

ENDANGERED SPECIES

Technical Bulletin

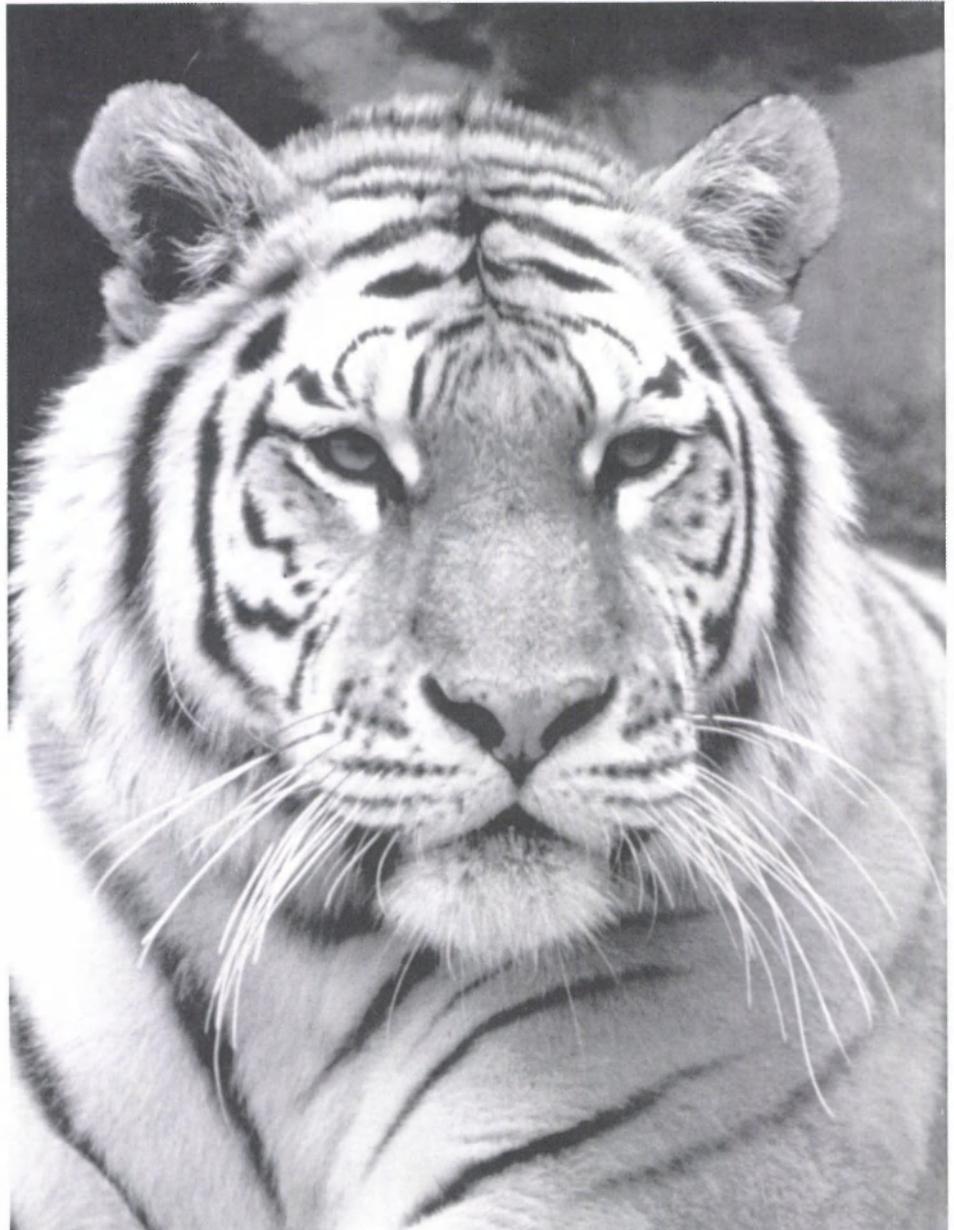
U.S. Department of the Interior
Fish and Wildlife Service

United States Imposes Limited Trade Sanctions on Taiwan for Continued Trade in Endangered Species

For the first time, the United States has imposed trade sanctions on another country to penalize trade in critically endangered wildlife. On April 4, President Clinton announced his decision to restrict the importation of wildlife products from Taiwan, which last year totalled approximately \$22 million in value. The primary reason cited in the announcement was Taiwan's insufficient progress in controlling its trade in products made from tigers (*Panthera tigris*) and various rhinoceros species. Although the People's Republic of China also had been warned about possible sanctions, the U.S. decided not to impose sanctions at this time because of progress in China's enforcement of laws outlawing the trade.

Tigers and rhinoceroses face a dire outlook in the wild. The most immediate and dangerous threat to these species is poaching to satisfy the market in their parts and products, which are used extensively in traditional Asian medicines. At the turn of the century, the world's population of tigers stood at about 100,000, but the number has plummeted to only 5,000. Three of the eight subspecies are already extinct, and the largest of all living cats — the Siberian tiger (*P. t. altaica*) — may be lost soon. Global rhinoceros populations have fallen even more precipitously, from over 100,000 in 1970 to fewer than 10,000 today. The U.S. Fish and

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Tigers are worth thousands of dollars on the black market, where their parts are sold for use in traditional Asian medicines. The United States hopes that economic sanctions will help to control the trade in tigers and other endangered wildlife.

photo by Dr. Bruce W. Bunting, World Wildlife Fund-U.S.



Regional News

Regional endangered species contacts have reported the following news:

Region 2 - The Houston toad (*Bufo houstonensis*) will be the subject of a

3-day seminar of public and private organizations to focus on consensus-building to promote the survival and recovery of this Endangered species. A

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U.S. Fish and Wildlife Service Regions

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Population and Habitat Viability Analysis Workshop was held May 23-25, 1994, in Austin, Texas, to combine the resources of, among others, the National Fish and Wildlife Foundation, the Lower Colorado River Authority, and the Fish and Wildlife Service (FWS). The goal is a revised recovery plan that will lay the biological groundwork for habitat conservation planning.

The FWS recently conducted two public meetings in Bastrop County, Texas, to discuss ways protect the road while allowing development of a growing community.

The U.S. Whooping Crane Recovery Team met in Rockport, Texas, on February 24 and 25, 1994 to review its progress. Steve Nesbitt of the Florida Game and Fresh Water Fish Commission reported on the whooping crane reintroduction experiment at Florida's Kissimmee Prairie. Twelve of the 25 released birds survive, and another 8 birds are scheduled for shipment to Florida in March. A male and female released as juveniles in February 1993 have exhibited the characteristics of subadult pair bonding, including copulation. Although the earliest egg production is not expected until 1995, when the birds are 3 years old, this behavior is encouraging because it was not observed between whooping cranes cross-fostered in the Rocky Mountains.

The Team recommended continuing the experimental release in Florida for another year, and it expressed support for changes in captive rearing and wild release techniques designed to reduce losses from bobcat predation. Cranes will be trained to roost in water as chicks, and captive-reared bobcats will be used to teach the birds to avoid predators.

The Team meeting included a field trip to Aransas National Wildlife Refuge on the Texas coast to view the whooping cranes, as well as activities such as shoreline armoring to halt

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Controlling International Trade in Endangered Species

by Marshall Jones

This issue of the *Endangered Species Technical Bulletin* details international efforts, stretching from Washington, D.C., to Russia, China, and Taiwan, to protect the world's dwindling populations of tigers and rhinoceroses. But there is more to the story of our continuing fight to end harmful trade in endangered wildlife occurring outside U.S. borders. Some examples include:

- On February 28, the Fish and Wildlife Service's Office of CITES Management Authority initiated another Pelly Amendment review of trade in Asiatic black and brown bears, Malayan sun bears, sloth bears, clouded and snow leopards, gibbons, and orangutans, all of which reportedly pass through some of the same markets as tiger bone and rhino horn. A decision on what further action is needed, if any, is pending.
- Dialog with CITES authorities in the Republic of Korea continues regarding our expectations of Korea's continued progress in implementing CITES and eliminating the tiger parts trade in that country. Korea now appears to have the largest stockpile of tiger bone. Under threat of Pelly certification, Korea ended a decade-long holdout and joined CITES in June 1993, but progress has slowed since then.
- We are cooperating with the CITES Secretariat in efforts to convince Middle Eastern countries (Yemen, Oman, and the United Arab Emirates) to stop the trade in rhino horn dagger handles, and Southeast Asian countries (Viet Nam, Cambodia, and Laos) to stop the movement of tigers, leopards, orangutans, and other endangered species through their markets. One result of these efforts is Viet Nam's recent decision to join CITES. We hope Viet Nam's action will influence its neighbors to follow suit.

While these activities continue, the Fish and Wildlife Service is preparing to serve as host for the next CITES Conference of the Parties in Ft. Lauderdale, Florida, in November 1994. Issues involving not only tigers and rhinos, but also minke whales, African elephants, box turtles, crocodiles, marine fishes, tropical timber, and many other wildlife resources will be debated

by an estimated 3,000 delegates from all over the world. Future editions of the *Bulletin* will address these issues as the meeting grows closer.

Marshall Jones is Chief of the Fish and Wildlife Service Office of CITES Management Authority. He also Chairs the Interagency Coordinating Committee involved in the November Conference of the Parties in Florida.



The World Wildlife Fund estimates that the population of the black rhino has fallen to fewer than 2,000, due primarily to poaching for the animal's horn.

"The Power of Pelly":

FWS Director Mollie Beattie, testifying May 17 before the House Committee on Merchant Marine and Fisheries, expressed support for the "spirit and intent" of H.R. 3987, the Rhinoceros and Tiger Conservation Act of 1994, a bill co-sponsored by Congressman Jack Fields (R-TX) and Congressman Anthony Beilenson (D-CA), and its Senate counterpart, sponsored by James Jeffords (R-VT). H.R. 3987 would establish a rhino and tiger conservation fund, as well as institute a new review of countries involved in the trade of these seriously endangered animals.

However, Director Beattie also cited the effectiveness of the current Pelly Amendment authority. "We have learned," she said, "sometimes it is the power of Pelly certification alone, without recourse to actual sanctions, that has been enough to change a country's policies."

The Siberian Tiger Project: Saving Endangered Species Through International Cooperation

by Howard Quigley and Maurice Hornocker

A few years ago, people in a number of countries were surveyed on their general knowledge about wildlife. The survey crossed cultural, political, and economic boundaries. Of the six or eight species with the highest index of recognition, almost half were endangered species. The giant panda, the rhinoceros, and the tiger were on that list, and although all three are the focus of major international efforts to save them from extinction, they continue to decline. It is in Russia where we hope to reverse this trend for at least one of the subspecies of tigers, the Siberian tiger (*Panthera tigris altaica*).

Over the past 5 years, through the Hornocker Wildlife Research Institute at the University of Idaho, we have mounted a major research and conservation effort to save this great cat, known also as the Manchurian or Amur tiger. Five years ago, the estimated number of Siberian tigers in Russia was approximately 500, and very little was known in the West about the subspecies. Around a campfire in a central Idaho wilderness area with members of the then-Soviet Academy of Sciences, we proposed a research project to examine the ecology of this cat in depth. The response was, "Ngét problem." Over the next 2 years we organized the field project.

The goal of the project from the beginning has been to describe the ecology of the tiger in detail and apply those findings to the conservation of the cat and its native habitat. Russian biologists had been studying the tiger for several years and had accumulated impressive banks of information. But the data were limited by one fact: tigers could not be followed consistently when there was no snow on the ground for tracking. Thus, the picture of the Siberian tiger's behavior was quite good from about the end of Oc-



photo © by Michael P. Day, President, The Tiger Trust

A species that is the focus of an international effort to save it from extinction, this Siberian tiger cub is also a poignant representation of an immediate problem. Poachers orphaned the cub by shooting his mother who "probably wound up on a pharmacy shelf."

The Siberian Tiger Project at the Hornocker Wildlife Research Institute, University of Idaho, has been working with several Russian agencies to study the ecology of the species and to develop a conservation plan. Now, to complement the habitat preservation initiative, the emphasis is on anti-poaching efforts through acquiring "boots, bullets, and vehicles for park guards in Russia," says Project Co-Director Howard Quigley. Adds Dr. Quigley, "We will have a conservation plan in place, but if we don't halt poaching, there won't be any tigers to save. We could lose the largest cat in the world in the next few years."

In 1992, the Siberian Tiger Project rescued four cubs similarly orphaned. Today, the two surviving cubs, a male and a female, are doing well. Named Khuntami, for a landmark in the Sikhote-Alin Biosphere Reserve of Russia, the male cub is at the Qmaha Zoo and now weighs more than 250 pounds. The female Nadezhda, whose name in Russian means "hope," is at the Indianapolis Zoo and weighs almost 200 pounds.

tober to the end of March. But outside of those months, only spotty information existed. To understand the cat, and to find answers to help in its conservation, the entire picture had to be put together. In 1989, we proposed to fill those gaps and formed a field team of Russians and Americans to do just that. The initial problem was funding; although the Russian scientific community was supportive and eager to be involved, it could not supply monetary support.

With borrowed money, we made two organizational trips to Russia. In the meantime, two organizations — the National Geographic Society and

the National Fish and Wildlife Foundation — came forward with matching funds to start the project. Field operations began in January 1992. Subsequently, additional funding from the Exxon Corporation, the National Wildlife Federation, and private contributors have kept project activities moving.

There are eight recognized subspecies of tigers, three of which are believed to be extinct. The main feature distinguishing the Siberian tiger from its cousins is its great size. With males reaching recorded weights over 700 pounds in the wild, this subspecies is the largest of all felids. To secure the

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photo by Siberian Tiger Project Field Coordinator Dale Miquelle

Co-Director of the Siberian Tiger Project at the University of Idaho's Hornocker Wildlife Research Institute, Dr. Howard Ougley checks the radio collar on Tiger #1, nicknamed Olga, in February 1992. Olga was the first Siberian tiger captured by Russian and U.S. researchers, utilizing combined expertise—Russian tracking experience and U.S. telemetry and tranquilizing capabilities.

Siberian Tiger Project

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future of this cat in the wild was imperative, but it had to be done in Russia; only 10 to 30 were estimated at the time to roam their native home in China, although the historic range of the subspecies extended from Lake Baikal to Beijing.

The Siberian tiger occurs in a region of Russia about which few people in the West have much information. This area basically is bordered by the mouth of the Amur River on the north, and the Chinese and North Korean borders on the south (Miquelle et al., in press), and is known as the Russian Far East. It is roughly equivalent in size and topography to the coast range from San Francisco to Seattle on the west coast of the United States. This part of greater Siberia contains the largest block of contiguous forest in the world, the taiga forest. Although we are focusing on the tiger, the region has great biological diversity.

While Russia generally experiences cold temperatures, the Far East region is a combination of continental and milder maritime climates, strongly in-

fluenced by the Sea of Japan and the Pacific Ocean. In contrast to much of the continental climate, the Far East region of Russia obtains most of its precipitation in the spring and early summer from moist southeastern monsoon winds, which can bring more than 6 inches of rain in one day.

This combination of climates promotes a diversity of plants and animals from the northern boreal, Asian, and temperate coniferous life zones. More than 150 species of trees and shrubs exist in Primorye Province (or Krai; Berg, 1950), as well as strange combinations of northern and southern species, such as moose and sika deer, or marten and leopards. Thus, there is more at stake than just tigers.

The tiger, however, can be an effective symbol and tool for the conservation of biological diversity in the Russian Far East. With our team of Russian and American biologists, we continue to gather the information necessary for developing a conservation plan to secure the future of the Siberian tiger. Given the ecological and space requirements of the tiger, the conservation plan will likely secure the future of many other organisms as

well. This is the so-called "umbrella effect," which is so often cited when large carnivores are proposed as conservation tools.

But the Siberian Tiger Project is more than ecology, biology, and science. It has been an odyssey of experiences that neither we nor our Russian colleagues dreamed of when we began. The initial months of development, prior to field work, were filled with long negotiating sessions. Like arms negotiators, we were spurred on by some larger vision of moral imperative, although at times we questioned our judgment about taking on this task. When the negotiations stopped, however, and the field work finally got under way, we found the most gratifying and encouraging part of the project: bonding of people for a common cause breaks down the walls of politics and culture.

Since 1992, our American field coordinator, Dale Miquelle, and American assistant, Bart Schleyer, have become part of the community in which they live. They work side-by-side with Russian tiger expert Evgeny Smirnov (see sidebar) and several Russian assistants. We have all been willing to learn about the traditions of each other's worlds. For instance, we had to trust that it really was good for the pores and skin to be whipped by willow branches in a hot sauna, or that a certain tea from native plants would break a fever. And the Russians had to trust that our drugs would keep a tiger asleep while we worked on it, and that it would walk away healthy after we gathered our data and attached a radio-collar.

We are welcomed into the lives, homes, and communities of these people who were once considered our enemies. It is only through this type of integration that a true understanding can be generated. And from understanding and cooperation, we can build an effective conservation plan for the Siberian tiger from the ground level.

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Siberian Tiger Project

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To date, as we begin our third summer of field research, we have captured nine tigers and released them with radio-collars that allow us to follow their movements and activities. We have also caught nine bears, both brown bears (*Ursus arctos*) and Asiatic black bears (*Ursus thibetanus*), and two Amur leopards (*Panthera pardus orientalis*). The data from these animals accumulate daily and, with the data, our chances of understanding this ecosystem, as well as ensuring that these animals exist a century from now.

Two threats to tigers are apparent at this point: poaching and loss of habitat. In the past few years, poaching of tigers for the Asian traditional medicinal market has been responsible for the deaths of dozens of Siberian tigers, including one of our adult females. She crossed the road one night at the wrong time and was shot by someone in a passing vehicle. Only her radio collar was found, along with four orphaned cubs (Quigley, 1993).

In Russia, the killing of tigers for money is a relatively new enterprise. Now, there is a heavy price on the tiger's head, the borders are open, and the economic situation is unstable and worsening for most people. The tiger is a tempting target, especially in winter when the animal can be tracked in snow.

For relatively small amounts of money (by Western standards), we feel that effective anti-poaching teams can be put in the field. More than a year ago, we delivered the first donation from the West to help in the anti-poaching effort, and now more support has been coming. The proper organization of these efforts in the coming months will be important to ensure their effectiveness, but we are optimistic.

The second problem is more complex, and requires more time, organization, and energy. Habitat alteration and loss due to overcutting of the forest are a major threat to the fu-

ture of the Siberian tiger. But the adjustment in the current system of harvesting needed to conserve tiger habitat is simply one of sustainability. The taiga is a tremendous resource for the Russian people. For years, it was harvested at a rate that easily met the internal needs of the country and made little impact on the forest as a whole. But wood has become a precious international commodity that the Russians can sell for foreign currency, which is so important at this time. The big question in Russia is not whether or not to harvest wood, but *how* to harvest it.

We know from our Western experience, for instance, that we can maintain healthy populations of elk (*Cervus elaphus*) and mountain lions (*Felis concolor*) under moderate forest harvesting schemes. However, the type of forestry currently practiced in tiger habitat is hard on tigers and their prey. Timber is either harvested through very large clearcuts, or through intensive selective harvesting. The trees selected are usually important food sources for tiger prey.

We are currently encouraging the maintenance of a controlled harvest area with the construction of a model mill to demonstrate sustainable forestry practices. By doing so, we feel that methods new to Asia can be introduced, and that people will see the value in their implementation. It is a fact that the Russian forests will be harvested. Almost 60 percent of the world's softwood inventory is found in Siberia and the Russian Far East. Economics dictates that this resource will be used. But economics must be tempered with the technology of sustainable use, or a unique Russian heritage — the biological diversity of the Far East — will be lost.

An additional component of our conservation plan will be to assess the current reserve system and its potential for protecting tigers. Our research is showing that the Siberian tiger uses very large blocks of land, several times the size of territories used by the Ben-

gal tiger in Nepal. Although we feel the tiger can tolerate disturbance, fully protected areas will also be as important to tiger conservation as wilderness or protected areas have been for the maintenance of black bear (*U. americanus*) populations in the southeastern United States or mountain lion populations in the West. During the next few years, we will be assessing the reserve system of the Russian Far East through a large-scale, landscape approach, looking at each reserve, the types of nearby land use, and the connectivity between reserves.

Again, all of these activities are conducted through cooperation and teamwork between Americans and Russians. We now employ almost 30 Russians, and they have been integrated into every activity of the Siberian Tiger Project. Training in such activities as the use of radio-telemetry, animal capture and immobilization, and the use of our Geographic Information System is taking place.

Development of a truly comprehensive conservation plan is not an easy task, and when we started this project, many people said it simply could not be done. But after nearly 5 years of preparation, we and our Russian colleagues are ready to move forward to make a future for the Siberian tiger in the wild.

Dr. Maurice Hornocker has conducted and directed research on carnivores for more than 30 years, including original work on mountain lions, bears, and bobcats in North America, and leopards in Africa. He is the former Leader of the FWS Cooperative Wildlife Research Unit at the University of Idaho, and currently is director of the Hornocker Wildlife Research Institute at the University of Idaho.

Dr. Howard Quigley has conducted and directed research on wildlife for 20 years, including mountain lions and black bears in North America, giant pandas in China, jaguars in Brazil, and a number of vertebrates in Guatemala. He currently is president of the Hornocker Wildlife Research Institute. Drs. Hornocker and Quigley are co-directors of the Siberian Tiger Project.

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Russian Rangers Complement International Pressure to Save the Siberian Tiger

by Steven R. Galster

Tracked easily through the deep snow of the Russian Far East, the Amur or Siberian tiger was hit hard by commercial poachers again this winter, pushing the earth's largest cat a big step closer to extinction in the wild. Russian authorities estimate they may have lost 20-25 percent of their tigers between November and March alone, leaving the current number as low as 150-200. Most experts agree that if this trend continues, the Siberian tiger may, for all practical purposes, disappear from the wild within 5 years. Some Russian authorities, pointing to their country's economic situation and tenuous wildlife enforcement structure, give this great predator only 3 years at best, unless political pressure on tiger bone consuming countries continues and support for anti-poaching efforts are stepped up immediately.

Some Russian authorities and wildlife groups have heeded that warning and are teaming up in the Russian Far East to try to stem the tide of commercial poaching, which is devastating not only the Siberian tiger but also bears, deer, seals, and other species whose body parts are being sought for a burgeoning trade in traditional Asian medicines.

Before perestroika and the subsequent opening of the Sino-Soviet border, tiger poachers were held at bay. Commercial trade channels between the Soviet Far East and other countries in demand of tiger bone, such as China, were restricted. Wildlife rangers received enough financial and material support to field a "zone defense" in areas encompassing the tiger's range. After a period of intense poaching in the early part of the century, the population of Amur tigers rose from 30 in 1947 to 370 in 1989.

But post-perestroika Russia, which brought political freedom for most Russian citizens, has spelled disaster for



photo by Dr. Howard Quigley

"Poachers are enemies of nature," says this sign on a road in the Sikhote-Alin Biosphere Reserve in Russia. Note the bullet holes: one response. (Russian translation courtesy of Peter Ward, Office of International Affairs, U.S. Fish and Wildlife Service.)

Russian tigers. Unregulated and often illegal trade with other countries, spiralling inflation, corruption, and government austerity measures (such as severe budget reductions) have contributed to a situation in which wildlife poachers and traders can outpace park rangers and policemen. The Ministry of Environment has been forced to reduce its staff of rangers, some of whom make as little as \$50 a month. By contrast, commercial poachers can make enough money from their illegal hunting to buy Land Cruisers, vehicles that are very good in the snow and literally enable the poachers to run circles around government cars. The most lucrative of commercial wildlife products have been tiger skins and bones. A whole dead tiger can fetch more than \$30,000 on the black market in Taiwan or China. Until recently, little was being done to stop this illegal trade, which has driven tiger populations worldwide to their lowest levels ever.

In April of this year, President Clinton announced limited economic sanctions against Taiwan for its illegal trade in tiger parts (based on reviews conducted by the Fish and Wildlife Service's Office of Management Authority), and signalled China and South Korea that the U. S. would continue monitoring their progress in enforcing the international tiger trade ban. This was a historic decision, since it is the first time the United States has imposed sanctions on another country under the Pelly Amendment. Several weeks after the announcement, a little known but significant announcement was made in the Russian city of Ussurisk.

Standing in front of a ceremonial burning of confiscated tiger bones and skins in Ussurisk, located on the edge of the taiga in Primorsky Territory, Commander Vladimir Shetin and 16 rangers launched "Operation Amba," the Russian government's new anti-

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Note from the Field: A Russian Perspective on Tiger Conservation

by Evgeny Smirnov

In the 20th century, the Siberian or Amur tiger has survived four wars, two revolutions, and many hungry people. Wars, revolutions, and crises always impact nature, its fauna first. Like the images in a distorting mirror, the more disturbed the conditions in which people live, the more desperate the situation becomes for wildlife. Perestroika in Russia has had some unfortunate results. Poachers have been killing tigers, bears, deer, and sable with impunity. Figuratively speaking, tigers have contributed to the ABC's of democracy and market economy as their magnificent skins and bones have been sent to China, Korea, and Japan, perhaps even to Paris and San Francisco.

But perestroika also let the scientists of different countries join our protection efforts, and the Russian-American Siberian Tiger Project was the first act in cooperative activity. A group of Hornocker Wildlife Research Institute

(USA) researchers and Sikhote-Alin Biosphere Reserve (Primorsky Krai, Russia) researchers have been conducting intensive work on tigers for more than two years. Nine Amur tigers and seven brown and black bears have been wandering the Reserve in their fashionable American collars transmitting important information. A second group of zoologists has been working in the south Primorsky Krai in the Kedrovya Pad Reserve. Their task is even more complicated: to study and to conserve not only tigers but the last ten Far-Eastern leopards. Our plans and thoughts for further conservation efforts are only limited by time and the success of fund raising.

The tiger population is diminishing. How many tigers are there now—300? Tomorrow there may be only 200. It is necessary to stop the marketing of tiger skins and bones. But it also is imperative that we conserve the existing reserves, form new zapovedniks

(nature reserves) and national parks, study the biology and ecology of these beautiful cats in detail, and convince hunters, farmers, loggers, economists, politicians, lawyers, and local authorities that tigers have the right to live. And it is necessary to educate this generation and the next. If we can do all this, we can protect not only tigers, but also the Ussuri River basin taiga complex. All people must cooperate as we formulate an Action Plan and develop centers for information and coordination of the efforts.

We have the will *and* we have the tigers, yet.

Evgeniy Smirnov is a biologist with the Sikhote-Alin Biosphere Reserve and Siberian Tiger Project.

Editor's Note: The Fish and Wildlife Service's Office of International Affairs advises that in the past no public access was available to the more strictly controlled zapovedniks. Today, however, several zapovedniks allow ecotourism activities.

Russian Rangers

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poaching program. The tiger is not mentioned directly but is referred to with reverence as "Amba," meaning "Great Sovereign." Funding from the Tiger Trust and the World Wildlife Fund has brought Amba salaries up to \$300 a month. Outfitted with new uniforms, equipped with new vehicles, but still short on money for fuel and radios, Amba has begun operation. Consisting of 15 special rangers, a deputy, and a commander, it aims to reduce poaching of the tiger through a two-fold strategy: dispatching patrols quickly to poaching problem areas, and conducting investigations in cities and border areas where wildlife smugglers are known to operate. Amba officers were recruited not only from the park ranger system but also from

the military. Reflecting the post-Cold War conversion of some military resources to conservation, there are Amba officers with backgrounds including naval intelligence and army special airborne forces.

Three five-man teams rove constantly through nature reserves and other areas of Primorsky and Khabarovsk Territories, where poaching activity is known to be a problem. Once they are equipped with radios, these brigades will be able to stay in constant touch with one another and their headquarters in Vladivostok, where their commander will be collecting and collating information on poaching and wildlife trading activity. Mikhail Bibikov, Chairman of the Primorsky Territory Ecology Committee, hopes to add a fourth or fifth team to Amba if he can raise the money.

Community outreach will also play an important part in Operation Amba's activities. Gathering information from villages that border poaching areas, as well as compensating farmers who have lost livestock to a tiger, are vital to Amba's success. Amba will also be the liaison with Russian non-governmental organizations that have tiger education and protection programs in progress.

Amba is fighting a steep, uphill battle that can only be won if international efforts continue at the political level—such as Pelly action—to stamp out the tiger trade, and if more resources are injected into Amba's efforts on the ground. Current funding for Operation Amba comes from two foreign sponsors, the Tiger Trust of England and the World Wildlife Fund. People who wish to learn more or assist

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International Cooperation to Save Siberian Tigers: Russia and the United States Intensify Conservation Efforts

by Steven G. Kohl

photo © Endangered Species Project/Earth Island Institute



Tiger skull and bones and rhino horn on a pharmacy shelf in Taipei, Taiwan

In partnership with a number of American zoos, the U.S. Fish and Wildlife Service's Office of International Affairs has been working with its Russian counterparts for more than a decade to promote the conservation of Siberian tigers in the wild and increase the genetic diversity among those held in captivity. In 1983, three young Siberian tigers born in the Moscow Zoo to wild-caught parents were transferred to the New York, Omaha, and Indianapolis Zoos. Since that time, the young have successfully mated with tigers at several facilities to introduce genetic variety and reduce inbreeding.

Endangered in Russia for many years, tigers were strictly protected in three nature reserves (Sikhote-Alin,

Lazovskiy, and Kedrovaya Pad) along the southern Pacific coast of the Russian Far East. However, the recent economic difficulties in Russia, exacerbated by poaching and loss of habitat due to timber and logging operations, have brought this magnificent species to the brink of extinction. As a consequence, studies of the Siberian tiger have been reoriented to focus on emergency steps for their protection and management.

In 1990, the Fish and Wildlife Service invited Director Anatoliy Astafyev of Sikhote-Alin Reserve to visit the United States. His meetings with Dr. Howard Quigley of the Hornocker Wildlife Research Institute and representatives of the National Geographic Society resulted in the creation of a

project to radio-collar tigers in the Sikhote-Alin Reserve to track their movements and gain a better understanding of their distribution. The project came up against the grim realities of poaching when a transmitter that indicated no movement for several days led to the discovery of four orphaned cubs.

Responding to an appeal from the Russian Ministry of Environmental Protection and Natural Resources, the U.S. Department of State made available an emergency grant to Russia to strengthen ranger and law enforcement activities in the three reserves. The World Wildlife Fund and other private conservation organizations have contributed their own resources and expertise as well, and efforts are under way to assist Russia in saving tigers and their habitat in the unprotected areas linking the three reserves.

Recent articles in *Time* and *National Geographic* magazines, as well as other publications, have focused international attention on the tigers' plight, and many agencies and organizations, including the Fish and Wildlife Service, are promoting efforts to assist Russia. Given the recent sharp decline in tiger abundance in the Russian Far East—estimated to be more than 50% in just the last few years—timely help for this species is of the essence.

Steven G. Kohl, of the U.S. Fish and Wildlife Service's Office of International Affairs, administers the Service's exchange programs with Russia and China. Fluent in languages including Russian and Mandarin Chinese, he is U.S. Co-chairman of the Gore-Chernomyrdin Working Group on Biodiversity Conservation and Sustainable Use. This group was created to coordinate U.S.-Russia conservation policy and management issues between the Government agencies of the two countries.

Russian Rangers

(continued from previous page)

Operation Amba can write to either of these organizations:

- The Tiger Trust, New Market, Suffolk, CB8 8TN, England
- World Wildlife Fund, 1250-24th Street, N. W., Washington, D.C. 20037.

Steven R. Galster coordinates "The Investigative Network," an information cooperative linking environmental and human rights investigators worldwide. He recently returned from Russia, where he conducted an investigation of the tiger bone trade for The Tiger Trust.

The National Fish and Wildlife Foundation Goes *International*

by Darv Johnson

The National Fish and Wildlife Foundation (NFWF), a non-profit conservation organization established in 1984, prefers to base its conservation strategy on the need to protect species before they become Threatened or Endangered. To date, however, the NFWF has supported 143 projects dealing with Threatened and Endangered species, of which 36 are international in scope. The NFWF commitment to species recovery on the international level stems in part from the increasing realization that solutions to natural resource conservation problems must be placed in an international context to ensure their ef-



fectiveness. The decline of neotropical migratory birds, for example, is due not only to impacts on nesting habitats in the United States, but also to the deforestation and fragmentation of

their wintering grounds in Mexico, the Caribbean, and Central America. Jurisdictions and national borders are meaningless in this situation, and a conservation solution will only be successful if these "Partners in Flight" nations are included as full and equal partners.

This multi-national perspective is essential when examining endangered species recovery. Any effort to address the plight of the North Atlantic humpback whale (*Megaptera novaeangliae*) on a strictly national scale will meet with little success because the whale's migratory patterns are not governed by

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U.S. Imposes Trade Sanctions

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Wildlife Service (FWS) believes that most of the world's tiger and rhino populations (except the white rhino in South Africa) will become extinct in the next 2 to 5 years if the trade in these species is not eliminated.

Action to protect these animals accelerated in September 1993. Based on a FWS review of the trade, carried out under the Pelly Amendment to the Fisherman's Protection Act of 1967, Interior Secretary Babbitt certified that Taiwan and the People's Republic of China were engaging in trade that promoted the poaching of rhinos and tigers. Such trade undermines the effectiveness of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), an agreement among 122 countries to prohibit trade in endangered wildlife. In November 1993, President Clinton responded by warning Taiwan and the People's Republic that the U.S. may impose sanctions against them unless "measurable, verifiable, and substantial progress" in eliminating the trade was made by March 1994.

The President's statement suggested a number of actions that Taiwan and the People's Republic could take to demonstrate a commitment to ending the trade in endangered species. These measures, which were based on CITES recommendations, included consolidation and control of stockpiles, formation of a permanent wildlife law enforcement unit with specialized training, development and implementation of a comprehensive law enforcement and education plan, and establishment of regional law enforcement arrangements with neighboring countries. The U.S. offered technical aid to both countries to assist them in their efforts. Additionally, the FWS funded and participated in 3 delegations sent to China and Taiwan over the past 4 months to evaluate the progress in ending the trade.

At a recent meeting, the CITES Standing Committee found that the minimum requirements have not been met by the government of Taiwan, leaving in place the committee's previous recommendation that CITES member countries prohibit the importation of all wildlife (including parts and products) from Taiwan. The President's April 4 action follows this

recommendation. On the other hand, the CITES Standing Committee noted that the People's Republic of China has made progress in controlling the trade in endangered wildlife. However, the committee said further actions were needed from China as well as Taiwan to adequately combat the endangered wildlife trade. Therefore, the Pelly Amendment certifications will remain in effect for both countries. Their progress will be evaluated again in December 1994, at which time sanctions against Taiwan could be lifted or strengthened, and the decision not to sanction China will be reassessed.

A notice was published in the April 28, 1994, *Federal Register* to solicit public comments on the range of otherwise legal wildlife specimens and products to be covered by the import prohibitions. Examples of items that could be targeted include jewelry made from coral and mollusk shells, and leather products fashioned from snake, lizard, and crocodile hides.

Additional information is available from the U.S. Office of CITES Management Authority, Fish and Wildlife Service, 4401 North Fairfax Drive, Room 420-C, Arlington, Virginia 22203.



The Endangered humpback whale (*Megaptera novaeangliae*) is a perfect example of a species that will benefit from a coordinated, multi-nation conservation effort. This humpback is shown enjoying the Stellwagen Bank National Marine Sanctuary in the Gulf of Maine, three miles off the northern end of Cape Cod, Massachusetts.

The NFWF goes International

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national boundaries. Similarly, North America's stocks of Atlantic salmon (*Salmo salar*), petitioned for listing in the United States, cannot be restored without the cooperation of the Greenland fishermen who catch 235 tons of the salmon each year. In the Gulf of California, efforts to conserve the Gulf of California harbor porpoise (*Phocoena sinus*) and a fish, the totoaba (*Cynoscion macdonaldi*), depend on the cooperation of Mexican conservation interests.

The NFWF strategy in these instances is to work cooperatively with multi-national partners to develop the best possible management solution. To address the pressures facing the humpback whale, NFWF is supporting a three-year research project guided by the Center for Coastal Studies in which scientists from seven nations

will pool data gathered at sea, thereby creating a solid scientific foundation for future understanding and management of this species. In the case of the Atlantic salmon, the result was a two-year buyout of the West Greenland commercial salmon quota, enabling large percentages of these fish (more than 120,000 annually) to return to their native North American rivers and spawning grounds.

With a population roughly four times that of the United States in an area one-third the size, India's natural resources are under enormous pressure. Any conservation initiative in India, therefore, is that much more difficult to undertake. The first NFWF venture in that region comes through a fund established in partnership with the U.S. Fish and Wildlife Service to support conservation activities in the Near East and South Asia regions. Through our partnership with the Wildlife Institute of India and other conservation organizations in the area, NFWF will reap the benefits of their experience with recovery efforts for such endangered species as the tiger (*Panthera tigris*), snow leopard (*Panthera uncia*), and Indian wolf (*Canis lupus pallipes*) in a climate of intense population pressure.

Similarly, NFWF's support of Siberian tiger (*Panthera tigris altaica*) research in the former Soviet Union has proven to be a rare chance for a US/Russia team to study and develop a conservation plan for the world's largest cat. These cooperative efforts represent an enormous opportunity for nations to exchange scientific data and management techniques, and may prove to be of value in directing our conservation efforts on the domestic front.

The NFWF has also offered support for international wildlife law enforcement efforts, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the World Wildlife Fund's "Buyer Beware" programs. NFWF has provided three grants in support of CITES, including training

for Chinese scientists on implementation of CITES programs. The "Buyer Beware" campaign promotes awareness of priority international wildlife trade issues through public service announcements, publications, brochures, and other projects.

Unfortunately, the need for the protection of endangered species on an international level continues to grow. This fall, the biennial CITES conference will be held in the United States for the first time in 20 years, presenting a tremendous opportunity for U.S. involvement in these conservation and enforcement efforts to increase. Through this conference, and through support of international endangered species work, NFWF will continue to encourage the exchange of scientific data management techniques and approaches. With this exchange, individual countries and communities can begin to implement increasingly effective endangered species programs, and shift gears from reactive to proactive species management.

For more information, write to the NFWF at 1120 Connecticut Avenue, N.W., Suite 900, Washington D.C. 20036, or call (202) 857-0166.

Darv Johnson recently joined the National Fish and Wildlife Foundation, where he works on the development and marketing staff. His article is the first the Bulletin has received via Internet.

Siberian Tiger Project

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Old-Growth Forests and the Puerto Rican Parrot

by J. Michael Meyers

The Puerto Rican parrot (*Amazona vittata*) is an extremely endangered cavity-nesting species. Fewer than 40 parrots inhabit the forests of the Luquillo Mountains. The birds have nested predominantly in palo colorado (*Cyrilla racemiflora*) since the early 1970's. Palo colorado, or titi as it is known in the southeastern United States, is a small tree (less than 0.3 meter, or 1.0 foot, in trunk diameter) through most of its range, which extends from the swamps of North America to Brazil. In the rain forests of Puerto Rico, however, palo colorado reaches mammoth sizes, as large as 2.6 meters (8.5 feet) in diameter.

According to Pete Weaver, a forester with the U.S. Department of Agriculture's International Institute of Tropical Forestry who has studied the palo colorado extensively in Puerto Rico, this species is a slow-growing tree that probably is an average of 660 years old when its diameter reaches 1.0 meter (3.3 feet). The palo colorado trees used by Puerto Rican parrots for nesting average 1.1 meter (3.6 feet) in diameter, which means these trees may be more than 700 years old.

Puerto Rican parrots have used only two other tree species for nesting since the 1970's. One nest in 1974 was in a large laurel sabino (*Magnolia splendens*) tree.¹ Another nest, used every year since 1991, is in a tabonuco (*Dacryodes excelsa*) tree (F. J. Vilella, U.S. Fish and Wildlife Service, pers. commun.).

Puerto Rican parrots obviously use old-growth forests. However, Weaver and others believe that palo colorado is a late secondary species that may need openings in the forest for successful reproduction. This means palo colorado forests need periodic disturbances to maintain their population and replace



photo by Pete Weaver, International Institute of Tropical Forestry, U.S. Forest Service

older trees as they die. The most recent such disturbance was in 1989, when Hurricane Hugo struck Puerto Rico. However, studies of potential nesting trees by the Puerto Rico Research Group of the National Biological Survey after the hurricane revealed that on the eastern side of the parrot's nesting range, palo colorado may not be replacing itself. The hurricane killed 22 percent of the palo colorado that were potential nesting trees in the eastern mountains (personal observation). It is also in this area that a new nest was discovered in a tabonuco tree in 1991 (personal observation).

There may be enough nesting cavities for the parrot population in the short term; however, as the population increases, a shortage of nesting sites could develop. A hurricane even stronger and more devastating than Hugo may occur at any time and destroy more parrot nesting trees. Because it takes more than 660 years

The Puerto Rican parrot, a cavity nesting bird, most often uses old-growth trees such as this ancient palo colorado.

to produce optimum palo colorado trees for nesting parrots, and there are no other areas in Puerto Rico with old growth forests like those of the Luquillo Mountains, growth of the parrot population could become limited by the supply of suitable nesting trees.

Can nesting traditions change? Birds have been known to alter their nesting patterns if they successfully raise young at new nesting sites.² Research and management of potential nesting habitat may be able to expand the parrot's use of trees that are more common and widespread than palo colorado. Tabonuco and other large trees in Puerto Rico could provide nesting habitat if cavities in these trees suitable for parrot nesting are created or enhanced. With the successful management effort conducted by the Fish and Wildlife Service and the Forest Service, the parrot population could approach 80-100 individuals by the turn of the century. Encouraging new nesting traditions may be the key to increasing the population and achieving the goals of the Puerto Rican parrot recovery program.

¹ Snyder, N. F. R., J. W. Wiley, and C. B. Kepler. 1987. The parrots of Luquillo: Natural history and conservation of the Puerto Rican parrot. Western Foundation of Vertebrate Zoology. Los Angeles, California. 384 pp.

² Temple, S. A. 1977. Manipulating behavior patterns of endangered birds. Pages 435-443 in S. A. Temple (ed.). Endangered birds management techniques for preserving threatened species. University of Wisconsin Press, Madison.

Dr. Meyers is Leader of the Puerto Rico Research Group, National Biological Survey, Patuxent Wildlife Research Center, P.O. Box N, Palmer, Puerto Rico 00721-0501.

Listing Proposals — February/March 1994

Thirty-nine species — 37 animals and 2 plants — were proposed by the Fish and Wildlife Service during February and March 1994 for listing as Endangered or Threatened. If the listing proposals are approved, Endangered Species Act protection will be extended to the following:

Pacific Pocket Mouse *(Perognathus longimembris pacificus)*

This tiny mammal had not been seen in over 20 years until recently, when a small population was rediscovered at a site on the Dana Point Headlands, a historically occupied site and a remnant of undeveloped habitat in Orange County, California. One documented threat to the mice is predation by domestic and/or feral cats. The most immediate danger, however, is a proposed hotel and residential complex, which would destroy almost all 3.75 acres (1.5 hectares) of occupied habitat. For this reason, the FWS published a temporary emergency rule on February 2, protecting the Pacific pocket mouse for 240 days as an Endangered species. During that time, the FWS will consider a proposal — also published February 2 — to give the animal long-term protection.

Pacific pocket mice cannot survive in developed areas. They historically occurred within such natural habitats as coastal dunes, river alluvium, and coastal sage scrub growing on marine terraces. Once, populations were known from eight areas in three southern California counties. In Los Angeles County, however, only about 1 percent of Pacific pocket mouse habitat remains. Land use patterns in San Diego County are similar. Approximately 150 acres (60 hectares) of habitat in Orange County are still undeveloped, but surveys have found the mouse only at the small Dana Point Headlands site.



photo by B. "Moose" Peterson/WRP

Pacific pocket mice, which cannot survive in developed areas, now inhabit an area of less than 4 acres.

The coastal California gnatcatcher (*Polioptila californica californica*) occurs at the same site. This habitat, however, is not within an area proposed for conservation under the State of California's Natural Communities Conservation Planning Program.

California Red-legged Frog (*Rana aurora draytonii*)

The largest native frog in the western United States, the California red-legged frog is found primarily in wetlands and streams in coastal drainages. This subspecies requires a fairly distinct habitat, combining specific aquatic and riparian components. Adults depend on dense vegetation associated with deep, still or slowly moving water.

Once widely distributed, the frog occurred in California from Marin County coastally, and from Shasta County inland, southward to northwestern Baja California, Mexico. But habitat loss or alteration, combined with overexploitation and the introduction of exotic predators, has eliminated the frog from 75 percent of its historical range in California. Most

of the wetlands the subspecies once inhabited have been diked, drained, or filled for agricultural and urban development. Other habitats disappeared when streams were channelized, diverted, or inundated by impoundments. Cattle grazing, off-road vehicle use, and logging in red-legged frog habitat also have damaged riparian vegetation and degraded the aquatic environments with siltation.

In the 1800's, California red-legged frogs were considered a delicacy. From 1890 to 1900 alone, up to 80,000 were taken each year to supply the San Francisco market. Around 1900, however, there was a dramatic fall in the numbers collected, indicating that the frog had fallen victim to overharvest. Today, the frog's main predators are introduced fishes and another non-native species, the bullfrog.

Known populations of the California red-legged frog larger than 350 individuals remain in only three areas: Pescadero Marsh Natural Preserve in coastal San Mateo County, Point Reyes National Seashore in Marin County,

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photo by B. "Moose" Peterson WRP

The California red-legged frog is the largest native frog in the western United States.

Listing Proposals

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and canals west of San Francisco International Airport. Because of the frog's seriously reduced numbers and range, and the continuing threats, the Service proposed February 2 to list this subspecies as Endangered.

Two California Butterflies

Two butterflies native to central and northern California were proposed February 4 for listing as Endangered. Both have a typical wingspan of about 55 millimeters (2.17 inches), and are orange-brown in color with silver and black spots on their undersides. They have a limited range:

- Callippe silverspot (*Speyeria zerene behrensii*) - Historically, the Callippe silverspot inhabited native grasslands in seven areas of the San Francisco Bay region. Only two populations remain, in a city park and on San Bruno Mountain in San Mateo County.
- Behren's silverspot (*Speyeria zerene behrensii*) - A related subspecies, this butterfly once was found on coastal prairie habitat from the mouth of the Russian River in Sonoma County north along the coast to southern Mendocino County in the vicinity of

Point Arena. Its six former populations have been reduced to one, which occurs near Point Arena.

Extensive habitat modification or destruction is the main reason for the decline of these butterflies. Some populations were displaced by residential and commercial development. Others disappeared when off-road vehicle use, unsuitable levels of grazing, trampling, and invasions of non-native plants eliminated the foodplants of the butterfly larvae or the nectar sources for the adults. The remaining populations are vulnerable to further habitat change and overcollecting. There is an extensive commercial trade in both taxa, which are highly prized by butterfly collectors.

Alameda Whipsnake (*Masticophis lateralis euryxanthus*)

Included with the proposed rule to list the two silverspot butterflies was a proposal to list the Alameda whipsnake — which inhabits the same general region — as Endangered. This slender, extremely fast-moving snake has a relatively large head, which it holds off the ground in a cobra-like manner to peer over grass or rocks as it hunts lizards. Alameda whipsnakes, which are non-

venomous, have a dark brown or sooty back with distinct yellow-orange stripes down the sides. They reach about 4 feet (1.2 meters) in length.

The Alameda whipsnake inhabits the inner coast range in Contra Costa and Alameda Counties, where it usually is found within northern coastal scrub or chaparral. Historically, the snake was known from 60 locations, but only 25 populations remain. Like the two butterflies, it faces loss of habitat from a variety of sources.

Barton Springs Salamander (*Eurycea sosorum*)

This small amphibian, found only in the Barton Springs system in central Texas, is entirely aquatic. It does not metamorphose into a terrestrial form, but retains its bright red external gills throughout its life. The dorsal coloration varies from pale purplish-brown or gray to yellowish-cream. Irregular pigmentation gives the salamander a mottled, "salt and pepper" pattern.

Barton Springs consists of a complex of springs in Zilker Park, owned by the City of Austin. Three of the system's four springs are inhabited by the salamander. All three have been impounded for swimming, which itself does not seem to have harmed the salamander. The main threat to the species is water pollution. Barton Springs has good water quality most of the time, but it is vulnerable to degradation from any contaminants that drain into the aquifer and degrade the ground water. Less than 5 percent of the system's 150 square mile (390 square kilometer) recharge zone has been developed so far. As development in this rapidly growing part of Texas continues, so does the potential for a catastrophic chemical spill or chronic degradation from urban runoff. If the salamander is listed, the recovery effort could include measures to prevent and/or control pollution during and after development.

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photo by Wymann Meinzer

The mottled pigmentation of the Barton Springs salamander is accented by its bright red external gills.

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Any contaminants released into the recharge area, which is part of the Edwards Aquifer, could make their way to Barton Springs. The Texas Water Commission has identified the Edwards Aquifer as one of the most sensitive aquifers in Texas to ground water pollution. Loss of water quality poses a threat not only to the salamanders but also the amphipods upon which they feed. The vulnerability of the Barton Springs salamander is exacerbated by its restricted range.

The salamander faces several other potential threats as well, including groundwater depletion and disturbance of the habitat by the use of chemicals and high-pressure hoses for pool cleaning. Accordingly, the FWS proposed February 17 to list the Barton Springs salamander as Endangered.

San Xavier Talussnail (*Sonorella eremita*)

As its common name indicates, this land snail lives in talus slope habitat not far from San Xavier, a town in Pima County, Arizona. It has an extremely restricted range: a 50- by 100-foot (15- by 30-meter) site on the northwestern side of a hill where limestone and decomposed granite have formed a deep rock slide. The species is known nowhere else.

San Xavier talussnails have a globose, whorled shell about 19 millimeters (0.7 inches) in diameter and white to pinkish in tint, accented by a chestnut-brown band. They can

estivate (remain dormant) for up to 3 years, and in most years are active only 3 or 4 days. Dormancy helps the snails survive in the Sonoran Desert climate. The moist conditions this species needs when active are maintained by surface vegetation, the deep talus, and the shelter of the hill itself.

Because of the species' very limited distribution and specific moisture requirements, the San Xavier talussnail is vulnerable to relatively small-scale changes in its environment. Future activities on nearby lands could have an impact on the species' environment. As a precaution, the FWS proposed March 23 to list the San Xavier talussnail as Endangered.

Thirty African Birds

After evaluating listing petitions from the International Council for Bird Preservation, the FWS proposed March 28 to list 30 species of African birds as Endangered (E) or Threatened (T):

- Amsterdam albatross (*Diomedea amsterdamensis*) - a large seabird that breeds only on Amsterdam Island, a French possession in the southern Indian Ocean. Only 5 pairs were known to breed each year in the 1980's. (E)
- Thyolo alethe (*Alethe choloensis*) - a small, ground-dwelling bird known only from submontane evergreen forest in Malawi and Mozambique. About 1,500 pairs are estimated to survive. (E)
- Uluguru bush-shrike (*Malaconotus alius*) - a small predatory bird occurring in the Uluguru Mountains of central

Tanzania. Although rare, its numbers have not been quantified. (T)

- Madagascar serpent eagle (*Eutriorchis astur*) - a raptor related more to harriers than eagles. The continued existence of this extremely rare bird was confirmed when a specimen was captured and released in January 1994. (E)

- Mauritius fody (*Foudia rubra*) - a small weaver bird known only from the island of Mauritius in the Indian Ocean. A large-scale logging project has reduced the population to an estimated 150 breeding pairs. (E)

- Rodrigues fody (*Foudia flavicans*) - a related species endemic to the island of Rodrigues, part of the nation of Mauritius. By the 1980's, only about 100 individuals remained. (E)

- Djibouti francolin (*Francolinus ochropectus*) - a ground-dwelling, partridge-like bird restricted to highland forests in the country of Djibouti. By 1985, only about 1,500 birds were known to survive. (E)

- freira (*Pterodroma madeira*) - a small seabird native to the mountains of Madeira, an island possession of Portugal in the Indian Ocean. Only 20 breeding pairs may remain. (E)

- Alaotra grebe (*Tachybaptus rufolavatus*) - a small diving bird occurring primarily at Lake Alaotra and adjacent marshes in Madagascar. Human alteration of its limited habitat has promoted a tremendous increase in numbers of the related little grebe (*T. ruficollis*), resulting in extensive hybridization. (E)

- white-breasted guineafowl (*Agelastes meleagrides*) - a medium-sized ground-dwelling bird related to turkeys and peacocks. Overexploitation of its rainforest habitat has reduced this species to small numbers in the Ivory Coast and Liberia. (E)

- Raso lark (*Alauda razae*) - a songbird known only from Raso, one of the islands in the nation of Cape Verde off the west coast of Africa. This once common species had declined to 150 individuals at last count. (E)

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photo by Martin Babar/The Peregrine Fund

According to *The Peregrine Fund*, this is the first photograph ever of a live Madagascar serpent eagle. It was captured in January 1994, fitted with a miniature radio transmitter, and released. Researchers are monitoring the bird to learn more about its behavior and ecology.

Listing Proposals

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- **Madagascar sea-eagle (*Haliaeetus vociferoides*)** - a fish-hunting species related to the American bald eagle. Only 96 individuals were counted during the mid-1980's on the island of Madagascar. (E)
- **Ibadan malimbe (*Malimbus ibadanensis*)** - another small weaver about the size of a house sparrow. This species, which is restricted to southwestern Nigeria, was once widespread but is now very rare. (E)
- **Algerian nuthatch (*Sitta ledanti*)** - a small arboreal bird found only on Mount Babor in northern Algeria. Deforestation had reduced this species to about 80 pairs by the 1980's. (E)
- **Canarian black oystercatcher (*Haematopus meadewaldoi*)** - a shore-bird somewhat like a rail that is known only from the eastern Canary Islands, a Spanish possession off northwestern Africa. Although it is uncertain if this species still exists, four apparently genuine sightings in recent years have given biologists hope. (E)

- **Seychelles lesser vasa parrot (*Coracopsis nigra barklyi*)** - a dark brown parrot endemic to Praslin, one of the islands in Seychelles, a nation off the east coast of Africa. By the 1980's, destruction of its palm forest habitat reduced the species to about 100 birds. (E)
- **Mascarene black petrel (*Pterodroma aterrima*)** - a small seabird native to the islands of Reunion and Rodrigues, which are part of the nation of Mauritius. It had been eliminated from Rodrigues by the 18th century and is very rare on Reunion. (E)
- **pink pigeon (*Nesoenas mayeri*)** - a bird about the size of the domestic pigeon but generally pink in color. This species, which is restricted to southwestern Mauritius, has declined to about 20 birds in the wild, although there are large numbers in captivity. (E)
- **white-tailed laurel pigeon (*Columba junoniae*)** - a large pigeon known only from the Canary Islands. Destruction of the endemic Canarian laurel forests has reduced this bird in numbers and range. (T)
- **Madagascar pochard (*Aythya innotata*)** - a diving duck apparently confined to freshwater lakes and pools in the north-central plateau of Madagascar. Although common as recently as 1930, this bird is now on the brink of extinction. Until a single specimen was captured in 1991, it had not been seen since 1970. (E)
- **dappled mountain robin (*Modulatrix orostruthus*)** - a thrush recorded from three remnants of montane forest in Mozambique and Tanzania. The Mozambique population has not been located since 1932, and those in Tanzania may number in the low thousands. (T)
- **Marungu sunbird (*Nectarinia prigoginei*)** - a nectarivorous bird comparable to hummingbirds. It occurs only in the Marungu Highlands of southeastern Zaire. (E)
- **Taita thrush (*Turdus helleri*)** - a dark-colored, ground-dwelling bird apparently confined to the highlands of southeastern Kenya. The only well-

- known population contains several hundred individuals. (E)
- **Bannerman's turaco (*Tauraco bannermani*)** - a greenish parrot with a conspicuous crest. This bird is found in the Bamenda-Banso Highlands of western Cameroon, where its forest habitat is rapidly being cleared. (E)
- **Seychelles turtle dove (*Streptopelia picturata rostrata*)** - a bird generally dark grayish purple in color and somewhat smaller than the domestic pigeon. This subspecies declined through hybridization after a related taxon was introduced from Madagascar in the mid-19th century. The Seychelles turtle dove may still occur in at least a relatively pure form on Cousin Island. (E)
- **Pollen's vanga (*Xenopirostris polleni*)** - a predatory bird somewhat similar to the shrikes. It is rare but still relatively widely distributed in the remaining rainforests of eastern Madagascar. (T)
- **Van Dam's vanga (*Xenopirostris damii*)** - a similar bird that is restricted to a single area of northwestern Madagascar but still exists in fairly good numbers. (T)
- **Aldabra warbler (*Nesillas alda-branus*)** - a small songbird found only on Aldabra, an island in the nation of Seychelles. The International Council for Bird Preservation called the Aldabra warbler the "rarest, most restricted, and most highly threatened species of bird in the world." Discovered only in 1967, it is confined to about 25 acres (10 hectares) of coastal vegetation. Its habitat is being destroyed by introduced animals (rats, which also prey on the nests, and goats). (E)
- **banded wattle-eye (*Platysteira laticincta*)** - a small flycatcher characterized by pale plumage and a wattle of bare red skin above the eye. It is known only from the Bamenda Highlands of western Cameroon, where its forest habitat is rapidly being cleared. (E)

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Listing Proposals

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- **Clarke's weaver (*Ploceus golandi*)** - a bird recorded only from a small forested area on the southeastern coast of Kenya. At the current rate of logging, its habitat could be eliminated within 15 years. (E)

All 30 of the birds are restricted in range and face habitat destruction, overhunting, predation by introduced animals, and/or genetic swamping. Most have suffered serious losses in recent years. Although the Endangered Species Act cannot prohibit the take of foreign species or the loss of their habitat, it does regulate their importation into the United States. The Act also authorizes the U.S. to provide training assistance, personnel, and limited financial assistance to other countries.

Parish's Alkali Grass (*Puccinellia parishii*)

Parish's alkali grass, an ephemeral, dwarf annual growing only at permanent alkaline springs and seeps, is restricted to widely scattered sites within desert habitat in the southwest. At present, 10 populations are known — 7 on Navajo and Hopi lands in Arizona, 1 on private land in New Mexico, and 2 on private and Department of Defense lands in California. Most of the sites are very small. The Arizona populations, for example, occupy a total area of about 0.2 acre (0.1 hectare).

The moist habitat of Parish's alkali grass is vulnerable to damage from any activities that alter the site hydrology. Water diversions or impoundments, construction, excess groundwater pumping, and conversion to cropland are among the threats to this plant. One population also was deliberately destroyed. Because of the species' very limited distribution, Parish's alkali grass is believed vulnerable to extinction. On March 28, the FWS proposed listing it as Endangered.

Gesneria pauciflora

Another rare plant dependent on constant moisture is *Gesneria pauciflora*, a small shrub endemic to Puerto Rico that lacks a common name. This member of the family Gesneriaceae is an attractive species, with glossy, dark green, trowel-shaped leaves and yellow to yellow-orange flowers. The plants grow in stream beds on wet serpentine rock. Two populations are known, and they contain a total of just over 1,000 individuals.

Both sites are located within the Maricao Commonwealth Forest. Because the plants are restricted to mountain streambeds, their habitat may be vulnerable to damage from rockslides and floods. Forest management activities such as trail construction also could pose a threat if the species' habitat is not taken into account. It is not known if *G. pauciflora* was more widely distributed before the large-scale deforestation of Puerto Rico in the late 1800's and early 1900's. According to the Center for Plant Conservation, *G. pauciflora* could become extinct within the next 5 years if it is not protected. In light of the species' precarious status, the FWS proposed February 18 to list it as Threatened.

Available Conservation Measures

Among the conservation benefits authorized for Threatened and Endangered plants and animals under the Endangered Species Act are: protection from being jeopardized by Federal activities; restrictions on take and trafficking; a requirement that the FWS develop recovery plans and take conservation actions; authorization to seek land purchases or exchanges for important habitat; and Federal aid to State and Commonwealth conservation departments with cooperative endangered species agreements. Listing also lends greater recognition to a species' precarious status, encouraging other

conservation efforts by State and local agencies, independent organizations, and concerned individuals.

Section 7 of the Act directs Federal agencies to use their legal authorities to further the purposes of the Act by carrying out conservation programs for listed species. It also requires these agencies to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of any Endangered or Threatened species, or to adversely modify its designated Critical Habitat (if any). When an agency finds that one of its activities may affect a listed species, it is required to consult with the FWS to avoid jeopardy. If necessary, "reasonable and prudent alternatives," such as project modifications or rescheduling, are suggested to allow completion of the proposed activity. Where a Federal action may jeopardize the survival of a species that is *proposed* for listing, the Federal agency is required to "confer" with the FWS (although the results of such a conference are not legally binding).

Additional protection is authorized by section 9 of the Act, which makes it illegal to take, import, export, or engage in interstate or international commerce in listed animals except by permit for certain conservation purposes. The Act also makes it illegal to possess, sell, or transport any listed species taken in violation of the law. For plants, trade restrictions are the same but the rules on "take" are different. It is unlawful to collect or maliciously damage any Endangered plant on lands under Federal jurisdiction. Removing or damaging listed plants on State and private lands in knowing violation of State law, or in the course of violating a State criminal trespass law, also is illegal under the Act. In addition, some States have more restrictive laws specifically against the take of State or federally listed plants and animals.

Final Listing Rules — February/March 1994

Final rules to list the following 66 plant and animal species as Endangered (E) or Threatened (T) were published in February and March 1994:

56 Hawaiian Plants

Three listing packages addressing unique plants of the Hawaiian Islands were published during this period. The first, published February 25, listed 24 plant taxa found primarily on the island of Kaua'i. The Hawaiian names, if any, follow the scientific names:

- *Brighamia insignis*, or 'olulu - a succulent in the bellflower family (Campanulaceae); E
- *Cyanea asarifolia*, or haha - a shrub in the bellflower family; E
- *Delissea rhytidosperra* - a shrub in the bellflower family; E
- *Diellia pallida* - a fern in the spleenwort family (Aspleniaceae); E
- *Exocarpos luteolus*, or heau - a shrub in the sandalwood family (Santalaceae); E
- *Hedyotis cookiana*, or 'awiwi - a shrub in the coffee family (Rubiaceae); E
- *Hibiscus clayi* - a shrub or tree in the mallow family (Malvaceae); E
- *Lipochaeta fauriei*, or nehe - a perennial herb in the aster family (Asteraceae); E
- *Lipochaeta micrantha*, or nehe - a perennial in the aster family; E
- *Lipochaeta waimeaensis*, or nehe - a perennial in the aster family; E
- *Lysimachia filifolia* - a shrub in the primrose family (Primulaceae); E
- *Melicope haupuensis*, or alani - a tree in the citrus family (Rutaceae); E
- *Melicope knudsenii*, or alani - a tree in the citrus family; E
- *Melicope pallida*, or alani - a tree in the citrus family; E
- *Melicope quadrangularis*, or alani - a shrub or small tree in the citrus family; E
- *Munroidendron racemosum* - a tree in the ginseng family (Araliaceae); E



photo by Joby Rohrer

Clermontia lindseyana

- *Nothoecstrum peltatum*, or 'aiea - a tree in the nightshade family (Solanaceae); E
 - *Solanum sandwicense*, or popolo'aiakeakua - a large shrub in the nightshade family; E
 - *Phyllostegia waimeae* - a climbing perennial in the mint family (Lamiaceae); E
 - *Pteralyxia kauaiensis*, or kaulu - a tree in the dogbane family (Apocynaceae); E
 - *Schiedea spergulina* var. *leiopoda* - a shrub in the pink family (Caryophyllaceae); E
 - *Schiedea spergulina* var. *spergulina* - a large shrub in the pink family; T
 - *Cyrtandra limahuliensis*, or ha'iwale - a shrub in the African violet family (Gesneriaceae); T
 - *Peucedanum sandwicense*, or makou - a sprawling herb in the parsley family (Apiaceae); T
- On March 4, a package was published listing 21 plant taxa that occur primarily on the island of Hawai'i (the "Big Island"):
- *Clermontia lindseyana*, or 'oha wai - a terrestrial or epiphytic shrub in the bellflower family; E

- *Clermontia peleana*, or 'oha wai - an epiphytic shrub or tree in the bellflower family; E
- *Clermontia pyrularia*, or 'oha wai - a terrestrial tree in the bellflower family; E
- *Colubrina oppositifolia*, or kauila - a tree in the buckthorn family (Rhamnaceae); E
- *Cyanea copelandii* ssp. *copelandii*, or haha - a shrub in the bellflower family with the habit of a woody vine; E
- *Cyanea hamatiflora* ssp. *carlsonii*, or haha - a palm-like tree in the bellflower family; E
- *Cyanea shipmanii*, or haha - a shrub in the bellflower family; E
- *Cyanea strictophylla*, or haha - a shrub or tree in the bellflower family; E
- *Cyrtandra giffardii*, or ha'iwale - a shrubby tree in the African violet family; E
- *Cyrtandra tintinnabula*, or ha'iwale - a shrub in the African violet family; E
- *Ischaemum byrone*, or Hilo ischaemum - a perennial in the grass family (Poaceae); E
- *Isodendron pyrifolium*, or wahine noho kula - a shrub in the violet family (Violaceae); E

(continued on next page)

Final Listing Rules

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- *Mariscus fauriei* - a perennial in the sedge family (Cyperaceae); E
- *Nothocestrum breviflorum*, or 'aiea - a stout tree in the nightshade family; E
- *Ochrosia kilaueaensis*, or holei - a tree in the dogbane family; E
- *Plantago hawaiiensis*, or laukahi kuahiwi - a perennial herb in the plantain family (Plantaginaceae); E
- *Portulaca sclerocarpa*, or po'e - a perennial herb in the purslane family (Portulacaceae); E
- *Pritchardia affinis*, or loulou - a fan-leaved tree in the palm family (Arecaceae); E
- *Tetramolopium arenarium* - a shrub in the aster family; E
- *Zanthoxylum hawaiiense*, or a'e - a tree in the rue family (Rutaceae); E
- *Silene hawaiiensis* - a sprawling shrub in the pink family; T

Finally, on March 28, a third rule listed 11 plants found primarily in the Ko'olau Mountains on the island of O'ahu:

- *Chamaesyce deppeana*, or 'akoko - a shrub in the spurge family (Euphorbiaceae); E
- *Cyanea truncata*, or haha - a shrub in the bellflower family; E
- *Cyrtandra crenata*, or ha'iwale - a shrub in the African violet family; E
- *Cyrtandra polyantha*, or ha'iwale - a shrub in the African violet family; E
- *Eugenia koolauensis*, or nioi - a shrub or small tree in the myrtle family (Myrtaceae); E
- *Hesperomannia arborescens* - a shrubby tree in the aster family; E
- *Lobelia oahuensis* - a shrub in the bellflower family; E
- *Lycopodium nutans*, or wawae'iole - an herbaceous epiphyte in the clubmoss family (Lycopodiaceae); E
- *Melicope lydgatei*, or alani - a small shrub in the citrus family; E
- *Rollandia crispa* - a shrub in the bellflower family; E
- *Tetraplasandra gymnocarpa*, or 'ohé'ohé - a tree in the ginseng family; E

These Hawaiian plant species have declined in numbers and range, and face a variety of threats: habitat destruction by feral or domestic introduced animals; competition from introduced plant species; soil erosion; fire; and predation by non-native goats, rats, and insects. Some of the species listed above now have fewer than 10 surviving individuals.

Four California Plants

A February 4 rule listed four plants native to central coastal California. Three of these are spineflowers, wiry annuals in the buckwheat family (Polygonaceae) that produce a branched inflorescence from a basal rosette:

- Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*); E
- Monterey spineflower (*Chorizanthe pungens* var. *pungens*); T
- robust spineflower (*Chorizanthe robusta*); E.

The fourth plant is a biennial, or occasionally an annual, plant in the mustard family (Brassicaceae);

- Ben Lomond wallflower (*Erysimum teretifolium*); E.

All four taxa occur in coastal habitats in southern Santa Cruz and northern Monterey Counties. They are imperiled by residential and golf course development, conversion of habitat to agricultural uses, sand mining, military activities, and/or encroachment by non-native plant species.

Three Caribbean Plants

A February 18 rule listed two Caribbean evergreen trees in the myrtle family:

- *Myrcia paganii* - a species known from three sites in the limestone hill area of northwestern Puerto Rico; E
- *Calypttranthes thomasiana* - found on three islands: Vieques, a small islet off Puerto Rico; St. John in the U.S. Virgin Islands; and Virgin Gorda in the British Virgin Islands; E.

Another Puerto Rican plant, a member of the buckthorn family, was listed March 2:

- *Auerodendron pauciflorum* - an evergreen shrub or small tree from the island's northwestern limestone hills; E.

All three species are threatened by agricultural and tourist development.

Holy Ghost Ipomopsis (*Ipomopsis sancti-spiritus*)

This plant, a biennial to short-lived perennial in the phlox family (Polemoniaceae), is known only from a single site in the Sangre de Cristo Mountains of San Miguel County, New Mexico. Its small numbers, restricted range, and proximity to human development make the species vulnerable to road construction or maintenance and pesticide or herbicide use. A March 23 rule listed the Holy Ghost ipomopsis as Endangered.

Tidewater Goby (*Eucyclogobius newberryi*)

A relatively small fish, the tidewater goby is endemic to the freshest of brackish water habitats in coastal lagoons along the California coast from Del Norte County south to San Diego County. Within this range, coastal development has eliminated the goby from nearly 50 percent of the coastal lagoons it once inhabited. Continuing threats led the Fish and Wildlife Service to list this species on February 4 as Endangered.

Hungerford's Crawling Water Beetle (*Brychius hungerfordi*)

This small, rare beetle is found in low numbers within two Michigan streams and a river in Ontario, Canada. It inhabits cool riffles of clean, slightly alkaline waters. Management of the streams and adjacent habitats that may alter these aquatic conditions threatens the survival of the water beetle. The species was listed March 7 as Endangered.

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marshland erosion along the Gulf Intracoastal Waterway, prescribed burning of uplands to promote their use by cranes, and the creation of coastal marsh using dredge spoil material. Shoreline armoring involves using concrete mats to protect the shore from boat-wakes and wave erosion, which have caused the loss of between 3 and 4 acres of marshland habitat annually.

Bill Lishman reported on his research on training Canada geese (*Branta canadensis*) to follow a preselected migration route and use a specific wintering site. The Team endorsed Mr. Lishman's research proposal to train sandhill cranes (*Grus canadensis*) to follow a similar migration route, and the National Biological Survey staff from Patuxent Wildlife Research Center has agreed to provide sandhill crane eggs for the study in 1994. If results of the sandhill crane research are favorable, the technique will be tested on Endangered whooping cranes (*Grus americana*) to see whether it might be used to reintroduce captive-reared whoopers in a migratory situation.

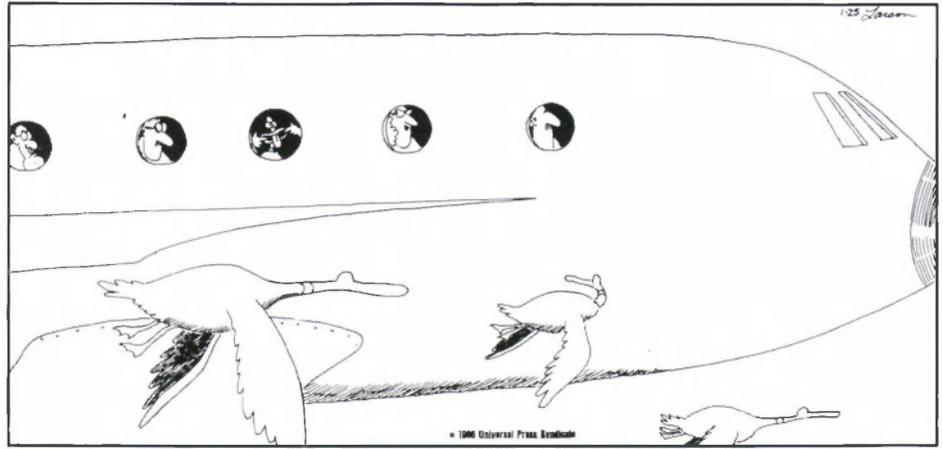
The annual meeting of the Whooping Crane Conservation Association (WCCA) followed the U.S. Whooping Crane Recovery Team meeting on February 25.

Lynn Starnes (the FWS Deputy Regional Director), Dr. Jim Lewis (Recovery Team Leader), and four Recovery Team members spoke at the meeting.

The WCCA and World Wildlife Fund-Canada (Fund) announced favorable reviews of grant applications for assistance in continuing the guide-bird experiments for the Rocky Mountain population of whooping cranes in 1994. The WCCA will provide \$5,000 and the Fund \$15,000 (Canadian) for the project, which they supported at similar levels in 1993.

THE FAR SIDE

By GARY LARSON



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photo by Lishman D Jff

In flight: Shown during their fall 1993 migration, these captive-raised Canada geese followed Bill Lishman in his ultra-light aircraft from Ontario to Virginia. In early April 1994, the "ultrageese" took the initiative and made the 400-mile journey home without their mechanical leader.

Today, Canada geese; tomorrow, sandhill cranes?

Region 3 - The 1993 survey for the Illinois cave amphipod (*Gammarus acherondytes*) resulted in bad news for this category 1 listing candidate: not a single specimen was found. This small crustacean is known from only 6 caves in Illinois. The entrance to one cave was bulldozed by the landowner and could not be searched.

In Michigan, State and Federal biologists are intensifying their research, management, and outreach efforts on behalf of the Endangered Great Lakes population of the piping plover (*Charadrius melodus*), now at a peril-

ously low level. Since 1983, the number of Great Lakes pairs nesting in the State has ranged from 12 to 19.

This year, the Michigan Department of Natural Resources will be contacting private landowners in plover habitat to provide educational material. The FWS East Lansing, Michigan, Field Office also will develop an updated brochure and interpretive signs for use at public access sites in prime plover habitat. Biologists will expand protection efforts to include locating, caging, and monitoring every nest. In addition, a lab under contract to the Patuxent Analytical Control Facility is

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analyzing 26 addled plover eggs. Previous analyses indicated that high levels of environmental contaminants, such as PCB's, mercury, and selenium, may be causing embryo death, thus hindering recovery of the species.

The recovery team for the Endangered Karner blue butterfly (*Lycaeides melissa samuelis*) met for the first time on February 23 and 24, uniting representatives from public and private organizations to begin drafting a recovery plan. Most widespread in Wisconsin, the butterfly can be found in portions of Indiana, Michigan, Minnesota, New Hampshire, and New York, and may also be present in Illinois.

Along with FWS personnel, team members include faculty from three universities (and one student), State natural resources department biologists, and The Nature Conservancy staff. FWS field offices represented are Green Bay, Wisconsin; Bloomington, Indiana; Cortland, New York; and the Necedah National Wildlife Refuge. The team expects to complete the first draft of a recovery plan by the end of the year and a final plan by June 1995.

Region 4 - The FWS and The Nature Conservancy are developing a Partners for Wildlife cooperative agreement to eliminate pollution in the Clinch River. A Tennessee River tributary in eastern Tennessee, the Clinch River contains a diversity of freshwater fish and mussels that are being affected by poor land use practices. The primary source of pollution is silt caused by the removal of riparian habitat and by cattle that crush stream banks and wander into streams. Under the cooperative agreement, the FWS will be able to help fund The Nature Conservancy's attempts to assist local landowners in minimizing or eliminating siltation.

By contacting 200 organizations about 70 insect species that are candidates for listing, the FWS Asheville, North Carolina, Field Office gathered information about the status, location, and threats affecting each species. All the insects occur within Kentucky, North Carolina, South Carolina, and/or Tennessee; some occur in other States as well.

FWS biologists collected enough information to warrant proposed category changes for some species. In fact, FWS staff members found this *en masse* approach to surveying so effective and economical that they plan to use it for crustaceans and other "low visibility" taxonomic groups.

Region 5 - West Virginia Department of Natural Resources (WVDNR) biologists conducting winter bat surveys counted 113 Indiana bats (*Myotis sodalis*), including a new population in a cave in Pocahontas County. Other bats hibernating at the site were 2,382 eastern pipistrelles (*Pipistrellus subflavus*), 738 little brown bats (*Myotis lucifugus*), 1 small-footed bat (*Myotis leibii*), and 15 big brown bats (*Eptesicus fuscus*).

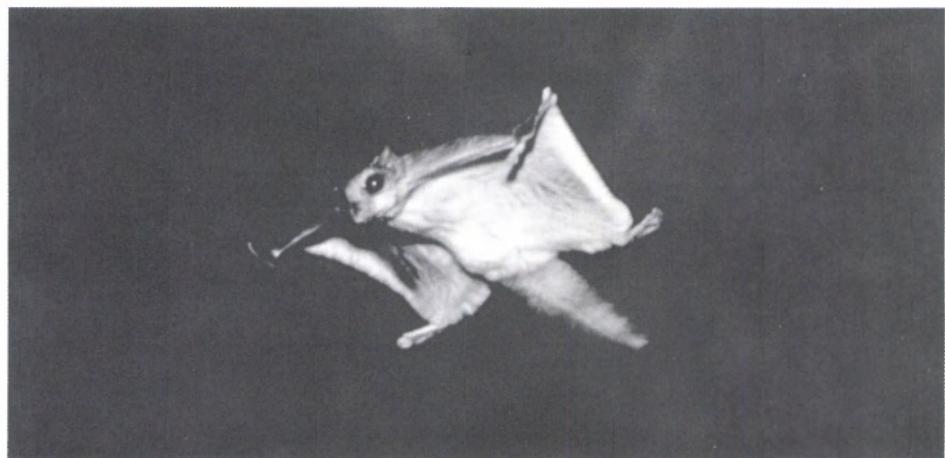


Indiana bat

Of note this winter was an increase in the number of *M. sodalis* hibernating in Martha's Cave, also in Pocahontas County. In the 1950's, as many as 180 *M. sodalis* were seen in Martha's Cave, but the number had dropped to 23 by 1980. After the cave entrance was fenced to control disturbance, the number began to increase. By 1992, the 210 total exceeded the historic level. The winter 1993-94 survey found 241 bats.

Also in West Virginia, nest box inspections resulted in the discovery of

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Virginia northern flying squirrel in flight

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new localities for the Endangered northern flying squirrel (*Glaucomys sabrinus fuscus*). Monongahela National Forest biologists captured three squirrels at new sites in Pocahontas County — one near Clubhouse Run and two at Mountain Lick Creek. Dr. Edwin Michael of West Virginia University captured a single northern flying squirrel in Canaan Valley, Tucker County. A WVDNR biologist discovered an additional site when he found a dead flying squirrel impaled on a barbed wire fence near White's Cemetery in Randolph County.

What biologists thought was a defeat in their attempts to reestablish the Delmarva Peninsula for squirrel (*Sciurus niger cinereus*) in Virginia may turn out to be a victory. A single fox squirrel, spotted after 100 hours of intensive "feeder-watch" program, confirmed that the Endangered animals have successfully reproduced at a second release site on Virginia's Eastern Shore. Before abandoning recovery efforts at the site, team members from the Nature Conservancy and Virginia Department of Game and Inland Fisheries conducted what they suspected might be a final vigil to determine if any of the two dozen Delmarva Peninsula fox squirrels released during the early 1980's had survived.

Biologists will continue their efforts to document the existence of fox squirrels at this location, and may introduce more of the animals to increase genetic diversity. Before attempting to establish a second population, the FWS succeeded in reintroducing the species at Chincoteague National Wildlife Refuge.

A new database agreement among public and private agencies in New Jersey will help endangered species conservation in the State. The FWS New Jersey Field Office and Delaware Bay Estuary Project, The Nature Con-



photo by Gus VanVliet

The Fish and Wildlife Service is working to develop population estimates in southeast Alaska for seabirds such as this marbled murrelet, along with other category 2 listing candidates. The light coloring is typical of young birds.

servancy, and the New Jersey Natural Heritage Program have agreed to allow FWS offices to become "nodes on the network" of the Biological Conservation Database. This database contains the most comprehensive compilation of candidate and federally-listed species information available in New Jersey. Installing the database into Service offices will provide a shared reference that should help unify efforts to protect rare, Threatened, and Endangered species in the State.

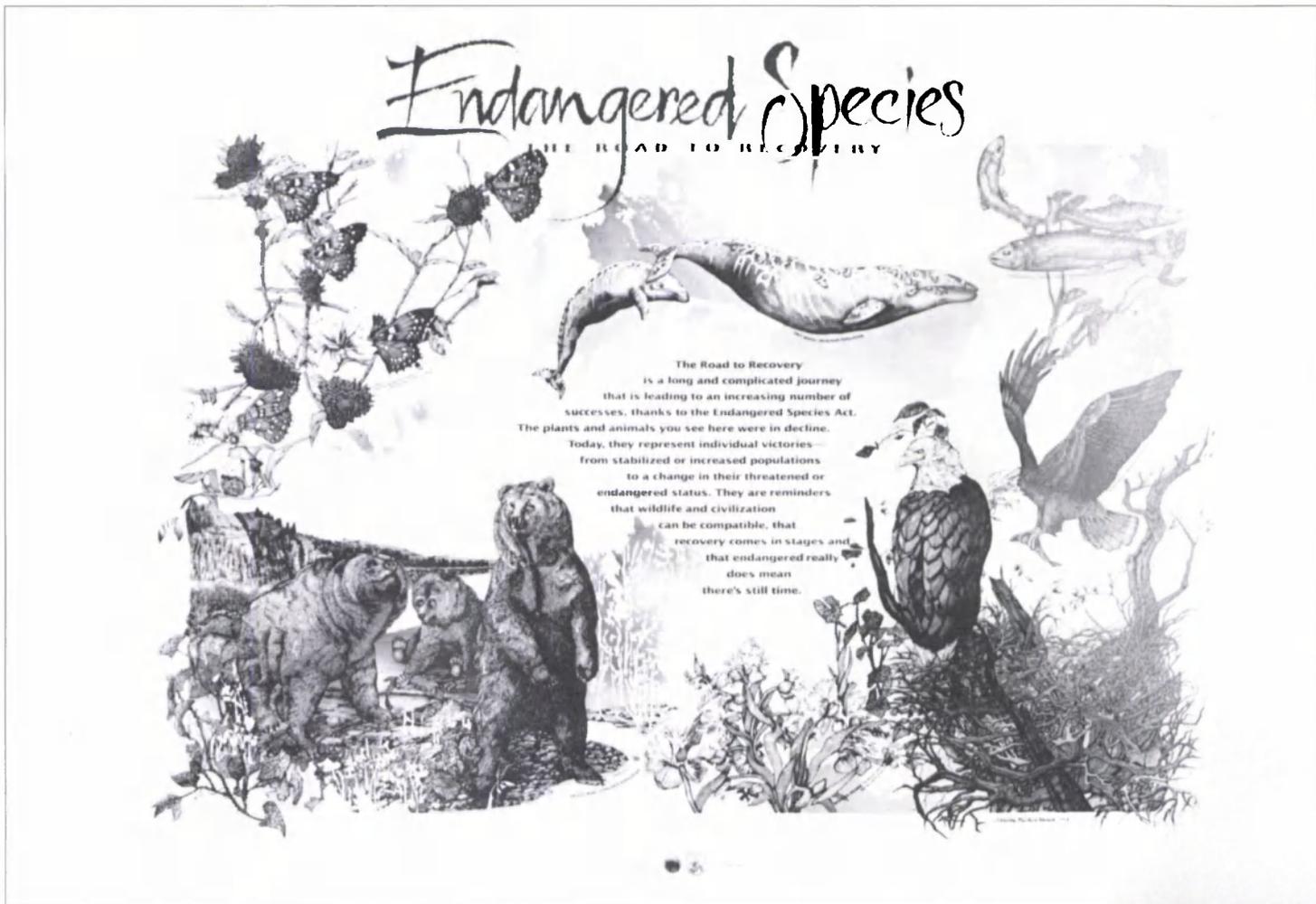
Region 7 - Continuing amphibian field studies initiated in 1991, FWS Juneau Field Office biologists surveyed four southeast Alaska rivers during 1993 for spotted frogs (*Rana pretiosa*), a Category 2 listing candidate in the State. Investigations included a mark-recapture study to estimate abundance at one area on the Stikine River where spotted frogs had previously been observed. During 1991 and 1992, the species was documented along this river and on several islands near its delta. Preliminary analysis indicates that about 800 spotted frogs occupy 7

small ponds within an approximate 1-hectare (2.5-acre) study area.

Biologists also surveyed the Chickamin, Unuk, and Taku Rivers to determine the presence of spotted frogs and other amphibians. The 1993 survey is the first documentation of unconfirmed reports on the Taku River, where the frogs were seen at several locations.

Region 7 has increased efforts to develop a population estimate for two Category 2 listing candidates — marbled murrelets (*Brachyramphus marmoratus*) and Kittlitz's murrelets (*Brachyramphus brevirostris*) — along with other seabirds in southeast Alaska. Little information is available on which to base current status analysis for most seabirds in this area.

During 1993, Juneau Field Office biologists initiated surveys for murrelets and other species in Sumner Strait, Icy Strait, and Glacier Bay. Biologists will expand survey efforts in 1994 and subsequent years to establish baseline information and monitor population trends. (continued on page 24)



The Road to Recovery, a new full-color poster illustrated by artist Dorothy Michele Novick, depicts some of the progress being made in the effort to restore our nation's vulnerable wildlife. It features six threatened and endangered animals and plants—from the bald eagle to the western prairie fringed orchid—that are now stable or even improving in status. The 26-by-39-inch poster is available for \$6.50 by writing the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, or by calling 202/783-3238. Ask for product number 024-010-00702-8.

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We look forward to hearing from you!

Bulletin Staff

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In mid-December 1993, the FWS received a petition to list the Alexander Archipelago wolf (*Canis lupus ligoni*) as Threatened. A smaller, dark-colored subspecies of gray wolf that inhabits the Alexander Archipelago and coastal mainland of southeast Alaska, the Archipelago wolf preys primarily on Sitka black-tailed deer, a species whose preferred habitat is old growth forest. Petitioners contend that logging of old growth forests will cause significant reductions of deer and wolf populations, and that the extensive road system constructed to accomplish timber harvest will cause increased killing of wolves because of legal and illegal hunting and trapping.

Although Archipelago wolf numbers appear to be stable at present, petitioners believe that the relatively small population, estimated at 700-1,000 individuals, may not remain viable in many areas because of the segmented nature of the landscape, territorial behavior of the animal, and other behavioral traits. A decision on the petition is expected soon.

BOX SCORE LISTINGS AND RECOVERY PLANS

Category	ENDANGERED		THREATENED		LISTED SPECIES TOTAL	SPECIES WITH PLANS
	U.S.	Foreign Only	U.S.	Foreign Only		
Mammals	56	251	9	22	338	37
Birds	73	153	17	0	243	73
Reptiles	16	63	19	14	112	30
Amphibians	6	8	5	0	19	9
Fishes	63	11	38	0	112	63
Snails	14	1	7	0	22	27
Clams	50	2	6	0	58	40
Crustaceans	11	0	2	0	13	4
Insects	19	4	9	0	32	16
Arachnids	4	0	0	0	4	0
Plants	375	1	83	2	471	184
TOTAL	697	494	195	38	1,424*	483**
Total U.S. Endangered	697		(312 animals, 385 plants)			
Total U.S. Threatened	195		(112 animals, 83 plants)			
Total U.S. Listed	892		(424 animals, 468 plants)			

* Separate populations of a species that are listed both as Endangered and Threatened are tallied twice. Those species are the leopard, gray wolf, grizzly bear, bald eagle, piping plover, roseate tern, chimpanzee, Nile crocodile, green sea turtle, and olive ridley sea turtle. For the purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

** There are 377 approved recovery plans. Some recovery plans cover more than one species, and a few species have separate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

Number of CITES Party Nations:

122

June 3, 1994

May/June 1994

Vol. XIX No. 3

ENDANGERED SPECIES

Technical Bulletin

Department of Interior, Fish and Wildlife Service
Washington, D. C. 20240

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