened (rank = four or five). Urbanization jeopardized 48% (13/27) of the linkages recognized, 62% (8/13) of which were ranked as severely threatened. Roads endangered 26% (7/27) of the linkages identified, 57% (4/7) of which were ranked as severely threatened. Of the linkages, 22%(6/27) were threatened to some degree by water diversions, 67% (4/6) of which ranked as severely threatened. Petroleum extraction, vineyard expansion and invasion of exotic species were also considered threats in a few of the linkages. A number of threats to habitat connectivity were identified for the region, though the average severity of the threat varied. The weighted average (average rank × number of linkages affected) was calculated for each threat identified to determine the severity of each threat in the region (Figure 7-4, Central Valley*: Severity of Threats*). Figure 7-4, average severity of each threat among linkages, reveals similar trends as Figure 7-3, the number of linkages impacted by each threat.

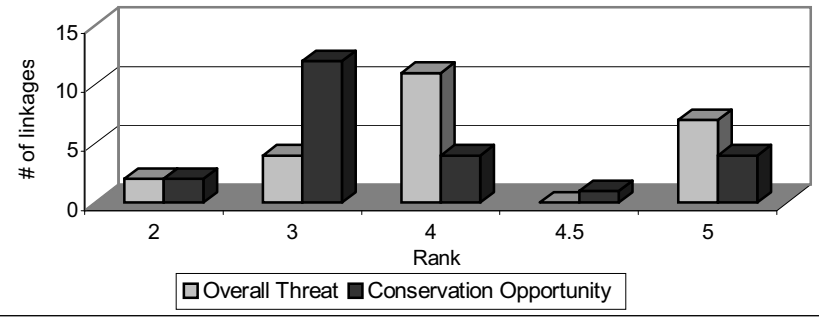
Figure 7-4, *Central Valley: Severity of Threats*



Note: The above graph depicts the weighted average of each threat identified. Weighted average = average rank × number of linkages affected. The severity of each threat was ranked from one to five (one = not severe, five = extremely severe).

Conference participants also scored the feasibility of conserving the linkage and ranked the overall degree of threat (Figure 7-5, *Central Valley: Ranking the Priorities*). Scientists ranked 33% (9/27) of the linkages as high priorities with good opportunities for

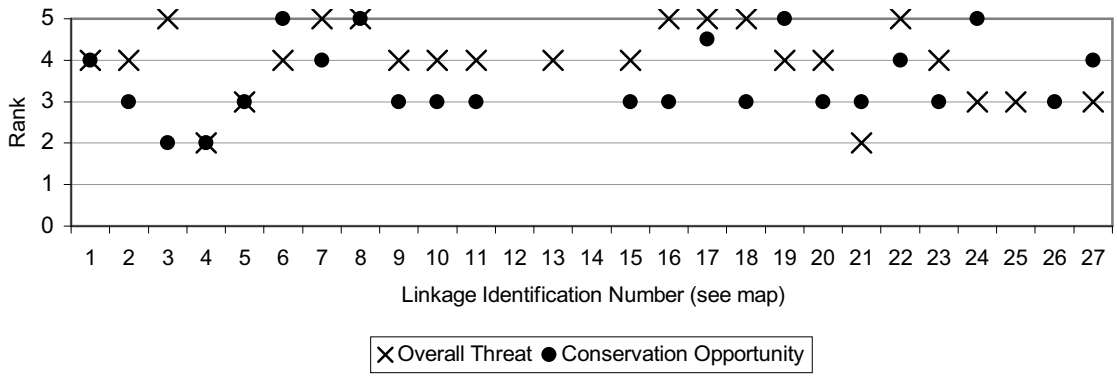
Figure 7-5, *Central Valley: Ranking the Priorities*



Note: Graph compares the number of linkages ranked for overall threat and conservation opportunity. No linkages were ranked a one for either category.

conservation (ranked four or five), 26% (7/27) of which were ranked as severely threatened (rank = four or five). These linkages are depicted in Figure 7-1, *Central Valley: Missing Linkages,* Map ID#s 1, 6, 7, 8, 17, 19 & 22. Overall, 67% (18/27) of the linkages identified were ranked as severely threatened. 15% (4/27) of the linkages were identified as the highest conservation opportunities (ranked 5), three which were ranked as severely threatened (Figure 7-1, *Central Valley: Missing Linkages,* Map ID#s 6, 8 &19). These include one Missing Link[3]/Choke-Point[2] (the Deer Creek-Sand Ridge linkage Map ID# 6), one Missing Link[3] (the Lower San Joaquin River linkage Map ID# 19), and one Choke-Point[2]/Landscape linkage[1] (the Carrizo Plain-Western San Joaquin Valley linkage Map ID# 8). Brief descriptions are provided below of the top ranked conservation priorities (threat = four or five & conservation opportunity = five). A comparison of how individual linkages were ranked is depicted in Figure 7-6, *Central Valley: Degree of Threat and Conservation Opportunities*.

Figure 7-6, *Central Valley: Degree of Threat & Conservation Opportunities*



Note: The above graph compares how each linkage was ranked for overall threat (one = no threat/secure, five = severe threat/loss imminent) and the feasibility of conserving the linkage (one = not feasible, five = good opportunity). Two of the linkages were not ranked for either category.

The Deer Creek-Sand Ridge linkage (Figure 7-1, *Central Valley: Missing Linkages,* Map ID# 6) was identified as a Missing Link[3] and a connectivity Choke-Point[2]. This linkage was described as providing habitat connectivity for many threatened and endangered species, as well as colonial and neotropical migratory birds. Tulare Lake and Marsh were specifically mentioned; other habitat types in the linkage include riparian, grassland, dunes, and vernal pools. No specific barriers or threats were identified for this linkage, though restoration opportunities were mentioned. Landownership was explicitly stated in the linkage description log; the primary landowners are the federal government (Pixley National Wildlife Refuge) and S. Wilbur Hacienda. There are willing sellers and potential for agency acquisition in this linkage. This linkage is also identified in the Recovery Plan for Upland Species and is part of a Sierra Los Tulares Land Trust conservation plan. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The Carrizo Plain-Western San Joaquin Valley linkage (Figure 7-1, *Central Valley: Missing Linkages,* Map ID# 8) was identified as a Choke-Point[2] and a Landscape linkage[1], extending from the southern valley to the western edge of Fresno County. Key species used to identify this linkage included the San Joaquin kit fox, giant kangaroo rat, short-nosed kangaroo rat, blunt-nosed leopard lizard, and Le Conte's thrasher. The principal threats identified include petroleum development, urbanization, and roads. Roads and highways were the primary barriers listed for this linkage; Highways 58, 33, 580 and 205 were specifically mentioned. Contiguous valley grassland and saltbush scrub habitats were considered the primary linkage features. Landownership in the linkage was described as both public and private, with the California Department of Fish and Game and the Bureau of Land Management managing the publicly owned lands. This linkage was identified as part of the Recovery Plan for Upland Species and participants indicated that potential exists for agency acquisition. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The Lower San Joaquin River linkage (Figure 7-1, *Central Valley: Missing Linkages,* Map ID# 19) was identified as a Missing Link[3]. Key species used to identify this linkage included riparian brush rabbit, wood rat, ringtail, western yellow-billed cuckoo and other neotropical migrants. The primary threats identified were gaps of twenty miles or more in riparian habitat due to stream channelization. Extensive riparian restoration and management was identified as a need to provide refuge from major flood events. Ownership in this linkage was described as a complex mix of public and private land, including land owned or managed by the Army Corps of Engineers, United States Fish and Wildlife Service and Tuolumne River Trust. The Recovery Plan for Upland Species was listed as documentation for this linkage and participants indicated that there is potential for agency acquisition. Please refer to the corresponding Linkage Description Log Sheet for more specific information.

Scientific documentation and/or GIS-based maps were provided that indicate the importance of some of the linkages. Documented salmon and steelhead use were referenced for some of the riparian linkages. The comprehensive *Recovery Plan for Upland Species of the San Joaquin Valley* (Williams et al. 1998) was cited for a number of the linkages identified. Of the linkages, 37% (10/27) recorded (Figure 7-1, *Central Valley: Missing Linkages,* Map ID#s 1, 3, 4, 5, 6, 7, 8, 15, 17, 18) coincide with linkage areas depicted in Figure 7-7, *San Joaquin Valley Conservation and Recovery Planning Overview*. Of the linkages, 15% (4/27) identified (Figure 7-1, *Central Valley: Missing Linkages,* Map ID#s 2, 8, 9, 16) correspond with areas of

contiguous habitat in Figure 7-7, *San Joaquin Valley Conservation and Recovery Planning Overview*. Of the linkages, 30% (8/27) recognized (Figure 7-1, *Central Valley: Missing Linkages,* Map ID#s 1-5, 7, 12 & 15) feed into areas proposed as special reserves (Figure 7-7, *San Joaquin Valley Conservation and Recovery Planning Overview*). Two of the conservation priorities identified, (Figure 7-1, *Central Valley: Missing Linkages,* Map ID#s 6 & 8) are depicted in the above referenced figure, while linkages 19 and 24 feed into linkage 16 in an area of contiguous habitat along the southeast portion of the valley. Please refer to the corresponding Linkage Description Log sheets for more specific information.

Potential exists for agency acquisition in 52% (14/27) of the linkages, 43% (6/14) of which were identified as having willing sellers in all or a portion of the linkage (Figure 7-1, *Central Valley: Missing Linkages,* Map ID#'s 5, 6, 15, 17, 18, 24). Two of the conservation priorities (Figure 7-1, *Central Valley: Missing Linkages,* Map ID#'s 6, 17) were noted as having willing sellers, both of which have the potential for agency acquisition. Other opportunities identified to secure or restore functional connectivity included conservation easements, acquisition through local and national land trusts and conservancies, formal conservation plans, mitigation banks, the Department of the Interior's Land Retirement Program, the enhancement of underpasses, and coordination among various federal and state agencies.

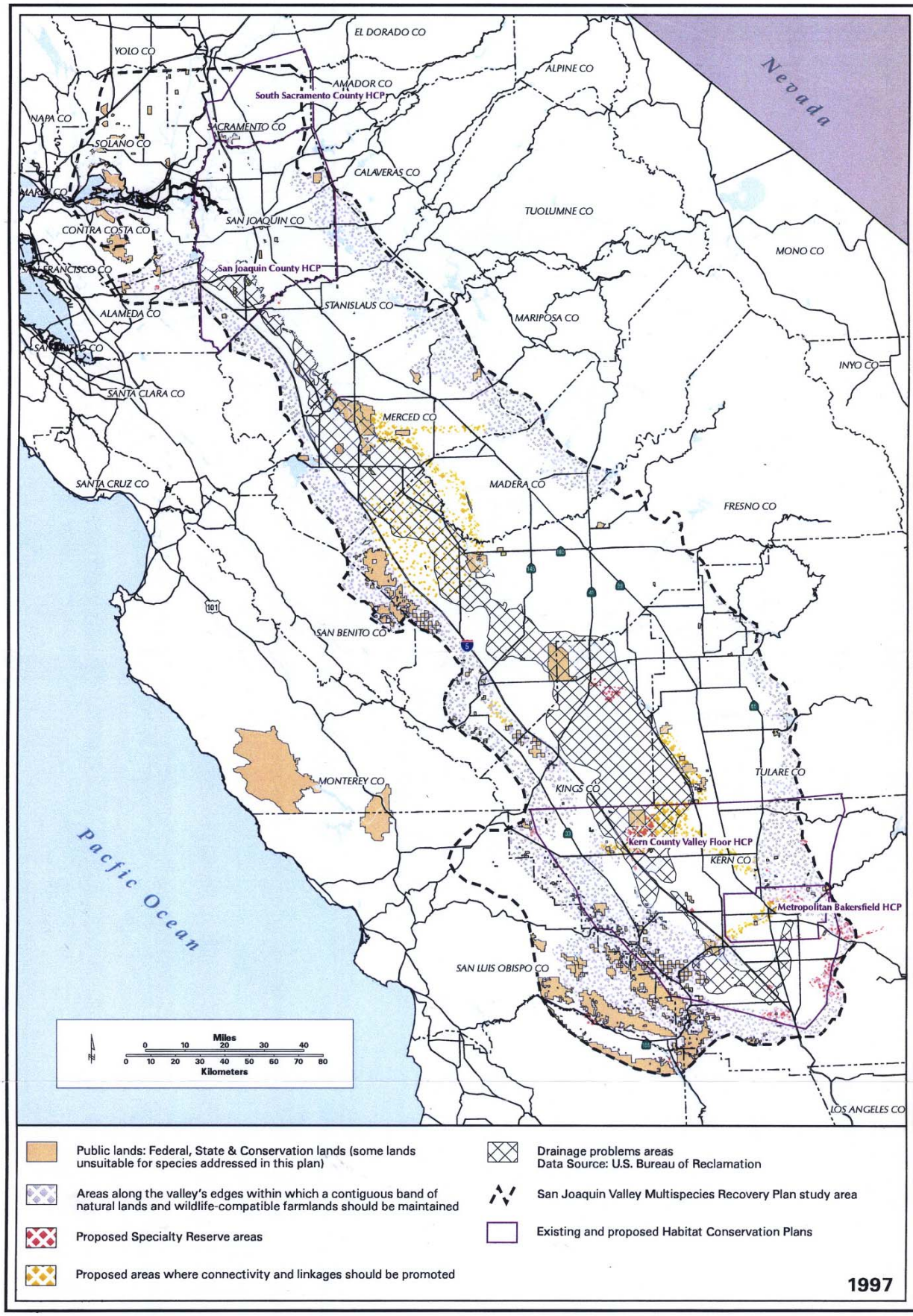


Figure 73. *San Joaquin Valley conservation and recovery planning overview (see table 12).*

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Kern River
Ecoregion: Central Valley
Map Name/ID#: 1

Key contact for this linkage: R. Hansen, D. Wiliams, P. Kelly
Telephone #: 559/627-5473, 559/453-1103
Email: birdman1@lightspeed.net, patrickk@csufresno.edu

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Buena Vista lake shrew, San Joaquin kit fox, Tipton kangaroo rat

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
Mild Agriculture	3
Stream Channelization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Recovery Plan for Upland Species

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian habitat, dependable stream flow

5. Provide brief description of the linkage:

Major Habitat Types: Riparian and upland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, urban, agriculture

Major landowners: State of California (Stream bed)

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in riparian habitat, water impoundments (east of Bakersfield which restricts movement of terrestrial species across formerly intermittent water flow)

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat; upland habitat on levees and in stream bed

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of corridor.

9. What scientific documentation is available demonstrating the value of the linkage?

San Joaquin Recovery Plan, U.S. Fish and Wildlife Service, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: South End San Joaquin Valley
Ecoregion: Central Valley
Map Name/ID#: 2

Key contact for this linkage (optional): Patrick Kelly, Dan Williams
Telephone #: 559/453-1103, 209/667-3446
Email: patrickk@csufresno.edu, dwilliam@toto.csustan.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox, short-nosed kangaroo rat, blunt-nosed leopard lizard, Le Conte's thrasher

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	3
Agriculture	2
Petroleum Extraction	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Recovery Plan for Upland Species

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Restoration of irrigated ag land to natural community at choke points

5. Provide brief description of the linkage:

Major Habitat Types: Valley Grassland, Saltbush Scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, Ag, petroleum fields, urban

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highways 5 and 58, 1-5 mi. gaps in cover, steep and hilly terrain

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): bridges/underpasses, continuous habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): document use of linkage

9. What scientific documentation is available demonstrating the value of the linkage?

Recovery Plan for Upland Species of the San Joaquin Valley, US Fish and Wildlife Service, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Lost Hills-Semitropic Ridge
Ecoregion: Central Valley
Map Name/ID#: 3

Key contact for this linkage: R. Hansen, P. Kelly, D. Williams
Telephone #: 559/627-5473
Email: patrickk@csufresno.edu

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox, blunt-nosed leopard lizard, Tipton kangaroo rat

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	3
Agriculture	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): DOI Interagency Program, Recovery Plan for Upland Species

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Restore irrigated agricultural lands to natural communities (Valley Grassland, Saltbush Scrub)

5. Provide brief description of the linkage:

Major Habitat Types: Valley Grassland, Saltbush Scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Agriculture, Urban

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highways 5 and 46, 5-8 mi. gaps in habitat cover, waterway (Kern River overflow channel)

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): None

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Purchase and restoration

9. What scientific documentation is available demonstrating the value of the linkage? Recovery Plan for Upland Species of the San Joaquin Valley, USFWS, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Pozo Creek
Ecoregion: Central Valley
Map Name/ID#: 4

Key contact for this linkage: R. Hansen, D. Williams, P. Kelly
Telephone #: 559/627-5473
Email: patrickk@csu.fresno.edu

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	5
Stream Channelization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

Recovery Plan for Upland Species

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

upland and riparian

5. Provide brief description of the linkage:

Major Habitat Types: riparian and upland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Agriculture

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in habitat cover, several of 1-5 mi. in length

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Underpasses/bridges over major highways (Hwy 99)

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Purchase, document use of linkage

9. What scientific documentation is available demonstrating the value of the linkage?

Recovery Plan for Upland Species of the San Joaquin Valley, USFWS, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Highway 43 – Garces Highway
Ecoregion: Central Valley
Map Name/ID#: 5

Key contact for this linkage (optional) D. Williams, P. Kelly
Telephone #: 209/667-3446, 559/453-1103
Email: dwilliam@toto.csustan.edu, patrickk@csufresno.edu

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox, blunt-nosed leopard lizard, Tipton's kangaroo rat

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency land retirement, Recovery Plan for Upland Species

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Several 1000 acres need to be restored from mitigated ag to natural communites.

5. Provide brief description of the linkage:

Major Habitat Types: Alkali Sink Scrub, Valley Grassland, Saltbush Scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag, Natural Vegetation

Major landowners: Private, DOI, State

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): habitat gaps (several miles)

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): purchase and restoration

9. What scientific documentation is available demonstrating the value of the linkage?

Recovery Plan of Upland Species of the San Joaquin Valley, USFWS, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Deer Creek – Sand Ridge
Ecoregion: Central Valley
Map Name/ID#: 6

Key contact for this linkage (optional) Rob Hansen
Telephone #: 559/627-5473
Email: birdman1@lightspeed.net

1. Linkage Type (check one)

[1] Landscape Linkage [ ] Connectivity Choke-Point
[ ] Missing Link [1] Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Many threatened and endangered species, Tulare Lake marsh colonial birds, neotropical migratory birds

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 [4] 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 [5]
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

[1] Local support (who) [ ] willing land sellers
[ ] Agency acquisition (which agency) [ ] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Few owners, great restoration potential, big Tulare Lake opportunities

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Great undamaged riparian corridors.

5. Provide brief description of the linkage:

Major Habitat Types: Riparian, grassland, vernals pools, marshes and dunes

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other: Pixley NWR, S. Wilbur Hacienda

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Deer Creek, San Ridge

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

San Joaquin Recover Plan

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Kern Refuge –Semitropic Ridge
Ecoregion: Central Valley
Map Name/ID#: 7

Key contact for this linkage (optional) D. William, P. Kelly
Telephone #: 209/667-3446, 559/453-1103
Email: dwilliam@toto.csustan.edu

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox, blunt-nosed leopard lizard, Tipton's kangaroo rat (upland species)
Buena Vista lake shrew (wetland/riparian)

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	2
Water Banking	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Semitropic Water District supports; potential agency acquisition: US Bureau of Reclamation, CA Dept. of Water Resources, CDFG; part of Upland Species Recovery Plan

What are the most important restoration needs (describe types of habitat, degree of restoration needed): wetland and riparian restoration; upland restoration

5. Provide brief description of the linkage:

Major Habitat Types: upland, riparian, wetlands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag

Major landowners: Private; US Fish and Wildlife Service, CDFG

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in habitat cover, several of 1 or more miles; roads

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): continual habitat where it exists

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): habitat restoration; habitat management

9. What scientific documentation is available demonstrating the value of the linkage?

Recovery Plan for Upland Species of the San Joaquin Valley, USFWS, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Carrizo Plain-W. San Joaquin Valley
Ecoregion: Central Valley
Map Name/ID#: 8

Key contact for this linkage (optional) Kelly/Williams
Telephone #: 559/453-1103
Email: patrickk@csufresno.edu, dwilliam@toto.csustan.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox, giant kangaroo rat, blunt-nosed leopard lizard, short-nosed kangaroo rat, LeConte's thrasher

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Petroleum development	4 (western Kern County)
Urbanization	5
Roads	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Potential agency acquisition: BLM, CDFG; mitigation banks; conservation agreements with private landowners, see question 10; part of Recovery Plan for Upland Species.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Moderate restoration (Saltbush Scrub, Valley Grassland)

5. Provide brief description of the linkage:

Major Habitat Types: Valley grassland, Saltbush Scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, petroleum production

Major landowners: Private, CDFG, BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads (Highways 58 and 33). Significant choke-points: Pleasant Valley Area, Santa Nella, Hwy 580/205 – Altamont Pass area near Tracy

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): continuous habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): habitat management; control of exotic annual plants, verify movement of kit foxes through choke-points.

9. What scientific documentation is available demonstrating the value of the linkage?

Recovery Plan for Upland Species of the San Joaquin Valley, USFWS, 1998

10. Other information: Choke-points: (1) Pleasant Valley – Coalinga HCP has potential to assist; (2) Santa Nella – major public/private partnership needed: mix of State and Federal Agencies (ie: developers, HCP); (3) Highways 580 and 205 – Highway Agencies and private landowners

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Southeastern Foothills
Ecoregion: Central Valley
Map Name/ID#: 9

Key contact for this linkage: P. Kelly, D. Williams, R. Hansen
Telephone #: 559/453-1103, 209/667-3446, 559/627-5473
Email patrickk@csufresno.edu, dwilliam@toto.csustan.edu, birdman1@lightspeed.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox; vernal pools; foothill listed plants

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 [4] 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
Agriculture	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 [3] 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

Recovery Plan for Upland Species

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Valley Grassland; vernal pools

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag, Urban

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads, urbanization

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): continuous habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Habitat management; document use of linkage by kit foxes

9. What scientific documentation is available demonstrating the value of the linkage?

Recovery Plan for Upland Species of the San Joaquin Valley, USFWS, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Tule River
Ecoregion: Central Valley
Map Name/ID#: 10

Key contact for this linkage (optional) Rob Hansen
Telephone #: 559/627-5473
Email: birdman1@lightspeed.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Rare flowers, neotropical birds, pond turtles

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Foothill riparian forest, mixed riparian forest, grassland, marshes, vernal pools

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners:

Other: Circle J Ranch, Lake Success Ecological Area (DFG), Yaudauchi Ecological Area (DFG), Tule River Parkway (City of Porterville

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): connects 10 miles of Foothill Riparian Forest to Tulare Lake marshes of mixed riparian forest

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Outside Creek – Elk Bayou
Ecoregion: Central Valley
Map Name/ID#: 11

Key contact for this linkage (optional) Rob Hansen
Telephone #: 559/627-5473
Email: birdman1@lightspeed.net

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Swainson's hawk, neotropic birds

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: vernal pools, foothill oak woodland, valley oak woodland, marshes, grasslands

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Kaweah Oak Preserve, Elk Bayou Regional Park, Greighton Ranch, Pixley NWR

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Kings River
Ecoregion: Central Valley
Map Name/ID#: 12

Key contact for this linkage (optional) Rob Hansen
Telephone #: 559/627-5473
Email: birdman1@lightspeed.net

1. Linkage Type (check one)

1 Landscape Linkage] Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

neotropical birds and Fresno kangaroo rat. Last alkali sink habitat in Kings County.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who) 1 willing land sellers
] Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): ESFP Lands, Tulare County land

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: riparian forest

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: Tulare County land, Lemoore NAS, ESRP lands

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Connecting Fresno County foothills to Tulare Lake and the last alkali sink habitat in Kings County.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Fresno Slough
Ecoregion: Central Valley
Map Name/ID#: 13

Key contact for this linkage (optional) R. Hansen, P. Kelly
Telephone #: 559/627-5473, 559/453-1103
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Valley oak, Swainson's hawk, Fresno kangaroo rat, giant garter snake, pond turtle, beaver, neotropical birds

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): NRCS, Whitesbridge Ecological Reserve, DFG

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Valley oak, riparian, mixed riparian, marsh, alkali sink

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Fresno Slough to Lemoore NAS, Summit Lake north to Gragnoti, NRCS property to Mendota (DFG) to Whitebridge Ecological Preserve (DFG).

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: St. Johns River- Cross Creek
Ecoregion: Central Valley
Map Name/ID#: 14

Key contact for this linkage (optional) Rob Hansen
Telephone #: 559/627-5473
Email: birdman1@lightspeed.net

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Kangaroo rat, kit fox, and neotropical birds. Last alkali sink habitat in Kings County.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)]		part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

DFG, CAPP, Corcoran Irrigation District, ESRP

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Valley oak, riparian forest, mixed riparian forest, grassland, alkali sink

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: NASL - SR 41
Ecoregion: Central Valley
Map Name/ID#: 15

Key contact for this linkage (optional) P. Kelly, D. Williams
Telephone #: 559/453-4103
Email: patrickk@csufresno.edu, dwilliam@toto.csustan.edu

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox and kangaroo rats

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	4
Highways	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): CalTrans (41/198 enhancement), Westlake Farms (willing seller), NAS Lemoore (Management Plan)

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Better management of public lands, acquisition and restoration

5. Provide brief description of the linkage:

Major Habitat Types: Valley grassland, alkali scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Agriculture

Major landowners: NASL, Westlake Farms

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Ag, development, highways

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Currently very little movement through area but remaining parcels have significant resources and potential.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document movement of kit foxes

9. What scientific documentation is available demonstrating the value of the linkage?

Recovery Plan for Upland Species of the San Joaquin Valley, USFWS, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Fresno - Sacramento
Ecoregion: Central Valley
Map Name/ID#: 16

Key contact for this linkage (optional) P. Kelly, D. Williams
Telephone #: 559/453-1103
Email: patrickk@csufresno.edu, dwilliam@toto.csustan.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox and vernal pools

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5
Vineyard/Orchard Development	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: East Valley Grasslands, Vernal Pools

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Mainly natural vegetation, with urban encroachment of agriculture and ranchettes

Major landowners: Private landowners

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Urbanization, roadways

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): continual habitat coverage

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): continued research on kit fox

9. What scientific documentation is available demonstrating the value of the linkage?

Recovery Plan for Upland Species of the San Joaquin Valley, USFWS, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: West Fresno County
Ecoregion: Central Valley
Map Name/ID#: 17

Key contact for this linkage (optional) P. Kelly, D. Williams
Telephone #: 559/453-1103
Email: patrickk@csufresno.edu, dwilliam@toto.csustan.edu

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	5
Roadways	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): DOI (Department of Interior Land Retirement Program

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Restoration of retired ag lands to natural communities.

5. Provide brief description of the linkage:

Major Habitat Types: Currently Ag

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Agriculture

Major landowners: Westlands Water District, Department of Interior, CDFG, CA Department of Water Resources, Bureau of Reclamation, Caltrans, Federal Highways

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Agricultural matrix

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): N/A

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Habitat restoration and document use by kit foxes

9. What scientific documentation is available demonstrating the value of the linkage?

Recovery Plan for Upland Species of the San Joaquin Valley, USFWS, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Madera – Merced Linkage
Ecoregion: Central Valley
Map Name/ID#: 18

Key contact for this linkage (optional) P. Kelly, D. Williams
Telephone #: 559/453-1103
Email: patrickk@csufresno.edu, dwilliam@toto.csustan.edu

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

San Joaquin kit fox, blunt-nosed leopard lizard, kangaroo rat

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	5
Agricultural Development	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): National Wildife acquisition and easements, mitigation for highway impacts (habitat acquisition), land sellers in Madera County.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Moderate level of restoration needed.

5. Provide brief description of the linkage:

Major Habitat Types: Grassland, Alkali Scrub, Alkali Sink Scrub, marshland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation and agriculture, not huge threat from urbanization.

Major landowners: NWR, many private landowners

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in habitat cover.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterway, riparian habitat, dirt road, continual habitat coverage. Plus, flood control channel (normally dry:East Side Bypass)

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Purchase it.

9. What scientific documentation is available demonstrating the value of the linkage?

San Joaquin Recovery Plan

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Lower San Joaquin River
Ecoregion: Central Valley
Map Name/ID#: 19

Key contact for this linkage (optional) D. Williams, P. Kelly
Telephone #: 559/453-1103
Email: dwilliam@toto.csustan.edu patrickk@csufresno.edu

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Riparian brush rabbit, wood rat, W. yellow-billed cuckoo, neotropical migrants, ringtail.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	3
Ag	3
Channelization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from Tuolumne River Trust; potential agency acquisition through CalFed and USFWS; part of Recovery Plan for Upland Species.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian habitat restoration; protection of refugia from flooding.

5. Provide brief description of the linkage:

Major Habitat Types: Riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag, natural, urban

Major landowners: Private, Army Corps of Engineers (easements), USFWS, Tuolumne River Trust

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Gaps in habitat, areas of 20 or more miles where there is no riparian species refugia above flood levels; stream channelization.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat (continuous doesn't exist now – see above).

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Habitat restoration; habitat management; control of exotic black rats (through habitat management or increase in size of habitat); controlled propagation, reintroductions methods.

9. What scientific documentation is available demonstrating the value of the linkage?

Recovery Plan for Upland Species of the San Joaquin Valley, USFWS, 1998

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Sacramento Valley Grasslands
Ecoregion: Central Valley
Map Name/ID#: 20

Key contact for this linkage (optional) Dan Williams
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Valley grasslands (northern); San Joaquin pocket mouse; California kangaroo rat; vernal pools

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Agriculture	3
Urbanization	4
Water Impoundments	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Blue Oak savanna, valley grassland, vernal pools

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag, Urban

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continuous habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Habitat management, restoration, and use of linkage

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Grizzly – Cache Slough
Ecoregion: Central Valley
Map Name/ID#: 21

Key contact for this linkage (optional) Diana Hickson
Telephone #: 916/327-5956
Email: dhickson@dfg.ca.gov

1. Linkage Type (check one)

]	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Potential Tule Elk; Fairy shrimp; Delta smelt; *Orcuttiae neostapha*; *Lastirnia conjucens*, Black rail, Saltmarsh harvest mouse (no driving carnivores – but the marsh upland transition is rare).

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Agriculture	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): I think TNC, Solano Co. Farmland and Open Space Trust is planning link at least between Suisun and Jepson. Conservation easements to prevent conversion of grazing lands to cropland and manage grazing most important. Fee Title may be required for eventual introduction of Elk.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Some restoration to tidal action in Susun (the SE connection shown)

5. Provide brief description of the linkage:

Major Habitat Types: Salt marsh, grasslands, vernal pools

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, Ag (grazing), some duck clubs.

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Two lane roads, fences. Highway 12 may be a barrier if eventual introduction of Elk is a goal.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continuous grassland from Susun Marsh to Calhoun Cut.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Putah Creek
Ecoregion: Central Valley
Map Name/ID#: 22

Key contact for this linkage (optional) Riley Swift
Telephone #: 916/344-4943
Email: rswift@psyber.com

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Chinook; birds

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Agriculture	1

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
1 Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): City of Davis, RCD's of Yolo, Solano; Army Corps in lower reaches; Teichert aggregates, conservancy in upper reaches; Putah Creek council

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Riparian habitat needs restoration along some sections.

5. Provide brief description of the linkage:

Major Habitat Types: Riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural riparian, aggregate mined areas.

Major landowners: Teichert

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): The creek itself.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Dry Creek-Natomas-American River
Ecoregion: Central Valley
Map Name/ID#: 23

Key contact for this linkage (optional) Riley Swift
Telephone #: 916/344-4943
Email: rswift@psyber.com

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Constrained floodplain. Anadromous fish (Chinook salmon and steelhead)

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
Exotic Plants	3
Roadways	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from Dry Creek Conservancy, Sacramento Area Flood Control Agency, City of Roseville. Opportunity to connect public trail system to American River Parkway.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Stream bank stabilization, riparian restoration, instream habitat work, floodplain wetland creation.

5. Provide brief description of the linkage:

Major Habitat Types: Waterway, Riparian corridor, Floodplain

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation - lower reaches, urban/parks etc. in middle, natural vegetation and rural residential in upper reaches.

Major landowners: Private, City of Roseville, SAFCA controls some in lower, Sacramento City Parks at American

River.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Urban development adjacent to stream, some significant gaps in cover-overstory and understory in developed areas. Too narrow a corridor in some locations

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Waterway, riparian habitat, habitat coverage, underpasses/bridges.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Salmon and steelhead use documented. Hydrology probably fairly well studied but flooding of residential properties is still common. Larger scale planning should focus on managing flood waters and habitat values. Some houses should probably be purchased and razed.

9. What scientific documentation is available demonstrating the value of the linkage? Unknown

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Bear River-Coon Creek-Auburn Ravine
Ecoregion: Central Valley
Map Name/ID#: 24

Key contact for this linkage (optional) Riley Swift
Telephone #: 916/344-4943
Email: rswift@psyber.com

1. Linkage Type (check one)

]	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Riparian water corridor for anadromous fish (steelhead, Chinook salmon), and bird species primarily. Fish passage will need to be created at Camper West Reservoir Dam. Also beaver, river otter

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Highway 65	5 (all three corridors)
Agriculture	3
Urbanization	1 (on Auburn Ravine)
Water Diversion and for agriculture	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Auburn Ravine/Coon Creek CRMP local support; part of Placer Legacy Plan; Teichert Aggregates, Delwebb, City of Lincoln (Wastewater Mitigation) willing sellers; Placer County Water Agency, South Sutter Irrigation District, Nevada Irrigation District, Placer County RCD

What are the most important restoration needs (describe types of habitat, degree of restoration needed): In lower reaches, Ag has disturbed riparian/floodplain habitat- need is for setback levee and restoration of flooding processes.

5. Provide brief description of the linkage:

Major Habitat Types: Streams with riparian corridors bordered by ag (rich in lowlands, grazing at edge of foothills.

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Bear River – Ag, natural vegetation; Auburn Ravine – Ag, rural residential, some urban; Coon Creek – Ag, natural vegetation, rural residential.

Major landowners: Many private landowners

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Bear River – Hwy 65 overcrossing, dam aat Camp Far West Lake.

Coon Creek – water diversion dams for ag use, Hwy 65, major gaps in overstory riparian vegetation. Auburn Ravine – gaps in

riparian overstory vegetation, Hwy 65 bridge, adjacent residential use at City of Lincoln.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): All of the example mentioned for each stream corridor.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): A new alignment for Hwy 65 will cross Auburn Ravine and Coon Creek and possibly Bear River

in reasonably near future. CalTrans must recognize need for passage of terrestrial animals under new stream crossing.

9. What scientific documentation is available demonstrating the value of the linkage?

Salmon and steelhead documented in streams.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Cosumnes River to Mather
Ecoregion: Central Valley
Map Name/ID#: 25

Key contact for this linkage (optional) D. Hickson, N. McCarten
Telephone #: 916/327-5956, 916/737-3000
Email: dhickson@dfg.ca.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Riparian corridor; birds; Tule Elk (ghost). Linkage to Sierra Nevada ecoregion.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Agriculture	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): South Sacramento HCP, The Nature Conservancy

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Levee setbacks, riparian restoration

5. Provide brief description of the linkage:

Major Habitat Types: Riparian, grassland, vernal pools

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Valley Crossing
Ecoregion: Central Valley
Map Name/ID#: 26

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Highways	3
Agriculture	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): The linkage should be somewhere within the corridor as mapped, including Sutter Buttes and WLA's.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Grasslands, Riparian, Woodlands (natural and managed), Agriculture

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag

Major landowners: Private, DFG, FWS, Air Force

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highways, rivers, canals

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Most of region is dominated by agriculture. Grazing in adjacent foothills and Sutter Buttes, rice on valley floor, some orchards near river(s).

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: This is just our dream crossing of the Central Valley

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Cache Creek – Bear Valley
Ecoregion: Central Valley
Map Name/ID#: 27

Key contact for this linkage (optional) Jim Thorne
Telephone #: 530/752-4389
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Salmonids, riparian species, potential Tule Elk (from Bear Valley area).

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure 2 3 Moderate threat 4 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	3
Roads	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible 2 3 Moderate Opportunity 4 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Streamflow enhancement, noxious weed control

5. Provide brief description of the linkage:

Major Habitat Types: Riparian, Valley and Blue Oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag

Major landowners: Private, Teichert Aggregates

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Monoculture vegetation and water withdrawals.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Creek itself

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

8.0 MODOC PLATEAU & CASCADES ECOREGION

The Modoc ecoregion is roughly bounded by the Oregon border to the north, the Nevada border to the east, the Feather River and Honey Lake Valley to the south, with the Sacramento Valley forming the western boundary (Figure 1-1, *California Regions and Topography*). The primary vegetation types of the region are coniferous forest including mixed coniferous forest, true fir, and eastside pine, juniper woodland, Great Basin Shrub/Steppe, California annual grasslands, oak woodland, and various aquatic habitats.

Coniferous forests comprise a large portion of the region. Forests dominated by yellow pine (*Pinus ponderosa*) occur on the east side of the Cascades and on the plateaus, which lie to the east in Siskiyou and Modoc counties. The understory is often sagebrush scrub but may also be comprised of species belonging to the chaparral community such as manzanita (*Arctostaphylos* spp.) and ceanothus (*Ceanothus* spp.). Other characteristic species of the coniferous forests of the region include Jeffrey pine (*Pinus jeffreyi*), lodgepole pine (*P. contorta*), Douglas fir (*Pseudotsuga macrocarpa*), white fir (*Abies concolor*), and red fir (*A. magnifica*). Lodgepole pine dominates the forests east of Mt. Shasta on the Modoc Plateau; it usually occurs in dense stands but in drier conditions it has a more scattered distribution. On the slopes of eastern Lassen County, forests dominated by Jeffrey pine merge with sagebrush habitat.

Oak woodlands in the region may be dominated by species such as interior live oak (*Quercus wislizenii*) or Canyon live oak (*Q. chrysolepis*). These species may contribute to mixed coniferous forest, scrubland, savanna, and riparian woodland communities.

Juniper woodland and scrub habitats occur from the Modoc Plateau and Cascade Ranges north to southern Washington and southwestern Idaho. This is an open woodland dominated by juniper (*Juniperus occidentalis*), with a sagebrush scrub understory where the dominant plant is sagebrush (*Artemisia tridentata*). This community may intergrade with coniferous forests at higher elevations.

The Modoc ecoregion has high desert riparian habitats, marshes, vernal pools, and foothill riparian woodlands. The riparian scrub community occurs along streams and creeks on the Modoc Plateau and in the Great Basin deserts. A number of willow (*Salix* spp.) species are characteristic of this community; common species of the understory are sagebrush (*Artemisia tridentata*), sedges (*Carex* spp.), and rushes (*Juncus* spp.).

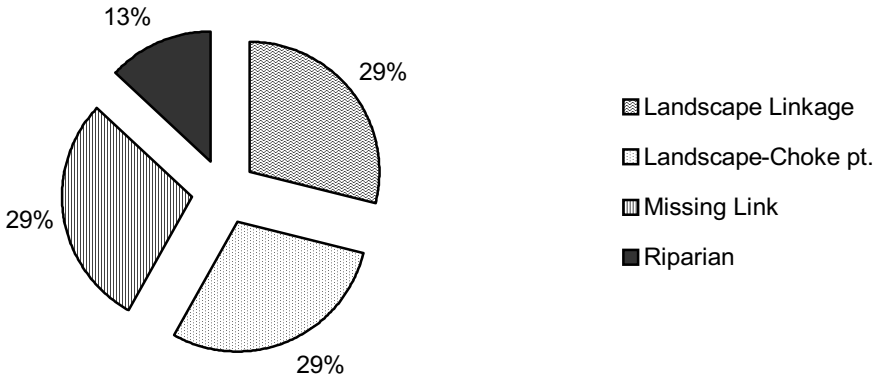
The freshwater marsh community occurs in lakebeds, at the margins of springs and along rivers. Typical species in this habitat include cattail (*Typha latifolia*) and tule (*Scirpus* spp.). The freshwater marsh habitat intergrades with Alkali marsh where temperatures are lower and the conditions more alkaline. Characteristic species in this community are saltgrass (*Distichlis spicata*), sedges (*Carex* spp.), rushes (*Juncus* spp.), and tules (*Scirpus* spp.).

Vernal pools occur in small depressions on lava flows of the plateau where the pools may fill and empty several times over the year. Annual herbs and grasses adapted to the fluctuating

water levels characteristic of this community are common blennosperma (*Blennosperma nanum*), western marsh cudweed (*Gnaphalium palustre*), coyote thistle (*Eryngium vaseyi*), and vernal pool goldfields (*Lasthenia fremontii*).

Cottonwood willow riparian forests occur in lower elevation, montane streams along the eastern Sierras north to the Modoc Plateau. The dominant species are cottonwood (*Populus fremontii*) and black willow (*Salix laevigata*); the understory is not well developed in this community.

Figure 8-2, *Modoc Plateau & Cascades: Types of Linkages*

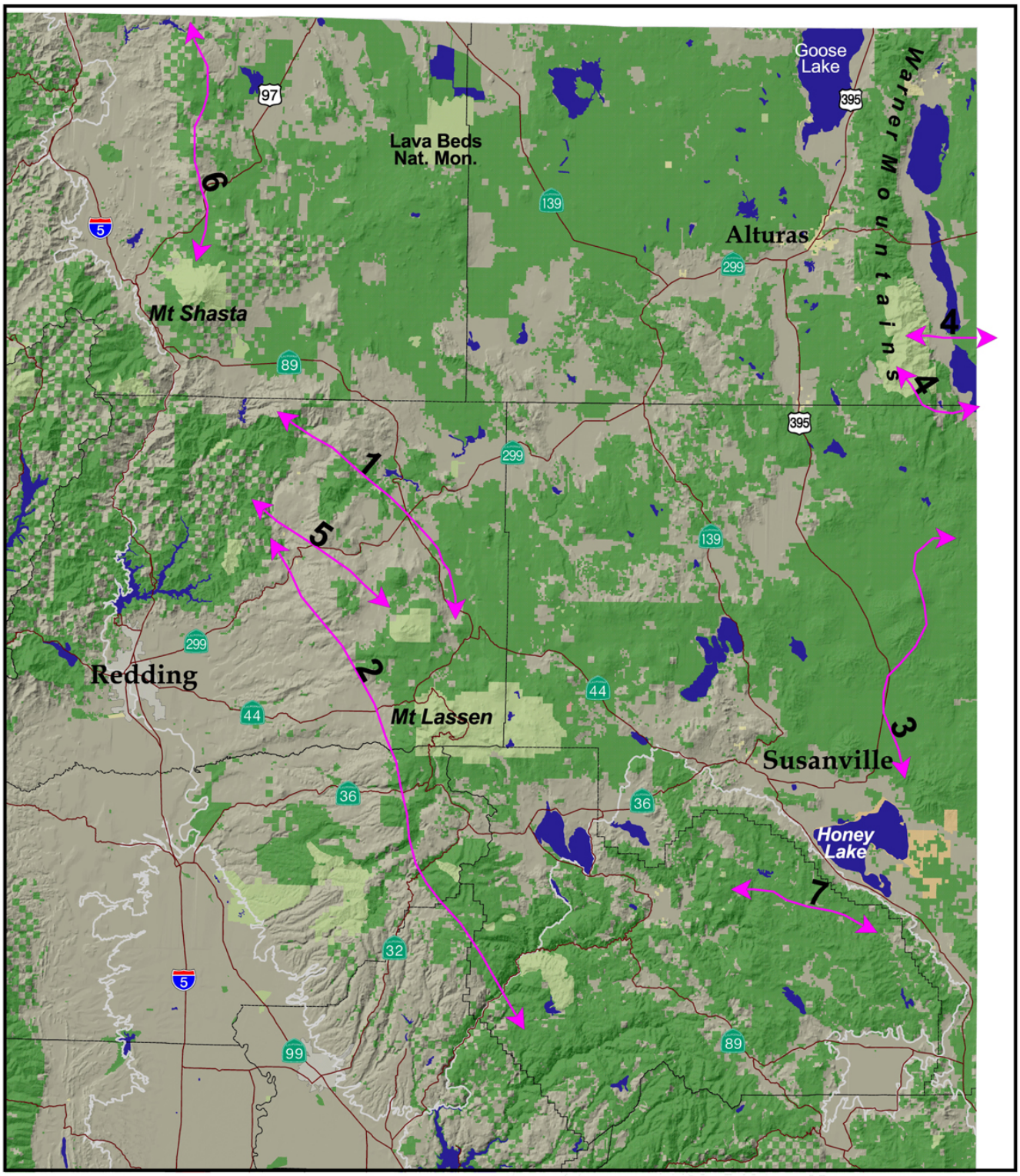


The United States National Forest Service and the Bureau of Land Management manage the majority of the land, with checkerboard ownership throughout the central portion of the ecoregion. Publicly owned lands in the ecoregion include Modoc National Forest, Lassen National Forest, Shasta National Forest, Lava Beds National Monument, Lassen-Volcanic National Park, Tule Lake National Wildlife Refuge, Clear Lake National Wildlife Refuge, Modoc National Wildlife Refuge, Warner Mountains State Game Refuge, and Whiskeytown-Shasta-Trinity National Recreation Area. In addition, a significant block of land is managed by the military, the Sierra Army Depot.

A total of seven habitat linkages were identified for the region (Figure 8-1, *Modoc Plateau & Cascades: Missing Linkages*). Of the linkages identified, 29% (2/7) were considered Landscape Linkages[1], 29% (2/7) were determined to be Missing Links[2], and 13% (1/7) were identified as riparian linkages. Participants identified 29% (2/7) of the linkages as being both Choke-Points[3] and Landscape Linkages[1] (Figure 8-2, *Modoc Plateau & Cascades: Types of Linkages*).

The key species used to identify the linkages in the region were either, those dependent on closed canopy forest conditions or those associated with riparian communities. Mammalian

[1] Landscape Linkage = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between different sections of the landscape.
[2] Missing Link = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function.
[3] Choke-Point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas").



Modoc Plateau & Cascades Missing Linkages

Figure 8-1

10 0 10 20 30 40 Miles

N W E S

Legend

- Linkages
- Major Roads
- Jepson Regions
- County Lines
- Major Cities
- Major Lakes & Reservoirs

Land Management

- Public Conservation Lands
- Public Use Lands
- Military
- Native American
- Private Conservation

carnivores listed as key species included pine marten (*Martes americana*), Pacific fisher (*M. pennanti*), wolverine (*Gulo gulo*), gray wolf (*Canis lupus*), and mountain lion (*Felis concolor*). Ungulates recognized as key species included pronghorn antelope (*Antilocapra americana*), bighorn sheep (*Ovis canadensis*), and mule deer (*Odocoileus hemionus*). Birds identified as key species included northern spotted owl (*Strix occidentalis*), willow flycatcher (*Empidonax traillii*), sage grouse (*Centrocercus urophasianus*), and neotropical migratory birds. Both single and multiple key species were used in identifying the linkages; 86% (6/7) of the linkages recognized mammals as key species and 57% (4/7) used birds. Mammalian carnivores were recognized as key species in 71% (5/7) of the linkages.

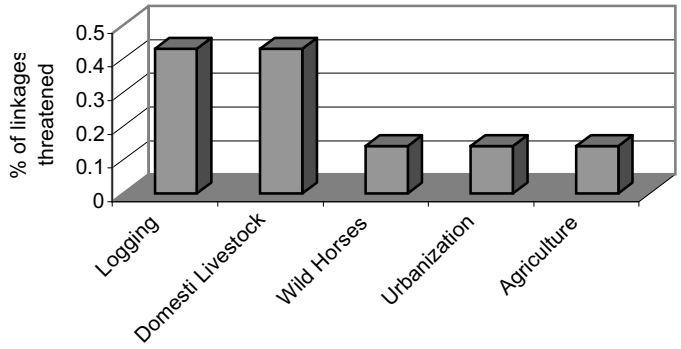
Features listed as facilitating animal movement in the region varied. Some were listed as large semi-contiguous parcels of mixed coniferous forest where bridge underpasses provide passage between blocks of habitat, while others were identified as patches of industrial timberland that may provide movement cover between protected areas, but not adequate reproductive habitat. Riparian corridors were also recognized as providing connectivity function in the region.

The primary barriers to animal movement in the region also varied. Habitat gaps due to intense logging were identified as barriers in 43% (3/7) of the linkages. Roads specifically mentioned as major impediments included Highways 70 and 36. Rural residential areas, ranching operations and the associated roads, fences and development were also identified as barriers to passage. In addition, riparian linkages degraded by domestic livestock were recognized as limiting "Stepping-Stone" habitat.

A number of specific recommendations were provided to restore connectivity in the region. Habitat types in need of restoration included mixed coniferous forest and riparian. In the mixed coniferous forest managing for old growth characteristics and restoring the natural fire regime were mentioned as vital restoration needs. The elimination of domestic sheep from portions of Surprise Valley was cited as a need to restore connectivity for Bighorn sheep. Excluding domestic animals from riparian habitats was also identified as a component of restoring connectivity. Participants felt that plans for restoring habitat linkages need to be developed, implemented, and monitored for use by target species.

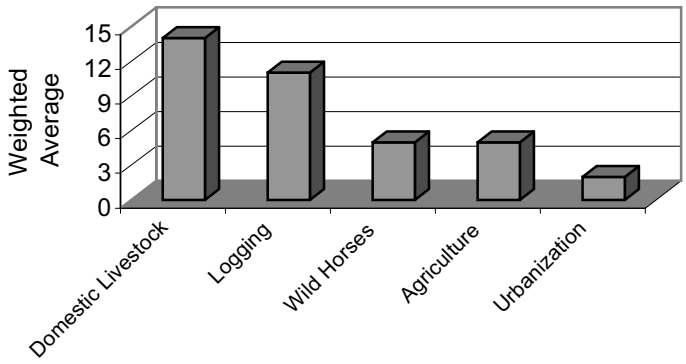
The primary threats identified in the ecoregion were logging and domestic livestock; other acknowledged threats to connectivity included wild horses, urbanization, and agriculture (Figure 8-3, *Modoc Plateau & Cascades: Threats to Connectivity*). Of the linkages, 29% (2/7) identified are owned, all or in part, by industrial timber companies.

Figure 8-3, *Modoc Plateau & Cascades: Threats to Connectivity*



In addition, 43% (3/7) of the linkages are threatened by logging, all of which were ranked as severely threatened (rank = four or five). Domestic livestock threatened connectivity in 43% (3/7) of the linkages, all of which were ranked as severely theatened. Wild horses, urbanization, and agriculture each jeopardized 14% (1/7) of the linkages identified. A number of threats to habitat connectivity were identified for the region, though the average severity of the threat and the number of linkages affected varied. The weighted average (average rank × number of linkages affected) was calculated for each threat identified to determine the severity of each threat in the region (Figure 8-4, *Modoc Plateau & Cascades: Severity of Threats*). Figure 8-4, average severity of each threat among linkages, reveals slightly different trends than Figure 8-3, the number of linkages impacted by each threat.

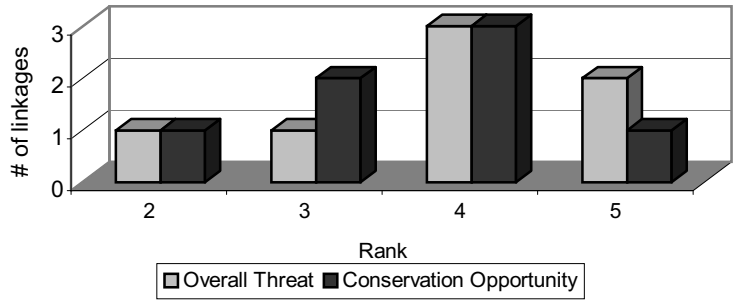
Figure 8-4, *Modoc Plateau & Cascades: Severity of Threats*



Note: The above graph depicts the weighted average of each threat identified. Weighted average = average rank × number of linkages affected. The severity of each threat was ranked from one to five (one = not severe, five = extremely severe).

Conference participants also scored the feasibility of conserving the linkage and ranked the overall threat to connectivity (Figure 8-5, *Modoc Plateau & Cascades: Ranking the Priorities*). Participants ranked 57% (4/7) of the linkages as high priorities (rank = four or five) with good opportunities for conservation (Figure 8-1, *Modoc Plateau &*

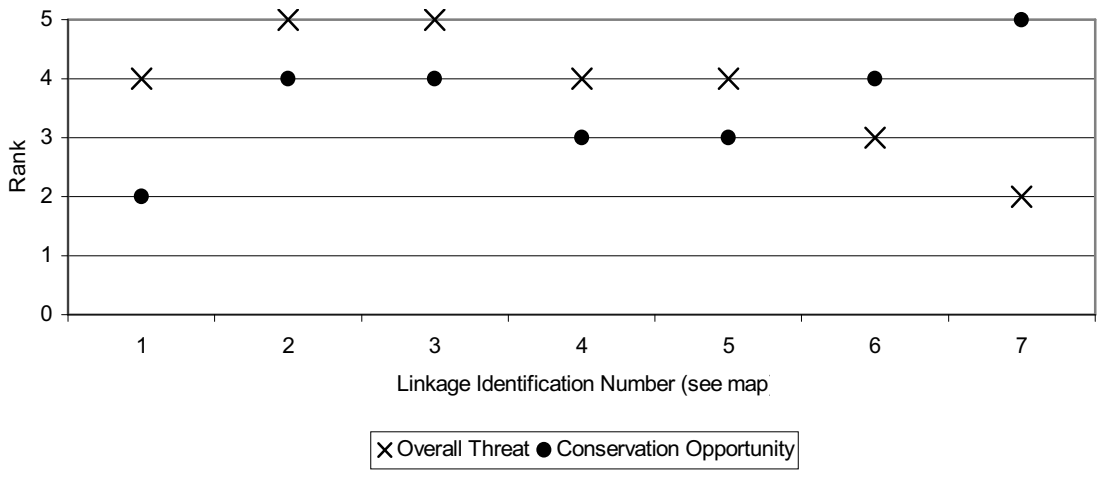
Figure 8-5, *Modoc Plateau & Cascades: Ranking the Priorities*



Note: Graph compares the number of linkages ranked for overall threat and conservation opportunities. No linkages were ranked one for either category.

Cascades: Missing Linkages, Map ID#s 2, 3, 6, & 7). Overall, 71% (5/7) of the linkages identified were ranked as severely threatened (rank = four or five). The West Lassen-Fisher linkage (Map ID# 2) and the Great Basin Riparian linkage (Map ID# 3) were both ranked high (rank = four) as conservation opportunities; both were listed as severely threatened (rank = five). The Last Chance linkage (Map ID# 7) was ranked as the highest priority (rank = five) but it is not severely threatened (rank = two). The California-Oregon Cascades linkage (Map ID# 6) was also ranked as a high conservation priority (rank = four), it was ranked as moderately threatened (rank = three). A brief description is provided below of the top-ranked linkages (threat & opportunity = four or five). A comparison of how individual linkages were ranked is depicted in Figure 8-6, *Modoc Plateau & Cascades: Degree of Threat and Conservation Opportunities*.

Figure 8-6, *Modoc Plateau & Cascades: Degree of Threat and Conservation Opportunities*



Note: The above graph compares how each linkage was ranked for overall threat (one = no threat/secure, five = severe threat/ loss imminent) and the feasibility of conserving the linkage (one = not feasible, five = good opportunity).

The West Lassen-Fisher linkage (Figure 8-1, *Modoc: Missing Linkages,* Map ID# 2), on the west side of the Sierra Nevada, was identified as a Landscape Linkage[1] and a connectivity Choke-Point[3]. Forest carnivores, including the Pacific fisher, were the key species used to

identify this linkage, though this species has not been documented in the area for decades (per Bill Zielinski). The major landowners in the area were identified as the National Forest Service and industrial timber companies. Participants mentioned that the area has been subject to timber harvest and that commercial logging companies are aggressively liquidating old growth forests. Other barriers to connectivity included Highways 70 and 36. Please refer to the corresponding the Linkage Description Log sheet for more specific information.

The Great Basin Riparian linkage (Figure 8-1, *Modoc: Missing Linkages,* Map ID# 3) was identified as a Missing Link[2], limiting connectivity for mountain lion, pronghorn antelope, deer, sage grouse, and neotropical migratory birds. This linkage consists of riparian habitat in a high desert ecosystem. Wild horses and domestic livestock were cited as the primary threats to connectivity. Land in this linkage is administered by the Bureau of Land Management. Revising the Bureau of Land Management's grazing management program to exclude domestic livestock from riparian areas was identified as a restoration priority. Please refer to the corresponding Linkage Description Log sheet for more specific information.

Participants indicated that two linkages have willing sellers in all or a portion of the designated area (Figure 8-1, *Modoc: Missing Linkages,* Map ID#s 6 & 7), both of which were identified as conservation priorities (rank = four or five). There is potential for agency acquisition in one of the linkages (Map ID# 6). Other specific opportunities identified to secure or restore connectivity function included reforming forest protection laws on commercial timberland and modifying the California Forest Practices Act to recognize the importance of habitat attributes. In addition, working with federal and state agencies on management directives was identified as an opportunity to restore connectivity.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Lassen-Shasta Old Forest
Ecoregion: Modoc
Map Name/ID#: 1

Key contact for this linkage (optional) Gary Smith
Telephone #: 530/257-2151
Email: gsmith@fs.fed.us

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

California spotted owl, Pacific fisher, American marten

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Timber (old growth) harvest primarily on private land	4 (USFS has management strategy)
Threat of stand replacing wildfire	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Reform to California forest protection laws regarding commercial timber harvest on private lands.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): On NFS lands – treat existing stands to encourage fastest growth of large conifers to create desired stand structure conditions for old forest dependent species. Restore frequent, low intensity fire to mimic natural processes. Recognize that in many places, first treatment will require some mechanical treatment to remote small ladder fuels.

5. Provide brief description of the linkage:

Major Habitat Types: West side mixed coniferous forest

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: USFS, Sierra Pacific Industries, Roseburg Timber, Beatty and Associates

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Primarily large gaps in old forest conditions (habitat fragmentation), large wildfires (Fountain Fire) on private lands with thousands of acres of plantation (pine, Doug fir) with herbicide applications.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Currently, adequate movement cover, not adequate reproductive habitat.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: West Lassen - Fisher
Ecoregion: Modoc
Map Name/ID#: 2

Key contact for this linkage (optional) Gary Smith
Telephone #: 530/257-2151
Email: gsmith@fs.fed.us

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Pacific fisher

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5

No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Timber harvest in low elevation west side of Sierra Nevada	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5

Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Change California Forest Practices Act to recognize importance of protecting these habitat attributes.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Unfortunately, as we are working on this, the large landowners are aggressively liquidating old forest in an effort to beat a potential listing for California spotted owl.

5. Provide brief description of the linkage:

Major Habitat Types: West side of Sierra mixed conifer

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Sierra Pacific Industries, Roseburg Lumber, Beatty and Associates, USFS

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Major highways (Hwys 70 and 36), habitat modification – specifically timber (old growth) harvest.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Fishers have not been documented in the area for decades. Refer to Bill Zielinski for more specific information.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Great Basin Riparian
Ecoregion: Modoc
Map Name/ID#: 3

Key contact for this linkage (optional) Gary Smith
Telephone #: 530/257-2151
Email: gsmith@fs.fed.us

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other large degraded area of habitat

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Neotropical migrant birds, resident flora/fauna

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Impact from wild horses	5
Domestic livestock (cattle and sheep)	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): This situation is primarily on public land administered by the BLM.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Remove animal impact from wild horses, and domestic livestock from all riparian areas.

5. Provide brief description of the linkage:

Major Habitat Types: All riparian habitats

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Complete degradation of all riparian areas in this high desert ecosystem has severely degraded the ability of this large area to provide "stepping stone" habitat for migrating species as well as life history habitat for resident species of wildlife. Some key species include pronghorn antelope, sage grouse, mule deer and mountain lion.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Zero

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Its important to recognize that this condition exists over millions of acres and the damage must be seen to believe. Because of the remote nature of the area and the very rugged terrain, it is a situation that is unaddressed by the environmental community.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: To correct the problem the BLM's grazing management program must be changed because they are the agency permitting it to continue. Also, the public must come to terms with the Wild Horse and Burro Protection Act and its effects on the land. This will take legislative reform.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Surprise Valley Bighorn Sheep
Ecoregion: Modoc
Map Name/ID#: 4

Key contact for this linkage (optional) Gary Smith
Telephone #: 530/257-2151
Email: gsmith@fs.fed.us

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

California bighorn sheep

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Agriculture – domestic sheep	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Domestic sheep carry disease that kills bighorn. Bighorn Rams become nomadic, can interact with domestics and bring the disease back to the bighorn flock. Then they all die.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM – issues grazing permits to domestic sheep owners. Also, private landowners

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Surprise Valley agriculture, farms, domestic sheep flocks

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Not sure if the sheep move directly across Surprise Valley or if they skirt the south end of the Valley throught the Coppersmith Hills.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Fountain Fire
Ecoregion: Modoc
Map Name/ID#: 5

Key contact for this linkage (optional) Gary Smith
Telephone #: 530/257-2151
Email: gsmith@fs.fed.us

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Old forest: California spotted owl, fisher, marten

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Need to manage to grow old forest conditions as quickly as possible

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: Mostly private land

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): 60,000 acre wildfire removed forest habitat in 1996. They are converting it to plantations and spraying with herbicides. It will be managed by them as a short rotation, monotypic industrial tree farm.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: California-Oregon Cascades Link
Ecoregion: Modoc
Map Name/ID#: 6

Key contact for this linkage (optional) Bill Zielinski
Telephone #: 707/825-2959
Email: bzielinski@fs.fed.us

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Preparedness for wolf/wolverine return and recovery and other species that move north to south within corridor.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Timber Harvest	3
Urbanization	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)] willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from County planners

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Maintenance

Of forest canopy closure, reduced human

5. Provide brief description of the linkage:

Major Habitat Types: Mixed conifer, white fir, red fir, Jeffrey pine

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: County, Feds

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Large gaps in cover and human presence

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): semi-continual habitat cover, underpasses/bridges

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage

9. What scientific documentation is available demonstrating the value of the linkage? Application of wolverine and wolf habitat model derived in Rocky Mountains.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Last Chance
Ecoregion: Modoc
Map Name/ID#: 7

Key contact for this linkage (optional) Gary Smith
Telephone #: 530/257-2151
Email: gsmith@fs.fed.us

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other riparian habitat

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Important for linear riparian/montane meadow complex, maybe important for willow flycatcher.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Livestock grazing	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): USFS supports. Also, riparian habitat purchase opportunities

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Currently, land is in private ownership; they want to sell. The Nature Conservancy or similar could purchase and remove cattle, thereby facilitating recovery of the area

5. Provide brief description of the linkage:

Major Habitat Types: Montane riparian

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: Humphry Ranch, Milford, California

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: Area consists of several hundred acres along about10 mi or less of Last Chance Creek in Plumas County.

Price should be quite low and benefits quite spectacular over time.

9.0 SIERRA NEVADA ECOREGION

The Sierra Nevada ecoregion is roughly bound by the Modoc Plateau and Cascade Ranges to the north, the Great Basin to the east, the Antelope and Fremont Valleys to the south, with the Central Valley forming the western boundary (Figure 1-1, *California Regions and Topography*). The primary vegetation types of the region are mixed coniferous forest, oak woodland, foothill riparian woodland, mixed chaparral, sagebrush, alkali sink, vernal pools, grassland, and desert scrub.

The Sierra Nevada ecoregion is comprised of various vegetation zones. The foothills are a natural mosaic of oak woodland, chaparral, riparian forest habitats, and grass-covered slopes in the lower reaches. Canyon oak (*Quercus chrysolepis*) and interior live oak (*Q. wislizenii*) trees are co-dominant species in the montane hardwood forests of the region. River and stream systems are lined with cottonwood (*Populus* spp.) and willow (*Salix* spp.), important habitat for neotropical migratory birds.

Further up the western slopes of the Sierra Nevada, mixed coniferous forest is the dominant habitat type. Here, the canopy is comprised of species such as yellow pine (*Pinus ponderosa*), lodgepole pine (*P. contorta*), Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies* concolor), and black oak (*Quercus kelloggii*). On more mesic sites, there are groves of giant sequoia (*Sequoiadendron gigantea*).

At high elevations, wet meadows are an important habitat type. Subalpine and alpine habitats are present at higher elevations, with the white-bark pine (*Pinus albicaulis*) as the dominant tree at or below timberline.

The eastern part of the range is comprised of more drought-tolerant species, with Jeffrey pine (*P. jeffreyi*) as the dominant conifer, as well as, juniper (*Juniperus* spp.) woodlands, sagebrush and desert scrub.

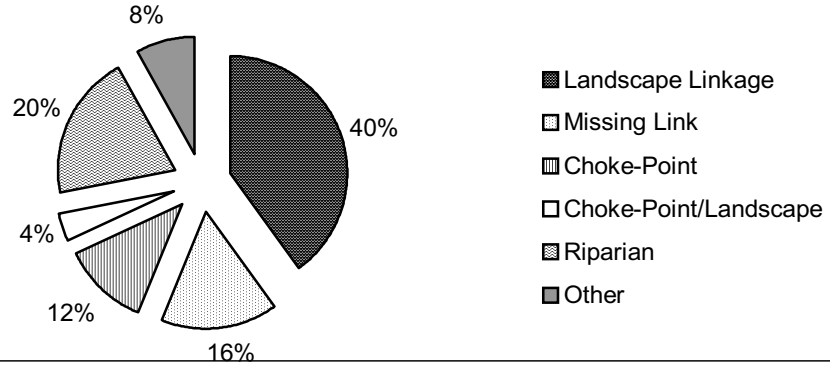
The majority of the region is publicly owned. There are eleven national forests and four national parks in the region. National Forests include: Lassen, Plumas, Tahoe, Eldorado, Humboldt-Toiyabe, Stanislaus, Sierra, Inyo, Lake Tahoe Basin, Modoc and Sequoia. Checkerboard ownership of land is an issue in Lassen, Plumas, Tahoe, and Eldorado National Forests. National Parks in the region include: Yosemite, Sequoia and Kings Canyon, and Lassen Volcanic. The Bureau of Land Management and California State Parks manage additional publicly owned land in the region. The Bureau of Land Management administers the majority of the land in the eastern foothills. Additional publicly owned land is administered by the Bureau of Reclamation and the California Department of Fire.

A total of 25 habitat linkages were identified for the region (Figure 9-1, *Sierra Nevada Missing Linkages*). Of the linkages identified, 40% (10/25) were considered Landscape Linkages[1],

[1] Landscape Linkage = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between different sections of the landscape.

12% (3/25) were recognized as Choke-Points[2], and 16% (4/25) were determined to be Missing Links[3]. Participants also identified other linkage types, 4% (1/25) were considered Choke-Points[2] and a Landscape Linkages[1], 20% (5/25) were listed as Riparian linkages, and 8% (2/25) were identified as other types of linkages (Figure 9-2, *Sierra Nevada: Types of Linkages*).

Figure 9-2, *Sierra Nevada: Types of Linkages*

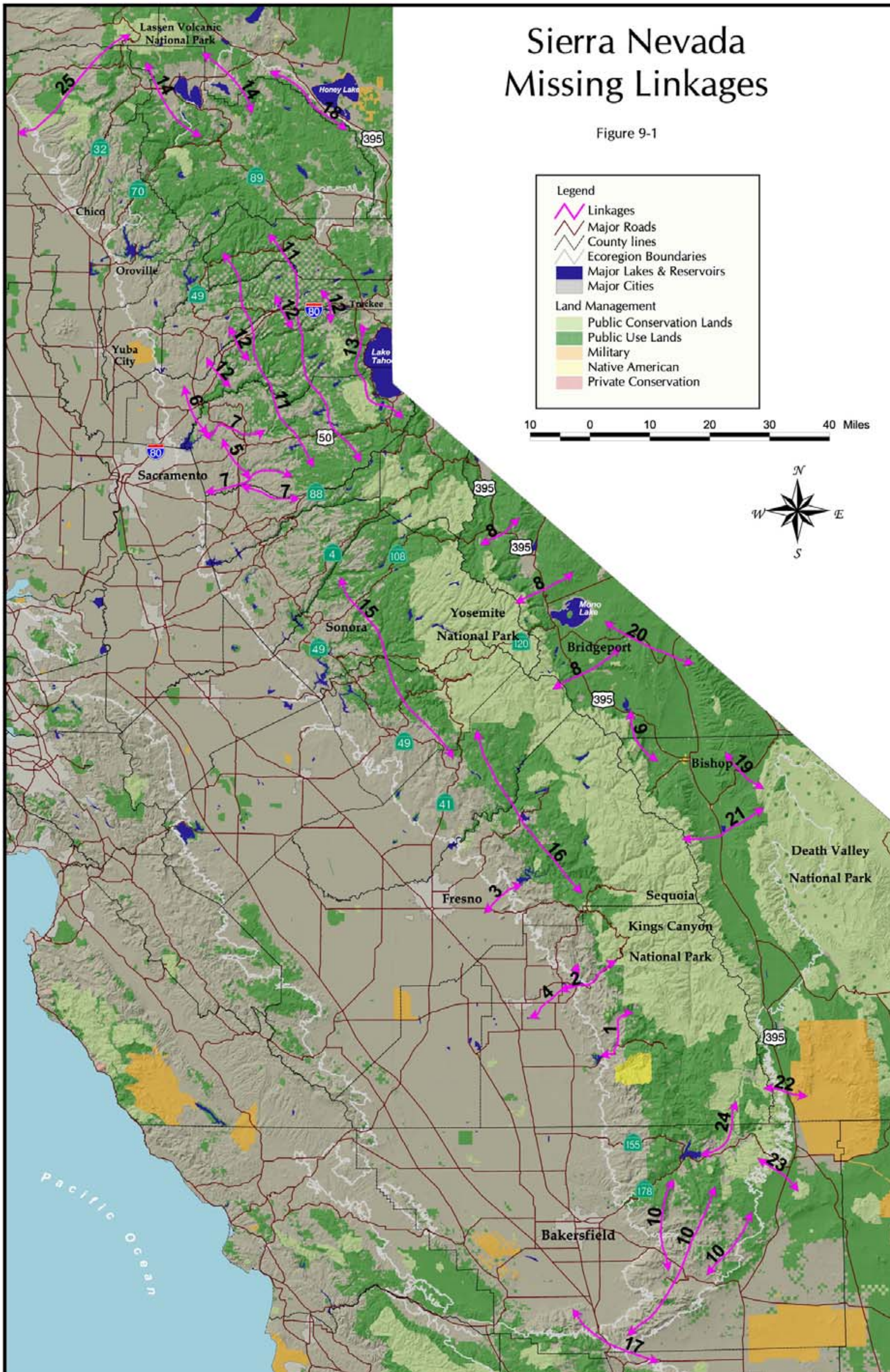


The key species used to identify the linkages belonged to a number of taxonomic groups. In the riparian linkages, Swainson's hawk (*Buteo swainsoni*), neotropical migratory birds, kangaroo rat (*Dipodomys* spp.), gray fox (*Urocyon cinereoargenteus*), mink (*Mustela vison*), and fish were recognized as key species. In the terrestrial linkages, forest carnivores such as the Pacific fisher (*Martes pennanti*), coyote (*Canis latrans*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), spotted owl (*Strix occidentalis*), and ungulates such as bighorn sheep (*Ovis canadensis*) and mule deer (*Odocoileus hemionus*) were listed as species indicative of connectivity. Both single and multiple key species were used in identifying the linkages; 56% (14/25) of the linkages recognized mammals as key species, 28% (7/25) used birds, 8% (2/25) used fish, while 24% (6/25) did not specify key species. Mammalian carnivores were recognized as key species in 40% (10/25) of the linkages.

The primary features identified as facilitating animal movement in the region included riparian corridors and contiguous or semi-contiguous habitat, some which connect existing protected land, such as the Yosemite-Kings Canyon linkage (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID#16). The North Fork of the Tule River, the Kings River, and the Upper Consumnes River were named as important riparian linkages, along with numerous streams. One Landscape Linkage[1] (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID#10) identified semi-contiguous habitat connecting the Sierras to the Coast and Transverse Ranges of the South Coast ecoregion. Another ecoregional linkage in the southern Sierra Nevada (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID# 17) was recognized as a Choke-Point[2] at the conference. Underpasses and culverts were also identified as facilitating wildlife movement in the ecoregion.

The primary barriers to animal movement in the ecoregion varied, though no barriers were

[2] Choke-Point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas").
[3] Missing Link = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function.



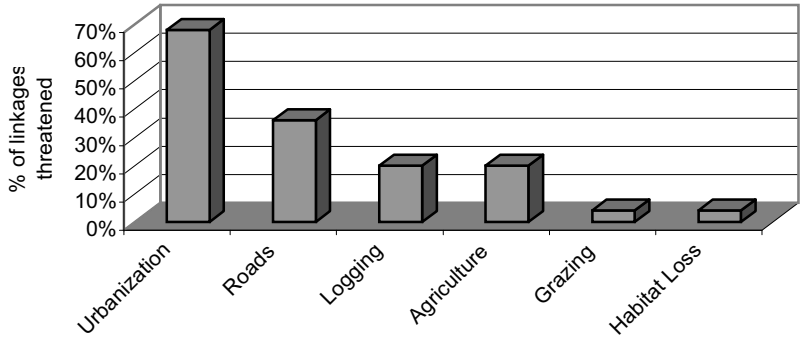
Sierra Nevada
Missing Linkages
Figure 9-1
Legend
Linkages
Major Roads
County lines
Ecoregion Boundaries
Major Lakes & Reservoirs
Major Cities
Land Management
Public Conservation Lands
Public Use Lands
Military
Native American
Private Conservation
10 0 10 20 30 40 Miles
N
S
E
W
Lassen Volcanic National Park
Honey Lake
Chico
Oroville
Yuba City
Truckee
Lake Tahoe
Sacramento
Sonora
Yosemite National Park
Mono Lake
Bridgeport
Bishop
Death Valley National Park
Fresno
Sequoia Kings Canyon National Park
Bakersfield
Pacific Ocean

listed for seven of the linkages identified. In some of the linkages, habitat fragmentation and gaps in cover were listed as barriers due to urban, rural and ski resort development, as well as clearcutting, and/or intense logging. Checkerboard ownership of industrial timberlands caused one of the linkages to be identified as a Missing Link[3]. Different types of roads were identified as barriers to passage, from those associated with extractive industries to major highways. Highways 395, 14, 80, 58, 50, and 36 were specifically mentioned as major barriers. The over-appropriation of water in the major river systems was also named as an obstacle to movement.

Habitat types identified in need of restoration included foothill riparian, chaparral, oak woodland, mixed coniferous and desert scrub. Of the linkages, 64% (16/25) did not list any restoration needs, while it was specified that no restoration was necessary in 8% (2/25) of the linkages (Figure 9-1, *Sierra Nevada: Missing Linkages*, Map ID#s 20 & 23). Acquisition and reforestation of logged-over mixed coniferous forest habitat were restoration priorities in two of the identified linkages (Figure 9-1, *Sierra Nevada: Missing Linkages*, Map ID#s 11 & 14). Toxic cleanup of mercury was listed as a priority in one of the riparian linkages (Figure 9-1, *Sierra Nevada: Missing Linkages*, Map ID# 7). Maintenance of ecosystem function in high desert scrub habitat was also mentioned as a restoration need. In general, participants felt plans for restoring habitat linkages need to be developed, implemented, and monitored for use by target species.

The primary threats identified in the ecoregion included urbanization, roads, logging, and agriculture; other threats included grazing and habitat loss (Figure 9-3, *Sierra Nevada: Threats to Connectivity*). Urbanization was listed as a threat in 68% (17/25) of the linkages recognized, 59% (10/17) of which ranked as severely threatened (rank = four or five). Roads jeopardized 36% (9/25) of the linkages identified, 33% (3/9) of which were ranked as severely threatened. Of the linkages, 20% (5/25) were threatened to some degree by logging, 60% (3/5) of which were ranked as severely threatened. Agriculture was identified

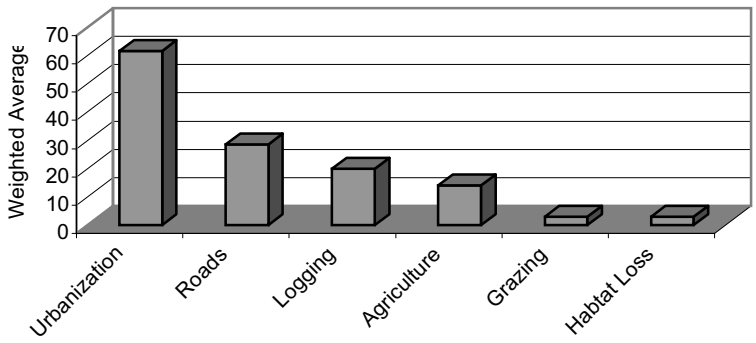
Figure 9-3, *Sierra Nevada: Threats to Connectivity*



as a threat to connectivity in 20% (5/25) of the linkages, only one of which was considered severely threatened. Of the linkages, 4% (1/25) were threatened by livestock grazing and habitat loss. A number of threats to habitat connectivity were identified for the region, though the average severity of the threat and the number of linkages affected varied. The weighted average (average rank × number of linkages affected) was calculated for each threat identified to determine the severity of each threat in the region (Figure 9-4, *Sierra Nevada: Severity of Threats*). Figure 9-4, average severity of each threat among linkages, reveals similar trends as Figure 9-3, the number of linkages affected by each threat.

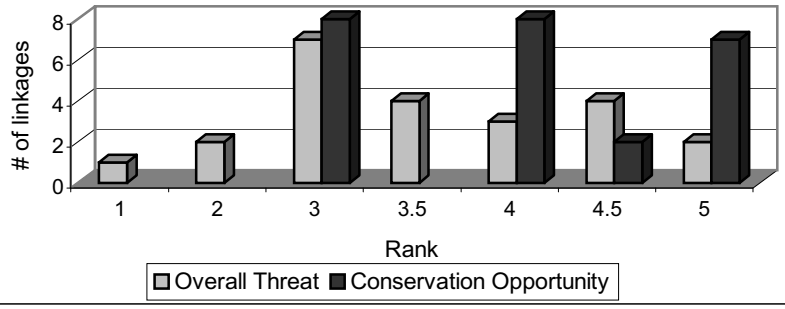
Conference participants also scored the feasibility of conserving the linkage and ranked the overall threat to connectivity (Figure 9-5, *Sierra Nevada: Ranking the Priorities*). Scientists ranked 68% (17/25) of the linkages as high priorities with good opportunities for conservation (rank = four or five), 35% (6/17) of which were ranked as severely (rank = four or five) threatened (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID#s 1, 2, 9, 11, 17, & 22). Overall, 36% (9/25) of the linkages identified were ranked as severely threatened (rank = four or five). In addition, 28% (7/25) of the linkages were identified as

Figure 9-4, *Sierra Nevada: Severity of Threats*



Note: The above graph depicts the weighted average of each threat identified. Weighted average = average rank × number of linkages affected. The severity of each threat was ranked from one to five (one = not severe, five = extremely severe).

Figure 9-5, *Sierra Nevada: Ranking the Priorities*



Note: Graph depicts the number of linkages ranked for overall threat and conservation opportunity.

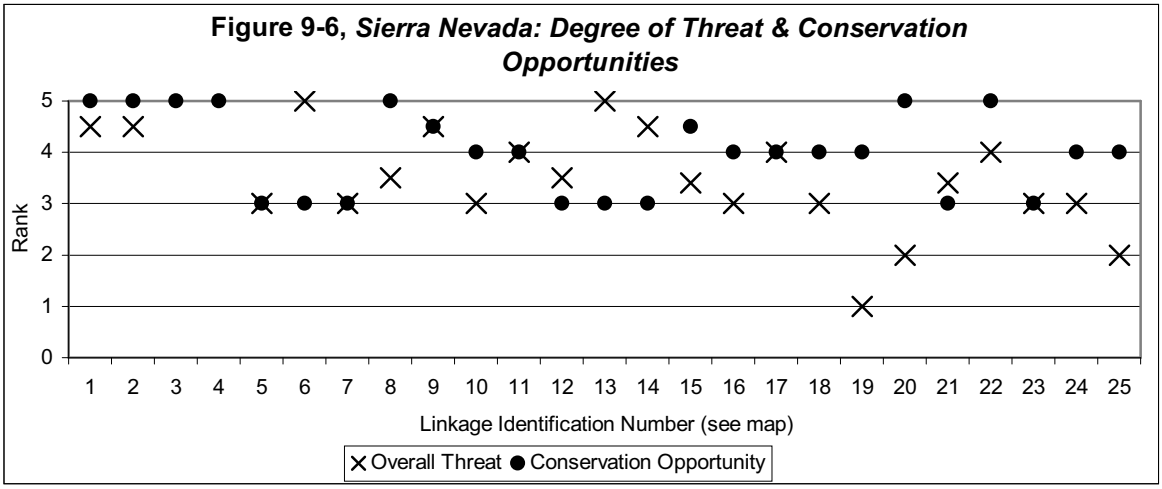
the highest conservation opportunities (rank = five), 43% (3/7) of which were ranked as severely threatened (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID#s 1, 2 & 22). These included two Riparian Linkages (the North Fork of the Tule linkage Map ID# 1 and the St. Johns-Cottonwood-Cross Creek linkage Map ID# 2), and one Choke-Point[2] and Landscape Linkage[1] (the Sierra Nevada-Coso Hills linkage Map ID# 22). Brief descriptions of the top-ranked conservation opportunities are provided below. A comparison of how individual linkages were ranked is depicted in Figure 9-6, *Sierra Nevada: Degree of Threat and Conservation Opportunities*.

The North Fork of the Tule linkage (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID# 1) was listed as a Riparian Linkage, with the potential to connect riparian forests to Tulare Lake. Marshes, grassland and vernal pool communities were also listed as habitat types in the linkage. Neotropical migratory birds were recognized as the key species for this linkage. The

over-appropriation of water was identified as the primary barrier, while the primary threat listed was expanding ranch development. Landownership in the linkage was listed as a mixture of public and privates lands. Participants indicated that there were willing sellers in this linkage. They also identified this linkage as part of California Department of Fish and Game and Sierra Los Tulares Land Trust conservation plans. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The St. Johns-Cottonwood-Cross Creek Riparian Linkage (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID# 2) was identified as providing habitat connectivity for kangaroo rat, fox,

Figure 9-6, *Sierra Nevada: Degree of Threat & Conservation Opportunities*



Note: The above graph compares how each linkage wasranked for overall threat (one = no threat/secure, five = severe threat/loss imminent) and the feasibility of conserving the linkage (one = not feasible, five = good opportunity).

mink, and neotropical migratory birds, from the Kaweah River to Tulare Lake. This linkage boasts the last alkali sink habitat in Kings County. The principal threat recognized was development, but no barriers were identified for this linkage. Riparian habitat was considered the primary conduit for wildlife movement. Landownership in the linkage was listed as a complex mixture of public and private lands, including unincorporated county land and the City of Visalia. Participants indicated that there were willing sellers in the linkage, and that the linkage was part of a Sierra Los Tulares Land Trust conservation plan. Please refer to the corresponding Linkage Description Log sheet for more specific information.

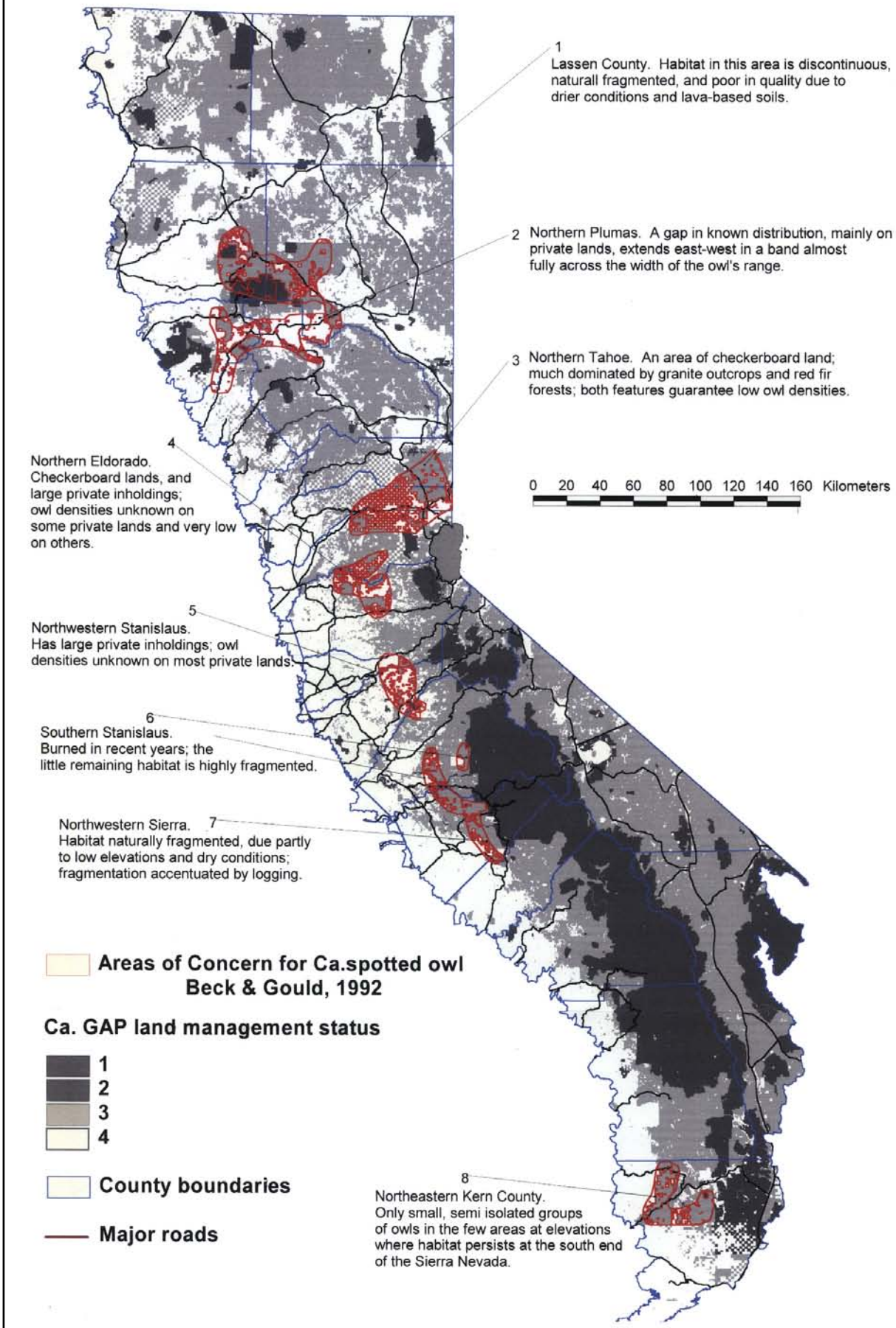
The Sierra Nevada-Coso Hills linkage (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID# 22) was identified as a Choke-Point[2] and a Landscape Linkage[1]. This linkage was recognized as providing a dispersal corridor for bighorn sheep, connecting populations in the Sierra Nevada with those in the Mojave ecoregion. Highway 395 was identified as the primary barrier and threat to this linkage. Landownership in this linkage is comprised of federal and state agencies including the National Park Service, Bureau of Land Management, United States Air Force, and water agencies. CalTrans was identified as a possible solution for restoring connectivity through retrofitting an underpass to accommodate bighorn sheep and other wildlife species. Please refer to the corresponding Linkage Description Log Sheet for more specific information.

Scientific documentation and/or GIS-based maps referenced for the region included (see Appendix C, *Connectivity References*, for complete citation, if provided):

- California Spotted Owl Technical Report
- Guernsey Endangered Species Recovery Plans
- El Dorado City Resource Conservation District
- Models predicting fisher and owl occurrences

Conference participants also provided a GIS-based map to highlight some of the linkages. Six of the linkages recorded (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID#s 10-15) coincide with ecologically significant areas depicted in Figure 9-7, *Areas of Concern for the California Spotted Owl*.

Ecoregional team members indicated that 28% (7/25) of the linkages have willing sellers in all or a portion of the linkage. Potential exists for agency acquisition in 40% (10/25) of the linkages, 30% (3/10) of which were identified as having willing sellers (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID#'s 6, 21, and 24). Five of the high-ranking conservation opportunities (Figure 9-1, *Sierra Nevada: Missing Linkages,* Map ID#'s 1, 2, 3, 16, and 24) were noted as having willing sellers; one of which has the potential for agency acquisition (Map ID# 24). Other opportunities identified to secure or restore connectivity function included landowner incentives for conservation easements, acquisition through private land trusts, formal conservation plans, coordination among federal and state agencies, acquisition of key tracts of post-logging industrial timberland, and coordination between land managers and CalTrans to plan for underpasses at various elevations.


1
Lassen County. Habitat in this area is discontinuous, naturall fragmented, and poor in quality due to drier conditions and lava-based soils.
2 Northern Plumas. A gap in known distribution, mainly on private lands, extends east-west in a band almost fully across the width of the owl's range.
3 Northern Tahoe. An area of checkerboard land; much dominated by granite outcrops and red fir forests; both features guarantee low owl densities.
4
Northern Eldorado. Checkerboard lands, and large private inholdings; owl densities unknown on some private lands and very low on others.
0 20 40 60 80 100 120 140 160 Kilometers
5
Northwestern Stanislaus. Has large private inholdings; owl densities unknown on most private lands.
6
Southern Stanislaus. Burned in recent years; the little remaining habitat is highly fragmented.
7
Northwestern Sierra. Habitat naturally fragmented, due partly to low elevations and dry conditions; fragmentation accentuated by logging.
Areas of Concern for Ca.spotted owl
Beck & Gould, 1992
Ca. GAP land management status
1
2
3
4
County boundaries
Major roads
8
Northeastern Kern County. Only small, semi isolated groups of owls in the few areas at elevations where habitat persists at the south end of the Sierra Nevada.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: North Fork Tule
Ecoregion: Sierra Nevada
Map Name/ID#: 1

Key contact for this linkage (optional) Carole Combs
Telephone #: 559/561-1915
Email: ccombs@thegrid.net

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other riparian corridor

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Connects ten miles of foothill riparian forest to Tulare Lake marshes via mixed riparian forest. Vernal pools, grassland, neotropical birds.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	4.5	5
No threat/secure		Moderate threat			Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Development – selling large ranches	4-5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Part of Department of Fish and Game and Sierra Los Tulares Land Trust.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Riparian Forest, Vernal pools

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural, rural, urban mixture

Major landowners: Large ranches, mixed public and private.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Tule is over-appropriated with regard to water.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat, willing community participants

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Contact Rob Hansen (birdman1@lightspeed.net - 559/627-5473)

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: The Nature Conservancy ecoregional map

Linkage Description Log

(One for each mapped linkage)

Linkage Name: St. Johns/Cottonwood/Cross Creek
Ecoregion: Sierra Nevada
Map Name/ID#: 2

Key contact for this linkage (optional) Carole Combs/Rob Hansen
Telephone #: 559/561-1921 559/627-5473
Email: ccombs@thegrid.net, birdman1@lightspeed.net

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:
Kaweah River to Tulare Lake, last alkali sink habitat in Kings County. Key species: fox, kangaroo rat, mink, neotropical birds.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	4.5	5
No threat/secure		Moderate threat			Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
development	4.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Contract Carole Combs

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Valley oak riparian, mixed riparian, grassland, alkali sink

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Mixture of natural, rural residential and urban.

Major landowners: Private, County, City of Visilia. Complete mixture of public and private.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Contact Rob Hansen

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: On The Nature Conservancy ecoregional map

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Kings River
Ecoregion: Sierra Nevada
Map Name/ID#: 3

Key contact for this linkage (optional) Carole Combs
Telephone #: 559/561-1915
Email: ccombs@thegrid.net

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Connects Fresno County foothills to Tulare Lake. Key species – neotropical birds and Fresno kangaroo rat.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Development	4.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Contact Carole Combs

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Riparian forest, alkali sink habitat

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Mix of natural, rural residential, and urban.

Major landowners: Mixture of public and private.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Contact Rob Hansen

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: On The Nature Conservancy ecoregional map. Avocado Lake to Centerville Bottoms, Lemore Naval Air Station, Guernsey Endangered Species Recovery Plans.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Outside Creek – Elk Bayou
Ecoregion: Sierra Nevada
Map Name/ID#: 4

Key contact for this linkage (optional) Carole Combs
Telephone #: 559/561-1915
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Foothill oaks to Tulare Lake marshes, permanent water in valley floor. Key species: Swainson's hawk and neotropical birds.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Development	4.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Contact Carole Combs

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Grassland, foothill oak, valley oak, vernal pools, marshes

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Urban/Riparian, mix of natural, rural residential, and urban.

Major landowners: Mix of public and private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Contact Rob Hansen

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: Links Kaweah Res and Dry Creek to Kaweah Oaks Preserve, Herbert Preserve, Elk Bayou Regional Park, Greigton Ranch and Pixley National Wildlife Refuge.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: N-S Oak woodland in El Dorado
Ecoregion: Sierra Nevada
Map Name/ID#: 5

Key contact for this linkage (optional) Greg Greenwood
Telephone #: 916/227-2655
Email: greg_greenwood@fire.ca.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Gene flow through oak woodland; local movement of oak woodland species.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	4
Agriculture	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Existing County report

What are the most important restoration needs (describe types of habitat, degree of restoration needed): In good shape now.

5. Provide brief description of the linkage:

Major Habitat Types: oak woodland, riparian woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural, rural residential

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): US 50 presents some obstacles, but real threat is complete buildout.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Numerous undeveloped woodland; riparian features, underpasseson the freeway.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Very accurate veg data with which to guide planning and acquisition (underway by El Dorado City Resource Conservation District).

9. What scientific documentation is available demonstrating the value of the linkage?
http://frap.cdf.ca.gov/projects/<impactofdevelopmentonElDorado>

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Placer County Oak Woodlands
Ecoregion: Sierra Nevada
Map Name/ID#: 6

Key contact for this linkage (optional) Loren Clark
Telephone #: Placer County Planning Department
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Oak woodland gene flow

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Included in Placer Legacy

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Unknown

5. Provide brief description of the linkage:

Major Habitat Types: Oak woodland, riparian woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, 1-5 acre parcels

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Upper Cosumnes River
Ecoregion: Sierra Nevada
Map Name/ID#: 7

Key contact for this linkage (optional) Alan Ehrgott
Telephone #: 530/621-1224
Email:

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Native fish; riparian habitat; hydrology processes, last undimmed river.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Agricultural Development	3
Urbanization	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 [3] 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
] Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Under study by the American River Conservancy.

Part of El Dorado Biodiversity Strategy. Interested agencies: Forest Service, Bureau of Land Management, The Nature Conservancy.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): mercury?

5. Provide brief description of the linkage:

Major Habitat Types: Foothill riparian, chaparral, oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural vegetation, vineyards, rural residential.

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Some habitat degradation, some riparian housing development.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): All riparian

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: East Sierras – White Mountains
Ecoregion: Sierra Nevada
Map Name/ID#: 8

Key contact for this linkage (optional) Wayne Spencer/Nate Greenberg
Telephone #: 619/296-0164 707/924-0555
Email: wdspencer@consbio.org nate@talonassociates.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Deer migration corridor between eastern Sierra & White Mountains, major corridor identified within larger connection area

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 3.5 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Hwy 395 – Road kill hazard	3.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Good opportunity - road re-design and mitigation

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: pinyon juniper, yellow pine, sage scrub (eastern Sierra to Mono Valley)

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, rural housing, resort development.

Major landowners: Mixture of public and private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 395

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Eastern Sierra – Owen's Gorge
Ecoregion: Sierra Nevada
Map Name/ID#: 9

Key contact for this linkage (optional) Nate Greenberg
Telephone #:
Email: nate@talonassociates.net

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Large mammals, mostly deer.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 4.5 5

No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Development (Rimrock Ranch Development)	4.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 4.5 5

Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Zoning laws and changes

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: sage scrub, pinyon juniper woodland (eastern Sierra habitat)

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: Mixed

Other: Last north – south linkage, natural narrow funnel between eastern Sierra and Owen's Gorge.

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): None right now.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: High priority for Mono County, highly threatened by current development issues.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Southern Sierra Checkerboard
Ecoregion: Sierra Nevada
Map Name/ID#: 10

Key contact for this linkage (optional) Graciela Terrazas
Telephone #: 760/788-0250
Email: gterrazas@fs.fed.us

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Deer, Bear, Mountain lion, Bobcat (big animals). Connection between ecoregions flora and fauna

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure 2 [3] Moderate threat 4 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Fragmentation	4
Highway 58	3
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible 2 3 Moderate Opportunity [4] 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Federal agencies, likely Bureau of Land Management, as well as Sequoia National Forest.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: woodlands, chaparral, foothills, ponderosa (east side)

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: Private lands, Tejon Ranch (70% LA Times)

Other: Links Sierras to Coast Ranges to Transverse Ranges – Southern California Mexico

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadways Highway 58

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Eldorado–Tahoe NF Checkerboard
Ecoregion: Sierra Nevada
Map Name/ID#: 11

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Forest carnivores = key species
Forest fragmentation = ecological process

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Logging/Checkerboard ownership	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Potential interested agency: United States Forest Service. Primary landowner is SPI; opportunities to acquire land may be limited to post-logging; area identified as an Area of Concern for California spotted owl.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Reforestation; restoration of old forest conditions; protection

5. Provide brief description of the linkage:

Major Habitat Types: Douglas fir, mixed conifer and red fir

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: SPI and United States Forest Service (checkerboard ownership)

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): The checkerboard ownership pattern has created , or has the potential to create, 640 acres chunks of logged forest with low or now old forest characteristics.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): The potential for continual habitat coverage.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): 1) design most logical shape/pattern of corridor (can use high suitability owl habitat), 2) purchase identified private sections.

9. What scientific documentation is available demonstrating the value of the linkage? California Spotted Owl Technical Report (1992), which identifies this area as an Area of Concern.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Interstate 80 Corridor
Ecoregion: Sierra Nevada
Map Name/ID#: 12

Key contact for this linkage (optional) Rick Truex
Telephone #: 707/825-2960
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

I-80 provides a potential movement barrier to numerous organisms, particularly forest carnivores moving with habitats from north to south.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	3.5	4	5
No threat/secure		Moderate threat			Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Roadway	5
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Coordination between US Forest Service and CalTrans to plan underpasses at various elevations to facilitate movement.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): I 80 traverses all habitats in Sierra Nevada – increasing movement opportunities in representative habitat should be objective.

5. Provide brief description of the linkage:

Major Habitat Types: All

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, managed forest, some urbanization.

Major landowners: US Forest Service, Sierra Pacific Industries, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadway – open year round, high traffic volume.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Much of the roadway could be crossed. Areas where fences and other barriers prevent any opportunitiy for movement should be targeted for underpasses.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Placement of underpasses, size of underpasses

9. What scientific documentation is available demonstrating the value of the linkage? Minimal

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Tahoe - Shoreline
Ecoregion: Sierra Nevada
Map Name/ID#: 13

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Forest carnivores, fragmentation

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urban development	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Highly developed area with multiple stakeholders

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: mixed conifer, riparian areas around the lake

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): mixed urban, rural, and natural

Major landowners: mixed private & public

Other: development zone around Lake Taho including adjacent ski areas

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Urban development, ski area development

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Identify corridors/linkages at a finer scale.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Lake Almanor
Ecoregion: Sierra Nevada
Map Name/ID#: 14

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Forest carnivores, forest fragmentation

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	4.5	5
No threat/secure		Moderate threat			Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Logging	4.5
Agriculture Development	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Unknown?

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Forest recovery post-logging.

5. Provide brief description of the linkage:

Major Habitat Types: mixed conifer, Jeffrey pine

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural vegetation, rural residential, agricultural land

Major landowners: Mix of public and private

Other: Lake Almanor region south of Lassen National Park. Threatened by continued logging and agricultural development (fruit growers).

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Clear-cut logging, logging roads, agricultural development

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Stanislaus National Forest Recovery
Ecoregion: Sierra Nevada
Map Name/ID#: 15

Key contact for this linkage (optional) Rick Truex
Telephone #: 707/825-2960
Email: rtruex@fs.fed.us

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other Recovery

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Stanislaus foothill fire zone

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	3.5	4	5
No threat/secure		Moderate threat			Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Logging	1
Urbanization	1

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	4.5	5
Not feasible		Moderate Opportunity			Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Political planning for preservation of area.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Forest recovery post-fire.

5. Provide brief description of the linkage:

Major Habitat Types: general west slope foothill - ponderosa pine, some oak

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural vegetation

Major landowners: Federal with intermittent private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Logging and future development. Current urban areas limit movement in low elevations.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Once continuous forest coverage - fire

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Potential development of future policy.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Yosemite - Kings Canyon
Ecoregion: Sierra Nevada
Map Name/ID#: 16

Key contact for this linkage (optional) Bill Zielinski
Telephone #: 707/825-2959
Email: bzielinski@fs.fed.us

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Habitat for fishers

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	4
Agricultural	3
Forestry-Logging	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	]	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Working with Forest Service managers and coordinating with the Park Service.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Analysis of cumulative effects of Forest Service activities and timber management on state and private lands.

5. Provide brief description of the linkage:

Major Habitat Types: Mixed conifer, ponderosa pine, oak woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Forest

Major landowners: US Forest Service

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): A landscape mosaic that is fragmented to the point that it discourages movement of mammalian carnivores and affects ecosystem function. Largely via timber harvest, fire and fuel treatments.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Canopy cover and the existing culverts under roads.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): To evaluate current and future habitat value for fishers and other old forest associated species.

9. What scientific documentation is available demonstrating the value of the linkage? Current distribution of fishers and owls and habitat models that predict their occurrence.

10. Other information: This linkage is designed to connect mid elevation (3,000-6,000) forests protected in Yosemite and Sequoia Kings Canyon.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Southern Sierra
Ecoregion: Sierra Nevada
Map Name/ID#: 17

Key contact for this linkage (optional) Graciela Terrazas
Telephone #: 760/788-0250
Email: gterrazas@fs.fed.us

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Fragmentation	3
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Angeles National Forest

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: desert scrub, chaparral, woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural vegetation

Major landowners:

Other: Conduit to Mojave Desert to Fraser Canyon, Transverse Ranges, and Central Valley, primary linkage.

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Area of Special Concern
Ecoregion: Sierra Nevada
Map Name/ID#: 18

Key contact for this linkage (optional) Jim Thorne
Telephone #: 530/752-4385
Email: jthorne@ucdavis.edu

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Relict forests in steep northeast canyons west of Susanville are only moist coast mixed conifers on the east side of the Sierras.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Logging	3.5
Roads	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Control of logging would maintain these relict communities for next wet period.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Road closure, logging prevention.

5. Provide brief description of the linkage:

Major Habitat Types: coastal mixed coniferous

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural vegetation

Major landowners: National Forest Service, private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Logging, timber, roads

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: White Mountains – Inyo Mountains
Ecoregion: Sierra Nevada
Map Name/ID#: 19

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Connects the White and Inyo Mountains through the Westguard Pass.

3. Score the overall degree of threat to connectivity function (circle one):

[1] 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 [4] 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Already Bureau of Land Management land.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): None, maintenance of ecosystem function.

5. Provide brief description of the linkage:

Major Habitat Types: high desert scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural vegetation

Major landowners: Bureau of Land Management

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): None

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Intact habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: White Mtns – Benton Range/Mono Lake
Ecoregion: Sierra Nevada
Map Name/ID#: 20

Key contact for this linkage (optional) Jim Thorne
Telephone #: 530/752-4385
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Bighorn, ungulates, coyote, cats

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Road – little traveled	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Linking northern White Mountains to the Benton Range and Mono Lake.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): None.

5. Provide brief description of the linkage:

Major Habitat Types: From mountain scrub to Ponderosa/sage brush

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: Bureau of Land Management, some private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadway, probably not impacting to mammals.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Owens Valley
Ecoregion: Sierra Nevada
Map Name/ID#: 21

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Link from Sierra Nevada to Inyo Mountains – migration route.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 3.5 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Development	2
Agriculture	2
Roadways	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)] willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Some private, Bureau of Land Management and US Forest Service on margins

What are the most important restoration needs (describe types of habitat, degree of restoration needed): 395 is barrier to movement from Sierra Nevada to Inyos – corridor is narrowest at private ownership.

5. Provide brief description of the linkage:

Major Habitat Types: Riparian, scrub, wash, reservoir

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: Bureau of Land Management, private

Other: Some forest service ownership on margins

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): 395

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Not certain, underpasses may aid movement.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage, design it, evaluate its success, and purchase it.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Sierra – Coso Hills
Ecoregion: Sierra Nevada
Map Name/ID#: 22

Key contact for this linkage (optional) Jim Thorne
Telephone #: 530/752-4389
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Closest mountains to Sierras in Mojave Desert. Best dispersal corridor for Bighorn.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
395 Highway	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Coordination with CalTrans to design underpass or overpass for sheep at the 395.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: mixed coniferous, desert vegetation

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: National Park Service, Bureau of Land Management, US Air Force, California Water Agencies

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Southern Sierra – Chalk Hills
Ecoregion: Sierra Nevada
Map Name/ID#: 23

Key contact for this linkage (optional) Jim Thorne
Telephone #: 530/752-4389
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Sheep dispersal

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Highway 14	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Sheep dispersal to these mountains, only 1 road.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): None or underpass

5. Provide brief description of the linkage:

Major Habitat Types: Southern Sierra dry forests, Mojave woody vegetation

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation

Major landowners: Bureau of Land Management, National Forest Service

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): 1-2 lane roads

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: South Fork Kern River
Ecoregion: Sierra Nevada
Map Name/ID#: 24

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other Area of Importance

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Riparian forest (neotropical migratory birds)

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Development	3
Livestock	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Much of South Fork Kern is riparian forest is protected, areas not should be targeted for acquisition.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Restoration of riparian and oak forests.

5. Provide brief description of the linkage:

Major Habitat Types: riparian, valley oak

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural vegetation, agriculture, developed.

Major landowners: Private, Bureau of Land Management, Forest Service

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): None, key riparian forest.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Determine current extent of reserve, enhance it through acquisition.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Lassen Foothills
Ecoregion: Sierra Nevada
Map Name/ID#: 25

Key contact for this linkage (optional) Craig Mayer
Telephone #:
Email: cmayer@tnc.org

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Migratory deer, mountain lion, birds, fish

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Roads	2
Habitat loss	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who) 1 willing land sellers
] Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): The Nature Conservancy project area, state wildlife area.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: mixed coniferous, oak woodlands, chaparral

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): natural vegetation

Major landowners: Lassen National Forest, DFG, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadway, Highway 36; loss of winter habitat in oak woodlands; fire suppression in summer range

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Deer follow ridgelines parallel to east-west drainages.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Protect winter range from fragmentation, change fire management in summer range.

9. What scientific documentation is available demonstrating the value of the linkage? The Nature Conservancy site plan Lassen Foothills

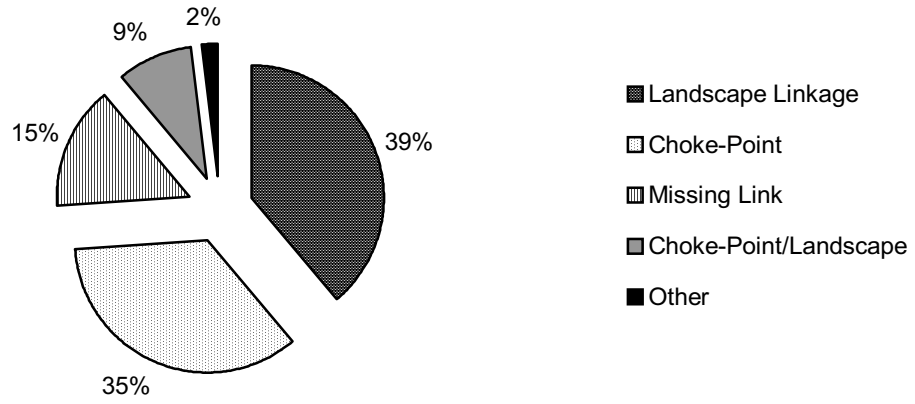
10. Other information:

10.0 MOJAVE & SONORAN DESERT ECOREGION

The Mojave and Sonoran Desert ecoregion is roughly bound by the Sierra Nevada and Central Valley to the north, the Arizona and Nevada deserts to the east, the San Gabriel and San Bernardino Mountains to the west, with the Sonoran Desert continuing southward into Baja (Figure 1-1, *California Regions and Topography*). The primary vegetation types of the region are sand dunes, creosote bush scrub, saltbush scrub, mesquite, desert washes, desert riparian, palm oasis, ironwood and desert willow forest, Joshua tree woodland, chaparral, pinyon-pine juniper woodland, and pine-oak woodland.

The primary reason for the differences between the Mojave and Sonoran Deserts is elevation. The Mojave Desert is higher in elevation, and is therefore cooler, receiving more precipitation. This accounts for the differences in vegetation types; evergreen trees such as the Joshua tree (*Yucca brevifolia*) flourish in the Mojave but cannot persist in the Sonoran. At higher elevations in the Mojave Desert, juniper (*Juniperus* spp.) and pinyon pine (*Pinus quadrifolia*) are present with an understory of creosote bush (*Larrea tridentate*) and other shrubs and herbs. Creosote bush scrub, saltbush scrub, desert riparian, bajadas or desert washes, and sand dunes are characteristic habitats in the Sonoran Desert.

Figure 10-2, *Mojave & Sonoran Deserts: Types of Linkages*



The majority of the region is publicly owned; however, there is considerable checkerboard ownership of private land interspersed. The Bureau of Land Management manages the greater part of the region. There are two National Monuments in the region; Joshua Tree and Death Valley. There are two State Parks, Anza-Borrego and Cuyamaca Rancho, and one National Park, Death Valley. The Salton Sea National Wildlife Refuge and Mojave National Preserve are other publicly owned lands. The military also has a significant presence in the region, including Fort Irwin, China Lake, Edwards Air Force Base, and the Chocolate Mountains Gunnery Range.

A total of 46 habitat linkages were identified for the region (Figure 10-1, *Mojave & Sonoran Deserts: Missing Linkages*). Of the linkages identified, 39% (18/46) were considered

Landscape Linkages[1], 35% (16/46) were determined to be Choke-Points[2], and 15% (7/46) were identified as Missing Links[3]. Participants identified some of the linkages as having multiple linkage types; 9% (4/46) were listed as Choke-Points[2] and Landscape Linkages[1], and 2% (1/46) were named as Sand Source linkages (Figure 10-2, *Mojave & Sonoran Deserts: Types of Linkages*).

The key species used to identify the linkages belonged to many taxonomic groups. Mammals recognized as key species included the grizzly bear (*Ursus arctos*), black bear (*Ursus americanus*), mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), bighorn sheep (*Ovis canadensis*), mule deer (*Odocoileus hemionus*), and Mohave ground squirrel (*Spermophilus mohavensis*). Reptiles and amphibians recognized as key species included desert tortoise (*Gopherus agassizii*), flat-tailed horned lizard (*Phrynosoma mcallii*), Colorado & Mojave desert fringe-toed lizards (*Uma* spp.), and arroyo southwestern toad (*Bufo microscaphus californicus*). Birds listed as key species included Peregrine falcon (*Falco peregrinus*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), snowy plover (*Charadrius alexandrinus nivosus*), and other migratory birds. Both single and multiple key species were used in identifying the linkages; 57% (26/46) of the linkages recognized mammals as key species, 20% (9/46) used birds and 43% (20/46) used amphibians or reptiles. Mammalian carnivores were recognized as key species in 30% (14/46) of the linkages.

Existing features that facilitate animal movement varied. Some were listed as large contiguous parcels of intact habitat, others semi-contiguous, while some were merely strips of remnant habitat. Waterways, riparian corridors, broad alluvial fans and desert washes were listed as natural connectivity conduits; highway overpasses, underpasses, bridges and dirt roads were also recognized as facilitating wildlife passage.

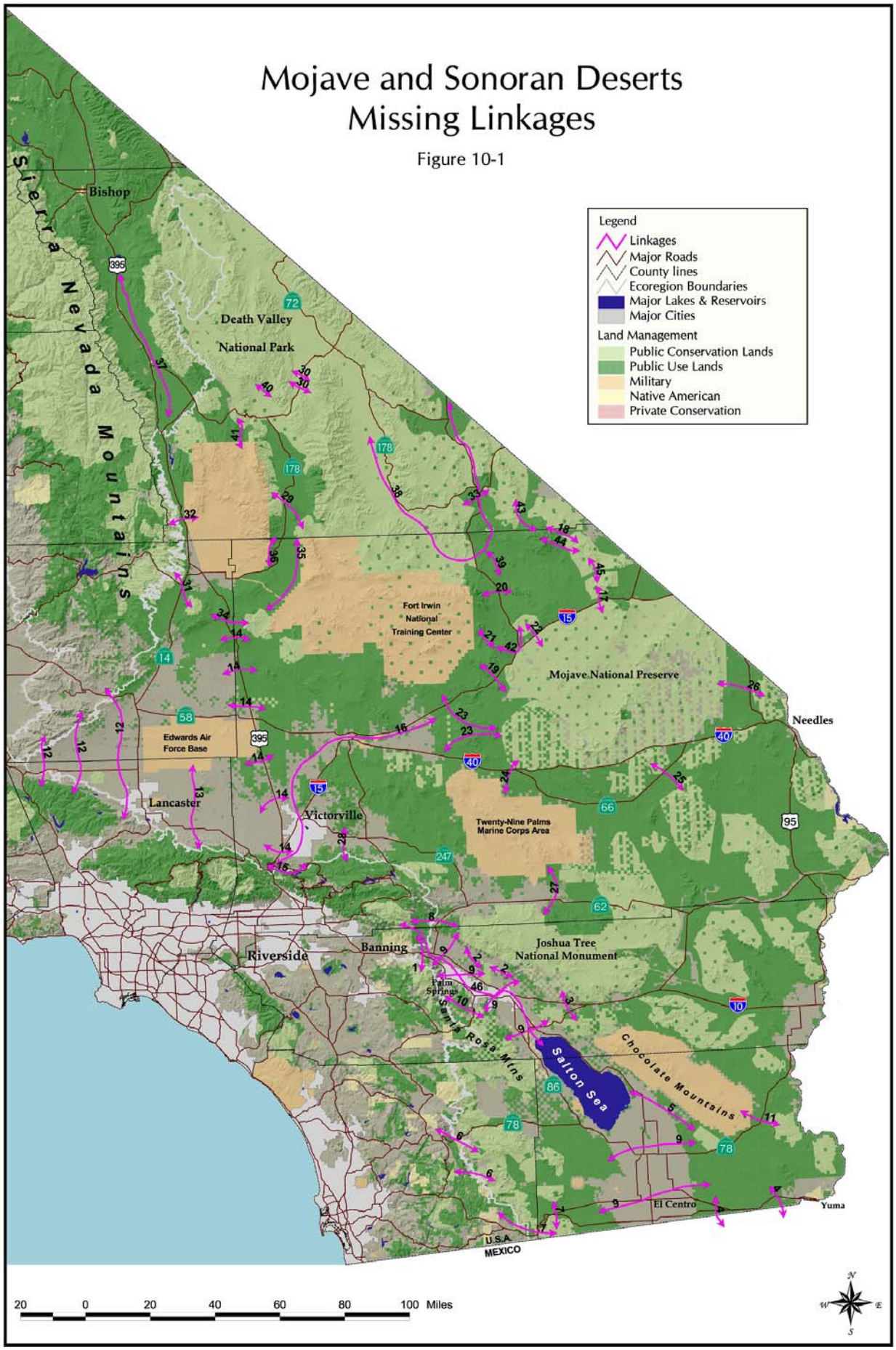
The primary barriers to animal movement in the region also varied. Highways and roads were named as barriers in 72% (33/46) of the linkages; Highways 8, 10, 78, 58, 395, 40, 15, 14, and 127, and State Routes 1 and 2 were specifically mentioned as obstacles to movement. Military bases, urbanization, rural residential development, ranches, golf courses, resorts and their associated roads and fences were also identified as barriers. Extractive activities such as gold and gravel mining operations were also listed as obstacles for wildlife, as were grazing, agriculture, railroads, and aqueducts. The degradation of habitat due to off-road vehicles was also specifically named as an impediment to wildlife movement in the region.

Numerous threats to connectivity were identified for the ecoregion, including roads, military, mining, off-road vehicles, border patrol, grazing, urbanization, flood control, agriculture, wind turbines, power lines, human disturbance, habitat conversion, and invasive species

[1] Landscape Linkage = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between different sections of the landscape.
[2] Choke-Point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas").
[3] Missing Link = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function.

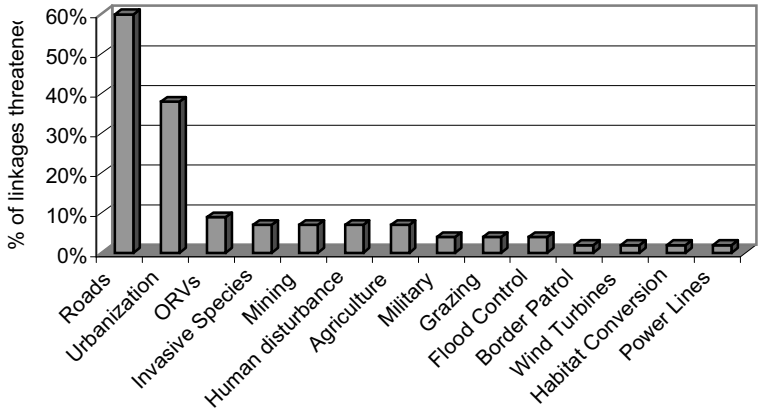
Mojave and Sonoran Deserts
Missing Linkages

Figure 10-1



(Figure 10-3, *Mojave & Sonoran Deserts: Threats to Connectivity*). The primary threats were roads and urbanization. Of the linkages, 59% (27/46) were threatened to some degree by roads or highways, 52% (14/27) of which were ranked as severely threatened (rank = four or five). Urbanization jeopardized 37% (17/46) of the linkages, 71% (12/17) of which were ranked as severely threatened. Of the linkages, 9% (4/46) were listed as threatened, to varying degrees, by mining, agriculture, human

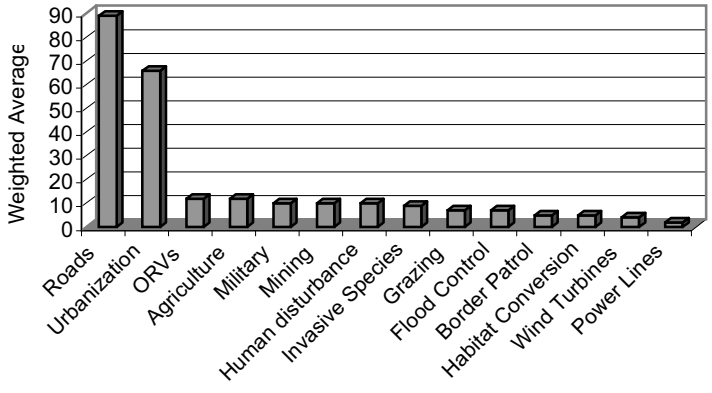
Figure 10-3, *Mojave & Sonoran Deserts: Threats to Connectivity*



Note: The above graph depicts the percent of linkages affected by each threat identified for the ecoregion.

disturbance, and invasive species. In addition, 4% (2/46) are threatened, to some degree, by military, and flood control; wind turbines, power lines, border patrol and invasive species each put 2% (1/46) of the linkages at risk. A number of threats to habitat connectivity were identified for the region, though the average severity of the threat and the number of linkages affected varied. The weighted average (average rank × number of linkages affected) was calculated for each threat identified to determine the severity of each threat in the region (Figure 10-4, *Mojave & Sonoran Deserts: Severity of Threats*). Figure 10-4, average severity of each threat among linkages, reveals similar trends as Figure 10-3, the number of linkages impacted by each threat.

Figure10-4, *Mojave & Sonoran Deserts: Severity of Threats*

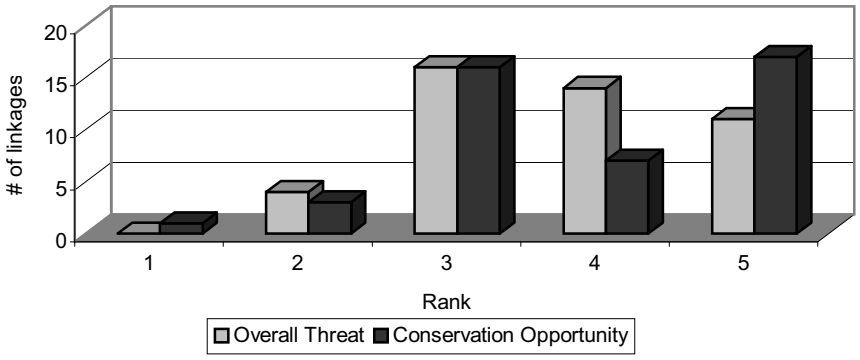


Note: The above graph depicts the weighted average of each threat id entified. Weighted average = average rank × number of linkages affected. The severity of each threat was ranked from one to five (one = not severe, five = extremely severe).

Several types of restoration needs were identified to reestablish connectivity in the ecoregion.

Habitat types identified in need of restoration included desert washes, creosote bush scrub, wet meadows, desert riparian, Joshua tree, juniper, and pine-oak woodland. In some linkages, the eradication of invasive species was listed as the primary restoration need. In some linkages, prevention of off-oad vehicle use was mentioned as a need to restore connectivity. Road closures and/or restricted-use of roads were listed as restoration needs for a few of the linkages. Establishing an east to west corridor with no grazing or fencing was also proposed. Protection of flood plains, management of water resources, and restoration of natural flood regimes were also named as restoration priorities. Other needs listed to restore connectivity in the region included restoring portions of agricultural land to native habitat and reclaiming an open-pit mine.

Figure 10-5, *Mojave & Sonoran Deserts: Ranking the Priorities*



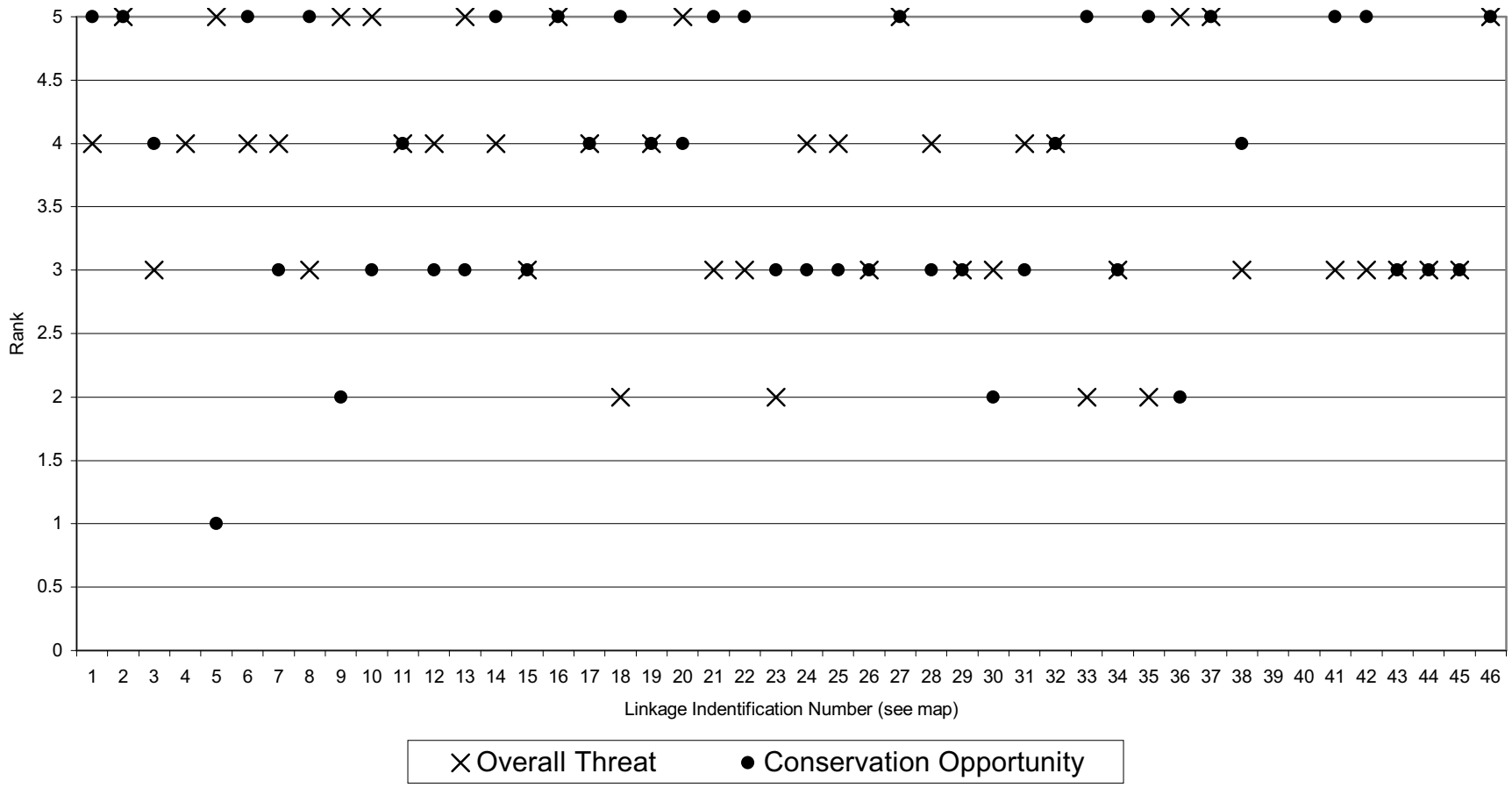
Note: Graph compares the number of linkages ranked for overall threat and conservation opportunity.

Conference participants scored the feasibility of conserving the linkage and ranked the overall degree of threat (Figure 10-5, *Mojave & Sonoran Deserts: Ranking the Priorities*). Scientists ranked 52%(24/46) of the linkages as high priorities with good opportunities for conservation (rank = four or five). Overall, 54% (25/46) of the linkages identified were ranked as severely threatened (rank = four or five). Of the linkages, 37% (17/46) were given the highest rank for conservation opportunity (rank = five). Eight of the top conservation opportunities were ranked as severely threatened (rank = four or five), five of which were ranked as in imminent danger (rank = five), Figure 10-1, *Mojave & Sonoran Deserts: Missing Linkages,* Map ID#s 2, 16, 27, 37, 46. These included three Landscape Linkages[1] (the Coachella Valley Preserve linkage Map ID# 2, Mojave River-Barstow-Camp Cady linkage Map ID# 16, and the Whitewater River linkage Map ID# 46), one Landscape Linkage[1] and connectivity Choke-Point[2] (the Joshua Tree linkage Map ID# 27), and one Missing Link[3] (the Owens Lake linkage Map ID# 37). Brief descriptions of the top ranked linkages (threat & conservation opportunity = five) are provided below. A comparison of how individual linkages were ranked is depicted in Figure 10-6, *Mojave & Sonoran Deserts: Degree of Threat and Conservation Opportunities*.

The Coachella Valley Preserve linkage (Figure 10-1, *Mojave & Sonoran Deserts: Missing Linkages,* Map ID# 2) was identified as a Landscape Linkage[1]. The key species listed for this linkage were bobcat and kit fox; this linkage was also identified as a critical sand source corridor. An intact broad alluvial fan consisting of creosote bush scrub, desert dunes and desert washes was listed as the primary linkage feature. Urbanization was named as the primary threat to connectivity and proposed development plans may create future barriers. Landownership in this linkage was listed as private; however, participants identified the

linkage as a key component of the Coachella Valley Multi-Species Habitat Conservation Plan, so potential exists for agency acquisition. Three studies have been conducted on sand source identification in the linkage and recent satellite imagery highlights sand movement. Please refer to the corresponding Linkage Description Log sheet for more specific information.

Figure 10-6, *Mojave & Sonoran Deserts: Overall Threat & Conservation Opportunities*



Note: The above graph compares how each linkage was ranked for overall threat (one = no threat/secure, five = severe threat/loss imminent) and the feasibility of conserving the linkage (one = not feasible, five = good opportunity). Some linkages were not ranked for either category.

The Mojave River/Barstow/Camp Cady linkage (Figure 10-1, *Mojave & Sonoran Deserts: Missing Linkages,* Map ID# 16) was identified as a Landscape Linkage[1]. This linkage was identified as providing connectivity for arroyo southwestern toad, least Bell's vireo, willow flycatcher, and other riparian birds. The linkage was also listed as a sand source corridor supplying sand to the Kelso Dunes. Riparian habitat was named as the primary linkage features, while lack of water was named as the most significant impediment to wildlife movement. The key threats identified for the linkage were urbanization, exotic plants, and flood control. The primary restoration needs listed were exotic plant removal (tamarisk & arundo), ensuring stream flow, and preventing encroachment into the flood plain. Landownership in the linkage was listed as both private and public, with the publicly owned land administered by the Bureau of Land Management and the California Department of Fish and Game. Participants indicated that this linkage was part of the West Mojave Conservation Plan and that potential exists for agency acquisition. Specific agencies mentioned included the Federal Emergency Management Agency, Flood Control District, CalTrans, and the California Department of Fish and Game. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The Joshua Tree linkage (Figure 10-1, *Mojave & Sonoran Deserts: Missing Linkages,* Map ID# 27) was identified as a Landscape Linkage[1] and a connectivity Choke-Point[2], linking the Bullion Mountains with the Sheep Hole Mountains to the north of Joshua Tree National Park. This linkage was recognized as an excellent wildflower and general wildlife corridor. Urbanization and roads were named as significant barriers to wildlife movement. Planning for urban build-in at 29 Palms and road decommissioning of non-essential dirt roads were both identified as opportunities for protecting and restoring habitat connectivity. Landownership in the linkage was listed as both public and private; the Bureau of Land Management administers the publicly owned land. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The Owens Lake linkage (Figure 10-1, *Mojave & Sonoran Deserts: Missing Linkages,* Map ID# 37) was identified as a Missing Link[3] between the Sierra Nevada and the Inyo Mountains. This linkage was identified as a stopover for migratory bird species. In fact, an inland population of snowy plover breeds in this area. The primary threats identified were habitat conversion and lack of water. Participants explained that Owens Lake was historically a navigable waterway; after Los Angeles began exporting water, it became a shallow wetland; presently, it is an alkali sink. This linkage was listed as being owned by the State, managed by the Great Basin Unified Air Pollution Control District, and directed by a Los Angeles Department of Water and Power Environmental Impact Report on PM10 emissions. The motivation for dust abatement measures was primarily for human health concerns, but implementation is expected to indirectly benefit wildlife. Various dust control measures are currently being initiated, including shallow flood control, gravel cover, and revegetation plots. Please refer to the corresponding Linkage Description Log sheet for more specific information.

The Whitewater River linkage (Figure 10-1, *Mojave & Sonoran Deserts: Missing Linkages,* Map ID# 46) was identified as a Landscape Linkage[1]. This linkage was identified as providing connectivity for carnivores and birds; it was also identified as a sand movement corridor. The primary threat identified was suburban development blocking sand transport. Participants

indicated that there was local support for protecting this linkage and willing sellers. They also indicated that the linkage was part of the Coachella Valley Habitat Conservation Plan and that potential exists for agency acquisition. Please refer to the corresponding Linkage Description Log sheet for more specific information.

Scientific documentation or studies referenced for some of the linkages included (see Appendix C, *Connectivity References*, for complete citation, if provided):

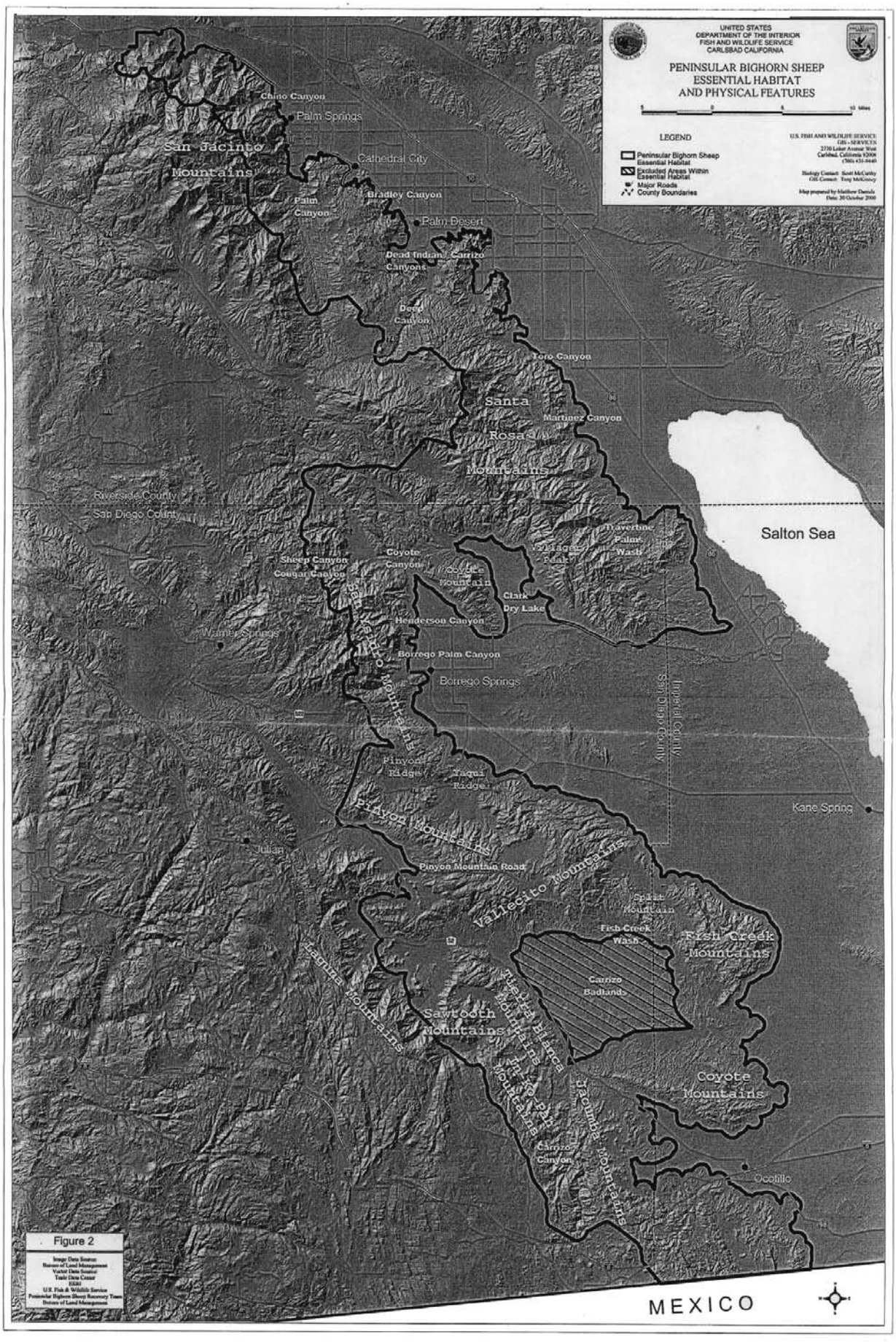
- Coachella Valley Multi-Species Habitat Conservation Plan
- West Mojave Plan
- North East Mojave Plan
- The Recovery Plan for Bighorn of the Peninsular Ranges
- Desert Tortoise Recovery Plan
- Desert Bighorn of the Chocolate Mountains
- Bureau of Land Management Plans for Desert Tortoise and Bighorn
- Mojave River Forks Dam Biological Report
- Death Valley Natural Resource Management Plan
- Los Angeles Department of Water and Power Environmental Impact Report on PM10 Emissions
- Bureau of Land Management ACEC Plan
- Bighorn Meta-population model, California Department of Fish and Game
- Biology of the Kingston Range, University of California Santa Cruz publication

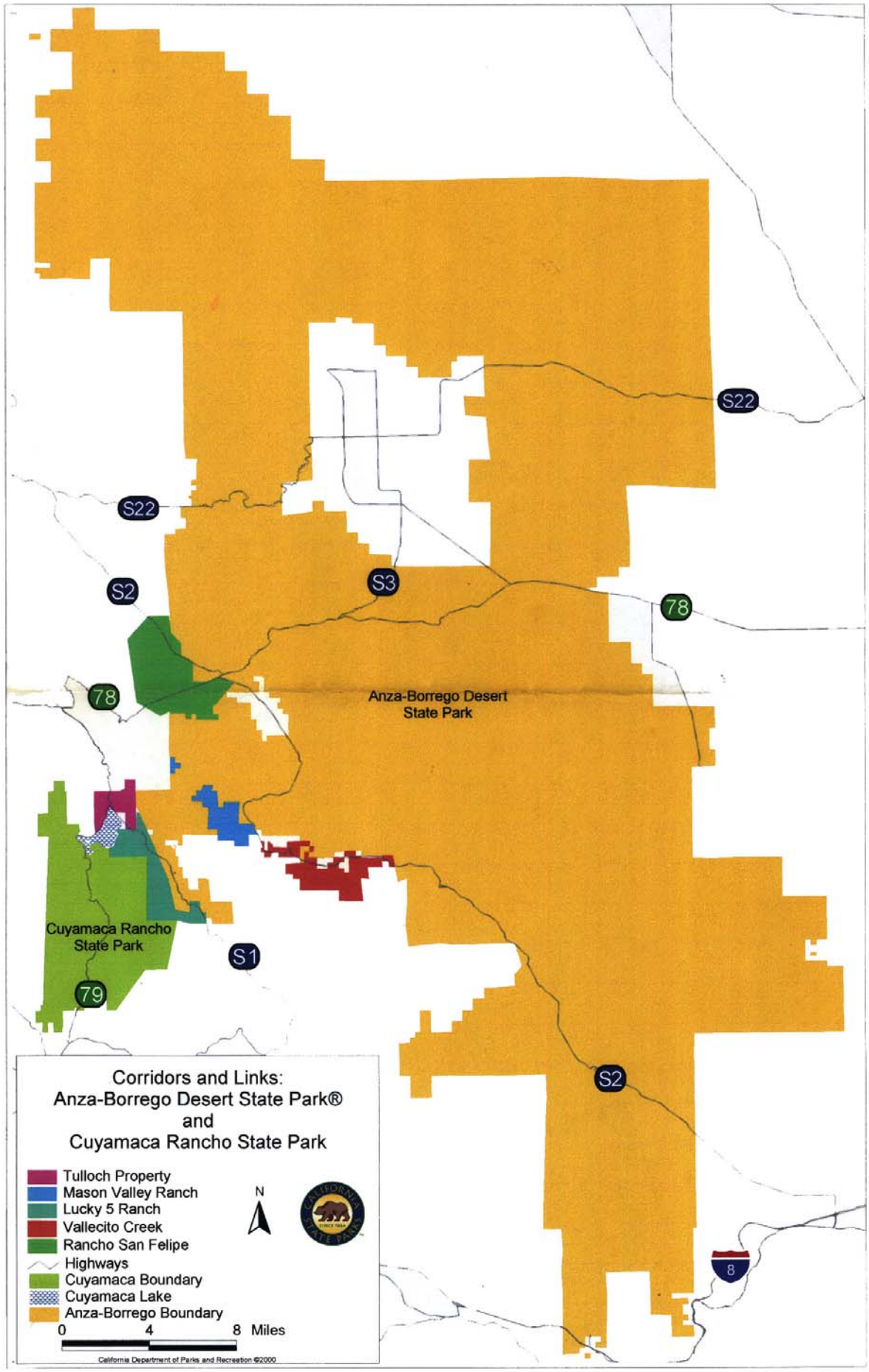
Ecoregional team members provided GIS-based maps and satellite images for some of the linkages. Bighorn sheep were recognized as a key species, indicative of habitat connectivity, in 41% (19/46) of the linkages identified for the region; 26% (5/19) of which (Figure 10-1, *Mojave & Sonoran Deserts: Missing Linkages,* Map ID#s 1, 6, 7, 9, & 10) coincide with areas depicted in Figure 10-7, *Peninsular Bighorn Sheep Essential Habitat and Physical Features*. Please refer to the corresponding Linkage Description Log sheets for more specific information.

The Peninsular-Borrego linkage (Figure 10-1, *Mojave & Sonoran Deserts: Missing Linkages,* Map ID# 6) is illustrated in Figure 10-8, *Corridors and Links: Anza-Borrego Desert State Park and Cuyamaca Rancho State Park*. California State Parks also provided four additional focus maps of properties identified in the map referenced above, which are available upon request. All five properties were listed as having willing sellers. Please refer to the corresponding Linkage Description Log sheet for more specific information.

Five of the linkages have willing sellers in all or a portion of the linkage (Figure 10-1, *Mojave & Sonoran Deserts: Missing Linkages,* Map ID#s 1,6,10, & 15), three of which were considered conservation priorities (Map ID#s 1, 6, 46). Potential exists for agency acquisition in 54% (25/46) of the linkages, 20% (5/25) of which were identified as having willing sellers. Of the linkages, 26% (12/46) were identified as part of formal conservation plans. Other opportunities identified to secure or restore connectivity function include developing landowner incentives for conservation easements, coordination with CalTrans on fencing and underpasses for future highway realignments, working with the military,

Environmental Protection Agency clean-up projects, working with federal and state agencies on management directives, and formal conservation plans.


UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
CARLSBAD CALIFORNIA
PENINSULAR BIGHORN SHEEP
ESSENTIAL HABITAT
AND PHYSICAL FEATURES
LEGEND
Peninsular Bighorn Sheep Essential Habitat
Excluded Areas Within Essential Habitat
Major Roads
County Boundaries
U.S. FISH AND WILDLIFE SERVICE
GIS - SERVICES
2730 Loker Avenue West
Carlsbad, California 92008
(760) 431-9440
Biology Contact: Scott McCarthy
GIS Contact: Tony McGeorge
Map prepared by Matthew Dvorak
Date: 20 October 2008
Chino Canyon
Palm Springs
San Jacinto Mountains
Cathedral City
Bradley Canyon
Palm Canyon
Palm Desert
Dead Indian/ Carrizo Canyons
Deep Canyon
Toro Canyon
Santa Rosa Mountains
Martinez Canyon
Riverside County
San Diego County
Salton Sea
Travertine Palms
Wash
Village Peak
Sheep Canyon
Cougar Canyon
Coyote Canyon
Coyote Mountain
Clark Dry Lake
Henderson Canyon
Warner Springs
Borrego Palm Canyon
Borrego Springs
Imperial County
San Diego County
Vallecito Mountains
Pinyon Ridge
Yaqui Ridge
Kane Spring
Julian
Pinyon Mountain Road
Split Mountain
Fish Creek Wash
Fish Creek Mountains
Carrizo Badlands
Laguna Mountains
Sawtooth Mountains
Tierra Blanca Mountains
Tule Peak Mountains
Tacumba Mountains
Carrizo Canyon
Coyote Mountains
Ocotillo
MEXICO
Figure 2


S22
S22
S2
S3
78
78
Anza-Borrego Desert
State Park
Cuyamaca Rancho
State Park
S1
79
S2
8
Corridors and Links:
Anza-Borrego Desert State Park®
and
Cuyamaca Rancho State Park
Tulloch Property
Mason Valley Ranch
Lucky 5 Ranch
Vallecito Creek
Rancho San Felipe
Highways
Cuyamaca Boundary
Cuyamaca Lake
Anza-Borrego Boundary
N
0
4
8 Miles
California Department of Parks and Recreation ©2000

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Gorgonio Crk/Whitewater River San Gorgonio Pass
Ecoregion: Mojave/Sonoran
Map Name/ID#: 1

Key contact for this linkage (optional) Cameron Barrows
Telephone #: 760/343-1234
Email: cbarrows@cnlm.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
] Other Process linkage

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Desert tortoise, bears, deer, bighorn, mountain lion, and reptiles
Critical sand source corridor
Interesting desert coastal species differentiation and intergrades in pass

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Highway/Roadway	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Coachella Valley Multi-species HCP in progress, covers this corridor. Need to coordinate with San Gorgonio Creek corridor in Riverside County MSHCP.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Remove ORVs, maintain underpass in road improvement projects.

5. Provide brief description of the linkage:

Major Habitat Types: Desert wash – creosote bush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Private, BLM, FS, Morongo Indian Reservation, San Bernardino and Riverside County Flood Control

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Interstate 10

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Several underpasses (two large, many small). Bridge on San Gorgonio Creek under Interstate 10.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Purchase it.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: Both San Gorgonio and Whitewater are critical, San Gorgonio Creek is critical desert/coastal linkage that connects San Bernardino Mountains and San Jacinto Mountains.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Coachella Valley Preserve
Ecoregion: Mojave/Sonoran
Map Name/ID#: 2

Key contact for this linkage (optional) Cameron Barrows
Telephone #: 760/343-1234
Email: cbarrows@cnlm.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other Process linkage

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Critical sand source linkage, bobcat, kit foxes

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1] Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Key component of Coachella Valley MSHCP

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Everything still intact.

5. Provide brief description of the linkage:

Major Habitat Types: Creosote bush scrub, desert dunes, desert washes

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Proposed urbanization plans

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Broad, open alluvial fan.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Purchase it – how to determine minimum corridor width?

9. What scientific documentation is available demonstrating the value of the linkage? Sand source identification (3 studies), plus recent satellite imagery that highlights sand movement corridors.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Shavers Valley
Ecoregion: Mojave/Sonoran
Map Name/ID#: 3

Key contact for this linkage (optional) Cameron Barrows
Telephone #:
Email: cbarrows@cnlm.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Desert tortoise

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Proposed development	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 [4] 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)]
1 willing land sellers
part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Coachella Valley MSHCP

What are the most important restoration needs (describe types of habitat, degree of restoration needed): None

5. Provide brief description of the linkage:

Major Habitat Types: Desert wash, creosote bush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Private, BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Interstate 10 (existing), proposed development

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Freeway underpasses

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Corridor width?

9. What scientific documentation is available demonstrating the value of the linkage? Tortoise surveys.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Algodones Dune System
Ecoregion: Mojave/Sonoran
Map Name/ID#: 4

Key contact for this linkage (optional) Ray Bransfield
Telephone #: 805/644-1766
Email: ray_bransfield@r1.fws.gov

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

flat-tailed horned lizard, Colorado Desert fringe-toed lizard, sensitive plants (Pierson's milkvetch, sand food, other Algodones Dunes spp.)

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Land ownership is generally not a problem. Bridges could be built across the AA Canal, but INS would oppose that or want to fence then, I'd guess.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Bridges with natural substrates across AAC. Bridges/culverts over I-8. Wildlife passage through INS fences.

5. Provide brief description of the linkage:

Major Habitat Types: Algondones Dunes, creosote bush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM; Bureau of Reclamation; possibly Imperial Irrigation District, CalTrans for I-8.

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Linear obstructions – I-8 (4 lanes) and All American Canal (100-125 feet wide).

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): I-8 maybe culverts, AAC – four drop structures could provide crossings; they are not evenly spaced. Fences across the drop structures preclude wildlife movement.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Where would additional structures be useful? Existing drop structures are all east of Algodones Dunes. How can you design a wildlife crossing acceptable to INS?

9. What scientific documentation is available demonstrating the value of the linkage? General conservation principles

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Algodones Sand Source
Ecoregion: Mojave/Sonoran
Map Name/ID#: 5

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Historic sand source (Salton Sink)

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Agriculture	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): None

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Sand dunes, creosote bush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Existing agriculture

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): None

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? Published research ID this as the historic sand source.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Peninsula Borrego Link
Ecoregion: Mojave/Sonoran
Map Name/ID#: 6

Key contact for this linkage (optional) Dave Van Cleve
Telephone #: 760/767-4037
Email: bigwavedave@statepark.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Connect Anza Borrego with Cuyamaca State Parks. Pacific Crest Trail access – S. Emigrant Trail portions. Bighorn, least Bell's vireo (51 territories), mountain lion, mule deer.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Cattle Grazing	4
Potential for Home Sites/Development	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency) 1
] willing land sellers
part of formal conservation plan (which one)

Other opportunities and details (or information from check items): State Parks (Colorado Desert District) needs funding to buy from five willing sellers (5 ranches). Project sponsored by Anza Borrego Foundation and general public.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Removal of cattle, removal of tamarisk from Vallecito Ranch, removal of fencing. Excellent connectivity between Anza Borrego and the Peninsular Range. Excellent opportunity to restore habitat of Peninsular bighorn sheep and least Bell's vireo.

5. Provide brief description of the linkage:

Major Habitat Types: Peninsular Range to Colorado Desert includes wet meadows, pine-oak woodland, chaparral, desert riparian, cottonwood-sycamore and mesquite bosque. Uplands include Cuyamaca Lake meadow, pine-oak woodland. Desert includes riparian woodland, mesquite bosque and two year round streams.

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural, Ag, Rural Residential

Major landowners: Five properties: Ben Tulloch (Tulloch Ranch), Donald Daley (Mason Valley), Lawrence Daley (Lucky 5), Norman Kannof (Vallecito), Tom and Marylou Edwards (San Felipe Ranch).

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Ranch fences, cattle grazing, two county roads (S-1 and S-2), exotic plants (Tamarisk at Vallecito Ranch precluding bighorn access)

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Two year round streams, large drainages linking Peninsular Range with Anza Borrego Desert. Contiguous habitat, but need uniform ownership to secure in conservation management for future.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Enhance two water sources on Vallecito Ranch to provide access for bighorn. Eliminate Tamarisk from San Felipe Ranch for Bell's vireo.

9. What scientific documentation is available demonstrating the value of the linkage? Recovery Plan for Bighorn of Peninsular Ranges (USFWS).

10. Other information: Contact Paul or Mark Jorgensen at Colorado Desert District 760/767-4037.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Border I-8
Ecoregion: Mojave/Sonoran
Map Name/ID#: 7

Key contact for this linkage (optional) Paul Jorgensen
Telephone #: 760/767-5311
Email: pjorgensen@stateparks.org

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Road (I-8)	4
Illegal Immigrants/Border Patrol	5
Urbanization	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Coordination with CalTrans and Border Patrol, State Parks and SANDAG.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Limit human activity. Corridors over and under freeway, management of natural water source (Carrizo Creek).

5. Provide brief description of the linkage:

Major Habitat Types: Desert scrub, riparian, chaparral, juniper, rocky outcrops

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Rural residential, natural vegetation, Ag (grazing).

Major landowners: State Parks, BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): I-8 (road), human disturbance (illegal immigrants and border patrol), urbanization.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): There are some underpasses but no known use.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): All of the above.

9. What scientific documentation is available demonstrating the value of the linkage? South of I-8 is historic habitat. USFWS , 1999. Draft Recovery Plan for Bighorn Sheep in the Peninsular Ranges, Portland, Oregon.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Morango Valley
Ecoregion: Mojave/Sonoran
Map Name/ID#: 8

Key contact for this linkage (optional) Cam Barrows
Telephone #:
Email: cbarrows@cnlm.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

deer, bighorn sheep, predators

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Highway	4
Urbanization	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

None.

5. Provide brief description of the linkage:

Major Habitat Types: creosote bush scrub desert wash

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway overpass, potential ranch development

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): overpass

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document wildlife use.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: East West Imperial Coachella Valley
Ecoregion: Mojave/Sonoran
Map Name/ID#: 9

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Blow sand source, fringe-toed lizard, desert tortoise, Peninsular bighorn, mountain lion, desert mule deer

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5
Agriculture	4
Roadways	3
OHVs Recreation	4
Wind Turbines	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Draft HCP, possible mitigation for proposed development projects.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Removal of exotics; wildlife crossings under roads and across canals; restoration of blow sand source process.

5. Provide brief description of the linkage:

Major Habitat Types: desert scrub (Mojave/Sonoran), riparian, springs, blow sand areas (sand dunes)

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Islands of natural vegetation, urban and Ag.

Major landowners: BLM, Private, Coachella Valley Mission Indians

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Urban development, roads, railroad tracks, canal

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Any washes, riparian corridors; narrow strips of remnant habitat.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Land ownership information; locations of known species populations and telemetry studies of their movements.

9. What scientific documentation is available demonstrating the value of the linkage? Bighorn sheep and desert mule deer populations exist in Chocolate Mountains and area connecting these populations with those west of the linkage would enrich genetic diversity of those species.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: North Santa Rosa – San Jacinto
Ecoregion: Mojave/Sonoran
Map Name/ID#: 10

Key contact for this linkage (optional) Esther Rubin
Telephone #: 760/751-8981
Email: esrubin@ucdavis.edu

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

bighorn sheep, bears, lions, deer, tortoise

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5
Roads/fragment	4
Human Disturbance	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	]	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: BLM , State (F & G), Coachella Valley Mountains Conservancy. Part of formal conservation plans: Coachella Valley MSHCP, Recovery Plan for Bighorn Sheep of Peninsular Ranges. New National Monument – Santa Rosa Mountains.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Land acquisition, exotic plant control and management of water sources.

5. Provide brief description of the linkage:

Major Habitat Types: desert scrub, palm oasis, desert wah, pinyon-pine/juniper woodlands, chaparral, mixed conifer

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag, Rural Residential

Major landowners: Private, BLM, Forest Service, University of California, Indian Reservation, State Fish and Game

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Rural residential, golf course/resort, roadways

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): continual habitat coverage

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? Coachella Valley MSHCP, Recovery Plan for Bighorn Sheep (see #7 for reference).

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: East Chocolate – Colorado River
Ecoregion: Mojave/Sonoran
Map Name/ID#: 11

Key contact for this linkage (optional) Mark Jorgensen
Telephone #: 760/767-4962
Email: bighorn@statepark.org

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Nelson's bighorn sheep, desert mule deer, desert tortoise

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Gold Mining/Gravel Pits	4
Highway Expansion	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: BLM/Private mix. Connection between Chocolate Mountains and E. Chocolate Mountains/Picacho Peak needs to be maintained and enhanced.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Mesquite Gold Mine open pit and protection of corridor from any future mining activities.

5. Provide brief description of the linkage:

Major Habitat Types: Microphyll woodland, creosote scrub, ironwood and desert willow forest, palo verde/smoke tree wash

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: BLM, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 78 and potential expansion of gold mining and gravel mining on BLM or private land

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Open desert washes, mountain masses adjacent on both sides of this corridor.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? Nancy Andrews Master's Thesis on Desert Bighorn of Chocolate Mountains. BLM Plans on Tortoise and Bighorn.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: San Gabriels - Tehachapis
Ecoregion: Mojave/Sonoran
Map Name/ID#: 12

Key contact for this linkage (optional) Ray Bransfield
Telephone #: 805/644-1766
Email: ray_bransfield@r1.fws.gov

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

general wildlife corridor

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Agriculture	4
Private Lands/Human Disturbance	3
Urbanization	4 (maybe more in the long term)

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Potential agency acquisition: CDFG, CDPR. Part of West Mojave conservation plan. Potential to link through some state properties.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Old Ag to native. Extensive in some areas.

5. Provide brief description of the linkage:

Major Habitat Types: Joshua tree/Juniper woodland; creosote scrub; saltbush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag, Rural Residential

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Private lands, agriculture, future development. One big issue: what would they link to on the north? This is Tejon land (or other private), with development in the future likely.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Some existing CDPR and CDFG lands.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Investigate the feasibility of acquisition or conservation easements or zoning . Investigate what is to the north.

9. What scientific documentation is available demonstrating the value of the linkage? West Mojave Plan documents

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Big Rock Creek
Ecoregion: Mojave/Sonroan
Map Name/ID#: 13

Key contact for this linkage (optional) Ray Bransfield
Telephone #: 805/644-1766
Email: ray_bransfield@r1.fws.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Riparian corridor/sand source to Saddleback Butte State Park. Mojave Desert fringe-toed lizard

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5
Flood Control	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: CDFG, Flood Control, FEMA. FEMA and Flood Control may be interested in using hazard mitigation funds to remove need for future flood control or flood damage. Part of West Mojave Plan.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Not sure. Ask Larry LaPre. Maybe some agriculture.

5. Provide brief description of the linkage:

Major Habitat Types: Riparian; wash; sand dune; creosote scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag

Major landowners: Private; CDPR

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Future land development. The "bridge" at Highway 138. It needs to be enlarged when road is fixed/widened.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Mostly open habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Land ownership

9. What scientific documentation is available demonstrating the value of the linkage? West Mojave Plan documents

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: 395 S. of Ridgecrest
Ecoregion: Mojave/Sonoran
Map Name/ID#: 14

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Desert tortoise. State Highway near future realignment, widening

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
State Highway	4 (past history of highway mortality in this area)

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from BLM, CalTrans

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Desert tortoise fencing, undercrossings for tortoise and other wildlife.

5. Provide brief description of the linkage:

Major Habitat Types: creosote scrub, Joshua tree

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): State Highway

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): drainage culverts, bridges

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): All of the above.

9. What scientific documentation is available demonstrating the value of the linkage? DWMA, Desert Tortoise Recovery Plan, Ground Squirrel and other West Mojave Coordinated land documents.

10. Other information: Increased impacts to corridor upon realignment widening of Route 395 and Route 58

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Summit Valley
Ecoregion: Mojave/Sonoran
Map Name/ID#: 15

Key contact for this linkage (optional) Ruben Ramirez
Telephone #: 949/753-7001
Email: rsramirez@earthlink.net

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Federally endangered arroyo toad, large mammal movement corridor, listed migratory bird habitat (least Bell's vireo, southwestern willow flycatcher), also Peregrine falcon and bald eagle. Drainage connections (Cajon Wash, Horsethief Canyon, Little Horsethief Canyon, West Fork Mojave).

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Proposed Development	5
Exotic flora/fauna	4
Recreational Activity	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)] willing land sellers
] Agency acquisition (which agency)] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: USFS; willing seller: Summit Valley Ranch; part of Habitat Conservation Plan

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Horsethief Canyon – extensive exotic species presence, beaver degrading riparian habitat. West Fork Mojave – unnatural water releases from Silverwood Reservoir degrading riparian habitat and breeding success of arroyo toad.

5. Provide brief description of the linkage:

Major Habitat Types: cottonwood-sycamore riparian, Great Basin scrub, chamise chaparral, Joshua tree, juniper woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Currently natural vegetation

Major landowners: USFS, private inholdings, Summit Valley Ranch Group, Ranch Los Flores Limited Partnership

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Currently roadways (2 lane) represent only barrier.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Riparian habitat, dirt road, continual habitat coverage

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Natural history of key species, movement patterns, territory size, habitat usage.

9. What scientific documentation is available demonstrating the value of the linkage? N/A specific to this linkage

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Mojave River – Barstow/Camp Cody
Ecoregion: Mojave/Sonoran
Map Name/ID#: 16

Key contact for this linkage: R. Bransfield, L. LaPre, B. Jones
Telephone #: 805/644-1766
Email: ray_bransfield@r1.fws.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Sand to Kelso Dunes. Water along riparian areas, as far as Afton Canyon. Arroyo toad, least Bell's vireo, willow flycatcher, riparian birds.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization (encroachment, water pumping)	5
Exotic Plants (tamarisk, giant reed)	2
Flood Control	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: FEMA, Flood Control, CalTrans, CDFG. Part of West Mojave conservation plan. Mojave River adjudication; West Mojave Plan funds.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Exotic plant removal; ensuring stream flow; preventing encroachment into the flood plain

5. Provide brief description of the linkage:

Major Habitat Types: riparian, wash, mesquite

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Private, some CDFG and BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Lack of water.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Water, riparian habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): How much water do we need? Where is the best place to insert water? Cowbird control and acquisition of flood plain.

9. What scientific documentation is available demonstrating the value of the linkage? Mojave River Forks Dam Bio Report (if you need a copy contact me). West Mojave Plan documents. Ask Becky Jones (CDFG).

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Hwy 58 from 395 – through WMP DWMA
Ecoregion: Mojave/Sonoran
Map Name/ID#: 17

Key contact for this linkage (optional) Ray Bransfield
Telephone #:
Email: ray_bransfield@r1.fws.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Desert tortoise and other ground-dwellers

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Highway	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

]	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	]	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Local support from CalTrans and BLM. Part of West Mojave plan. Fencing and culverts can be installed with future widening.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Culverts, bridges and fences.

5. Provide brief description of the linkage:

Major Habitat Types: Salt bush and creosote scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM, CalTrans

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Desert tortoise die on the road. Fencing can preclude linkage, need bridges.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Some existing culverts.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): What culverts/bridges work best?

9. What scientific documentation is available demonstrating the value of the linkage? Contact Bill Boarman, BRD (909)697-5200. He did most work on this area. For documents, Ed LaRue, BLM (760/249-4948), probably has all of Bill's publications.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Clark Mountain
Ecoregion: Mojave/Sonoran
Map Name/ID#: 17

Key contact for this linkage (optional) Jim Thorne
Telephone #: 530/752-4389
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Tortoise, bighorn sheep

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Interstate 15	4
Toxic Mine	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): EPA clean up site for mine.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Tortoise fence, underpass development (existing).

5. Provide brief description of the linkage:

Major Habitat Types: white fir, creosote bush scrub, Joshua tree woodland, limestone outcrops

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: Park Service, BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Freeway - 15

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): waterway

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Evaluate wash bridges as dispersal vectors.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information: Clark Mountain to Baker – good tortoise habitat exists. Arroyo wash underpass exist just need to put up fences.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Mesquite – Kingston Mountains
Ecoregion: Mojave/Sonoran
Map Name/ID#: 18

Key contact for this linkage (optional) Jim Thorne
Telephone #: 530/752-4389
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Landscape level connection between major mountain islands. Key species: bighorn, mountain lion, bobcat, coyote, white fir, endemic *Nolima parryi.*

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Development	1
Roads	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Open vegetation, over-grazed

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): undeveloped

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: I-15 Soda Mountains
Ecoregion: Mojave/Sonoran
Map Name/ID#: 19

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Desert tortoise, bighorn

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Freeway	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): The freeway from this point east to Baker is a source of mortality for tortoise. Fences and developed wash underpasses needed.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Rolling vegetation, mountain side vegetation – creosote bush scrub, dry washes (bajada)

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Freeway

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): wash underpasses

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Slurian Hills – Arawatz Mountain
Ecoregion: Mojave/Sonoran
Map Name/ID#: 20

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Large valley - good tortoise habitat. Road issues, but expansion of Ft. Irwin much bigger threat.

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5

No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Military Base Expansion	5
Road	2.5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5

Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Depending on if expansion can be stopped.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: large valley between mountains good tortoise habitat

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Road (moderate), military (potentially huge)

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Soda –Arawatz Mountains
Ecoregion: Mojave/Sonoran
Map Name/ID#: 21

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

bighorn, coyote, mountain lion

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Possible Ft. Irwin Expansion	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Narrow valley between two mountain ranges , little traveled by humans yet.

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Danger of Ft. Irwin expanding.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Mojave Preserve Unit
Ecoregion: Mojave/Sonoran
Map Name/ID#: 22

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Freeway blocks both tortoise and bighorn.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Freeway	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Use underpass washes for corridors.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM, NPS

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Freeway

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Cody Mountain Potential Core Area
Ecoregion: Mojave/Sonoran
Map Name/ID#: 23

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Potential expansion of Mojave Preserve. Bighorn, tortoise, coyote, possibly mountain lion

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Ranching	1

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): BLM lands ranched. Good wash vegetation for wildlife habitat.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Closing road to east, restrict road access west.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography):

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Bristol Mountain - MACAGCI
Ecoregion: Mojave/Sonoran
Map Name/ID#: 24

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Desert tortoise, bighorn

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Freeway	4
Private lands	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): I-40 passes between mountains, blocking dispersal. Same issues as I-15, but lower level of traffic.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Underpass development at washes.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Ag, some rural urban

Major landowners: BLM, private mix, military base

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Freeways – I-40 and 15

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): waterway

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Clipper Mtn – Old Woman Mtn.
Ecoregion: Mojave/Sonoran
Map Name/ID#: 25

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Freeway blocks tortoise and bighorn sheep

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Freeway	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Some as 24, but no private lands.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Develop wash underpasses as dispersal corridors.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Freeways – I-40 and I-15

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): wash

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Piute Valley – East-West
Ecoregion: Mojave/Sonoran
Map Name/ID#: 26

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Bighorn sheep

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Ranching	3
Roads	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Extensively used as ranching, but good habitat none the less.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Establishing some EW corridor with no ranching.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM, some private, ranch easements, some housing

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): A few small roads and non-native animals generally degrading linkage from mountains on either side (EW).

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Dry waterways.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Joshua Tree
Ecoregion: Mojave/Sonoran
Map Name/ID#: 27

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Fragmentation of lands in valley east of 29 Palms. Excellent wildflower location, corridor and Sheep Hole Mountains, Bullion Mountains on the north from Joshua Tree National Park on south of valley.

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Urbanization	5
Roads	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Stopping expansion of 29 Palms east (forcing urban build-in) and protecting wildflowers/dispersal N-S.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Road decommission of non-essential dirt roads.

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, Urban

Major landowners: BLM, Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Expanding urbanization and roads.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Open areas still open – strips of remnant habitat.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Granite Mtns. – San Bernardino Mtns.
Ecoregion: Mojave/Sonoran
Map Name/ID#: 28

Key contact for this linkage (optional) Larry LaPre
Telephone #: 909/697-5218
Email: llapre@ca.blm.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Bighorn sheep

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | [4] | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | [3] Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: BLM , CDFG. Part of West Mojave Plan. Hold Zoning at large lots; acquisition; conservation easements.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Not sure.

5. Provide brief description of the linkage:

Major Habitat Types: Joshua tree woodland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Ag, Natural Vegetation, Rural Residential.

Major landowners: Private

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Ag fields, some houses, at least one fairly busy road.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Mostly open, not too many houses.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Existing zoning needs to be refined.

9. What scientific documentation is available demonstrating the value of the linkage? West Mojave Plan documents.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Slate Range Crossing
Ecoregion: Mojave/Sonoran
Map Name/ID#: 29

Key contact for this linkage (optional) Larry LaPre
Phone #: 909/697-5218
Email: llapre@ca.blm.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Bighorn sheep on both sides

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Highway	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): This linkage is not specifically addressed by West Mojave Plan or Northeast Mojave Plan.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Under/overpass

5. Provide brief description of the linkage:

Major Habitat Types: mixed Mojave woody scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): roadways

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): none

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): All of the above

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Emigrant Pass
Ecoregion: Mojave/Sonoran
Map Name/ID#: 30

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Roadway	1

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Within Death Valley National Park

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Safe wildlife crossing.

5. Provide brief description of the linkage:

Major Habitat Types: creosote bush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: National Park Service

Other: Top of pass

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadway

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Unknown

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document impacts to wildlife (e.g. road kill).

9. What scientific documentation is available demonstrating the value of the linkage? Death Valley Natural Resources Mgt Plan

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Freeman Junction
Ecoregion: Mojave/Sonoran
Map Name/ID#: 31

Key contact for this linkage (optional) Larry LaPre
Telephone #: 909/697-5218
Email: llapre@ca.blm.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Connects two mountain ranges for variety of species.

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Highway 14	4 (busy)
California Aqueduct	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Overpass needed.

5. Provide brief description of the linkage:

Major Habitat Types: creosote bush, foothills vegetation

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 14, big aqueduct

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): None.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage, design it, monitor it.

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Sierra - Coso
Ecoregion: Mojave/Sonoran
Map Name/ID#: 32

Key contact for this linkage (optional) Larry LaPre
Telephone #:
Email: llapre@ca.blm.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

deer, bighorn sheep (ghost), mountain lion

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)
Highway 395	4
2 Aqueducts	4 (barrier)

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Military may be opportunity to establish/protect linkage.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): over/underpass

5. Provide brief description of the linkage:

Major Habitat Types: creosote scrub, fairly pristine

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation, lava flow

Major landowners: China Lake, BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Aqueducts, Highway 395

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): None yet.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Resting Springs
Ecoregion: Mojave/Sonoran
Map Name/ID#: 33

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Mountain pass

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Roadway	1

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Goody opportunity but low priority.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Unknown

5. Provide brief description of the linkage:

Major Habitat Types: creosote bush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadway

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Unknown

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Documentation of wildlife crossing impacts – road kill

9. What scientific documentation is available demonstrating the value of the linkage? Unknown

10. Other information: This choke-point identified by map only. No one had personal knowledge of this site.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Poison Canyon
Ecoregion: Mojave/Sonoran
Map Name/ID#: 34

Key contact for this linkage (optional) L. LaPre
Telephone #: 909/697-5218
Email: llapre@ca.blm.gov

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Drainage between hills

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Roadway	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
1	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): BLM ownership

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Wildlife crossings – culverts.

5. Provide brief description of the linkage:

Major Habitat Types: saltbush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Mostly natural.

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roadway.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Unknown

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage.

9. What scientific documentation is available demonstrating the value of the linkage? Unknown

10. Other information: Water pipeline in canyon may be an additional barrier.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: East & West Searles Valley
Ecoregion: Mojave/Sonoran
Map Name/ID#: 35 & 36

Key contact for this linkage (optional)
Telephone #:
email:

1. Linkage Type (check one)

]	Landscape Linkage (East)	1	Connectivity Choke-Point
]	Missing Link (West)	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Desert tortoise, Mojave ground squirrel

3. Score the overall degree of threat to connectivity function (circle one):

1	2 East	3	4	5 West
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Urbanization/Development (West)	4

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2 West	3	4	5 East
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Military (East)

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Remove dumps and abandoned buildings (West)

5. Provide brief description of the linkage:

Major Habitat Types: creosote bush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: BLM and military (East), some privately owned (west

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Development

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): semi-continual habitat coverage

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Owens Lake
Ecoregion: Mojave/Sonoran
Map Name/ID#: 37

Key contact for this linkage: Michael Prather, Vern
Telephone #: Sierra Audubon
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
]	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Migratory stop-over for birds

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Lack of water/habitat conversion	5

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: State. Good opportunity for partial restoration; already plan to shallow flood key areas.

What are the most important restoration needs (describe types of habitat, degree of restoration needed): Increase flooded areas.

5. Provide brief description of the linkage:

Major Habitat Types: Alkali sink now, historically was navigable waterway, wetland

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): One remnant portion of a riparian area, degraded but they've rediverted water back. Mostly desolate.

Major landowners: State

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Lack of water and suitable habitat

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Limited number of springs (@ 10 ac)

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): To design it.

9. What scientific documentation is available demonstrating the value of the linkage? Great Basin Unified Air Pollution Control District EIR for PM10 emissions and dust abatement.

10. Other information: Ownes Valley/Lake wasn't really covered on our maps. There is an obvious need for linkages across the Owens Valley between the Sierra Nevada and Inyo Mountains, as well as between Inyo and White Mountains. Check with Sierra ecoregion maps

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Armagosa River
Ecoregion: Mojave/Sonoran
Map Name/ID#: 38

Key contact for this linkage (optional) Barstow BLM
Telephone #:
email:

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Riverbed, riverway

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Off-Road Use	3
Exotic Species	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 [4] 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who) 1 willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items):

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Habitat restoration – tamarisk removal.

5. Provide brief description of the linkage:

Major Habitat Types: wash, creosote bush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): exotics - tamarisk

Major landowners: BLM, Private – D.V.N. Park

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): loss of habitat, ORV's, exotic plants

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): wash, waterway

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage, purchase it.

9. What scientific documentation is available demonstrating the value of the linkage? BLM documents

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Dumont Dunes Panamint Dunes
Ecoregion: Mojave/Sonoran
Map Name/ID#: 39 & 40

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

1	Landscape Linkage	1	Connectivity Choke-Point
1	Missing Link	]	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Sand source for dune system

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: BLM

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Assess OHB threat and address if necessary.

5. Provide brief description of the linkage:

Major Habitat Types: sand dunes

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): OHV activity?

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage and threats to linkage.

9. What scientific documentation is available demonstrating the value of the linkage? Death Valley Natural Resources Management Plan (Panimint Dunes), Northeast Mojave Ecosystem Plan (Dumont Dunes)

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Darwin Falls
Ecoregion: Mojave/Sonoran
Map Name/ID#: 41

Key contact for this linkage (optional)
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
] Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Key links between Inyo and southern ranges

3. Score the overall degree of threat to connectivity function (circle one):

1 No threat/secure | 2 | 3 Moderate threat | 4 | 5 Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	Severity: 1 (Not severe) – 5 (Extremely Severe)

4. Score the feasibility of linkage as a conservation priority (circle one):

1 Not feasible | 2 | 3 Moderate Opportunity | 4 | 5 Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
] Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: BLM, Death Valley Nation Park

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types:

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Roads, Darwin Hills Development.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): semi-contiguous habitat

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage, design it.

9. What scientific documentation is available demonstrating the value of the linkage? BLM ACEC Plan

10. Other information: Not necessarily threatened now, but should be maintained as a linkage.

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Avawatz Mountains – Silurian Hills
Ecoregion: Mojave/Sonoran
Map Name/ID#: 42

Key contact for this linkage (optional) Larry LaPre
Telephone #: 909/697-5218
Email: llapre@ca.blm.gov

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Bighorn sheep

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Roadway – Highway 127	3
Expansion of Fort Irwin	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 [5]
Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)
1 willing land sellers
1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): BLM ownership

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Safe Bighorn crossing over highway

5. Provide brief description of the linkage:

Major Habitat Types: creosote bush scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Highway 127

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Short distance

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document Bighorn sheep use.

9. What scientific documentation is available demonstrating the value of the linkage? CDFG Bighorn metapopulation model

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Kingston - Nopah
Ecoregion: Mojave/Sonoran
Map Name/ID#: 43

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage 1 Connectivity Choke-Point
1 Missing Link 1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5
No threat/secure Moderate threat Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Lack of Protection (Kingston Core Area)	3
OHV at edges	3
Mining	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 [3] 4 5
Not feasible Moderate Opportunity Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who) 1 willing land sellers
] Agency acquisition (which agency) 1 part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Agency acquisition: BLM

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

Lack of protection for core area in Kingston Mountains,

5. Provide brief description of the linkage:

Major Habitat Types: creosote bush scrub between mountains, pinyon-juniper woodland on peaks

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): None

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage.

9. What scientific documentation is available demonstrating the value of the linkage? UC Santa Cruz, Biology of Kinston Mtns.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Kingston - Mesquite
Ecoregion: Mojave/Sonoran
Map Name/ID#: 44

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jthorne@ucdavis.edu

1. Linkage Type (check one)

1	Landscape Linkage	]	Connectivity Choke-Point
1	Missing Link	1	Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Birds, deer, lions

3. Score the overall degree of threat to connectivity function (circle one):

1	2	3	4	5
No threat/secure		Moderate threat		Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Development	2
ORV's	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1	2	3	4	5
Not feasible		Moderate Opportunity		Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1	Local support (who)	1	willing land sellers
]	Agency acquisition (which agency)	1	part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Already under BLM

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: creosote scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential): Natural Vegetation

Major landowners: BLM

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Not many yet.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): Continual habitat coverage.

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Document use of linkage, evaluate its success.

9. What scientific documentation is available demonstrating the value of the linkage? UCSC – Biology of Kingston Range

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Mesquite to Clark
Ecoregion: Mojave/Sonoran
Map Name/ID#: 45

Key contact for this linkage (optional) Jim Thorne
Telephone #:
Email: jhthorne@ucdavis.edu

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Birds, deer, lions

3. Score the overall degree of threat to connectivity function (circle one):

1 2 [3] 4 5

No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**
Power-line corridor	2
Road	3

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 [3] 4 5

Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

1 Local support (who)
1 Agency acquisition (which agency)]
1 willing land sellers
part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Part of Mojave National Preserve Management Plan.

BLM to North NPS to South.

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: pinyon-juniper woodlands, creosote scrub

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners: BLM, NPS

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Powerline and dirt road

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges): none

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.):

9. What scientific documentation is available demonstrating the value of the linkage? BLM and NPS Management Plans for region.

10. Other information:

Linkage Description Log

(One for each mapped linkage)

Linkage Name: Whitewater River
Ecoregion: Mojave/Sonoran
Map Name/ID#: 46

Key contact for this linkage (optional) Cam Barrows
Telephone #:
Email:

1. Linkage Type (check one)

] Landscape Linkage
1 Missing Link
1 Connectivity Choke-Point
1 Other

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

Birds, carnivores – sand movement

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5

No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plan invasion) and score the severity of each threat (fill in chart):

Type of Threat	**Severity: 1 (Not severe) – 5 (Extremely Severe)**

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5

Not feasible — Moderate Opportunity — Good Opportunity

What opportunities exist to establish/protect linkage (Check all that apply, explain below):

] Local support (who)
] Agency acquisition (which agency)
] willing land sellers
] part of formal conservation plan (which one)

Other opportunities and details (or information from check items): Part of Coachella Valley Habitat Conservation Plan

What are the most important restoration needs (describe types of habitat, degree of restoration needed):

5. Provide brief description of the linkage:

Major Habitat Types: Sand dunes

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural Residential):

Major landowners:

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex: roadway, linear obstructions, gaps in habitat cover [how big], topography): Suburban development blocks sand transport.

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. Waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges):

8. Briefly, what are the most important information/research needs? (ex. To document use of linkage, to design it, to evaluate its success, to purchase it, etc.): Sand sources and transport corridors

9. What scientific documentation is available demonstrating the value of the linkage?

10. Other information:

APPENDIX A
CONFERENCE AGENDA

Missing Linkages:
Restoring Connectivity to the California Landscape

San Diego Zoo, San Diego, California

8:30	Check-in at Otto Center
9:00	Welcome - Dr. Alan Dixson, Center for Reproduction of Endangered Species
9:10	Dr. Michael Soulé – Is Connectivity Necessary?
9:30	Dr. Paul Beier – Documenting the Conservation Value of Corridors
9:50	Dr. Kevin Crooks – Goals of the Missing Linkages Conference
10:00	Walk to Tree Tops
	BREAK-OUT SESSION BY ECOREGION
10:25	Introductions - name, affiliation, area of expertise: specific geographic area, knowledge of particular species, etc.
	Discussion of focal species/processes for ecoregion
	Begin identification and mapping of linkages
12:00	LUNCH
1:00	Continue identification and mapping of linkages
3:30	Work with other ecoregion teams to identify connections to adjacent ecoregions
4:45	Turn-in linkage maps and description forms
5:00	Summary Remarks & Next Steps
5:30	Adjourn

APPENDIX B
IDENTIFYING THE LINKAGES

LINKAGE DESCRIPTION LOG

General Information

Linkage name - name of linkage

One naming option is to label the linkage by the core areas, protected areas, or mountain ranges that the linkage in intended to connect. For example, a linkage intended to connect the Santa Ana and Palomar Mountains would be "Santa Ana - Palomar"

Ecoregion(s) - name of ecoregion

Map Name/ID NO. - number of linkage as labeled on map

Key contact information for this linkage - participant most knowledgeable of this particular linkage

Specific Information

1) Linkage Type - Landscape linkage, Choke-Point, Missing Link

Below are definitions of each linkage type. We recognize that these labels fall within a continuum of linkage types, from large, relatively intact connections to highly constricted choke-points. The purpose of this question is simply to provide a qualitative classification of the type of linkage.

1. **Landscape linkage** = Large, regional connections between habitat blocks ("core areas") meant to facilitate animal movements and other essential flows between different sections of the landscape (taken from Soulé and Terborgh 1999). These linkages are not necessarily constricted (yet), but are essential to maintain connectivity function in the ecoregion. These may include habitat linkages, riparian corridors, etc.

2. **Connectivity choke-point** = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas"). Choke-points are essential to maintain landscape-level connectivity, but are particularly in danger of losing connectivity function. An example of a connectivity choke-point is a narrow peninsula of habitat, surrounded by a human-dominated matrix, that connects larger habitat blocks. Another example would be an underpass under a major roadway that is critical to allow animal movement between habitat blocks.

3. **Missing link** = A highly impacted area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function. For example, a missing link might be a critical section of a major highway that bisects two large habitat blocks but that is currently impermeable to animal movement.

2) Species or ecological process considered

List the key focal species/ecological processes used to identify this linkage.

All focal species that might use this linkage should not be listed. Rather, list the key (or unique) species that were used to identify this linkage and that would be indicative of its connectivity.

3) Threat to connectivity function

Intended to provide a relative, qualitative score of the immediacy of the overall threat to connectivity function, and the identity and severity of the most important threat/s.

4) Feasibility of conservation opportunity

Intended to provide a relative, qualitative score of opportunities for conservation/management at this linkage. For example, if funding is available for on-the-ground corridor or connectivity projects, how important/feasible/effective would be funding directed at this particular linkage?

Is there local support, willing land sellers, an agency interested in acquisition, a formal conservation plan to protect the linkage?

Is the linkage in need of restoration to restore connectivity function? How?

5) Provide a brief description of the linkage -

What types of habitats (riparian, coastal sage, etc.) are present within the linkage?

What types of land cover (eg. natural vegetation, cropland/irrigated agricultural, low density residential, etc.) are within and immediately adjacent to the linkage?

Describe land ownership patterns (public/private) within and adjacent to the linkage area.

6) Significant impediments/barriers -

Identify primary barriers to movement that are impediments to wildlife movement. Be as specific as possible.

7) Existing features that facilitate animal movement within linkage

For example, waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges.

8) Information & research needs -

For example, document use of linkage, design linkage, evaluate its success, purchase it.

9) Scientific documentation

What studies exist to demonstrate the use of the linkage? Provide any citations or anecdotal evidence for any field studies conducted on this particular linkage.

EXPECTED FINAL PRODUCT AT END OF BREAKOUT SESSION

1) Map with primary linkages in ecoregion labeled

2) For each linkage, a completed description form

Linkage Description Log

(One for each mapped linkage)

Linkage Name: _____ Key contact for this linkage optional)_____
Ecoregion(s): _____Telephone #:_____
Map Name/ID #:_____
Email:_____

1. Linkage Type (Check one)

Landscape Linkage — Connectivity Choke-Point
Missing Link — Other_____

2. What are the key species or ecological processes that were used to identify the linkage and that are indicative of its connectivity:

3. Score the overall degree of threat to connectivity function (circle one):

1 2 3 4 5
No threat/secure — Moderate threat — Severe threat/loss imminent

Identify the most important threat/s to connectivity function (e.g. urbanization, agriculture, roadways, exotic plant invasion) and score the severity of each threat (Fill in chart):

Type of Threat	Severity: 1 (Not severe) - 5 (Extremely Severe)
Urbanization	4
Exotic Plants	2

4. Score the feasibility of linkage as a conservation priority (circle one):

1 2 3 4 5
Not feasible — Moderate opportunity — Good opportunity

What opportunities exist to establish/protect linkage? (Check all that apply, explain below)

local support (who) — willing land sellers
agency acquisition (which agency) (which) — part of formal conservation plan

Other opportunities and details, (or information from check items):_____

_____

What (if any) are the most important restoration needs (describe types of habitat, degree of restoration needed:_____

_____

_____

5. Provide brief description of the linkage:

Major Habitat Types: _____

Major Land Cover Types (e.g. Natural Vegetation, Urban, Ag, Rural, Residential): _____

_____

Major landowners:

_____

Other:

6. Briefly, what are the most significant impediments/barriers to animal movement within linkage area? (ex.: roadway, linear obstructions, gaps in habitat cover [how big?], topography).

7. Briefly, what existing features facilitate animal movement through linkage area? (ex. waterway, riparian habitat, dirt road, continual habitat coverage, underpasses/bridges)

8. Briefly, what are the most important information/research needs? (ex. to document use of linkage, to design it, to evaluate its success, to purchase it, etc.)

9. What scientific documentation is available demonstrating value of linkage?

10. Other information:

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APPENDIX D
STATEWIDE ANALYSIS

The statewide analysis was conducted using the database generated from the linkage log sheets completed by participants. Four major categories were used in the analysis: conservation opportunity, target species, overall threat, and existing documentation.

Conservation Opportunity

Conference participants ranked the overall feasibility of each linkage as a conservation priority, from one to five, with one being not feasible, and five being a good opportunity. Participants also identified if there was local support, willing sellers, potential for agency acquisition, and if the linkage was part of a formal conservation plan. One point was given for each populated field (local support, etc); this was summed with the numerical score given for the overall feasibility of the linkage as a conservation priority. The distribution of *Opportunity* was then normalized with quantile breaks and three classification fields, such that: 0 - 4 = 1 or low, 5 – 6 = 2 or medium, and 8 – 9 = 3 or high. An example of how *Opportunities* were calculated is provided in the following table:

Priority	4
Local support	X
Agency support	X
Willing sellers	
Formal plan	X
Opportunity	***7***

Target Species/Process

Conference participants listed key species and/or ecological processes indicative of connectivity to identify the linkages. This information was categorized by taxon and ecological process in the database as follows: carnivores, mammals, birds, fish, herps, and process. One point was given for each populated field (birds, etc.); populated carnivore fields received an extra point because of their function as umbrella species. The distribution of was then normalized with quantile breaks and three classification fields, such that: 0 – 2 = 1 or low, 3 = 2 or medium, and 4 - 5 = 3 or high. An example of how *Targets* were calculated is provided in the following table:

Carnivores	XX
Mammals	X
Birds	
Fish	X
Herps	X
Process	Sand source
Species/Process	***6***

Overall Threat

Conference participants scored the overall degree of threat to connectivity function for each linkage. This was represented by the Threat field in the statewide database. The distribution was then normalized with quantile breaks and three classification fields, such that: 0 – 3 = 1 or low, 4 = 2 or medium, and 5 = 3 or high.

Existing Documentation (Certainty)

Conference participants were asked to cite any scientific documentation available demonstrating the value of each linkage. If a formal study was referenced for the linkage then it received three points.

Final Priority Rank

The final priority rank was calculated by adding up all previous rank fields, such that:

Final Priority Rank = Opportunity_Rank + Targets_Rank +Threat_Rank +Certainty_Rank

Final priority ranks were classified into high = 10 –12, medium = 7 – 9, and low = ≤ 6 .

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APPENDIX F
GLOSSARY OF TERMS

Alpine rocky screes – a mantle of rock fragments created through the movement of water, ice, and snow, at high altitudes above timberline

Bajadas – an arroyo; a streambed that is usually dry

Biodiversity – biological diversity, or the sum of all living things native to a particular area or region

Choke-point – a narrow, impacted or otherwise tenuous habitat linkage connecting two or more habitat blocks ("core areas"). Choke-points are essential to maintain landscape-level connectivity, but are particularly in danger of losing connectivity function.

Clearcuts – to cut a forested area completely; a timber-cutting methodology that leaves no standing trees

Connectivity – habitat linkage that connects to or more larger habitat areas; may be a Landscape Linkage, Choke-Point, Missing Link, or other defined linkage type

Conservation Easement – private landowners sell an easement over a portion of, or all of their land to a land trust or other appropriate public agency that restricts certain types of land use; the easement must have a conservation purpose to be deductible for both income and estate taxes

Conservation opportunity – a subjective, qualitative score (rank = one through five) of the feasibility or opportunity of conserving the linkage

Core areas – extensive areas of habitat without paved roads; the majority of core areas lie on publicly owned land

Corridors – connectivity zones, wildlife movement corridors, habitat linkages; corridors connect two or more larger core areas

Culverts - a concrete or metal conduit, that passes under a road, highway, railroad track, etc.

Ecoregional – belonging to a particular ecoregion or region

Emergent vegetation – vegetation that rises unexpectedly from water in wetland habitats

Exotic species – species that are not native to an area; may cause extreme disruptions to natural communities and native species

Extirpated – locally extinct

Flow regime – may be natural stream flow with periodic flood events or altered stream flow in highly managed situations (e.g. controlled water release from dams)

Forbs – herbaceous plants

Fuel breaks – the removal of flammable, often native, vegetation from around structures; County Fire Departments specify the aerial extent that must be cleared

Habitat conversion – the conversion of habitat from a natural state to other land uses

Habitat patches – areas of natural habitat, of varying sizes, surrounded by non-natural conditions

Headwaters – the beginning of a large stream or river

Hydrological – the distribution and cycle of surface and underground water

Inholdings – parcels of privately owned land surrounded by publicly owned land

Insufficient flow – water flow not sufficient to sustain target species

Key species – species indicative of habitat connectivity or habitat quality

Landscape linkage – large, regional connections between habitat blocks ("core areas") meant to facilitate animal movement and other essential flows between different sections of a landscape (taken from Soulé and Terborgh 1999). These linkages are not necessarily constricted, but are essential to maintain connectivity function in the ecoregion.

Linkages – may be Landscape Linkages, Choke-Points, Missing Links, or other participant defined linkage

Listed species – plant and animal species listed as threatened or endangered under the federal or state Endangered Species Acts

Mesic – plants or habitats that require moisture for sustenance

Missing Link – a highly impacted area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function.

Natural disturbance regime – allowing natural disturbances (fire, floods, etc.) to occur as an ecological process necessary for community regeneration

Neotropical migrant- species that migrate with the change of seasons to the biogeographic realm that includes South America, the West Indies, Central America, and tropical Mexico

Obligate – limited to a certain habitat type or ecological condition

Old growth forest – very old forests that have not been logged; closed-canopy conditions

Range management – the management of land open to grazing by domestic livestock

Recovery linkage – participant defined linkage, habitat linkage returning to natural state

Relict habitat linkage – participant defined linkage, remnant of native habitat

Remnant habitat – relic or remaining patch of native habitat

River down-cutting – a timber harvesting methodology that logs trees from the slopes surrounding rivers and streams causing increased sedimentation and erosion

Salmonid – fish of the suborder Salmoniformes; includes salmons, trouts, and most smelts

Sand source linkage – a linkage that promotes movement of sand from a source to a destination; an ecological process

Serpentine geology – geological substrate or soil composed of magnesium silicate

Stepping-stones – scattered habitat patches connecting two or more, larger habitat areas

Stewardship zones – designated as privately owned land with high habitat value

Subpopulation – division of a larger population; subpopulations long-term persistence often dependent on occasional influx of genes from neighboring populations

Threat – participants defined threats to habitat connectivity, existing threats, such as a road or highway, or impending threats, such as a proposed development

Understory – plants that occupy the lower strata in a plant community

Urban matrix – urban or non-natural land uses surrounding native habitat areas or linkages

Vegetation zones – vegetation changes with different physical gradients (elevation, geologic, etc.)

Water impoundments – a dam or something that retains water

Watershed – a ridge dividing the areas drained by different river systems

Xeric – plants or habitat types typical of dry, desert type conditions