

CRIMES AGAINST THE WILD



Poaching in California

KEVIN HANSEN
AND THE
MOUNTAIN LION
FOUNDATION

Protecting California's Wildlife

CRIMES AGAINST THE
WILD:
POACHING
IN CALIFORNIA

by

KEVIN HANSEN

and the

MOUNTAIN LION FOUNDATION

JULY 1994

Mountain Lion Foundation, P.O. Box 1896, Sacramento, CA 95812
(916) 442-2666

CONTENTS

Foreword by Mark J. Palmer	iii
Acknowledgments	iv
Methods	v
SECTION I - The Crime of Poaching	1
Poaching Defined	3
Who Poaches?	3
Profile of a Noncommercial Poacher	4
Ethnic Factors in Poaching	5
Why Poach?	6
Noncommercial Poaching	6
Commercial Poaching	7
How Poachers Poach	11
Noncommercial Poaching	11
Commercial Poaching	12
Impacts of Poaching	13
Public Perception of Poaching	17
SECTION II - Wildlife Law Enforcement	21
Wildlife Laws and Regulations	21
State Laws	21
Federal Laws	23
Law Enforcement Agencies	26
To Catch a Poacher	28
Undercover Operations	32
To Convict a Poacher	34
Ominous Trends in Poaching Enforcement	38
A Final Note	42
SECTION III - Recommendations	44
Legislation	44
Law Enforcement	48
Education	49
Public Education	49
Education of Judges and Prosecutors	50
Research	51
Bibliography	53

FOREWORD

In 1986, the Mountain Lion Foundation was formed by a group of dedicated conservationists. Since the 1960s, a group of individuals and organizations in California called the Mountain Lion Coalition had been protecting mountain lions from exploitation. While the Mountain Lion Coalition was successful in banning bounties on mountain lions (1963) and securing a moratorium on trophy hunting (1971), the opposition of Governor George Deukmejian to mountain lion protection, orchestrated by the National Rifle Association and the Gun Owners of California, led to a veto of protective legislation in 1985, setting the stage for a potential hunt of mountain lions for the first time in 15 years.

The newly formed Mountain Lion Foundation, in those first years, focused on stopping the trophy hunt through grassroots organizing and lawsuits. But other threats to mountain lions and wildlife were not ignored. In 1990, voters passed Proposition 117, the California Wildlife Protection Act (more popularly known as the Mountain Lion Initiative). Proposition 117, which was developed by the Mountain Lion Foundation, Planning and Conservation League, and many other conservation and animal organizations, banned trophy hunting of mountain lions permanently in California. But it went further.

The most serious threat to mountain lions in California, and indeed to all wildlife, is habitat loss. Proposition 117 also required the state legislature to expend at least \$30 million annually in special environmental funds to protect wildlife habitat, including deer and mountain lion habitat, oak forests, wetlands, streamside (riparian) habitat, and habitat for endangered and threatened species. A major goal of the Mountain Lion

Foundation since 1990 has been to implement Proposition 117, which in the first three years has already led to acquisition of over 128,000 acres of wildlife habitat and enhancement of over 870 miles of streams and rivers. Proposition 117 also addressed the poaching threat in part, raising maximum fines for illegal killing of mountain lions from \$1,000 to \$10,000.

With the passage of Proposition 117, the Mountain Lion Foundation itself began to change. We realized that one cannot talk about saving mountain lions and their habitat without talking about saving other wildlife as well. A mountain lion poacher will just as often take a bear or deer as a lion. A shopping mall development in wildlife habitat is just as devastating to other plants and animals as to mountain lions.

The Mountain Lion Foundation has become a diverse wildlife organization. We work on habitat protection, poaching issues, endangered species, funding of wildlife programs, and general wildlife policy issues. We have not abandoned the mountain lion. We have rather broadened our focus to address the underlying problems all wildlife, including mountain lions, face in the fight for survival.

This report on poaching in California is the first phase of a three-year **Anti-Poaching Campaign** to develop research, education, law enforcement, and legislative programs to fight against the illegal killing of wildlife in our state. We expect our Anti-Poaching Campaign to be a model for other states, as well as a blueprint for action on any important wildlife conservation topic.

Mark J. Palmer
Executive Director
Mountain Lion Foundation

ACKNOWLEDGEMENTS

This report was a collaborative effort. A special thank you to Gabrielle Meindl, Policy Analyst for the Mountain Lion Foundation, for her skill at research, her talent for interviewing, and her tenacity in tracking down facts. Her suggestions and advice improved the report immeasurably. My gratitude to Mark J. Palmer, Executive Director of the Mountain Lion Foundation, for being patient but insistent about deadlines. I would never have survived such a project without the support of my co-workers at the Mountain Lion Foundation: Carsynn Costa, Jennifer Williams, and Shannon Eddy. Thanks for tolerating my closed door.

Wardens, special agents, biologists, prosecutors, judges, and wildlife officials from

state and federal agencies throughout California were consistently gracious in returning telephone calls, answering endless questions, and filling many requests for facts and figures. Protecting California's wildlife heritage is a difficult task. My gratitude to them all.

Financial support for *Crimes Against the Wild: Poaching in California* and the Anti-Poaching Campaign of the Mountain Lion Foundation was provided by The Roberts Foundation, The Summerlee Foundation, The Threshold Foundation, The True North Foundation, several anonymous foundations, and major donors and friends of the Mountain Lion Foundation. We gratefully thank these foundations and individuals for their support of our work to protect wildlife and fight poaching.

METHODS

In writing *Crimes Against the Wild: Poaching in California* we drew upon several sources of information, the first being books, journals, newspapers, reports, documents, magazines, theses, and monographs, representing law enforcement, criminological, sociological, and wildlife management literature. The second source was interviews with wildlife and legal professionals from throughout California, as well as other western states. Besides innumerable telephone conversations, we visited them in their offices, laboratories, homes, and outdoors in the field. They were very generous with their time and ideas. They included wardens, special agents, park rangers, biologists, prosecutors, judges, and wild-

life officials from state and federal agencies, as well as university professors and researchers. While most individuals we interviewed were forthright in providing information and opinions on poaching, many requested that they not be quoted for attribution. For this reason we chose to keep all informants anonymous.

We have endeavored to be as thorough as time and resources allowed. There has been little critical study of poaching in California or elsewhere. Therefore our report is based upon opinions of knowledgeable individuals working in the wildlife law enforcement arena. We think these informed opinions are very important and stand by our recommendations.

SECTION I

THE CRIME OF POACHING

California's wildlife is being slaughtered on an alarming scale by a new breed of criminal who kills wild animals illegally for money — the commercial poacher. The image of a poacher as a poor, uneducated man just trying to put meat on the table is outdated. No longer simply an occasional deer killed outside the legal hunting season or catching a couple of fish over the legal limit, the age of large-scale commercial poaching has arrived.

While more traditional forms of poaching persist, killing wildlife for monetary gain has taken the carnage to a new level and poses a significant threat to our state's wildlife heritage. Skilled, organized, and well-equipped teams of poachers are decimating California's wildlife and reaping obscene profits in the process. The California Department of Fish and Game (DFG) conservatively estimates that commercial poaching in the state is a \$100,000,000 a year business and is now the *second greatest threat* to our wildlife after habitat destruction.

The variety and scope of the killing are staggering:

- Black bears in northern California's mountains are tracked relentlessly by packs of trained hounds, run up trees, and shot at point-blank range. Their gall bladders are then cut out and paws severed. The gall bladders will bring \$5,600 an ounce in the apothecary markets of Korea or China as a medicinal curative. (More than the cost of an equal weight of gold or cocaine.) The paws will fetch \$30 to \$100 each as a gourmet delicacy. A bear paw meal could cost \$400 in some Asian countries.
- In 1989, wardens arrested two men as they pulled their boat into Sausalito harbor with a huge haul of 600 abalone. The confiscated mollusks had a wholesale value of at least \$10,500, double that at retail. Consumers may pay as much as \$32 to \$37 a pound, making it the costliest seafood on the market. Some abalone poachers boast openly of pulling down \$20,000 in a good month (Castle 1989). The mollusk must also contend with natural predation, disease, legitimate commercial and sport harvest, and pollution. Meanwhile, abalone populations are in precipitous decline in central and southern California (Karpov 1990).
- In 1980, the Department of Fish and Game reported that 32,377 deer were killed legally in the state and an estimated 75,000 were poached (Sheehan 1981a, 1981b). Many of the illegal kills are for the sale of the meat, hides, and horns. DFG also estimates that in excess of 1,000 deer valued at \$32,500 are taken and illegally sold annually in southern California. The estimate is based upon known commercial operations and arrests. Similar statistics are found throughout the rest of the state. Studies show that wardens made arrests in only one percent of the illegal deer violations and that only two percent of the

illegal activities were even reported to DFG (CDFG 1986).

- In the San Francisco Bay and Sacramento/San Joaquin Delta areas, poachers take enormous numbers of striped bass using illegal gill nets and set lines. One year the illegal catch was estimated at 50,000 fish — a number which matched the sport catch. Arrests were made of individuals who had taken up to 1,200 pounds of illegal striped bass in one night's fishing (CDFG 1986). With the fish going for as much as \$3.75 per pound at a store or restaurant, a poacher toting several hundred pounds of fish can make a healthy profit after a night's work. Some game wardens estimate that more than 400,000 fish of many different species are poached each year from the Delta (Locklin 1991).
- In 1988, 16 people were arrested by wildlife officers in synchronized raids in California and Arizona, culminating a 2-1/2 year undercover sting operation. California wardens seized 149 venomous snakes, six endangered desert tortoises, a dozen piranhas, a 6-foot crocodile, and other rare and protected animals. Among the snakes was a rare Catalina Island rattlesnake, valued at \$400 by collectors (Johnston 1988). Wardens fear that reptile poachers in California's deserts are stripping entire mountain ranges of resident snakes and lizards. Chuckwallas, a large lizard inhabiting the Mojave Desert, bring \$75 to \$100 in the illicit pet trade.

Some wildlife officials suggest that commercial poaching is not new, but rather the latest incarnation of the market hunting that occurred in California and throughout North America in the late 1800s and early 1900s. During this era, wild animal species were decimated to supply the restaurant and fashion trades. The carnage was so extensive that it led to some of the first wildlife protection laws and the establishment of state agencies

such as the California Department of Fish and Game.

However, modern commercial poaching differs from market hunting in a number of significant ways: 1) the scope of the killing is far greater, involving many more species; 2) foreign markets provide a new and larger demand for California wildlife; 3) new technology allows the commercial poacher to find, kill, process, and hide wildlife more efficiently than ever; 4) commercial poachers are criminals frequently involved in other types of crime; and 5) commercial poaching is extremely lucrative, second only to the drug trade in profits.

Well organized and illegal, commercial hunting operations are open for business throughout California (CDFG 1986). If a wild animal or any of its parts can be eaten, worn, stuffed and displayed, caged as a "pet," made into jewelry, or sold as a purported medicine, it probably is falling prey to poachers. Animals that are poached include bear, elk, deer, mountain lion, bighorn sheep, wild pig, bobcat, coyote, rabbit, eagle, and other birds of prey, duck and other waterfowl, most fish and seafood, bullfrog, reptile, and even butterflies (Breedlove and Rothblatt 1987).

Poaching has a long tradition in rural America: blinding deer at night with a spotlight, and shooting it with a coffee can over the rifle barrel to muffle the shot; using a barrel of molasses chained to a tree as bait for black bears; shooting a duck or two in the farm pond for dinner. But over the past decade, as wildlife numbers dropped, the stakes have soared. Word is out in the illegal hunting community that fresh black bear gall bladders are worth up to \$200 each, a bobcat pelt \$100, or a bighorn sheep head \$3,000 (the value of each multiplying many times before it reaches the consumer). Poaching has become big business (Poten 1991).

Commercial poaching in California is part of the much larger international wildlife trade that, according to the U.S. Fish and Wildlife Service, grosses at least \$5 billion a year. As much as 25 percent (\$1.25 billion) may be

illegally smuggled birds, reptiles, and mammals. With Los Angeles and San Francisco being major ports of entry, California receives a major portion of wildlife imports from other countries. The U.S. Fish and Wildlife Service has only nine wildlife inspectors at the two ports trying to fight off an ever-growing tide of illegal imports. Of the 80,000 wildlife shipments coming into the United States through ten ports of entry each year, 95 percent of the shipments are never inspected, but cleared on paperwork alone (Speart 1993). Estimates put the black market in America's wildlife at \$200 million and rising (Hanback 1992a). Wildlife runs second only to the illegal drug trade in profits (Speart 1993).

POACHING DEFINED

Poaching generally refers to the illegal "taking" of wildlife. Taking is defined in the *Fish and Game Code of California* as hunting, pursuing, catching, capturing, or killing, or attempting to hunt, pursue, catch, capture, or kill. A person is poaching if he or she:

- Kills or captures an animal without a license to do so.
- Takes more animals than is allowed under a specific license.
- Takes a protected animal, such as an endangered or threatened species.
- Violates, in taking an animal, the laws or regulations applicable to hunting, fishing, netting, or trapping that animal.

More broadly defined, poaching can also include buying or selling animals that were either taken under a sporting license or taken via poaching (Breedlove and Rothblatt 1987).

Researchers Michael Scialfa and Gary Machlis (1993) interviewed admitted poachers in the Pacific Northwest and identified these typical violations: killing more animals than is allowed under a specific license; using illegal techniques or prohibited equipment; shooting outside times legally desig-

nated for hunting; killing an animal for someone else who has a license; hunting without a required license; hunting out of season; hunting in areas where such activity is prohibited; shooting from vehicles or a roadway.

Obviously, there are degrees of poaching. The sport fisherman who catches one fish over his limit and takes it home to eat, causes much less impact than the commercial poacher who takes thousands of pounds of fish with a gill net and then sells them to a local store or restaurant. The killing of a threatened or endangered species is the most egregious form of poaching. Unfortunately, in many cases, the more endangered a species is, the greater its value on the black market.

WHO POACHES?

In his classic study of commercial poaching in the United States, Carl Farnsworth (1980) explains that poachers come from a variety of backgrounds, education levels, and employment histories. The traditional view of poachers as individuals who are poor, uneducated men who must take wildlife by illegal means in order to provide food for their families is erroneous. On the other hand, not all poachers fit the mold of the commercial poacher nor do they present a threat of the same magnitude to wildlife populations.

The Mountain Lion Foundation's report considers five categories of poachers:

- 1. Unwitting Poacher** - one who is ignorant of the laws relating to the take of wildlife, and who is not really aware of the consequences of his actions. (As any warden will confirm, this is a popular defense of many of the other categories of poachers caught in the act.)
- 2. Defiant Poacher** - a person who is aware of the laws relating to the take of wildlife, but chooses to ignore the law because he feels that it is his right to kill as many animals, or any animal, he chooses. He may

know it is against the law but does not view his act as morally wrong. If he owns land, he may think the wildlife present also belongs to him, and is his to do with as he pleases. (Wildlife, in fact, is considered legally owned by the public, with management responsibility falling to the state or federal governments.)

3. Opportunistic Poacher - a hunter or fisherman presented with an unplanned opportunity to take wildlife illegally. An example is a deer hunter who encounters and kills a mountain lion while tracking deer, or the casual fisherman who catches double his legal limit on a day when the trout are biting.

4. Subsistence Poacher - Someone who takes animals illegally to put food on the table. When poaching is mentioned, the subsistence poacher is the image that springs to mind for most people. There has been a recent upsurge in this type of poacher due to the hard economic times and to the immigration of thousands of refugees whose customs include wildlife in their diet (Falasco 1985.)

5. Commercial Poacher - someone who is involved in poaching or the buying and selling of poached wildlife for profit. Commercial poachers are fully aware of wildlife laws and are frequently willing to accept the consequences of being caught as a cost of doing business. They may even be aware of the effect their activity is having on wildlife populations, but they choose to ignore these things in favor of profits and a ready market. Another characteristic of commercial poachers is that they are also often involved in other types of crime (Farnsworth 1980).

These categories can overlap and are presented here only as a general reference. For example, subsistence and defiant poachers will also frequently be opportunistic. For the

purpose of this report, unwitting, defiant, opportunistic, and subsistence poachers will be collectively referred to as **noncommercial** poachers, while **commercial** poachers will be discussed separately.

Commercial poachers are reported to have been involved in other offenses such as burglary, drug smuggling and sale, moonshine production, arson, bombing buildings, destruction of private property, trespassing, rustling livestock, assault, attempted bribery, attempted murder, and conspiracy and solicitation to commit murder (Farnsworth 1980). One commercial poacher in Wisconsin attempted to hire a "hit man" to kill the executive secretary and two field wardens of the state Department of Natural Resources. This drastic action was prompted by a crackdown on a commercial poaching operation that was shipping up to 50,000 pounds of illegal lake trout per week to markets outside of Wisconsin. Chicago, Detroit, and New York City were the primary markets for this operation. The fish were banned from legal sale due to contamination by the chemical PCB which is extremely toxic to humans (To Kill a Warden 1978).

The commercial poacher poses the most serious threat to wildlife populations and will be the primary focus of this report. He takes wildlife far in excess of his own immediate needs in order to realize financial gain. Even among noncommercial poachers, commercial poachers are regarded with contempt (Scialfa and Machlis 1993).

PROFILE OF A NONCOMMERCIAL POACHER

During their interviews of admitted non-commercial poachers in the Pacific Northwest, Scialfa and Machlis (1993) used an ethnographic approach in their study. This entails examining poaching behavior from the point of view of the poacher, rather than from the point of view of society. Such an approach produced interesting findings. The

researchers found they could not describe a "typical poacher," nor could they distinguish poachers from other types of hunters or the general public. Almost all the poachers interviewed reported substantial amounts of both legal and illegal hunting experience, but few had any history of arrests or convictions for non-wildlife related offenses.

Few of the poachers interviewed characterized themselves as poachers, or even illegal hunters, and they didn't think their actions were wrong. Most saw themselves as hunters and sportsmen. They described poachers as individuals who, singly or in various combinations, hunt out of season, hunt for monetary gain, are wasteful, or shoot more animals than they are entitled to. In addition, poachers may be hunters who use prohibited hunting techniques or prohibited hunting apparatus, plan on hunting illegally, illegally hunt game, kill animals for pleasure or other unacceptable reasons, hunt illegally on a regular basis, or in such a manner that species numbers are reduced. Commercial poachers and Native American hunters were viewed by these noncommercial poachers as the greatest threats to wildlife (Scialfa and Machlis 1993).

Attributes of a highly skilled, noncommercial poacher included a thorough knowledge of wildlife habits, being physically fit, having superior marksmanship and orienteering skills, knowing the area hunted, patience, being safety conscious, and having respect for the process of hunting. Most considered themselves "fairly" or "highly" skilled hunters and were reluctant to discuss illegal hunting behavior. It was not unusual for them to be accompanied by close friends and relatives, generally the same people they hunted with legally (Scialfa and Machlis 1993).

Generally, those interviewed believed that, regardless of hunting laws, it is legitimate to kill wildlife under a variety of circumstances, provided the animals are used for food and none is wasted or sold (Scialfa and Machlis 1993).

ETHNIC FACTORS IN POACHING

One of the most controversial aspects of the upsurge in poaching in California is that a substantial portion of it appears to be the work of ethnic minorities. While definitive information is lacking, almost every warden interviewed for this report felt ethnicity was a factor in increased poaching of certain species in some areas of the state. Most wardens also understood the political volatility of the issue and asked not to be quoted. The three ethnic groups most often mentioned were Asian, Hispanic, and Native American; all cultures with long histories of subsistence hunting. Unfortunately, the nature of their poaching activity in California seems to be a mixture of both subsistence and sometimes commercial poaching.

It is an acknowledged fact among wildlife law enforcement officials that the Asian American apothecary industry in Los Angeles and San Francisco is the primary market for poached black bear gall bladders and paws, both here and for illegal export abroad. Los Angeles has over 300 licensed herbal-acupuncture shops, some of which may or may not be handling animal part products (Klein 1982). An examination of Department of Fish and Game citations/arrests for illegal gill netting along the Richmond and Oakland waterfront shows a majority of violators to be Vietnamese. The fish may be sold directly for money or used as barter within the community itself. Poached venison and wild pig may find a ready market in Hispanic labor camps. In 1988, Hispanic laborers brought a pair of mountain lion cubs into the Downieville office of Tahoe National Forest. Desperate for food, the workers had eaten the cub's mother after the foreman bought them a .22 rifle and told them to hunt for their food (Bowman and Composeco 1993). Controversy has long surrounded the salmon and steelhead fishing practices of the Hoopa, Yurok, and Klamath Indian Tribes in northern California. Seven Native Americans were arrested in 1985 as a result of an undercover

sting operation mounted by DFG (Hodgson 1985).

As California grows and becomes more ethnically diverse, it will become imperative that the Department of Fish and Game and conservation organizations develop ways to work with ethnic groups to preserve wildlife and the environment. Within each culture, means must be found to address wildlife conservation issues in a meaningful manner. We must also avoid blaming only ethnic minorities and immigrants for losses of wildlife. There are troubling signs that an atmosphere of intolerance in California is growing with state and county budget cuts and consequent declines in delivery of human services, as well as political and media attention to illegal immigration problems. Cultural diversity should be embraced as one of California's strengths. A healthy wildlife heritage for all peoples is also a strength that our society cannot afford to lose.

WHY POACH?

NONCOMMERCIAL POACHING

In 1991 and 1992, researchers Craig Forsyth and Thomas Marckese (1993) interviewed 36 French Acadian (Cajun) poachers in southwest Louisiana. Poaching has long been a part of Cajun culture and is a deeply ingrained practice, so much so that skilled poachers are highly respected in local communities. The primary motivation for this group of poachers seems to be the pleasure derived from both the excitement of poaching and the outsmarting of game wardens through the demonstration of superior knowledge of the terrain and hunting skills.

Cajun poachers seem to have a need to express independence from the authority of outsiders and to outsmart them. They fulfill these needs through poaching. By most standards, these individuals could be considered failures; they were all poor and uneducated. They attempt to demonstrate their adequacy

through poaching. Most of them are acting within roles that are justified by local standards. Indeed, within the lifetimes of many of these men, their actions were once legal (Forsyth and Marckese 1993).

Probably the most sobering discovery of the study was that basic beliefs about poaching form early. Most were introduced to poaching by a family member, usually a father or grandfather. All continued to receive support from family and significant others and most continued to poach with them. Thus, cultural supports and belief systems have continually reinforced and thus perpetuated poaching (Forsyth and Marckese 1993).

Scialfa and Machlis (1993) found the non-commercial poachers they interviewed also learned to poach at an early age, generally between nine and twelve. Furthermore, almost half of the informants reported that their first hunt was illegal. Most also stated that family members or close friends played critical roles in the development of their poaching behavior, either by actually teaching them how to poach, knowing they hunted illegally and more or less condoning it, or by hunting the same way themselves.

Interviewees emphasized that they hunted primarily for food, trophies, sport, and recreation. Other reasons included unplanned opportunity, challenge and excitement beyond that offered by legal hunting, legitimate hunting opportunities not sufficient to satisfy their desire to hunt, to be with friends, to gain respect from others, and a conscious decision to participate in a particular lifestyle. Many saw hunting as an efficient manner to harvest food, and preferred game over domestic meats. Wildlife laws notwithstanding, all thought it legitimate to kill wildlife under a variety of circumstances, provided the animals (including those killed for trophies and sport) were used for food and none was wasted or sold (Scialfa and Machlis 1993).

Hunting only for trophies, for commercial purposes, just to kill something and leave it to waste, for added excitement, to reduce or eliminate crop depredation, and for sport,

were listed as some of the unacceptable reasons to hunt illegally. Similarly, certain types of animals were generally deemed unacceptable to poach: females, rare or endangered species, and animals not suitable for food. Although informants did report occasionally poaching such animals, these acts were held to be infrequent and under extenuating circumstances (Scialfa and Machlis 1993). (It must be stressed that these feelings were those of *noncommercial poachers* only.)

In Washington and Idaho, another factor influencing noncommercial poachers' motivations is their attitudes toward the local wildlife management agency. Informants poaching principally in Washington had universally negative attitudes towards the Washington Department of Wildlife. Informants poaching principally in Idaho had mixed attitudes towards Idaho Department of Fish and Game. All informants expressed negative attitudes towards certain wildlife management policies, especially hunting regulations (Scialfa and Machlis 1993). Informants believed that certain regulations:

- were unnecessary or did not benefit wildlife in the manner intended
- were actually harmful to wildlife
- unfairly diminished or impeded hunting opportunities
- discriminated against certain types of hunting
- created "fine-line" situations that invited violations
- favored special interest groups, especially the wealthy and out-of-staters
- were more concerned with generating revenue than increasing or protecting wildlife or hunting opportunities (Scialfa and Machlis 1993).

Finally, the reasons for poaching seem to change as a poacher grows older. Most began hunting simply to see if they could hit a moving target, but by their late teens, began to hunt for food. Subsequently, a number of informants began to hunt increasingly for

selected species, especially those which offered antlered or horned trophies. Economic hard times were also cited as a reason for increased hunting for food. The trend among the majority of those interviewed went from hunting for shooting sport, to hunting for food, to hunting for trophies. Some reported the increasing importance of hunting just to be outdoors or with friends, and that the killing of game became relatively inconsequential. Several reported having given up hunting altogether (Scialfa and Machlis 1993).

COMMERCIAL POACHING

Motivations of the commercial poacher are far simpler: the practice is lucrative, the risk of getting caught is low, and until recently, the penalties have been minimal. It is a sad fact that much of our wildlife is now worth more dead than alive. (See Table 1.) The list of destructive uses of wildlife from which illicit profits can be obtained is endless:

Black Bears - gall bladders are sold as a medicinal curative; feet as a gourmet delicacy; jaws, teeth, and claws for jewelry. The biggest market for gall bladders and feet is in the Asian apothecary trade, while claws are popular in jewelry with Native American themes or motifs. The value of a gall bladder freshly cut out of a bear in the field is \$75 to \$200 each; dried, powdered, and sold in San Francisco's Chinatown, the value jumps to \$560 an ounce. In Asia, the dried and powdered gland can bring up to \$5,600 an ounce. (Far exceeding an equal amount of gold or cocaine.)

Elk and Deer - are killed for their hide, meat, and antlers. Elk are one of the most valuable animals today for the antlers alone. For instance, legal dealers in Wyoming sell antlers to South Korean apothecaries, who slice them paper thin, boil ginseng and herbs with them, then squeeze the blood out of the horn.

They believe the tonic wards off flu and colds. Elk produce new antlers every year, worth \$140 a pound in the blood-filled velvet stage (Poten 1991). In 1992, at a legal auction in Jackson Hole, Wyoming, the highest bid for elk antler was \$24 a pound. An average-sized set of elk antlers (43 inches) will go for \$1,000 intact. Farm labor camps appear to be big consumers of venison (deer meat), which sells for \$50 to \$100 a carcass (CDFG 1986). Additionally, theft and the illegal sale of wildlife for the purpose of game farming is running rampant in some western states. Such facilities raise wildlife species in enclosures similar to domestic livestock operations. A mule deer obtained illicitly for such a game farm will sell for \$1,500; elk will bring \$10,000 to \$15,000. This does not currently appear to be a big problem in California.

Mountain Lions - are killed for their heads, pelts, and claws. While classified as a specially protected mammal in California under the California Wildlife Protection Act (Proposition 117), illegal lion hunts continue. (One warden reported to us being able to book an illegal lion hunt within a week of request.) A good lion pelt will go for \$1,000 to \$1,500. Wardens report an increasing number of California lion hunters buying tags in border states (i.e., Oregon, Nevada, or Arizona), killing a lion in California, then taking it to the other state, tagging it, and then bringing it back. All of these acts are illegal, but difficult to enforce.

Bobcats - pelts can bring \$100 on the black market. Wardens estimate 30 to 50 percent of the bobcats killed in California go unreported. Beaver, river otter, bobcat, fox, and coyote pelts are smuggled out of state and sold to tanners (CDFG 1986).

Bighorn Sheep - are killed for their heads and hides, and the illegal guide makes from \$15,000 to \$60,000 for leading a hunt (CDFG 1986). A bighorn sheep pelt to go on a

“picked up” set of sheep horns sells for \$700 to \$1,500, depending upon its size. It is illegal to pick up bighorn sheep horns found in the wild, even if the ram died of natural causes.

Wild Pigs - are killed for their meat and tusks. Wild pork can be more popular than deer meat in areas of the state with good pig populations. Again, farm labor camps may be the big consumers. Pig carcasses sell for \$50 to \$75 each. If you know the right words, pigs and deer can be bought at bars in certain areas with ease (CDFG 1986).

Birds of Prey - are stolen from the wild for use in falconry. Live fledglings from the nest bring hundreds of dollars, while live adults, such as the endangered peregrine falcon, fetch \$3,000 to \$4,000 per bird. (The improved success of captive-breeding programs seems to have lessened the illicit trade somewhat.) A dead bald eagle carcass can be worth up to \$2,500, depending upon its condition, and a golden eagle feather alone is worth \$50. The feathers are popular for decoration, jewelry, or in some Native American religious ceremonies.

Fish - gill netters take striped bass, salmon, catfish, black bass, corvina, tilapia, and other sport fish. Black market sales of catfish in San Diego County total an estimated \$15,000 annually. Wardens seized 30,000 pounds of corvina and 80,000 pounds of tilapia, all illegally caught from the Salton Sea area. The estimated wholesale value of the fish was \$360,000. Salmon and sturgeon are captured for their meat and eggs. Sacramento River sturgeon roe is worth \$400 a pound as caviar (CDFG 1986).

Reptiles - collectors can make \$2,000 a night driving the desert highways, picking up reptiles lying on the pavement, then selling the animals to the illicit pet trade. Common garter snakes bring \$5 each, while rare and endangered species such as the California

TABLE 1. ESTIMATED BLACK MARKET PRICE LIST

Animal Part	Black Market Price
Bear	
fresh/sold in the field	\$75-200/ each
dried/powdered/sold in San Francisco Chinatown	\$560/ounce
dried/powdered/sold in Asia	\$5,600/ounce
paws/sold in field	\$10-15/each
paws/sold in San Francisco Chinatown	\$30-\$100/each
claws	\$2-5/each
claw jewelry	\$200-\$400
Bobcat pelts	\$100/each
Deer (whole carcass for meat)	\$50-\$100/each
Birds of Prey	
live fledglings for falconry	\$100's/each
live adults for falconry	\$3,000-\$4,000/each
peregrine falcons	\$2,000/each (1986)
goshawks	\$1,000/each (1986)
prairie falcons	\$800/each (1986)
Harris hawks	\$600/each (1986)
dead carcass for feathers (depends on condition)	
American bald eagle	\$2,500/each
golden eagle feather	\$50/each
red-tailed hawk	\$20/each
Reptiles (live, for collectors and pet trade)	
common (e.g., garter snake)	\$5-\$20/each
rare and endangered	
San Francisco garter snake	\$1,100/each
California mountain king snake	\$250/each
Frogs (food)	
sold in field	\$1.25-\$1.50/pound
sold in San Francisco Chinatown	\$5.25-\$5.75/pound
legs	\$15/pound
Sturgeon with roe	\$150-\$200/each
Caviar (sturgeon eggs)	\$400/pound
Red Abalone	
in shell	\$12-\$36/each
popped from shell/meat	\$15-\$20/pound
steak	\$32-\$34/pound
Striped Bass	\$0.70-\$1.50/pound
Butterflies (collectors)	
some tropical South American species	\$8000/each
some rare American species	\$300/each

Source: California Department of Fish and Game (1994)

mountain king snake is worth \$250 and the San Francisco garter snake \$1,110. One San Diego dealer reportedly makes \$60,000 annually dealing in illegally taken reptiles. The total profit made in reptiles in southern California alone is estimated at \$500,000 annually (CDFG 1986).

Frogs - frog legs go for about \$15 a pound, and are a delicacy in many California restaurants. While legal to take, hunters must have permits and can take no more than 12 of the amphibians per day during the season, which runs from April 1 to November 30. One hundred to 300 frogs a night are taken illegally in the delta and sold in San Francisco's Chinatown (CDFG 1986). The amphibians sell for about \$5.25 a pound, and one suspected broker is believed to have made \$65,000 by allegedly collecting frogs from poachers and selling them to San Francisco Bay Area fish markets.

Butterflies - prices for some tropical South American butterflies have reached \$8,000, while rare U.S. butterflies can sell for about \$300 each. The U.S. Fish and Wildlife Service is currently investigating a number of collectors in California and other states who could be charged with illegally trading in threatened and endangered butterflies (Cox 1993).

In addition to wildlife poached within California, there is the flood of illegal wildlife products being imported into California from other states and foreign countries. The United States is one of the world's largest consumers of wildlife parts and products. In its January 1992 newsletter, *Traffic USA*, the wildlife trade monitoring program of the World Wildlife Fund, reported that the total declared value of U.S. wildlife imports and exports is approximately \$1 billion annually (Hanback 1992a). California likely contributes a substantial portion of the market. Illegal products include intricately carved sperm whale teeth (\$2,000); leopard skin coats

(\$40,000); caiman ashtrays (\$3,000) — a cousin of the alligator, caimans live in Central and South America; matching cobra skin boots and purse (\$700 and \$1,000); a guitar made out of sea turtle shell (\$200); viper snake sneakers (\$400). Fashion frequently has deadly consequences for wildlife (Speart 1993). The U.S. demand for Indian python boots like John Travolta's in the movie *Urban Cowboy* and reticulated python jackets like Paul Hogan's in the movie *Crocodile Dundee II* have endangered both species (Poten 1991). Live venomous reptiles are particularly popular with collectors.

Commercial poaching would not be so lucrative if there were no willing buyers of illegal wildlife products. Such is not the case. Buyers generally come in three categories:

- 1. Unwitting Buyer** - purchase poached animals or the parts and products of these animals in ignorance of the law. (Again, a popular excuse when detained by law enforcement officials.)
- 2. Traditional Buyer** - person who may be aware of the law, but his traditions and cultural beliefs outweigh his fear of legal sanction.
- 3. Commercial Buyer/Retailer** - one who deals in the sale of poached animals for profit. This type of buyer may be equated to a large scale drug supplier and indeed, evidence indicates that persons involved in the commercial supply of animals and animal parts may also be involved in illegal drug trafficking, as well as other crimes (Farnsworth 1980). Wardens believe that in some Asian-American communities poached fish and wildlife are traded rather than sold.

Profit isn't the only motive behind the illegal traffic in big-game animals. Another is the obsession by some to possess, at any cost, these symbols of power and freedom (Poten 1991). Enter the big game trophy hunter. These individuals are willing to spend big money for hunting trophy-class big game, and the standards by which trophy animals are measured

is usually set by the Boone and Crockett Club. Founded by Theodore Roosevelt to recognize exceptional hunting with fair-chase criteria, the prestigious Boone and Crockett Club publishes a record book of trophy animals (Poten 1991). For example, the rack from a trophy Boone and Crockett white-tailed deer now reportedly sells on the black market for \$20,000 to \$25,000.

Bighorn sheep are one of the most prized animals by trophy hunters and a cornerstone of hunting's coveted Grand Slam — the set of heads of the four wild mountain sheep species native to North America. Together, the heads of the Dall, the desert bighorn (which is found in California in very limited numbers), the Rocky Mountain bighorn, and the stone sheep can bring a black market price of \$50,000 (Milstein 1989). Some states allow only a few sheep each year to be killed and auction off these permits or tags to the highest bidder. In 1993, a legal Montana sheep tag was auctioned for \$209,000. A legal Arizona sheep tag went for \$303,000. Such enormous amounts surprise even seasoned wildlife officials.

Unfortunately, in their quest for big game trophies, some hunters willingly step outside the law. On November 16, 1990, state and federal authorities converged on a ranch near Lockwood, California. What they found were the skulls, heads, and hides of mountain lions, Bengal tigers, spotted leopards, black leopards, and jaguars—remnants of illegal “hunts” conducted by the ranch owners, Floyd and Dawn Patterson (Akeman 1991a). “Big game hunters” paid the Pattersons up to \$3,500 for the privilege of shooting the big cats and taking their stuffed carcasses home as trophies. Most of the animals were thought to have been surplus zoo animals and many were simply shot in the stock trailer they were delivered in. One cat was dragged out with a lasso around its neck and shot just outside the door (Schrader 1991). The Pattersons were tried and convicted on 42 counts of violating state wildlife laws (Moreno 1991).

Not only is commercial poaching lucrative, the risk of getting caught is slim. Studies in California, Alberta, Maine, and Idaho, indicate that only one to two percent of actual illegal deer hunting is reported (CDFG 1976, Boxall and Smith 1987), which makes deer poaching one of the most underreported crimes in this country (Farnsworth 1980). The studies also show that wardens made arrests in about one percent of the illegal deer violations (CDFG 1976). Further incentive to poach is added by the lack of harsh penalties meted out to those few who are caught. The reasons behind the low reporting rates, low apprehension rates, and minimal penalties will be discussed in-depth in the following sections on wildlife law enforcement.

HOW POACHERS POACH

NONCOMMERCIAL POACHING

Scialfa and Machlis (1993) found that the noncommercial poachers they interviewed in Idaho and Washington generally hunt in forested areas, within 50 miles of home, and either along or within one mile of a paved or dirt road. Hunting effort is focused where the desired quarry can be found and where detection or apprehension can be avoided. Additional considerations include where desired quarry can be taken legally, uncrowded areas, weather, time and distance from home, and aesthetic preferences. Over 40 species were reported taken illegally, with deer being the principal quarry, followed by ducks, grouse, and elk (Scialfa and Machlis 1993).

The types of equipment and hunting techniques used depend upon the types of animals poached and reasons for poaching. Big game animals generally are hunted with rifles and by stalking, still hunting (hunting from a fixed location), or in the case of deer, road hunting. Meat-hunters poaching deer are more likely to spotlight along roads or hunt on a “push.” A push is when hunters work as a team to herd their quarry toward another

hunter. Illegal trophy hunters typically hunt big game by stalking or still hunting and using techniques such as "rattling" and "bugling" to lure quarry towards them. Rattling involves rattling pieces of antler together to imitate the sound of deer or elk fighting or scraping their antlers against branches to remove velvet. Bugling is imitating the shrill bellow a bull elk makes during the fall rut (Scialfa and Machlis 1993).

Waterfowl are principally poached by still hunting and with shotguns. Blinds, decoys, and artificial calls are used by some. Shooting at birds on the ground is a common technique of both the commercial and noncommercial poacher. One shot will usually kill more than one bird. One warden described a case where one shot killed five snow geese. Required shotgun plugs are occasionally not used. A plug ensures no more than three shells can be loaded in a shotgun at a time, which is the law in California and many other states. Small game and upland birds are principally poached by stalking and road hunting. Road hunting is used most frequently by poachers hunting animals for food or out of season. Both rifles and pistols are reported used on small game and upland birds. Fish are taken by a variety of methods and equipment, including hook and line, nets, permanently set hooks, explosives, and bare hands (Scialfa and Machlis 1993).

Techniques or equipment that are considered unacceptable to noncommercial poachers include those that do not give animals an equitable opportunity to avoid being killed, are unsafe, cause crippling loss, or are so effective they are likely to reduce wildlife numbers. Spotighting is the hunting technique objected to by the greatest number of informants (Scialfa and Machlis 1993).

When poaching occurs depends upon the animal sought, reasons for hunting, and weather. Most poaching occurs during legal seasons and on weekends. Availability of suitable prey and time off from work are also principal factors. Big game is hunted in early morning and late afternoon. Waterfowl is

taken a half-hour before or after sunset. Small game, upland birds such as grouse and chukar, and fish are poached during daylight. Poachers hunting big game for meat are most likely to hunt at night or out of season. In California, many marine species, such as lobster, are poached at night, but poachers will also hunt during the legal season as cover. Cold, snowy, and moderately stormy weather was favored by a number of poachers. At night (with a light), out of season, and early spring were considered unacceptable times to hunt by many of the noncommercial poachers interviewed (Scialfa and Machlis 1993).

Poachers use a variety of methods to avoid detection or apprehension while poaching. Poachers hunting at night or out of season are the most cautious. Some illegal hunters use small caliber weapons, such as a .22, because they are quieter. Most frequently reported precautions are to hunt only in areas with which the poachers are familiar, to fire only one shot, to hunt only with trusted people, to use no alcohol or drugs, and not to discuss illegal hunting with others (Scialfa and Machlis 1993).

COMMERCIAL POACHERS

Commercial poachers follow many of the same techniques and patterns employed by noncommercial poachers, but are less constrained in their method of killing and their ethics. For instance, they do not hesitate to use such sophisticated equipment as aircraft, assault weapons, illegal fishing lines, radio-telemetry equipment, laser night scopes, police radio scanners, one-million-candlepower spotlights to transfix deer, two-way radios, firearm silencers, poison, and all-terrain vehicles (Poten 1991, Hastings 1993).

Nor are these illegal hunters hesitant to kill wildlife in restricted areas such as national and state parks. Elk have been poached at Prairie Creek State Park near Eureka and rangers at Lassen National Park suspect deer and

bear poaching takes place more frequently than they can detect with their limited staff. Wild pigs may be targets of illegal hunters in Pinnacles National Monument near Hollister. According to the California Department of Parks and Recreation, poaching is a known threat to wildlife in 110 state parks, or 36.7 percent of the state park system (CDPR 1984). In a National Park Service appraisal in 1988, wildlife poaching ranked as the third most prevalent threat facing the nation's parks, based upon the almost 50 parks that reported it as a menace (Milstein 1989).

Another characteristic of the commercial poacher is wastefulness. After killing a bear and removing the gall bladder, paws, and sometimes the hide, the rest of the carcass is often left to rot. It's frequently the same pattern with mountain lions, after the big cat is beheaded and skinned. Some will kill an elk or bighorn just for the antlers or horns. Some sturgeon poachers will slit open a female while still alive, and remove her eggs for caviar. Sometimes they will use the meat as well; other times they will leave the fish to die a slow death.

While most hunting guides run legitimate operations, the expense of long pursuits and the impatience of clients to bag a trophy black bear or mountain lion entice some guides to provide a higher level of convenience in the form of "will-call" (as in, "When we have your bear or cougar treed, we will call you") or "shootout" (as in, "All you have to do is shoot it out of the tree") hunts. The guide puts a list of clients in his pocket, then heads out into the woods to find and track a bear or cougar. Once he has one treed, he radios the client or leaves the bear or cat under the watchful eye of a helper and drives to the nearest telephone. The client then flies and drives to the location of the treed cougar or bear to collect his or her trophy. As a result, bears or cougars can remain up in the tree for days at a time, under a death watch. If it jumps from the tree it is simply treed again, until the client arrives. Sometimes bears are shot in the paws with a light caliber firearm.

This practice is used to train dogs by making it easier for them to track the bear and ensuring the animal will tree again easily. One Arizona Game and Fish official estimates that around 30 percent of the guided hunts in Arizona are will-call hunts. Will-call hunts are illegal in California, because keeping game species in trees for extended periods violates laws against harassment of wildlife.

IMPACTS OF POACHING

Rural crime in general and commercial poaching in particular have received little study by criminal justice researchers. Most criminological research has been limited to those crimes which are reported in the Uniform Crime Reports (UCR) and has been centered primarily on urban populations. Further compounding the problem is the lack of efficient and consistent reporting of crime statistics on the part of small, rural law enforcement agencies (Farnsworth 1980). Richard L. Hummel also speculates that sociologists have generally avoided the study of hunting and fishing because these activities (especially hunting) are personally abhorred, scorned, or avoided by the sociological establishment, which is dominated by an urban, liberal world-view. This world-view is characterized by, among other factors, strong anti-hunting sentiment (Hummel 1983).

Wildlife researcher James R. Vilkitis went into the Idaho backcountry in 1967 looking for material for a master's thesis. When he returned to civilization a year later after working underground with big game poachers to learn their methods, his findings shocked the fish and wildlife conservation and management community. Vilkitis was able to document that:

- Most poachers are bold, working in daylight hours, and they are excellent marksmen, bringing down quarry with a single shot.
- Commercial poachers are almost never

caught; the odds against their winding up in jail or getting so much as a citation are 200 to 1.

- The chances of a poaching incident even being detected by enforcement officers are only 2.5 percent, or one in every 40 kills.
- Compared to the legal harvest, the volume of the illegal kill of big game is significant; Vilkitis put it at 50 percent. (A later California Department of Fish and Game study (1976) estimated the illegal kill to be equivalent to the legal kill.)
- By and large, the general public is apathetic about fish and wildlife poaching (Vilkitis 1968, Sheehan 1981b).

Carl Farnsworth (1980) made one of the first attempts at a comprehensive study of commercial poaching in the United States. He concluded that up to 25 percent of the total illegal traffic in wildlife may be commercial in nature. The difficulty in separating commercial poachers from less-serious game law violators was the primary reason that only 22 of the 50 states Farnsworth surveyed were able to provide usable data on the numbers and dollar value of this activity; but the minimum value of commercial poaching in those 22 states alone is estimated to be \$175,101,773 (Farnsworth 1980).

No one really knows the bottom line. U.S. Fish and Wildlife Service (FWS) officials estimate that the illegal profits from U.S. animals are \$200 million a year and growing (Poten 1991). Department of Fish and Game law enforcement officials place the California black market at \$100 million a year and consider it the *second greatest threat* to wildlife after habitat destruction.

These illegal take figures are controversial. Some sportsmen and conservation groups believe the Fish and Wildlife Service inflates the numbers, blowing the issue out of proportion to garner publicity and funds for its wildlife law enforcement division. Conversely, other critics claim the service underreports wildlife trafficking, covering up the extent of the problem to avoid criticism

of legal sport hunting as a wildlife management practice (Hanback 1992a).

As Farnsworth's research showed, the exact dollar value of illegal activity is difficult to obtain because it is nearly impossible to separate commercial poaching from less-serious forms of poaching. For instance, wardens arrested four individuals in the spring of 1986 for possession of 16 striped bass. One of the people had a prior arrest for selling striped bass. The wardens suspected the fish were headed for the commercial market, but with the evidence at hand the individuals could only be cited for sport overlimit (CDFG 1986).

Another difficulty in placing an exact dollar value on the activity is that most instances of poaching go unreported. To pinpoint how much poaching goes unchecked, Canadian wildlife officials in Alberta hired a man in 1985 to commit a variety of hunting offenses, including the illegal hunting or killing of deer, on Canadian lands. Of 649 crimes, just seven (one percent) were ever reported (Boxall and Smith 1987). California conducted an earlier study in 1975-76 and found that of 134 simulated crimes, not even one was reported (CDFG 1976).

There are other economic factors to be considered when assessing the economic impact of theft from the resource. Fish and wildlife thieves undercut legitimate businesses when they sell their products. Sale of illegal salmon reduces the price of commercially caught legal salmon, harming the entire fishing industry. The legitimate anglers who have paid for their license, boat registration and other permits simply can not compete. Fish moving through normal commercial channels create jobs in the wholesale sector and other related industries; illegal fish generally go direct to the consumer or retailer (CDFG 1986).

California Department of Fish and Game estimates that the illegal sale of ocean resources alone exceeds \$60 million per year (CDFG 1986). In 1990, wardens found two gill net boats fishing illegally inside Santa

Monica Bay three days apart; 7,000 feet of gill net and 2,900 pounds of fish were seized. Two other commercial fishing vessels were inspected within a month of each other, and 110,000 pounds of bonito were seized. Eighty-four percent of the bonito aboard one of the vessels, which totaled 57,000 pounds, was found to be undersized. A DFG marine biologist estimates the tourism dollars generated from abalone alone can run between \$20 million and \$30 million a year (Castle 1989), benefiting local businesses. Yet abalone populations are in precipitous decline in central and southern California (Karpov 1990).

In terms of economic importance to all citizens of California, whether employees in related support industries, deer hunters or deer viewers, deer contribute \$455 million annually to California's economy and citizens, and support nearly 10,500 jobs (Loomis et al. 1989). Based upon information provided by the California Department of Fish and Game and a survey of seven other selected states, roughly one-half or more of some wildlife species killed each year are taken illegally by poachers (Breedlove and Rothblatt 1987). Considering the illegal take estimates of deer and marine species alone, DFG's statewide poaching estimate of \$100 million per year in value seems conservative indeed.

There is a direct relation between access and poaching impact. For instance, fire, logging, and mining roads that cut into remote regions of the Sierra Nevada or coastal ranges provide ready access for illegal hunters to the wildlife they intend to poach. Poaching adjacent to Yosemite National Park is more of a problem on the west side where fire roads provide good access. The more remote and rugged east side seems to have less of a problem.

According to Stephen H. Berwick, chief scientist with a California-based environmental consulting firm, poaching levels have increased 50 times normal in some areas of the American West where large energy developers have moved into unpopulated wilderness.

As a result, Berwick charges, local populations of animals are being completely destroyed. Berwick studied the problem extensively while preparing an environmental impact statement for the Defense Department on a proposed military construction project (Quinn 1983). In California, the Helms Creek Project serves as an example. Located east of Fresno in a remote area of Sierra National Forest, 1800 construction workers were employed in digging a tunnel between Courtright Reservoir and Wishon Reservoir as part of a hydroelectric project. DFG wardens and biologists still talk of the pronounced escalation in local poaching that occurred during the project.

Determining the ecological impact of poaching on wildlife populations is even more complicated and controversial than trying to quantify poaching alone. Measuring ecological impacts starts with censusing wildlife populations — an arduous, expensive, and imprecise task that falls to the wildlife biologists of DFG's Wildlife Management Division. Federal and state agencies use census data to study effects of predation, weather, and habitat loss. Hunting, trapping, and fishing regulations are all based upon some kind of count. The information can be invaluable for decisions about protecting species or building developments like mines or dams.

Technology has made censusing wildlife somewhat easier, but depending upon the species, counting wildlife numbers is still a statistical exercise that varies widely in its precision. One federal wildlife agent told us that even waterfowl forecasts conducted in the fall have a 20 percent plus or minus factor built in because of the difficulties in counting waterfowl populations. Twenty percent plus or minus is a large margin of error considering the 50-year history of intensive study including banding and aerial surveys which goes into the forecast.

Another controversial aspect of wildlife censusing is rooted in a long-entrenched rivalry between biologists and wardens. Some

biologists feel that wardens frequently blow the poaching issue out of proportion. Wardens counter that census techniques are notoriously inaccurate and that biologists are consistently optimistic in their population estimates because they fear appearing inept and fear representing sportsmen in a bad light. As an example, the DFG's 1975-76 study on deer poaching indicated that out-of-season deer kills occur at a rate nearly twice that of the legal in-season take (CDFG 1976). In the most recent Environmental Impact Report on deer hunting in California, biologists state that the earlier study was not statistically reliable and that deer poaching is not a significant problem (CDFG 1992b). Most wardens adamantly disagree.

Beyond the debate over wildlife censusing lies the even more complex issue of ecological values. The importance of habitat to the well-being and continuity of interrelated plants and animals is widely accepted, but precise, measureable relationships and values remain unknown. This includes diversity, population numbers, uniqueness, productivity, and position in the food chain. What does the loss of an individual, population, or species do to an ecosystem? Some wildlife professionals understand the need to begin thinking on a larger scale — from species to ecosystems — but baseline information is sorely lacking and resistance to change is great. Amidst the debate, concrete answers remain elusive.

In assessing the impacts of poaching on California's wildlife, it is important to understand that wildlife has "value" that transcends monetary worth alone. When a poacher kills a deer or catches a fish, the impact is greater than a lost recreational opportunity, a loss in revenue to the state, or depletion of a resource. Yale researcher Stephen R. Kellert (1984) explains that at least seven environmental values or benefits should be considered in any cost-benefit analyses of wildlife:

1. Naturalistic/outdoor recreational values - the appreciative benefits associated

with direct contact and experience with natural settings and wildlife (such as those experienced while camping, backpacking, hunting, fishing, bird watching, etc.).

2. Ecological values - the systemic importance of particular environmental habitats to the well-being and continuity of interrelated flora and fauna. Possible criteria include diversity, population uniqueness, biomass, productivity, and trophic position.

3. Existence or moralistic values - the significance of particular habitats or species as treasured spiritual objects to preserve and protect, regardless of their immediate utility or tangible benefit.

4. Scientific values - the biological and physiological importance of environmental objects for advancing human knowledge and understanding of the natural world; the potential educational value of natural areas as outdoor classrooms.

5. Aesthetic values - the physical attractiveness and artistic virtues of environmental wildlife objects.

6. Utilitarian values - the present and future potential of environmental objects as sources of material benefits to people and society.

7. Cultural, symbolic and historic values - the importance of natural areas or species as reflections of unique societal experiences and specialized affections, such as strong affection for individual environmental wildlife objects.

Two major obstacles exist in assessing the importance of intangible environmental benefits: a bias exists in the minds of most analysts, the general public and legislative decision-makers toward the consideration of quantitative factors, especially if measurable in dollars and related human needs (e.g. food, energy, jobs); and the assignment of qualitative assessments to intangible environmental values typically results in grossly imprecise evaluations and a poor identification of the values at risk (Kellert 1984).

Kellert believes that before an equitable and comprehensive basis is established for properly assessing wildlife values, we must be clearer about what intangible values are at risk and use these categories consistently to assure comparability. Additionally, given the inherent bias toward the quantifiable, we need to develop standardized procedures for numerically measuring all values (Kellert 1984). While these values are difficult to quantify, each has substantial bearing on how we view wildlife, how we manage wildlife, and how we evaluate the impact of poaching.

PUBLIC PERCEPTION OF POACHING

A general public disinterest towards illegal killing of wildlife is frequently cited as a major stumbling block to effective anti-poaching campaigns (East 1979, Turbak 1982), although polls in California show a strong general concern. In many parts of the country, this apathy is much closer to sympathy, if not support (Mann 1979). In parts of eastern Montana, rural children play "poacher and warden" much like "cowboys and Indians," and the warden is the bad guy (Scialfa and Machlis 1993). Schueller (1980) documents a case in Texas in which poachers on trial in Federal court received legal and financial support from members of the local community.

In what is probably the most famous case of all, folk-hero status was accorded Claude Dallas, a poacher who shot and killed two Idaho Department of Fish and Game officers in early 1981. Dallas worked as a ranch hand and trapper in southeastern Oregon and northern Nevada. He was a loner who cultivated the image of a 19th century cowpoke; dressing in distinctive buckskins, chaps, and spurs and always armed with a revolver and rifle. In the winter of 1980, he was trapping bobcats along the Owyhee River near where the borders of Oregon, Nevada, and Idaho meet. Two wardens approached Dallas in his

remote hunting camp to check on a report that he had been poaching deer and bobcat, neither of which was in season in Idaho at the time. Dallas readily admitted killing deer for camp meat and argued it was a reasonable thing to do considering his location. When the wardens, both of whom were armed, announced their intention to arrest him, Dallas shot them both in a quick draw reminiscent of a western movie shoot-out. He then went to his tent, retrieved a rifle, and shot both men in the head (Long 1985, Scialfa and Machlis 1993).

Dallas subsequently became the object of a highly publicized, sixteen-month manhunt. He was ultimately captured only a few hours from his original hunting camp where the shootings took place. His ability to elude capture was attributed to his exceptional wilderness skills and to the probability that he was receiving assistance from local residents (Long 1985, Scialfa and Machlis 1993).

At his trial, Dallas testified that he believed the wardens were going to kill him and that he shot them in self-defense. The furor over the incident increased when the Idaho jury agreed and found him guilty only of voluntary manslaughter. Several jurors remarked after the trial that had Dallas not shot the two wardens a second time, they would have ruled for justifiable homicide. Dallas was sentenced to thirty years in prison and declared eligible for parole in seven years (Long 1985, Scialfa and Machlis 1993).

However, in March of 1986, Dallas escaped from prison. He was recaptured ten months later in southern California. Dallas claimed he had escaped because he feared being killed by vengeful prison guards. Once again the jury agreed, and in a subsequent trial he was acquitted of escape charges. Shortly afterwards, he was transferred to a correctional facility in another state (Long 1985, Scialfa and Machlis 1993).

Much of the debate surrounding the Claude Dallas trial revolved around his characterization as an admirably old-fashioned and fiercely independent individual who

merely sought to be left alone and who was entitled to live off the land. The controversy illustrates the considerable animosity that exists toward wildlife laws among certain groups and that unrestricted access to wildlife is still closely associated with deeply held beliefs about personal freedoms (Scialfa and Machlis 1993).

As stated in the previous section, the California Department of Fish and Game simulated 134 deer poaching incidents in 1975-76, but not even one was reported by the public (CDFG 1976). In a more recent study in Alberta, only seven of 649 simulated poaching incidents were reported. Officials in both studies were directly observed by landowners or other members of the public during actual kills or immediately after when their purpose must have been known. Alberta researchers speculate possible reasons for the lack of reports of illegal activity are: 1) lack of awareness by the public of what constitutes a violation; 2) the probability of violators being friends or relatives; 3) sectors of the public having negative attitudes toward wildlife; and 4) illegal take activities not being considered significant enough to report (Boxall and Smith 1987). Another consideration, suggested by a DFG warden, is that, in California, potential witnesses may assume there is only a remote likelihood that DFG will respond to the report or apprehend the violator. The same warden said that the growing use of cellular phones is helping to encourage people to report violations, but DFG does not supply wardens with such equipment.

Apathy toward poaching is also a function of demographics. With a human population in excess of 30 million, California is one of the most urbanized states in America. Poaching is an activity most people relate to hunting and fishing, both forms of recreation practiced primarily in rural settings.

The public's current attitude toward poaching in the United States is rooted in a cultural tradition that dates back to feudal Europe. In historical Europe, wildlife be-

longed to the person who owned the land upon which it was found. The hunting and killing of wildlife was possible only with the permission of the landowner. As a result, hunting and fishing were restricted to the wealthy and aristocratic class (kings, dukes, and knights) which owned the land in large blocks. Those less fortunate, who frequently lived adjacent to the restricted lands, were banned from hunting or possessing game (Farnsworth 1980). Such a ban perpetuated a pervasive system of class discrimination, and poaching grew out of both a need for the meat and as a form of social protest against such class discrimination.

When American colonists began writing wildlife laws, they sought to avoid the class discrimination of old Europe by allowing hunting privileges for all citizens, regardless of land ownership. Just as every individual is equal in freedom and rights, wildlife is viewed as being held in a "public trust" — and is owned equally by all citizens. In addition, colonial America was largely wilderness, which helped to break down the old European traditions that reserved the game for the large landowners (Farnsworth 1980). This mindset is reflected in the belief that as long as the individual is not infringing upon the rights and property of others, he has the right to kill wildlife as he pleases (Falasco 1985), and whatever he kills, he owns.

Today, public attitudes toward wildlife are changing. "A sense of profound change pervades the wildlife management field today," writes Stephen R. Kellert (1985a). "Various indicators suggest that basic shifts have occurred in American attitudes and recreational uses of wildlife. These changes have been reflected, for example, in a series of studies of American attitudes, knowledge, and behaviors toward wildlife (Kellert 1979, 1980; Kellert and Berry 1981) as well as in the findings of the 1980 *National Hunting, Fishing, and Wildlife-Related Recreation Survey* (USDI 1982), which estimated that a remarkable \$40 billion [are] spent on all forms of wildlife recreation, including \$14.8 billion on noncon-

sumptive wildlife use.” Nonconsumptive wildlife use includes such activities as birdwatching, wildlife viewing, visits to zoos or museums, scientific study, or photography (Kellert 1980).

Research indicates that the public is concerned about violations of fish and wildlife laws (Hooper and Fletcher 1989). Eighty-seven percent of the respondents in a national survey thought that violators should receive stiff fines and possible jail sentences (Kellert 1979). Getting citizens actually to report violators has proven more difficult.

In 1988, the California Department of Fish and Game asked researchers at California State University, Chico, to conduct a survey to assess public attitudes concerning fish and wildlife protection and law enforcement in California. This survey of 2,525 Californians provided the following results:

- Almost two-thirds of all Californians believed that fish and wildlife and their habitat need more protection, and three-quarters of the nonconsumptive wildlife recreationists believed that greater protection is needed.
 - The most serious perceived threats to wildlife were: 1) pollution and hazardous wastes; 2) loss of endangered species; and 3) poaching.
 - More than half of all Californians indicated that they feel a lot of concern about these issues which affect fish and wildlife. The highest levels of concern were expressed by nonconsumptive wildlife recreationists.
 - Almost half of all Californians perceived fish and game law violations to be very serious, yet more than half believed that violators of these laws are hardly ever apprehended.
 - Overall, almost one-third reported having observed a violation in the past, and more than half of the respondents who participate in both consumptive and nonconsumptive fish and wildlife activities indicated that they had observed one or more violations.
- Only 80 of the 786 respondents (10.2 percent) who stated that they had observed a violation actually reported it to a law enforcement agency. Approximately one-third reported to a park ranger and one-fourth reported to the California Department of Fish and Game. The most frequently cited reason for not reporting was that the respondent “did not know where to report.”
 - However, only 14.5 percent felt that present enforcement activities by the California Department of Fish and Game are very effective in protecting fish and wildlife.
 - Three-fourths of the hunters and anglers in California stated that they would be willing to pay an additional \$5 license fee to fund additional fish and wildlife protection services.
 - In addition, almost two-thirds of nonhunters and nonanglers said that they would be willing to pay a \$5 voluntary fee for additional protection of fish and wildlife.

Therefore, while most Californians are concerned about fish and wildlife resources and are willing to pay more for its protection, most are at a loss as to how to help. Since the success of any anti-poaching campaign depends upon the support of the public, such a program must aggressively educate both the hunting and nonhunting public as to the new character of the crime of poaching. Such an education program must convey four critical messages:

1. Poaching is a serious and widespread crime in California that is a significant threat to our state’s wildlife heritage and causes hundreds of millions of dollars in damage.
2. The modern poacher is rarely an impoverished subsistence hunter just trying to feed his family.
3. The poacher is a thief, who steals wildlife

that belongs to all Californians, and the commercial poacher is the most destructive wildlife thief of all.

4. State and federal wildlife officials cannot adequately protect California's wildlife without the support of the public. The public needs the ability to contact DFG wardens in a timely manner to be effective in reporting violations and to aid in apprehending violators.

SECTION II

WILDLIFE LAW ENFORCEMENT

WILDLIFE LAWS AND REGULATIONS

During the reign of the Roman Empire, wild animals were considered to be like the air and the oceans in that they were the property of no one. Yet unlike the air and the oceans, wild animals could become the property of anyone who captured or killed them. Apparently the only legal restriction in Rome on the right to kill or possess wildlife was that the private landowner had the exclusive right to kill and possess the wildlife on his property. Government regulation of the right to take wildlife became more evident in feudal Europe. Through the prohibition of hunting and fishing, feudal kings and barons sought to retain the fruits of their conquests by keeping weapons out of the hands of those they had conquered.

Further restrictions on hunting were imposed in England following the Saxon invasion of 450 A.D. and the Norman Conquest in 1066 A.D. The king soon claimed the sole right to pursue game or to take fish anywhere in the kingdom, though he frequently bestowed hunting privileges upon the favored nobility. Over time, Royal power over wildlife gradually gave way to Parliament. However, this transition continued to favor those of wealth, while discriminating against those less privileged by restricting hunting and access to firearms. The essential core of English wildlife law on the eve of the American Revolu-

tion was the complete authority of the king and Parliament to determine what rights others might have with respect to the taking of wildlife (Bean 1983).

It was a series of Supreme Court rulings in the nineteenth century that moved America away from the earlier legal precedents of Roman law, civil law of the European continent, and the common law of England, to establish a doctrine of public ownership of wildlife. This doctrine affirms the principle that wildlife is not the private property of any individual or group of individuals, but rather the collective property of all the people. It establishes the role of the government as public trustee in the task of wildlife conservation. That role is filled primarily by the states, and to a lesser degree by the federal government (Bean 1983).

STATE LAWS

The California Legislature bears the responsibility for making the laws which protect the state's wildlife. These laws are codified in the *Fish and Game Code of California*. In addition to setting forth the general laws covering wildlife, the Fish and Game Code also describes the organization and general functions of the Fish and Game Commission and the Department of Fish and Game (State of California 1992b).

The Fish and Game Commission is a body of five members appointed by the Governor and approved by the Senate for six-year

TABLE 2. SAMPLING OF CALIFORNIA POACHING LAWS

Crime	Class of Crime	Maximum Penalty
Sale or purchase of bear parts	Felony	\$5,000/1 year state prison or County jail
Take, injure, possess, transport or sale of any mountain lion or parts thereof	Misdemeanor	\$10,000/1 year County jail
Take of game mammal or bird without a license tag or stamp	Misdemeanor	\$2,000/1 year County jail
Fishing without a license	Infraction	\$1,000
Use of gill nets to take salmon, steelhead, or striped bass, except in specified districts -- first conviction	Misdemeanor	\$5,000/6 months in County jail/ revocation of license
Second conviction (of above)	Felony	\$10,000/1 year state prison
Purchase, sell, or offer to purchase or sell sturgeon or any parts thereof, including sturgeon eggs	Misdemeanor	\$5,000/1 year County jail
Take of endangered species or threatened or fully protected birds-of-prey	Misdemeanor	\$5,000/1 year County jail
Knowing purchase of sport-caught abalone for commercial purposes	Misdemeanor	\$40,000
Sale or purchase of fish under a sport fishing license	Misdemeanor	\$7,500
Any violation of the Fish and Game Code		Forfeiture of device/apparatus used in committing offense (at the discretion of judge)

Source: *Fish and Game Code of California 1992*

terms. The Commission essentially implements the general laws passed by the Legislature by setting specific regulations covering seasons, limits, and methods of take for game species. These regulations are codified in the California Code of Regulations, Title 14. Natural Resources. The Fish and Game Commission also has authority to suspend or revoke licenses, assess civil penalties against violators, hear appeals from individuals whose licenses have been revoked, and approve the listing or delisting of threatened and endangered species in California (State of California 1992b). The Commission further has the ability to establish "policies," although the legal status of such general policies is vague at best.

The Fish and Game Commission has a major role in hearing appeals from sportsmen and some commercial fishermen over loss of their hunting and fishing privileges. The Department of Fish and Game (DFG) can suspend hunting, fishing, and commercial fishing licenses under some conditions when a Fish and Game Code violation occurs. The affected person has the right to appeal this decision to the Fish and Game Commission, which will, at a regularly scheduled meeting, hear testimony from the appellant and the DFG's Wildlife Protection Division. The Commission has one of three options: 1) deny the appeal and let the DFG decision on suspension of the hunting, fishing, or commercial fishing license stand; 2) modify the DFG decision, such as changing the length of the license suspension; or 3) reverse the DFG decision and allow continuation of hunting or fishing privileges for the individual appellant. In past years, the Commission's appeals process was inconsistent in application to individuals, but recent regulations and process improvements have substantially improved the Commission's ability to deal consistently with license suspension appeals.

The Department of Fish and Game is charged by law with the protection, management, and enhancement of fish and wildlife resources in California. The Department also

provides technical expertise and advice on wildlife issues being considered by the Fish and Game Commission. It is the game wardens in the Department of Fish and Game's Wildlife Protection Division who enforce the laws and regulations passed by the Legislature and the Fish and Game Commission.

The Fish and Game Code and Title 14 contain a variety of laws and regulations covering poaching. (See Table 2.) The fines and penalties vary in severity, depending upon whether the violation has been classified as a felony, misdemeanor, or infraction. For instance, fishing without a license is a minor infraction punishable with a maximum fine of \$1,000. At the other extreme is the sale or purchase of bear parts — a felony, punishable by a maximum fine of \$5,000 and imprisonment for up to one year in state prison or county jail. Killing a deer without a license is a misdemeanor, and carries a maximum fine of \$2,000 and up to one year in county jail. The majority of violations listed in the Fish and Game Code are misdemeanors. The penalty for some violations increases in severity if the violation is repeated. For instance, the use of gill nets to take salmon, steelhead, or striped bass is a misdemeanor for the first conviction, but a felony for the second conviction. The Fish and Game Code also allows the judge before whom any person is tried for a violation to require the forfeiture of any device or apparatus used in committing the offense (State of California 1992b). This can include firearms, traps, gill nets, motor vehicles, and even fishing vessels.

FEDERAL LAWS

In 1900, the federal government entered the wildlife protection arena with the passage of the **Lacey Act**, which prohibits the interstate transportation of any wild animals killed in violation of state law. Violation of the Lacey Act is a felony punishable with a fine of up to \$2,000, up to two years in federal prison, and forfeiture of any guns, traps, nets, vehicles or

other equipment used in the offense. Other federal wildlife protection laws soon followed:

- **Migratory Bird Treaty Act** (1918) - prohibits the sale or offer for sale of migratory birds. Violation of this federal law is a felony and can bring a maximum criminal penalty of \$2,000, two years in federal prison, and forfeiture of equipment used in the offense.
- **Bald Eagle Protection Act** (1940) - prohibits the taking, possession, sale, purchase, transportation, importation, or exportation of bald and golden eagles. Carries a misdemeanor criminal penalty of up to \$20,000, five years in federal prison, and cancellation of federal hunting or fishing permit. The Secretary of the Interior can also levy a civil penalty of \$10,000 for each violation.
- **Endangered Species Act** (1973) - prohibits the taking, possession, sale, purchase, transportation, importation, or exportation of endangered species. This is a federal misdemeanor which carries a criminal penalty of up to \$50,000, one year in federal prison, and a civil penalty of \$25,000 for each violation.
- **Airborne Hunting Act** (1976) - makes it unlawful to shoot or harass wildlife from an aircraft. This crime is a misdemeanor and can result in a criminal fine of \$5,000, up to one year in federal prison, and possible forfeiture of firearms, aircraft, or other equipment.
- **Marine Mammal Protection Act** (1972) - places a moratorium on taking and importing marine mammals and marine mammal products. A federal misdemeanor, this violation carries a criminal fine of up to \$20,000, one year in federal prison, and an additional civil penalty of \$10,000.

These federal laws, along with their fines and penalties (both criminal and civil) are codified in the *Code of Federal Regulations* (CFR). (See Table 3.) Primary responsibility for enforcement of federal wildlife laws falls

to the special agents of the U.S. Fish and Wildlife Service, with the exception of the Endangered Species Act and the Marine Mammal Protection Act. Under these acts, law enforcement is shared by the National Marine Fisheries Service (which is responsible for the protection of whales, porpoises, and seals) and the U.S. Fish and Wildlife Service (which is responsible for the protection of manatees, dugongs, polar bears, sea otters, and walruses) (Bean 1983). Both federal agencies also handle cases involving endangered marine species such as salmon and sea turtles. DFG wardens are deputized as federal officers and have authority to enforce federal laws as well.

Some of the typical state and federal wildlife violations that enforcement officers encounter include:

- **Taking or attempting to take game or fish out of season** - taking game or fish during a closed season or outside of prescribed hunting hours.
- **Taking or attempting to take wildlife in an illegal place** - taking game or fish in closed areas, refuges, or on private property posted against hunting and fishing.
- **Improper license** - hunting or fishing without a license (most common violation), using a license issued to someone else, or failing to display a license properly.
- **Illegal method** - California has established proper and improper methods and equipment for taking fish and wildlife. For example, it is unlawful to hunt deer with a spotlight or with a .22-caliber rifle, to use a shotgun that holds more than three shells when hunting ducks or geese, and to use fishing gear with too many hooks.
- **Illegal possession** - California has laws that prohibit the possession of fish or wildlife or their parts at certain times of the year, that limit the number of animals that may be taken per day, season, or year, and that may be possessed at any one time.
- **Illegal procedure** - one of the most common procedural violations is failure to tag

TABLE 3. SAMPLING OF FEDERAL POACHING LAWS

Law	Description	Class of Crime	Maximum Penalty
Migratory Bird Treaty Act	prohibits the knowing sale or offer for sale of migratory birds	Felony	Criminal: \$2,000/2 years Federal prison/ forfeiture of guns, traps, nets, vehicles or other equipment used in offense
Lacey Act	prohibits the interstate transport of fish, wildlife, or plants taken or possessed in violation of any state, federal, or international law	Felony	Criminal: \$20,000/5 years Federal prison (each violation)/ cancellation of federal hunting or fishing license/permit Civil: per Secretary of Interior /\$ 10,000 (each violation)
Eagle Protection Act	prohibits the taking, possession, sale, purchase, transportation, importation, or exportation of bald and golden eagles	Misdemeanor	Criminal: \$5,000/1 year Federal prison Civil: \$5,000 (each violation)
Endangered Species Act	prohibits the taking, possession, sale, purchase, transportation, importation, or exportation of endangered species	Misdemeanor	Criminal: \$50,000/1 year Federal prison Civil: \$25,000 (each violation)
Airborne Hunting Act	unlawful to shoot or harass wildlife from an aircraft	Misdemeanor	Criminal: \$5,000/1 year Federal prison/ forfeiture of guns, aircraft, or other equipment used in offense
Marine Mammal Protection Act	moratorium on taking and importing marine mammals and marine mammal products, except as specified	Misdemeanor	Criminal: \$20,000/1 year Federal prison (each violation) Civil \$10,000 (each violation)

Source: *The Evolution of Wildlife Law* (Bean 1983)

big-game animals properly. Tags are used to identify the hunter who killed the animals and must remain attached to the animal during transit and storage.

- **Illegal transportation or exportation of protected species** - California regulates the transportation of fish and wildlife, in whole or in part, across state lines. In some instances, the importation or exportation of certain species may be totally prohibited.
- **Illegal taking or possession of protected species** - federal law prohibits the taking of animals listed as endangered or threatened under the federal Endangered Species Act. California also prohibits the taking of federally listed species or state listed species that are threatened, endangered, or otherwise protected.
- **Offering for sale wildlife species in violation of federal and state law** - California prohibits the offering for sale of animals killed out of season or otherwise illegally taken (State of California 1992b, Chandler 1986).

LAW ENFORCEMENT AGENCIES

The **Department of Fish and Game** (DFG) is the lead state agency in wildlife protection in California. The 239 field wardens in DFG's Wildlife Protection Division are charged with guarding more than 1,100 miles of coastline, 3,600 lakes, 1,200 reservoirs, 80 major rivers, and 159,000 square miles of land (Hastings 1993).

Wardens have statewide authority as peace officers with the primary duty of enforcing the Fish and Game Code and the regulations of the Fish and Game Commission. A warden is normally assigned to a specific area within the state or to a specific marine location which might include ocean boat patrols. A warden usually works on weekends, holidays, and often during the night, performing both land and ocean patrols to prevent violations. Wardens provide

the public with hunting and fishing information, as well as promote and coordinate hunter safety programs. They assist other departmental personnel in collecting and reporting information on the condition of fish and wildlife and their habitat. Wardens are also responsible for inspecting stream alterations, timber harvests, and development projects, commercial fishing boats, canneries, markets, stores, and other commercial establishments handling fish or game. While DFG has the primary responsibility for wildlife law enforcement in the state, there are other state and federal agencies with more limited authority for wildlife protection in California (See Table 4.)

The **Department of Parks and Recreation** (DPR) is responsible for 1.3 million acres of parkland in California, consisting of 70 state parks, 16 state reserves, 71 state beaches, 47 historical units, 35 state recreation areas, and 7 state vehicular recreation areas. DPR's 632 rangers are peace officers charged with authority to enforce all state laws, including the Fish and Game Code. DPR policy is for rangers to only enforce laws inside state parks. According to the DPR report, *Stewardship 1983*, poaching was identified as the third greatest threat to wildlife in California state parks, behind direct human disturbances (e.g., harassment, noise, presence) and predation by nonnative species (e.g., feral cats) (CDPR 1984).

The **U.S. Fish and Wildlife Service** (USFWS) is an agency within the Department of Interior and is the lead federal agency in wildlife protection in California. In addition to federal law enforcement, the USFWS manages a system of national wildlife refuges in the state. Hunting is permitted on many of these refuges and is strictly regulated. Only 17 USFWS special agents are stationed in California, nine of whom work as inspectors at the ports of entry in Los Angeles and San Francisco, leaving eight special agents to cover the entire state.

The **National Marine Fisheries Service** (NMFS) is an agency within the Department

of Commerce and shares responsibility for enforcement of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) with USFWS. NMFS special agents recently charged a Monterey squid fisherman with shooting sea lions (Springer 1993). They also regulate both the foreign and domestic groundfish fishery off California, Oregon, and Washington, as part of the Pacific Coast Groundfish Fishery Management Plan. Agents boarded one commercial trawl vessel in Bodega Bay and discovered over 15,000 pounds of unlawfully taken rockfish concealed in a boarded off section of the fish hold. The operator and owner of the vessel were fined \$20,000. During the summer months, agents also patrol the upper Sacramento River near Redding to protect the

spawning beds of the endangered winter run chinook salmon (NMFS 1993). NMFS performs these many duties with only fourteen special agents and one fisheries enforcement officer stationed in California, although they get occasional assistance from the Coast Guard.

The **National Park Service** (NPS) is an agency within the Department of the Interior and administers some 18 national parks, monuments, historic sites, and recreation areas throughout California. Hunting is generally not permitted in units of the National Park System. Various types of jurisdiction, i.e. concurrent, exclusive, and proprietary, may affect federal legal activities and degrees of cooperation with state officials. Some 250 law enforcement rangers enforce pertinent

TABLE 4
STATE AND FEDERAL WILDLIFE ENFORCEMENT AGENCIES IN CALIFORNIA

Agency	Number of Law Enforcement Personnel
State	
Department of Fish and Game (DFG)	239
Department of Parks and Recreation	632
Federal	
U.S. Fish and Wildlife Service	17
National Marine Fisheries Service	15
Bureau of Land Management	75
* U.S. Forest Service	210
National Park Service	250
Total	1469

*Turns all poaching cases over to DFG

Source: California Department of Fish and Game, California Department of Parks and Recreation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Bureau of Land Management, and the National Park Service. (1993)

sections of the *Code of Federal Regulations* (CFR), including those covering poaching.

The **U.S. Forest Service** (USFS) administers some 18 national forests covering 20 million acres (20 percent of the state) in California. The Forest Service operates under a multiple-use mandate. Activities such as timber production, grazing, mining, recreation, and wilderness preservation occur in the national forests. Hunting is allowed in most of these areas during established seasons and is coordinated within each state. It is the policy of the Forest Service's 210 law enforcement rangers (50 special agents and 160 law enforcement officers) to turn over all poaching cases to the Department of Fish and Game.

The **Bureau of Land Management** (BLM) manages 17.1 million acres of public lands in California (17 percent of the state). It is also responsible for about 47 million acres of subsurface mineral resources representing 47 percent of the state. BLM has a multiple-use mandate similar to the Forest Service, but is administered by the Department of the Interior. Similar activities occur on BLM lands as in national forests, including hunting during established seasons. The BLM has 75 law enforcement rangers in California, 55 of whom are in the California Desert Conservation Area in the southern part of the state. BLM rangers have authority to enforce several federal laws, including the Endangered Species Act and the Wild Free-Roaming Horses and Burros Act. In May 1993, a BLM ranger arrested one Cambodian national and cited five others for illegally capturing nine endangered desert tortoises. The tortoises were allegedly intended as the main course at a Cambodian wedding feast (Keen-Eyed Cop 1993).

TO CATCH A POACHER

The most basic tool of the warden in preventing poaching and catching poachers is patrol, either by land or by sea. Much of a

warden's time is spent behind the wheel of a truck or at the helm of a boat. Only 239 DFG field wardens must cover 159,000 square miles (665 square miles per warden), and this figure does not include the hundreds of square miles of ocean adjacent to the 1,100 miles of coastline. One warden in northeastern California points out that it takes him two hours at highway speed to drive from one end of his patrol area to the other. The problem is that he spends most of his time driving the back roads. He's lucky if he can cover one-fourth of his area in a day. A lot of the experienced poachers know that, and they have little fear of getting caught (Voet 1992c).

Marine patrols along the coast will often reveal violations of commercial fishing regulations. Wardens monitoring the sardine fishery boarded two purse seine vessels and found loads of 99 percent sardines, well in excess of the 35 percent incidental tolerance allowance. Ten fishermen were cited, and 100 tons of sardines were seized. Within months the same fishermen were caught with a load of 68 percent sardines, and this time wardens seized 60 tons of fish. This case highlights the critical need to have DFG personnel available to document every landing in these regulated fisheries (CDFG 1990).

In San Diego County, one of the more unusual duties of a warden is to patrol for reptile poachers in the desert. The Anza-Borrego Desert is home to several reptiles found nowhere else in the world, and there is a big business in capturing and selling the rare reptiles to scientific collecting houses that specialize in reselling the specimens to colleges and universities. The collecting of some species of reptiles is legal — usually the limit is two, the reptiles cannot be sold, and the collector must have a fishing license. Other reptiles, like the desert tortoise, the San Diego horned lizard, and the southern rubber boa, are strictly protected. DFG wardens often patrol the desert at night, particularly on calm, warm, moonless nights when reptiles — and collectors — are out in great numbers. The wardens turn off their lights and

park on a knoll overlooking a stretch of highway. Reptile collectors often have their low-beam headlights adjusted lower than normal, and their pattern of collecting is easy to spot: they drive slowly until they see a reptile crossing the road, then they stop, get out, capture the reptile, then drive again. It is a more common practice than many people realize. One night, just south of the Anza-Borrego Desert State Park boundary, every single car the wardens stopped was collecting reptiles (Sorensen 1989).

Wardens also spend time at swap meets and gun shows looking for people selling illegal animal parts. The claws, jawbones, and teeth from black bears and mountain lions are popular jewelry items, and an illegal bear-skin rug will sometimes bring as much as \$1,000 (Sorensen 1989). Additional time is spent inspecting Asian American apothecary shops, restaurants, fish markets, and pet stores — all potential markets for illegal wildlife.

Wildlife check stations on public highways are another important enforcement tool. Usually set up during hunting seasons, the purpose of the checkpoints is to prevent violations of the Fish and Game Code and apprehend violators. They are also used on the coast to check abalone divers. Violations most frequently detected involve illegal take, possession, and transportation of animals in California. Checkpoints are also used to gather biological and statistical data related to abundance, health, range of species plus user-group demographics. They also provide a method to help educate the public about laws, regulations, and resource conditions. Successful checkpoints have been conducted in the counties of Butte, El Dorado, Sutter, Tehama, Shasta, Siskiyou, Imperial, and on Grizzly Island in Solano County (CDFG 1990).

The use of specialized or directed enforcement teams was once more common in DFG's law enforcement operations. It was standard practice to move wardens from low activity areas (such as from the Sierra Nevada

in winter) to high activity areas (such as in the Central Valley during duck hunting season or to the coast during abalone season). When a problem, such as continuous reports of the illegal take of striped bass, was identified, a plan to combat the problem was developed, and additional wardens were assigned to work with the district warden in the problem area to assure the plan is a success (CDFG 1989, 1990). Directed enforcement details have been held throughout the state:

- Patrol efforts on private duck clubs in western Kern County produced a number of citations. Two clubs were found in violation of baiting regulations. Twenty arrests were made for such violations as shooting ducks over the limit, possession of too many ducks, using unplugged shotguns, and no license or duck stamp.
- A directed enforcement detail of 22 wardens was mounted in the Sacramento/San Joaquin River Delta area. The target was violators taking undersized striped bass. In one 12-hour period over 700 undersized striped bass were recovered with many of them returned to the water. The operation resulted in 218 arrests and 76 verbal warnings.
- Protection of spawning salmon was the goal of another detail held on the American River. Personnel from the U.S. Fish and Wildlife Service, state and county park personnel, and 12 wardens spent 855 hours contacting 2,689 people. 355 arrests were made along with 255 verbal warnings (CDFG 1989).

Directed enforcement details also allowed for the use of specialized enforcement methods and techniques that may not have been available to the solo warden. One noteworthy case involved the use of a specialized enforcement tool to combat the illegal taking of lobsters in the San Diego area. Several lobsters were removed from unlawfully set traps, injected with a tiny, coded, metallic tag and

returned to the traps. A stakeout was set and when the traps were serviced by a SCUBA diver, a team of wardens was in place to greet him at the Shelter Island boat ramp. Thirty-six (36) lobsters were found hidden in a compartment under the floorboards of the boat. Six of his lobsters reflected the presence of the tags when "read" by the scanning device passed over them. Similarly, six lobsters were electronically tagged in one trap of a series of traps illegally placed in a closed area of San Diego Bay. After three days of surveillance, a commercial fisherman was seen working and resetting the traps. When he was contacted at the docks, the tags were found in the lobsters in his vessel, and eight undersized lobsters were found in a concealed area (CDFG 1990). Unfortunately, budget cuts have sharply curtailed directed enforcement efforts.

In an interesting reversal of the age-old hunting technique of decoying, DFG wardens are using deer decoys to catch deer poachers. "Bucky," a simple, full-body stuffed mount of a forked-horn buck, is usually set up in areas near roads that are frequented by deer, while the wardens remain hidden nearby. Poachers who mistake the decoy for a live deer are apprehended by the hidden wardens. DFG hopes such details will help reduce incidents of poaching from roads and spotlighting deer at night (Tognazzini 1992). The results have been so encouraging that DFG is now using wild pig, turkey, and pheasant decoys as well.

Several states across the country employ similar programs, although some remain reluctant due to legal concerns over entrapment. Most states have avoided entrapment problems by conferring with legal officials before setting up decoys. In Delaware, Georgia, Alabama, Washington, Virginia, and other states, using decoys has resulted in an almost 100 percent conviction rate. Although no one would argue the deterrent effect of a stiff fine and jail time for crimes like road poaching, peer pressure is also at work here; the embarrassment of shooting a fake deer is

tremendous. Offenders are often chided mercilessly about killing wooden deer or "deercos," with names like Rolex, Sucker, Memorex, Timex, and, of course, Bucky (Woodard 1988).

Using all these strategies, DFG wardens made 283,171 contacts with the public in 1992. They issued 3,518 citations for hunting violations, 15,415 citations for sport fishing violations, and 365 citations for commercial fishing violations. The most common violation was fishing without a license (9,632).

While such statistics are impressive, they reveal little about the extent of commercial poaching. For instance, 214 citations were written for spotlighting deer at night. How many of those killed were intended for personal consumption and how many were intended for the black market? Was the fishing violator who was cited for two fish over-the-limit going to take them home for dinner, or to the local fish market to sell? It is next to impossible for the warden to know.

Catching a poacher in the act is obviously the easiest way to stop the crime, but it is also a rare occurrence. Wardens are more likely to find evidence after the fact — a gut pile in the brush or blood stains in the back of a pickup — which are frequently insufficient for a conviction. Physical evidence of poaching and other wildlife crimes historically has been difficult to obtain, but the science of criminal forensics is helping to change that.

An eastern Shasta County man was recently fined \$2,500 and had his hunting privileges revoked for three years for killing a large mule deer buck, ending California's first prosecution of a wildlife poaching case using new DNA gene matching techniques. The buck was shot in the fall of 1992 on a ranch adjacent to the Rising River Ranch, owned by actor Clint Eastwood, near the Cassel area, but it was tagged as if it had been killed on Burney Mountain south of town. Tissue samples of the deer — found hanging in a Burney garage — and tissue samples of the

intestinal remains found on the Rising River Ranch were sent to the U.S. Fish and Wildlife Service Forensics Laboratory in Ashland, Oregon for DNA analysis. The tests — a series of newly developed examinations of deer deoxyribonucleic acid (DNA) codes found in chromosomes — matched the gut pile tissue samples with the deer in the garage (Voet 1993c).

California Department of Fish and Game has its own Wildlife Forensic Laboratory in Rancho Cordova, near Sacramento. Staffed by wildlife pathologists, the Wildlife Forensics Laboratory conducts various biological examinations and analyses on a variety of wildlife species found in California. The most frequent analyses involve matching bloodstains, organ tissue, hair, feathers, and bone with the species of origin; dissection of carcasses to determine cause of death, time of death, and recovery of bullets; and chemical analysis of bear gall bladders to determine authenticity (90 percent of dried, confiscated gall examined is either pig or cow). The Wildlife Forensics Laboratory has received funding to develop DNA probes for identifying (matching) individual deer from blood and tissue samples, similar to those used in the federal laboratory in Oregon.

Wildlife Forensic Laboratory staff work on about 150 cases per year and testify as expert witnesses in Justice, Municipal, and Superior courts. Only 20 to 30 percent of the cases investigated by the lab ever make it to court, but 95 percent of those result in conviction. Approximately 15 percent of the current cases involve commercial poaching. That is down from 30 to 35 percent in the past, when more DFG wardens were working undercover investigations. There appears to be a strong correlation between the number of undercover investigations and the number of commercial poaching operations discovered in California.

Given the size of California and the only 239 wardens in the field, public support and involvement in anti-poaching efforts is critical. One program allows concerned citizens

to become the eyes and ears of DFG. **Californians Turn In Poachers** (CalTIP) is a secret witness program initiated in 1981 to help in the effort to protect the state's fish and wildlife resources. Many fish and game departments across the nation have similar programs. The CalTIP program provides a confidential, privately funded witness reward program to encourage the public to provide information leading to the arrest of poachers. Individuals wishing to report a poaching incident dial a toll-free number (1-800-952-5400). A 24-hour hotline is staffed by DFG personnel who then refer the call to a warden closest to the area. No names are given, and the witness is not asked to testify. If the information leads to an arrest, a five member Citizen Review Board determines the amount of the reward up to \$1,000. The Board then publicizes the award, and the caller may contact the DFG to claim their reward. Since 1981, CalTIP has paid out more than \$112,000 in rewards for 462 cases. Rewards come from private contributions made by county fish and game commissions and sportsmens groups and are administered by the Citizen Review Board.

Only a small percentage of callers is interested in a reward. During 1991, CalTIP received 4,277 calls and only 63 callers were interested in a reward. In 1992 the calls surpassed 6,200. However, it is unclear how many of these calls were made to report poaching incidents, since CalTIP serves both the DFG's Office of Oil Spill Prevention and Response as well as the secret witness program, allowing callers to report both illegal polluters and poachers. Additionally, it is unknown how efficient the system is, since many calls may not provide good information, and many wardens are too busy to respond to reports of minor violations.

DFG is also in the process of helping county Fish and Game Commissions select CalTIP coordinators to help develop awareness of the CalTIP program in all 58 counties. To date, 21 Coordinators have been appointed to promote the CalTIP program to

local sportsmen, environmental, and other community organizations.

Travelers outside of California who witness a violation, can simply call 1-800-8-WARDEN. Sponsored by the National Anti-Poaching Foundation, Inc. (NAPF), based in Colorado Springs, Colorado, this toll-free hotline will connect the caller with an NAPF operator. NAPF is a nonprofit, nonadvocacy organization funded solely through contributions and annual memberships. NAPF operators will not take any information but will transfer the caller to the appropriate state agency. For the first time, the entire nation is linked through this communications system to help stop poachers (Voet 1993b).

The DFG's Wildlife Protection Division attempts to educate the public through other forums as well, although lack of staff and time makes this difficult. These include warden participation in career days, sportsmen's fairs, and other public law enforcement events which reach thousands of individuals. "Townhall meetings" are held to maintain open dialogue with both the commercial fishing industry and the sport "party boat" fleet. These meetings were established to allow a forum for the hearing of differences and has resulted in the establishment of procedures or standards to resolve those differences. Wardens also make an effort to meet with prosecutors and judges to help make them aware of changes in fish and game regulations (CDFG 1990). Additionally, wardens regularly attend County Fish and Game Commission meetings.

UNDERCOVER OPERATIONS

While patrols, checkpoints, directed enforcement, decoys, forensics, CalTIP, and education are all proven methods in combating the noncommercial poacher, they have little impact on the commercial poacher. The only method that has proven consistently effective against the illegal commercialization of wildlife is to infiltrate poaching operations

with undercover wardens.

Suspecting that bear poaching was taking place in parts of northern California, DFG initiated one of its first undercover investigations in 1981 to determine the extent of illegal bear parts sales in the state and identify some of the persons involved. The eighteen-month operation revealed, for the first time, clear evidence of statewide marketing of bear parts, a high percentage of the consumer sales taking place in Asian American communities of Los Angeles and in southeast Asia. It was the first time wardens had been able to penetrate the ranks of some of the "houndsmen" and other hunters who engage in illegal activities in the pursuit and hunting of bears. The limited undercover effort revealed the presence of a loose marketing network the length of California that wardens believe brought increasing pressure on black bear populations of the state to meet demand for animal parts. In northern California, wardens accompanied houndsmen who illegally used dead cows and other meat to attract bears and who killed bears during the closed season. In southern California, wardens discovered that bear gall bladders, bringing prices ranging from \$30 to \$300 each in whole form, were being sold primarily in Asian American communities. During the investigation, wardens observed or were aware of bear parts that represented no less than 250 black bears (Klein 1982).

From 1981 to 1984, the U.S. Fish and Wildlife Service conducted **Operation Falcon**, a three year covert investigation of illegal activity involving raptors (birds of prey). The operation resulted in the conviction of 52 individuals from California and other western and midwestern states for the illegal capture of raptors from the wild, and the illegal possession, transportation, sale, and purchase of birds of prey for falconry — hunting game with trained birds of prey. Other charges included the manipulation of federal bird bands and the falsification of records to conceal or thwart detection of birds unlawfully taken from the wild.

In early 1985, DFG culminated one of its most massive undercover sting operations with the arrest of 24 people accused of catching and illegally selling sport fish. The sting was aimed at fishermen who take striped bass, sturgeon, salmon, and steelhead, and sell them on the black market. DFG set up its own fish market called "New China Specialty Foods" in Oakland, and was able to buy 12,534 pounds of illegal fish caught in San Francisco Bay and the Klamath River. Participating in the investigation were members of the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the San Francisco Police Department.

The success of the New China operation led to the introduction of legislation by Senator Ed Davis (Senate Bill 499, 1986 session) to set up a **Special Operations Unit (SOU)** within the Department of Fish and Game. With an initial budget of \$700,000 and consisting of three teams of undercover officers working throughout California, the primary aim of SOU was to identify and prosecute illegal trafficking in wildlife and wildlife products.

Working closely with other federal, state, and county agencies, SOU has broken cases involving illegal take, possession, and/or sale of wildlife species ranging from snakes to sturgeons to bears to birds. Over one-third of all cases initiated have carried felony charges, with the typical violation being the sale of bear or sturgeon. The team's undercover investigators have produced \$60-70 million worth of stolen marine life and over \$25 million in other poached wildlife species (i.e. bear, deer, bighorn sheep).

SOU was designed to investigate every phase of illegal wildlife activity including hunting and fishing, importing and exporting, sales and purchasing of illegally poached fish and wildlife. A sample of past investigations is impressive:

Operation Ursus (1989)

Operation Ursus was a two-and-a-half year investigation into illegal trade of bear

parts in California. The operation spanned the state from Trinity to San Diego County and resulted in the prosecution of 75 defendants for the illegal take, sale, and offer to sell bear parts. The investigation involved infiltrating an organized ring of bear poachers who guided hunters, as well as following the illegal sale of bear gall bladders by apothecary shops and acupuncturists in many California Asian American communities. Other species whose parts were illegally sold in this operation included deer, elk, abalone, rhinoceros, and tiger. Those convicted received fines up to \$5,000 and had their hunting licenses suspended for up to three years.

Operation Rufus (1988-1989)

Operation Rufus was a 15-month undercover investigation involving the illegal take and sale of furs in Modoc, Shasta, and Humboldt counties. Wardens obtained an array of pelts, including 171 raccoons, 160 bobcats, 94 foxes, 5 river otters (a protected species), 5 coyotes, and one ringtail (also protected). Twenty-seven percent of the pelts were illegally sold. The operation netted 21 defendants who were charged with a variety of offenses including the purchase and sale of bear parts, sale of furs without a license, sale of untagged bobcats, and sale of sport-taken game.

Operation Snare (1988-89)

Operation Snare involved the investigation of aquaculture companies located in northern California, engaged in domestic rearing of sturgeon under DFG permit. Several were charged with illegal purchase of sturgeon from sport anglers, taking fish for eggs (caviar), illicit sale of sturgeon, violation of mitigation agreements, illegal transfer of permits, and records violations. This investigation showed how sophisticated wildlife crime can be, in some cases resembling white-collar crime. A number of the companies lost their aquaculture permits and had to pay fines.

Operation Haliotus (1990)

Operation Haliotus was a two-year undercover investigation into illegal abalone sales. Wardens created a fictitious fish business which led to the prosecution of 24 individuals. Charges included illegally taking abalone for commercial purposes from the north coast, knowingly purchasing abalone illegally taken, conspiracy, grand theft, and receiving stolen property. The operation exposed only a small amount of the red abalone poaching taking place on the north coast. It is estimated that 12,000 abalone are poached from this area per week of diveable weather. Restitution from defendants totaled \$100,000. In addition, two fishing vessels, worth approximately \$80,000, were seized under a forfeiture order.

In the late 1980s and early 1990s, declining revenues from fewer hunting and fishing license sales, budget cuts, economic recession, and partisan politics spelled doom for undercover operations. Draconian budget cuts at DFG reduced the undercover staff from 12 wardens to 4 in 1991. The following year, three more positions were eliminated. Recognizing the importance of covert investigations, an interim arrangement has been worked out between the five regions of DFG to "loan" officers to SOU on a temporary basis. While undercover operations continue, their effectiveness has been drastically reduced.

Some wildlife officials resist the use of covert operations, claiming they are more expensive, time-consuming, and less effective than uniformed patrol. Advocates strongly disagree, pointing out that undercover investigations are the most effective way of stopping commercial poaching and that both covert and uniformed patrol are necessary. Many wildlife management agencies lack sufficient manpower and funds; therefore, they tend to expend both on those projects and activities which are seen as being in the greatest demand from their public. (A warden seen writing a citation is viewed

by the public as more effective than an undercover warden who is never seen at all.) Commercial poaching tends to be a low visibility crime, and the general lack of knowledge as to the nature and extent of this activity by the general public results in very little demand being placed on the wildlife law enforcement agencies to monitor and control this crime (Farnsworth 1980).

Without adequate covert operations to gather evidence, commercial poachers often are charged with other offenses such as illegal possession, exceeding bag limits, or some other such offense rather than the true offense of exploiting wildlife for profit. Without sufficient evidence, it is impossible to sustain a conviction for the more serious offense of commercial poaching (Farnsworth 1980). It is interesting to note that, while most other states are in the process of expanding their covert units, California has chosen to reduce its — a situation that should please commercial poachers to no end.

TO CONVICT A POACHER

After catching a wildlife violator in the act, a warden usually issues a citation. For infractions and some misdemeanors, the violator has the option of paying the fine by mail. If a mandatory court appearance is required, the violator is notified of the court date. Judges usually decide which violations necessitate a mandatory appearance. The violator also has the option of requesting a court date if he wishes to contest the citation. When the individual appears before the judge on the date specified, he is arraigned and enters a plea. A guilty plea usually results in an immediate fine and sentencing, although the violator may request to explain the reasons for his actions. A plea of not guilty results in a trial date being set by the judge. In some cases, this is actually a pretrial hearing in which the prosecutor and defense attorney meet to see if they can agree to a plea bargain and avoid a trial altogether. If no plea

bargain can be arrived at, the case goes to trial.

For more serious violations, such as the commercial sale of bear parts, the warden will take the violator into custody. The arresting warden files a report with the District Attorney's Office specifying the charges. The District Attorney has the following options: 1) accept the charges as recommended; 2) modify the charges; or 3) drop the case entirely. At the arraignment, the judge hears the defendant's plea, sets bail, and schedules a court date. It is here that the violator decides whether or not to contest the charge. Depending on the complexity of the case, there may be many pretrial motions, which are often used to delay the trial. Following the trial, the judge has a variety of sentencing options depending upon whether the crime is a misdemeanor or felony, the nature of the crime itself, and whether the violator has a previous record. Sentences can range from dismissal to substantial fines and jail time.

Violators frequently continue to poach while awaiting trial and do not stop until they are convicted. One warden tells of a herring poacher he arrested who continued to poach through another entire season before his case came to trial 14 months later.

Wardens point out that there is tremendous turnover in the District Attorney's office and that the least experienced prosecutors are frequently given wildlife violation cases. This necessitates constantly reeducating the prosecutors as to the nature of the crimes and the significance of their impacts. Officials within DFG's Wildlife Protection Division say that generally their conviction rate is 90 percent and that most violators plead guilty or just pay the fine. What concerns wardens is the quality of the convictions. Convicting five individuals of fishing without a license is much easier than convicting one person of selling five bear gall bladders. The latter violation has a far more severe impact on wildlife, but five convictions look much better than just one in the crime statistics.

Another concern of wardens is the relatively mild and inconsistent sentences many convicted violators receive. Every officer has a judicial horror story. One warden tells of watching a poacher kill a fawn just off Highway 79 in Cuyamaca Rancho State Park near San Diego. After confiscating his gun, the warden cited him for possessing a loaded gun in a state park, discharging a loaded gun in a state park, shooting across a highway, hunting deer without a license or tag, killing an illegal deer (a fawn), and shooting a deer with a light .22 caliber rifle. The judge gave the poacher his gun back and fined him \$65 (Sorensen 1989).

A judge in Tule Lake Justice Court took a much different approach. He fined one first-time offender \$1,500 and suspended his hunting privileges for three years for taking a deer out of season. Such inconsistent sentencing has been a source of exasperation for DFG wardens throughout California. Some wardens report satisfaction with prosecutors and judges in their districts, while others feel the local judiciary simply do not take Fish and Game Code violations seriously.

The majority of wildlife officers interviewed by Carl Farnsworth (1980) reported some dissatisfaction with at least portions of the criminal justice system. The primary objection was that judges and prosecutors do not view wildlife law violations as serious matters. Farnsworth speculates that judges and prosecutors do not realize the extent of the problem, particularly the activities of the commercial poacher. He pointed out that lack of knowledge about the seriousness of the problem and the tendency to view all game law violations as minor appears to have two basic foundations:

1. History and tradition from frontier days hold that wildlife is the property of all citizens equally, and those who violate the wildlife laws are doing no serious harm to society in general, particularly when viewed as a threat to the life and property of other individuals. Some view laws re-

stricting the killing of wildlife as being an infringement upon the basic right of all American citizens to do as they please as long as they are not infringing upon the rights and property of others.

2. Lack of knowledge of the extent of commercial poaching insofar as the number of species, individual animals, and the dollar volume involved is concerned. Farnsworth's study indicates that commercial poaching is a problem of serious magnitude even though it has been one of the least known crimes in the country. There is a need to emphasize strongly that each animal illegally taken is a theft from other citizens.

In 1987, a Senate Office of Research Report on the crime of poaching stated that the effectiveness of anti-poaching programs probably depends upon four factors: 1) the probability of poachers being apprehended; 2) the level of fines and/or punishments associated with the crime; 3) the probability of convictions of accused criminals; and 4) the fines and punishments ultimately imposed by the courts. Seven other states surveyed as part of the report and the California Department of Fish and Game emphasized the role of the courts in anti-poaching campaigns. All agreed that the courts were inconsistent in administering justice to poachers and often unwilling to impose maximum fines and penalties (Breedlove and Rothblatt 1987).

Reasons cited by the states for the low fine and jail-term assessments include:

- District attorneys and judges who are inadequately informed of the social costs of poaching;
- Crowded court calendars and associated incentives to reach out-of-court compromise settlements;
- A high volume of crimes on court calendars considered by prosecutors and judges to be more serious (such as robbery, burglary, and assault); and

- Crowded jails and prisons.

These problems probably transcend the poaching problem specifically and apply to crimes generally in our courts today (Breedlove and Rothblatt 1987).

As evidence that the Legislature considers wildlife violations relatively minor offenses, one warden points out that the entire Fish and Game Code contains only three felonies: killing or wounding a human being while taking a bird or mammal; buying or selling bear parts; and the second conviction for using a gill net to take salmon, steelhead or striped bass. Conspiracy to commit certain wildlife violations is also a felony, but most offenses are classified as misdemeanors. While misdemeanors can result in both fines and jail time for offenders, judges rarely impose the latter. A judge may also order the forfeiture of any device or apparatus used to take wildlife illegally, such as firearms, nets, or motor vehicles, but this is also rarely done, except in the case of illegal gill netters who will almost always lose their nets. One warden told us that loss of hunting or fishing privileges is the penalty most feared by commercial poachers because it removes their excuse for being out in woods or on the water.

Besides the criminal justice system, DFG has another law enforcement tool in place to impose civil penalties on wildlife violators. Passed by the California Legislature in 1988, Assembly Bill 512 allows DFG to impose a civil penalty equal to the loss to the state, the loss of the animal, and the cost of the investigation and prosecution. Additionally, A.B. 512 gives DFG the option of imposing a punitive civil penalty if the violator has not been convicted under the criminal justice system. Penalties of up to \$10,000 for each bird, mammal, or fish lost can be assessed. These civil penalties could prove most effective in cases of extensive and illegal wildlife habitat destruction or large over-limits. Unfortunately, the new law has not yet been fully implemented by the DFG.

In addition to the laws in the Fish and Game Code, prosecutors can charge those caught selling illegal wildlife with "unfair business practices" under the *Business and Profession Code of California*. During Operation Ursus, individuals were charged with selling pig gall bladders as bear gall bladders. One warden explained that such swindles are a common practice among Asian Americans in the illicit market because of the demand for bear gall bladders and because of the difficulty in determining their authenticity. Confiscated gall bladders must be tested at the Wildlife Forensics Laboratory to determine whether they are actually bear gall bladders or pig or cow. If the tests are positive for bear, the warden can charge the person who was in possession with a violation of the Fish and Game Code. If the tests are positive for pig or cow, then the warden can also charge the person with unfair business practices (misrepresenting the product being sold) under the Business and Profession Code. In another case in 1991, a Tulare County man was charged with illegally selling freshwater shellfish from uncertified waters (misbranded food). Using the Business and Profession Code was popular with prosecutors because it allowed for higher fines and counties received all the revenue as opposed to prosecuting under the Fish and Game Code, where counties got only a portion of the penalty money. Unfortunately, a recent change in the law requires all fine money to go to DFG, which has caused some problems for local prosecutors.

How a poaching violation is handled also depends upon whether the offender appears in a Justice Court or Municipal Court. Justice Courts are found in the more rural areas of the state where hunting and fishing are popular forms of recreation and substantial sources of income to local communities. Municipal Courts are in more urban areas where felonious crimes such as drug dealing, murder, and robbery are more common. Wardens claim Justice Courts are generally tougher on poachers, while Municipal Courts

give wildlife violations only cursory attention. This poses a particular problem with commercial poaching cases. While most killing of wildlife takes place in rural areas (because that is where the animals are), the black markets are primarily in the cities.

Sentencing guidelines do exist and are published by the Judicial Council of California in the *Uniform Bail and Penalty Schedules*. For instance, according to the January 1993 schedule, unlawful hunting (a misdemeanor) carries a recommended bail (fine) of \$200, plus an added penalty of \$340, for a total fine of \$540 (Judicial Council of California 1993). Wardens report that few judges follow the guidelines. Judges, in turn, defend their need for latitude in sentencing offenders. They point out that the perspective of wardens is unique in that poaching is a warden's special interest. Judges emphasize that they must weigh crimes against one another, consistently asking questions such as: Who is more of a threat to society, a rapist or a poacher? Setting minimum fines for some violations can also have unexpected results. For instance, fishing without a license, the most common violation of the Fish and Game Code, is an infraction carrying a recommended total fine of \$675. Rare is the judge who will levy the full penalty. In one case where the offender appearing before the judge was too poor to buy a license, let alone pay the fine, the judge simply dismissed the case.

The Judicial Council of California conducted a Municipal Court caseload study in 1986 to estimate the number of judges that a court will need to process its incoming cases. Cases were weighted based on the number of minutes required to process one case in a specific case category (misdemeanors and infractions). The study showed that judges spent an average of 55 minutes on each felony and only 7 minutes on misdemeanors such as those in the Fish and Game Code (Judicial Council of California 1988). In Municipal Courts, crowded jails and court dockets have forced prosecutors and judges into

practicing “judicial triage” — in which only the most serious cases are heard, which in the eyes of the current criminal justice system are crimes against people, not wildlife.

Many judges come from an urban background, with little experience in the outdoors, and they have no way to attach a value on a deer’s life (Sorensen 1989). Farnsworth (1980) emphasized the need to establish standardized monetary values for each species which can be utilized in computing the dollar value of the wildlife taken by the commercial poacher. A standard value for each species would provide the basis for making comparisons over set time periods and between states. This would be helpful in establishing a measure of the extent to which commercial poaching is harming the citizens of this country through the loss of wildlife which is held in joint ownership by all citizens.

Judicial attitudes toward poaching can change — sometimes in unusual ways. Howard Blewett, once known as the “Dillinger of duck hunting,” shot trunk-loads of ducks during the 1930s, then sold the meat to restaurants in San Francisco. Federal wildlife officers nabbed Blewett and ten other Los Banos men in 1935 for selling wild ducks. Blewett evaded officers for so long in part because many local citizens turned a blind eye to poaching. He served 13 months on a federal road camp crew for his crime and reformed well enough to be elected Justice Court judge in San Andreas, a job he held for 19 years until retirement in 1976. Blewett sentenced others for wildlife crimes not unlike his own. Two men who poached deer at night in his mountain community were each given six months in jail and \$350 fines. “One of them said that based on the penalty, they may as well have been robbers,” Blewett recalled. “They were treated like everyone else, according to the law” (Certini 1993).

OMINOUS TRENDS IN POACHING ENFORCEMENT

California’s growing human population and the subsequent loss of wildlife habitat are two current trends that will have the greatest impact on the future of our wildlife heritage. From 1948 to 1990, the state’s human population rose from 9.6 million to 30 million, and is projected to reach 39 million by 2005. Over 90 percent of Californians live in urban settings, with the majority of immigrants coming from Asia, Mexico, Central, and South America — all cultures with long histories of subsistence hunting. As the stress of urban living begins to take its toll, more and more people seek to escape, finding a temporary refuge in the public lands. Many of California’s growing cities provide easy access to nearby state parks, national parks, national forests, wildlife refuges, and other public lands. This in turn places an enormous burden on state and federal wildlife officers both to educate and enforce. Such rampant growth also means many potential markets open for the ambitious commercial poacher.

Over 15 million acres of habitat were converted to agriculture in California before 1900, while another 5 million acres of habitat were lost to development between 1945 and 1980. Such trends point to the critical need for wildlife habitat protection.

Against this backdrop of human growth and habitat loss, institutions responsible for managing California’s wildlife are being swept up in the winds of change. Recent actions of the Fish and Game Commission have led to increasing controversy. Since its inception in 1909, the primary function of the Commission has been to ensure sportsmen enough animals to hunt and fish to catch. However, increasing environmental awareness, concern over loss of habitat, broadening attitudes toward animals, and a growing constituency of nonconsumptive wildlife users has many advocating a shift from only game management to broader concerns such as habitat mapping, wildlife in land-use plan-

ning, ecosystem health, and biological diversity. In theory, the Fish and Game Commission is supposed to represent the public's interest in regulating wildlife take. Some in the environmental community think it frequently abrogates this responsibility in favor of special interests, such as sportsmen, agriculture, and business. For instance, the Commission recently removed the Mojave Ground Squirrel from the California Endangered Species List, despite opposition from independent biologists, environmental organizations, and the Department of Fish and Game's own biologists. Long a bastion of sportsmen, virtually every member of the Fish and Game Commission has listed his or her respective memberships in hunting organizations as primary qualifications for a seat on the Commission. The sitting members of the current Commission have little professional experience in wildlife management.

The Department of Fish and Game (DFG) has also been forced to contend with its changing role and expanding responsibilities. A recent study of DFG by the Legislative Analyst's Office highlights this transition: "The DFG historically has provided services and programs primarily for those that use or consume the state's wildlife and natural habitat resource, such as individuals who hunt and fish. As California's population has grown, leading to increasing urbanization, this traditional constituency group of the DFG has diminished steadily. Meanwhile, the responsibilities of the DFG relating to general habitat protection and endangered species protection have increased, requiring the DFG to expand services and programs that protect the overall resource base" (Hill 1991). Researcher Stephen R. Kellert (1985a) adds a further warning: "If the wildlife profession is to avoid increasing isolation from the millions of Americans primarily interested in non-game wildlife, dramatic changes in traditional programs will be required."

Today, the duties of wardens have expanded to include the enforcement of laws

pertaining to the importation of exotic prohibited species; responding to and investigating hazardous materials and other pollution spills; enforcement of streambed alteration and habitat damage laws; the protection and preservation of threatened, endangered, and fully protected species; as well as the more traditional enforcement of laws pertaining to hunting and fishing such as seasons, bag and possession limits, and method of take laws.

Wardens are also spread dangerously thin across California. In 1976, there were 207 wardens and over 20 million people in California. By 1991, there were only 258 wardens with a population of 30 million people. By 1993, the number of wardens had dropped dramatically to 239 statewide. The Wildlife Protection Division's 239 field wardens must now cover 159,000 square miles and over 31 million people. That is one warden for every 665 square miles or 126,000 people. DFG conducted a Personnel Allocation Study and Technical Application of Criteria (PASATAC) study in 1988, which examined current workloads and staffing needs for the Wildlife Protection Division in Region 5. Region 5 is the largest of DFG's regions, extending from Mono County in the north to Imperial County in the south, and encompasses both Los Angeles and San Diego. The PASATAC study concluded that Region 5 needs between 100 and 150 additional wardens (Cribbs et al. 1988). Another survey of members of the California Fish and Game Wardens Protective Association in 1984 concluded that 527 *additional* wardens are needed statewide *to do an adequate job* of fish and wildlife enforcement (Horn 1985).

Unfortunately, these new demands on wildlife officers come at a time of tight budgets and declining revenues from hunting and fishing licenses and other environmental sources, revenues that provide a large portion of the operating funds for DFG. The roots of this problem go back to the beginning of DFG at the turn of the century, when the first wardens were put on staff, paid for

from license revenues of sportsmen. Up until the 1970s, most of DFG's budget came from hunting and fishing licenses and tags and commercial fishing landing taxes. However, since the 1970s, the role of the DFG has been greatly expanded from a hunting and fishing organization to a broader environmental organization, concerned with endangered species, "nongame" wildlife, water quality and supply, impacts of development projects and timber operations on wildlife, and native plants. With these increased environmental responsibilities came, somewhat sporadically, increased revenues from other sources, often promoted more by environmental organizations and sportmen than by the state legislature or DFG leaders. Today, the DFG receives almost half of its revenue from general public sources, through such special funds as the Environmental License Plate Fund, the Tobacco Tax Account (Proposition 99), the Endangered Species Tax Check-off, and developer fees supplied through Assembly Bill 3158.

But there continue to be serious DFG

funding problems. By and large, sportsmen funding is in sharp decline, as fewer and fewer people are buying hunting and fishing licenses. Since the beginning of the 1990 recession, California's overall economy has hurt revenues from environmental funds, such as voluntary donations from the Endangered Species Tax Check-off and voluntary personalized licenses. Even tobacco taxes are declining as fewer people smoke. Furthermore, most DFG funds are earmarked for special sport or environmental programs, not law enforcement. Wardens fall through the budgetary cracks. The worsening recession has seen virtually all General Fund money, which formerly helped to fund many warden activities, pulled away from the DFG budget.

From 1980 to 1989, the sale of hunting licenses decreased by 26 percent, while the sale of yearly resident inland fishing licenses decreased by 29 percent (Hill 1991). License revenues fell \$6 million short of the amount anticipated during the 1989-90 fiscal year — a sizeable chunk of the DFG's \$136 million

TABLE 5
WILDLIFE PROTECTION DIVISION BUDGET
1987-1994

Year	Actual WPD Budget	Total DFG Budget*	Percent of total DFG Budget allocated to WPD
1987-1988	\$23,214,000	\$106,504,000	22%
1988-1989	\$25,248,000	\$118,946,000	21%
1989-1990	\$27,952,000	\$136,248,000	21%
1990-1991	\$23,818,000	\$140,412,000	17%
1991-1992	\$25,162,000	\$145,465,000	17%
1992-1993	\$22,976,454**	\$167,588,000	14%
1993-1994	\$22,568,756**	\$159,305,000	14%

* as proposed by the Governor

** as approved by the Legislature

Source: California Department of Fish and Game (1994)

annual budget. This decline in revenues is further compounded by inflation with the subsequent increased cost of doing business.

An examination of DFG's total budget shows a steady increase from \$106,504,000 in 1987-88, to \$159,305,000 proposed in 1993-1994. What these numbers do not reflect is the greatly expanded functions of the agency. For instance, the new Office of Oil Spill Prevention and Response (OSPR) has greatly expanded DFG's capability, but its budget (obtained from oil industry revenue) masks the overall budgetary decline in other areas. By comparison there has been a reduction in the Wildlife Protection Division's budget from \$23,214,000 in 1987-88 to \$22,568,756 in 1993-94. This represents a decline from 22 percent of DFG's total budget to 14 percent. (See Table 5.) The situation is even worse at the federal level. The U.S. Fish and Wildlife Service budget devoted to law enforcement has continued to decline since 1987 from 6.5 percent to 5.1 percent. In 1992, while the U.S. Fish and Wildlife Service received a budget of almost \$1 billion, the Division of Law Enforcement was allotted a paltry \$31 million with which to fight an increasingly sophisticated war (Speart 1993).

Current spending cuts affect every division of DFG, from endangered species programs to refuge acquisitions, but those affecting the wardens get most of the public's attention (Bowman 1990). The budget situation got so bad in early 1990 that wardens were placed under strict orders to cut back vehicle mileage. Wardens responsible for the Sacramento-San Joaquin Delta were limited to 26 miles a day, while those in the Sacramento Valley could drive no more than 37. Officers who cover tens of thousands of square miles on the western slope of the Sierra Nevada were bound to 50 miles or less a day. One warden who used up his 26-mile daily quota in a single trip in his pickup truck to take care of some paperwork, borrowed his wife's mountain bike to complete his daily patrol. In addition to the driving limits, the wardens in the central region were instructed not to

renew the post office boxes they used for business mail and to record all calls made outside of their patrol district (Bowman 1990). When California was reduced in the fall of 1992 to issuing IOUs for its debts due to the failure by the governor and the Legislature to approve a state budget on time, many local vendors stopped providing services to wardens. The next time a patrol vehicle or vessel needs repairing, wildlife officers will be in dire straits. Some report vendors have not been paid since September 1992 (Hastings 1993).

While travel restrictions are no longer explicitly in effect, operation expenses (vehicle maintenance, gas, telephone, etc.) for each warden have been reduced to the point that they have much the same effect. In the early 1980s, operation expenses were approximately \$8,000 per warden. Current operation expenses are between \$4,000 and \$4,400. Vehicle maintenance is particularly expensive because patrol is hard on vehicles. While wardens are not now told how many miles they can drive, this tight budget has forced them to cut down their patrol time and spend more time in the office.

Unlike urban police officers who work an 8-hour shift and are then relieved, wardens are responsible for all fish and game-related violations in their district, 24 hours a day. Frequently working out of their own homes in remote areas, wardens must be judicious in how they spend their time. Regular patrol may be alternated with night patrol for spotlighters, surveillance for illegal anglers, or lots of overtime during hunting season. Wardens have a reputation for working long hours. The standard 9 to 5 workday is rare indeed. Unfortunately, the Fair Labor Standards Act (FLSA) requires DFG to pay time-and-a-half for all overtime worked, but tight budgets result in wardens frequently being discouraged from working extra hours. FLSA allows for wardens to take time off instead of pay for overtime, but current DFG management has set a limit on the amount of time off as well. The combined effect of increased

duties, tight budgets, and FLSA has drastically reduced the average warden's time in the field. Wardens interviewed for this report confirm that only 20 to 25 percent of their work hours are now spent patrolling; about 10 hours a week. One warden even points out that while programs like CalTIP result in more reports of violations, he frequently has no time or resources to follow up. As further evidence of reduced warden time in the field, there has been a decline in the number of annual enforcement contacts wardens make. In 1989, wardens contacted 474,160 individuals. In 1992, contacts had dropped to 283,171.

The paradox of this situation is that if wardens cannot get out in the field, then they cannot document the magnitude of the poaching problem. If they cannot document the magnitude of the poaching problem, then they cannot justify requests for more money to enforce the law (Quinn 1983).

Particularly disturbing among the recent budget cuts at the Department of Fish and Game are those affecting undercover investigations. This action seriously compromises DFG's ability to fight commercial poaching effectively. No serious law enforcement effort can be successful against commercial poaching without a commitment to undercover investigations. The current situation is no different from trying to stop drug importation and sales using only uniformed police. Suppliers and importers of illicit drugs or illicit wildlife cannot be stopped without infiltrating their organizations. The growing sophistication of the professional wildlife outlaw must be met with an equally sophisticated approach to law enforcement. Uniformed wardens working one-quarter time in the field with poorly maintained equipment cannot be expected to meet such a challenge.

Perhaps the most ominous trend of all is the increasing violence demonstrated by wildlife offenders. Wardens practice one of the most dangerous professions in law enforcement. They frequently work alone and

at night, in isolated locations where assistance is hours away, and constantly encounter well-armed and experienced woodsmen who are proficient marksmen. In October 1992, a Lassen County deer poacher twice tried to run down a DFG warden with a pickup truck after poaching deer near the Department of Fish and Game's Honey Lake Wildlife Area. The poacher was tried and convicted in Superior Court and sentenced to three years in state prison.

In 1989, there were 7,541 sworn wildlife law enforcement officers at the state level throughout the United States. (The Los Angeles Police Department has more personnel.) In addition, there was a total of 220 wildlife officers in the five reporting Territories and Possessions. Federal government agencies reported 341 sworn conservation officers (special agents and rangers). This accounted for a total of 8,102 fully sworn wildlife law enforcement officers on duty in the United States in 1989. The total number of assaults on wildlife officers in 1989 was 128, a 24% increase over the previous year. No deaths were reported from these assaults, although 23 of them resulted in personal injury to the officers (USDI 1990).

Twelve California Department of Fish and Game wardens have been killed in the line of duty since 1913.

A FINAL NOTE

Poaching is a widespread and significant threat to California's wildlife heritage. Commercial poaching is reported to occur in all parts of the state and involves hundreds of thousands of individual animals from many species of wildlife. The total dollar volume involved and the total cost to the citizens of California is unknown, but conservative estimates place it in the hundreds of millions of dollars. The California Department of Fish and Game considers poaching the second greatest threat to our wildlife after habitat destruction.

DFG wardens are overworked, underpaid, outmanned, outgunned, and engaged in a protracted war to protect the last vestiges of our wildlife heritage. Besides fighting the big money and increasing sophistication of the professional wildlife outlaw, wardens are forced to run a formidable gauntlet of apathy, ignorance, politics, and bureaucracy, thrown up by the public and the institutions they serve. One veteran warden claims that morale among his fellow officers is the lowest it has ever been. Wildlife law enforcement officers in California are in critical need of our help.

The recommendations that follow offer no magic bullets or simple solutions to the enormous problem of poaching in California. What is required is a fundamental reassessment of our relationship with wild animals.

SECTION III

RECOMMENDATIONS

Researcher Kirk Beattie (1976) points out that the ideal anti-poaching campaign “represents a short- or long-term attempt to reinforce, activate, or change opinions, attitudes, and actions toward wildlife violations or violators.” In a 1984 survey of 47 state wildlife agencies, it was revealed that 44 (93.6 percent) had anti-poaching campaigns composed of one or more programs involving education, peer-group pressure (similar to the CalTIP secret witness program), rewards, or increased manpower. Programs that increase staff or provide an educational message on the benefits of obeying wildlife laws were judged more effective and received considerably more funding than peer-group pressure and reward programs (Nelson and Verbyla 1984). While consideration of the efficacy of different programs leads to endless debate, the two paramount needs of DFG’s Wildlife Protection Division are increased funding and staff.

The Mountain Lion Foundation offers the following recommendations as part of a broader anti-poaching campaign based upon legislation, law enforcement, education, and research:

LEGISLATION

No institution has a greater influence on wildlife protection in California than the State Legislature. Unfortunately, many of the current laws which protect wildlife were passed

in a time before explosive human growth, rampant loss of critical habitat, and the advent of large-scale commercial poaching. California prides itself on being a leader in environmental protection, but at the same time it constantly asks agencies like the California Department of Fish and Game to do more for environmental protection with fewer financial resources. If California’s abundant and diverse wildlife heritage is to survive, fundamental changes in wildlife protection laws must be made to meet these new threats.

1. Establish Stable and Earmarked Funding Sources:

The California Department of Fish and Game (DFG) needs new and stable funding sources. Traditional funding is declining, as sales of sportsmen’s licenses and tags and commercial fishing fees attest. At the same time, while the Legislature and the environmental community have developed new sources of environmental funds (e.g., the Environmental License Plate Fund, the Endangered Species Tax Check-off Fund, the Tobacco Tax, and developer fees for environmental review), these funds have also suffered from recent trends such as the current recession and have not kept pace with the need. Additional support for the DFG is needed.

The Wildlife Protection Division of the DFG falls between the traditional funding from sportsmen, which is earmarked for additional sport hunting and fishing programs,

and newer environmental funds, which are earmarked for habitat enhancement, endangered species, environmental review, and pollution concerns. The Legislature should adopt new funding sources for the DFG, and earmark funding specifically for additional wardens and for undercover operations. Any increased revenue must be used to supplement existing funds, not replace them.

The issue of funding environmental/resource programs has been reviewed (Planning and Conservation League Foundation 1991). The following are potential sources of funding:

1A. With the recent successful passage of Proposition 172, which constitutes a half-cent sales tax in California for local law enforcement and fire protection programs, the Legislature and the environmental community should investigate the possibility of establishing an earmarked sales tax for wildlife in California. (Missouri funds their fish and wildlife program with a one-quarter cent sales tax.) Polls taken in recent years have shown much public opposition in general to increased sales taxes, but if the increase is earmarked for wildlife programs (with specific earmarked percentages for wardens and undercover operations, as well as other habitat and wildlife management projects), the public might agree to support such a charge. A half-cent sales tax generates approximately \$1.4 billion in revenue annually in California, depending of course on the amount of sales that occur.

1B. For several years, the Legislature and the environmental community have tried to increase vehicle registration fees in California earmarked for parks and wildlife area programs. Such a proposal would generate substantial amounts of money, and polls show the public is supportive, especially if the increase includes free day-use access to state parks and

wildlife areas for the public with California-registered vehicles. This proposal has constitutional problems, as fees and taxes associated with automobiles are required to be spent on transportation.

1C. The Legislature may consider increasing hunting and fishing fees to generate more revenue. According to a 1988 DFG survey, three-fourths of the hunters and anglers in California are willing to pay \$5 for their licenses to fund additional fish and wildlife protection services (Fletcher et al. 1988). However, the hunting and fishing community already pay substantial amounts, and the numbers of hunters and fishermen in California are steadily declining, so this source would have limited value.

1D. The Legislature may consider other voluntary fees for the general public, since 99 percent of the public in California do not hunt and 95 percent do not fish. In the same DFG survey, almost two-thirds of nonhunters and nonanglers said that they would be willing to pay a \$5 voluntary fee for additional protection for fish and wildlife (Fletcher et al. 1988). An attempt to take advantage of this possibility fizzled in 1988 with the establishment of voluntary "wildlife passes" for nonsportsmen. Little revenue has been raised, due to DFG overestimating the size of the user group. At the same time, the DFG Endangered Species Tax Check-off, with limited promotion, has been successful in attracting voluntary donations of \$750,000 to \$1 million annually. Other successful ways of generating voluntary contributions are needed, since the will of the public is generally supportive of such contributions. For example, one half of the nonsportsmen who bought wildlife passes never used them.

2. Determine DFG's Primary Mission:

The Legislature should determine the primary mission of the Department of Fish and Game. Currently, there are conflicts between programs focused on resource use and programs focused on resource protection — these conflicts interfere with DFG efficiency and hold back efforts to fund DFG programs fully in general (Hill 1991). The Legislature should establish protection of wildlife, including habitat protection, enforcement of poaching laws, and maintenance of healthy populations of all species of wildlife (including native plants and invertebrates, as well as mammals, birds, fish, reptiles, and amphibians) through protection of ecosystems, as the first priority of the DFG, followed by public education and resource uses.

3. Adopt the Wildlife Violator Compact:

The Legislature should adopt the national Wildlife Violator Compact (WVC) as a statute and authorize the Department of Fish and Game to enter into the WVC. The Wildlife Violator Compact (WVC) assures that when nonresident violators receive citations, they will also face suspension of their license in their home state until the terms of the citation are met. As of 1 June 1993, the member states of the WVC were Colorado, Arizona, Idaho, Nevada, and Oregon. Some eastern states also came on line in late 1993 as has the state of Washington.

4. Make the Sale of Illegal Wildlife a Felony:

Classify the illegal sale of wildlife with a value of over \$100 as a felony. The \$100 value is consistent with the Penal Code — petty theft versus grand theft. For property, such as a VCR or television, the value is \$300, but for agricultural products the value is \$100. Currently, there are only three felonies in the Fish and Game Code: illegal sale of bear parts; injuring another person while poaching; and a second offense for illegal use of a gill net. A distinction must be made between commercial poaching, which targets large numbers of wildlife for financial gain, and the non-

commercial poacher who is taking fewer wildlife for his own use for a variety of reasons.

Currently, illegal sale of bear parts is the only felony which addresses this issue. Illegal possession of parts or products of other species should also be made felonies: illegal possession of mountain lion parts, trophy species, furbearer pelts, live reptiles and amphibians, and large quantities of illegal fish and shellfish. Sale or possession with intent to sell of wildlife parts or products should also constitute a felony, although such violations are difficult to prove unless based on undercover operations that meticulously document such sales.

5. Make Poaching of Threatened and Endangered Species a Felony:

The illegal take or possession of species listed as endangered or threatened should be a felony.

6. Reduce Some Fish and Game Misdemeanors to Infractions:

Evaluate reducing some fish and game misdemeanors to infractions or “wobblers.” Judges can give the same fine for an infraction as a misdemeanor, but the defendant is not allowed a jury trial for an infraction, and there is no jail time involved. Since judges rarely send violators of fish and game misdemeanors to jail, such changes could reduce the cost of time spent in court and allow the judiciary to focus on important cases.

Most violations of the Fish and Game Code involve hunting or fishing without a license or appropriate tags. Under most circumstances, these violations are not harmful to resources. Instead, they involve problems with revenue collection for the DFG. Considerations should be given to emphasizing protection of resources, especially from commercial poachers, rather than on revenue enforcement.

7. Increase Poaching Penalties:

7A. Currently, poachers face either fines

through infractions or misdemeanors, and potential jail time. A program for providing civil penalties against poachers has also been approved (Assembly Member Doris Allen's A.B. 512), but has not yet been fully implemented by the DFG. This program should be implemented as soon as possible.

7B. Judges currently have the discretion to require forfeiture of any device or apparatus used in committing violations of the Fish and Game Code. This can include guns, traps, nets, vehicles, and boats. The Mountain Lion Foundation recommends that, for convicted commercial poachers, these penalties be expanded to include forfeiture of buildings and businesses that were used in the commercial poaching operation and any other gain realized from unlawfully obtained profits.

7C. To accommodate undercover investigations better, the statute of limitations for commercial poaching violations should be extended from one year to three years.

7D. According to the staff of the Assembly Committee on Judiciary, Senior Deputy District Attorney Allen from Shasta County recently obtained felony convictions against poachers who conspired to violate the law. A felony conviction also includes a lifetime ban on the future possession of firearms, arguably a severe deterrent to poachers. Existing law, Penal Code Section 12021(c), lists a series of misdemeanors that make the offending person ineligible to possess firearms for 10 years. Legislation should be considered to add various commercial poaching misdemeanors to this list.

8. Repeal Restrictions on Fish and Game Employees Entering Private Land:

S.B. 779 (1993) by Senator Tim Leslie substantially hinders DFG employees from entering private land for research, monitoring, and assessment of wildlife health. The Mountain Lion Foundation is concerned that S.B. 779 may be interpreted to interfere with law enforcement as well. We recommend that S.B. 779 be repealed and that it be replaced with a clear protocol specifying when and under what circumstances DFG employees may enter private land without permission or a court order.

9. Require Licensing of Taxidermists:

The Mountain Lion Foundation recommends that taxidermists be licensed by the DFG, as other businesses and groups in California. Such a license will provide DFG with information on activities of taxidermists, possible leads on markets for illegal trophies, and additional revenue.

10. Hold Special Joint Hearing on Poaching in California:

The Senate Natural Resources and Wildlife Committee and Assembly Water, Parks, and Wildlife Committee should hold a special joint hearing on poaching in California, with special emphasis on commercial poaching. It is only through such forums that crimes against wildlife will become more visible and receive the attention they deserve.

11. DFG Should Require Anglers to Wear Licenses:

On March 1, 1994, a new regulation took effect requiring fishing licenses to be visibly displayed. DFG estimates that from 13 to 47 percent of the state's anglers are fishing without licenses, because the odds of being caught are so slim. In 1992, DFG wardens issued 9,632 citations for fishing without a license, the most frequent of all fish and game violations. Some think the new regulation will increase revenue. However, many wardens believe the new rule will increase work for them and lead to more conflict with fishermen. Licenses must still be checked for

proper stamps, expiration, etc., which may irritate sportsmen who think wearing a license precludes a visit from the warden. Other wardens worry that seeing a displayed license may dissuade them from checking for other violations, such as possessing too many fish or possessing undersized fish, thereby reducing enforcement effectiveness.

12. Give Wardens Authority to Tape-Record Conversations:

Give wardens the same authority as other peace officers to tape record private conversations they participate in. This is especially important in undercover operations.

13. Establish a Fund to Pay Informants:

Establish a fund to pay informants — not like CalTIP — but as an informant cultivation program. DFG has a procedure that allows it, but not enough money to implement it.

LAW ENFORCEMENT

Wildlife management agencies are repeatedly faced with deciding whether to spend money on programs to increase voluntary compliance with wildlife laws or on programs to apprehend and prosecute violators. Although most managers agree meeting objectives of hunting and fishing regulations depends upon voluntary compliance, the majority of agency effort remains directed at coercive enforcement (Scialfa and Machlis 1993). Over the years wardens have been assigned additional duties and responsibilities without commensurate increase in staffing. Wardens in the field are now spread dangerously thin. Every effort should be made to reduce non-law enforcement duties and increase staffing.

1. Increase Number of Wardens in the Field:

Increase DFG's Wildlife Protection Division field warden staff to 300 by 1995, with

an additional complement of 20 wardens to be added yearly until 2005. Current staffing of field wardens is 26 positions short of minimum need. [Estimated cost: \$1.7 million for first year; \$1.3 million for each following year.]

2. Reestablish DFG's Special Operations Unit:

Bring SOU staff up to a complement of 15 personnel (10 wardens, 2 lieutenants, 1 captain, an intelligence officer, and a records officer). Undercover operations are the most effective law enforcement tool DFG has against commercial poaching. Any increased funding sources must have a portion specifically earmarked for SOU. [Estimated cost: \$1.5 million per year]

3. Relieve Wardens of Nonessential Duties:

Relieve wardens of all possible non-law enforcement duties, such as road-kill removals, nuisance animal complaints, general information requests, and unnecessary paperwork.

4. Increase Budget for Warden Overtime:

Increase budget for warden overtime and remove management restrictions on time off for overtime worked.

5. Allow More Flexibility in Law Enforcement Techniques:

Allow wardens more flexibility in law enforcement patrol techniques, such as working in plain clothes and in unmarked vehicles, being able to rent horses for backcountry patrols, or for directed enforcement efforts during times of high activity, such as hunting seasons.

6. Expand Wildlife Forensics Laboratory:

Augment current Wildlife Forensics Laboratory in Rancho Cordova with forensic labs in Redding, Fresno and Los Angeles, each

staffed by two wildlife pathologists. Increase Rancho Cordova laboratory staffing from two to four. Distance from the laboratory is the primary reason wardens do not take advantage of the investigation capabilities of the forensic staff. [Estimated cost: \$3 million per year]

7. Make 24-Hour Dispatch Operational Statewide

Develop a statewide system to provide 24-hour dispatch for field wardens, or tie in DFG field wardens with the Highway Patrol. Examine how the use of cellular telephone technology could augment system. This is critical to provide adequate safety backup and support.

8. Designate Court Liaison Positions:

These should be experienced DFG wardens assigned initially to urban areas (i.e., San Francisco Bay Area, Los Angeles, and San Diego) who can shepherd fish and game cases through the courts, educate District Attorneys and judges, and serve as the primary contact when the court has questions. This individual would provide all the courts one telephone number to call for advice, one address to mail subpoenas to, and one person to monitor what the courts are doing.

9. Create a Central Intelligence Database:

Create a Central Intelligence File that is accessible to all wardens, but regulated on a need-to-know basis. Information sources are currently fragmented, which hinders a warden's ability to check a violator's background for previous violations.

10. Give Priority to Warden Staffing in Urban Areas:

Give priority to warden staffing in urban areas where the commercial demand for animals is highest. Financial and promotional incentives should be considered to increase staffing and reduce turnover in areas such as Region 5 (southern California).

EDUCATION

Significant and permanent reductions in the rate of poaching will only result when there are corresponding changes in attitudes towards wildlife laws. If wildlife managers desire to change attitudes towards violating hunting and fishing regulations, agencies should expose targeted individuals to educational programs before they are likely to have already violated wildlife laws (generally children between nine and eleven years old). Such programs should be designed to go beyond traditional hunter safety issues by also addressing the ethics and etiquette of sportsmanship, basic wildlife biology principles, and history and purpose of wildlife laws (Scialfa and Machlis 1993).

Agencies would also be well-advised to increase their efforts to promote support for wildlife conservation practices and policies by more frequent use of interpretive and environmental education strategies (Scialfa and Machlis 1993). Such programs provide DFG an excellent opportunity to address its nonhunting constituency about the crime of poaching.

PUBLIC EDUCATION

1. Continue CalTIP Program:

Continue the CalTIP outreach program currently being conducted. Complete selection of the county volunteer CalTIP coordinators as soon as possible. Include discussion of commercial as well as noncommercial poaching in their presentations.

2. Increase the Amount of Time Spent on Poaching in the Hunter Education Curriculum:

The *California Hunter Education Manual* currently contains only two short paragraphs of text discussing poaching, as well as a small graphic and an advertisement for CalTIP on the back cover. There is no mention of commercial poaching. Both the curriculum and the manual should be expanded or supple-

mented to include more extensive explanations of commercial poaching and CalTIP.

3. Include Poaching in DFG's Interpretive Services Plan:

Poaching education should be included in the Department of Fish and Game's Interpretive Services Plan. Poaching education should be made an Interpretive Staff Program priority in both site-based and outreach activities. A particular effort should be made to target elementary school children under nine years old.

4. Target Ethnic Groups With Outreach Program:

Target specific ethnic groups with a comprehensive public outreach program focusing on law enforcement through education. Such a program should be a coordinated effort of Interpretive Services, Conservation Education, and the Wildlife Protection Division. Make use of brochures in native languages and presentations by DFG personnel from the same ethnic group, if possible.

5. Target Business Groups With Outreach Programs:

Target specific business groups with a comprehensive public outreach program focusing on commercial poaching. Such groups could include restaurant associations, commercial fishing groups, reptile collectors, insect collectors, sport fishing groups, taxidermists, and hunting guides. Such a program could build on the Wildlife Protection Division's current regional "townhall meetings" to maintain an open dialogue with various user groups and should be a coordinated effort of Interpretive Services, Conservation Education, and the Wildlife Protection Division.

6. Establish a Community Relations Program:

DFG should establish a community relations program where field wardens spend more time educating the public. Such a pro-

gram should be a coordinated effort of Interpretive Services, Conservation Education, and the Wildlife Protection Division.

7. Clarify Rationale for Regulations:

Wildlife managers must make clear the rationale for various regulations. A considerable amount of poaching is not the result of disregard for hunting and fishing regulations in general, but of objections to particular regulations or policies which prohibit or discourage what are considered acceptable or desired ways to hunt or fish. Existing publications which outline fishing and hunting regulations might facilitate distributing such information (Scialfa and Machlis 1993).

EDUCATION OF JUDGES AND PROSECUTORS

1. Meetings Among DFG Wardens, Judges, and Prosecutors:

DFG wardens should continue their efforts to meet with prosecutors and judges to make them aware of changes in wildlife regulations and the impact of poaching on the resource. A recent effort was made in this area due to the legislative changes to the Fish and Game Code that deal with fishing license requirements and the establishment of specific fines. These ongoing efforts appear to be paying off in some areas in higher fines and sentences (CDFG 1990).

2. Presentations to Judicial Organizations:

The DFG Wildlife Protection Division and the Judicial Council of California should organize and present a program on the Fish and Game Code, Title 14 Regulations, and the impact of poaching at the Judges Institute for Continuing Education and to judges at the Municipal and Justice Court Institutes. Other forums might include the Rural Judges Association, the California Judges Association, and the California District Attorneys Association.

3. Jury Instructions in Fish and Game Cases:

The Judicial Council of California should develop jury instruction guidelines for Fish and Game Code and Title 14 Regulations cases.

RESEARCH

Wildlife law enforcement is the oldest but least researched of wildlife management practices (Beattie et al. 1977). Because of the difficulties and reluctance associated with studying illegal behavior, studies on poaching are relatively few, and management responses to illegal hunting are frequently made without benefit of objective information (Scialfa and Machlis 1993). Wildlife law enforcement research needs identified by one survey were classified as forensic or nonforensic. Forensic research involves the development of methods for identifying particular animals or species from parts of the animal (e.g., hair, blood) and methods for determining time of death of killed animals. Nonforensic research is more broad scale, concentrating on activities such as optimum deployment of wildlife law enforcement manpower and the effectiveness of patrolling in deterring violations (Beattie and Giles 1979). Little research has been conducted on the development of strategies and techniques to improve enforcement operations. Most literature dealing with wildlife law enforcement techniques does not provide a scientific evaluation of such techniques (Beattie et al. 1977).

1. Budget for Law Enforcement Research:

The Mountain Lion Foundation recommends that a portion of the Wildlife Protection Division's budget be allocated to enforcement research.

2. Begin Law Enforcement Research Programs at Once:

Begin comprehensive, interdisciplinary law

enforcement research programs at once; include human attitudes and behavior as well as development of new enforcement techniques (Morse 1973). Programs should address such issues as adequate enforcement funding; quantification of violations; deterrent value of enforcement; optimum deployment of enforcement manpower; effectiveness of undercover enforcement; uniform measurement of enforcement productivity and efficiency; and effectiveness of negative sanctions assessed against violators (Beattie and Giles 1979).

3. Develop Uniform Record-Keeping and Reporting Systems:

Develop uniform law enforcement record-keeping and reporting systems for state use to aid in program comparison, evaluation and planning. The University of California and California State University systems may be able to provide research support. The World Wildlife Fund's TRAFFIC USA, the Wildlife Society, and the Wildlife Management Institute might all provide helpful forums for providing these national standards for enforcement records (Morse 1973).

4. Fund New Forensics Techniques:

Funding should be provided for the Wildlife Forensics Laboratory to develop additional tools for use in poaching cases, such as developing DNA probes for identifying and matching individual deer parts from blood and tissue samples and determining genetic variability within the three races of elk found in California. [Estimated cost: \$150,000.]

5. Conduct Research on Poaching Education:

Additional studies are needed in California to identify the best methods to educate the public on poaching issues and how to discourage potential poachers from committing crimes.

6. Conduct Cost/Benefit Analysis of Wildlife Cases:

Conduct a research project in which significant wildlife violation cases are monitored from beginning to end. Determine the financial cost to DFG, the loss to wildlife, and what happened to the violator.

BIBLIOGRAPHY

TECHNICAL ARTICLES AND SPECIAL REPORTS

- Beattie, K.H. 1975. Evaluative Criteria Used in Anti-Poaching Campaigns. *Wildlife Society Bulletin*. 7:185-188.
- , R.H. Giles, Jr., and C.J. Cowles. 1977. Lack of Research in Wildlife Law Enforcement. *Wildlife Society Bulletin*. 5:170-174.
- and R.H. Giles, Jr. 1979. A Survey of Wildlife Law Enforcement Needs and Current Research. *Wildlife Society Bulletin*. 7(3):185-188.
- Boxall, P.C. and L.C. Smith. 1987. *Estimates of the Illegal Harvest of Deer in Alberta: A Violation Simulation Study*. Alberta Forestry, Lands and Wildlife. Fish and Wildlife Division. Resource Economics and Assessment, Occasional Paper Number 2.
- Breedlove, B. and S. Rothblatt. 1987. The Crime of Poaching. Senate Office of Research Issue Brief. Senate Office of Research, Sacramento, California. 20pp.
- Brokaw, H.P., ed. 1978. *Wildlife and America: Contributions to an Understanding of American Wildlife and its Conservation*. Council on Environmental Quality, U.S. Government Printing Office, Washington, D.C. 532pp.
- California Department of Fish and Game. 1976. California Deer - Who's Counting. Wildlife Protection Division, Sacramento, California. 8pp.
- California Department of Fish and Game. 1986. The Theft of Fish and Wildlife for Profit. Wildlife Protection Division, Sacramento, California. 10pp.
- . 1989. *Report to the Fish and Game Commission, July 1, 1988 to June 30 1989*. State of California, The Resources Agency. 102pp.
- . 1990. *Report to the Fish and Game Commission, July 1, 1989 to June 30 1990*. State of California, The Resources Agency. 84pp.
- . 1992a. *Bighorn Sheep Hunting: Final Environmental Document*. State of California, The Resources Agency. 23 April 1992. 360pp.
- . 1992b. *Deer Hunting: Final Environmental Document*. State of California, The Resources Agency. 23 April 1992. 724pp.
- . 1992c. *Furbearing and Nongame Mammal Hunting and Trapping: Draft Environmental Document*. State of California, The Resources Agency. 14 February 1992. 606pp.
- . 1992d. *Pronghorn Antelope Hunting: Final Environmental Document*. State of California, The Resources Agency. 23 April 1992. 252pp.
- . 1993. *Bear Hunting: Draft Environmental Document*. State of California, The Resources Agency. 12 February 1993. 486pp.

- California Department of Parks and Recreation. 1984. *Stewardship - 1983: Managing the Natural and Scenic Resources of the California State Park System*. State of California, The Resources Agency. January 1984. 50pp.
- Chandler, W.J. 1986. State Wildlife Law Enforcement. Pages 593-628 in A.S. Eno, R.L. Di Silvestro, and W.J. Chandler, eds. *Audubon Wildlife Report 1986*. The National Audubon Society, New York, New York. 1094pp.
- Cribbs, G.L., C.J. Patin, J. Berkson, J. Young, H. Ethridge, and S. Grinrod. 1988. *PASATAC - Personnel Allocation Study and Technical Application of Criteria*, Final Report. California Department of Fish and Game, Wildlife Protection Division, Sacramento, California. 84pp.
- Falasco, M.R. 1985. Wildlife Poaching: A Little Known, Very Serious Crime. Senate Office of Research Issue Brief. Senate Office of Research, Sacramento, California. 17pp.
- Fletcher, J.E, M. King, and J. Hooper. 1988. *Attitudes Concerning Fish and Wildlife Protection and Law Enforcement in the State of California*. California Department of Fish and Game, Sacramento, California. 222pp.
- Forsyth, C.J. and T.A. Marckese. 1993. Thrills and Skills: A Sociological Analysis of Poaching. *Deviant Behavior: An Interdisciplinary Journal*, 14:157-172.
- Hemley, G. 1988. International Wildlife Trade. Pages 337-374 in W.J. Chandler, ed. *Audubon Wildlife Report 1988/1989*. Academic Press, San Diego, California. 817pp.
- Hill, E.G. 1991. *A Review of the Department of Fish and Game: Issues and Options for Improving its Performance*. Legislative Analyst's Office. Sacramento, California. September 3, 1991.
- Hooper, J.K. and J.E. Fletcher. 1989. *Public Perceptions of and Participation in Fish and Wildlife Law Enforcement*. Transactions of the 54th North American Wildlife and Natural Resources Conference. Wildlife Management Institute, Washington, D.C. 359-363.
- Hummel, R.L. 1983. Hunting and Fishing - But Not in Sociology. *Rural Sociologist*. 31(4):55-258.
- Jones and Stokes Associates. 1992. *Reassembling the Pieces: A Strategy for Maintaining Biological Diversity in California*. A report prepared for the California Department of Forestry and Fire Protection and the California Department of Fish and Game by Jones and Stokes Associates, Inc. Sacramento, California. 124pp.
- Judicial Council of California. 1988. 1986 Municipal Courts' Judicial Weighted Caseload Study. Administrative Office of the Courts, Sacramento, California. September 1988. 157pp.
- . 1993. *Uniform Bail and Penalty Schedules*. Administrative Office of the Courts, Sacramento, California. January 1993. 50pp.
- Kellert, S.R. 1978. Attitudes and Characteristics of Hunters and Anti-Hunters and Related Policy Suggestions. Paper presented at a Hunter Safety Education conference in Charleston, South Carolina, 24 January 1978.

- Kellert, S.R. 1979. *Public Attitudes Toward Critical Wildlife and Natural Habitat Issues*. U.S. Government Printing Office # 024-010-00-623-4, Washington DC.
- . 1980. *Activities of the American Public Relating to Animals*. U.S. Government Printing Office # 024-010-00-624-2, Washington, D.C.
- , and J.K. Berry. 1981. *Knowledge, Affection and Basic Attitudes Toward Animals in American Society*. U.S. Government Printing Office # 024-010-00-625-1, Washington, DC.
- . 1984. Assessing Wildlife and Environmental Values in Cost-benefit Analysis. *Journal of Environmental Management*. 18:355-363.
- . 1985a. Birdwatching in America Society. *Leisure Sciences*, 7(3):343-360.
- . 1985b. Social and Perceptual Factors in Endangered Species Management. *Journal of Wildlife Management*, 49(2):528-536.
- Klein, W.E. 1982. An Enlightening and Sobering Experience in California. California Department of Fish and Game, Sacramento. 5pp
- Little Hoover Commission. 1990. *Report on California's Fish and Game Commission and Department of Fish and Game*. Commission on State Government Organization and Economy, Sacramento, California. 40pp.
- Loomis, J., M. Creel, and J. Cooper. 1989. *Economic Benefits of Deer in California: Hunting and Viewing Values*. College of Agricultural and Environmental Sciences, University of California, Davis, Institute of Ecology Report #32. 270pp.
- Matsueda, R.L. 1988. The Current State of Differential Association Theory. *Crime & Delinquency* 34(3) July:277-306.
- Morse, W.B. 1973. Law Enforcement — One Third of the Triangle. *Wildlife Society Bulletin* 1(1):39-44.
- National Marine Fisheries Service. 1993. *Southwest Enforcement Division Annual Report, Fiscal Year 1992*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Enforcement, Long Beach, California. 41pp.
- Nelson, C. and D. Verbyla. 1984. Characteristics and Effectiveness of State Anti-Poaching Campaigns. *Wildlife Society Bulletin* 12:117-122.
- Planning and Conservation League Foundation. 1991. *The Twenty First Century Study: Preserving California's Natural and Human Environment*. Sacramento, California. 128pp.
- Smeltzer, J.F. 1985. *Wildlife Law Enforcement: An Annotated Bibliography*. Division Report No. 13, Colorado Division of Wildlife, Denver, Colorado. 139pp.
- Vilkitis, J.R. 1971. The Violation Simulation Formula Proves as Reliable as Field Research in Estimating Closed Season Illegal Big Game Kill In Maine. *Trans. N.E. Sect Wildlife Society*. 28:141-144.
- U.S. Department of the Interior. 1982. *1980 National Hunting, Fishing and Wildlife Related Recreation Survey*, Washington D.C.
- . 1990. *Conservation Officers Killed and Assaulted 1989*. Fish and Wildlife Service, Division of Law Enforcement, Washington, D.C. 42pp.

THESES AND DISSERTATIONS

- Farnsworth, C.L. 1980. A Descriptive Analysis of the Extent of Commercial Poaching in the United States. Ph.D. dissertation, Sam Houston State University, Huntsville, Texas. 224pp.
- James, A.F. 1979. The Feasibility and Effectiveness of the use of Aircraft to Detect and Apprehend Illegal Night Deer Hunters. Master's thesis, California State University, Sacramento. 114pp.
- Scialfa, M.A. and G.E. Machlis. 1993. An Ethnographic Analysis of Poachers and Poaching in Northern Idaho and Eastern Washington. Master's thesis, University of Idaho, Moscow. 369pp.
- Vilkitis, J.R. 1968. Characteristics of Big-Game Violators and Extent of Their Activity in Idaho. Master's thesis, University of Idaho, Moscow. 202pp.

BOOKS

- Anderson, S.H. 1991 *Managing Our Wildlife Resources*, Second Edition. Prentice-Hall, Englewood Cliffs, New Jersey. 492pp.
- Bean, M.J. 1983. *The Evolution of National Wildlife Law*. Praeger Publishers, New York, New York. 448pp.
- California Department of Fish and Game. 1992. *California Hunter Education Manual*, Revised Edition. Outdoor Empire Publishing, Inc., Seattle, WA. 88pp.
- Dasmann, R.F. 1981. *Wildlife Biology*, 2nd edition. John Wiley and Sons, New York. 212pp.

- Giles, R.H. 1978. *Wildlife Management*. W.H. Freeman, San Francisco, California. 416pp.
- Hodges, T. 1988. *Sabertooth: The Rip-Roaring Adventures of a Legendary Game Warden*. T&C Books, Oroville, California. 274pp.
- Leopold, A. 1949. *A Sand County Almanac*. Oxford University Press, London. 269pp.
- Long, J. 1985. *Outlaw: The True Story of Claude Dallas*. William Morrow and Company, New York.
- Reisner, M. 1991. *Game Wars: The Undercover Pursuit of Wildlife Poachers*. Viking Penguin. 294pp.
- Schueler, D.G. 1980. *Incident at Eagle Ranch: Man and Predator in the American West*. Sierra Club Books. San Francisco, California. 297pp.
- State of California. 1992a. *California Code of Regulations for 1992, Title 14. Natural Resources*. Fish and Game Commission, Sacramento, California. 346pp.
- . 1992b. *Fish and Game Code of California, 1992*. Gould Publications, Inc., Altamonte Springs, Florida. 630pp.
- Swendsen, D.H. 1985. *Badge in the Wilderness: My 30 Dangerous Years Combating Wildlife Violators*. Stackpole Books, Harrisburg, Pennsylvania. 191pp.

MAGAZINE ARTICLES

- Begley, S. and M. Hage. 1981. The "Snakescam" Sting. *Newsweek*, 27 July:64.
- Beneath The Skins. 1990. *The Animal's Agenda*, May:35.
- The Buck Starts Here. *Time*, 10 December 1990:47.
- CITES Appendix II Needed for American Black Bear. 1992. *Animal Welfare Institute Quarterly*, Winter:6-7.
- Clifton, M. 1988. Big-time Poaching: Game No Longer. *The Animals Agenda*, July/August 1988:22-23.
- Congress Looks at Wildlife Law Enforcement. 1992. *Animal Welfare Institute Quarterly*, Winter:11.
- Dagget, D. 1988. Dishonorable Discharges. *New Times*. August:18-23.
- Durbin, K. 1982. Game Laws Have Long History. *Oregon Wildlife*, 37(5):14.
- East, B. 1979. Biggest Poaching Bust Ever. *Outdoor Life*, May:152-159
- For poachers, 3 little letters spell trouble. 1993. *Tracks: A Newsletter About California Deer and Other Big Game*, Spring 1993:7.
- Fowl Play. *Scientific American*, October 1990:28. Glick, D. 1990.
- The New Killing Fields. *Newsweek*, July 23, 1990: 54-55.
- The great bear aphrodisiac caper. *U.S. News & World Report*, 6 February 1989:14.
- Hanback, M. 1992a. Poaching: Crime in our Wilderness, Part I. *Outdoor Life*, October: 57-97.
- . 1992b. Poaching: Crime in our Wilderness, Part II. *Outdoor Life*, November: 79-118.
- Henry, R. 1991. Wildlife Forensics: Closing in on Violators. *Oregon Wildlife*, November-December:12-13.
- High Country News. 1990. Big Game Poaching An Organized Crime. *Environment*, January-February 1990:23.
- Hjelte, C. 1981. The First Six Months of Operation Game Thief. *Colorado Outdoors*, 30(3):49.
- Horn, G.L. 1985. Need for more rangers wins overwhelming support. *The Green Line: Official Publication of the California Fish and Game Wardens Protective Association*, January:2.
- Karpov, K.A. 1990. Red abalone of northern California: resource with a future? *Outdoor California*, January-February:1-4.
- Keen-Eyed Cop Saves State Reptiles From the Stew. 1993. *Newsbeat*, July:3.
- Kellert, S.R. 1981. Perceptions of Hunting and Wildlife in America. *Hunting*, Winter 1981.
- Mann, E.B. 1979. News, Good and Bad. *Field and Stream*, July:16.
- Mariposa Bear Case Suspects Draw Fines, Lose Licenses. 1993. *Fish and Game Today*, April-June:4.
- Mason, J. 1993. Going Going Gone! *Audubon* July-August 1993:78-83.

- Milstein, M. 1989. The Quiet Kill. *National Parks*, May/June 1989:19-24.
- Morell, V. 1989. Crimes Against Nature. *Outside*. July 1989:21.
- Murphy, M. and L. Murphy. 1990. Crime Story...With A Difference. *Sierra*, January/February 1990:19.
- Norman, G. 1984. Fashionable Killing. *Esquire*, August 1984.
- Poachbusters. *The Economist*, 16 June 1990:31.
- Poaching: Oriental Demand for Ungdam and Paws Decimates California Bears. *Audubon*, July 1983: 127-128.
- Poaching Persists Despite Stings. *National Parks*. May/June 1990:14-15.
- Poten, C.J. 1991. A Shameful Harvest: America's Illegal Wildlife Trade. *National Geographic*. September 1991.
- Quinn, V. 1983. Poaching Skyrockets When Miners Move Into Wilderness. *National Wildlife*, December-January 1983:35.
- Raeburn, P. 1991. Adventures in the Skin Trade. *Buzzworm: The Environmental Journal*, March/April 1991:22-23.
- Reisner, M. 1987. Bad News, Bears. *California Magazine* March:71-128.
- Robbins, J. 1985. Anatomy of a Sting. *Natural History* July 1985:4-10.
- Shay, R. 1986. Poaching: A troublesome recipe for wildlife. *Oregon Wildlife*, May-June 1986:8-10.
- Sheehan, J. 1981a. CalTIP: A New Battleground in War on Poachers. *Outdoor California*, July-August:23-24
- Sheehan, J. 1981b. Wanted: Poachers. *Outdoor California*, September-October:1-3.
- Smithsonian News Service. 1991. The "Scotland Yard" Of Wildlife Crime. *The Futurist*, March-April 1991:48.
- Sorensen, S. 1989. We're the New Wardens: Hunting and Fishing and Poaching and Killing. *Reader* (San Diego's Weekly). 20 April 1989:1-24.
- Speart, J. 1991. Poach Busters: Who you gonna call? A Scotland Yard detective agency for animals. *Omni*, November 1991: 32.
- . 1992. A Poacher's Worst Nightmare. *National Wildlife*, April/May 1992:26-28.
- . 1993. War Within. *Buzzworm: The Environmental Journal*, July/August 1993:36-85.
- Special Agents vs. Poachers. 1992. *Animal Welfare Institute Quarterly*, Spring:8-9.
- Springer, D. 1993. Sea Lions Under Fire. *E: The Environmental Magazine*, September/October 1993.
- Steinberg, D. 1983. It Pays to Bag Poachers. *National Wildlife*, October-November:22-23.
- Stuller, J. 1982. The war on wildlife. *Kiwanis Magazine*. November-December 1982:20-23.
- Tennesen, M. 1991. Poaching, Ancient Traditions, and the Law. *Audubon*, July/August 1991:90-97.
- Tognazzini, T. 1992. Bucky strikes. *Outdoor California*, July-August:9-11.

To Kill a Warden. 1978. *Wisconsin Sportsman*, November/December: 33-40

Turbak, G. 1982. The New Poachers. *Field and Stream*, November: 132-134.

Wertz, P. 1980. A Lot of Deer Out There Still Need Killing. *Outdoor California*, July-August:29-30.

White, J. 1976. The Lonesome Policeman. *Outdoor California*, July-August:29-30.

Wilkinson, T. 1988. Yellowstone's Poaching War. *Defenders*. May/June:30-36

Williams, T. 1989. Game Laws Weren't Writ For Fat Cats. *Audubon*, July 1989:104-113.

Woodard, T. 1988. A Different Kind of Decoy. *Field and Stream*, February 1988:64-65.

NEWSPAPER ARTICLES

Akeman, T. 1991a. Rancher tells why big cats were killed. *The Monterey Herald*, 26 April 1991.

———. 1991b. Rancher gets jail, fine in big-cat case. *The Monterey Herald*, 17 August 1991.

Appleby, J. 1990. Warrants issued for 15 poachers. *Hayward Daily Review*, 6 July 1990.

Bear parts sale brings guilty plea. 1988. *Record Searchlight*, 27 January 1988.

Bentzley, G. 1985. 24 busted in gill-net sting. *Times-Standard*, 25 February 1985.

Bentzley, G. 1985. Arrests fuel gill-netting furor. *Times-Standard*, 26 February 1985.

Bentzley, G. 1985. Indictments tell of alleged illegal sales. *Times-Standard*, 26 February 1985.

———. 1985. Indians unfairly blamed for Klamath's decline, Yurok says. *Times-Standard*, 2 March 1985.

Berthelsen, J. 1982. Sturgeon War Rages In North State. *The Sacramento Bee*, 15 August 1982.

Bishop, B. 1990. Man sentenced for killing, tagging a cougar illegally. *The Register-Guard*, 22 May 1990.

Bowman, C. 1990. Tight budget putting game wardens on foot. *The Sacramento Bee*, 20 January 1990.

———. and M.E. Camposeco. 1993. U.S. hires undocumented workers. *The Sacramento Bee*, 8 June 1993.

Bryce, R. 1991. Protection of Wildlife Threatened. *The Christian Science Monitor*, 2 July 1991.

Capps, S.A. 1987. Wardens bag dozens in big poaching 'sting.' *San Francisco Examiner*, 11 February 1987.

Carroll, J. 1983. The Passion For Sturgeon. *San Francisco Sunday Examiner & Chronicle*, 20 March 1983.

Castle, K. 1989. Abalone Arrests Expose Pervasive Poaching Trade. *San Francisco Chronicle*, 20 November 1989.

The Caviar Caper. 1990. *The Sacramento Bee*, 4 February 1990.

- Certini, R. 1993. Ex-judge recalls days as poacher. *The Sacramento Bee*, 22 October 1993.
- Champion, D. 1983. Crackdown on Dungeness Crab Poaching. *San Francisco Chronicle*, 26 May 1983.
- Coleman, D.E. 1988. Dove-hunter crackdown. *Fresno Bee*, 7 September 1988.
- Corwin, M. 1991. Caged cat hunts are defended by Monterey holder. *The Sacramento Bee*, 26 April 1991.
- Cox, J.D. 1993. Net out for butterfly outlaws. *Sacramento Bee*, 21 August 1993.
- Crackdown on poaching. 1988. *The Sacramento Union*, 3 August 1988.
- David Ruiz pleads guilty to felony F&G charge. 1988. *Trinity Journal*, 4 February 1988.
- DFG searching for mountain lion killer. 1990. *Inyo Register*, 28 December 1990.
- Dicke, W. 1982. Poaching Becoming an Increasing Problem for Many States. *The New York Times*, 31 October 1982.
- Dorgan, M. 1990. 12 Facing charges of bass poaching. *San Jose Mercury News*, 6 July 1990.
- Doyle, J. 1991. 5 Bay Area Men Held On Wildlife Violations. *San Francisco Chronicle*, 28 September 1991.
- Freezer yields head of lion reported shot on Mount Diablo. 1993. *Contra Costa Times*, 1 May 1993.
- Goldstein, G. 1993. What price can we put on miracle of nature? *The Sacramento Bee Final*, 12 February 1993.
- Greenville doctor fined in poaching. 1993. *The Sacramento Bee*, 25 May 1993.
- Hall, R.D. 1981. "Sting" Breaks Up Illegal Animal Trafficking. *The Sacramento Bee*, 17 July 1981.
- Hanville, S. 1993. Trial set in mountain lion trapping. *The Prescott Sun*, 24 March 1993.
- Hastings, D. 1993. Wardens Struggle to Protect Living Resources Against Poaching. *Los Angeles Times*, 11 July 1993.
- Hodgson, J. 1985. Agents buy gill-net fish. *The Union*, 28 February 1985.
- Illegal Animal Deals — Mail Is Full of Snakes. 1981. *San Francisco Chronicle*, 17 July 1981.
- Johnston, L. 1988. Raids in 2 States Hit Illegal Wildlife Trafficking. *The Los Angeles Times*, 13 January 1988.
- Jokelson, A. 1990. Duck hunters run afoul of federal, state restrictions. *The Tribune*, 2 February 1990.
- Kalfus, M. 1988. Officers seize reptiles in large-scale roundup. *The Orange County Register*, 13 January 1988.
- Kalfus, M. 1988. Reptile roundup means the end of the line to animal breeder. *The Orange County Register*, 14 January 1988.
- Kight, P. Police arrest 17 in probe of poaching. *The Oregonian*, 24 August 1989.
- Lane, D. 1988. 52 arrested in traffic of exotic animals, parts. *The Oakland Tribune*, 1 March 1988.

- Link, T. 1985. Fish poaching sting nabs 24. *The Oakland Tribune*, 26 February 1985.
- Little, J.B. 1992. New weapon against poachers: Genetic analysis. *The Sacramento Bee*, 21 December 1992.
- Locklin, L. 1991. Wardens say poaching is taking heavy toll on beleaguered Delta fish. *Contra Costa Times*, 18 February 1991.
- Lum, G. 1988. Fish and Game Raids Chinatown Herb Store. *East West News*, 11 February 1988.
- MacDonald, I. 1988. Hard-Boiled For Poachers. *ECONeWS*, October 1988.
- Man Sentenced and Fined for Shooting Sea Otters. 1989. *Los Angeles Times*, 30 April 1989.
- Martin, G. 1989. A Bull Market in Bears. *San Francisco Chronicle*, 8 June 1989.
- Masters, K. 1992. Former Smithsonian Scientist Indicted on Smuggling, Tax Fraud Charges. *The Washington Post*, 4 June 1992.
- McAuliffe, M. 1981. Bears killed for sex potion. *Record Searchlight*, 11 November 1981.
- McCarthy, P. 1984. State requested to begin crackdown on Bay Bandits. *The Tribune*, 14 June 1984.
- Michelson, H. 1985. State nets 27 it sting for fish poachers. *The Sacramento Bee*, 26 February 1985.
- Moreno, E.M. 1991. 'Big-cat' case jury convicts couple. *The Monterey Herald*, 26 June 1991.
- New York Times. 1993. Chinese ban trade of rhino, tiger parts. *The Sacramento Bee*, 6 June 1993.
- Onstad, E. 1985. Napa Valley fish "sting" headquarters. *The Napa Register*, 26 February, 1985.
- Opatrny, D.J. 1988. Exotic animal parts seized in Chinatown medicine shop. *San Francisco Examiner*, 10 February 1988.
- Perlman, J.A. 1993. Annual Wild-Game Barbecue Gets Burned by Wildlife Agents. *Los Angeles Times*, 19 September 1993.
- Peters, M. 1988. Paying the price in California. *The Sacramento Bee*, 7 September 1988.
- Poachers sold sea lions, tigers and bears. 1988. *Denver Post*, 2 March 1988.
- Popp, R. and B. Jarvis. 1985. 24 Arrested for Illegal Sales of Fish. *San Francisco Chronicle*, 26 February 1985.
- Probe targets frog dealers. 1993. *The Sacramento Bee*, 24 September 1993.
- Reward for mountain lion killer. 1990. *Victor Valley Daily Press*, 25 October 1990.
- Rheem, D.L. 1987. Poaching in US worsens as demand grows. *The Christian Science Monitor*, 24 April 1987.
- Robbins, J. 1993. Poaching hits home. *USA Weekend*, 24-26 September 1993.
- Sanders, J. 1993. Deer fall prey to poachers in Gilroy. *The Sacramento Bee*, 7 June 1993

- Schrader, E. 1991. Big-game hunting organizers convicted. *San Jose Mercury News*, 26 June 1991.
- Stienstra, T. 1984. Stiff penalties warning for striped bass poachers. *San Francisco Examiner*, 7 July 1984.
- . 1985. Giant illegal-fishing "sting." *San Francisco Examiner*, 25 February 1985.
- . 1988. Poaching problem is growing. *San Francisco Examiner*, 23 October 1988.
- . 1989. Illegal harvest of tidal sea life alarms DFG. *San Francisco Examiner*, 16 April 1989.
- . 1990. DFG will pursue fish poachers. *San Francisco Examiner*, 11 July 1990.
- . 1991. A model program with one flaw. *San Francisco Examiner*, 10 October 1991.
- Swissler, Lori. 1990. State seeking clues in lion's beheading. *Daily Times Advocate*, 1 October 1990.
- Thin green line losing battle with poachers. 1993. *Telegram-Tribune*, 20 April 1993.
- Thurman, S. 1989. War in the Wild Against Poachers. *Christian Science Monitor*, 14 March 1989.
- Trinity man arraigned on bear parts sales charges. 1987. *Trinity Journal*, 5 March 1987.
- Utah poaching arrests. 1991. *The Sacramento Bee*, 16 March 1991.
- Viets, J. Fish-poaching Ring Broken Up In East Bay. *San Francisco Chronicle*, 6 July 1990.
- Voet, G. 1992a. Foundation wants poaching to end. *The Sacramento Bee*, 5 January 1992.
- . 1992b. Record reward. *The Sacramento Bee*, 12 July 1992.
- . 1992c. Outnumbered game wardens need public's help. *The Sacramento Bee Final*, 1 December 1992.
- . 1993a. DNA evidence is the key to Norcal deer-killing case. *The Sacramento Bee*, 31 January 1993.
- . 1993b. This line can snag poachers. *The Sacramento Bee*, 4 April 1993.
- . 1993c. DNA helps bring wildlife conviction. *The Sacramento Bee*, 9 May 1993.
- Welkos, R. 1981. Salmon poaching arrest demanded. *Oakland Tribune*, 9 December 1981.
- Wildlife populations decline in state's first century. 1989. *The Register-Guard*. 12 November 1989.
- Willis, K. 1988. Plea shows DFG serious about illegal sale of bear parts. *Record Searchlight*, 28 January 1988.
- Wong, J. 1989. Wardens in need of help against deer poachers. *The Sacramento Bee*, 24 December 1989.
- Wurst, R. 1990. State nets Bay bass poachers. *Contra Costa Times*, 6 July 1990.
- Yoachum, S. 1985. Fishermen accused of poaching fish. *San Jose Mercury News*, 26 February 1985.
- Yun, Y. 1981. Herbalists Warned by Sate Officials. *The Korea Times English*, 16 November 1981.