

Endangered Species UPDATE

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THE UNIVERSITY OF MICHIGAN
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In this Issue:

Poachers: Driving
Wild Things To
Extinction

Reclassification
Proposed for Aleutian
Canada Goose

Red Wolf Recovery
Update

Listing Protection
Proposed for Eleven
Plant and Five Animal
Species

Poachers: Driving Wild Things To Extinction

by
Todd Wilkinson

[Note from the Editor: This article, recently published in the Rocky Mountain News, provides an insightful look into the controversial and timely issue of poaching. Because it contains much valuable information of particular interest to people working in the field of species preservation, we are reprinting the article here in full for UPDATE readers who might not otherwise have had access. We welcome your thoughtful debate on what should be done to best address this important issue.]

As habitat for game animals and endangered species continues to dwindle around the world, the Rocky Mountain West has become a stronghold for commercial poachers and illegal hunters seeking the last concentrations of trophy animals. Joel Scrafford does not want to sound pessimistic, but the special agent with the U.S. Fish and Wildlife Service in Billings, Montana, paints the picture of illegal wildlife killing in this way: less than 150 years ago, the frontier supported 60 million bison, 100,000 grizzly bears, 50,000 bald eagles, prolific herds of big game trophy animals and vast numbers of fur bearers and waterfowl; today, the ranges for most of those species have decreased by more than 50 percent.

One hundred fifty years from now, Scrafford says, few of those species will exist on public lands if present trends continue. Poaching, combined with increased pollution, loss of winter ranges, blockage of migration routes and despoiled riparian areas, will result in less and less wildlife. Those animals

still available for sportsmen will likely be raised and sold only on expensive, private game preserves. The public hunt for the non-rich will be over. "At some point in the future, the general public will look back upon this moment in history and realize it was a pivotal juncture for saving the wild animals and plants that made this country great," special agent Scrafford said. "Without exaggeration, our children three generations down the road could easily lose it all. Most people don't realize there is a serious battle being fought between illegal hunters and conservation officers which is no different than the drug war. Unfortunately, we're only winning the small battles but losing the war on poaching."

"At some point in the future, the general public will look back upon this moment in history and realize it was a pivotal juncture for saving the wild animals and plants that made this country great."

In 1989, Scrafford said federal agents witnessed one of the most active years for illegal wildlife killing in the Rocky Mountain West. From California to Colorado, and Canada to the Mexican border, the fever for exotic animal parts and record-book trophies reached an all-time high. "The Rocky Mountain region is a veritable treasure house for wildlife resources in the United States," said U.S. Fish and Wildlife Service agent Terry Grosz, who coordinates law enforcement for eight states from his office in Denver. "The wildlife executioner recognizes no

boundary," Grosz added. "You have to keep in mind there's a market for just about everything that's running wild or growing out there." For criminals dealing in wildlife parts and rare plants, Grosz said a map of the West's public lands reads like a directory to grocery store aisles: grizzly bears from Montana, moose from Idaho, bighorn sheep from Wyoming, elk from Colorado, mountain lions from Utah, eagles from New Mexico, cacti and snakes from Arizona.

The economic incentive for a poacher far outweighs the risk of serving time in jail or paying fines. And the rarer a species becomes, the higher the market value. By broad definition, "poaching" means simply to hunt or fish illegally. But Scrafford and Grosz place poachers in two categories. One is the commercial smuggler who stands to turn a large profit by selling live animals and exotic animal parts across state lines and international borders. The second is the illegal hunter who kills wildlife for personal benefit — a record-book trophy or rug for the den. "Our financial resources are limited," Grosz said. "There's no

way we can even begin to stop all the small-time poachers or the nickel and dime killing, though it all adds up. I am forced to look for the worst wildlife crooks in the bunch."

Only 200 Wildlife Agents

Law enforcement officials are outnumbered, outfinanced and unequipped compared to commercial poachers, said Dave Hall, a federal agent based in Louisiana who is an expert on poaching in North America. According to Hall, there are more police officers in



Wyoming game warden Kent Schmidlin standing among animals poached in Grand Teton National Park and surrounding areas, holding a rare trumpeter swan (Photo by Ted Wood)

New York City than conservation officers in all of the United States. The 200 U.S. Fish and Wildlife Service field offices nationwide are spread thin across isolated terrain where organized crime can only be penetrated through expensive — and sometimes controversial — undercover operations.

Nearly three decades ago, biologist James Vilkitis went undercover in Idaho to gather intelligence on commer-

cial poaching. His findings still are considered the most accurate tool for measuring the magnitude of poaching in the

"For criminals dealing in wildlife parts and rare plants . . . a map of the West's public lands reads like a directory to grocery store aisles. . ."

West. Vilkitis said that for every animal harvested legally, another is taken illegally. For an undercover operation to succeed, Scraf-ford says the federal government must invest a minimum of \$200,000 and give an officer at least 12 months to infiltrate a ring.

A forum for information exchange on endangered species issues
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Suzanne Jones.....Editor
Dr. Terry Root.....Faculty Advisor

Instructions for Authors:

The Endangered Species UPDATE welcomes articles related to species protection in a wide range of areas including but not limited to: research and management activities for endangered species, theoretical approaches to species conservation, and habitat protection and preserve design. Book reviews, editorial comments, and announcements of current events and publications are also welcome.

Readers include a broad range of professionals in both scientific and policy fields. Articles should be written in an easily understandable style for a knowledgeable audience. Manuscripts should be 10-12 double spaced typed pages. For further information please contact Suzanne Jones at the number listed below.

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Cover:

A bald eagle (*Haliaeetus leucocephalus*) shot in the Grand Teton National Park

Photo by Ted Wood

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Yet no guarantees exist for an officer's safety. According to federal officials, an increasing number of commercial poachers are well armed, have a history of dealing drugs or weapons, and possess a past criminal record. Cracking an operation can be tricky. When two agents in western Idaho stumbled upon the hunting camp of Claude Dallas, who was suspected of hunting wildlife illegally, the lawmen were shot and killed.

Government attorneys in each undercover case must consider the issue of entrapment. Raised continuously is the question of whether an agent should take part in the selling and killing of wildlife to apprehend criminals.

The poaching problem in the Rockies is made worse by the rapid destruction of habitat. That squeezes wildlife populations into smaller areas where they are vulnerable, biologists say. "If these trends continue, despite any good intentions on the part of law enforcement, you just won't have much wildlife in the future," said John Gavitt, a special agent based in Washington. "The ultimate solution to protecting wildlife is to protect habitat."

But Gavitt believes the movement by animal rights activists to eliminate hunting will only spawn more poaching. "It (eliminating legal hunting) is a simplistic answer to a very complex problem," he said. "A ban on hunting would eliminate monies that come in from licenses to help preserve habitat and combat poaching with law enforcement." Similarly, Gavitt says that privatizing wildlife herds and eliminating state authority will remove the average citizen from having a stake in wildland preservation. "Privatization promotes species-specific management of the land, not management that considers the environmental needs of all species," he said. "It makes wildlife management similar to raising cattle."

Poaching In The Parks

The American West — in particular the national parks — has become a repository for trophy animals and rare species that are genetically pure. That

There Is A Brisk, Destructive

America's hunger for tusks, furs, and other wildlife parts is causing the decline of species around the world. In 1986, almost 33 million wildlife items comprising over 64,000 shipments were legally imported into the United States from foreign markets, according to U.S. Fish and Wildlife Service special agent John Gavitt.

Although there is no way to calculate the number of illegal wildlife items entering this country, the magnitude of known legal imports is considered significant in its own right. Three years ago, five to ten million raw fur skins, six to eight million pieces of elephant ivory, and 15 to 20 million finished reptile products were shipped into the United States. But federal agents say smugglers also shipped thousands, perhaps millions, of other animal parts into the country: tiger skins, leopard coats, whale blubber, lion manes, rhinoceros horn, elephant tusks, live macaws. The list could go on.

The result is that time is quickly running out for many species, says Kurt Johnson, a research biologist with the World Wildlife Fund. The Fund estimates, for example, that only 3,500 black rhinos survive in

Africa, and numbers are plummeting quickly. Although the United States has banned products made from black rhinos and elephants, officials say there is still demand on the black market. The African elephant, which numbers 600,000 to 750,000 animals in the wild, dropped from a population of 1.5 million ten years ago. Roughly ten percent

"This country's purchasing power may be a significant factor contributing to the decimation of foreign wildlife populations, particularly in Third World countries."

of the population is killed each year to satisfy demands for ivory worldwide, including customers in the United States. "This country's purchasing power may be a significant factor contributing to the decimation of foreign wildlife populations, particularly in Third World countries," Gavitt told the North American Wildlife Conference meeting in Washington this year.



White rhinoceros (*Ceratotherium simum*)

New York Zoological Society

(Continued on UPDATE page 4)

Trade In Wildlife

Conversely, the United States — chiefly the western half of the country — is a major supplier of animal parts for markets in Asia, Africa and South America, Gavitt said. For example, a recent U.S. Fish and Wildlife Service investigation uncovered an illegal smuggling operation that channeled live falcons and other birds of prey to buyers in Saudi Arabia and the Middle East. As part of intelligence gathered in Operation Falcon, it was learned that oil sheiks reportedly were willing to pay as much as \$50,000 for an American gyrfalcon and \$10,000 for a native peregrine falcon.

But the herbal medicine market may pose the most serious threat to species in the West. Federal officials estimate that one-third of the world's 5.5 billion people practice traditional forms of medicine that consider animal parts to hold healing powers. "The Asian attitude towards plant and animal substances for medicine is compared to aspirin in the United States," Gavitt said. "Contrary to popular belief, the use of animal parts as aphrodisiacs in the Far East is negligible."

Efforts to supply the Asian market with such highly coveted parts as ungulate horns and bear gall bladders have put formidable pressure on American wildlife populations, federal agents say. "The demand for galls is almost insatiable in some areas of the world," Gavitt said. "With approximately 200,000 black bears in the lower 48 states, the impact of an unregulated commercial market can cause significant declines in populations." Dried bear galls fetch \$3,000 per pound in foreign markets usually reached through Pacific port cities such as Los Angeles, San Francisco and Seattle. In 1987, a federal field agent reported that of 12,000 to 15,000 black bears surviving in the wild

in California, the estimated illegal kill approached 700 to 900 bears, or almost ten percent of the population. Gavitt said Arizona wildlife officers seized over 20,000 pills containing bear gall with an estimated value of \$26,000. Johnson said the World Wildlife Fund is concerned about declining black bear populations in the United States and around the globe. "There's been no concerted push to have a complete ban on wildlife commercialization in the United States," Johnson said. "Many states have their own bans but there are a few states that still allow the sale of wildlife products. Those states are causing major problems, especially in regard to bears being shipped to the Orient." The Fund plans to launch a lobbying effort in

"Conversely, the United States -- chiefly the western half of the country -- is a major supplier of animal parts for markets in Asia, Africa, and South America."

states which do not ban commercialization.

American elk are also being purchased by commercial horn dealers overseas. Elk calves are worth an estimated \$5,000 per animal and velvet blood antlers have sold for as much as



Black bear (*Ursus americanus*)

Dave Kenyon/MI DNR

\$100 per pound. In Jackson, Wyoming, the annual Boy Scout Antler Auction draws many Korean Buyers. In 1989, they legally purchased most of the 5,000 pounds of antlers put on sale for an average price of \$8.92 per pound. After the antlers are shipped to Korea, they are sliced into thin sections and mixed into tea and medicines, fetching exponential profits for local dealers.

"The most effective way to curtail illegal markets is to totally ban commercialization," Gavitt said. "With the notable exception of fur and other skins, I believe the elimination of commercial markets for parts from native wildlife, particularly those destined for the Oriental medicinal market, would not place a significant burden on citizens of our country."

-- Todd Wilkinson

"More and more people are competing for trophies out of fear that they better get them now or there won't be any left. Animal heads have become almost like priceless paintings, like a Picasso or a Renoir."

accelerates their value in the world market, Gavitt said.

In the early 1980s, Gavitt was picked to infiltrate a poaching network around Yellowstone Park; that made him part of one of the largest wildlife busts in the Northern Rockies. The three-year undercover investigation known as Operation Trophy Kill led to the arrests of three dozen people, jail-time totaling 51 years, and more than \$128,000 in fines.

One man implicated in Operation Trophy Kill was Livingston, Montana, taxidermist Dan Quillen, who admitted trying to peddle two bighorn sheep heads. "He (Gavitt) was brave," Quillen said of the undercover officer. "He got in the middle of it, and his life was constantly in danger. Had Ellison ever known, he would have had (Gavitt's) throat cut." Loren Jay Ellison, considered the ringleader, was convicted in Billings, Montana, and slapped with the stiffest sentence ever rendered in an American poaching case: 15 years in a federal penitentiary. "Prior to Trophy Kill, poaching was a laughing matter," said Quillen, whose sentence was suspended. "They (poachers) had the park divided into areas. You can't believe the shock waves that went through this part of the country." Scrafford fears that Trophy Kill's value for deterrence may be waning. "Some of the guys convicted five years ago are back in business," he said. "Poaching is like an addiction. They can't stay away."

The lure of Yellowstone's world-class wildlife has already attracted illegal hunters this year who have shot and killed protected moose, elk, and deer — all in the name of making the Boone and Crockett record books. Philadelphia

businessman William Heyer was arrested and convicted on felony Lacey Act charges for killing a record-book elk in the center of the park. He was fined \$13,300 and given three year's suspended probation. Scrafford said that "sport and greed" drove Heyer to also seek completion of his second "grand slam," which consists of killing four species of bighorn sheep: the Rocky Mountain, Desert, Dall and Stone. "More and more people are competing for trophies out of fear that they better get them now or there won't be any left," Scrafford said. "Animal heads have become almost like priceless paintings, like a Picasso or Renoir."

State crime laboratories have assisted in some investigations by implementing DNA fingerprinting to determine the genetic makeup of some species. Occasionally, the method has been used to match decapitated wildlife heads with the bodies of animals left behind.

Laws Aren't All Tough

While some states have enacted tough laws to punish poachers in court, others such as Wyoming, Colorado and Idaho still allow the liberal sale of animal parts and legally tagged heads that were allegedly found in the wild. "The states with weak laws make it tough for all the rest," Scrafford said. "It causes more illegal activity to move across state lines. Fortunately, we have fairly tough federal laws which I call the bread and butter of enforcement."

The "bread and butter" of federal poaching laws are the Migratory Bird Treaty Act, the Marine Mammal Act,

the Endangered Species Act, the federal Airborne Hunting Act, the Bald Eagle Act and the Lacey Act, Scrafford said. The Lacey Act is one of the oldest wildlife laws on the books. Enacted in 1900, it was drafted originally to protect domestic fish and game and also prohibit introduction of unwanted species. It took eight decades of amendments and revision before the Act mandated prison terms and fines. In 1981, when poachers were killing Yellowstone elk for their blood antlers, the Lacey Act gave judges the authority to levy harsh sentences. Like the Racketeering Influenced Corrupt Organizations (RICO) Act used to prosecute organized crime, the Lacey Act allows seizure of property and income related to the illegal sale of wildlife.

Most of the federal wildlife laws today allow maximum sentences of up to five years in prison and a \$25,000 fine. A recent modification to the Endangered Species Act allows for fines of up to \$100,000. Sentencing, however, is left to the discretion of federal and state judges. Some view poaching as a serious offense while others send a message of toleration to repeat offenders.

These days, however, poaching seems remarkably closer to organized crime. Working under the security of darkness, poachers launch boats into lakes and reservoirs, using gill nets to harvest thousands of walleyes which are shipped to markets in St. Louis, New York City and San Francisco. Black bears are killed by the hundreds, their gall bladders used as herbal medicines in the Orient. Bear meat sells for \$12 a pound in cities like Chicago. Elk, deer and antelope are under siege on winter ranges in Colorado, Wyoming, Utah and Nevada. "They're really taking a beating," Scrafford said. "It's a hard operation to infiltrate because you're dealing with individuals and not groups." Around Yellowstone, more than 50 grizzly bears, a federally threatened species, have been killed illegally since 1975. The number is considered significant since only 200 bears are thought to survive in the greater Yellowstone ecosystem.

Charges Of Racism

In New Mexico, the fourth largest state in the lower 48, there are 52 state conservation officers covering 121,336 square miles. "Poaching is a very serious problem here," said John Cross, U.S. Fish and Wildlife Service special agent in charge of operations for New Mexico, Arizona, Texas and Oklahoma. According to Cross, a parochial

ducted an inquiry into charges of racism and those allegations were subsequently dismissed. "Rather than being used for food on the table, a lot of the animals were used to barter for liquor or drugs," Grosz said. "Under federal welfare programs, nobody has to go hungry. Nobody had to kill an eagle or an elk. In this country, you do not have to destroy the environment to survive."

highly susceptible. Illegal guides and outfitters are taking their toll upon Javalina wild pigs, wild billy goats known as ibex, Barbary sheep, and African antelope called oryx -- which are the size of elk but have spherical-shaped horns 35-40 inches long. A two-year investigation in New Mexico and Arizona resulted in the arrests of 37 people for killing such birds as eagles, hawks, and owls for their body parts. But the destruction does not stop with large fauna.

"The fair chase of the animal used to be what it was all about. If you got a critter, that was a bonus, but just being outside in nature was the reason to hunt. . .

Astronomical growth in the Phoenix metropolitan area has resulted in a blight of native cacti for miles around the city. "A good indicator is to go to Phoenix and travel outside the suburbs for 30 miles," Cross said. "You see no more saguaro where there used to be hundreds of thousands. They're all being taken by landscapers and put in front of desert homes." On the black market, a large saguaro can bring as much as \$15,000. Cross said hundreds of the famed barrel cactus and other rare desert plants are being removed daily to supplement private botanical collections on the West Coast.

view of wildlife has been promoted over centuries of settlement in the region, dating back to the time of the Spanish conquistadors. Some landowners feel that wildlife on their property is theirs to kill for personal use, Cross said. "With that kind of attitude, there are no limits to how much poaching actually goes on."

Such observations have fueled charges of racism from members of the Hispanic community. Cross denies any bias. But a recent bust in southern Colorado provoked these charges again. On March 6, 1989, Colorado's San Luis Valley swarmed with dozens of law enforcement officials who culminated the three-year investigation by arresting 47 people for felony wildlife violations. Ultimately, 108 people would be named in indictments.

Region chief Grosz said 850 serious wildlife violations were chronicled "and a tremendous movement of illegally taken wildlife." Even though only a portion of the market was penetrated, agents documented the killing of at least 96 big game animals and 25 eagles. Grosz said one officer was aware of the illegal killing and commercial transport of 547 elk, 2,006 deer, and 92 eagles. Still, some defendants claimed they were motivated to kill because they needed the meat to survive. The state of Colorado con-

Agent Cross has his own gauge for measuring the impact of poaching. "When you drive into Colorado in the dead of winter, it is not uncommon to see herds of wildlife along the highway," he said. "But when you come back into New Mexico you see nothing. Under normal circumstances, wildlife should be there too, because the habitat is the same."

Early in November, state conservation officers used the second weekend of the deer season to conduct a sweep of

A "Private" Stock Of Wildlife

Private hoarding of plants and wildlife is quickly becoming a major issue in

. . . Now you see large numbers of people paying large sums of money for guaranteed hunts. This puts a lot of pressure on legal and illegal outfitters to produce for their clients. Often it means breaking the law."

nighttime poachers. The effort netted more than 30 people for shining spotlights to see and then kill deer and elk.

Southwest Species Are Targeted

While considerable attention centers on protecting game animals, rare birds and exotic species in the Southwest are

many states. The federal government convened a grand jury investigation October 3 in Espanola, New Mexico, over allegations that a large game ranch had illegally removed dozens, if not hundreds, of wild elk from public lands and made them available for private hunts. Indictments likely will be handed down December 20 in a case

which is expected to set a national precedent, Cross said. It marks the first time that federal agents have vigorously pursued claims of illegal hunting on private lands.

Cross said the grand jury is investigating allegations that the Chama Land and Cattle Company supplemented its game park with publicly owned animals. Agents seized 109 elk and are holding them as evidence. There is speculation that the elk, some valued at \$5,000-\$7,000 apiece, were being shipped to game farms in Alberta, Canada, as breeding stock. Chama is one of the largest private game ranches in New Mexico. Clients pay a fee to hunt specific animals. For example, authorities say it costs \$6,400 to shoot a bull elk, \$2,000 for a cow elk, \$2,500 for a deer and \$200 a day to fish for trout. "We estimate it takes in over \$1 million a year on wildlife alone," Cross said. "There have been 1,000 animals hunted there over a 25-year period." Among those under investigation is Chama ranch owner Grady Vaughan, a wealthy Texas oilman from Dallas.

"The hunting ethic seems to be slipping away," Grosz said. "The fair chase of the animal used to be what it was all about. If you got a critter, that was a bonus, but just being outside in nature was the reason to hunt. Now you see large numbers of people paying large sums of money for guaranteed hunts. The whole trip is considered a major disappointment unless you kill something. This puts a lot of pressure on legal and illegal outfitters to produce for their clients. Often it means breaking the law."

Rambos And Slobs

Forests are being inundated by so-called "slob hunters" who know nothing about legal limits or conservation, Grosz said. Hunters clad in "Rambo" fatigues, carrying long knives and assault rifles, search for animals to shoot from the sanctity of their new four-wheel-drive pickups,

Prices for North American Wildlife and Plants

Bald eagle	\$2,500
Golden eagle	200
Elk penis	5 (each)
Gila monster	200
Peregrine falcon	10,000
Gyrfalcon	120,000
Goshawk	1,500
Grizzly bear	5,000
Grizzly bear claw necklace	2,500
Pronghorn antelope	1,500
Polar bear	6,000
Black bear paw pad	150
Reindeer antlers	35 (/pound)
Peyote fans	600
Wild ginseng	250 (/pound)
Grand slam sheep (Bighorn, Desert, Dall, Stone)	45,000
Mountain lion	500
Mountain goat	3,500
Saguaro cactus	15,000

Prices for World Species

Olive python	\$1,500
Rhinoceros horn	12,500 (/pound)
Tiger skin (Siberian)	3,500
Tiger meat	130 (/pound)
Red Blunt Nose Viper	720
Cockatoos	2,000
Leopard	8,500
Snow leopard	14,000
Elephant tusk	250 (/pound)
Walrus tusk	50 (/pound)
Mountain gorilla	150,000
Panda	3,700
Ocelot	40,000 (/coat)
Imperial Amazon Macaw	30,000

*Figures supplied by the U.S. Fish and Wildlife Service, whose agents recorded prices in the field.

Scrafford added. A New York man was arrested by Montana authorities this autumn for allegedly stopping his vehicle on Interstate 94 west of Livingston and killing two trophy elk that were grazing inside a fenced game preserve. When a local citizen stopped to tell him that what he had done was illegal, the man replied, "That's the way we hunt back in New York," and drove away. He was arrested a short time later.

Roadblocks in 10 Western states this autumn uncovered hundreds of hunters who did not properly gut and dress the animals they shot. "I have a feeling a lot of those animals will end up in the trash cans," Grosz said. Southwest of Glacier National Park, five teenagers were arrested November 28, 1989, by Montana game wardens for allegedly killing 30 deer, leaving many animals behind to rot. One young suspect said the group "wounded and lost five animals for every deer they retrieved." Another member of the group confessed to shooting at animals every night for more than a month.

"Don't get me wrong, there are still a lot responsible hunters out there, but many are not passing along the ethic to their children. As a result we're seeing more problems with illegal killing of wildlife," he added. "For many people, hunting in the forest used to represent an experience that was clean and quiet and rejuvenated the soul as well as the mind. Many people don't see it that way anymore."

Throw The Book At Them

The 40,000-member Rocky Mountain Elk Foundation supports judges who take a hard line on poachers and illegal hunters, said Gary Wolfe, the foundation's director of field operations. "In local situations, poachers can be very damaging to elk herds," Wolfe said. "From an ethical standpoint, the Rocky Mountain Elk Foundation is

concerned and disturbed about the amount of poaching going on in the woods. Poaching is giving hunters and sportsmen a bad name," he added. "We are extremely supportive of state and federal wildlife laws that exact strong penalties on the violators."

Poaching expert Hall said the remedies for illegal commercial poaching are based more on public attitude than market demand. "We need to create a situation in North America where the people who illegally take wildlife are viewed as villains rather than heroes," he said. "And the education process has got to go farther than trying to reform poachers. It has to reach judges and prosecutors." Hall said a new study on poaching will soon be released by Robert Johnson of the University of Wisconsin at La Crosse. Johnson, an expert on hunter behavior, says data show that suspending hunting privileges has a greater impact upon poachers than fines or prison time. "We now have the penalties in place that can be devastating to commercial rings," Hall said. "But it doesn't mean you will win the support of the courts. Some judges make fun of wildlife crimes and say they're no worse than a traffic ticket."

Elected officials on the state and federal level must take wildlife crimes as seriously as they do the illegal drug trade, said one conservation officer who

"Some judges make fun of wildlife crimes and say they're no worse than a traffic ticket."

wished to remain anonymous. In order to stop poaching, several federal wildlife agents suggested the following:

- Ban nationwide the commercial sale of all animal parts and put tighter controls on the distribution of game meat;
- Levy larger fines and longer prison sentences for big-time wildlife offenders;
- Make loss of hunting privileges mandatory for hunters who exceed legal limits or hunt out of season;
- Appropriate more money on the federal level to fund more under-

cover operations to fight wildlife smuggling rings;

- Make conservation ethics classes mandatory for American school children, beginning in the first grade.

"The American people have got to get off their dead butts," Grosz said. "The wildlife resources we're using today are those that belong to our grandchildren. Nobody has a right to use them up."

Acknowledgements

Todd Wilkinson lives in Bozeman, Montana, and writes about natural resource issues in the Northern Rockies.

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Book Review

Conservation in Africa: People, Policies, and Practice

Edited by D. Anderson and R. Grove

As a book on conservation in Africa, this book is unusual in that its emphasis is on the social rather than the biological sciences. It is based on a selection of the papers presented at the interdisciplinary workshop on "Conservation in Africa" held at the University of Cambridge African Studies in April 1985.

Though claiming to be interdisciplinary, this book is clearly dominated by social scientists. Consequently, some diehard ecologists and biologists may question the adequacy of some of the data presented. However, as Gamaledinn (Chapter 16) points out, one characteristic of both ecologists and social scientists is that they recognize the importance of the local situation and context. All of the authors, ecologists and social scientists alike, are in agreement in their criticism of imported models of conservation and development that are based on western values and assumptions, rather than the more complex reality of the local social and ecological situation.

The book is organized around four themes. The four papers in each section are preceded by a brief introduction summarizing the relevance of each to the theme of the section. In addition, the editors provide their own general, but excellent, introduction to the work as a whole. Unfortunately, there is no conclusion.

The first section addresses the origin and diversity of western ideas on African conservation. The views and policies of the early explorers, settlers, and colonial administrators are first discussed, followed by a thorough review of current ideas on conservation in southern and central Africa by Bell. The second section, titled "Wildlife, Parks, and Pastoralists," continues a

theme introduced by Bell and attempts, by way of one review article and three specific case studies, to debunk the notion that pastoralism is ecologically incompatible with conservation. The author first challenges the evidence for ecological degradation. Then the intervention of external forces, including colonial and post-colonial economic and land use policies, are blamed for disrupting pastoral systems and causing any ecological degradation that might occur.

Section three examines the effects of both contemporary and historical forest and soil conservation policies on rural communities. Little and Broken-sha provide a particularly helpful conceptual framework for understanding how local communities and institutions affect their environment. The final section starts with an excellent paper by Areoloa on the political reality of conservation in Nigeria, but this is then followed by three poorer case studies.

The point this book drives home most forcefully is the importance of understanding the local social reality and its past history, as well as the ecological situation. Without this understanding, conservation efforts may have some superficial success but are unlikely to be successful in the long term. In this regard, Lindsay's paper on Amboseli is of particular importance in demonstrating the inadequacies of efforts to integrate conservation and development based on an incomplete understanding of the local social situation. Though Western's early work in Amboseli (Western 1982) looked very promising, and is still widely cited by biologists and ecologists as a success story in integrating conservation and development, the whole truth is more sobering.

One criticism of the book is its failure, given its title and social science orientation, to address Africa as a whole. Although there are two case studies from each of Nigeria and Ethiopia and one from Sierra Leone, the rest of the book is focused on eastern and south-central Africa, in particular Kenya, and makes no reference at all to French-speaking Africa. Although this perhaps reflects the amount of work that has been done in these different areas, the differences between the French and British colonial influences are such that at least some reference to this would be expected in a work of this nature.

Overall, this is a most refreshing book. Though we clearly have a way to go in fully integrating the social and biological sciences around the problem of conservation, this is an excellent start. It deserves wide attention, both among biologists and ecologists, as an introduction to the social dimensions of conservation problems, and among those already grappling with these issues, as a valuable reference work.

References

Western, D. 1982. Amboseli National Park: Enlisting landowners to conserve migratory wildlife. *Ambio II*: 301-308.

Book review by John Hough, Ph.D.

Conservation in Africa: People, Policies and Practice (1987) is available from Cambridge University Press.

Technical Notes

Unoccupied Habitats and Endangered Species Protection

by Dennis D. Murphy
and Kathy M. Rehm

If the southern bald eagle is the symbol of endangered species, then the implementation of the Endangered Species Act to protect the bird's habitats from disturbance — limited to 300 feet around nest trees in the Pacific Northwest (Anthony and Isaacs, 1989. *J. Wildl. Manag.* 53:148-159) — might be considered symbolic of the Act's failure to protect habitats adequately. The Act specifically prohibits the disruption, modification, and destruction of critical habitat for listed species. However, the difficulty of defining and identifying such habitat allows for sloppy implementation, as evidenced by the protection of only tiny areas of habitat for the bald eagle and other organisms with obviously large area requirements.

The problems of identifying important habitat are magnified when such habitat is not permanently occupied by the species of concern. The life cycles of migratory birds and anadromous fishes, for example, require disjunct habitat, much of which may be alternately occupied and unoccupied depending on the season. For such species, it is generally accepted that although habitat may be unoccupied, it requires permanent protection. More difficult to identify, and hence to protect, is the unoccupied habitat of the many species that are not migratory or cyclical in their use of habitats. These species include those that are sedentary and comparatively narrowly distributed, that exhibit dramatic population fluctuations, or that survive in metapopulations that experience frequent local extinction events — small mammals, cold-blooded vertebrates, and invertebrates. For those species, protection of unoccupied habitat can be as important to regional persistence as protection of occupied habitat.

For the species fitting this descrip-

tion (including dozens of listed species and hundreds of candidate species), unoccupied habitat presents itself in two forms: 1) vacant habitat of marginal quality, contiguous with or adjacent to occupied habitat; and 2) spatially separate empty patches of high quality habitat. Habitat of marginal

"More difficult to identify, and hence to protect, is the unoccupied habitat of the many species that are not migratory or cyclical in their use of habitats."

quality, such as that with comparatively few food sources or nest sites, may support a species only under certain environmental circumstances. For example, normally empty marginal quality habitats may serve as the only refugia for plants or animals during times of fire, drought, or other environmental extremes. Under favorable conditions, such habitat may increase an area's short-term carrying capacity; resulting population expansion can buffer the population against future, less satisfactory environmental conditions.

Populations of the Bay checkerspot butterfly provide a classic example (S. B. Weiss and D. D. Murphy, *Endangered Species UPDATE* 5(6):10). Its populations survive largely on mesic north-facing grassland slopes. However, during years of above-average rainfall the butterfly expands its range onto more xeric south-facing slopes. Although infrequent and short-term, such expansions can contribute to long-term population persistence, especially for species whose numbers are usually

regulated by environmental factors rather than population density. Relatively low quality habitat areas, therefore, can be critical to the long-term persistence of populations that reside in habitats vulnerable to catastrophic environmental phenomena.

Entire patches of high quality or marginal quality habitat that may often be unoccupied can serve as stepping stones for regional metapopulations. These patches can facilitate gene flow between small populations and can provide routes for individuals to colonize surrounding habitats that have been subject to localized extinction. The loss of temporarily empty stepping stone habitat patches may disrupt the dynamics of the entire metapopulation. For example, the Karner blue butterfly was once widespread and abundant throughout the "pine bush" of New York and surrounding states. However, it quickly became regionally endangered following the disruption of habitat "patch dynamics" by the incremental fragmentation and isolation of occupied and unoccupied habitat patches, and the elimination of dispersal corridors.

Understanding the roles of irregularly unoccupied habitat in species persistence is an important step toward protecting that habitat under the Endangered Species Act. Unfortunately, stiff political opposition usually challenges prohibitions to land development, even in habitats occupied by charismatic species. The great difficulty of protecting habitat that is occupied by "popular" species suggests that attempts to protect unoccupied areas, especially habitats necessary for the persistence of less charismatic species, will be a very tough sell indeed.

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Bulletin Board

Wilderness Preservation Conference in Hawaii

The Western Canada Wilderness Committee, one of Canada's fastest growing non-governmental organizations, is hosting a working conference called "Mapping the Vision" June 17-23, 1990 at the East-West Centre in Honolulu, Hawaii. As part of the "Wilderness Is The Last Dream" (WILD) campaign to save the earth's remaining wilderness, this conference will bring together wilderness preservation activists and experts from over 30 different countries to map the world's remaining wild areas and identify the "hotspots" that require immediate conservation action. Maps will be drafted with Australian cartographer Kevin Healey, to be published by International Travel Books and Maps, Ltd. of Vancouver. The conference is limited to 350 participants. Space or time will be made for anyone to present or distribute information or strategies concerning wilderness preservation. Direct further questions to: WILD Conference, c/o Western Canada Wilderness Committee, 20 Water Street, Vancouver, B.C. CANADA V6B 1A4; 604-669-9453 or 604-683-8220.

Fire Research Institute Announcements

The Fire Research Institute has just announced the commencement of the *International Journal of Wildland Fire*, a new quarterly, refereed, scientific journal devoted solely to issues concerning wildland fire science, management, and technology. An international editorial board is now accepting manuscripts. The first issue is to be mailed in the fall of 1990. For more information, write to the *Journal of Wildland Fire*, at the address below.

In addition, a new annually updated *International Directory of Wildland Fire* is available, containing names, addresses, and telephone numbers of managers, academics, organizations, granting agencies, and journals involved in research, management or publishing concerning wildland fire. The Directory is available for \$34.50 in paperback and \$250 on disk. Also available in June will be the annually updated *International Bibliography of Wildland Fire* containing over 40,000 references to publications concerning all areas of wildland fire. The Bibliography is \$60 (add \$5 in Canada and \$8 elsewhere), and disks are \$150. Write

to: Fire Research Institute, PO Box 241,
Roslyn, WA 98941-0241.

"Partnerships For Conservation"

On Earth Day, April 20, 1990, the National Fish and Wildlife Foundation announced that its "Partnerships for Conservation" program has achieved its goal of initiating projects to conserve fish, wildlife, and plants in all fifty states, Puerto Rico, and the District of Columbia. Since its establishment in 1984, the Foundation has provided over \$26 million in funding for more than 260 projects throughout the United States and North America in conjunction with over 155 partners, including conservation organizations, state and federal agencies, and the corporate community. Projects range from protecting sensitive wetland habitat to research on endangered species, education programs for wildlife professionals and the general public, and resource management. The Foundation raises funds from private interests and the states, which are matched by the U.S. Congress.

The *UPDATE* welcomes announcements
and news items for the Bulletin Board page.

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