Overview of State Characteristics

Population

The population of Nevada grew by 66 percent during the 1990's, indicating many people find the Silver State to be a desirable place to live, work, and enjoy vast open spaces. In 2000, the state's population surpassed the two million mark (Table 1-1). Migration contributed to about 81percent of the growth. The rate of growth in Nevada (51%) was the highest among all states (Nevada State Demographer's Office, 2000). The state's population rank rose from 39 in 1990 to 35 in 2000. Neighboring states are growing rapidly also. By comparison, during the 1990's, the population of Arizona increased by 40 percent, Utah by 30, Idaho by 28 and Oregon by 20 percent. The population of California increased 14 percent, approaching 34 million in 2000 (U.S. Census Bureau, 2000a). By 2015, the population of Nevada and neighboring states is projected to increase from 48 million to 55 million (U.S. Census Bureau, 2000b).

Table 1-1. Population Change in Nevada from 1990 to 2000 and Projected Change to 2010

Population Rank	% State Population	County	Population		Population Change 1990 to 2000		Projected Change 2000 to 2010	
2000	2000		2000	1990	Number	%	Increase	%
1	68.8	Clark	1,375,765	741,459	634,306	86	484,230	35
2	17.0	Washoe	339,486	254,667	84,819	33	66,792	20
3	2.6	Carson City	52,457	40,443	12,014	30	10,895	21
4	2.3	Elko	45,291	33,530	11,761	35	9,535	21
5	2.1	Douglas	41,259	27,637	13,622	49	18,122	44
6	1.7	Lyon	34,501	20,001	14,500	72	14,840	43
7	1.6	Nye	32,485	17,781	14,704	83	24,967	77
8	1.2	Churchill	23,982	17,938	6,044	34	10,737	45
9	0.81	Humboldt	16,106	12,844	3,262	25	1,888	12
10	0.46	White Pine	9,181	9,264	-83	-1	-2,775	-30
11	0.33	Pershing	6,693	4,336	2,357	54	3,080	46
12	0.29	Lander	5,794	6,266	-472	-8	400	7
13	0.25	Mineral	5,071	6,475	-1,404	-22	-604	-12
14	0.21	Lincoln	4,165	3,775	390	10	30	1
15	0.17	Storey	3,399	2,526	873	35	989	29
16	0.08	Eureka	1,651	1,547	104	7	193	12
17	0.05	Esmeralda	971	1,344	-373	-28	145	15
		Nevada	**1,998,257**	**1,201,833**	**796,424**	**66.3**	**643,874**	**32.2**

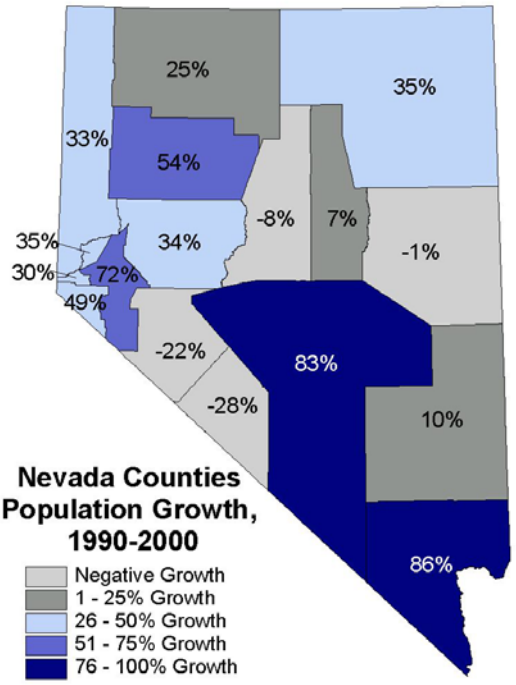
Sources: 1. U.S. Census Bureau, Census 2000 Redistricting Data (P.L. 94-171) Summary File, Table PL1, and 1990 Census. (Http://www.census.gov/population/projections/state/stpjpop.txt). 2. State Demographer's Office, *Nevada County Population Projections 2000 to 2010*. June 2000.

Nevada has become highly urbanized, meaning most people live within a few metropolitan areas. The average population density of the entire state is 18 persons per square mile, but nearly 86 percent reside in major population centers within Clark (69%) and Washoe (17%) counties. Of the five largest cities, three are located in Clark County (i.e., Las Vegas, Henderson, and North Las Vegas) and the others are in Washoe County (i.e., Reno and Sparks). Urbanization is no longer confined just to these cities. In western and southern Nevada, regional-scale urbanization has emerged. The urbanizing western region encompasses southern Washoe, Carson City, Douglas, Lyon, and Storey counties, with a combined population of about 470,000 in 1999. In the south, the regional scope of urbanization encompasses Clark County and southern Nye and Lincoln counties. Population exceeds 1.4 million in the southern region. In the urban regions, and some rural areas, more residential, commercial, industrial, and public service developments are being built outside "urban" boundaries. Urban sprawl expands the "urban/wildland interface," adding to environmental pressures and placing more demands on state resource agencies.

Urban (or suburban) sprawl is difficult to quantify. It can be described as a development cycle that starts with subdivisions built outside urban boundaries and ends with a blanket of residential and commercial buildings. In fast growing areas, consideration of systematically conserving open space for important ecological functions and socioeconomic values may be an afterthought. Eventually floodplain, wildlife habitat, or forest patches may be retained, often as parks, but a piecemeal approach relinquishes many of the natural values. From a long-run socioeconomic viewpoint, sprawl is an inefficient consumption of land and raises costs of municipal and utility services. Negative consequences of sprawl place greater demand on state and local agencies to mitigate additional issues, such as air and water quality deterioration; wildfire threats at the urban/wildland interface; fragmentation of wildlife habitat; threats to vulnerable plant and animal species; over-development of floodplains; loss of wetlands and riparian resources; and loss of public land access. More urban and suburban communities in are taking interest in retaining and improving management of open space and prime agricultural land, indicating the importance of this issue in our owing state.

A large number of rural communities are spread throughout the state's valleys and mountains. Even the state's four "urban" counties (i.e., Carson City, Clark, Douglas, and Washoe) contain large rural areas. The population density of rural Nevada is about 1.4 persons per square mile. Towns are widely spaced, connected to land and water resources suitable for farming, ranching, mining, and military installations. Rural county growth rates fluctuate, often a response to national or global economic factors that depress precious metals production. Rural communities with a strong agricultural base are more resilient. Seven rural counties grew 25 percent or more and the population in four counties declined during the 1990's (Figure 1-1). Two counties, Esmeralda and Mineral, experienced population losses greater than 20 percent (U.S. Census Bureau, 2000c). Supplies of high quality water are limited and mining has been the leading employer in both. Increasingly, rural area resources will be sought to meet urban area needs for water supply, waste disposal sites, and industries with large pollutant discharges, and outdoor recreation.

Figure 1-1. Nevada Counties Population Growth, 1990 – 2000.



Source: U.S. Census Bureau. Census 2000.

The Nevada State Demographer's Office projects the statewide annual growth rate will average 2.6 percent from 2002 to 2010, essentially adding another city each year the size of Carson City. By 2010, the state's population is anticipated to increase by another 644,000. Counties projected to grow an average of three percent or more each year are Douglas, Nye,

Lyon, Churchill, and Pershing. Clark County is expected to add about 484,000 more residents by 2010, and Washoe County about 67,000. Combined, these two counties account for 86 percent of the projected growth over the first decade of the new millennium (Nevada State Demographer's Office, 2000). The projections suggest the factors that made Nevada the most urbanized state will continue to strongly influence where people and businesses move here. Region-wide urbanization will challenge local governments and resource management agencies to coordinate their individual efforts to assess and mitigate the variety of ways growth can impact limited and valuable resources.

Economy

During the 1990's, Nevada's economy grew dramatically, as indicated by an increase in the labor force of 320,000 workers. As of January 2001, industrial employment (defined as number of jobs by place of work) stood at just over 1 million. Most jobs are in the service sector (about 43 percent) followed by wholesale and retail trade, government, construction, and manufacturing. In rural Nevada, government, mining, and agriculture dominate local economies. In metropolitan areas of Las Vegas and Reno, tourism drives the hotel gaming and recreation sectors. Over 30 million tourists visit the state each year.

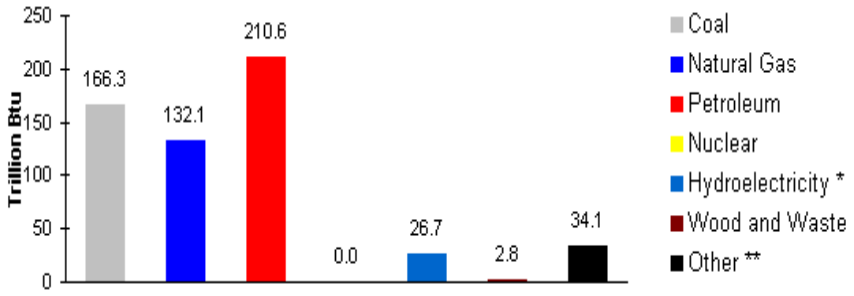
Nevada's tourism based economy has proven vulnerable to down turns in the national economy. Over the past year for example, hotel, gaming, and recreation employment, has grown less than one percent. Visitor counts in Reno and Las Vegas have also flattened as the gross gaming win has averaged little or no growth. The overall reduction in gaming activity can be expected to linger as long as the U.S. and global economies continue to struggle and California's high energy prices impact discretionary income. The growing number of gaming establishments on tribal lands in California also is expected to affect Nevada gaming and associated tourism revenues. While Nevada's overall economy remains robust, changes in the national economy will continue to affect tourism in Nevada.

Total output from the primary natural resource based industries increased, but not in proportion to the gross state product, which doubled to $63.044 billion from 1990 to 1998. Overall agricultural productivity rose 41 percent to $444 million. However, the farm production component fell 3 percent to $142 million. Mining productivity (i.e., metal, nonmetallic, and oil and gas extraction) grew $100 million during the same period to $1.529 billion. Despite the downturn in gold prices and drop in mining activity, almost all of the mining productivity increase was due to metals mining. Oil and gas productivity declined $31 million. The proportionate contribution from the agriculture and mining industries to the state total economy declined from 5.3 percent in 1990 to 3.1 percent in 1998 (U.S. Bureau of Economic Analysis, 2000).

Energy

Energy use involves fuel choices and consumption habits that affect air, water, and land resources in many ways. The state relies on a mix of all major types of energy resources, except nuclear power. Most of the energy consumed comes from the combustion of coal, natural gas, and oil (Figure 1-2). About 7 percent comes from non-fossil fuel sources, primarily hydropower and geothermal resources. In 2000, Nevada geothermal plants generated about 1.3 million mega-watt hours of electricity. Oil is the

Figure 1-2. Primary Energy (Btu) Consumed in Nevada by Source, 1997



Source. U.S. Energy Information Administration website: www.eia.doe.gov
*May not include net imported electricity from this source.
**Geothermal, wind, photovoltaic, and solar.

Nevada's oil production in 2000 was 620,651 barrels (0.01% of U.S. total), down from the 1992 high of 1.86 million barrels. Year 2000 production came from 99 wells located in Nye and Eureka Counties. About 1 million acres is under federal oil and gas leases in Nevada. This typical scene of a pump jack at an oil well is located in Pine Valley, Eureka County. 1990. Photo by Jon Price.

only fossil fuel extracted from Nevada's geologic resources. Recent yearly oil production ranged from 1.86 million in 1992 to 0.62 million barrels in 2000 (Nevada Bureau of Mines and Geology, 2001).

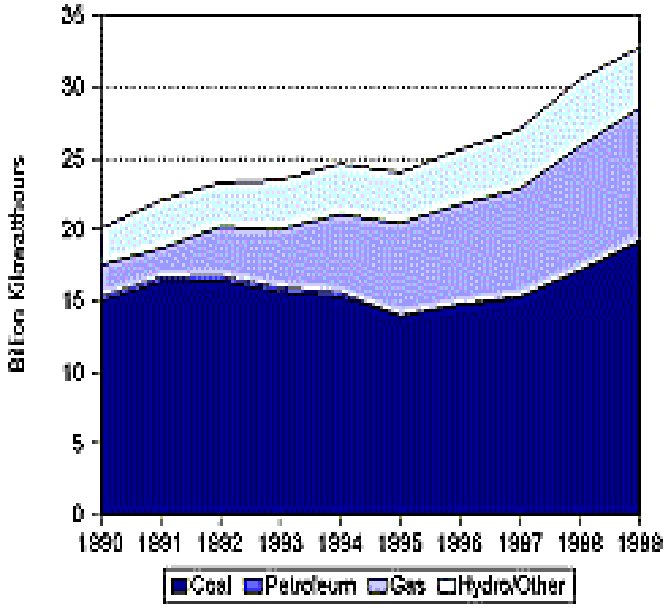
Total state energy consumption in 1997 was 572.6 trillion British thermal units (Btu), increasing 41% between 1991 and 1997, closely following the rate of population growth. Per capita energy consumption basically remained unchanged, fluctuating between 328 and 346 million Btu during the period. The use of energy per Nevada resident is close to the national average of 352 million Btu per person. By comparison, in the late 1970's per capita consumption ranged from 377 to 391 million Btu (U.S. Energy Information Agency, 1999b). Statewide, overall energy efficiency improved only slightly since the 1970's. Little, if any, gains in efficiency were made during the 1990s.

Electric Power

Generation of electricity in Nevada requires enormous inputs of fossil fuels, all imported. In 1997, 7.261 million short tons of coal, 52 billion cubic feet of natural gas, and 69 thousand barrels of oil were burned at power plants in Nevada. The primary generating fuel is coal. The state's geologic formations yield small quantities of crude oil, a smaller amount of natural gas coincident with oil production, and no coal. However, Nevada has enormous reservoirs of renewable energy (e.g., solar, wind, and geothermal), of which only a small fraction has been tapped. Fossil fuel fired plants make up 90 percent of the electric generating capacity in Nevada.

The total electric generating capacity of power plants in Nevada is about 6,400 megawatts (MW). Figure 1-3 shows the amount of fuel types used to generate electricity at Nevada power plants during the 1990's. Petroleum makes up a small fraction of fuel used to produce power. Though the coal-fired capacity (2,806 MW) makes up 40 percent of the total generating capacity, 67 percent of the fuel burned was coal in 1997 (U.S. Energy Information Agency, 2000). Natural gas is gradually becoming a larger part of the fuel mix (22 percent), replacing oil combustion at dual fueled plants. Lower air pollutant emissions are one reason for higher natural gas use, especially at generating stations within and nearby

Figure 1-3. Nevada Utility Generation of Electricity by Primary Energy Source, 1988-1998



Source. U.S. Energy Information Administration, 2000. Internet address: www.eia.doe.gov

Table1-2. Types of Generation Plants Proposed for Construction in Nevada, 2002

Generation Type		Capacity (MW)	Percent of Total
Combined Cycle (fossil)		9,321	91.3
Peaking	fossil	130	1.3
	hydro	400	3.9
Wind		350	3.4
Geothermal		12	0.1
TOTAL		10,213	100.0

Source: Nevada Public Utility Commission, 2002.
Internet address: http://puc.state.nv.us/electric/

urban areas with impaired air quality. Natural gas fired technologies consume less water than other fossil-fuel options.

Many power projects have been proposed in Nevada to meet growing electricity demand in Nevada and other western states. The Public Utilities Commission of Nevada (PUCN) has received applications to construct 19 new generating facilities, all but two in the southern region. Most of the proposed plants are natural gas fired (Table 1-2). The additional units may place cumulative, long-term stress on water resources, aquatic ecosystems, air quality, and wildlife habitat. Only 3.5 percent of the additional capacity would use renewable resources that could avoid or minimize water consumption and other resource issues. If in the coming years Nevada is to host a number of new fossil-fueled power plants, there is a need to study the potential cumulative, long term effects on the affected environment and resources, so appropriate conservation strategies can be evaluated and implemented should the need arise.

The State's Utility Environmental Protection Act (NRS 704.825) requires environmental review by the Nevada Division Environmental Protection (NDEP) of individual power proposals. The Nevada Division of Water Resources (NDWR) reviews applications for appropriation of water and for changes in the point of diversion, place of use, or manner of use. The NDWR has authority to approve, conditionally approve, or deny applications using criteria that may include related environmental concerns. In 2001, the Governor's Nevada Electric Energy Policy Committee acknowledging concern about competition for the state's scarce water resources, advised that preference should be given to air-cooled plants, sites with access to reclaimed water, or sites where water is more abundant, perhaps in other geographic areas (Public Utility Commission of Nevada, 2001).

Steam plumes rising from cooling towers, boiler stacks, and cooling pond at Tracy Generating Station east of Sparks. Huge volumes of water are used to operate steam electric power plants. New power plants using air-cooled and hybrid-cooling towers can reduce cooling water use by 98%, conserving the state's limited water and protecting aquatic ecosystems. Photo © Mark Savage 2000.

Transportation Fuels

Transportation related energy use makes up about 31 percent of the state total. Population and economic growth corresponds to more vehicles and more miles driven. The Nevada Department of Transportation estimates that vehicle miles traveled grew 65 percent from 1990 to 1997. During this period, the national corporate average fuel economy (CAFÉ – measured in average miles per gallon) for autos and light trucks decreased slightly. Overall vehicle fuel efficiency also dropped, in part because of increasing use of sport utility vehicles. The combination of a rapid increase in the number of people driving more miles in less-efficient vehicles drives pollutant emissions upward. Rapid growth and sprawling development patterns can result in a backlog of road construction projects, exacerbating

congestion and urban air quality concerns. The Clark County Department of Comprehensive Planning estimates that vehicle emissions are the principal cause for episodes of unhealthful carbon monoxide levels in Las Vegas Valley (Nevada State Energy Office, 2000).

The use of alternative transportation fuels increased slightly from 1990 to 1997. However, in Clark County, natural gas used to operate vehicles rose 55 percent, from 1.068 to 1.650 million gallons equivalent between 1996 and 2001 (Nevada Division of Environmental Protection, 2002). The inventory of alternative fueled vehicles operated in Nevada grew substantially to 3,719 in 1999 (U.S. Energy Information Agency, 1999a). In Clark County, the number of natural gas vehicles increased from 362 in 1993 to 2,200 in 2001. Alternative fueled vehicles include those fueled with liquefied petroleum gas (544), natural gas (3,702), ethanol (78), and electric power (25) (U.S. Energy Information Administration, 2000b). The larger number of alternative fueled vehicles does not correspond well with data on the use of alternative vehicle fuels, suggesting conventional gasoline fuel is used in dual-fueled vehicles.

Renewable Energy

The State Energy Office and the National Renewable Energy Lab ranks Nevada as one of the best areas in the country for solar electric and solar thermal power as well as substantial wind and geothermal energy potential. Geothermal and hydropower plants provide all of the renewable energy generated in Nevada today. Fourteen geothermal power plants have been built since the mid-1980's, with a combined capacity of 236 MW's (3.7 percent share of total in-state capacity). The primary hydroelectric resource is the Nevada share of power produced from the Colorado River at Hoover, Parker and Davis dams (about 417 megawatts). Six hydropower units run on seasonal Truckee River diversions west of Reno and near Lahontan Reservoir. Hydropower provides 6.8 percent of the state's total capacity.

The projected shortfall in the western region's electric generating capacity produced very modest interest in developing renewable resources in Nevada. Of the additional 10,200 MW of generating capacity that electric power companies proposed in 2000 and 2001 to the Nevada Public Utility Commission, only 3.5 percent would expand use of renewable resources (350 MW wind, 12 MW geothermal). Small-scale solar photovoltaic use for residential, small commercial and public facilities has increased in recent years.

The legislature has enacted two statutes encouraging renewable energy use and development. The "net metering" program enables utility rate payers to earn credits that lower their power bill proportionate to the electricity generated by small, grid connected solar or wind generators. The "renewable portfolio standard" requires Nevada's electric utilities to generate or acquire a minimum of 5 percent of electricity sold to retail customers from renewable energy systems in 2003 and 2004, and increases the standard by 2 percent biennially to 15 percent by 2013.

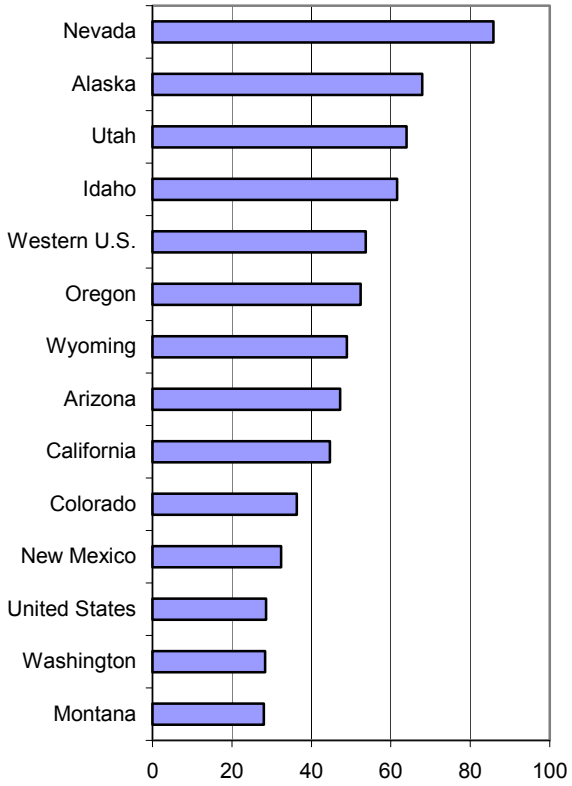
Land and Management Status

Land Status

Nevada's borders enclose about 70,745,600 acres, making it the seventh largest state. The federal government controls 60,863,345 acres, or 86.1 percent of the land (Table 1-3). Of the remaining 13.9 percent (or 9,882,250 acres), 11.5 percent is privately owned, 1.6 percent tribal, 0.4 percent local, and 0.4 percent state government owned. On a percentage basis, Nevada has more federal land than any other state (Figure 1-4). Tribal land is not federally owned, but is held in trust by the federal government for the tribes. Federal land status by county is shown in Figure 1-5. At least 90 percent of the land in Esmeralda, Lander, Lincoln, Nye, and White Pine counties is federally managed. Fifty percent or more of the land in each county is federally managed, except the two smallest (i.e., Storey and Carson City).

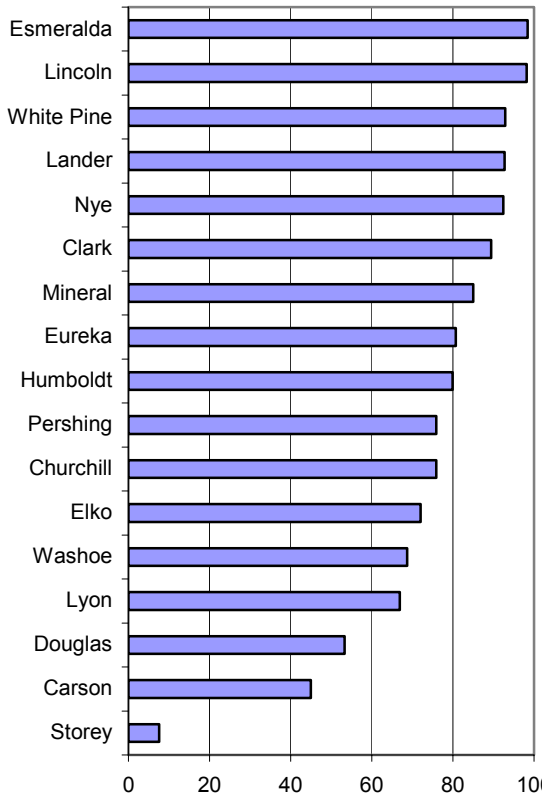
At the time of statehood in 1864, Nevada was granted 3.9 million acres, consisting of the 16th and 36th sections of each township. However, most of these sections of land were isolated from the state's 30,000 residents and were not surveyed. Under the Exchange Act of 1880, Congress agreed to let Nevada exchange its 3.9 million acres for 2 million acres selected by the state. Thus, Nevada relinquished about

Figure 1-4. Percent of Land Managed by Federal Agencies in Nevada and Other Western States



Source: Nevada data from NDSL, 2001. Others from BLM, 1993.

Figure 1-5. Percent of Land Managed by Federal Agencies in Each County



Source: NDSL estimate using data from various agencies, 2001.

half of the state grant land in order to select surveyed land and more desirable locations. The selected land generally was located near existing settlements and reliable surface water resources. Almost all state grant lands were patented to private landowners.

Additional private land for Nevada was obtained in the 1860's when the federal government granted the Central Pacific Railroad Company the odd numbered sections (each about one square mile) in a corridor extending twenty miles on each side of the railroad. This public land transfer totaled 5,086,683 acres, making this the primary source of private land in Nevada. The "checkerboard pattern" is evident on land status maps as a 40-mile wide corridor of alternating private and public sections of land that meanders from the eastern to the western borders of the state. The corridor straddles the Humboldt and Truckee rivers, and generally follows present day Interstate Highway 80. The checkerboard pattern of public and private land complicates land development and natural resource management. Development has been somewhat limited, favoring livestock grazing and farming. Several productive farm districts lie within the checkerboard lands.

There are approximately 8,182,000 acres of private land in Nevada today, an area close to the size of New Hampshire. Assuming all Nevada residents live on private land, the estimated population density is about 150 persons per square mile of private land. (New Hampshire's statewide population density is about 137 persons per square mile.) Data from the Nevada Department of Taxation indicate that local government entities (municipal, county, and schools) own approximately 264,600 acres (Nevada Department of Taxation, 2001).

Land ownership patterns in the state have changed little since 1985. Since then, the federal public land base and state owned land base increased about 0.2 and 0.1 percent, respectively (Table 1-3.) An

assumption in Table 1-3 values is that the federal land increase resulted in reduction of private land. Therefore, the decrease in private and local government owned land is calculated to be 0.3 percent, or about 212,000 acres.

Table1-3. Estimated Nevada Land Status, 1985 and Recent (1995/2000/2001)

Government Entity	1985		1995/2000/2001		Change in %
	Acres	% Of State	Acres	% Of State	
Federally Managed Land Total (a)	60,755,598	85.9	60,909,973	86.1	0.2
U.S. Department of Agriculture, Forest Service	5,149,684	7.3	5,805,129	8.2	
U.S. Department of Interior	51,183,400	72.4	50,786,530	71.8	
Fish & Wildlife Service	2,202,297	3.1	2,218,411	3.2	
Bureau of Indian Affairs	6,244	<0.1	3,982	<0.1	
Bureau of Land Management	48,281,508	68.3	47,701,393	67.4	
National Park Service	742,757	1.1	819,297	1.2	
Bureau of Reclamation	429,213	0.6	88,075	0.1	
U.S. Departments of Defense Total	3,115,874	4.4	3,297,057	4.7	
Air Force	2,896,954	4.1	2,903,606	4.1	
Army	155,266	0.2	152,659	0.2	
Navy	63,654	0.1	240,792	0.3	
U.S. Department of Energy	823,989	1.2	806,653	1.1	
Other Federal Agencies (b)	2,016	<0.1	2,000	<0.1	
Tribal Land Total (Held in Trust by Federal Government) (c)	1,152,672	1.6	1,161,685	1.6	<0.1
State Land Total (d)	199,528	0.3	273,861	0.4	0.1
University of Nevada & Community Colleges	-	-	24,990	<0.1	
Colorado River Commission	-	-	9,113	<0.1	
Nevada Department of Transportation	-	-	300	<0.1	
Division of State Lands (includes Divisions of State Parks and Wildlife)	-	-	239,458	0.3	
Local Government Land Total (e)	8,639,818	12.2	264,585	0.4	–0.3
Private Land Total (f)			8,137,496	11.5	
Statewide Total	**70,745,600**	**100**	**70,745,600**	**100**	

Notes: Acre values are most recent estimates from various sources. (a) BLM acres are from 9/2000 BLM estimate. Except recently updated Navy acres, all other federal values are from a 1995 BLM and Division of State Lands estimate using BLM Fiscal Year 1995 data, U.S. General Services Administration data, and other sources. (b) Other federal agencies include U.S. Geological Survey, Bureau of Mines, Postal Service, and others. (c) The 1985 value is from the *1983 Nevada Indian Commission Directory* and the most recent values are from *2001-2002 Nevada Indian Commission Directory.* (d) Division of State Lands. (e) *2000-01Statistical Analysis of the Roll*, Nevada Department of Taxation. (f) Private Land Total calculated as the difference between the Statewide Total and the sum of all other categories.

Two of the most significant single land ownership changes involve federal government transactions. In 1989, approximately 660,000 acres was transferred from the U.S. Bureau of Land Management (BLM) to the U.S. Forest Service (USFS) under the Nevada National Forest and BLM Enhancement Act. In 1985,

the Navy added 177,000 acres to the Fallon Naval Air Station land base to accommodate an expanded military mission. Today, land transactions are focused mainly on consolidating private and public lands to more effectively and prudently conserve, manage, and develop land and water resources. The level of activity involving public and private land sales and exchanges has intensified in recent years, primarily in and around cities and urbanizing towns.

The BLM, through the normal land disposal process (authorized by the federal Recreation and Public Purposes Act) and through a special process provided for in the Southern Nevada Public Land Management Act (SNPLMA) of 1998, has undertaken the most land transactions of any federal agency. In addition to the disposal (i.e., land sale and transfer to a nonfederal owner) of public land for development in Las Vegas Valley, the SNPLMA process involves acquisition of environmentally sensitive private parcels throughout the state.

Table 1-4. Recent and Pending BLM Land Transactions in Nevada

Location	Transaction	Acres
Clark County, Southern Nevada Public Land Management Act (SNPLMA)	Disposal	8,773
	Acquisition	914
Lincoln County and Northeast Clark County (Mesquite)*	Disposal	25,000
Nye County*	Disposal	400
Washoe and Storey Counties, Laborde Exchange	Disposal	731
	Acquisition	11,600
Ivanpah Airport, Clark County*	Disposal	6,200
Timbisha Homeland Transfer, Esmeralda and Nye Counties*	Transfer	5,800

Note: *Activities approved by Congress, 1999-2000 session, for implementation in the near future. Source: Nevada BLM, 2001.

Other federal agencies participating in the SNPLMA land acquisition process are the USFS, National Park Service (NPS), and Fish and Wildlife Service (FWS). State and local governments are participating as well by advising the federal agencies during the SNPLMA process. Recent and upcoming land transactions involving BLM are summarized in Table 1-4. The Federal Land Transaction Facilitation Act of 2000 is also expected to increase the amount of federal agency disposals and acquisitions in Nevada. The Act will create a new funding source and allow federal agencies to recover land transaction costs.

Land Management Status

All levels of government – federal, state, local, and tribal – are involved in the management of natural resources in Nevada. Each agency has statutory authorities that specify jurisdictions, and a range of responsibilities and duties. Intergovernmental coordination and cooperation is essential because watersheds, wildlife habitat, and many other natural features overlap political boundaries. State of Nevada policy promotes collaborative resource management planning and coordination with federal and local agencies.

Land Administered by Federal Agencies

The BLM and the USFS are the most prominent federal land management agencies in Nevada, managing about 68 percent and 8 percent of the state, respectively. Each agency prepares comprehensive resource management plans, and conducts environmental studies related to issuance of permits for mining, grazing, utility corridors, and other land use activities. The Humboldt-Toiyabe National Forest (HTNF) is the largest national forest in the country, outside of Alaska. About 92 percent of the HTNF land base is in Nevada. The remaining portion, which lies in California, consists of high elevation watersheds in the Sierra Nevada that are a major source of western Nevada water supplies.

The majority of BLM and USFS land in Nevada is managed under multiple use and sustained yield policies mandated by federal statutes. Multiple use requires federal agencies to manage the public lands and natural resources for a combination of diverse uses while balancing long-term needs for renewable and non-renewable resources, including recreation, rangeland, timber, minerals, watershed, and wildlife,

along with scenic, scientific, and cultural values. However, neither the courts nor government have interpreted implementation of the "multiple use" policy to require that all federal public land must simultaneously allow and be managed for all possible uses. Sustained yield means maintaining the continuous and productive output of the various renewable resources on the public lands consistent with the multiple use policy. In Nevada, the BLM and USFS manage multiple use lands for grazing, mining, timber harvesting, outdoor recreation, scientific study and ecological function. Resources that are receiving considerable attention in USFS forest plans and BLM resource management plans include wetland and riparian resources, wild horses, biodiversity, forage production, forest health, watershed conditions, wildlife habitat, motorized recreation, wildlife habitat, and noxious and invasive weeds.

A number of wilderness areas, national recreation areas, and other special management units have been established on BLM and USFS managed public lands (Table 1-5.). The special area designations are granted through Congressional or federal administrative actions. Specially designated areas are established to protect and preserve the ecological, natural, and cultural resources of specified areas. Grazing, mining, and other permitted activities existing at the time of the official designation often are allowed to continue.

Table 1-5. Special Designations on Federally Managed Resource Land in Nevada

Management Designation	Agency	Number of Management Units	Total Acres in Nevada	Created By
Wilderness Area	BLM	11	761,835	Act of Congress
	USFS	13	782,992	
Wilderness Study Area	BLM	102	4,344,600	Administrative Designation
	USFS	6	189,372	
Roadless Area	USFS	364	3,142,000	Administrative Designation
National Conservation Area	BLM	Black Rock Red Rock	795,200 196,000	Act of Congress
Areas of Critical Environmental Concern	BLM	30	1,139,267	Administrative Designation
National Trail	NPS BLM	California Trail Pony Express	475 miles 463 miles	Act of Congress
National Recreation Area	NPS	Lake Mead	709,129	Act of Congress
	USFS	Spring Mountain	316,000	
Research Natural Area	USFS	14	34,921	Administrative Designation
Lahontan Cutthroat Trout Natural Area	BLM	1	12,316	Administrative Designation
National Wildlife Refuges and Ranges	USFWS	9	2,200,000	Administrative Designation
National Parks*	NPS	3	110,168	Act of Congress
National Management Emphasis Area	USFS	Lake Tahoe Basin Management Unit	35,000	Act of Congress

Source: BLM, USFS, and National Park Service, 1999 and 2001.

The most recent wilderness area designation occurred in 2000, the result of a Congressional act creating the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area (NCA). The Act specifies protection and preservation for "historical, cultural, paleontological, scenic, scientific, biological, educational, wildlife, riparian, wilderness, endangered species and recreational values and resources associated with the Applegate-Lassen and Nobles Trails corridors and surrounding areas." The Act recognizes permitted livestock grazing as a use that is expected to continue in accordance with the management plan for the conservation area and other applicable laws and regulations. The BLM is preparing a new management plan for the NCA and ten wilderness areas that will review permitted grazing, mining, off-highway vehicle use, and other activities. The Act set aside approximately 815,000 acres as national conservation area and about 752,000 acres as wilderness area, of which approximately 380,000 acres are included in the NCA acreage (Bureau of Land Management, 2002).

Wilderness study areas (WSA's) cover 4.5 million acres. WSA's make up the largest category of specially designated public land in Nevada (Table 1-4). The newest category of management designation is the USFS Roadless Areas, potentially applicable to 3.1 million acres. Roadless area unit boundaries and management plans have yet to be established at the local forest district level. Inventoried roadless areas contain important environmental values that warrant protection, including drinking water sources, threatened and endangered species, biodiversity, dispersed outdoor recreation, barriers to the spread of noxious and invasive species, and scientific research. Until a forest-scale roads analysis is completed and incorporated into a forest plan, inventoried roadless areas shall, as a general rule, be managed to preserve roadless characteristics. However, the policy provides guidance on exceptions, in which case the decision to approve a road management activity or timber harvest is reserved to the Chief or the Regional Forester as provided (U.S. Forest Service, 2001).

The U.S. Fish and Wildlife Service (FWS) administers about 2.2 million acres of land that includes nine refuges and ranges and one fish hatchery. These public lands are set aside primarily for conservation of wildlife and habitat values and protection of threatened and endangered plant and animal species. Popular sites include the Sheldon National Wildlife Refuge (Antelope Range) and the Stillwater National Wildlife Complex in northwestern Nevada; Ruby Lake National Wildlife Refuge in eastern Nevada; Sheep Range Proposed Wilderness; and, the Ash Meadows Wildlife Refuge in southern Nevada, world renowned for its unique biological diversity (e.g., 24 plants and animals unique to the spring site).

Most national wildlife refuges and ranges are open for limited camping, fishing, hunting, boating, or other outdoor recreation uses that are compatible with the natural resources. The USFWS is the lead agency for implementation of the Endangered Species Act; preparation of recovery plans for threatened and endangered species (e.g., Lahontan cutthroat trout); and development of habitat conservation plans or agreements for sensitive species (e.g., the Clark County Multi-species Habitat Conservation Plan).

Land Administered by State Agencies

The Divisions of Wildlife, State Parks, and State Lands are the state agencies with primary authority for management of natural, outdoor recreation, or cultural resources on state-owned land. Other state agencies, also within the Department of Conservation and Natural Resources (DCNR), have resource management responsibilities on public and private land, such as air and water quality (Division of Environmental Protection – NDEP); water use and rights (Division of Water Resources – NDWR); forests and other native plants (Division of Forestry – NDF); fish and wildlife (Division of Wildlife – NDOW); plants and animals threatened with extinction (NDF and NDOW); mined-land reclamation (NDEP); and, cultural resources (State Historic Preservation Office – SHPO, Department of Cultural Affairs).

State land management agencies are mandated to manage resources according to multiple use and sustained yield principles, as defined by state law (NRS 321.0005). The NDOW manages 11 Wildlife Management Areas, for the maintenance and enhancement of fish and wildlife populations, diverse wetland and upland habitat, and wildlife-related outdoor recreation uses and facilities. The Division of State Parks (NDSP) is responsible for 24 state parks, water recreation areas, and historic parks and sites. State Parks contain boating access, campsites, and cultural resources, such as ancient marine fossils, petroglyphs, and settlement era forts, mills, and ranches. NDSP and NDOW prepare and update recreation and resource management plans for the parks and wildlife areas. In addition, NDOW prepares statewide management plans for certain game animals and fishes.

The Division of State Lands (NDSL) manages 500 parcels totaling 224 acres in the Lake Tahoe Basin as open space, emphasizing water quality improvement, wildlife habitat preservation, and forest health. The NDSL also manages 40,646 acres of "sovereign" land. Sovereign land consists of the river channels, lake bottoms, and shoreline areas below the "ordinary" high water marks of Lake Tahoe, Walker Lake, and the Truckee, Carson, Colorado, and Virgin rivers.

Land Administered by Tribes

Nevada includes 18 federally recognized Indian Tribes located throughout the state (Table 1-6). Prior to statehood, the Washoe, Paiute and Shoshone peoples occupied Nevada. Today, a relatively small amount of Nevada is reserved for the 18 tribes and their members. The amount of tribal acreage in Nevada is estimated at 1,161,865 acres. This amount is equivalent to 1.6 percent of the state's land area (Table 1-5) (Nevada Indian Commission, 2001a). The borders of many reservations overlap state or county borders, adding unique complexities to land administration efforts.

Table 1-6. Land Base of Nevada Tribes

Tribe	County	Total Tribal Land	Land in Nevada	Land in Adj. State	Comment
		Acres			
Duck Valley Shoshone Tribe	Elko	289,819	144,274	145,545	Portion in Idaho
Duckwater Shoshone Tribe	Nye	3,815	3,815		
Ely Shoshone Tribe	White Pine	111	111		
Fallon Paiute-Shoshone Tribe	Churchill	3,549	3,549		
Ft. McDermitt	Humboldt	35,488	16,660	18,829	Portion in Oregon
Fort Mojave Indian Tribe	Clark	34,998	3,998	31,000	Portion in California and in Arizona
Confederated Tribes of the Goshute Reservation	White Pine	108,933	70,489	38,444	Portion in Utah
Las Vegas Paiute Tribe	Clark	3,850	3,850		
Lovelock Paiute Tribe	Pershing	20	20		
Moapa Paiute Band	Clark	71,954	71,954		
Pyramid Lake Paiute Tribe	Washoe, Lyon, and Storey	475,000	475,000		Includes 112,000 acres of Pyramid Lake
Reno/Sparks Indian Colony	Washoe	1,978	1,978		
Summit Lake Paiute Tribe	Humboldt	10,098	10,098		Includes 560 acres of Summit Lake
Te-Moak Tribe of Western Shoshone Battle Mountain Band Elko Band South Fork Band Wells Band	 Lander Elko Elko Elko	16,636	16,636		Four Bands make up the Te-Moak Tribe: Battle Mountain, Elko, South Fork, and Wells
Timbisha Shoshone Tribe	Nye	7,454	5,500	1,954	Portion in California
Walker River Paiute Tribe	Churchill, Lyon	323,386	323,386		
Washoe Tribe of Nevada and California Carson Colony Dresslerville Colony Stewart Colony Woodsfords Colony	 Carson City Douglas Carson Alpine, CA	4,234	3,834	320 80	Four Colonies make up the Washoe Tribe: Carson, Dresslerville, and Stewart in Nevada; and, Woodsfords in California
Winnemucca Colony Council	Humboldt	340	340		
Yerington Paiute Tribe	Lyon	1,653	1,653		
Yomba Shoshone Tribe	Nye	4,718	4,718		
Total		1,398,036	1,161,865	236,171	

Source: modified from Nevada Directory of Native American Resources 2000/2001. Nevada Indian Commission.

Tribal lands are diverse and have been reduced from their original base located throughout Nevada. Tribal lands include: colonies, reservations, allotments, ranches, tribal fee land, federal land, government owned land, and trust lease lands. Tribal sovereignty encompasses lands within the exterior bounds of Tribal land held in trust by the federal government for Tribes and members. Tribal lands, colonies, and reservations are held in trust for the beneficial use of tribal members.

Native American culture with respect to land use management and protection often differs from the general populace. Indian people view their relationship to the land as one of stewardship. Their strong sense of protection over the land and its resources is inherent in the people and culture. Each generation is taught that their responsibility as a people is to guard over and protect "Mother Earth". Reservation community life is tied directly to the land tribal members occupy (Nevada Indian Commission, 2001b).

Mainly the tribes with a large land base engage in land use management plan development (i.e., the Pyramid Lake Paiute Tribe, Walker River Paiute Tribe, Duck Valley Shoshone Tribe, and the Washoe Tribe of Nevada and California). Many tribal master plans address natural resources and land use planning for residential and economic development on reservations. Historically, tribal and state agencies have had little interaction on resource plans. The primary reason is that tribal governments are sovereign and manage their own affairs. Tribal interactions on land use planning and resource management mostly involve the federal agencies having federal trust responsibilities (i.e., the Bureau of Indian Affairs, BLM, and USFS). In recent years awareness has grown that local, state, and federal land use and resource management decisions can impact tribal communities and tribal decisions can affect nearby communities.

Land Administered by Local Governments

Local governments play a major role in the conservation and development of natural resources on privately owned land and county and municipal controlled land. About 8.4 million acres of land in the state (12 percent) is owned privately or by local governments (Table 1-3). Local governments have the authority to establish master plans and regulate private land use activities through zoning. Master plans and zoning are land management tools that can be used to plan for the sustainable development of land, water, and other natural resources as communities develop. All of Nevada's 17 counties except Esmeralda, and all 18 incorporated cities, have adopted master plans that provide general guidance to land development and use activities.

Only the counties of Clark and Washoe are required by state law to prepare a master plan element that specifically addresses conservation of natural resources. In addition, Clark and Washoe counties each have created a state-mandated regional planning authority that considers the effects of growth and land development on environmental quality, water and energy use, outdoor recreation, wildlife habitat, and public land access. Other counties have the option of preparing resource conservation elements that establish environmental standards for land development and resource use. Several counties have prepared and adopted conservation plans for water conservation, open space preservation, stream corridor protection, as well as threatened, endangered and sensitive species conservation.

Counties also may directly participate in and influence land and resource planning and development on federal public land. Elko, Eureka, Lander, Lincoln, Lyon, Mineral, and White Pine counties have established Public Land Use Advisory Commissions for the purpose of participating in and influencing land and resource management plans and activities of federal agencies. Some counties have adopted a public land element as part of their master plan. Typically, public land policy plans articulate resource conservation and development policies supported by local citizens and county officials. Federal agencies preparing or updating resource management plans are required to be consistent with local government adopted policies. All of Nevada's counties have adopted Public Land Policy Plans or public land elements to the county master plan. Clark, White Pine, Humboldt, Lander, Esmeralda and Lincoln counties have updated their plans within the last five years.

Special districts that are political subdivisions of the State also may have substantial influence over land and resource management at the local level. Special districts include conservation districts, irrigation districts, water conservancy districts, and weed control districts. Special districts managed by elected

boards are empowered to levy fees for and implement environmental improvement projects. Districts may also conduct local resource planning and manage all or specified renewable natural resources within district boundaries in concert with private landowners.

Non-Governmental Organizations

A number of non-governmental organizations in Nevada prepare conservation plans, conduct resource inventories, construct environmental improvements, or acquire interest in conservation easements and environmentally sensitive land. Some of these organizations are The Nature Conservancy (TNC), Nevada Land Conservancy, Nevada Cattlemen's Association, Nevada Mining Association, Sierra Club, Nevada Association of Counties, Nevada League of Cities, Friends of Nevada Wilderness, and League to Save Lake Tahoe, Nevada Wilderness Project, American Land Conservancy, and the Audubon Society.

For example, TNC of Nevada recently completed "conservation blueprints" for the Great Basin and Mojave Desert ecoregions. Encompassing almost 80 percent of the Nevada land base, the resource plans identify 358 and 367 "portfolio sites," respectively. The goal is to enhance resource protection on the portfolio sites for the long-term survival of the diverse species and communities that characterize the ecoregions (The Nature Conservancy, 2000a and 2000b). TNC has also established about 7,700 acres of conservation easements on ranches in the Ruby and Carson valleys. In these cases, the landowners are compensated as an incentive to enhance conservation practices and forego new development while continuing agricultural operations. Some land trust organizations also acquire land and then convey it to another nonprofit organization or a government agency for permanent protection and stewardship.

Community and Citizen Stewardship

Throughout Nevada, citizens, conservation and industry organizations, government agencies, and public officials are working together to sustain and reclaim healthy environments. While a regulatory approach is appropriate to accomplish some environmental goals, more often we are relying on community cooperation and individual stewardship. Conservation districts and watershed planning groups are two examples of Nevadans taking strides toward sustainable development of renewable resources.

Natural resource planning activity has increased in recent years at each level of government. Most notable are the many collaborative planning processes established to seek solutions to contentious issues. Collaboration starts with willing participation by a full complement of government and citizen stakeholders that commit to cooperative work on finding equitable solutions for controversial resource issues. Collaboration produces solutions more likely to be implemented, rather than protested or litigated.

Over 60 natural resource planning and management projects are ongoing or will begin soon. In the past two years, the Governor's office initiated statewide collaborative planning projects for sage grouse conservation, noxious weed control, and wildfire management. One objective is to empower and support the role of county government or local organizations to take charge of site specific plan preparation and implementation. Examples of collaborative resource planning processes include the Nevada Sage Grouse Conservation Plan; Nevada's Coordinated Invasive Weed Strategy; Northeastern Nevada Stewardship Group; Great Basin Restoration Initiative; integrated natural resource planning at both the Nellis Air Force Range and Fallon Naval Air Station; Elk Management Plans; and, open space planning between the BLM, USFS, and western Nevada counties (Carson City, Douglas, and Washoe).

Conservation Districts

Statewide, there are 28 Conservation Districts (CDs) – locally led groups in rural and urban areas committed to proper management of renewable natural resources. Each CD prepares an annual and long-range work plan that identifies local resource management goals for the district. The CDs work closely with local offices of the federal Natural Resource Conservation Service (NRCS), which provide technical advice and professional services. Local watershed plans to improve water quality, enhance riparian areas, and control noxious weeds are developed and projects to improve wildlife, riparian, and

rangeland habitat implemented. Most CDs have implemented a noxious weed program. Cooperating with federal agencies, district members locate, map and control noxious weeds on private and public land. After the devastating wildfires of 1999 and 2000, the Paradise-Sonoma CD and the Nevada Division of Forestry (NDF) seeded several thousand acres of burned private rangeland. Each contributed equipment, labor and/or funds to successfully complete the seeding. Education, public outreach, and coordination among landowners and agencies are keys to the success of CD work plans.

A few CD's have taken on voluntary watershed planning initiatives. With grant funding through the State's Nonpoint Source Management Program and assistance by the federal Environmental Protection Agency, several CDs have developed Coordinated Resource Management Plans (CRMPs) that focus on improving water quality, stream bank rehabilitation, weed control, and channel clearance. The Carson Valley, Dayton Valley and Lahontan CDs are currently implementing CRMPs to address water quality and bank stability concerns in the upper, middle and lower sections of the Carson River. The Mason and Smith Valley CDs are doing similar work within the Walker River Basin.

Watershed Planning

Development of watershed management plans is another community-based activity that is increasing. Voluntary watershed planning is occurring at the municipal, watershed, and river basin levels. Though results are difficult to measure because each approach is different, watershed groups throughout the state make important contributions to stewardship of water and related resources. Well organized, collaborative watershed planning efforts are occurring throughout Nevada, with the most comprehensive efforts taking place in the Truckee, Carson, and Walker river basins, Las Vegas Valley, and Elko County.

Riparian area improvement project planning and implementation, an important element of watershed management, is more likely to be successful with collaboration. Crowley Creek is a perennial stream, tributary to the Quinn River, which flows in the Montana Mountain Range of Northwest Nevada. The area was in poor condition. The Lahontan cutthroat trout inhabits the stream. In 1992 (left photo) the Winnemucca BLM Field Office began an interdisciplinary resource and habitat evaluation process for the grazing allotment. The allotment permittee, Nevada Division of Wildlife, users groups, and resource specialists were involved in the evaluation and decision-making. The evaluation lead to a modified grazing cycle, reducing late summer use until conditions improved sufficiently to support additional use. Treatment began in 1993. Stream banks were next to non-existent, the water column was wide and shallow, and stream temperatures were lethal to fish in most locations. An unusually intense warm rain on snow flood event in February 1986 contributed to the degraded conditions. Between 1987 and 1991, little riparian habitat recovery occurred and the channel widened. By 1997 (right photo) significant improvements in habitat area were occurring. The water column narrowed and an active floodplain formed, retaining more of the limited spring runoff and resisting erosion. Water quality conditions have improved and streamflow is sustained throughout the year. Fisheries conditions have also improved in several reaches. 1992 and 1997 photos courtesy of Nevada BLM.

In 1998, a unique river basin planning coalition was formed for the Carson River. Following a conference and subsequent workshops, government officials and citizens recommended creation of a broad coalition to develop an integrated watershed planning process for the basin. The Carson River Coalition was formed and four years later continues to work on improving coordination. The Carson Water Subconservancy District and the University of Nevada Cooperative Extension facilitate the process. Guiding principles, statements of common interests and understanding, were developed and adopted by each county in the watershed, including Alpine County in California). Subgroups meet periodically to

devise and take action on specific planning issues, i.e., water quality protection and improvement, education and public information, regional water supply arrangements, land use planning, natural resource management, and government interaction. An intangible benefit is the cooperative support for individual programs, such as channel repair projects, community river clean-up events, water resource studies, conservation easement and land acquisition projects, and outdoor learning experiences for school children.

Urban area watershed plans are under development also. The Clark County Wetlands Park (CCWP) Master Plan will control erosion of and water quality impacts to the Las Vegas Wash related to greater discharges from wastewater treatment facilities and urban runoff. Cooperators include the Southern Nevada Water Authority, Clark County, the Conservation District of Southern Nevada and other members of the Las Vegas Wash Coordination Committee (Las Vegas Wash Project Coordination Team, 2001).

In the Truckee Meadows urban area, the Washoe-Storey CD, Washoe County, the University of Nevada Cooperative Extension, and other cooperators are implementing a restoration plan for Steamboat Creek. The Washoe-Storey Conservation District initiated the Steamboat Creek Restoration Plan because Steamboat Creek is considered the largest tributary source of non-point source pollution to the Truckee River. High levels of sediment, nitrogen, phosphorus and trace metals resulted in the tributary being listed as an impaired water body. The Nevada Division of Environmental Protection (NDEP) awarded a Clean Water Act 319(h) grant and the Regional Water Planning Commission also awarded a grant to promote plan implementation. The plan, which relies on voluntary participation, contains reach-by-reach recommendations for on-stream and off-stream restoration actions designed to improve water quality (Washoe Storey Conservation District, 1998).

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