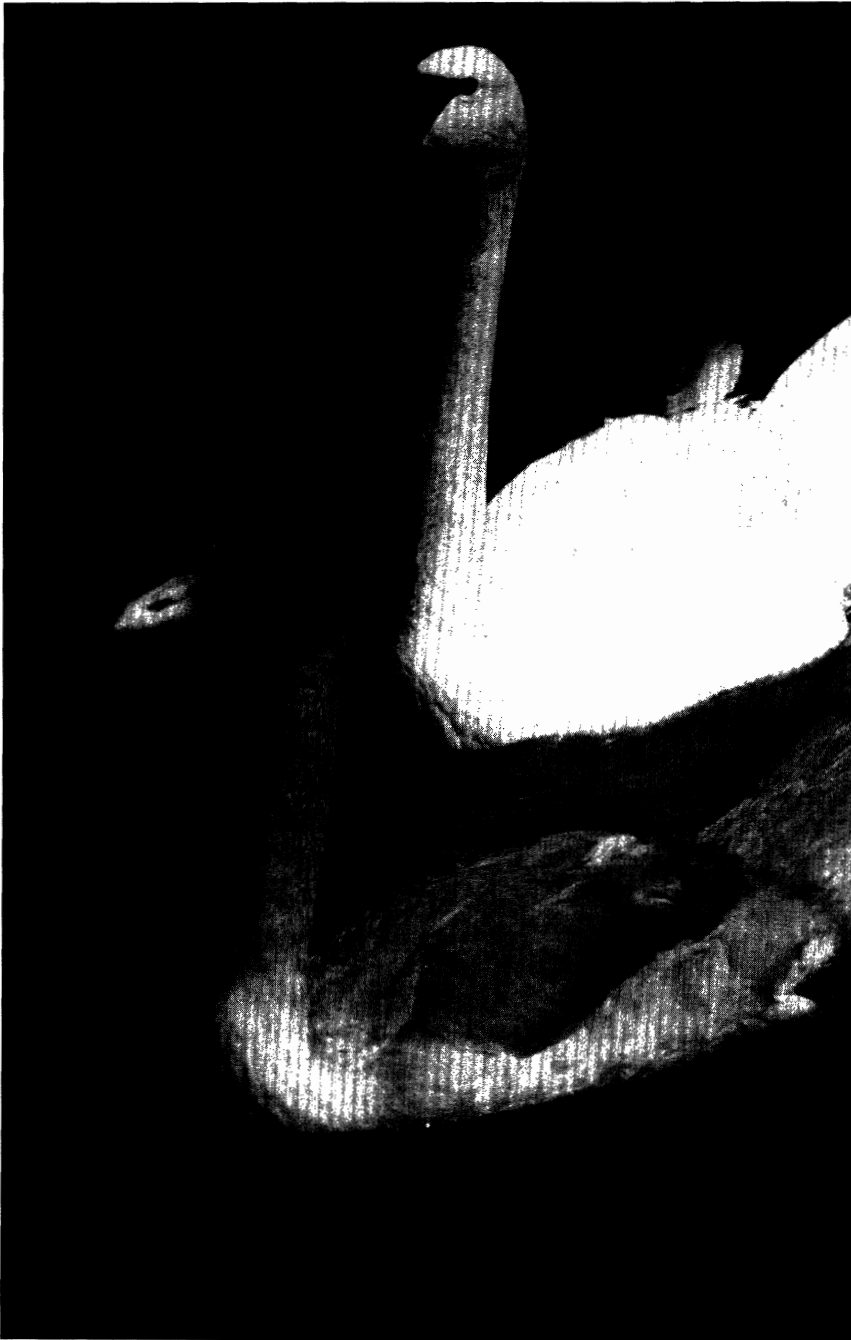


# Endangered Species UPDATE

*Including a Reprint of the latest USFWS  
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# Making Partnerships Work in Endangered Species Conservation

## An Introduction to the Decision Process

Tim W. Clark  
Ronald D. Brunner

Those committed to restoring endangered species can recognize years of heroic effort (e.g., Yaffee 1982, 1994; Alvarez 1993; Clark et al. 1994; Bennett et al. 1995; Miller et al. 1996; Clark in press). At the same time, they can acknowledge significant shortfalls in the overall effort. The tendency to subordinate the goal of recovery to other interests represented in a recovery program is one reason, among many, for these shortfalls. "Cooperation among scientists is not always a simple matter" (Mares 1991:59). The scientists, however, are not alone; bureaucrats, advocates, and others involved in a recovery program also have interests in addition to species recovery. A recovery program, in other words, is a human endeavor. It represents a noble human concern for other species, but it is vulnerable to goal substitutions and other human traits, including aggressiveness, dogmatism, and worse.

The increasing number and scale of partnerships augments both the possibilities for successful recovery and the vulnerabilities. Many types of partnerships exist, focusing on different species in different locations facing different biological challenges with different people involved. Some partnerships work better than others for species recovery (e.g., National Fish and Wildlife Foundation 1993; Beatley 1994; Clark & Cragun 1994; Jentoft & McCay 1995; Hutcheson et al. 1995; Roy & Fischer 1995). Despite differences, every partnership entails a decision process through which the partners attempt to clarify and secure their common interest. Every decision process must perform certain functions well in order to succeed, whatever the common interest may be. An improved understanding of the decision process—and how to evaluate and improve its critical functions—can maximize the possibilities for successful recovery and minimize the vulnerabilities.

This article discusses the problems

and possibilities in the decision processes of partnerships formed to recover listed species. It illustrates these using the Australian eastern barred bandicoot (*Perameles gunnii*) and the American black-footed ferret (*Mustela nigripes*) recovery programs. Components of the decision process itself are then identified.

### Partnerships

The trend in endangered species programs is toward more and larger partnerships. Habitat Conservation Plans (HCPs), called for under the Endangered Species Act (ESA), are just one form of partnership. About 50 HCPs are underway and hundreds more are under discussion (Bob Baum 1996, personal communication). Moreover, partnerships are no longer limited to government agencies as conservation groups, universities, and businesses are becoming more prominent and, under some circumstances, even taking the lead in new partnerships. Ideally, a partnership is motivated by the partners' common interest in recovery of an endangered species. The expectation is that the goal of recovery is beyond the reach of any one agency or organization; none of them, working alone, has the resources, such as expertise, funds, and authority, necessary or sufficient to get the job done. By cooperatively using pooled resources, partnerships can maximize possibilities for species recovery.

In practice, however, recovery is not always the primary (or even a priority) goal for everyone in the partnership. For some participants, the partnership may be a chance to maintain funding for an existing agency or organization that has priorities other than recovery. For others, the partnership may be an opportunity to perform basic scientific research that may or may not contribute to recovery. These types of "goal substitutions" make the partner-

ship more vulnerable to failure and the species more vulnerable to extinction. The style or approach that participants use to pursue their own goals can further jeopardize the partnership. Participants who are aggressive, dogmatic, secretive, suspicious, and vindictive can easily dominate the partnership. Participants who are excessively timid, compromising, open, trusting, and forgiving may unwittingly collude in the destruction of cooperation; they reinforce dominating and destructive behavior by letting the others get away with it. Without partners of good will and good sense, there is little that can be done to cope with such patterns of behavior. A better understanding of decision process can go a long way toward minimizing these potentially damaging patterns and maximizing the possibilities for successful recovery.

Two cases illustrate the importance of the decision process for successful partnerships and recovery programs.

### Eastern Barred Bandicoot Program

The Australian eastern barred bandicoot program, composed of a single governmental agency for over ten years and later joined by non-governmental organizations (NGOs) and universities, was unable to obtain key information needed to plan and carry out recovery. Intelligence gathering, planning, and open debate about what to do and when to do it were limited. The partnership never clarified rules or guidelines for its own operation or for species recovery. After a few years, individual and organizational partners pursued separate goals and actions without adequate consideration for the consequences to overall species recovery or to the developing partnership. As a result, implementation—both technically and organizationally—was inadequate, and the species continued to decline. Essential data were lacking, especially feedback about the efficacy of manage-

ment actions as well as the quality of the program itself. No comprehensive program appraisal was conducted, thus, there was little learning, and improvements were not possible. In short, despite activity in meeting rooms and in the field, the wild population continued to decline and the captive population grew little.

A "crisis intervention" appraisal of the entire program was eventually undertaken by several participants. The appraisal—systematic, comprehensive, and professional—resulted in a reorganization to streamline and upgrade all decision functions. Intelligence was improved by setting up working groups to gather scientific and social information, including a computerized captive breeding management plan. Open debate about the program and its future were encouraged. Implementation was improved by giving the working groups "the authority, guidance, and resources to develop and meet their own targets using their professional expertise," by appointing a strategic planner, and by developing the first true recovery plan for the species (Backhouse et al. 1994:263). Appraisal systems were improved by having the working groups meet with and report to core decision makers at frequent, regular intervals, by giving working group members better access to decision makers, and by having the partnership conduct regular assessments of the program. Ongoing evaluation has led to several refinements in the structure and operations of the program. All in all, these efforts resulted in significant improvements in partnership interactions and the species' status in a very short time (Backhouse et al. 1994; Clark et al. 1995), although it is premature to declare the species recovered.

### Black-footed Ferret Program

Over the past fifteen years, the American black-footed ferret program has shown similar dysfunctional features: limited debate among partners about how to proceed, inability to obtain consensus on rules for progress, unproductive conflict, individual behavior contrary to the best interests of ferret recovery or the partnership, and a lack of appraisal, to mention a few problems

(Clark & Harvey 1988; Reading & Miller 1994). According to Miller et al. (1996) the decision process functioned poorly relative to the overall goal because of goal substitution, narrow ideologies about power, and the use of coercive strategies on the part of the lead government bureaucracy. Decision functions were concentrated in the hands of a few and activities were channeled in ways that were congenial to the most powerful individuals and agency. Although the powerful role of government bureaucracies in decision functions is widely recognized, concentrating power over these functions seemed to be an end in itself in the ferret case, and the goals of species recovery and a successful partnership faded into the background.

These problems have not been addressed by federal or state authorities, despite widespread publicity. Due to a lack of progress and funding difficulties, however, the U.S. Fish and Wildlife Service (FWS) asked the American Zoo and Aquarium Association (AZA) to conduct a program analysis and action planning process. While the appraisal focused primarily on technical issues and fell short of looking comprehensively or systematically at the decision process, it did address parts of the decision functions and found them lacking. The appraisal's final report is forthcoming. Regardless of the AZA's recommendations, the FWS is ultimately responsible for making the partnership's decision process serve the overriding goal of ferret recovery.

### Decision Process

By knowing how the decision process works, or does not work, partners in endangered species recovery can maintain good practices or correct a poorly functioning process. The decision process is a means of reconciling or at least managing conflicts among policies through politics. Politics are inevitable because people develop and pursue different policies that reflect their own interests. Yet, in many instances, like endangered species restoration, people must reconcile policy differences to secure a common interest. In the

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*Cover:* Trumpeter swan (*Cygnus cygnus buccinator*) cygnets to be released to the wild through Iowa's Trumpeter Swan release program. Photograph by Mike Nepper, Milwaukee County Zoo.

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decision process, a working specification of the common interest takes the form of rules, both substantive and procedural (e.g., what is to be achieved and how?). There are many kinds of rules for many kinds of partnerships and communities, including informal guidelines and social norms that are accepted in a group (e.g., norms of discussion in meetings), requirements established by experts (e.g., population viability analyses), laws by representatives of the people for a local, state, or national community (e.g., the ESA), and rules about rule making (e.g., the U.S. Constitution). Rules are necessary for any group of people to coordinate, albeit imperfectly, the expectations and actions of its members. An action by a member is appropriate to the extent that it complies with applicable rules already prescribed by the relevant community; it is inappropriate when it does not comply. Fortunately, there is a large body of experience and theory about decision processes that can be applied directly and practically to species conservation (Lasswell 1971).

The decision process of a species conservation partnership should be an open, flexible, and fair means to produce operational rules for all partners to follow in meeting the partners' common goal. Recovery plans, management plans, proposals, cooperative agreements, and the like are the basis for rules. Yet, the existence of a recovery plan does not necessarily indicate a good decision process or adequate rules for cooperation and recovery. Partnerships cannot work if some members seek rules that benefit their own special interests at the expense of the common interest. Once rules are specified and agreed upon, the rules must be enforced against challengers. The rules can be evaluated by the partnership and changed if necessary—provided, of course, that the rules are clear enough to be evaluated.

Although many people think of decisions as a precise point in time when commitments to the rules are made, in fact, many related decisions precede that moment and many follow. Decision making is better described as a process rather than an event. Seven functions can be distinguished in every

complete decision process (Lasswell 1971). The best way to introduce them is to ask seven general questions: (1) How is information about a problematic situation gathered, processed, and brought to the attention of decision makers? (2) Based on this information, how are recommendations promoted and made? (3) How are general rules prescribed? (4) How are the rules invoked against challengers in specific cases? (5) How are disputes in specific cases decided or resolved? (6) How are the rules and the decision process appraised? (7) How are the rules and the process terminated or modified? Table 1 lists and describes these seven functions, gives some examples as well as standards they should meet, and suggests some basic questions that decision makers, other participants, and observers need to ask. In any ongoing decision process it is usually quite easy to identify these seven functions and the groups that are carrying them out, and to judge how well they are working. Consequently, it is also possible to intervene and improve one or more decision functions so that species recovery is enhanced and the partnership runs more smoothly.

Although it is possible to point to agencies and organizations that specialize in a given function, all partners perform all functions to some extent. It is apparent, too, that most functions are performed outside as well as inside the organizations involved in species conservation. For example, as directed by the ESA, the FWS carries out all seven functions, but many other organizations are involved as well. The National Biological Service and university researchers are primarily involved in gathering intelligence, planning, and estimating the conservation threat (e.g., pollution, habitat loss) and what to do about it. Conservation groups and businesses are often highly visible in promoting one course of action over others, although it should be acknowledged that all groups (and often subgroups and individuals), despite claims of objectivity and neutrality, take positions and promote decisions that will serve their own interests. Rules are set not only by legislative bodies, but also by agencies, which have enormous influence in the

design and operation of actual recovery programs, including field team activities. The FWS is usually joined by other agencies and organizations in implementing programs. The agencies are again involved in dispute resolution, as are the courts, while the media are involved through reporting on conflicts. The agencies, NGOs (e.g., AZA in the ferret case), and the public are involved in review and evaluation of conservation efforts. The final decision to terminate is usually made by government, but many other organizations are involved or affected by decisions to stop or significantly alter programs (e.g., see the dynamics of grizzly bear delisting in the Yellowstone region; Mattson & Craighead 1994; Greater Yellowstone Coalition 1995; Interagency Grizzly Bear Committee 1996). In the decision process of any organized partnership we may expect to find several official and unofficial participants involved in one or all the decision functions.

Whether part of the formal partnership or not, people committed to species recovery should demand excellence in each decision function and in the overall process. The decision functions described in Table 1 can be used to ask hard questions and to develop standards to be applied, continuously and independently, by all concerned. Partnerships in endangered species recovery will be much more effective and efficient when they develop high-quality decision processes, which will depend on members learning explicitly about how the decision process works, how they can monitor the process, and how to intervene to improve decisions. With a relatively complete picture of the decision process, based on good intelligence and appraisal, participants can realistically and functionally describe their interactions with other members and explain the actual processes and outcomes in their specific cases. A detailed analysis of the decision-making behavior of partnerships can reveal which values are at stake for individual members and the overall partnership. There must be fair trading and mutual exchange among members for a partnership to work well. In some (perhaps many) programs, however, partners do not share similar values, and

**Table 1. The seven decision functions essential to all endangered species conservation efforts (after Lasswell 1971).**

<b>Function<sup>1</sup></b>	<b>Activities</b>	<b>Examples</b>	<b>Standards</b>	<b>Questions to ask</b>
<b>Intelligence Planning</b>	Gather, process and distribute relevant information. Plan and predict outcomes. Clarify goals.	Field work, social surveys, models, pluralistic discussion	Reliable, creative, open, comprehensive yet selective	Intelligence collected on all relevant components of problem and its context? From all affected people? To whom communicated?
<b>Promotion</b> Open debate	Debate course of action. Promote different alternatives. Mobilize resources, data, and opinion to secure preferred out-comes. Clarify expectations and demands.	Forums, pluralistic discussion, recommendations	Integrated, comprehensive	Which groups urge which courses of action? What values are promoted or dismissed by alternatives? What groups served by each?
<b>Prescription</b> Setting rules or guidelines	Formulate and enact policies or guidelines for action. Crystallize demands. Examine and clarify information, rules and implications. Involve all concerned parties in approval of rules.	Recovery plans, other written and verbal agreements for species/habitat conservation	Comprehensive, open	Will new prescriptions harmonize or conflict with existing agency rules? What rules does partnership set for itself? What prescriptions are binding ?
<b>Invocation</b> Enforcing rules	Apply general rules to actual cases.	Programs organized, teams formed, work begins in field, lab, office	Prompt, open, not open to abuse by individual members	Implementation consistent with prescription? Who held accountable to follow rules? Who will enforce rules?
<b>Application</b> Dispute resolution	Resolve differences or deviations from rules. Implementation proceeds. Interpret and supplement rules. Integrate old and new prescriptions into working program. Enforcement, continuous review and approval or disapproval of behavior are necessary.	Open, pluralistic forums, internal and external means. Courts may figure prominently, but many resolutions take place formally or informally inside program.	Conforming to common interest prescriptions, independent of special interests, must work in practice, mobilizing consensus and cooperation	Will disputes be resolved by people with authority and control? How do participants interact and affect one another as they resolve disputes?
<b>Appraisal</b> Review	Evaluate efforts. Assess success and failure in terms of goal achievement and responsibility and accountability for outcomes. Gather information on how past decision functions worked. Assess quality of performance. Disseminate findings and recommendations to appropriate people and publics.	Formal and informal, internal and external evaluations	Dependably realistic, on-going, independent of special interests, fully contextual (take factors such as politics, matters of rationality, morality, into account)	Who is and is not served by program? Is program regularly and fully evaluated? Who responsible and accountable for success or failure? Who appraises one's own activities?
<b>Termination</b> Cancellation	End past prescriptions and frameworks. Compensate people adversely affected by termination.	Stop practices that are not working and those that have accomplished their goals, move to new beginning	Prompt, respectful, consistent with human dignity, comprehensive, balanced, ameliorative	Who will stop or change rules? Who is served, who is harmed by ending a program?

<sup>1</sup>The terms intelligence, promotion, prescription, invocation, application, appraisal, and termination are described in detail by Lasswell (1971).

little group effort is spent on clarifying and developing common ground. For example, while power, wealth or special knowledge are often necessary for effective partnerships, these resources can distort the decision process. Power can be used to centralize, concentrate, or legalize certain decision functions to the detriment of other involved or concerned people. The consequences may be catastrophic; if the partnership becomes embroiled in destructive conflict and disintegrates, the species may go extinct.

Decision making must be grounded in real-world contexts. It must be comprehensive yet manageable. The decision model presented here is a tool for building a map of each particular process. And the map can be used by partners to guide the recovery effort, ensuring, for example, adequate intelligence and appraisal functions. Decision making requires a successful pattern of thought and action, and it is this crafting and maintaining of a good decision process that is the central challenge to partnerships in endangered species conservation.

## Conclusions

Partnerships are being used with growing frequency to tackle many natural resource problems. The combined assets of government, conservation groups, business, and public involvement are a powerful tool to address these challenges. For partnerships to be effective, considerable attention must be given to the decision making process. Modern conservation practice demands a working knowledge of the seven decision functions; this knowledge is necessary for learning how to recognize and avert problems and how to build and maintain rational, participatory and equitable decision making processes to achieve species recovery.

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*Editor's Note: The following article highlights efforts by the Air Force and Marine Corps to protect endangered and threatened species on their lands. This article is the second of two focusing on the Department of Defense's contribution to species protection and conservation. The first article appeared in the July/August, 1996 issue of the Endangered Species UPDATE.*

## Endangered Species Management on U.S. Air Force Lands

L. Peter Boice

The Air Force manages more than 100 installations and training ranges on over 9 million acres of land. Many of these lands are in pristine condition because of the need for safety buffers around Air Force training operations. With more than 70 listed species known to occur on at least 45 installations, the Air Force invests more than \$5 million for the protection of these species each year.

### Ecosystem Management

The Air Force has led the way in implementing ecosystem management within the Department of Defense (DoD). Eglin Air Force Base (AFB), located in Florida's panhandle, has more than 460,000 acres and contains some of the most biologically significant public land in the entire United States. More than 90 rare or imperiled species, including at least nine federally listed species, are found on the base. Although approximately 57,000 acres have been cleared for military activities, the majority, close to 385,000 acres, remain forested.

A 320,000 acre longleaf pine (*Pinus palustris*) and wiregrass (*Aristida stricta*) sandhills ecosystem, representing the largest acreage of this imperiled natural community known to occur under single ownership, is the main focus of ecosystem management at Eglin. The integrated natural resources management plan centers on critical fire-maintained natural communities and is based upon tiers of ecological condition. The four-tiered land classification system is based on the quality and restorability of both natural and disturbed communities and the level of management required to achieve restoration. All management decisions are made under the "umbrella" of ecological integrity.

Successful implementation of eco-

system management at Eglin relies on ongoing cooperative partnerships with the Florida Natural Areas Inventory (FNAI) and the University of Florida. Three related surveys, conducted by FNAI, identified occurrences of rare plants, high quality natural communities, and selected rare amphibians. These inventories have been fundamental to the development of Eglin's management plan. Research by the University in Eglin's sandhill community is measuring the responses of insects, birds, vegetation, and soils to different restoration techniques. A long-term research project is determining the status and habitat requirements of red-cockaded woodpeckers (*Picoides borealis*) on Eglin, which contains the fourth largest population of this endangered bird.

Arnold AFB, Tennessee, is also using ecosystem management to enhance its natural resources program. The quality and abundance of rare plants on Arnold is unparalleled in Tennessee; forty-nine rare plant species have been identified, including ten previously listed candidate species. The base also contains the only intact, large-scale barrens habitat in the state.

Arnold has drafted a new integrated natural resources management plan using a collaborative approach to decision-making, which ensures the views of all potentially affected stakeholders are incorporated into long-term planning. This process, which was a key factor in developing the plan, had not previously been used in natural resources planning within DoD. Participants represented a broad cross-section of interested parties and disciplines, including the U.S. Fish and Wildlife Service (FWS), U.S. Geological Service, state agencies and universities, The Nature Conservancy (TNC), and DoD resource managers from several military installations in the Southeast. The approach

encourages all stakeholders to voice their concerns early in the planning process, promotes effective planning, and greatly reduces the potential for delays in military activities. This collaborative approach, having proven to be successful on a relatively small scale, has significant potential for application in much larger regions.

### Noise Studies

Noise studies to evaluate the effects of military overflights on protected species are important to all Military Services, but are perhaps of most interest to the Air Force. At Goldwater Air Force Range (AFR), Arizona, the Air Force is conducting a study of the effects of overflight noise on the nocturnal desert. Using an ecosystem approach, researchers are studying the effects of overflights on several interrelated species in hopes of providing important information for all DoD managers in desert areas. The study is also focusing on species that have small home ranges that fall completely within a particular flight path, which allows DoD to determine the effects of overflights on species that are consistently exposed to noise from aircraft.

### Partnership with The Nature Conservancy

All of the Military Services have benefited from a nearly decade-long partnership with TNC. The Air Force was the first Service to formally work with TNC, and the organizations continue to enjoy a mutually beneficial relationship. The two organizations are currently developing a Natural Heritage Management System to consolidate information regarding threatened and endangered species throughout the Air Force. (The Navy is working on a similar system.) The system will in-



clude information about the occurrence of endangered and threatened species, management recommendations to contribute to species recovery, and a geographic information system to map the location of existing and available habitat on Air Force installations.

The Air Force has also drawn on TNC's technical expertise to address many installation-specific issues. For example, a desert plant thought to be rare, the Merriam's bearpaw poppy (*Arctomecon merriamii*), was known to occur at Nellis Air Force Range, Nevada. During a biological inventory of the base, TNC discovered previously unknown populations of the plant. The existence of the additional populations led the FWS to remove the poppy from the former list of candidate species.

### Red Wolf Reintroduction

Buffer zones around Air Force military training areas, such as air-to-ground ranges, runways, and missile launch areas, can have multiple uses including protected species management. Dare County AFR, North Carolina, played a major role in the success of efforts to reintroduce red wolves in the Alligator River National Wildlife Refuge. An agreement between the Air Force and the FWS authorized release of red wolves (*Canis rufus*) onto the 46,600 acre air-to-ground range at the AFR. The availability of a large land area

with limited public access was considered vital to the success experienced during the early part of the reintroduction program. The most consistent production of offspring of released wolf pairs has been on the Dare County Range. The Air Force also provides assistance by participating in field surveys, monitoring activities of the wolves, and periodically closing roads to protect active den sites.

### Sea Turtle Protection

Tyndall AFB is one of several coastal Air Force installations in Florida which have aggressive programs to protect endangered sea turtles. Tyndall has the longest ongoing loggerhead sea turtle (*Caretta caretta*) monitoring program in the northern Gulf of Mexico—18 miles of beach are monitored daily during the nesting season. Wire cages protect nests from predators, and those in danger of being destroyed by high tides are moved to safer locations. Natural resources personnel conduct controlled nighttime releases of hatchlings designed to mimic natural conditions, reduce mortality from predators, and correct for possible disorientation from artificial lights. Tyndall's management efforts have maintained hatching rates above 70%, significantly enhancing the population of this endangered species.

## U.S. Marine Corps Lands

The Marine Corps manages thirteen major installations on its 1.7 million acres of land. Many installations are located in sensitive coastal areas due to the need to provide amphibious training. At least nine bases are known to have listed species, and each year the Marine Corps invests about \$2 million into species protection.

### Installation Programs

#### Marine Corps Base Pendleton

Marine Corps Base (MCB) Camp Pendleton, California, demonstrates how a heavily used military base can successfully coordinate plans for military activities and management of ecological zones for multiple threatened and endangered species. By careful management of endangered species, Pendleton was able to increase its flexibility to train. Camp Pendleton signed an agreement with the FWS in FY 1995 to formalize consultations on the effects of military activities on 14 threatened and endangered species. Camp Pendleton conducted this programmatic consultation to address all species of concern in riparian, estuarine, and beach areas of the base where military construction and training activities were being planned for a five-year period. Consultation goals include promoting partnerships with the FWS as a way to improve conservation practices, defining Pendleton as a provider of habitat within the larger regional context, and reducing the need for lengthy consultations on future actions by providing consistency for future consultations. The goals also aim to define conservation plans and establish a precedent for follow-up uplands programmatic consultation.

The Marine Corps has developed several innovative techniques in order to meet these goals. A set of comprehensive programmatic instructions has been written to guide future base actions in order to avoid or minimize adverse impacts on habitat and species. Incentives, in the form of a mitigation



Merriam's bearpaw poppy (*Arctomecon merriamii*). Photo courtesy of DoD.



bank that offers mitigation ratios, is designed to promote good management. A sliding scale, based on species population growth, has been developed for incidental take. Lastly, Camp Pendleton has now defined its role with respect to regional ecosystem and biodiversity management initiatives. As a result of the consultation and Camp Pendleton's proposed management practices, military training can now occur in riparian areas previously off-limits due to the presence of endangered species.

This multi-species agreement was a logical extension of earlier efforts at Pendleton to manage the least Bell's vireo (*Vireo bellii pusillus*). Resource managers at the base have been protecting and managing vireo habitat for a decade. In that time, the songbird's population has increased from approximately 90 nesting pairs in 1986 to more than 220 pairs in 1993. At one point, the FWS was considering formally establishing 10,000 acres at Camp Pendleton as critical habitat for the vireo. However, FWS determined that the Marine Corps was providing a level of protection that was equal to or greater than that which would have been established with the formal designation. This landmark decision was very positive for the military mission, as the critical habitat designation could have severely restricted Marine Corps flight activities in the 10,000 acre area.

#### Marine Corps Base Lejeune

MCB Lejeune, North Carolina, has successfully integrated protection of the red-cockaded woodpecker (*Picoides borealis*) with mission activities. Camp

Lejeune's aggressive prescribed burning program is designed to mimic the natural fire cycles typical of the fire-maintained sub-climax communities in which the woodpecker evolved. This controlled burning does much more for the base than simply improve endangered species habitat—it also suppresses dense understory growth, providing open areas for field training exercises. The reduced forest fire hazard facilitates realistic live ammunition training. As a result of the Marine Corps' management efforts, the population of woodpeckers has remained stable, despite intense military use, and the FWS has reduced restrictions on training activities in nesting areas.

Under Lejeune's newly adopted Long-Range Habitat Management Plan for the woodpecker, military activities are closely managed in areas where the birds live and breed. Each cluster site containing woodpecker colony trees is surrounded by a 200-foot buffer. Within the zones, vehicular and foot traffic are restricted to designated roads and trails, and only blank small arms firing is allowed. Activities prohibited from these areas include firing artillery within 600 feet of the colonies, digging fox-holes or burying cable, climbing, cutting, or damaging any size pine tree, and using trees to install antennas. The plan includes a base-wide woodpecker population objective which incorporates current and future military land use requirements and existing and potential woodpecker foraging habitat.

#### Marine Corps Base Hawaii

At the 482 acre Nu'upia Wildlife Management Area of MCB Hawaii, the Marine Corps is enhancing habitat for the endangered Hawaiian stilt (*Himantopus mexicanus knudseni*). Base managers are clearing introduced mangrove trees that are causing water quality problems and invading mudflats where the stilt lives. An integrated natural and cultural resources inventory is

also being conducted to include long-term data on stilt distribution and behavior, types and abundance of marine life, and water and sediment quality.

The Marine Corps has also found an innovative way to manage stilt habitat. Troops periodically operate amphibious assault vehicles in mudflats used by the stilt. The vehicles break up invasive vegetation that is filling in open mudflats and providing artificial bridges for the mongoose, an introduced mammal that preys on the stilt.

#### Marine Corps Base Quantico

DoD must often monitor and manage species and their habitats to avoid negative effects on them or to demonstrate that mission activities have no adverse impacts. For example, the Marine Corps monitors the habitat of the endangered dwarf wedge mussel (*Alasmidonta heterodon*) at MCB Quantico, Virginia, to determine whether tank training activities in the watershed affect the specific habitat and the survival of the species. Water quality is continuously monitored for changes in siltation and other indicators of quality, such as pH and biochemical oxygen demand. Identification of changes in water quality allows the Marine Corps to modify training activities, if necessary.

#### Endangered Species Awareness

The Marine Corps and the FWS have jointly produced two endangered species awareness posters. The first depicts Marines "hitting the beach" at Camp Pendleton with a Western snowy plover (*Charadrius alexandrinus nivosus*) in the foreground and reads "These Guys Hit the Beach Every Day." The second, showing a red-cockaded woodpecker at Camp Lejeune with camouflaged Marines in the background, states "Operation RCW: The New Air-Ground Team." A third poster featuring the desert tortoise (*Gopherus agassizii*) is planned.



Managing Hawaiian stilt (*Himantopus mexicanus knudseni*) habitat. Photo courtesy of DoD.

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## Impending Global Decisions and Forest-Dependent Endangered Species

John Fitzgerald

Concern over the global loss of forests and their biological diversity has increased during the past ten years. Efforts to reduce this loss have ranged from citizen boycotts of corporations that trade in forest products thought to be harvested unsustainably, to the adoption of new legal limitations on the harvesting of certain timber species or forest types. During the fall of 1996, several meetings will take place that may have a tremendous impact on the fate of forest-dependent species around the world, particularly those that are endangered or threatened. This article is intended to provide some insight into the key issues being considered at both the international and national level.

The recent revision of the General Agreement on Tariffs and Trade (GATT) and the granting of greater powers to the World Trade Organization (WTO), undertaken with the goal of removing unilateral barriers to trade, have made some nations and organizations reluctant to establish standards which may be construed as restricting international trade. The extent to which the revised GATT will allow unilateral regulation of trade in the interest of natural resource conservation has not yet been determined. Many believe, therefore, that the best way to implement regulations is within the context of agreements or treaties between nations.

Although several international bodies have been active in forest management issues, there are two treaties under which nations and interest groups have begun to address the loss of forest-dependent biodiversity: the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Biological Diversity (CBD). These two existing natural resource management treaties together are comprehensive enough in their scope and number of parties to cover nearly all aspects of forest conservation, trade, and sustainable use worldwide.

Since 1972, CITES has been the primary treaty controlling trade in wild animals and plants. It forbids commercial trade in species listed by a vote of the parties in Appendix I. It establishes international trade controls for species listed in Appendix II to ensure that the international trade in them continues only so long as they are maintained throughout their range at a level consistent with their role in the ecosystem and well above the level at which they might become eligible for threatened status and inclusion in Appendix I. Nations that regulate the trade or harvest of species under domestic law may list those species on Appendix III in order to obtain trade reporting assistance of countries to which such species may be exported, legally or illegally.

Twenty years after CITES was concluded as a treaty to deal comprehensively with wild species in trade, the Convention on Biological Diversity (CBD) was signed in Rio de Janeiro, Brazil, at the United Nations Conference on Environment and Development (UNCED). The CBD is designed to deal more directly with all other aspects of the conservation and sustainable use of all forms of genetic and species diversity, both wild and domestic. Parties to the CBD are required to adopt procedures that help maintain genetic and species diversity and ensure that use is sustainable and fair to those peoples and nations that have conserved that diversity. The steps include identifying and monitoring indicators of diversity; conserving or restoring its elements, such as endangered species and degraded ecosystems; incorporating incentives for conservation into the various sectors of the economy and government; developing environmental impact assessments to help guide decisions; and sharing the benefits of biological resources and the technologies for developing those benefits (e.g., new pharmaceuticals, disease-resistant genetic features for agriculture).

The CBD requires each party to

establish standards for endangered species conservation and sustainable use management. Although President Clinton signed the CBD in 1993, the Senate has not voted to ratify the treaty, despite approval by the Foreign Relations Committee in 1994 by a vote of 16-3. The United States (U.S.), in fact, provides a prime example of regression in forest conservation standards. In 1995 President Clinton signed into law the Congressionally approved "timber salvage rider," which set aside, under certain conditions, all federal laws regulating the harvest of federal forests, including protections for biodiversity under the 1976 National Forest Management Act (NFMA) and protections for endangered species under the 1973 Endangered Species Act (ESA). The rider is slated to expire this year but Congressional leaders want to extend it. The existence of the salvage rider means that the U.S., instead of playing a leading role in setting international environmental standards, could be viewed as hindering the process. The U.S. could also be in violation of our existing international duty not to harm the environment of our neighbors, for example, by harming resources shared with British Columbia such as owls, murrelets, salmon, and other species dependent on ancient forests. (See "The Biological Diversity Treaty of the U.N. Conference on Environment and Development," *Endangered Species UPDATE*, Vol. 9, Nos. 9 & 10, July/August, 1992).

### The Intergovernmental Panel on Forests

To review domestic and international forest practices and regulations and potential conflicts with the GATT, a large number of meetings and working groups have been, since 1995, addressing nearly every element of forest management, trade, and law. These meetings are being held under the auspices of the Intergovernmental Panel on

*(Continued on UPDATE p. 14)*

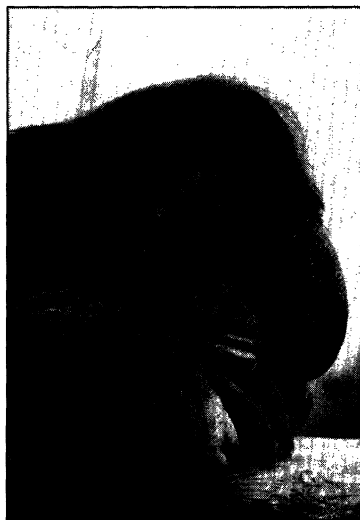
# AZA Species Survival Plan Profile:

## Orangutans

Lori Perkins

Orangutans (*Pongo pygmaeus*) share many characteristics with the African great apes, yet, in several important ways, they are unique among the Pongids. The orangutan is the only Asian representative of the great apes. Although its range once extended throughout Southeast Asia, it is now found only on the islands of Borneo and Sumatra. It is also the only frugivorous great ape, and the only taxon that is truly arboreal. Finally, in contrast to the gregarious chimpanzees, bonobos and gorillas, wild orangutans adopt a semi-solitary lifestyle. These unusual characteristics, combined with a comparatively placid and adaptable disposition, have made orangutans historically popular in zoological collections worldwide.

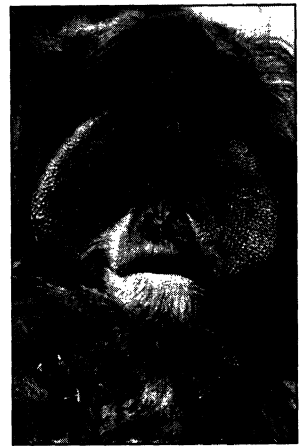
A Species Survival Plan (SSP) for orangutans was initiated in 1982. The vast majority of AZA-member zoos in North America housing this taxon agreed to participate in the SSP and all orangutans in North America began to be managed as one population. The question of subspecies has, however, been an issue for the orangutan SSP since its inception. A morphological difference between orangutans from Borneo (*Pongo pygmaeus pygmaeus*) and those originating in Sumatra (*P.p. abelii*) has long been recognized by both field researchers and managers of captive animals (e.g., MacKinnon 1975; Mallinson 1978; Seuanéz 1982). These physical differences are most apparent in adult male animals, and include differences in hair color and texture, facial shape, and cheek flange size. Whereas most orangutans in North America were traditionally managed as a single species regardless of origin, a few institutions did house the two forms separately, based on morphology. As a result of several long-term examinations of the chromosomes of the two forms (Seuanéz et al. 1979; Seuanéz 1982; Janczewski et al. 1990; Ryder & Chemnick 1993), the SSP in 1985 adopted a moratorium on the reproduction of subspecific hybrid orangutans. Similar moratoria were subsequently adopted by each of the regional orangutan management programs worldwide



Adult male Bornean orangutan (*Pongo pygmaeus pygmaeus*). Photo by Lori Perkins.

(Europe, Great Britain, Japan, Australia, and Southeast Asia).

The long history of managing orangutans as one population resulted in a sizable captive population of subspecific hybrid animals. Thus the orangutan SSP program found itself from the start in the position of managing three separate populations of animals (Bornean, Sumatran, and subspecific hybrid). The moratorium on subspecific



Adult male Sumatran orangutan (*Pongo pygmaeus abelii*). Photo by Joe Sebo.

hybrid reproduction was met with a fair degree of controversy—some disputed the substantial genetic evidence; others argued that by becoming taxonomic "splitters" the SSP was making its genetic and demographic goals impossible to accomplish; still others accused the management program of treating subspecific hybrid orangutans as "second-class citizens." In the decade since the moratorium, the SSP has worked hard to dispel these misconceptions. The genetic evidence of orangutan subspeciation is so overwhelming that it cannot be ignored. Much as responsible captive animal managers would not interbreed chimpanzees with bonobos, Asian lions with African lions, or the various subspecies of lion tamarins with one another, the SSP does not allow interbreeding between the forms of orangutan (the genetic distances in these examples are comparable; Janczewski et al. 1990). "Splitting" did make the SSP's population goals more difficult, because instead of one large population, it must manage three smaller ones, which makes the genetic and demographic goals much more challenging. However, with careful management and frequent review of the populations' status, those goals are being met. Finally, the point that is consistently emphasized is the fact that subspecific hybrid orangutans are managed according to the same husbandry standards as are the Bornean and Sumatran individuals; there are no "second-class citizens" among the orangutans in the SSP. Subspecific hybrid orangutans are prevented from reproducing by means of contraceptive implants and vasectomies or tubal ligation. Thus such animals can be and are maintained in social groupings identical to those of their Bornean and Sumatran counterparts.

The SSP's goal is to achieve self-sustaining populations of Bornean and Sumatran orangutans that

can continue to serve as ambassadors for their wild counterparts and their habitat, as well as a resource for conservation education and research. Specifically, the SSP program presently aims to preserve approximately 91% of original genetic diversity in the Bornean population over the next 100 years, and approximately 94% of original genetic diversity in the Sumatran population. The Bornean population in North America is both smaller in number and, on average, older than the Sumatran; the SSP's management group is exploring the possibility of "merging" the North American population of Bornean orangutans with that of Europe and Great Britain. Most of the individuals of this subspecies would in this proposal remain in North America, but would be managed "as if" they were within the European population. This would enable the management of a larger pool of animals as one population. The demographic goal of the SSP is to "grow" each population to carrying capacity and to stabilize the populations at those levels. More generally, the intent is to combine knowledge of genetics, demographics, husbandry, and individual behavior patterns to best preserve as much genetic diversity as possible in stable captive populations, as both direct and indirect means of supporting orangutan conservation in the wild.

In order to more readily promote the mandate of providing direct support to wild orangutans and their habitat, the SSP in 1995 completed a survey of ongoing orangutan field conservation and research programs in Indonesia and Malaysia. Survey results were sent to all 54 North American zoological facilities that participate in the SSP. These facilities have been encouraged to choose one or more of these *in situ* projects to which to provide direct support, by means of developing formal or informal partnerships with the field projects. The survey will be updated annually, and the results of this new initiative will be assessed regularly in order to determine how successful the SSP continues to be in providing direct support to the conservation of orangutans in the wild.

A program initiated at Zoo Atlanta in 1995 is being used as one model for how such support can be generated and maintained. Zookeepers at Zoo Atlanta developed a grassroots fundraising program called "Action for Animals." They wanted to provide keepers and educators with a means of contributing financially to a field conservation project, while educating others about the specific issues surrounding *in situ* conservation. The Action for Animals program uses "Breakfast with a Keeper" talks, recycling programs, brochures, and a host of other fund-raising tools to increase staff and visitor awareness of and involvement in orangutan conservation in the wild, while remaining a low-cost, grassroots effort about which enthusiasm remains consistently high. All proceeds from the Action for Animals program go to the Wanariset Orangutan

Rehabilitation Project in Indonesia in the form of equipment and material support. Progress reports, newsletters and updates from Wanariset staff keep Action for Animals participants informed and involved in the program, maintaining consistent levels of support. An important goal of the SSP is to encourage all participating zoological facilities to develop similar programs whereby other *in situ* conservation projects are directly supported by zoos that house orangutans.

In another effort to promote the conservation and protection of wild orangutans and their habitat, the SSP supported and participated in the first Population and Habitat Viability Analysis (PHVA) workshop for orangutans. This workshop, held in Sumatra in 1993 (Tilson et al. 1993), assessed the current population status of wild orangutans and identified and evaluated threats to those populations. Specific recommendations were made for the critical habitat requirements needed to achieve viability for the wild populations, and for the alleviation or elimination of threats to those populations. While the 1993 workshop focused largely on the Sumatran subspecies, the SSP continues to promote the idea of a second PHVA focused on the Bornean populations.

A short-term goal for the orangutan SSP is the imminent distribution of a comprehensive husbandry manual representing the state of current knowledge of the management of orangutans in captivity, including chapters on enrichment, diet, sociality, genetics, and exhibit design. Another important goal is to continue working with educators to develop more and better ways to educate the visiting public about orangutans and their Asian rainforest habitat, and to explore new ways of demonstrating to zoo visitors the unusual and fascinating characteristics of these unique great apes.

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# Conservation Spotlight: Trumpeter Swan

## Wisconsin's Cooperative Conservation Program

The marshes and lakes throughout the northern United States and Canada were once inhabited with great numbers of trumpeter swans (*Cygnus cygnus buccinator*). Due to large-scale hunting in the 1700s and 1800s, the species became severely endangered and disappeared as a nesting bird throughout much of its range. For example, by the mid-1900s, only 69 swans remained in Wyoming, Idaho, and Montana and, prior to 1987, it had been one hundred years since a pair of trumpeters reproduced in Wisconsin. The Milwaukee County Zoological Gardens, the Zoological Society of Milwaukee County, and the Wisconsin Department of Natural Resources (DNR) are working cooperatively with the U.S. Fish and Wildlife Service (FWS) and others to return trumpeter swans to at least a portion of their former breeding range.

The goal of the Wisconsin Trumpeter Swan Recovery Program, which began in 1987, is to restore a breeding and migrating population of at least 20 pairs of trumpeter swans to Wisconsin by the year 2000. The Bureau of Endangered Resources within the Wisconsin DNR provides overall administration and coordination of the program, while the Milwaukee County Zoological Gardens and the Zoological Society of Milwaukee County play essential roles in egg collection, captive breeding and release of swans.

Wisconsin DNR personnel fly to Alaska annually to collect trumpeter swan eggs for the program from the healthier Alaskan populations. In accordance with the FWS guidelines for egg removal, at least two viable eggs are left in each nest visited and eggs are collected from a different region each year to ensure genetic variation. The eggs are carefully transported to Milwaukee County Zoo for hatching in special incubators. Newly hatched cygnets are then reared and reintroduced by one of two techniques: decoy rearing or brooder rearing.

Cygnets that are decoy reared are transferred from the incubators to a specially designed imprinting/rearing area and isolated from human contact. The cygnets are introduced to a life-sized trumpeter swan decoy and for three to seven days the cygnets learn to follow the decoy parent to food and away from danger as it is manipulated by zoo staff hidden behind visual barriers. From a speaker in the decoy the cygnets are exposed to swan calls appropriate to different situations. After this brief imprinting period at the zoo, the swans are taken to selected reintroduction sites in northern Wisconsin marshes. Interns, funded by the Zoological Society of Milwaukee County and supervised by the Wisconsin DNR, are disguised at the site on camouflaged floats. From these floats, the interns carefully tow the parent

decoy through the water, leading the cygnets to food and demonstrating with the decoy's movable head and neck how to retrieve it. The swans are attended daily until the ice of winter forces their migration and release.

Brooder rearing is an entirely different technique. Cygnets reared in this manner are transferred from the incubators to a "brooder box." To discourage imprinting on humans, zoo keepers cover themselves in neutral colored gowns and do not speak when working in the brooder area. After five to six weeks, the cygnets are transferred from the Zoo to an "overwintering" lake site where they are protected and closely monitored, but again strictly isolated from their human caretakers. After two years at the site, when they are ready to begin nesting, the swans are paired and released on selected marshes.

All released swans are banded and collared for monitoring. These data are critical for gauging progress and for evaluating the effectiveness of the two captive rearing and reintroduction techniques. To prevent accidental shooting of reintroduced swans, the DNR educates hunters in the area about the identification of swans and goals of the program. In addition, both the Milwaukee County Zoo and the DNR distribute educational materials to diverse audiences and conduct lectures to promote this conservation effort.

The program has demonstrated great success, attracting support from a diverse coalition of public and private institutions including zoos. The Lincoln Park Zoological Gardens supports the current AZA Trumpeter Swan Studbook keeper; the Minnesota Zoo participates in a captive-release program with the state of Iowa; and the state of Ohio is beginning a program modeled after the Wisconsin program. Currently, 18 nesting pairs of trumpeter swans in Wisconsin originated from the captive release program and a total of 255 trumpeter swans have been released into the wild. There have been 25 cygnets produced from released pairs. The Milwaukee County Zoo hatched 48 out of 51 eggs this year. Participants are confident that they will meet the goal of establishing at least 20 breeding and migrating pairs by the year 2000. (*Excerpted from Julia Bowdoin, AZA Communiqué October 1994 and personal communication, Kim Smith, Milwaukee County Zoological Garden.*)

For more information, contact:

Kim Smith, Milwaukee County Zoo, 10001 West Bluemound Road, Milwaukee, WI 53226; Tel: (414) 256-5457; Fax: (414) 256-5450.

Ed Diebold, Riverbanks Zoological park and Botanical Gardens, P.O. Box 1060, Columbia, SC 29202.

# NEWS FROM ZOOS



Photo by Michael Hutchins

## Giant Pandas Arrive at San Diego Zoo AZA Giant Panda Action Plan to be Implemented

The San Diego Zoo received two giant pandas (*Ailuropoda melanoleuca*), Bai Yun and Shi Shi, from the People's Republic of China on September 10, 1996. The pandas will remain in the United States on a 12-year research loan as part of an ongoing global giant panda conservation program. As a result of the panda's arrival, the AZA's Giant Panda Action Plan was set into motion. Monies received through the Panda Foundation will assist with the implementation of the AZA Action Plan, which includes significant support for wild habitat protection projects outlined in China's National Conservation Plan for the Giant Panda and its Habitat. The goals of the Action Plan include captive breeding, research, educating the public about pandas and their habitat, and conservation of the panda in the wild.

## Black-footed Ferret Plan Finalized

The AZA Conservation and Science Office has completed the Black-footed Ferret Recovery Program Analysis and Action Plan. The AZA Plan is a set of recommendations to the U.S. Fish and Wildlife Service (FWS) and will be used to update the FWS Recovery Plan. The Action Plan suggests that the reorganization of the Black-footed Ferret Recovery Program include an executive committee and three technical committees (Field Conservation, Education and Outreach, and Captive Breeding). The FWS will be recognized as the lead agency in the Program. The analysis outlined Priority Recommendations such as developing a plan for the preservation of existing and potential ferret habitat, focusing short-term reintroduction efforts on no more than three sites, and increasing the size of the current captive breeding population. Increasing public awareness and appreciation of the prairie ecosystem were also identified as important goals.

### BLACK-FOOTED FERRET

#### Recovery Program Analysis and Action Plan



AMERICAN ZOO AND AQUARIUM ASSOCIATION

## AZA Announces Awards

The AZA Conservation and Science Office is pleased to announce the recipients of several awards. Seventy-three outstanding proposals were received, competing for a total of \$392,000 with the AZA Conservation Endowment Fund (CEF) providing \$250,000 of the total amount. One of the programs funded by CEF was the development, production and safety evaluation of canine distemper vaccines for use in black-footed ferrets and other carnivores. The Disney Wildlife Conservation Fund provided \$102,000 in award monies; one of the recipients was a coral propagation facility at the Waikiki Aquarium in Honolulu. The Ralston Purina Big Cat Survival Fund provided \$40,000 in award monies for research, including a study of the strategies for survival of free-ranging cheetahs in Namibia, Africa, by the Cheetah Conservation Fund. Selecting award recipients was a difficult task for the 12-member Conservation Endowment Fund Scientific Advisory Committee. The AZA feels very fortunate that funding levels have increased to the point that 23 proposals received funding.

## Calendar

October 6-10, 1996:

The National Conference of the American Association of Zoo Keepers will be held in Detroit, Michigan, at the Cobo Conference/Exhibition Center. For further information, contact Michelle Seldon-Koch, Detroit Zoological Institute, P.O. Box 39, Royal Oak, MI 48168-0039; Tel: (810) 398-0903; Fax: (810) 398-0504.



(Fitzgerald continued from UPDATE p. 9)

Forests (IPF), which was established under the United Nation's Commission on Sustainable Development (CSD). Topics to be addressed include criteria and indicators of sustainable forest management, valuation of forest products and services, and restoration technologies.

The IPF recently completed its third formal session, September 9-20 in Geneva. On September 9, the World Wildlife Fund (WWF) and the World Conservation Monitoring Center (WCMC) released maps for consideration by the IPF showing that 94 percent of the world's 13 million square miles of forests have no form of protection. The WWF/WCMC recommend protection for 10 percent of all forests, with forests of Brazil, Cambodia and Cameroon among their greatest concern, although they also noted that only 2 percent of the forests in the lower 48 United States have not been logged at least once.

Balancing forest diversity and trade has been an ongoing issue. Some parties, particularly those engaged in trading forest products, have felt that CITES and the CBD overemphasize the conservation of forest biological resources without balancing the need to provide economic development and free trade. The Terms of Reference of the IPF, Part IV, on Trade and the Environment, direct the panel to use an approach that "promotes a supportive relationship between trade and the environment" and notes "the need to remove unilateral bans and boycotts inconsistent with the rules of the international trade system." The terms also express the need to review even the voluntary certification and labeling of forest products and their impact on developing countries. This language reflects a concern that certain countries have begun to enact or consider trade requirements that do for timber or wood products what the U.S. ban on the importation of non dolphin-safe tuna did for dolphins—apply our nation's production standards to products we import from other countries. The Terms of Reference also demonstrate an openness to using certain economic tools, however, in directing the Panel to "promote the development of methodologies to advance the full valuation, including replacement and environmen-

tal costs, of forest goods and services, with a view to promoting full cost internalization."

### Other Forest Related Meetings

Several other bodies are considering forest diversity issues during the fall of 1996. A Timber Working Group of CITES has been conducting a review of the listing of timber species in response to questions raised at a nearly successful vote to list bigleaf mahogany (*Swietenia macrophylla*) on Appendix II as to whether more timber species should be listed under CITES and what problems could arise if they are. The Timber Working Group reviewed existing international timber-related organizations and recommended that these groups be consulted on timber species listings. The group also concluded that such listings under CITES are manageable and advised when warranted according to the appropriate listing criteria. The group made a number of suggestions for improving the reporting of trade, which it conceded was not up to the standard that should be expected. The next Conference of the Parties (COP) to CITES will likely consider proposals to list certain tree species that are harvested and traded internationally.

The CBD will hold its Conference of the Parties in Buenos Aires in November and discuss terrestrial biodiversity, among other issues. The meeting may consider adopting a framework for action on forests that emphasizes several key elements of the CBD. These include, among other things, developing and integrating national strategies across the various sectors including public agencies and private corporations; identifying, monitoring, and regulating harmful categories of action; assessing the impact of proposed projects; and taking into account the effects of proposed programs and policies, including the full cost and value of any restoration that may be required.

The World Conservation Congress, the governing meeting of the International Union for the Conservation of Nature (IUCN), will consider a resolution at its mid-October meeting in

Montreal, which calls for the adoption of a forest conservation program or framework for action for CBD parties. The resolution may also urge CITES action on international timber trade to complement the CBD program.

The proposed IUCN resolution recommends further that citizens, particularly traditional communities and indigenous peoples, be afforded the ability to effectively participate in the forest planning and impact assessment processes. It also recommends full valuation of the components of biological diversity, so that biological resources and ecosystem services are incorporated in the accounting of such economic indicators as Gross National or Domestic Products (or separate satellite accounts) to demonstrate the rising or falling value of each nation's natural capital.

### Conclusion

The IPF will present its report to the CSD in April 1997. Many NGOs and governments are hopeful that the IPF, and other international organizations working on forest issues, will provide a framework to guide the conservation of forest resources around the world. This framework should, at least, move toward ensuring that uses of forests are biologically sustainable, while pushing countries towards a more comprehensive system of accounting that takes into account the full value of all forest resources.

The ultimate question under the CBD, CITES and other conservation and sustainable use mandates is how to restore and maintain the biological diversity of the forests while recognizing that nations have a right to the sustainable use of their forests, as long as that use does not harm their neighbors' environments.

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John Fitzgerald is an attorney in Washington representing conservation groups on federal and international issues. He was the NGO representative on the U.S. Delegation to the 1993 intergovernmental meeting of signatories to the CBD. He can be reached at 4320 Fessenden St., NW, Washington, DC 20016. Fitzgjm1@aol.com. Tel: (202) 686-8279.



# Bulletin Board

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## Research Funds Available

The Massachusetts Environmental Trust has recently established an Endangered Species Fund. In FY97, the Fund has \$100,000 available for research on the northern right whale. Grants are for projects that create short-term tangible results and leverage long-term benefits for the survival of the whale. The deadline for proposals is November 1, 1996. To obtain proposal guidelines, contact the Trust at 33 Union Street, 4th Floor, Boston, MA 02108; Tel: (617) 727-0249; E-mail: rpeach@state.ma.us.

## Ecological Reserve Systems

Wild Earth recently published *How to Design an Ecological Reserve System*, the first in a series of special papers. The monograph provides detailed guidance for non-scientists on how to design science-based ecological reserves. The author, Stephen C. Trombulak, PhD, is professor of biology and environmental studies at Middlebury College in Vermont. Copies are \$5 from Wild Earth, POB 455, Richmond, VT 05477.

## Green Guide

The *Sierra Club Green Guide: Everybody's Desk Reference to Environmental Information*, by Andrew J. Feldman, is both a reference and a networking tool. The Green Guide offers the reader in-depth evaluations of 1,200 organizations, services, and on-line sources that provide information about environmental issues. Issues covered include toxic substances, solid and hazardous waste, endangered species, environmental justice, sustainable communities, air and water quality and alternative energy sources. In addition to serving as a professional desk reference, the guide is a primer for ecologically friendly living, covering the full range of "green living" issues, such as eco-travel, funding resources, employment opportunities, environmental education, and socially responsible investing. The Guide is available for \$25 in bookstores, or contact Sierra Club Store Orders, 730 Polk St., San Francisco, CA 94109; Tel: (800) 935-1056.

## Wetland Field Guide

The most recent version of the *National List of Plant Species That Occur in Wetlands* is now available in an easy-to-use pocket size format. The field guide lists wetland plant species alphabetically by both common and scientific names and notes the frequency of occurrence in wetlands, using the federally recognized indicator status levels. Guides are available for all regions of the continental United States. Contact Resource Management Group, Inc., P.O. Box 487, Grand Haven, MI 49417-0487; Tel: (616) 847-1680.

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*Announcements for the Bulletin Board are welcomed. Some items from the Bulletin Board have been provided by Jane Villa-Lobos, Smithsonian Institution.*

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# Endangered Species UPDATE

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