Endangered Species UPDATE

Including a Reprint of the latest USFWS Endangered Species Technical Bulletin

March/April 1989 Vol. 6 No. 5&6

THE UNIVERSITY OF MICHIGAN
School of Natural Resources

In this Issue:

Andean Condor Experimental Release to Enhance California Condor Recovery

Red Wolf Recovery Effort Intensifies

Listing Protection Proposed for Three Plant Species

Tar River Spiny Mussel Recovery Efforts Under Way

Andean Condor Experimental Releases to Enhance California Condor Recovery

by
Mike Wallace, Ph.D.

Basic to the recovery of the California condor (*Gymnogyps californianus*) is the plan for captive propagation and release of the progeny that are surplus to a genetically well-represented captive flock. The goal for the condor's recovery, as stated by the California Condor Recovery Team, which is an advisory body to the U.S. Fish & Wildlife Service (USFWS), is to establish at least two disjunct and growing populations of over 100 individuals before the species is considered for downlisting to threatened status.

...we anticipate releases of California condors to commence sometime between 1993 and 1995. During the interim, we plan to prepare for that day by refining condor release techniques through experimentation with the California condor's closest relative, the Andean Condor.

Currently, 28 California condors exist. All are in captivity and are dispersed evenly between the San Diego Wild Animal Park and the Los Angeles Zoo. Between 1982 and 1986, 16 eggs were taken from wild nests and, of these eggs, 13 condors hatched and survived. During that time, several young condors were also captured forming a cohort that is just now nearing the breeding age of six years old. Members of the California Condor Recovery Team, including myself, were encouraged to see more reproductive activity than ever this year from captive condors with several eggs being laid by five- and six-year-old females and courting from all the males—even one only four years old.

Only seven or eight genetic lines are represented in the captive population. From previous data on wild condors, it is safe to assume that released birds will be at some higher risk than those held in the relative safety of their zoo pens. .Consequently, before release of these birds in the wild can occur, we must insure the numerical safety of each line in captivity. To address this problem, the Condor Recovery Team has recommended that at least 96% of the heterozygosity of each genetic line be reached in progeny representation before releases to the wild of that line begin. This equates to about five offspring per pair.

Use of the Andean Condor As A Surrogate Species

If current levels of reproductive activity progress as expected, we anticipate releases of California condors to commence sometime between 1993 and 1995. During the interim, we plan to prepare for that day by refining condor release techniques through experimentation with the California condor's closest relative, the Andean condor (Vultur *gryphus*).

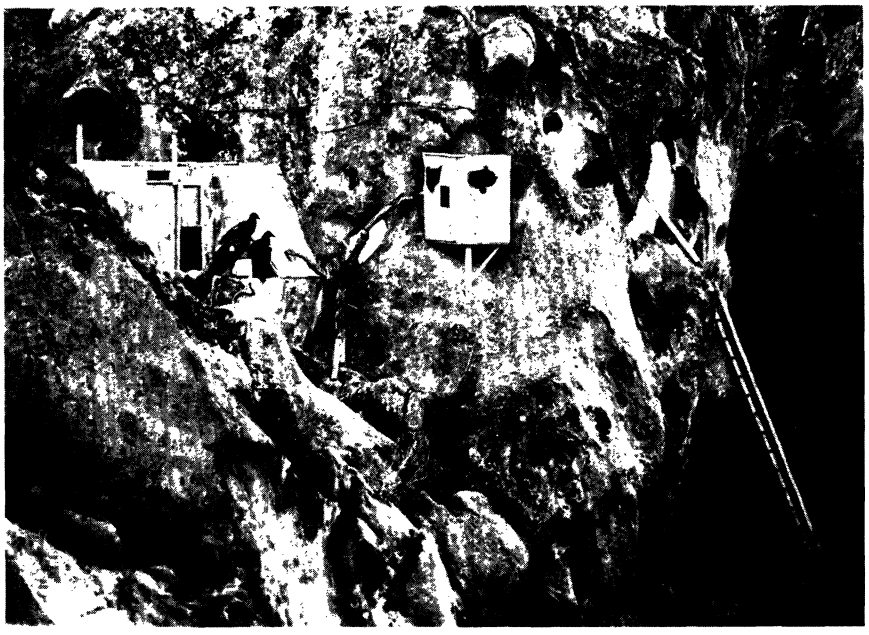
Andeans have been used as surrogates for California condors in nearly every aspect of captive and field research on California condors. There are two minor differences in anatomy between the species besides the obvious plumage color differences. Andean males can be substantially larger than females—from one to ten pounds heavier—while California condor males are only one to four pounds heavier. Also, Andean males have a fleshy caruncle on top of their heads that is absent on females, while California condors do not show this difference between the sexes. Behaviorally, however, we have not seen substantial differences in the two species. In fact, we use the same ethogram, an array of behavioral codes, to study either species—whether in captivity or in the wild.

Most of what is applied to the California condor has been first tested on Andean condors. The egg incubation and hatching procedures, protocols for puppet- and parent-rearing young condors, sexing by use of chromosomes, identification tags and transmitter attachment methods, as well as trapping techniques were all developed to various degrees using Andean condors.

It is not surprising that Andeans would be used again to refine release methods, a most crucial aspect of California condor recovery in the wild. The plan, sponsored by the U.S. Fish and Wildlife Service in cooperation with the State Department of Fish and Game, Los Angeles Zoo and San Diego Zoo, is to release 10 to 15 fledgling Andean females in the same area where we hope to conduct future California condor releases. Although breeding age for Andeans is near six years, we are limiting the releases to one sex to ensure that no reproduction occurs in the wild should we fail to recapture all the birds when the study is complete in two years. We chose to release females since they exhibit the same size, weight and aerodynamics as California condors.

Value of an Andean Condor Release Program

The experience we gain from this field study will help to minimize mor-



The pinnacles release site looks out over chapparal covered slopes from peaks in wind sculptured rocks. The site provides an outdoor pen and indoor roosting area. Photo by Mike Wallace

tality during the first releases of California condors. Fledging Andean condors from the sites where we hope to release California condors allows us a chance to work out the logistical headaches of properly maintaining birds under release conditions in the field—no easy task when you consider that the young birds cannot be allowed to see the observers or associate them with food. Some of the methods we employ to visually isolate the birds include: utilizing one-way glass, working under cover of darkness when moving carcasses or other carrion into position, and observing them, once they are flying, from brush covered plywood blinds that we construct in strategic spots.

The first releases of condors, which were also sponsored by the U.S. Fish and Wildlife Service, were conducted in Peru between 1980 and 1984 when, for Ph.D. research, I released 11 young Andeans ranging in age from eight-months to three-years. Seven of the 11 condors released successfully integrated into the wild population and survived at least two years after being set free.

The information I gained during the exercise was valuable and encouraging, however, critical differences between Peruvian and California environments need to be analyzed before California condor releases can be conducted in relative safety. The release environment in Peru, for example, consisted of treeless desert mountains bordering the Pacific coastline where the food supply, mainly dead marine birds and mammals, was dispersed linearly along the beaches. A resident wild condor population influenced, to different degrees, the movements and behavior of the released birds, depending on their ages. By contrast, the release area in California is mostly covered with dense chaparral which is nearly impossible for researchers to traverse without first cutting trails, and varies in temperature from below freezing to over 100 degrees F. The mud created by any amount of rain rends useless even the best equipped 4-wheel drive truck on the steep slopes of the study site. On top of this, the food supply is practically non-existent and must be provided.

Several important questions will be addressed by conducting this "dry run" of Andean releases in California condor country. How will condors released from captivity interact with the specific environmental conditions of the California sites we have chosen? How will they deal with snow and frozen carcasses? When condors fledge naturally, their parents feed them if they become stranded in the vegetation. Will our released condors strand themselves during their first clumsy flights and not

Endangered Species UPDATE

A forum for information exchange on endangered species issues
March/April 1989
Vol. 6 No. 5&6

Rob Blair.....Editor
Dr. Michael Soulé.....Faculty Advisor
Yu Man Lee.....Production

Instructions for Authors:

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

Readers include a broad range of professionals in both scientific and policy fields. Articles should be written in an easily understandable style for a knowledgeable audience. Manuscripts should be 7-10 double spaced typed pages. For further information please contact Rob Blair at the number listed below.

Subscription Information:
The Endangered Species UPDATE is published approximately ten times per year by the School of Natural Resources at The University of Michigan. Annual subscriptions are $15 each ($18 outside the U.S.). Send check or money order (made payable to The University of Michigan) to:

Endangered Species UPDATE
School of Natural Resources
The University of Michigan
Ann Arbor, MI 48109-1115
(313)763-3243

Cover:
Andean condor
(Vultur gryphus)

Photo by Mike Wallace

be able to get back to safety and food without human intervention? How will the increased human activity in the release area in North America affect the immediate survivorship of the released condors? Finally, how will we, as managers, be able to deal with the logistical problems created by the climate, terrain and vegetation, and at the same time supply the birds adequate food and water in a discreet manner? The food must be placed in a way that the birds learn to forage. Both the timing and positioning of these food transfers are important.

With the opportunity to release birds comes the chance to field test protocols being used or proposed for use in raising California condors suitable for release. Also, we can further refine the radio telemetry tracking system used to follow the birds in the wild.

Challenges In Releasing

Some of the known or likely causes of the California condor's decline include shooting, lead poisoning by ingestion of bullets from deer and other animals that have been wounded by hunters and later die in an area where the carrion is accessible to condors, collisions with man-made objects, disturbances of their nesting areas and habitat destruction. It is not realistic to think we can correct these problems before the California condors will be ready for release, indeed, some problems will never be fully addressed. To reduce the mortality rate to the level where it is effectively counterbalanced by reproduction in the wild so that overall population growth occurs, we plan to circumvent or reduce the effects of most of the problems faced by condors in California by conducting releases in what appears to be the safest part of their former range. Evidence from the Peruvian release experiments and successful griffon vulture releases in Europe suggest that if large avian scavengers are released under the right conditions, the population that is established can be successfully encouraged to live and feed in a particular area. If we can accomplish this when the California condor, that is, re-establish them in an area such as the mountains of the Los Padres National Forest where it is relatively safe, and not have them venture out into areas that are less protected, future condor populations may have a chance in the wild.

Although the mountains of the Los Padres National Forest were the heart of where condors formerly nested, lounged, drank, and bathed in the waterfall pools, only a portion of the carcasses on which they fed could be found in that area owing to its steep topography and thick vegetation. In order to convince future populations of condors that their "new home" in the age-old condor range need only extend through the mountains, we will need to provide a portion of their food supply. The California release experiment with Andeans is allowing us to refine our methods and to see how well we can expect to influence their movements.

Rearing of Andean Condors

Between January 17 and August 2, 1988, 12 Andean condor eggs from seven zoos were successfully hatched at the Los Angeles Zoo and the San Diego Wild Animal Park. Except for one male who was reared by its parents, these birds were all "puppet-reared" using a leather covered fiberglass model in the likeness of an adult condor head and neck. Working from behind one-way glass, a zoo keeper used the hand puppet to feed and socialize with the condor chick, effectively fooling the nestling into thinking it was mom. So convinced were the chicks that the insertion into the rearing chamber of a slightly different puppet elicited an aggressive reaction. Also, three additional chicks were parent-reared at the U.S. Fish and Wildlife Service's Patuxent Wildlife Research Center.

The birds were brought to their release site in the mountains at an age between two-and-one-half and four-and-one-half months. There, they were reared with two or three other nestlings until fledging at the age of six to seven months. In the wild, condors are just getting brave enough to venture out of the nest cave and peer at the environment they will eventually fledge into at three to four months old. By moving them to the release pens at this age, we hope to capitalize on their natural developmental period when site imprinting may occur, yet not have to deal with the logistics of caring for very young birds in the field.

This year, we have used two different release sites. One, a naturalistic site on Nature Conservancy land, looks out over chaparral covered slopes from peaks in wind sculptured rocks. The other site sits atop cliffs on a long ridge and consists of a wide platform elevated by telephone poles ten feet off the ground. Both pens are divided into two parts. The roost areas of about 40 square feet open onto an outdoor pen of about 300 square feet through a sliding "trap" door that allows us to isolate the birds in order to clean or deliver food and water. The enclosed portion simulates a cave and gives a sense of security as the young birds grow up, while the outside pen allows them a view of the environment into which they will fledge.

At the pinnacles release site, a natural cave with some plywood modifications serves as a blind to watch the bird's behavior in the outside pen. Activities inside the roost are monitored using a solar powered video camera. The platform site, four miles away from the first, incorporates the blind as part of the roost and looks into the pen as well.

Because black bears (*Ursus americanus*) can be dangerous competitors with the confined condors over the carrion we provide, both sites have been selected and constructed to prevent bear interference. The pinnacles site is inaccessible by virtue of precipitous cliffs while the raised platform at the ridge site affords the birds a good degree of safety. Twice, so far, during the study, bears have torn at portions underneath the deck at the ridge site in attempts to access the condor food above.

Release of Andean Condors

Where possible, we tried to keep the composition of our release groups as

(Continued on UPDATE page 4)

close in age as possible and most birds were within a few weeks of age of each other.

During the night of August 19, 1988, we placed three birds at the pinnacles site. During that move, a fourth young bird died during transit. We have moved many condors of the same age and background using the same transportation method and we have never had a problem. In fact, the other three birds were subjected to a much more travel time on the same trip having come from a longer distance. The necropsy indicated that stress was the most likely cause, although the underlying factors predisposing the bird to that condition are still under investigation.

On the night of October 13, 1988, another group of three birds was transported to the ridge site without incident. Finally, a bird two months younger than all the others was put in with the ridge site birds on December 2, 1988. We placed her in a netted portion of the roost apart from the three other condors because of our concern over the discrepancy in size between her and the original group—she was only 12 pounds while the others averaged 19 pounds. We quickly realized that this precaution was unnecessary. Although she was one-half their size, the other birds were sufficiently intimidated by her threat displays that they did not pose a danger. The netting was removed within a few weeks, but at the time of writing this article, the young bird has yet to integrate fully with the others.

To release the birds, the netting over the outside pen was removed in the night after we had locked the birds in the roost portion of the structure. The next morning, with observers in six or seven blinds, the door to the roost was opened. In each case the birds tentatively walked out then paused recognizing the difference. Soon they were flapping about to previously unavailable perches for practice. Bird number R-6 flew from the platform twice the first day, and returned to it after investigating the few trails on the ground. Another bird, Y-1, during an excited exercising stint, leaped from the pinnacles release site and fluttered to a semi-soft landing in the chaparral three hundred feet below the site. She spent four days trying to return to the release site in thirty- to sixty-foot flights, sometimes gaining ground, sometimes loosing. Finally, she found one of our trails and hiked to a strategic area where uplifting winds elevated her to the pinnacles cliffs. Another bird, R-4, was not so lucky, she spent six days in the chaparral and finally needed rescuing. We quietly clipped a tunnel through the thick brush on the sixth day, triangulating on her radio transmitters for her location beneath the brush, then clipped the last 15 feet to her at night. After two days back at the release site with plenty of food and water, she was ready for more practice, this time in better wind conditions.

Although it takes two to three weeks for fledgling condors to learn to fly, there is significant variation between individuals. Those birds that showed a greater tendency to practice and exercise were the first birds to catch on to the subtleties of slope or thermal soaring. Where many other species of birds can fly where they want through powered flight, condors, especially young ones, are incredibly dependent on the strength and direction of air movement.

Like most animals, condors seem to like the security of a routine. This tendency showed plainly when the weather was constant. They flew at the same time of day and usually into the same areas. However, during their first months of flying, when a weather front would move in and change the wind direction and speed, the birds would either be grounded or flew way beyond their previous level of experience.

At this point in the project, two to three months after release, the birds sometimes fly up to seven miles away from the release pens, but return to feed at the site or other spots where we have provided food. Based on the experience gained by the release of condors in Peru, we have been able to anticipate with some accuracy the behavior and movements of these birds. On a daily basis, however, these condors are teaching us through their reactions to our management efforts, not only how to maintain them more efficiently, but also what lies in store for the California condors that will be flying over the same terrain and facing similar problems in the future.

Already, the pinnacles release site presents some difficulties, even though it is an excellent spot for young birds to learn how to fly and poses few logistical problems for us. We found that, like birds released in Peru, these condors tend to spend a large amount of time around the release site and explore their surroundings along the easiest flight lines depending on wind direction and topography. Certain winds encourage the birds released at the pinnacles to spend an inordinate amount of time in areas with some human activity and man-made structures. After many close calls, Y-3 struck a power line, and crashed to the ground. Electrocution may have been the cause of her death, or she may have died from blood loss caused by the impact. Another bird, Y-2, also released at the pinnacles, showed developmental problems early on, and very little interest in flying compared to the others. Her lack of ambition and flying ability began to compromise the other birds in the program, so she was retrieved and brought back to the Los Angeles Zoo.

By dealing with these problems ahead of time with Andean condors, we can alleviate some of the more common mishaps that will occur during our first attempts with California condors. In a program that depends on the behavior of animals and their response to management, there will always be unique problems with the release of each bird. This study will enable the U.S. FWS and other participating agencies to make informed decisions during their attempts to reestablish California condors in portions of their former range.

Mike Wallace is a member of the California Condor Recovery Team and Curator of Birds at the Los Angeles Zoo. He is cosupervising the field release program with the U.S. FWS.

Publication Schedule for the UPDATE:

Irregularity of our distribution is unavoidable because the UPDATE follows the publication schedule of the *Endangered Species Technical Bulletin*. One of our goals is to provide the most current information on the federal Endangered Species Program. Hence, we publish and distribute the UPDATE as soon as possible after we receive reprint materials from the USFWS.

Book Review

Preserving Communities and Corridors

Edited by Gay Mackintosh

Preserving communities and corridors purports to be a book tackling the issues surrounding wildlife movement corridors and their use in conserving biological diversity. It isn't. It is a collection of essays covering a wide variety of topics ranging from the need for movement corridors in Florida to the status of state nongame programs. Its 96 pages provide a succinct review of federal and state policy efforts concerning the preservation of nongame and endangered species as well as point the direction for future policy work.

The first essay, *New Initiatives for Wildlife Conservation: The Need for Movement Corridors*, by Larry D. Harris and Peter B. Gallagher reviews the arguments for providing wildlife corridors and their importance in preserving biological diversity. The authors build on the issues raised by Harris in his book, *The Fragmented Forest* (1984), and offer solutions using specific examples from Florida to support their arguments. The bibliography for this 18-page essay is one of the few compilations of documents addressing the need for movement corridors and would be extremely useful to anyone interested in the topic.

The second essay in the book, *The Thin Green Line: Riparian Corridors and Endangered Species in Arizona and New Mexico*, continues the theme of corridors by examining the importance of riparian habitat for endangered species in Arizona and New Mexico. Unfortunately, this section confuses the definition of the word corridor by using it to refer to a linear habitat, such as that which is along a river, without considering it as a means for wildlife movement. Nevertheless, this piece successfully documents the importance of riparian habitats and the need to protect these habitats for their diversity.

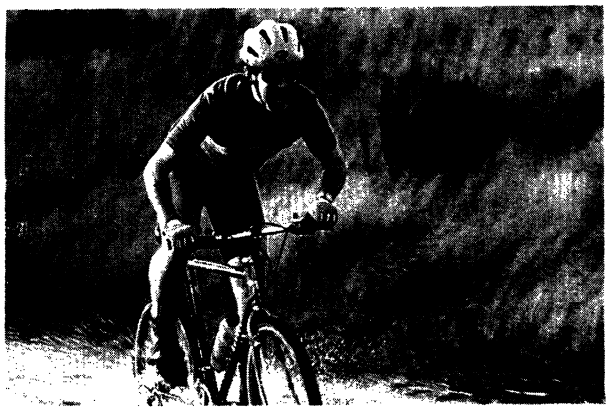
The third essay in the book, *Saving Endangered Species: Implementing the Endangered Species Act*, is an excellent summary of the sixteen-year history of the Endangered Species Act. This piece provides an introduction to the Act and how it is implemented, reviews the recent reauthorization of the Act and the changes it incurred, and provides several suggestions for better implementation in the future. This essay does not address explicitly the preservation of corridors or communities but it is an excellent primer on the Endangered Species Act and would be useful to anyone interested in the Act.

The last essay in the book, *State Wildlife Protection Efforts: The Nongame Programs*, examines the state-run nongame and endangered species programs. This essay presents an overall view of these programs as well as a series of recommendations to make these programs more effective in the future. The author brings together information that has never been assembled in one article.

Overall, *Preserving Communities and Corridors*, presents several excellent essays on protecting endangered species and biological diversity and could be useful to anyone interested in policy-issues. On the other hand, the book is not an exhaustive treatise on wildlife corridors as its title and introductory overview portray.

Preserving Communities and Corridors is available from Defenders of Wildlife 1244 19th St. NW, Washington, DC 20036 for $10.

Sierra Club Third International Assembly



- ✓ MAJOR MUSICAL ENTERTAINMENT
- ✓ VARIETY OF WORKSHOPS & OUTINGS
- ✓ OUTINGS JUST-FOR-CHILDREN
- ✓ DAY-CARE FACILITY
- ✓ REASONABLY-PRICED LODGING OPTIONS
- ✓ 20 MINUTES FROM MAJOR AIRPORT
- ✓ FREE BUS TRANSPORTATION LINKING TWO NATIONS

1989 International Assembly Presents Six Major Plenary Sessions:

THE GREENHOUSE EFFECT:
THE END OF THE WORLD AS WE KNOW IT ?
(A panel discussion of this critical issue featuring renowned environmental experts and a leading member of Congress).

ALTERNATIVE VISIONS:
CREATING A GREEN FUTURE.
(A panel featuring David Brower, founder of Friends of the Earth; David Foreman, founder of Earth First!, and other legendary environmental pioneers).

MAKING COMMON CAUSE:
THE EMERGING, GLOBAL ENVIRONMENTAL ALLIANCE.
(Featuring environmental leaders from Malaysia, Senegal and Mexico).

WITHOUT BOUNDS:
RESOURCES, POLLUTION AND POLITICS IN A SHRINKING WORLD.
(A dialogue on transboundary issues).

PRESENTATIONS ON U.S. & CANADIAN ENVIRONMENTAL FOREIGN POLICY.
(Featuring top administration officials from the two nations).

LIGHTS! SOUND! CAMERA! ENVIRONMENTAL ACTION!
(Featuring celebrities discussing the role of the entertainment industry in the environmental movement).

Ann Arbor, Michigan **JULY 6, 7, 8, 9** **Windsor, Ontario**

VISION FOR THE FUTURE
ACTION FOR GLOBAL ENVIRONMENT

For More Information, Please Call or Write:
1-800-888-5131 or **1-800-333-5317**
19827 W. Twelve Mile Rd., Suite 344 • Southfield, MI 48076

Please Send Registration Information To:

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone(s): _____

Number of Children Attending: _____ Age(s): _____

Day-Care: (Yes)☐ (No)☐ _____ Children's Outings: (Yes)☐ (No)☐

Bulletin Board

Species Act Applies Overseas

On February 17, Federal District Judge Donald D. Alsop in St. Paul ruled invalid a Reagan administration attempt to exclude federal government actions overseas from an Endangered Species Act consultation requirement.

Congress in 1973 directed federal agencies to consult with the U.S. Fish and Wildlife Service before taking actions that could jeopardize endangered species. In 1986 Secretary of the Interior Donald Hodel issued new regulations limiting the consultation requirement to actions in this country or at sea.

Rejecting this limitation, Judge Alsop declared: "Interior's consultation mandate is all-inclusive: it could not be more broad." Judge Alsop ordered promulgation of new regulations "clearly recognizing the full mandate" of the law. He stayed the order pending a government decision on whether to appeal, however.

Recovery Plans Not Followed

Recovery plans have not been approved for 44 percent of the nearly 500 United States species listed as threatened or endangered, according to a new General Accounting Office report. What's more, many tasks in the approved recovery plans aren't being accomplished, GAO says.

Investigators estimated that a third of the nation's threatened and endangered species are declining and that the status of only a sixth is improving. For 16 plants and animals selected as case studies, GAO found that work had begun on only about half the tasks identified in the 15 existing recovery plans, which on average are four years old. U.S. Fish and Wildlife Service (FWS) recovery plans "are rarely, if ever, updated," GAO said. Commenting on FWS priority rankings of recovery tasks, the report found that the agency "attaches high priority to too many tasks, essentially defeating the purpose of the priority system. Inadequate FWS and National Marine Fisheries Service budgets contribute significantly to recovery program deficiencies, GAO said.

Blueprint for the Environment

Blueprint for the Environment is the result of a cooperative effort by America's environmental community to develop a comprehensive list of over 700 detailed recommendations for the Bush administration. It concerns the actions the U.S. government should take to solve the environmental problems that confront the United States and the world. The participants included organizations such as the Natural Resources Defense Council, Global Tomorrow Coalition, National Wildlife Federation, Worldwatch Institute, and the Sierra Club. *Blueprint for Tomorrow* is available for $13.95 from the publisher, Howe Brothers, PO Box 6394, Salt Lake City, Utah 84106, or 1-800-426-5387.

Endangered Species Technical Bulletin Index

The Endangered Species UPDATE now has the index to Volume XII Nos. 1-12(1987) of the USFWS Endangered Species Technical Bulletin, which is the center portion of the UPDATE. This index is in addition to the 1986 index that was listed in the UPDATE two issues ago. If you would like to receive a copy of this index, or the previous one, write a note with your request and mail it to: The Endangered Species UPDATE, The School of Natural Resources, University of Michigan, Ann Arbor, MI 48109-1115

Bulletin Board provided in part by Jane Villa-Lobos, Smithsonian Institution and Defender's of Wildlife, Washington DC.

Endangered Species UPDATE

School of Natural Resources
The University of Michigan
Ann Arbor, MI 48109-1115

Non-Profit
Organization
U.S. POSTAGE
PAID
Ann Arbor, MI
Permit No. 144