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Report to the Chairman, Subcommittee on Fisheries and Wildlife Conservation and the Environment, Committee on Merchant Marine and Fisheries, House of Representatives

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ENDANGERED SPECIES

Management Improvements Could Enhance Recovery Program

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GAO

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The Honorable Gerry E. Studds
Chairman, Subcommittee on Fisheries
and Wildlife Conservation
and the Environment
Committee on Merchant Marine and Fisheries
House of Representatives

Dear Mr. Chairman:

This report responds to your request that we review possible deficiencies in the endangered species recovery program. It specifically addresses your questions concerning the extent to which endangered species are recovering and the rate at which recovery plans are being completed and implemented.

As agreed, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from its issue date. At that time, we will send copies to the Secretaries of the Interior and Commerce, Members of Congress, and other interested parties and make copies available to others upon request.

The work was performed under the direction of James Duffus III, Associate Director. Other major contributors are listed in appendix IV.

Sincerely yours,

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

Extinction of animal and plant species has become a serious problem that threatens to become more acute in coming years. The endangered species program was established to prevent further extinctions and ultimately recover species designated as threatened or endangered through the development and implementation of species recovery plans. Concerned about possible program deficiencies, the Chairman, Subcommittee on Fisheries and Wildlife Conservation and the Environment, House Committee on Merchant Marine and Fisheries, asked GAO to determine (1) the extent to which domestic threatened and endangered species are recovering, (2) federal agencies' progress in developing recovery plans, and (3) whether recovery plans are being implemented.

Background

The Endangered Species Act of 1973 was passed because many species had become extinct or were threatened with extinction as a result of economic growth and development. The act instituted a process for listing species determined by the Secretaries of Commerce or the Interior to be endangered (in danger of extinction) or threatened (likely to become endangered in the foreseeable future), set out requirements to protect against further reductions, and established a recovery process aimed at increasing their numbers to the point where the species would no longer need protection under the act. To help guide these recovery activities for domestic species, the act, as amended in 1978, required the Fish and Wildlife Service (FWS) in the Department of the Interior and the National Marine Fisheries Service (NMFS) in the Department of Commerce to develop and implement specific recovery plans.

Recovery plans identify the problems threatening the species and the actions needed to resolve them. Their main objective is to provide a course of action that will ultimately lead to the species' recovery and its removal from the act's protection. However, because some species are in such critical condition, the only realistic objective for some plans may be preventing extinction. The agencies' guidelines direct that priority for plan development and implementation be given to the most endangered species and to actions needed to prevent extinctions in the foreseeable future.

Results in Brief

Measuring the success of the endangered species program against the act's objectives of protecting and recovering species is problematic because few domestic species have officially been declared either extinct or recovered. Further, not all recoveries or extinctions can be directly attributable to agencies' actions or inactions, and factors beyond the

agencies' control may preclude recovery for many species. The agencies do not maintain centralized information of species' movements toward or away from recovery. However, the best available estimates indicate that about one-third of the species are declining, two-fifths are stable, and one-sixth are improving; the status of about one-tenth is unknown.

While both agencies have made progress in developing and implementing recovery plans in the 10 years that have elapsed since the 1978 amendments, more remains to be done. Required plans have not been developed and approved for many listed species. Moreover, nearly half of the tasks in the 16 approved plans we reviewed in depth have not been undertaken, even though the plans have been approved on average for over 4 years. Further, the agencies are not systematically tracking undertaken tasks. Officials with both agencies point to a shortage of funds as the primary reason for existing shortcomings.

The increased workload coupled with relatively stationary funding makes it essential that available funds are optimally used. While the Congress has called for, and FWS has established, a priority system to guide the expenditures of limited funds, FWS is not adhering to it. Instead of giving priority to the most endangered species and to those actions needed to prevent extinctions in the foreseeable future, as required by its guidelines, FWS instead is concentrating recovery funds on species with high "public appeal" and those approaching recovery. Moreover, FWS rarely, if ever, updates approved recovery plans. It also attaches high priority to too many tasks, essentially defeating the purpose of the priority system. For its part, NMFS has run its program without a priority system, having only recently developed draft guidelines.

GAO's Analysis

Status of Species

The agencies have had few measurable successes or failures in the 15 years since the act's passage. Of the 493 domestic species formally identified as threatened or endangered, 6 have officially been declared extinct and 5 declared recovered. The remaining 482 domestic species continue to be listed as threatened or endangered. Ten of these species have been officially reclassified from endangered to threatened, and one has been reclassified from threatened to endangered. Beyond inclusion in these formal categories, the agencies do not maintain centralized information on the status of the threatened and endangered species.

However, the best available information gathered by GAO from agency biologists suggests that 16 percent of the species are improving, 37 percent are stable, 34 percent are declining, 2 percent are believed to be extinct (although not officially declared so), and the status of the remaining species is unknown.

Because so few species have either officially recovered or become extinct and factors beyond the agencies' control preclude recovery for many species, it is difficult to measure the success of the program. Centralized trend information would provide program managers with a better performance indicator by which to gauge program success.

Recovery Plan Development and Implementation

Before the 1978 amendments required recovery plans, FWS had, on its own initiative, approved plans for 8 percent of the domestic species and had plans for an additional 19 percent under development. After the amendments, plan development accelerated—as of September 30, 1987, the agencies together had approved plans for 56 percent of the domestic species and had plans underway for 18 percent.

Many of the tasks identified in the approved plans, however, have not been initiated. Only about half of the tasks for GAO's 16 case studies with approved plans (15 by FWS and 1 by NMFS) have been initiated even though the plans have been approved on average for over 4 years. Officials with both agencies said an increasing workload in combination with stationary funding levels was hampering their recovery planning and implementation performance.

Existing Guidelines and Priority Systems

FWS is not adhering to its guidelines for preparing and updating recovery plans, allocating funds, or tracking recovery activities. While the guidelines emphasize that plans should be frequently updated and should assign high priority only to those tasks needed to prevent extinctions or irreversible declines in the foreseeable future, the plans are rarely, if ever, updated and may contain too many tasks assigned high priority. Of 15 FWS case studies with approved recovery plans, 14 have never been updated. While GAO did not assess the biological soundness of the plans' assignment of task priorities, it found that over one-third of the tasks in its case studies were assigned the highest priority and that FWS documents verify that many task priority designations are unwarranted.

Contrary to its established guidelines and priority system, FWS has been concentrating recovery funds on "highly visible" species and those approaching recovery, such as the bald eagle and Aleutian Canada goose. Congressional earmarking of funds for individual species has contributed to the agency's deviation from its established priority system, but FWS officials told GAO that the desire for a positive public view of the program also is motivating its actions. If FWS cannot or decides not to follow its priority system, it should officially amend the priority system and, as required by the act, notify the public. Likewise, NMFS should finalize and follow its draft guidelines and priority system.

Recommendations

GAO is making a number of recommendations to the Secretaries of the Interior and Commerce. Most importantly, GAO recommends that the agencies either follow their existing priority systems or, if changes are deemed necessary, officially amend the systems and provide the public an opportunity to comment on the changes. GAO believes that adherence to guidelines and a priority system will ensure that the recovery plans' value as a recovery tool is maximized and that limited funds are optimally used. GAO also recommends that the Secretaries establish and maintain centralized information on all domestic species' status. This information will be useful in gauging the success of their recovery programs.

Agency Comments

The Department of Commerce generally agreed with GAO's recommendations and stated that the report provided useful guidance on managing and tracking the recovery process. The Department of the Interior agreed that centralized information on all domestic species' status would be useful in gauging the success of its recovery program and plans to develop and maintain this information beginning this year.

Interior disagreed that it should more closely follow its existing priority system. Interior's view is that the Endangered Species Act and its own guidelines provide for some flexibility in developing and implementing recovery plans. While GAO recognizes that the act and the guidelines provide flexibility in developing and implementing recovery plans, both emphasize that the recovery process should be directed by a priority system. While circumstances arise that justify periodic deviations from the established priority system, these should be case-by-case exceptions rather than frequent occurrences. If Interior finds that it cannot more closely adhere to its existing priority system, it should amend the system and, as required by the act, notify the public.

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Abbreviations

BLM	Bureau of Land Management
DOD	Department of Defense
FHWA	Federal Highway Administration
FS	Forest Service
FWS	Fish and Wildlife Service
GAO	General Accounting Office
MMC	Marine Mammal Commission
NMFS	National Marine Fisheries Service
NPS	National Park Service
TVA	Tennessee Valley Authority

Introduction

The earth is nearing a stage of extinction of species unequaled since that of the age of the dinosaurs. Scientists estimate that one plant or animal species is currently being lost per day worldwide and that by the end of the decade the extinction rate may rise to one species per hour. Over the next 30 years, they estimate that as many as 20 percent of the world's species may be lost. Most of the species losses are resulting not from natural environmental events but rather from destruction of tropical rain forests for timber exploitation. Because so little is known about species that inhabit the tropics, where most species live, many of the species that will become extinct will never have been named or studied by scientists.

The current rapid loss of species poses serious economic, social, aesthetic, and ethical concerns. Species diversity provides many medical, agricultural, and industrial benefits. For example, about half of the nation's prescription medicines owe their existence to living species. Many of these naturally derived medicines have proven to be successful in combating serious illnesses such as leukemia, herpes encephalitis, and high blood pressure. Other species may hold the key to curing cancer or other dread diseases. Losing such species before they are fully examined could have enormous medical consequences.

Species diversity also yields many agricultural benefits. Using germplasm from wild varieties, scientists regularly alter the genetic constitutions of corn, wheat, and soybeans in order to maintain and expand their productivity and to resist new insect pests, climatic changes, or other environmental threats. According to the U.S. Department of Agriculture, increases in crop productivity due to genetic improvements are worth at least $1 billion annually. Further, although humans depend on fewer than 20 plant species for 90 percent of food consumption, about one-third of the earth's 250,000 plant species are believed to be edible. According to the National Academy of Sciences, several hundred of these species could be used to relieve world hunger and to improve nutrition.

The biological world is exceedingly complex and its resiliency may be dependent on the diversity of its parts. Accordingly, the rapid loss of species not only poses lost opportunities for human endeavors, but may also threaten mankind's continued survival. Because of the complex interrelationship among species, the extinction of one species can jeopardize tens of others. As the Worldwatch Institute (a nonprofit research organization) notes, "Scientists cannot yet say where the critical thresholds lie, at what level of species extermination the web of life will be

seriously disrupted. . ." and cautions that "Crushed by the march of civilization, one species can take many others with it, and the ecological repercussions and rearrangements that follow may well endanger people."

Finally, there are aesthetic and moral dimensions to the unwarranted extinction of species. Few would argue that the world would be a less aesthetically pleasing place if large and diverse numbers of species become extinct. For example, as one commentator has put it, "If the giant panda disappears from the face of the Earth, there will be no lack of mourners." Others have argued that we have an obligation to conserve species for ensuing generations, especially since the demise of so many has resulted from human activities.

The Endangered Species Act of 1973

Recognizing the aesthetic, ecological, and other values of species and finding that human activities have caused the depletion and extinction of many species, the Congress enacted the Endangered Species Act of 1973[1] (Public Law 93-205). The purpose of the act is to conserve threatened and endangered species and their physical environments. The act defines conservation as "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [this act] are no longer necessary."

To help protect and enhance threatened and endangered species, the act, as amended, prescribes a variety of conservation steps, including

- the official listing of plants and animals as endangered or threatened;[2]
- restrictions on the killing, collecting, and sale or purchase of listed species;
- acquisition of habitat for the conservation of listed species;
- grants to state governments to assist in carrying out programs for the conservation of listed species;
- restrictions on actions authorized, funded, or carried out by federal agencies that would negatively affect listed species; and

[1]The Endangered Species Act of 1973 completely replaced more limited predecessor laws passed by the Congress in 1966 and 1969.

[2]"Endangered" species are those determined to be currently in danger of extinction; "threatened" species are those not currently in such danger, but likely to become so within the foreseeable future. The term "species" covers both plants and animals and is defined in the act to include subspecies. In the case of some vertebrate animals, distinct geographic populations are included as well.

- the development and implementation of specific plans of action for the recovery of listed species.

The last step—recovery—is the subject of this report.

Federal Agency Responsibilities

The Secretaries of the Interior and Commerce have principal responsibility for administering the act. In general, Interior is responsible for freshwater and land species, Commerce for sea and ocean (marine) species. Both agencies share responsibility for sea turtles, which spend most of their lives at sea but come ashore to nest. Each Secretary is responsible for determining which species should be listed;[1] for enforcing the act's prohibitions against violators; and, through mandatory consultations, for reviewing the actions of other federal agencies that may affect listed species.

Within Interior, responsibility for implementing the act has been delegated to the Fish and Wildlife Service (FWS). Prior to a November 1987 reorganization, the Office of Endangered Species within FWS was the principal office responsible for implementing the act and overseeing the seven regional offices and numerous field stations where much of the work is performed. The reorganization abolished the Office of Endangered Species, transferred its responsibilities to several headquarters units, and granted greater authority to the regions.

The duties of the Secretary of Commerce have been delegated to the National Marine Fisheries Service (NMFS), a bureau within the National Oceanic and Atmospheric Administration. Within NMFS, the principal office responsible for program administration is the Office of Protected Resources and Habitat Programs. Five regional offices and four regional fisheries centers carry out work at the field level.

[1]While the Secretary of Commerce may add marine species to the threatened and endangered species list, he may not remove them from the lists or "downlist" them from endangered to threatened without the concurrence of the Secretary of the Interior.

Profile of Endangered and Threatened Species

As of September 30, 1987, about 965 species were officially listed as either threatened or endangered.[1] Of these, 482 are found in the United States and its territories and possessions. Plants comprise the largest percentage of this domestic total (35 percent), followed by birds (19 percent), fish (16 percent), and mammals (16 percent); reptiles, clams, insects, amphibians, snails, and crustaceans make up the remaining 20 percent. FWS has primary responsibility for 464, or 96 percent, of the domestic listed species. NMFS has primary responsibility for the remaining 18 species.

In addition to the listed species, approximately 3,900 species have been identified as "candidate" species that may warrant listing. Of this number, about 950 are classified as "category-1" species, denoting that substantial information supporting listing has already been assembled. The remaining 2,950 species are designated as "category-2" species, for which additional information is needed to clarify their status. According to a May 1987 report by Defenders of Wildlife (a nonprofit organization working to preserve and enhance wildlife),[2] as many as 177 category-1 species and 118 category-2 species may have gone extinct while awaiting listing decisions.

Program Funding

Funding for the FWS and NMFS endangered species programs has been relatively constant over the past several years. Table 1.1 shows FWS' appropriations for fiscal years 1985 through 1987.

[1]Any person can petition FWS or NMFS to add a species to the list. Foreign species are also listed because the act encourages international cooperation in conserving species and prohibits the importing or exporting of any listed species.

[2]Saving Endangered Species: Implementation of the Endangered Species Act, Defenders of Wildlife (May 1987).

Table 1.1: Appropriations for FWS' Endangered Species Program Fiscal Years 1985-87

Dollars in thousands

Activity	FY 85	FY 86	FY 87
Listing	$3,191	$3,071	$3,567
Consultation	2,845	2,625	3,115
Law enforcement	5,815	7,381	6,090
Recovery	5,884	6,031	6,391
Research	4,404	4,544	4,759
State grants	3,920	4,204	4,300
Permits[a]	718	815	842
Total	**$26,777**	**$28,671**	**$29,064**

[a]FWS reviews applications by and issues permits to individuals and agencies for activities that may result in the incidental loss of listed species

Source: Division of Budget, FWS

NMFS does not receive a separate appropriation for its endangered species program. Instead, it receives an appropriation for protected species that includes its marine mammal protection program as well as its endangered species program. Because there is considerable overlap between the two programs (many of the species protected under the Endangered Species Act are also protected under the Marine Mammal Protection Act), NMFS does not break out endangered species expenditures. However, NMFS officials estimated that in fiscal year 1987, the Service spent about $3.3 million annually for its endangered species work. About $1.7 million of this amount was estimated to have been spent on basic biological research, $700,000 for recovery plan preparation and implementation, $600,000 for consultations, $250,000 for law enforcement, and $50,000 for listing. NMFS does not have a state grants program.

In addition to FWS and NMFS endangered species funding, other federal and state agencies and private organizations contribute resources to research and recovery plan preparation and implementation. Further, land acquisition[b] and some recovery actions and grants to states are supported by wildlife refuge and wildlife grant and other funds not included in the endangered species program appropriations.

[b]In fiscal years 1967-87, FWS had acquired 164,370 acres of habitat for about 45 listed species. Obligations from the Land and Water Conservation Fund for this acquisition totaled about $151 million.

Previously Issued Reports

In March 1987, we issued a report on the effect of the Endangered Species Act on the exercise of water rights in western states.[1] We found that the act's consultation requirements have, on the whole, had little negative effect on western water development. In July 1979, we issued a comprehensive report on the endangered species program.[2] In that report we noted that few recovery plans had been approved and that monitoring of recovery efforts had been limited. We recommended that Interior approve and implement its draft priority system to guide species recovery planning and resource allocation.

Objectives, Scope, and Methodology

Concerned about possible deficiencies in the endangered species recovery program, the Chairman, Subcommittee on Fisheries and Wildlife Conservation and the Environment, House Committee on Merchant Marine and Fisheries, requested on February 9, 1987, that we study the implementation of the program for domestic species. Specifically, the Chairman asked that we address the following questions:

- To what extent are endangered and threatened species recovering?
- What progress is being made in developing recovery plans for listed species?
- To what extent are recovery plans, once developed, being implemented?

To address the first question, we obtained information on the progress of all domestic species since the time of their listing. Because this information was not compiled in any one central location and was not always documented, we relied extensively on the FWS field staff biologists most familiar with the species for status estimates.

Species' status is classified as improving, stable, declining, or unknown. Where a species' status had changed enough to be reclassified from endangered to threatened (or from threatened to endangered), we obtained the reasons for the reclassification. For species that recovered, became extinct, or were otherwise removed from the threatened and endangered list, we obtained information on the primary factors involved in "delisting." Finally, we obtained the number of species that staff biologists deemed "unrecoverable" and the reasons why they believe recovery is infeasible or unlikely.

[1] Endangered Species: Limited Effect of Consultation Requirements on Western Water Projects (GAO/RCED-87-78, Mar. 26, 1987).

[2] Endangered Species: A Controversial Issue Needing Resolution (CED-79-65, July 2, 1979).

In responding to the second question, we verified the number of species that have approved recovery plans.[9] Plans in process were also identified, as well as those species for which the agencies do not intend to develop plans. For this latter group of species, we obtained the cognizant agency's rationale for not developing recovery plans. We calculated the range and average time between listing and plan approval for those species with approved plans. For those species without plans, we likewise calculated the range and average time these species have been without approved recovery plans since listing. We obtained agency officials' views on the appropriateness of the time it takes to develop a recovery plan and the effect that delays in plan development have on species recovery. While we did not attempt to assess the biological soundness of the plans, we reviewed the extent to which they were prepared in accordance with agency guidelines.

In addressing the third question, we relied extensively on in-depth case studies because FWS and NMFS do not have centralized information on plan implementation. We selected 18 species to examine the extent to which recovery plans were implemented. The 18 species provided taxonomic and geographical diversity and represented differing levels of recovery effort and expenditures. FWS had primary responsibility for plan implementation for 17 of the species, and NMFS had primary responsibility for the remaining species. Sixteen of the species had approved plans, while the remaining two had draft plans.[10] (See app. I for the case study summaries.) To broaden the information gathered through the case studies, we reviewed agency documents and major publications concerning species recovery, interviewed agency officials, and obtained nonagency recovery experts' views about the endangered species recovery program.

In addition to performing work specifically related to each of the three questions, we also developed background information on the recovery plan preparation and implementation process. We reviewed (1) the act and its legislative history, (2) applicable FWS and NMFS regulations, policies, and guidelines for the recovery process, and (3) records of court cases affecting the recovery process.

[9]Because some recovery plans cover more than one species and some species have more than one recovery plan, there is not an exact match between the number of approved recovery plans and the number of species covered in a recovery plan.

[10]One of the draft plans was approved on March 31, 1988.

Our review was conducted between March 1987 and May 1988. The FWS work was performed at the Office of Endangered Species and its successor organizations, the Division of Budget, six regional offices, five field offices, and the Patuxent Wildlife Research Center. We also obtained information on species and plan status from the remaining regional office that we did not visit. The NMFS work was performed at the headquarters Office of Protected Resources and Habitat Program and at one regional office. This work was supplemented by data obtained from one fisheries center. We also interviewed officials and obtained documents from the Marine Mammal Commission (which has oversight responsibilities for the protection and conservation of marine mammals) and discussed aspects of the recovery program with several environmental groups. Our work was conducted in accordance with generally accepted government auditing standards.

Measuring Recovery Program Success

Measuring the success of the endangered species program is problematic for a number of reasons. While the act provides a standard of success—protecting and recovering species—it does not provide time frames for recovery. Although the number of species that have officially been declared recovered or extinct provides some indication of program successes and failures, only a small percentage of the listed species fall into these categories. Further, not all recoveries or extinctions have been directly attributable to agencies' actions or inactions, and factors beyond the agencies' control preclude recovery for many species.

Although there are difficulties in measuring program success, up-to-date trend information for all listed domestic species would provide program managers, the Congress, and the public with a performance indicator by which to better gauge the endangered species program's success. However, the agencies do not compile and maintain centralized information on species movement toward or away from recovery. In response to our inquiries, individual staff biologists provided trend information or estimates for the listed domestic species. The trend information we compiled indicates that about one-third of the species are declining, two-fifths are stable, and fewer than one-sixth are improving. We could not obtain trend information for the remaining one-tenth of the species.

Few Species Officially Declared Either Recovered or Extinct

The act's goal of protecting and recovering listed species provides a logical standard by which to measure the success of the endangered species program. However, since the act does not provide time frames for achieving recovery, it is difficult to determine whether progress is being made. Measured against the logical, absolute standard, the small number of domestic species officially declared recovered would suggest that the program has been of limited success in recovering species.

According to the official list of threatened and endangered species, only five species have recovered.[1] These species are the brown pelican, the American alligator,[2] the Palau dove, Palau fantail, and Palau owl. According to FWS officials, although officially designated as recovered, the three Palau species owe their "recovery" more to the discovery of additional birds than to successful recovery efforts. Moreover, the brown pelican has recovered only in the southeastern United States and

[1] Three additional species were removed from the endangered and threatened list due to errors in the data used in listing the species.

[2] The American alligator is still technically listed as "threatened" to protect other species that are similar in appearance.

remains endangered throughout the remainder of its historic range. Further, its recovery success in the Southeast may have been due more to the nationwide ban of DDT than to specific FWS recovery efforts. On the other hand, the American alligator owes its recovery primarily to recovery efforts, specifically, the vigorous state and federal crackdown on poaching. NMFS has not officially recovered any of its 16 domestic species.

Ten additional species have progressed to the point where they have been officially reclassified—"downlisted"—from endangered to threatened.[3] However, these reclassifications may not always accurately reflect species' progress toward recovery. According to FWS regional and field officials, the decisions to reclassify five of these species were due less to improvements in the species' status than to interest in allowing for the regulated hunting, fishing, or capture of these species, actions that are permitted through special rulings for threatened, but not endangered, species. Further, they said the status of 3 of these 10 species—the snail darter, Lahontan cutthroat trout, and Paiute cutthroat trout—is currently declining. None of the NMFS species have been officially reclassified.

FWS and NMFS have had some success in preventing further extinctions. Since the act's passage in 1973, only six listed domestic species have officially been declared extinct.[4] According to FWS officials, three of these species (the Tecopa pupfish, the Santa Barbara song sparrow, and the Sampson's pearly mussel) may have already been extinct by the time they were listed. Two other extinctions (the longjaw cisco and the blue pike) were due to hybridization (interbreeding with similar fish species), which may have been caused by changes in the environment resulting from pollution and other human activity. The final species—a fish known as the Amistad gambusia—had its habitat destroyed by flooding pending the construction of a dam in 1967. Two remaining captive populations were subsequently found to be genetically contaminated due to hybridization. Beyond those species that have gone extinct, one additional species (the Schaus swallowtail butterfly) was reclassified from threatened to endangered because of continuing losses. FWS officials believe, however, that its status is currently improving.

[3]The 10 species are the Arctic peregrine falcon, the Tinan monarch (a species of bird), the snail darter, Apache trout, Lahontan cutthroat trout, Paiute cutthroat trout, greenback cutthroat trout, Utah prairie dog, and populations of the bald eagle and gray wolf.

[4]A seventh species, the dusky seaside sparrow, is also known to be extinct but has not yet been officially removed from the endangered and threatened list.

With almost 500 species listed as threatened or endangered, the relatively few species officially reclassified or declared recovered or extinct provide little information by which to gauge the endangered species program's success in meeting the act's objectives of protecting and recovering species. Not only have few species experienced one of these major events, but some of the factors involved in their recovery or extinction may have been beyond the agencies' control. Similarly, only a small number of species have been officially reclassified from endangered to threatened, and these reclassifications do not always accurately reflect the species' actual progress toward recovery.

Trend Data May Provide a Better Measurement of Program Success

Recognizing the limitations of using only the official recoveries, extinctions, and reclassifications to measure the agencies' success in meeting the act's objectives, we attempted to obtain trend data for all listed domestic species. Specifically, we wanted to know if the species status is improving, stable, or declining. However, we found that the agencies do not maintain centralized data on species status. Therefore, we contacted individual biologists most familiar with specific species to obtain a complete profile of the species' status. For many of the species, reliable population figures were not available and the status information provided was biologists' "best-guess" estimates.

These figures and estimates suggest that 16 percent of the species are improving, 37 percent are stable, and 34 percent are declining. We also discovered that 12 (or 2 percent) of the listed domestic species are believed to be extinct. (These 12 are in addition to the 6 species officially declared extinct.) The biologists did not know the status of the remaining 11 percent. Table 2.1 breaks out these estimates for FWS and NMFS species.

Table 2.1: Estimates of Listed Domestic Species' Status

	FWS		NMFS		Total	
Status	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Improving	72	(16)	3	(17)	75	(16)
Stable	179	(39)	0		179	(37)
Declining	153	(33)	12	(67)	165	(34)
Extinct[a]	12	(3)	0		12	(2)
Unknown	48	(10)	3	(17)	51	(11)
Total	**464**		**18**		**482**	

[a]The 12 species believed to be extinct, though not yet officially declared so, are the Mariana mallard, Mariana fruit bat, Palos Verdes blue butterfly, Scioto madtom (a species of fish), Bachman's warbler, giant anole, tuberculed-blossom mussel, turgid-blossom mussel, yellow-blossom mussel, dusky seaside sparrow, ivorybilled woodpecker, and eastern cougar.

Source: GAO compilation of FWS and NMFS materials and estimates.

We believe trend figures that we developed for all listed domestic species provide a more useful indicator of program success than does the small number of official recoveries, extinctions, and reclassifications. However, as with the official change in status figures, not all improvements or declines can be attributed to the agencies' actions or inactions. For example, improvements in status are sometimes due more to events like the banning of DDT or the discovery of additional populations than to implemented recovery actions. Similarly, declines in species status may be due to factors largely outside of the agencies' control. Examples include continuing development activities, pollution, and adverse weather.

In this connection, FWS and NMFS officials told us that at least 137 of the 482 listed domestic species (not including the 12 species believed to be extinct) are not likely to ever fully recover. Reasons for their inability to recover include

- the species lacks sufficient habitat,
- the threats endangering the species are poorly understood,
- intensive recovery actions needed for the species have a low or uncertain probability of success, and
- there are so few survivors that the species will continue to need protection under the act indefinitely.

Often, several of these factors combine to make recovery unlikely. For example, the New Mexico ridgenose rattlesnake is deemed to be unrecoverable because of its limited habitat and very low numbers. The Morro Bay kangaroo rat will not likely recover because of continuing habitat losses and vegetation changes, even though an intensive captive

breeding program has been attempted. Despite two decades of conservation effort for the Kemp's Ridley sea turtle, the benefits of these efforts remain unknown and recovery may not be possible because this species has been so drastically depleted.

While a number of species may be "unrecoverable," the biologists we interviewed suggested that recovery is possible for nearly 70 percent of the listed domestic species, if appropriate recovery actions are identified and implemented.

Conclusions

During the intervening 15 years since the Endangered Species Act of 1973 was enacted, few species have been officially reclassified as recovered, extinct, or improved to the point where they can be reclassified from endangered to threatened. Thus, these official movements are not good indicators of how successful FWS and NMFS have been in meeting the act's objectives of protecting and recovering species. Up-to-date trend data such as the type we compiled would provide program managers, the Congress, and the public with a better performance indicator to measure the success of the endangered species program.

Recommendations

We recommend that the Secretaries of the Interior and Commerce direct the Directors of FWS and NMFS, respectively, to develop and maintain centralized information on the status of all listed domestic species.

Agency Comments

The Department of Commerce agreed that maintaining centralized information on listed domestic species would be beneficial and further agreed to evaluate what type of system can be developed and maintained within its available budget (see p. 88). The Department of the Interior also agreed that recovery success can be better measured from a centralized trend data base and is currently field-testing an automated system adaptable to maintaining such information (see p. 93).

Recovery Plans Have Not Been Developed or Implemented for Many Species

The Endangered Species Act directs the Secretaries of the Interior and Commerce to develop and implement recovery plans for domestic listed species. Although the agencies have made significant progress in developing recovery plans over the last decade, about 40 percent of the species do not have approved plans. Further, only about half of the tasks in the approved recovery plans we reviewed in detail have been initiated, and the agencies are not systematically tracking initiated tasks. Officials with both FWS and NMFS told us that funding shortfalls, exacerbated by a growing workload, have hampered their progress in plan development and implementation.

Recovery Plan Development

A 1978 amendment to the Endangered Species Act directed the Secretaries of the Interior and Commerce to develop and implement recovery plans for the survival and recovery of listed species unless such a plan would not promote the recovery of a species.[1] Recovery plans identify the problems threatening the species and the actions needed to resolve these threats. These actions should be divided into specific, ranked assignments for handling by each agency, organization, and individual participating in the plan's implementation. Although the prime objective of all recovery plans is to lead to the species' recovery, some species are in such critical condition that the immediate objective may be confined to preventing extinction or reversing downward trends. Typically, each listed species should have its own recovery plan. However, a group of species occupying common or similar environments that suffer similar problems may have one plan. Conversely, a single species located in many areas is sometimes split into separate populations for which separate recovery plans are developed.

While FWS and NMFS have made substantial progress in developing recovery plans over the last decade, many species remain without plans. As noted in our 1979 report, as of October 1, 1978, FWS had approved plans for only about 8 percent (18 of the then 236) of the listed domestic species. An additional 19 percent of the species had plans in the development process. As of September 30, 1987, FWS and NMFS had approved plans for about 56 percent of the listed domestic species with an additional 18 percent in process. The recovery plan process has not yet begun for the remaining 26 percent of the species. Table 3.1 summarizes FWS' and NMFS' performance in developing recovery plans.

[1] Although recovery plans were elective prior to the 1978 amendment, FWS has been developing plans since 1972.

Table 3.1: Status of Recovery Plans for Domestic Listed Species

	FWS	NMFS	Total
Species with approved plans	264	7	271
Species with plans in process	80	5	85
Species without plans in process	107	6	113
Species that will not have plans prepared	13	0	13
Total	**464**	**18**	**482**

Source: GAO compilation of information provided by FWS and NMFS

FWS does not intend to prepare recovery plans for 13 of its species for the following reasons:

- The species is already believed to be extinct or is viewed as being unrecoverable.
- Other existing resource management plans contain sufficient guidance for the species protection and/or enhancement.
- The few needed recovery actions are already well known.
- The species is proposed for delisting because of errors made at the time of listing.

The act does not specify time frames for completing recovery plans. However, some in the Congress and some environmental groups have raised concerns about the timeliness of FWS' and NMFS' plan preparation. Although FWS' existing and NMFS' draft guidelines do not discuss time frames for plan preparation, they do set out the important role the plans play in preventing extinctions and bringing about recovery.

We found that the 271 species with approved plans were listed for an average of nearly 6-1/2 years before their plans were completed. The shortest period between listing and plan approval for these species was 9 months; the longest period was 13 years. The 85 species with plans in process have been listed an average of slightly under 4 years, ranging from 4 months to nearly 14 years. For the 113 species for which the planning process has yet to begin, the average time they have been listed without plans is just under 3-1/2 years, ranging from less than a month to almost 14 years. As table 3.2 illustrates, FWS has been more timely than NMFS in developing and completing recovery plans.

Table 3.2: Average Number of Years Domestic Species Have Been Listed Without Recovery Plans

	FWS	NMFS	All
Species with completed plans	6.4	8.2	6.4
Species with plans in process	3.3	12.0	3.8
Species without plans in process	2.8	13.8	3.4

Note: As of September 30, 1987

Source: GAO analysis of information provided by FWS and NMFS

FWS officials stated that despite recent emphasis on and progress in completing recovery plans, their ability to reduce the backlog of uncompleted plans is hampered by the growing number of listed species while program funding has remained relatively stationary. For example, although FWS approved plans for 49 species in 1985 and 1986, 95 additional domestic species were added to the threatened and endangered list during this period. Accordingly, despite FWS' progress in completing plans, its backlog of species without plans actually increased by 46. Further, as more species are added to the list, the number of mandatory consultations with federal agencies planning development projects increases, reducing the availability of staff and resources for plan preparation. NMFS officials attributed their lack of recovery plans primarily to the low priority given to endangered species by the agency in the past.

FWS officials told us that the time between listing and plan approval is acceptable and does not adversely affect species' recovery. They said that because staff are already knowledgeable about initially needed recovery actions, which are often initiated before a plan is completed, recovery is usually not hindered by delays in preparing plans. Our case studies confirmed that recovery actions are often initiated before plans are completed. For all 18 species we studied, recovery actions were initiated before plans were approved.

Recovery Task Implementation

We believe that unless recovery plan tasks are tracked and implemented in an organized fashion, the plans' value as a management tool is diminished. Our review disclosed that neither FWS nor NMFS is systematically tracking task implementation activities or expenditures. Lacking centralized data on task implementation for all species, we examined the work progress made on our 18 case study species. For these species, we found that many tasks had not been performed.

Task Completion Not Being Tracked

While FWS and NMFS guidelines call upon managers to track task completion and progress as part of overall program management, we determined that neither agency maintained centralized information on task implementation status. We found that the regional and field offices maintained files containing various pieces of information on activities associated with the species but that these files were not complete, did not relate accomplishments to the recovery plans, and rarely contained cost information.

FWS has made efforts in the past to track recovery activities and may again do so in the near future. In early 1983, FWS notified the regions by memorandum that the Secretary of the Interior was personally interested in keeping abreast of the status of the implementation of recovery plans. The memorandum went on to state that "the need for an automated system to more fully manage the implementation of recovery plans has been recognized for a long time" and that the Washington office, with the assistance of a region, would develop such a system for nationwide use by September 30, 1983. In the interim, the regions were to submit progress reports twice a year on recovery plan implementation for all species having draft or approved recovery plans. These reports were supposed to detail the status of each recovery action implemented by FWS, federal and state agencies, or other organizations.

According to a May 13, 1983, FWS memorandum to the regions, however, the first batch of submissions were "generally unsatisfactory." The memorandum stated that most of the submissions were of "an unusable nature" and stressed that for future reports, "an excess of information is preferable to insufficient information." In late fiscal year 1983, the regions were reminded also to include the appropriate recovery plan task number when reporting accomplishments and needs, strengthening the link between the plans and the reports.

By fiscal year 1985, the reporting requirements were discontinued. Instead, the regions had to report only a summary of significant highlights for selected species. Further, the automated system was never developed because of the press of other work. Since 1981, FWS has been developing a separate automated system for storing, retrieving, and disseminating scientific information on domestic listed species. This year, FWS will evaluate the possibility of using this system for tracking recovery accomplishments.

Despite the agencies' recognition of the importance of tracking recovery plan implementation, past efforts have been spotty and sporadic, and

there is currently no systematic tracking of recovery activities or costs. Many of the FWS and NMFS officials we spoke to agreed that a more systematic tracking of recovery activities and expenditures is important for the effective management and accountability of the recovery program.

Many Case Study Species Tasks Not Being Implemented

Because centralized task implementation data are not available, we could not readily determine FWS' and NMFS' progress in performing established tasks for all species. As a result, we restricted our analysis to the 18 case study species. For these species, we worked with biologists managing the recovery teams to obtain the best available information. On the basis of limited documentation and these individuals' memories and best-guess estimates, we found that only slightly more than half of the tasks in the 16 approved recovery plans have been initiated even though the plans have been approved for, on average, over 4 years.

According to FWS and NMFS officials, a shortage of funds is the primary reason for the lack of recovery task implementation. For example, one FWS region estimated its first-year cost to implement all recovery actions identified in its plans at about $10 million. However, the region is allocated only about $1 million annually for recovery plan preparation and implementation. An example of the adverse effect of funding shortages is the case of the greenback cutthroat trout. Here, a $15,000 shortage has precluded habitat improvements, which in turn has hampered the trout's recovery.

According to the NMFS recovery leader for the Hawaiian monk seal, funding shortages have precluded NMFS from initiating the full range of activities identified in the seal's recovery plan. Another problem resulting from FWS and NMFS funding shortages centered around a proposed "user fee" FWS was going to charge NMFS to use the FWS refuge where the seals spend much of their time. According to the seal recovery team leader, FWS eventually received sufficient appropriations to operate the refuge and dropped its plan to charge NMFS the fees. However, the NMFS official remains concerned that FWS may again in the future charge NMFS a fee, which, he stated, NMFS cannot afford because of its own funding constraints. If NMFS cannot use the refuge, the seal's recovery will be severely hampered.

The funding shortage is made more acute as the list of threatened and endangered species grows. As more species are added to the list while recovery funding remains stationary, fewer dollars are available per species for recovery plan preparation and implementation. A 1985 FWS

internal memorandum stated that "Even beyond the rapidly increasing number of new species listed, the total resources needed for recovery of currently-listed species is above those presently available to the Service." According to officials at two FWS regional offices, available funding essentially covers only salaries and basic operating expenses, allowing for only minimal recovery plan implementation by FWS.

Conclusions

While the agencies have made progress in developing and implementing recovery plans, many species remain without plans and many of the tasks identified in our case study plans have not been initiated. Agency officials identified funding shortages made more acute by a growing workload as the primary hindrance to plan development and implementation. Although the agencies recognize the need to track task implementation, their efforts remain spotty and sporatic. We believe that a more systematic tracking of recovery plan implementation is important for the effective management and accountability of the recovery program.

Recommendations

We recommend that the Secretaries of the Interior and Commerce direct the Directors of FWS and NMFS, respectively, to develop and maintain a tracking system of all initiated recovery activities. Initiated tasks should be identified by recovery plan task numbers and, when possible, indicate implementation costs.

Agency Comments and GAO Evaluation

The Department of Commerce agreed that systematic tracking of recovery plan implementation is important and noted that its draft recovery planning guidelines will address tracking recovery actions (see p. 89). The Department of the Interior, while agreeing that effectiveness and accountability of the recovery program could be improved by a more systematic tracking of recovery actions, had reservations about developing detailed cost accounting for recovery expenditures. However, Interior intends to determine the feasibility of modifying its automated information system to include tracking recovery plan implementation (see p. 94). We believe that expenditure tracking combined with a complete record of task implementation is important for the effective management of the recovery program (see p. 99).

Established Guidelines and Priority Systems Should Be Followed or Amended

Given the increasing workload of FWS and NMFS in combination with relatively stationary endangered species funding, it is essential that available funds be optimally used. Recognizing this need, the Congress has mandated that the Secretaries of the Interior and Commerce develop priority systems to guide the expenditures of limited funds for developing and implementing recovery plans. We found that while FWS has established the required priority system, it is not adhering to it in practice. NMFS has not yet implemented a priority system, having developed only draft systems. If FWS is unable or decides not to follow its priority system, the agency should amend it as necessary and provide the public an opportunity to comment on the changes. NMFS should clarify, finalize, and implement its draft priority system. Finally, we found that because FWS lacks an effective system for tracking endangered species expenditures, it may not be complying with congressional reprogramming procedures. It should take the steps necessary to correct this problem as well.

Priority System Mandated by Act

During fiscal year 1977, FWS developed a draft priority system to guide recovery resource allocation. Our 1979 report recommended that FWS approve and implement the priority system. Following this report the Congress (in 1979 amendments to the act) required the Secretaries of the Interior and Commerce to establish, and publish in the Federal Register, agency guidelines that include a priority system for developing and implementing recovery plans. The amendment also required the agencies to provide the public with an opportunity to submit written comments on the system and any later amendments made to it. FWS adopted its priority system in 1980 and amended it in 1983. NMFS has only recently drafted guidelines for a priority system.

Characteristics of Agency Priority Systems

FWS' recovery activity priority system consists of two parts. First, the species themselves are ranked on a scale of 1 through 18 on the basis of (in descending order of importance) the degree of threat confronting the species, recovery potential, genetic distinctiveness (taxonomy), and conflict with economic activities. Table 4.1 illustrates FWS' system for ranking the order in which listed species receive recovery attention.

Table 4.1: FWS' Species Priority System

Degree of threat	Recovery potential	Taxonomy	Priority	Conflict(C)
High	High	Monotypic genus	1	1C 1
	High	Species	2	2C 2
	High	Subspecies	3	3C 3
	Low	Monotypic genus	4	4C 4
	Low	Species	5	5C 5
	Low	Subspecies	6	6C 6
Moderate	High	Monotypic genus	7	7C 7
	High	Species	8	8C 8
	High	Subspecies	9	9C 9
	Low	Monotypic genus	10	10C 10
	Low	Species	11	11C 11
	Low	Subspecies	12	12C 12
Low	High	Monotypic genus	13	13C 13
	High	Species	14	14C 14
	High	Subspecies	15	15C 15
	Low	Monotypic genus	16	16C 16
	Low	Species	17	17C 17
	Low	Subspecies	18	18C 18

Source: FWS Endangered and Threatened Species Recovery Planning Guidelines

The second part of the system ranks the tasks within each species' plan. Once written, recovery plans are to contain specific tasks, ranging from actions necessary to prevent extinction through those needed to bring about recovery. Each task is assigned a priority number from 1 to 3. A number-1 priority task is defined as "an action that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future [emphasis in guidelines]." A number-2 priority task is "an action that must be taken to prevent a significant decline in species population/habitat quality, or some other significant negative impact short of extinction." A number-3 priority task is "all other actions necessary to provide for full recovery of the species."

As set forth in FWS guidelines, the species and task priority components are to be used together to ensure that resources are distributed to the most endangered species. If followed, a 1C-1 (species priority 1C, task priority 1) should be the highest priority recovery activity—an action necessary to prevent extinction of a highly threatened monotypic genus that has a high recovery potential and is also in conflict with a development project. As designed, the priority system gives more weight to the task priority number than the species priority. Accordingly, under FWS' system a priority 6-1 action would receive consideration before a 1C-3 action. Because the task priority number is supposed to play such a significant role in allocating funds within the program, FWS guidelines stress that a priority 1 task

> "should be assigned only after careful consideration . . . . The narrative description of any priority 1 task should include a strong explanation of why or how this action is required to prevent extinction in the foreseeable future [emphasis in guidelines]. Inflated priorities defeat the purpose of assigning priorities and reduce the credibility of the ranking system and the recovery plans."

NMFS has only recently drafted guidelines for a priority system. The NMFS system is modeled after FWS' and differs in only a few respects. The primary difference is that the NMFS system does not take taxonomy into account. Accordingly, the system has only 6 species priority numbers compared with FWS' 18. Table 4.2 illustrates NMFS' species priority system.

Table 4.2: NMFS' Recovery Priority System

Priority	Degree of threat	Recovery potential
1	High	High
2	High	Low
3	Moderate	High
4	Moderate	Low
5	Low	High
6	Low	Low

Source: NMFS Endangered and Threatened Species Recovery Priority Draft Guidelines.

While both systems give priority to actions that must be taken to prevent extinction of highly threatened species, the NMFS guidelines claim that its system "would also recognize those species approaching recovered status." NMFS officials differed on their interpretation of this statement. One official explained that the priority system will allow for funding inexpensive, low-priority recovery tasks for species on the threshold of recovery. Another official interpreted the guidelines as giving priority to the most endangered species. Both officials acknowledged that the statement in the guidelines is unclear.

FWS Is Not Closely Following Existing Guidelines and Priority System

Although FWS has developed guidelines and a priority system for implementing recovery actions, we found that the priority system is generally not being followed in deciding how to allocate funds among different species and determining which tasks to implement first. The heavy concentration of recovery funds for 12 species—only 6 of which are considered highly threatened and 2 of which are classified as facing low threats—is one indicator that the priority system is not being utilized. According to FWS documents, in fiscal years 1982 through 1985, these 12 species (comprising less than 5 percent of FWS-listed species) received nearly half of the available recovery funds. The documents also projected this concentration of funding to continue and even increase.

Our case studies also demonstrate that the priority system has not been closely followed for implementing and funding recovery actions. In all but two of our case studies, lower priority tasks were initiated before all higher priority tasks. For example, 8 of the 13 number-1 priority tasks have not been initiated for the key tree-cactus while 6 lower priority tasks have been initiated.

FWS officials acknowledged that the priority system is not strictly adhered to for task implementation and recovery fund allocations. Two

reasons they cited for deviating from the system were (1) congressional earmarking of funds to certain lower priority species and tasks and (2) FWS decisions to recover lower priority species that have high visibility and/or are on the threshold of recovery. With respect to the first reason, FWS told us that congressional earmarking of add-on funds is partly responsible for the concentration of nearly half of FWS recovery funds on 12 species. In fiscal year 1987, the House and Senate Committees on Appropriations directed FWS to use about 11 percent of its recovery funds for eight species. Concerning the second reason, FWS officials told us that the need to achieve a positive public perception of the program sometimes drives the agency to devote extra attention to species with high "public appeal," such as the bald eagle, and those approaching recovery, including the Aleutian Canada goose. Such decisions, in effect, divert funds from those species "with the highest degree of threat" that are supposed to receive priority attention under FWS' priority system.

We noted two additional factors involving problems with the plans themselves that are contributing to FWS' not following its priority system. First, the plans may contain inflated task priority numbers. If too many tasks are assigned high priority, then essentially there is no functioning priority system. While we did not assess the biological soundness of the recovery plans, of the 481 tasks in our 18 case study plans, 164, or 34 percent, were number-1 priority tasks. Further, 7 percent of the tasks for species not considered highly threatened were assigned number-1 priorities. Because a number-1 task priority is supposed to be reserved for those actions necessary to prevent extinction in the foreseeable future, it follows that these tasks should be reserved primarily for highly endangered species closest to extinction. This problem is discussed in the guidelines and was the subject of a 1984 Office of Endangered Species memorandum to the regions. The memorandum stated,

> "Unfortunately, we are seeing too many priority 1 tasks which are obviously not necessary to prevent extinction or an irreversible decline in the species in the foreseeable future. This defeats the purpose of assigning priorities and hurts the credibility of the ranking system and the recovery plans. These inflated priorities are then carried over into the budget process, adversely affecting that as well."

Second, the plans are not being kept up to date. FWS' recovery plan guidelines stress that plans must be annually reviewed and should be continuously updated or revised as the plans move from initial implementation to completion. This is necessary for the plans to include new data obtained during implementation, identify additional actions that are needed during the next 3 years for continued recovery, and ensure

that the assigned task priorities are valid. We found, however, that most plans are rarely, if ever, updated. For our 15 FWS case studies with approved plans, 14 have never been updated even though they are between 2 and 10 years old.

Inflated task priorities and out-of-date recovery plans may be contributing to the perception among many FWS officials that recovery plans are only general blueprints rather than the driving mechanism for species recovery. We believe that if the plans were prepared and updated in accordance with the guidelines, they would be a more useful and valuable tool in directing recovery actions.

FWS Is Not Accurately Tracking and Reporting Expenditures

In addition to not following its system for ranking recovery program expenditures among eligible species, FWS is not accurately tracking and reporting expenditures among subcategories of the overall endangered species program such as listing, consultation, research, law enforcement, and recovery. As a result, FWS may not be following congressional reprogramming guidelines.[1] According to the House and Senate Committees on Appropriations' and FWS' reprogramming procedures, any proposed reprogramming must be submitted to the Appropriations Committees in writing before it is implemented if it exceeds $250,000 annually or results in an increase or decrease of more than 10 percent annually in affected programs or subactivities. However, according to FWS officials in four of the seven regions, funds from one subactivity are often used for activities in another subactivity. Further, this shifting of funds between subactivities is not always reported to FWS budget officials. Instead, the regions and field offices often "predetermine" and report their expenditures to match their subactivity allocations. For example, one FWS official told us that his region probably spends less than $100,000 a year on listing activities. However, FWS budget documents show the region's fiscal year 1986 listing expenditures totaled $562,862, or 99 percent of its fiscal year allocation of $565,600. While this one example alone appears to be sufficient to have required FWS to notify the Appropriations Committees, it is possible that other regions' shifting of funds between subactivities may have cancelled out this transfer of funds and kept FWS under the $250,000/10 percent reprogramming threshold. However, unless subactivity expenditures are accurately reported by each region, FWS will not have the needed information to

[1] FWS guidelines define reprogramming as "the reallocation of funds from one budget activity to another. In cases where either [Appropriations] Committee report displays an allocation of an appropriation below the activity level, that more detailed level shall be the basis for reprogramming."

know whether or not reprogramming procedures should be initiated. To date, FWS has not notified the Congress of any reprogramming affecting its endangered species program.

Conclusions

Both FWS and NMFS have had problems implementing the recovery program priority system required by the act. NMFS has not finalized a system, having only recently developed a draft system. While FWS has developed a system, it has not followed it in practice. Instead of focusing expenditures and attention on species closest to extinction, FWS has concentrated on highly visible species in relatively less danger. While congressional earmarking has contributed to this situation, we believe FWS' desire for a positive public perception of its program and its problems in assigning task priorities and updating plans have also been contributors. We believe that adherence to guidelines and a priority system will ensure that the recovery plans' value as a recovery tool is maximized and that limited funds are used optimally. Further, FWS' inaccurate tracking of program expenditures may be resulting in reprogramming actions that violate budgetary reprogramming procedures.

If FWS cannot adhere to or decides to deviate from its established priority system, it should officially amend the system and, as required by the law, notify the public of the changes. Likewise, NMFS should clarify how its system, once finalized, can give priority to the most endangered species while also recognizing those species approaching recovered status.

Recommendations

We recommend that the Secretaries of the Interior and Commerce direct the Directors of FWS and NMFS, respectively, to

- ensure that recovery plans are annually reviewed, are updated as necessary, and do not contain inappropriately classified high-priority task designations and
- ensure that the priority systems are used in allocating recovery funds or amended. If the agencies cannot follow or decide to deviate from the systems, the systems should be amended and the public provided notice and opportunity to comment on the proposed changes. The Director, NMFS, should also clarify how the agency's priority system, once finalized, can recognize species approaching recovery while giving priority to the most endangered species.

Moreover, we recommend that the Secretary of the Interior direct the Director, FWS, to take those steps necessary to ensure that any funding

reallocations within the endangered species program comply with budgetary reprogramming procedures.

Agency Comments and GAO Evaluation

The Department of Commerce stated that while reviews of recovery plans may not be necessary on an annual basis, they agreed that recovery plans should be periodically reviewed and updated. Their comments indicate that their draft listing and recovery guidelines, which will be available for public comment next year, will address these matters (see p. 89). We note, however, that Commerce did not address our recommendation about clarifying how its proposed priority system can simultaneously give priority to the most endangered species and to species approaching recovery. We believe that Commerce should address our recommendation prior to releasing the guidelines for public review (see p. 90).

The Department of the Interior disagreed that it should more closely follow its priority system. The Department stated that the Endangered Species Act provides for some flexibility in developing and implementing recovery plans and notes that its priority system is only one factor used in allocating recovery resources. Interior further noted that other factors, such as funding availability, state priorities, and the potential for recovery success, are also considered in making allocation decisions (see p. 95).

We recognize that the act and Interior's guidelines provide for some flexibility in developing and implementing recovery plans. However, they are also clear that development and implementation should be directed by a priority system. Further, most of the reasons Interior cites for deviating from its priority system are already recognized by the act and are incorporated into Interior's priority setting system. We therefore continue to believe that sufficient flexibility is already built into the priority system and that deviations from it should be case-by-case exceptions rather than frequent occurrences. If Interior finds it cannot more closely adhere to its existing priority system, it should amend the system and notify the public as required by the act.

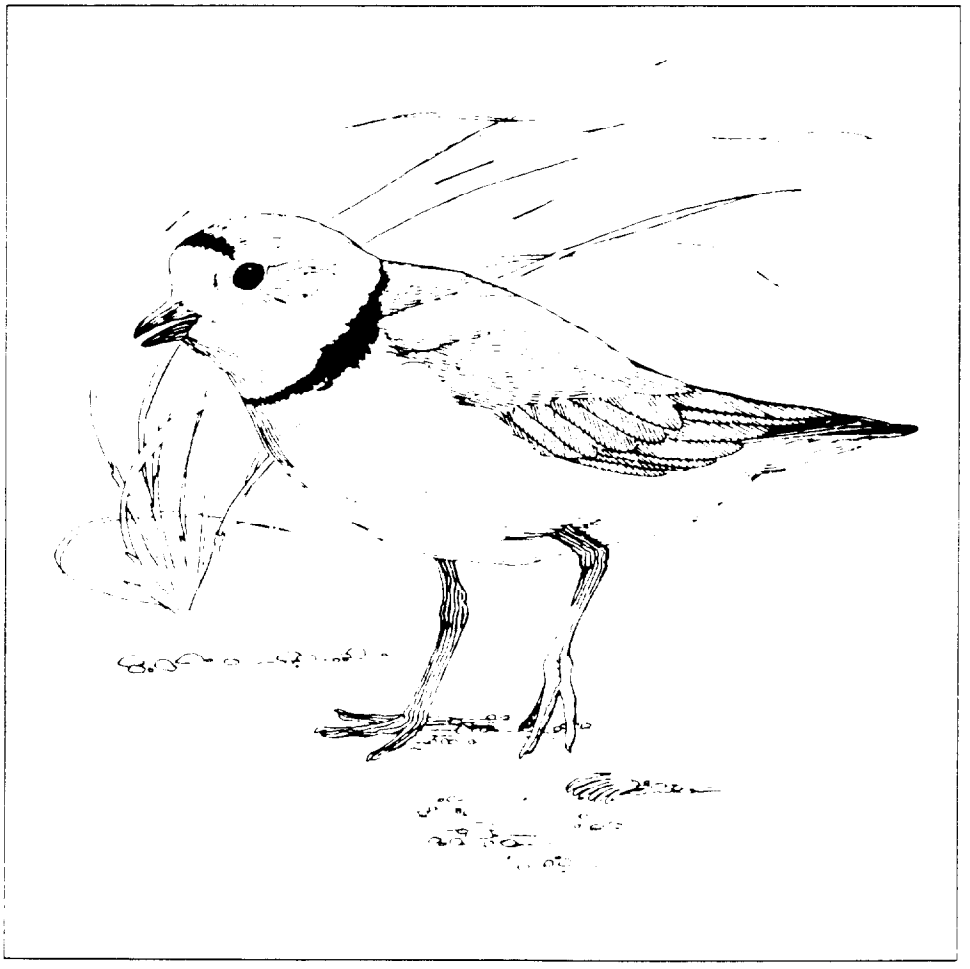
Interior also stated that it will continue to advise its managers of reprogramming guidelines to ensure compliance with congressional direction.

Eighteen Case Studies

Piping Plover, Atlantic Coast Population

The piping plover is a small, stocky, sandy-colored bird resembling a sandpiper. Like other plovers, it runs in short starts and stops. When still, the piping plover blends into the pale background of open, sandy habitat on beaches where it feeds and nests. The bird's name derives from its call notes—plaintive, bell-like whistles that are often heard before the birds are seen. On January 10, 1986, the Atlantic Coast and Great Plains populations were listed as threatened, while the rarer Great Lakes population was designated as endangered.

Figure I.1: Piping Plover



Primary Threats

Hunting is believed to have been a primary factor in the piping plover's decline in the late 19th and early 20th centuries. Habitat loss and degradation, disturbance by humans and domestic animals, and increased predation contribute to the plover's current decline. Because the plover no longer nests on the many beaches it once did, biologists speculate that the current downward trend is primarily due to disturbance or direct loss of nests, rather than a lack of suitable habitat.

Recovery Plan

The goal of the Atlantic Coast piping plover recovery plan (approved March 31, 1988) is to increase the population to 1,200 breeding pairs and maintain that level along most of the Atlantic Coast for 5 consecutive years. Once this is accomplished, the population may be removed from the threatened and endangered list. The estimated cost for the first 3 years of recovery actions was $232,400 for 22 of the 24 recovery plan tasks. The recovery plan did not include cost estimates for the remaining two recovery tasks.

Recovery Actions

To date, FWS, the National Park Service (NPS), 11 states, and several conservation groups have initiated 8 of the plan's 24 tasks. The initiated tasks include (1) monitoring population trends, (2) reducing pedestrian and recreational vehicle disturbances, (3) trapping predators, (4) evaluating nesting and migration habitats, and (5) distributing informational brochures and posters. All of these tasks were initiated before the plan's approval.

As of September 30, 1987, an estimated total of $370,673 had been spent on recovery efforts. Table I.1 shows funding sources and estimated expenditures through September 1987.

Table I.1: Piping Plover Funding and Estimated Expenditures (Through September 1987)

Funding source	Expenditures (10/85-9/87)	Percent of expenditures
FWS	$216,639	58
NPS	53,410	14
States	70,759	19
Other	29,865	8
Total	**$370,673**	**99[a]**

[a]Total is less than 100 percent due to rounding

Source: GAO compilation of FWS documents and estimates

Recovery Progress

Since its January 1986 listing as threatened, the piping plover Atlantic Coast population has declined from about 800 pairs to 760 pairs, a 5-percent decline. If the plover continues to decline, FWS may reclassify it as endangered.

Special Concerns

FWS staff biologists and several conservation organizations expressed concern that FWS had not restricted off-road vehicles and other recreational uses at the Chincoteague National Wildlife Refuge beach during the plover's nesting season. They told us that even though FWS had identified the disturbances as a serious threat and the beaches were under FWS management, they believed that restrictions were not adopted because of pressures from off-road vehicle users and developers. On March 15, 1988, however, FWS closed the refuge nesting areas during the plover's nesting season. While the conservation groups and FWS staff biologists are pleased with the decision to close the nesting area, one FWS biologist said that he expects the issue to surface again in the future.

San Bruno Elfin Butterfly

At one time, the San Bruno elfin butterfly probably occurred on hill tops and ridges throughout much of northern San Mateo County to the San Francisco Peninsula and northward to southern Marin County. Urbanization of this region has reduced the range of the butterfly to a few sites in San Mateo County: San Bruno Mountain, Milagra Ridge, Montara Mountain, Peak Mountain, and Whiting Ridge. Figure I.2 shows the locations of the San Bruno elfin butterfly.

Because of its reduced range and the continued threats to the remaining colonies, the San Bruno elfin butterfly was listed as endangered on June 1, 1976.

Primary Threats

Records indicate that the San Bruno elfin butterfly may have previously inhabited several sites long since destroyed by urbanization or irreversibly altered by plantings of nonnative plants that crowded out native plants upon which the butterfly feeds. The remaining colonies in San Mateo County are threatened with loss of habitat from commercial development, proposed road development, county park development, and quarrying.

Recovery Plan

Approved on October 10, 1984, the recovery plan covers both the San Bruno elfin and the Mission blue butterflies. The plan's primary objective for the San Bruno elfin butterfly is to maintain and enhance the existing 14 populations. The plan states that the butterfly can be considered for reclassification to threatened when the existing colonies are secure and self-sustaining. Because 26 of the plan's 34 tasks are for both butterfly species, it was not possible to break out 3-year implementation costs for the San Bruno elfin butterfly alone.

Recovery Actions

To date, FWS, the state of California, San Mateo County, and private developers have initiated and/or funded 10 of the plan's 31 tasks that pertain to the San Bruno elfin butterfly. These tasks include (1) securing habitat, (2) conducting surveys, (3) removing nonnative plants, and (4) reintroducing native flora. Seven of these tasks were initiated prior to the plan's approval.

As of September 30, 1987, an estimated total of $66,154 had been spent on recovery efforts. Table I.2 shows funding sources and estimated expenditures through September 1987.

Figure I.2: Locations of the San Bruno Elfin Butterfly in the San Francisco Peninsula Region

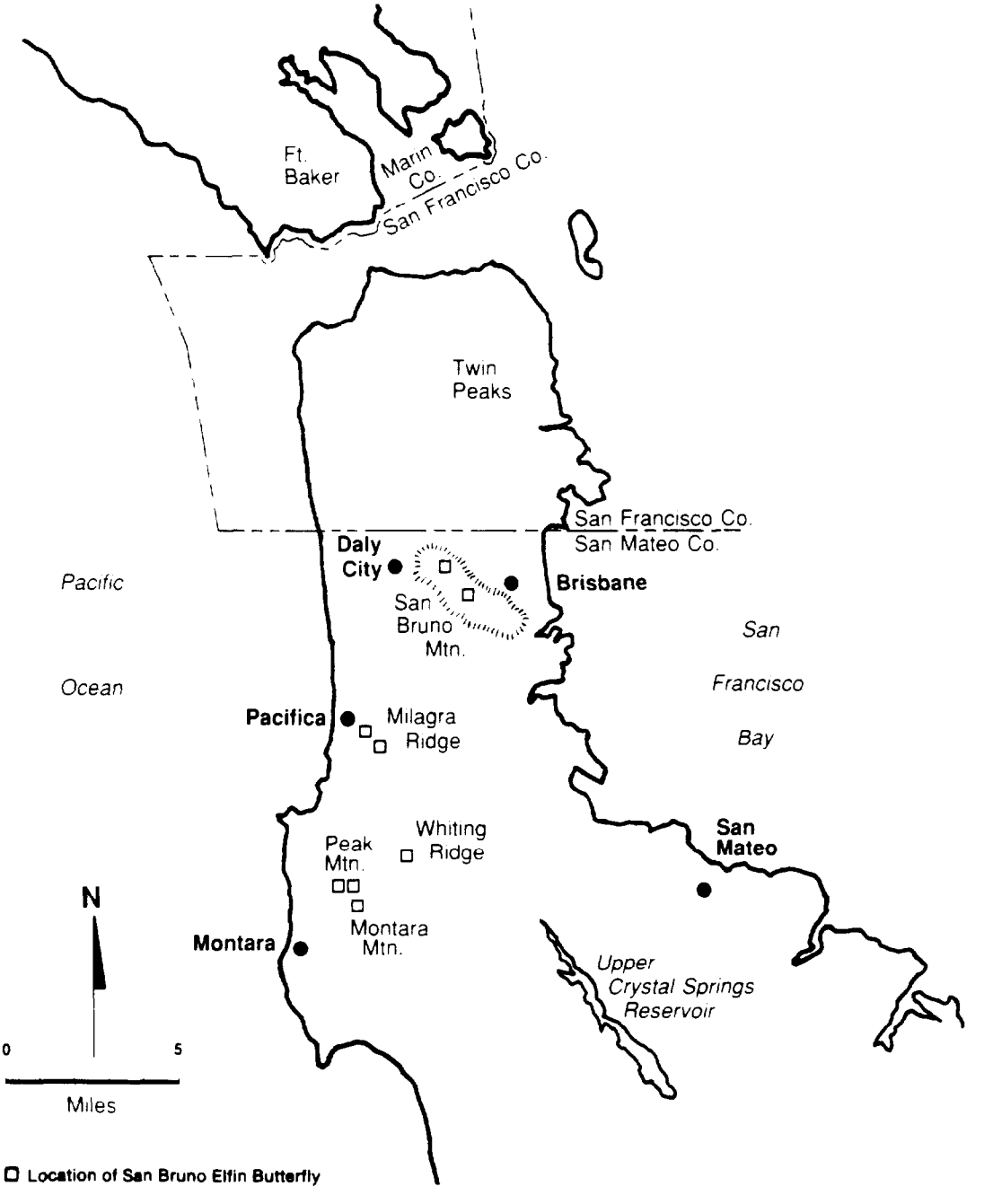


Table I.2: San Bruno Elfin Butterfly Funding and Estimated Expenditures
(Through September 1987)

Funding source	Expenditures: Preplan (10/78-9/84)	Expenditures: Postplan (10/84-9/87)	Total	Percent of total
FWS	$37,240	$1,500	$38,740	58
State	12,414	0	12,414	19
Private	6,000	9,000	15,000	23
Total	**$55,654**	**$10,500**	**$66,154**	**100**

Source: GAO compilation of FWS documents and estimates

Recovery Progress

The San Bruno elfin butterfly's status has been stable, or slightly improving, since its 1976 listing. While one FWS biologist we spoke to believes that the butterfly can be reclassified to threatened in the near future, another biologist told us that encroaching development will likely preclude reclassifying the species.

Special Concerns

On the basis of a 1982 amendment to the Endangered Species Act, FWS issues permits, under limited circumstances, to applicants allowing the taking of endangered and threatened species so long as the taking is incidental to, and not the primary purpose of, otherwise legal activities.[1] The applicant must submit a conservation plan that specifies the (1) impact that will likely result from such taking, (2) steps the applicant will take to minimize and mitigate such impacts and the funding that will be available to implement such steps, and (3) alternative actions to such taking the applicant considered and the reasons such alternatives are not being utilized. On March 4, 1983, FWS issued a permit to local and county governments to allow incidental taking of the San Bruno elfin and Mission blue butterflies during the course of developing San Bruno Mountain.

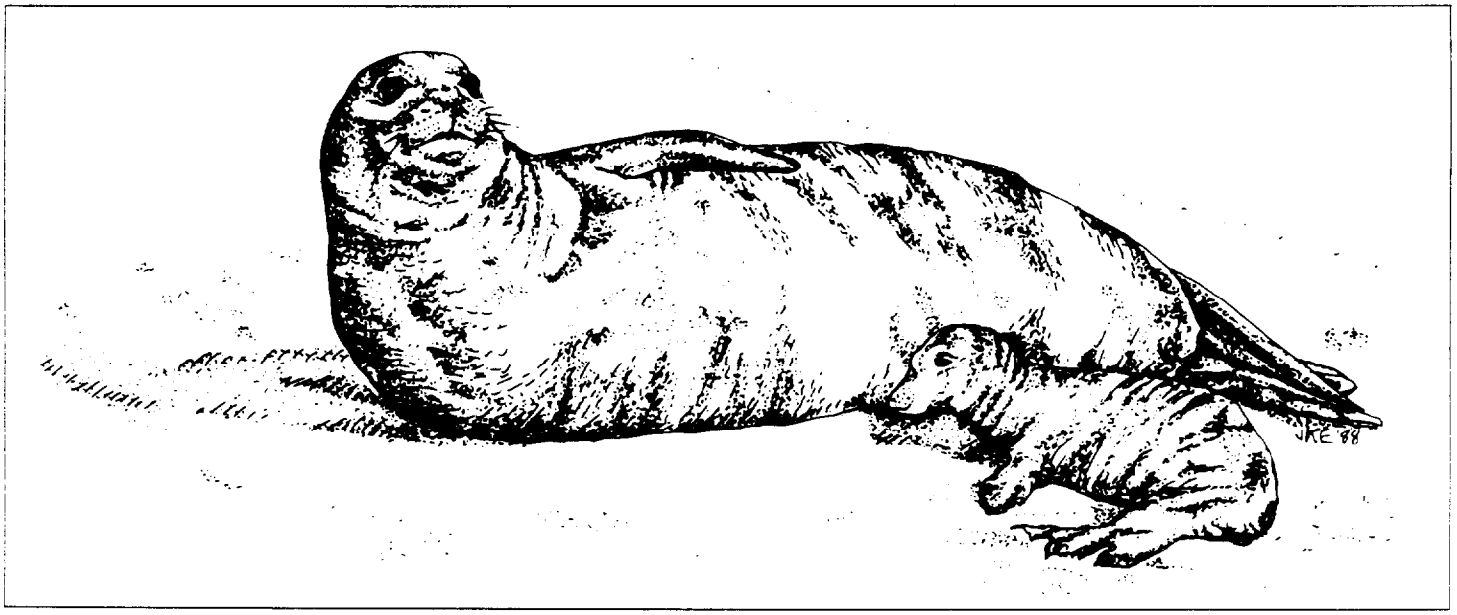
While FWS officials we spoke to generally view the 1982 amendment as a valuable tool to allow development while receiving concessions and funding from developers to protect the species, a local conservation group views the amendment as "a dangerous loophole to the original intent of the Endangered Species Act. . ." and has called for the repeal of the conservation plan provisions.

[1]The act defines "taking" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

Hawaiian Monk Seal

The Hawaiian monk seal is currently found throughout the northwestern Hawaiian Islands. Except for protracted periods ashore during pupping (approximately 5 weeks) or molting (approximately 2 weeks), an individual seal will generally remain at sea for up to 2 weeks before returning for several days rest on land. The Hawaiian monk seal was listed as endangered on November 23, 1976.

Figure I.3: Hawaiian Monk Seal



Primary Threats

During the 19th century, harassment and over-exploitation by sealers reduced the species to precariously low levels. While the cessation of sealing, coupled with the species' isolated habitat, enabled the seal to survive, human disturbance continues to endanger it. Although not directly responsible for monk seal mortality, human activity on a beach, if sustained over long periods, even at low levels, can cause the seals to abandon areas where they pup, nurse, and rest. For example, few seals were observed at Tern Island during the period the Coast Guard operated a station there. Following the station's closure in 1979, the average number of seals counted in a daily census increased to over 40. Other threats to the monk seal include shark attacks, entrapment in discarded fishing gear, and disease. Mass mating attempts by males may also be responsible for the death of adult females and immature seals.

Recovery Plan

The Hawaiian monk seal's recovery plan was approved on April 1, 1983. While the plan lists "conservation and recovery" as one of its six objectives, it does not specify what constitutes recovery. The remaining five objectives primarily concern learning more about the seal's habits and threats. The recovery plan contains 96 tasks. Because some of the cost estimates represent total implementation costs while others represent yearly costs and the task duration information was often missing, we were unable to calculate the estimated 3-year implementation costs.

Recovery Actions

To date, NMFS, the Marine Mammal Commission (MMC), FWS, the Center for Environmental Education, and the Smithsonian Institution have initiated and/or funded 69 of the plan's 96 tasks. The types of initiated tasks include (1) identifying those natural factors causing or contributing to decreased survival and productivity, (2) identifying habitat requirements, (3) monitoring populations, and (4) documenting effects of human disturbance.

From the time of its listing through September 30, 1987, an estimated total of $2,872,283 has been spent on the recovery-related activities for the seal. Approximately 40 percent of this amount was spent before the recovery plan was approved. Table I.3 shows funding sources and estimated expenditures through 1987.

Table I.3: Hawaiian Monk Seal Funding and Estimated Expenditures (Through September 1987)

	Expenditures			
Funding source	**Preplan (11/76-3/83)**	**Postplan (4/83-9/87)**	**Total**	**Percent of total**
NMFS	$681,233	$1,620,650	$2,301,883	80
MMC	229,217	75,000	304,217	11
FWS	224,183	7,500	251,683	9
Center	0	12,000	12,000	<1
Smithsonian	0	2,500	2,500	<1
Total	**$1,154,633**	**$1,717,650**	**$2,872,283**	**100**

Source: GAO compilation of NMFS and MMC documents and estimates.

Recovery Progress

The Hawaiian monk seal remains in serious danger of extinction. The seal's population has declined since the first systematic counts were made in the 1950s. The number of animals counted in 1983 was roughly half the number counted in 1958. Current estimates put the seal's population between 1,200 and 1,500 animals.

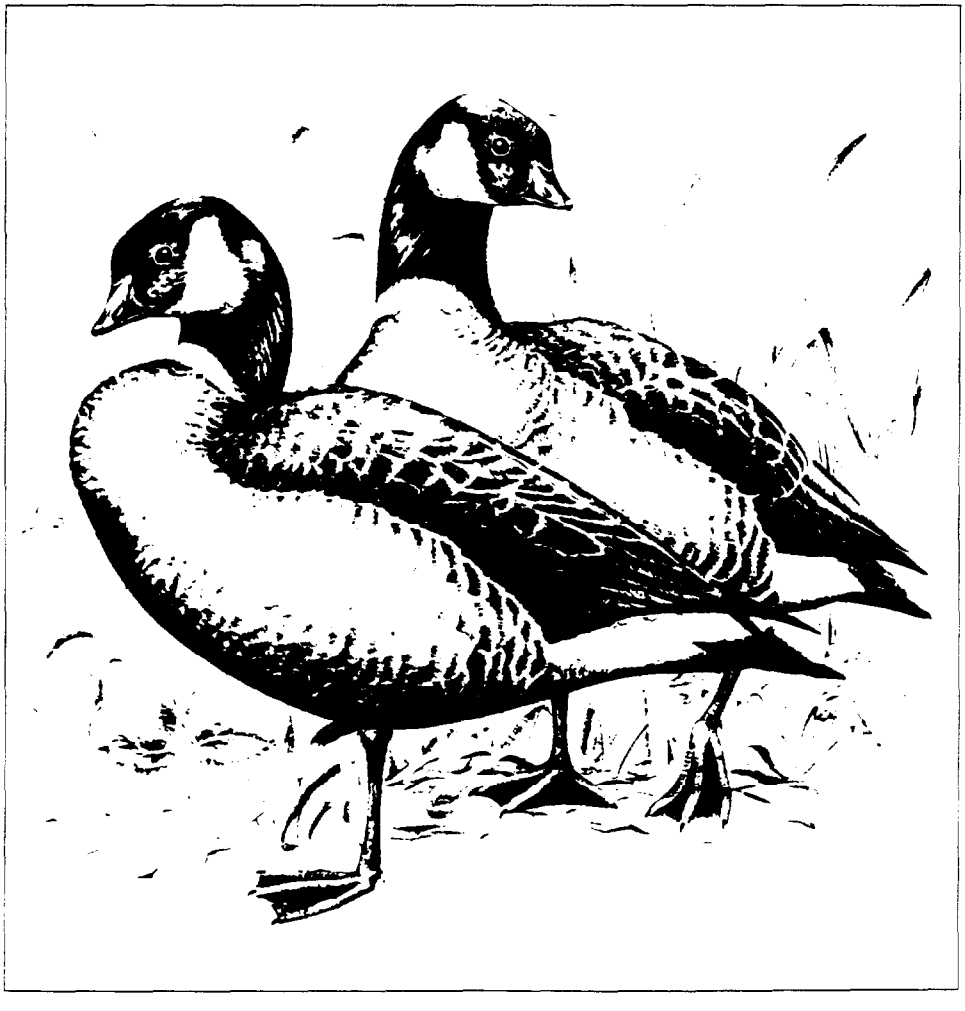
Special Concerns

NMFS and MMC remain concerned about the possible closing or restricting of operations at FWS' Tern Island field station where as many as 170 seals have been observed at one time. The Commission believes that the presence of FWS personnel provides an important deterrent against unauthorized landings by fisherman or other individuals who might disturb seals and cause them to abandon the area. Although the Congress provided a special appropriation to FWS to maintain the field station in 1987, NMFS and MMC believe that the issue may rise again in 1988. Other concerns include the continued disturbance of seals by Coast Guard personnel stationed at Kure Atoll and the need to update the seal's 5-year old recovery plan.

Aleutian Canada Goose

The Aleutian Canada goose resembles other small Canada goose subspecies such as Cackling, Taverner's, and Lesser Canada geese. While there is currently no single characteristic that absolutely distinguishes the Aleutian from the other subspecies, a combination of characteristics can reliably separate most of the birds. Although the precise historic range of the Aleutian Canada goose is not known, it once bred from the eastern Aleutian Islands to the Kuril Islands, northeast of Japan. At the time of their March 11, 1967, listing as an endangered species, the geese's only known breeding population was on tiny Buldir Island in the western Aleutians, estimated at 150 to 200 pairs.

Figure I.4: Aleutian Canada Goose



Primary Threats

The decline in numbers of Aleutian Canada geese and the reduction of their breeding range are largely attributed to predation by arctic foxes, which were introduced by "fox ranchers" between 1836 and 1930. Other factors that may have contributed to the decline of the geese include hunting and loss of wintering grounds habitat.

Recovery Plan

The first Aleutian Canada goose recovery plan was approved on March 7, 1979. The plan was substantially revised in 1982 because of the perceived need to address disease on the geese's wintering grounds in California and because some of the information in the original plan had become outdated.

The primary objective of the revised recovery plan is to remove the Aleutian Canada goose from the threatened and endangered species list. According to the plan, removal from the list can be considered once the wild population is maintained at 1,200 or more and 50 breeding pairs are reestablished on each of three former breeding areas in addition to Buldir Island. The plan also has an interim objective of reclassifying the goose from endangered to threatened status once 50 breeding pairs have been reestablished on each of two areas or a total of 100 pairs have been reestablished on three areas. The estimated 3-year cost for implementation of the plan's 28 tasks is $1,582,300.

Recovery Actions

Although recovery actions date back to the late 1940s, efforts began in earnest in 1976. Major recovery actions initiated since 1976 include (1) continuing to eradicate foxes, (2) breeding captive geese and releasing them, (3) restricting hunting on the geese's wintering grounds, (4) determining migration patterns, seasonal distribution, and numbers of geese, and (5) acquiring habitat. All of the tasks identified in the revised plan have been initiated or completed. FWS and state recovery expenditures between fiscal years 1976 and 1987 totaled an estimated $9,286,146. About 40 percent of this amount was spent for acquiring 1,009 acres of wintering grounds. Table I.4 shows funding sources and estimated expenditures in fiscal years 1976-87.

Table I.4: Aleutian Canada Goose Funding and Estimated Expenditures
(July 1975 Through September 1987)

Funding source	Expenditures: Preplan (7/75-2/79)	Expenditures: Postplan (3/79-9/87)	Total	Percent of total
FWS	$1,408,448	$3,990,665	$5,399,113	99
State	7,629	51,904	59,533	1
Subtotal	**$1,416,077**	**$4,042,569**	**$5,458,646**	**100**
FWS Land Acquisition	57,100	3,770,400	3,827,500	
Total	**$1,473,177**	**$7,812,969**	**$9,286,146**	

Source: GAO compilation of FWS documents and estimates

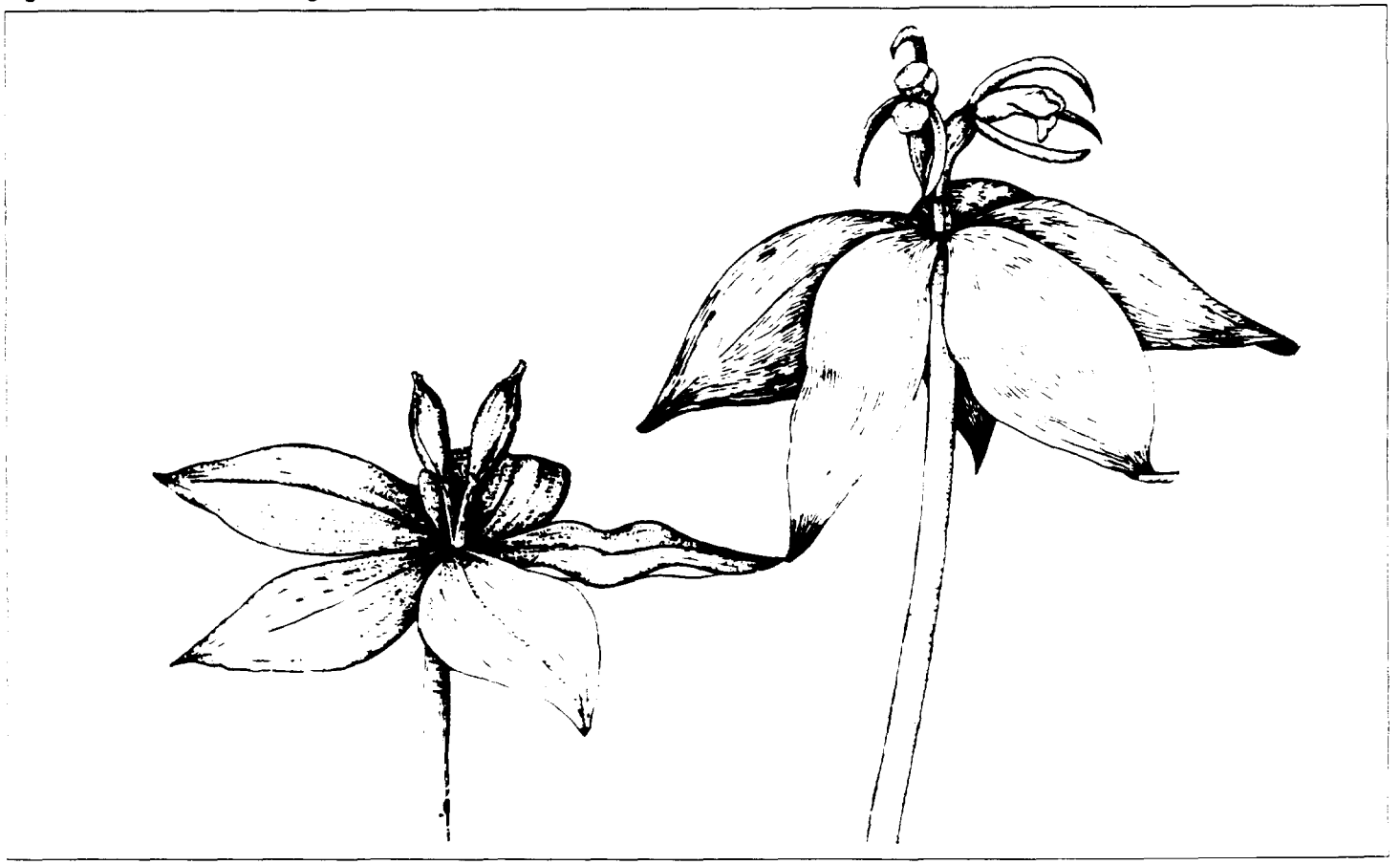
Recovery Progress

Over the last decade, the number of Aleutian Canada geese has increased from about 1,200 to 5,000. Arctic foxes have been eradicated from five islands, and geese have been reintroduced on three of these islands. FWS plans to reclassify the goose from endangered to threatened status within 2 years and may remove the species from the threatened and endangered species list in 1992.

Small Whorled Pogonia

The small whorled pogonia, a member of the orchid family, has grayish-green stems with a thin, waxy covering. The whorl of five or six leaves near the top of the stem and beneath the flower gives the plant its name. One of the rarest plants in eastern North America, the plant is found from Ontario, Canada, and Maine in the north, south along the eastern seaboard to Georgia, and west to Illinois. Although widespread, it is very limited in distribution, rare in all parts of its range, and has not been found within the interior of its range (i.e., West Virginia, Kentucky, Tennessee, Ohio, and Indiana). When the species was proposed for listing in 1980, there were 16 known sites. The small whorled pogonia was listed as endangered on September 10, 1982.

Figure I.5: Small Whorled Pogonia



Primary Threats

The two major threats to the existence of this species are habitat destruction and collecting. Most of the sites are on private land, and some are susceptible to development. Studies indicate that shopping malls, housing developments, and golf courses have replaced historical populations. Destruction of the pogonia's habitat is expected to continue. The species has always been popular with wildflower enthusiasts who have been known to attempt transplanting from wild populations to wildflower gardens. At the time the pogonia was proposed for listing, herbarium collections through the years accounted for more plants than were known to exist in the wild.

Recovery Plan

Approved on January 16, 1985, the small whorled pogonia recovery plan cites an objective of locating and protecting 30 sites that each contain at least 20 individual plants. Once this objective has been met, the plan calls for a review of the species to consider reclassification and determine if delisting is a viable alternative. The estimated cost for the first 3 years of recovery actions was $135,500 for 13 of the 18 recovery plan tasks. The plan did not provide cost estimates for the remaining five recovery tasks.

Recovery Actions

To date, the FWS, Forest Service (FS), National Park Service, 20 states, and the Nature Conservancy have initiated 6 of the plan's 18 recovery tasks. The initiated tasks include (1) conducting surveys, (2) monitoring existing populations, (3) conducting demographic studies, (4) developing management plans, and (5) disseminating information to the public. Five of the six actions were initiated before the plan was approved. As of September 30, 1987, an estimated total of $362,002 had been spent on recovery efforts. Table I.5 shows funding sources and estimated expenditures through September 1987.

Table I.5: Small Whorled Pogonia Funding and Estimated Expenditures (Through September 1987)

Funding source	Expenditures		Total	Percent of total
	Preplan (7/75-2/79)	Postplan (3/79-9/87)		
FWS	$32,919	$75,953	$108,872	30
NPS	167	423	590	<1
FS	4,995	0	4,995	1
States	34,681	40,364	75,045	21
Private	95,157	77,343	172,500	48
Totals	**$167,919**	**$194,083**	**$362,002**	**100**

Source: GAO compilation of FWS documents and estimates.

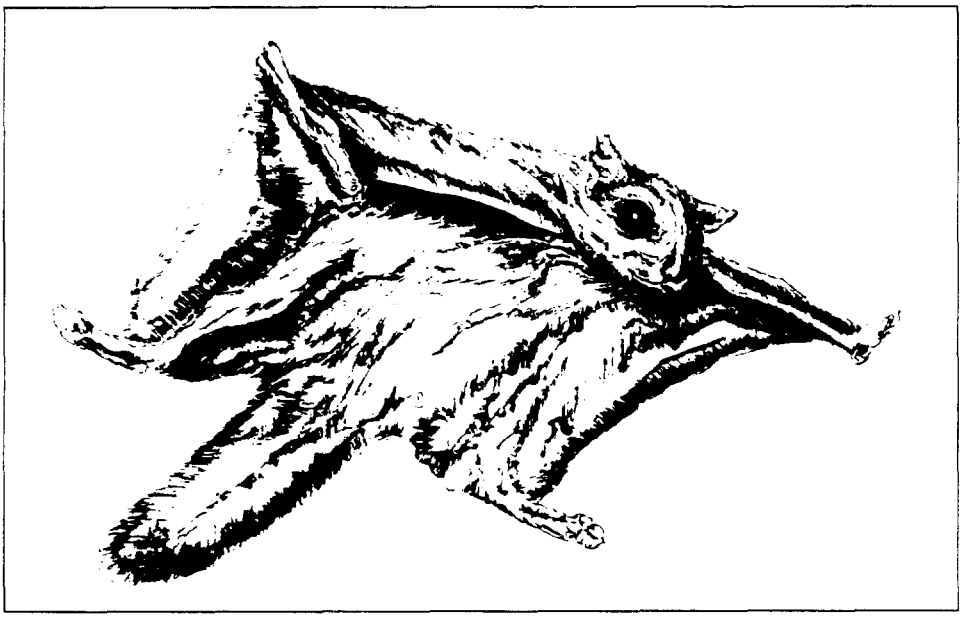
Recovery Progress

When the small whorled pogonia was proposed for listing in 1980, there were 16 known sites. By the end of the 1983 field season, 30 populations were known to exist. FWS biologists estimated that there are currently 60 known sites and attributed the increases primarily to stepped-up survey work that located previously unknown sites. Although the recovery plan objective of locating 30 sites has been met, most sites are on private land and remain susceptible to development. Accordingly, FWS does not plan to reclassify the pogonia as threatened in the near future.

Northern Flying Squirrel

The northern flying squirrel is a small, nocturnal, gliding mammal with a long, broad, flattened tail, prominent eyes, and dense, silky fur. The two endangered subspecies of the northern flying squirrel are found in certain highland areas of the southern Appalachian Mountains in West Virginia, Virginia, North Carolina, and Tennessee. The Carolina and Virginia northern flying squirrel subspecies were listed as endangered on July 1, 1985.

Figure I.6: Northern Flying Squirrel



Primary Threats

Habitat destruction, fragmentation, or alteration associated with clearing of forests, introduced insect pests, mineral extraction, recreational or other development, and pollution pose the most serious threats to the northern flying squirrel. For example, timbering operations from the 1880s to the 1920s removed all but 200 acres of red spruce that had originally covered nearly half a million acres in West Virginia. While the spruce has since regenerated somewhat, its current acreage represents about only 10 percent of the squirrel's favored habitat in West Virginia. Habitat modification may have also favored the spread and proliferation of competitors, pathogens, or predators.

Recovery Plan

As of June 17, 1988, the recovery plan for the northern flying squirrel was still in draft. The draft plan cites a goal of reclassifying the squirrel

from endangered to threatened status. This will be possible when (1) populations exist in all historic localities and are relatively stable or expanding, over a 10-year period, (2) at least two additional stable centers of distribution of each subspecies exist within the species' southern Appalachian range, (3) the habitats of all known major centers of distribution are permanently protected, and (4) sufficient ecological data have been accumulated to permit future protection and management. Because we were not able to obtain the draft implementation schedule, the estimated implementation costs for the first 3 years of recovery tasks are not presented.

Recovery Actions

To date, FWS, the Forest Service, the National Park Service, and three states have initiated 14 of the draft plan's 20 tasks. The initiated tasks include (1) studies of the squirrel's habitat, life history, and threats, (2) development of management guidelines, and (3) distribution of educational and informational materials.

As of September 30, 1987, an estimated $113,824 had been spent on recovery efforts. Table I.6 shows funding sources and estimated expenditures through September 1987.

Table I.6: Northern Flying Squirrel Funding and Estimated Expenditures (Through September 1987)

Funding source	Expenditures (7/85-9/87)	Percent of Expenditures
FWS	$82,873	73
FS	8,000	17
NPS	598	1
States	22,353	20
Total	**$113,824**	**101[a]**

[a]Total is more than 100 percent due to rounding.

Source: GAO compilation of FWS documents and estimates.

Recovery Progress

Because of the difficulty involved in locating and accurately estimating populations, the status of the northern flying squirrel remains unknown. While more squirrels are now known to exist than estimated at the time of listing, this "increase" is due to improved status surveys. Because the squirrel is rare and occupies isolated islands of vulnerable habitat, it is unlikely that it will ever fully recover.

Bunched Arrowhead

The bunched arrowhead is a small herbaceous plant that produces white-petaled flowers from mid-May to July. The plant grows in saturated to flooded soils in the Carolinas. The rarity of the species and the vulnerability of its habitat led to its July 25, 1979, listing as endangered.

Figure I.7: Bunched Arrowhead

Primary Threat

The primary threat to the bunched arrowhead is development of land for pastures and homes. For example, parts of three colonies[2] in one population were destroyed in 1982 by the filling of a bog for pasture, and in 1983 a South Carolina population was virtually destroyed during the course of highway construction.

Recovery Plan

The bunched arrowhead recovery plan was approved on September 8, 1983. Although the plan provides criteria for considering reclassification to threatened status (permanent protection of 15 colonies within five populations) and for recovery (protection of 26, or 93 percent, of the known colonies), the immediate objective is to protect the species from extinction.

The recovery plan contains cost estimates for FWS only. FWS' estimated cost for the first 3 years of recovery actions was $36,000 for 12 of the plan's 14 tasks. The plan did not include cost estimates for the remaining two tasks.

Recovery Actions

To date, FWS, the Federal Highway Administration (FHWA), the states, and private organizations and individuals have initiated 12 of the 14 tasks in the bunched arrowhead recovery plan. Initiated tasks include (1) protecting and monitoring existing populations and their habitat, (2) conducting population and ecological studies, (3) transplanting plants, and (4) habitat acquisition. Total estimated expenditures for the bunched arrowhead from the time of its listing through September 1987 were $313,456. Nearly half of this amount was for the acquisition of 59 acres of habitat in 1987. Table I.7 shows funding sources and estimated expenditures through September 1987.

[2]A colony is a group or cluster of plants within a geographical area (population).

Table I.7: Bunched Arrowhead Funding and Estimated Expenditures (Through September 1987)

Funding source	Expenditures: Preplan (10/79-9/83)	Expenditures: Postplan (10/83-9/87)	Total	Percent of total
FWS	$4,667	$96,012	$100,679	62
FHWA	•	5,000	5,000	3
State	7,833	42,688	50,521	31
Others	1,000	4,000	5,000	3
Subtotal	**$13,500**	**$147,700**	**$161,200**	**99[a]**
Land acquisition	•	$152,256	$152,256	
Total	**$13,500**	**$299,956**	**$313,456**	

[a]Total is less than 100 percent due to rounding.

Source: GAO compilation of FWS documents and estimates.

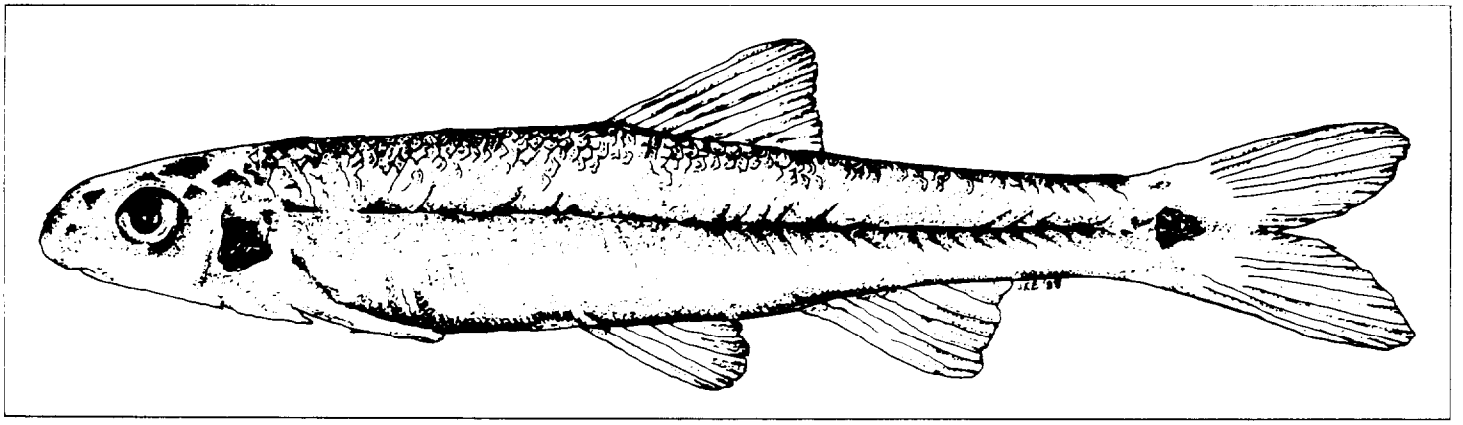
Recovery Progress

The bunched arrowhead has been declining since it was listed. Although three additional populations were discovered following the plan's approval, one population has since been destroyed, leaving a total of seven populations. Further, the colonies within the populations have also been generally declining.

Spotfin Chub

The spotfin chub is a small freshwater fish with a slightly compressed, elongated body. It is dusky green on its upper side and silver on the lower side. The species' dorsal fin has a distinctive dark spot. While the fish was once endemic to 12 tributary systems in five states (Alabama, Georgia, North Carolina, Tennessee, and Virginia), it is currently found in only four systems in three states (North Carolina, Tennessee, and Virginia). The spotfin chub was listed as threatened on September 9, 1977.

Figure I.8: Spotfin Chub



Primary Threats

The species' decline is primarily attributed to habitat alteration and destruction due to pollution, silt and coal sedimentation, impoundments, channelization, and water temperature changes. Over-collecting and competition from other species also may have contributed to the spotfin chub's decline.

Recovery Plan

Approved November 21, 1983, the spotfin chub recovery plan cites a goal of restoring the species to a significant portion of its historic range and removing it from the threatened and endangered species list. The species will be considered recovered after existing populations in the four river systems and two additional populations established in two other rivers are stable over a 10-year period.

The recovery plan provides cost estimates only for FWS. The plan's estimated 3-year implementation cost was $70,500 for 11 of the 16 tasks in the recovery plan. The remaining five tasks did not have cost estimates.

Recovery Actions

Through fiscal year 1987, FWS, the National Park Service, and North Carolina have initiated 5 of the plan's 16 tasks: (1) protecting the species and its habitat, (2) determining its present distribution and status, (3) identifying present and foreseeable threats, (4) conducting life history studies, and (5) developing plans to reintroduce the fish to its historic range. From the time of the species' listing through September 1987, FWS spent an estimated $252,231 on recovery efforts. Of this amount, $196,831 (or 78 percent) was spent before the recovery plan was approved. FWS did not have information on and did not provide estimates of other federal or state expenditures.

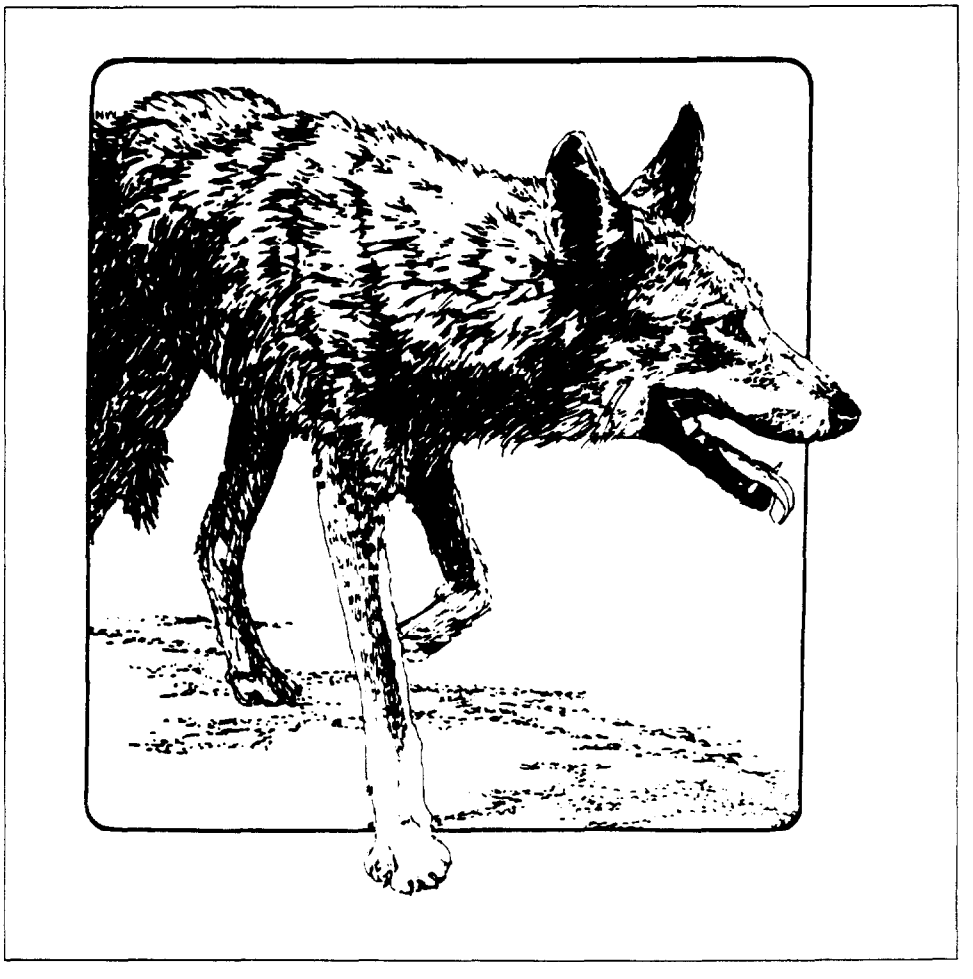
Recovery Progress

The spotfish chub has gradually declined since its listing. Although the recovery plan cites a goal of recovery, it also states that the species seems to be prone to extinction.

Red Wolf

The red wolf is a little-known North American canine whose social structure in the wild exhibits a strong family bond. Although the wolf will sometimes prey on domestic livestock, a 1972 study concluded that the red wolf is not a serious predator of cattle. The red wolf was once found in numerous areas throughout the southeastern United States, ranging from the Atlantic Ocean to central Texas and from the Gulf of Mexico to central Missouri and southern Illinois. However, by the early 1970s, the wolf was found only in limited numbers in small areas of southeast Texas and southwest Louisiana. The red wolf was listed as an endangered species on March 11, 1967.

Figure I.9: Red Wolf



Primary Threats

The primary threats to the red wolf are (1) loss of habitat, (2) predator control activities, (3) loss of young animals to parasites, and (4) a dilution of the species due to inbreeding with coyotes.

Recovery Plan

The red wolf recovery plan was approved on July 12, 1982. It was subsequently revised on September 18, 1984, and was updated in 1987. The ultimate goal of the revised recovery plan is to remove the red wolf from the threatened and endangered species list. According to the plan, recovery of the species will require establishing at least three viable, self-sustaining wild populations of 35 to 50 animals each. The primary means of recovery is establishing and maintaining a captive breeding stock to produce pure red wolves for reestablishing the species in the wild. The plan does not identify reclassifying the wolf to threatened status as a near-term objective.

The revised plan's estimated 3-year (fiscal years 1985-87) implementation cost was $279,000 for 4 of the plan's 16 tasks. The updated implementation schedule estimates a cost $563,000 for implementing 8 of the plan's 16 tasks in fiscal years 1988-90.

Recovery Actions

A limited red wolf recovery program was established in 1967. By late 1975, FWS concluded it was no longer feasible to preserve the red wolf gene pool in its limited range in Texas and Louisiana. Once that decision was made, the recovery program concentrated on capturing the remaining wolves to preserve the species in captivity and reestablish red wolf populations in selected areas of the species' historic range.

To date, FWS, the Tennessee Valley Authority (TVA), the American Association of Zoological Parks and Aquariums, the Point Defiance Zoo, and the 3M Corporation have initiated all of the 16 tasks in the revised red wolf recovery plan. These tasks include (1) establishing and maintaining captive breeding facilities, (2) evaluating and selecting release sites, (3) determining public relations aspects of reestablishing the wolf in the wild, and (4) reintroducing the red wolf in the wild on FWS lands in North Carolina.

As of September 30, 1987, an estimated total of $594,000 had been spent on recovery efforts. Table I.8 shows funding sources and estimated expenditures through September 1987.

Table I.8: Red Wolf Funding and Estimated Expenditures (Through September 1987)

Funding source	Expenditures: Preplan (7/73-6/82)	Expenditures: Postplan (7/82-9/87)	Total	Percent of total
FWS	$240,146	$300,854	$541,000	91
TVA	5,166	8,834	14,000	2
Other	21,375	17,625	39,000	7
Total	**$266,687**	**$327,313**	**$594,000**	**100**

Source: GAO compilation of FWS documents and estimates

Recovery Progress

At the time that FWS completed the capture of the animals in the mid 1970s, there were about 40 genetically pure red wolves. As of January 20, 1988, there were 91 red wolves, 6 of which had been reintroduced on FWS lands in North Carolina. Two other reintroduced wolves recently died. FWS still considers the reintroduction program a success and had, in fact, predicted that two or three of the wolves would be lost. During 1988, FWS plans to reintroduce eight additional wolves on FWS lands in North Carolina and to introduce a pair on a South Carolina island for breeding. In 1988, FWS will also evaluate a Mississippi island for use as a breeding site.

According to the red wolf project coordinator, it is hard to assess the overall progress of the red wolves' recovery. On the one hand, the captive breeding program has protected the species from possible extinction. On the other hand, fewer red wolves now exist in the wild than at the time of listing. If the reintroduction program proves to be successful, recovery of the species is possible.

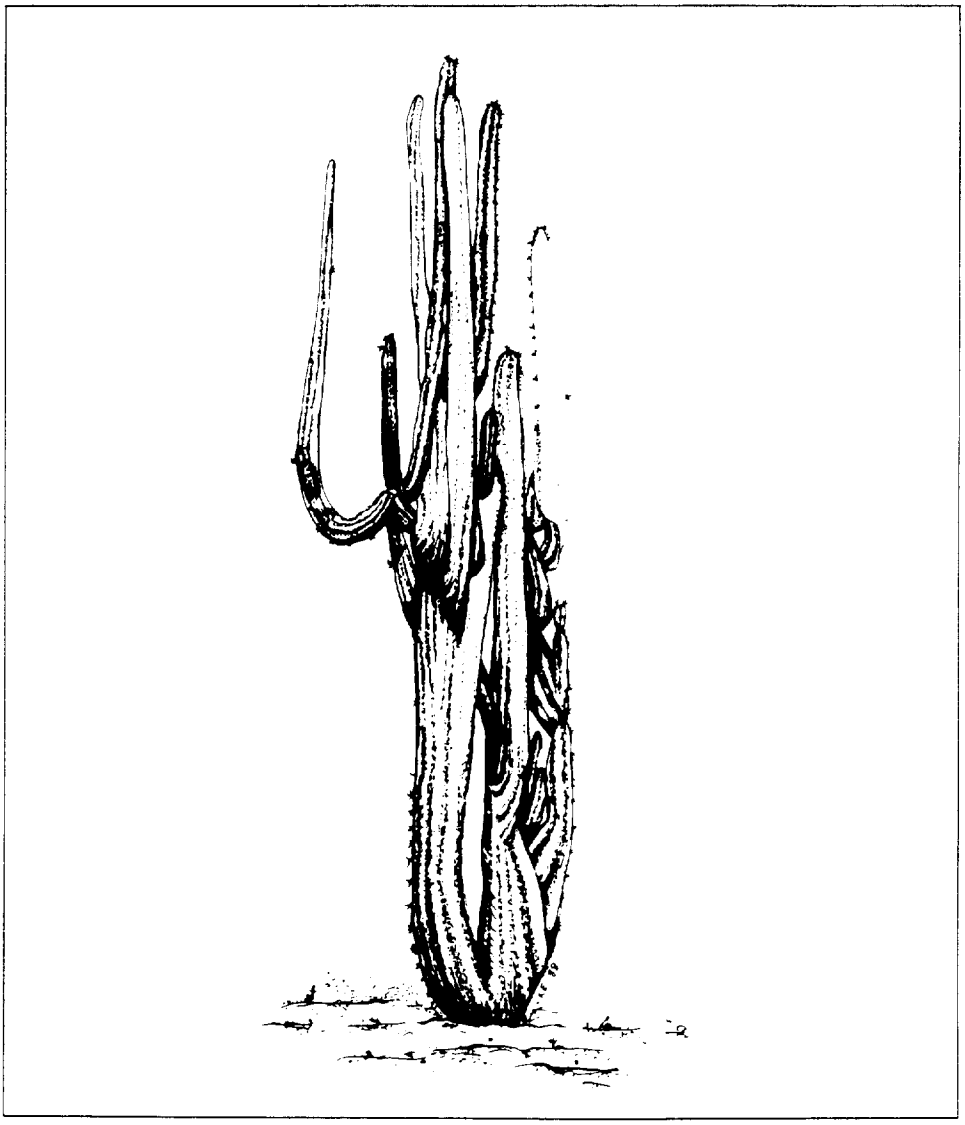
Special Concerns

According to the recovery plan, the biggest problem facing a successful red wolf introduction is the name "wolf." For example, an early 1980s' effort to reintroduce a population of red wolves on TVA land in Kentucky and Tennessee failed because of preconceived notions and fears concerning wolves. The red wolf project coordinator believes that future reintroduction will be successful if the public is adequately informed of the details of the project and of the plight and nature of the red wolf.

Key Tree-cactus

The key tree-cactus is the largest native Florida cactus. The plants either are unbranched, forming stiffly erect columns up to 10 meters tall, or are sparingly forked with the branches ascending closely parallel to the main stem. Upper branches produce flowers that open in the late afternoon and produce a garlic-like odor. Petals are green to purplish toward the outside, shading to white in the center. The cactus once existed on at least 11 sites in the Florida Keys and 2 in Cuba. Current estimates are that sites have decreased to five in the Florida Keys and to one in Cuba. On July 19, 1984, the species was listed as endangered.

Figure I.10: Key Tree-cactus



Primary Threats

Continuing degradation and destruction of habitat is the primary threat to the future existence of the cactus. By 1974, an estimated 50 percent of the tropical hardwood areas in South Florida where the cactus is found had been lost due to development activities. By 1986, nearly 90 percent of the habitat had been lost. Off-road vehicles, vandalism, and collecting also pose threats to the remaining cacti.

Recovery Plan

Approved on September 9, 1986, the recovery plan cites a goal of removing the species from the endangered and threatened list. According to the plan, the cactus could be considered recovered when 20 vigorous, self-sustaining populations are established at secure sites with a wide geographical distribution in the Florida Keys. The plan also provides criteria for reclassifying the cactus from endangered to threatened—when 10 vigorous, self-sustaining populations are established at secure sites within the Florida Keys. However, the plan states that these numerical goals are tentative and that the species is currently near extinction.

The estimated cost for the first 3 years of recovery actions was $118,000 for 26 of the 41 tasks identified in the recovery plan. The remaining 15 tasks had no cost estimates.

Recovery Actions

To date, FWS and Florida have initiated 11 of the plan's 41 recovery tasks. These tasks include (1) protecting existing population sites, (2) developing a plan to transplant the cactus to other suitable sites, and (3) land acquisition.

Of these, according to a FWS field supervisor, land acquisition has been the most significant recovery action initiated to date. While only one of the two FWS purchases were made specifically for the cactus, both acquisitions will be beneficial to the recovery effort.

The two tracts totaled about 128 acres and cost $2,357,870. From the time of the cactus' listing through September 1987, FWS spent an estimated $53,270 on recovery efforts exclusive of land acquisition. Of this amount, $29,770 was spent before the recovery plan was approved.

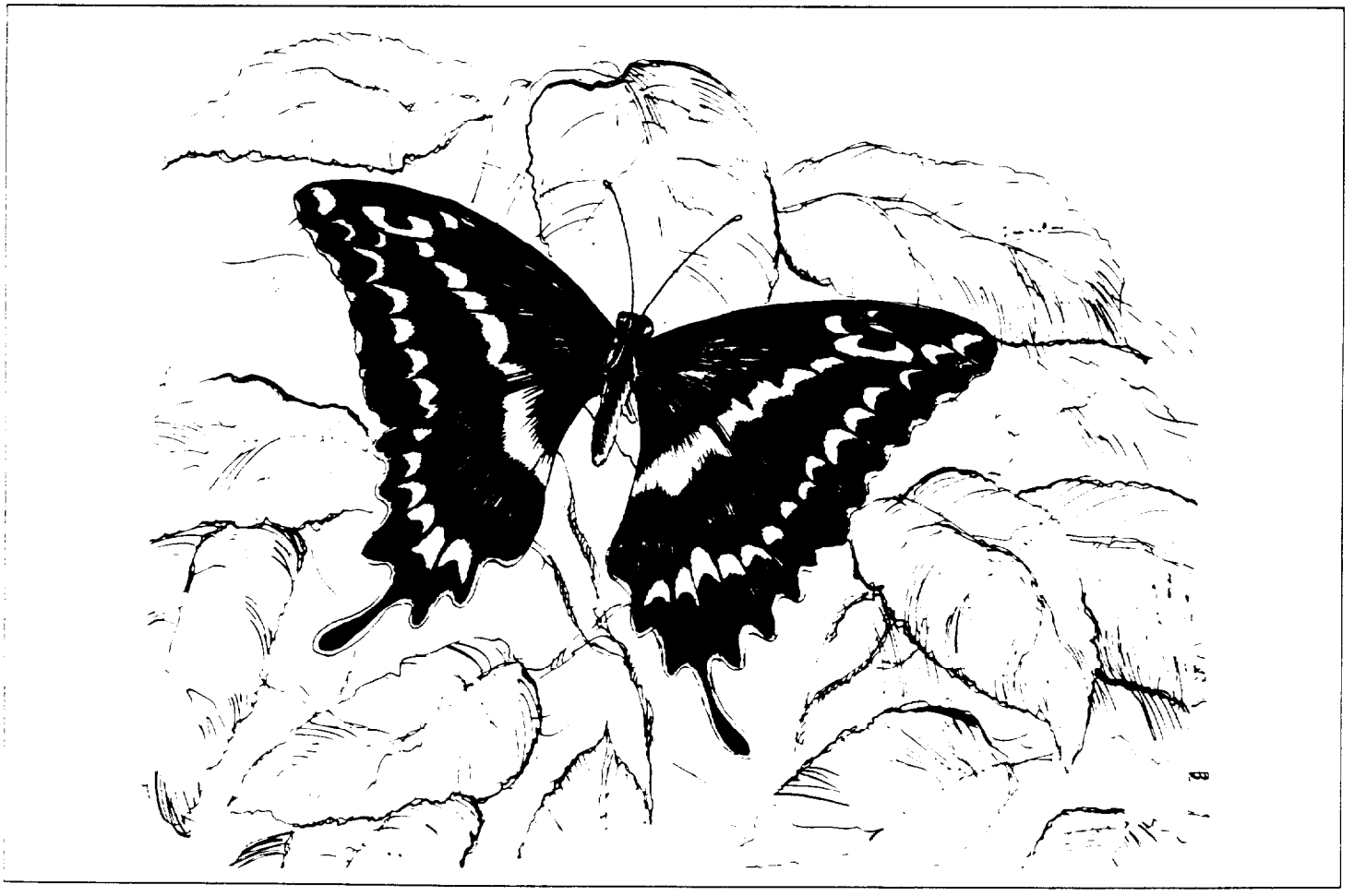
Recovery Progress

According to an FWS official, there has been no change in the status of the key tree-cactus since listing and it remains close to extinction.

Schaus' Swallowtail Butterfly

The Schaus' swallowtail is a large and colorful butterfly endemic to southern Florida. At the beginning of this century, it was found from the Miami area south to most of the upper Florida Keys. By 1924 it became extinct on the Florida mainland. During the 1970s, the butterfly was found only in Key Biscayne National Park and north Key Largo. On April 28, 1976, the species was listed as threatened. Because of its continuing decline in numbers and distribution, the butterfly was reclassified as endangered on August 31, 1984.

Figure I.11: Schaus' Swallowtail Butterfly



Primary Threats

One or more of the following four factors is believed to have caused the severe range restriction and population decline of the Schaus' swallowtail butterfly during this century: (1) aerial insecticide application, (2) over-collecting, (3) disruption and destruction of habitat, and (4) natural factors such as weather, predation, or parasitism. The spraying of insecticides for mosquito control and the loss of habitat are believed to have been the most influential factors in the species' decline.

Recovery Plan

Approved on November 17, 1982, the recovery plan's objective is to prevent extinction and reestablish colonies within the species' historic range. The plan does not contain specific population targets.

Because there were still many unknowns surrounding the butterfly's specific habitat requirements, factors affecting its numbers and distribution, and the population and distribution needed to ensure the butterfly's viability, the plan did not indicate when the species should be considered for removal from the threatened and endangered list. Rather, the plan recommended reclassifying the butterfly as endangered to reflect its true biological status and to afford it greater protection under the Endangered Species Act.

Because of the many unknowns surrounding the butterfly, the plan emphasized habitat protection and basic research. The estimated cost for the first 3 years of recovery was $82,500 for 6 of the 20 recovery plan tasks. The plan did not include cost estimates for the remaining 14 tasks.

Recovery Actions

To date, FWS, Florida, and other organizations have initiated 10 of the plan's 20 tasks. Initiated tasks include (1) restricting insecticide spraying, (2) status surveys, and (3) land acquisitions. According to an FWS field supervisor, while all actions have benefited the butterfly, the insecticide spraying restrictions reduced one of the greatest immediate threats to the species. Since 1980, FWS has been acquiring lands on north Key Largo for inclusion in the Crocodile Lake National Wildlife Refuge. These lands are within the butterfly's historic range. Since 1984, the Florida Department of Natural Resources has also been acquiring lands that should benefit the butterfly. Table I.9 shows funding sources and estimated expenditures (excluding land acquisitions) through September 1987.

Table I.9: Schaus' Swallowtail Butterfly Funding and Estimated Expenditures
(Through September 1987)

Funding source	Expenditures: Preplan (10/80-11/82	Expenditures: Postplan (12/82-9/87)	Total	Percent of total
FWS	$23,635	$109,895	$133,530	61
State	6,000	65,943	71,943	33
Other	•	12,000	12,000	6
Total	**$29,635**	**$187,838**	**$217,473**	**100**

Source: GAO compilation of FWS documents and estimates.

Recovery Progress

Although the butterfly was reclassified from threatened to endangered in 1984, the species' numbers have increased from an estimated 200 to 400 at the time of its 1976 listing to 1,200 to 1,400 in 1987. The increase in numbers is largely attributed to the restrictions placed on insecticide spraying.

Sonoran Pronghorn

The Sonoran pronghorn antelope has an historic range from southern Arizona through the northern part of the state of Sonora, Mexico. Currently, the species' U.S. range is southwest Arizona, with a few animals in northwestern Sonora, Mexico. The Sonoran pronghorn was listed on March 11, 1967, as an endangered species.

Figure I.12: Sonoran Pronghorn

Primary Threats

Primary threats to the Sonoran pronghorn are currently unknown but are being studied. Speculated threats include over-hunting and loss of habitat.

Recovery Plan

Approved on December 30, 1982, the Sonoran pronghorn recovery plan cited a long-term goal of removing the species from the threatened and endangered list. This could be accomplished after establishing a stable U.S. population of 300 animals. The plan's near-term goal was to maintain the existing population and distribution while developing techniques to increase them. Requirements for reclassifying the species as threatened were not stated in the plan. The estimated cost for the first 3 years of recovery actions was $550,000 for five of the seven recovery plan tasks. The recovery plan did not include cost estimates for the remaining two recovery tasks.

Recovery Actions

To date, FWS and other organizations have initiated five recovery plan tasks: (1) collecting data on the species' population and distribution, (2) protecting and managing the existing habitat, (3) assisting the Mexican government in establishing a management plan, (4) studying the taxonomic (scientific classification) status, and (5) studying the species' life history. The first four tasks were initiated before the recovery plan was approved; the last was initiated afterward. The organizations that funded and/or performed these tasks were FWS, the Arizona Game and Fish Department, the Department of Defense (DOD), the Forest Service, the Bureau of Land Management (BLM), and a private organization.

As of September 30, 1987, an estimated total of $150,900 had been spent on three recovery tasks. FWS officials could not provide expenditure information on the two other initiated tasks. Table I.10 shows funding sources and estimated expenditures through September 1987.

Table I.10: Sonoran Pronghorn Funding and Estimated Expenditures (Through September 1987)

Funding source	Expenditures: Preplan (10/72-12/82)	Expenditures: Postplan (1/83-9/87)	Total	Percent of total
FWS	$71,511	$30,300	$101,811	67
DOD	5,400	15,000	20,400	14
Forest Service	525	0	525	<1
BLM	960	0	960	1
State	14,204	8,000	22,204	15
Private	0	5,000	5,000	3
Total	**$92,600**	**$58,300**	**$150,900**	**100**

Source: GAO compilation of FWS documents and estimates

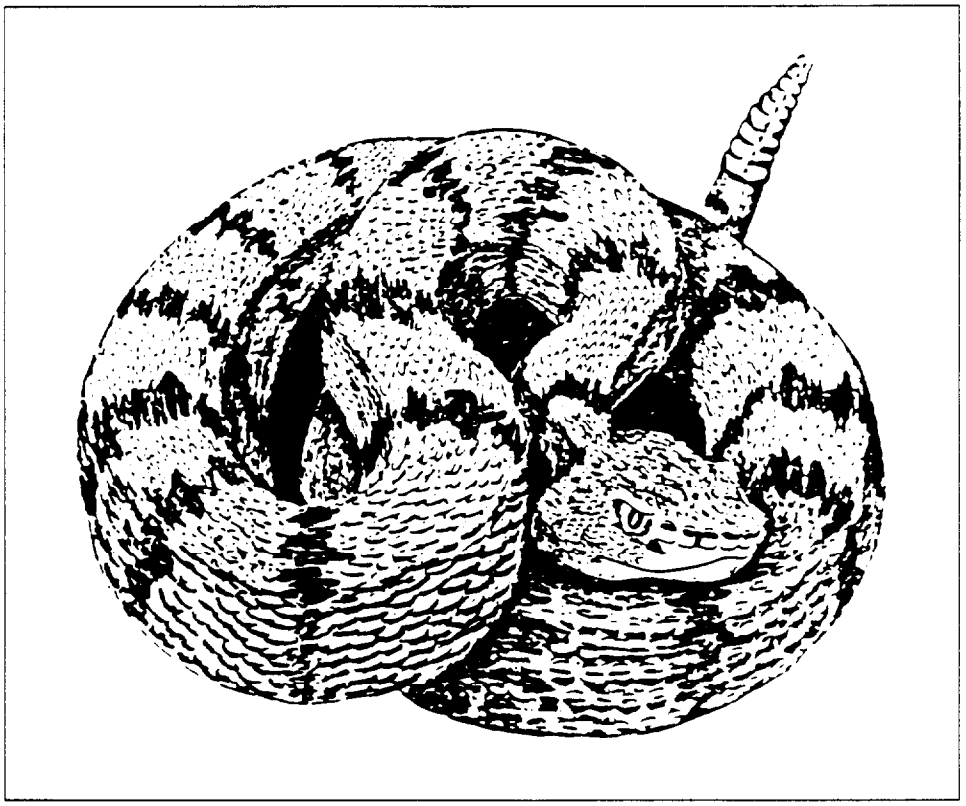
Recovery Progress

Since its March 1967 listing as endangered, the pronghorn species is thought to have remained stable in number with an estimated U.S. population of 50 to 150 animals.

New Mexico Ridgenose Rattlesnake

The New Mexico ridgenose rattlesnake is found in the Animas Mountains of southwestern New Mexico and the adjacent Sierra San Luis of Chihuahua, Mexico. This subspecies is considered an "island species" because geological changes over many years have severely restricted its habitat area. The New Mexico ridgenose rattlesnake was listed on August 4, 1978, as a threatened species.

Figure I.13: New Mexico Ridgenose Rattlesnake



Primary Threats

The primary threat to the New Mexico ridgenose rattlesnake is collecting. Excessive cattle grazing, mining, wood harvesting, and other development activities that alter the rattlesnake's habitat also threaten the subspecies. Natural threats include predation, starvation, and disease.

Recovery Plan

Approved on March 22, 1985, the New Mexico ridgenose rattlesnake recovery plan cited a goal of ensuring the subspecies' survival. Recovery is not considered a realistic goal because of the subspecies' restricted distribution and limited habitat. The plan's estimated cost for the first 3

years of recovery actions was $132,000 for 19 of the 22 recovery plan tasks. The plan did not contain cost estimates for the remaining three tasks. The estimates represent only FWS costs.

Recovery Actions

FWS, the New Mexico Department of Game and Fish, and the Bureau of Land Management have funded and/or initiated 5 of the recovery plan's 22 tasks. Initiated tasks include (1) establishing a cooperative agreement with a habitat landowner, (2) surveying suitable habitats, (3) clarifying the taxonomic (scientific classification) status of the subspecies, and (4) enforcing state and federal laws protecting wildlife. Although the land ownership has since changed and a new memorandum of agreement has not been signed, the current landowner is cooperating by restricting access to the area in which the New Mexico ridgenose rattlesnake is known to exist.

Between the animal's 1978 listing and September 30, 1987, an estimated total of $30,001 had been spent on two recovery tasks. FWS did not estimate the costs for the other three initiated tasks. An additional $9,650 was spent by FWS and New Mexico on survey efforts prior to the rattlesnake's 1978 listing. Table I.11 shows funding sources and estimated expenditures from the listing date through September 1987.

Table I.11: New Mexico Ridgenose Rattlesnake Funding and Estimated Expenditures (Through September 1987)

	Expenditures			
Funding source	**Preplan (8/78-3/85)**	**Postplan (4/85-9/87)**	**Total**	**Percent of total**
FWS	0	$9,001	$9,001	30
BLM	$18,000	0	18,000	60
State	0	3,000	3,000	10
Total	**$18,000**	**$12,001**	**$30,001**	**100**

Source: GAO compilation of FWS documents and estimates

Recovery Progress

The current population of the New Mexico ridgenose rattlesnake is unknown. The population is difficult to count because the subspecies is very hard to find and weather conditions affect the probability of sightings. However, the subspecies is thought to have remained stable since its August 1978 listing because collecting was deterred by restricting access to the rattlesnake's habitat area.

Black-footed Ferret

The black-footed ferret, the only ferret native to North America, has a historic range extending from Saskatchewan and Alberta, Canada, to the states of Texas, New Mexico, and Arizona. The species' current range is believed to be considerably reduced, if not entirely absent in the wild. A black-footed ferret population found in 1981 in Meeteetse, Wyoming, is the only one currently known to exist; that population is now in captivity. The black-footed ferret was listed on March 11, 1967, as an endangered species.

Figure I.14: Black-footed Ferret

Primary Threats

The primary threat to the black-footed ferret is the reduction and local eradication of the prairie dog population, the ferret's primary food source. In addition, the species' scarcity has hampered biologists' efforts

to learn more about the species and to base recovery efforts on that knowledge.

Recovery Plan

Approved on June 14, 1978, the black-footed ferret recovery plan cited a primary objective of maintaining at least one wild, self-sustaining population of black-footed ferrets in each of the 12 states within the species' historic range. Attainment of this objective will not necessarily result in removing the species from the endangered and threatened list but will provide protection against extinction. The plan's estimated cost for the first 3 years of recovery actions was $3,555,700 for 33 of the 50 recovery plan tasks. The plan did not provide cost estimates for the remaining 17 tasks.

FWS is currently revising the black-footed ferret recovery plan. A draft plan was submitted for agency comments in January 1988, and the final plan is expected this year.

Recovery Actions

To date, FWS and other entities have initiated 42 of the recovery plan's 50 tasks. The initiated tasks fall into the following seven general categories: (1) inventorying potential black-footed ferret habitats (three tasks initiated); (2) inventorying known black-footed ferret populations (five tasks initiated); (3) managing habitats (nine tasks initiated); (4) managing ferret populations (three tasks initiated); (5) conducting informational and educational activities (three tasks initiated); (6) researching the species (14 tasks initiated); and (7) studying and managing ferret propagation (five tasks initiated). Ten of the 42 tasks were initiated before the recovery plan was approved, some as early as 1966.

Many organizations have been involved in funding and implementing recovery tasks. FWS has provided recovery, research, and state grant funding. Also involved in funding have been the Bureau of Land Management, eight states, and at least 16 private organizations within the conservation community, including the Wildlife Preservation Trust International, the New York Zoological Society, and the World Wildlife Fund. (Each of the latter three has provided about $60,000 in funding.) Further, highly qualified people have volunteered much of their time to black-footed ferret studies.

As of September 30, 1987, an estimated $3,175,717 had been spent since fiscal year 1973 on recovery efforts. Table I.12 shows funding sources and estimated expenditures from July 1972 through September 1987.

Table I.12: Black-footed Ferret Funding and Estimated Expenditures (Through September 1987)

	Expenditures			
Funding source	**Preplan (7/72-5/78)**	**Postplan (6/78-9/87)**	**Total**	**Percent of total**
FWS	$373,889	$2,005,314	$2,379,203	75
BLM	0	190,900	190,900	6
States	13,671	340,165	353,836	11
Private	23,580	228,198	251,778	8
Total	**$411,140**	**$2,764,577**	**$3,175,717**	**100**

Source: GAO compilation of FWS documents and estimates

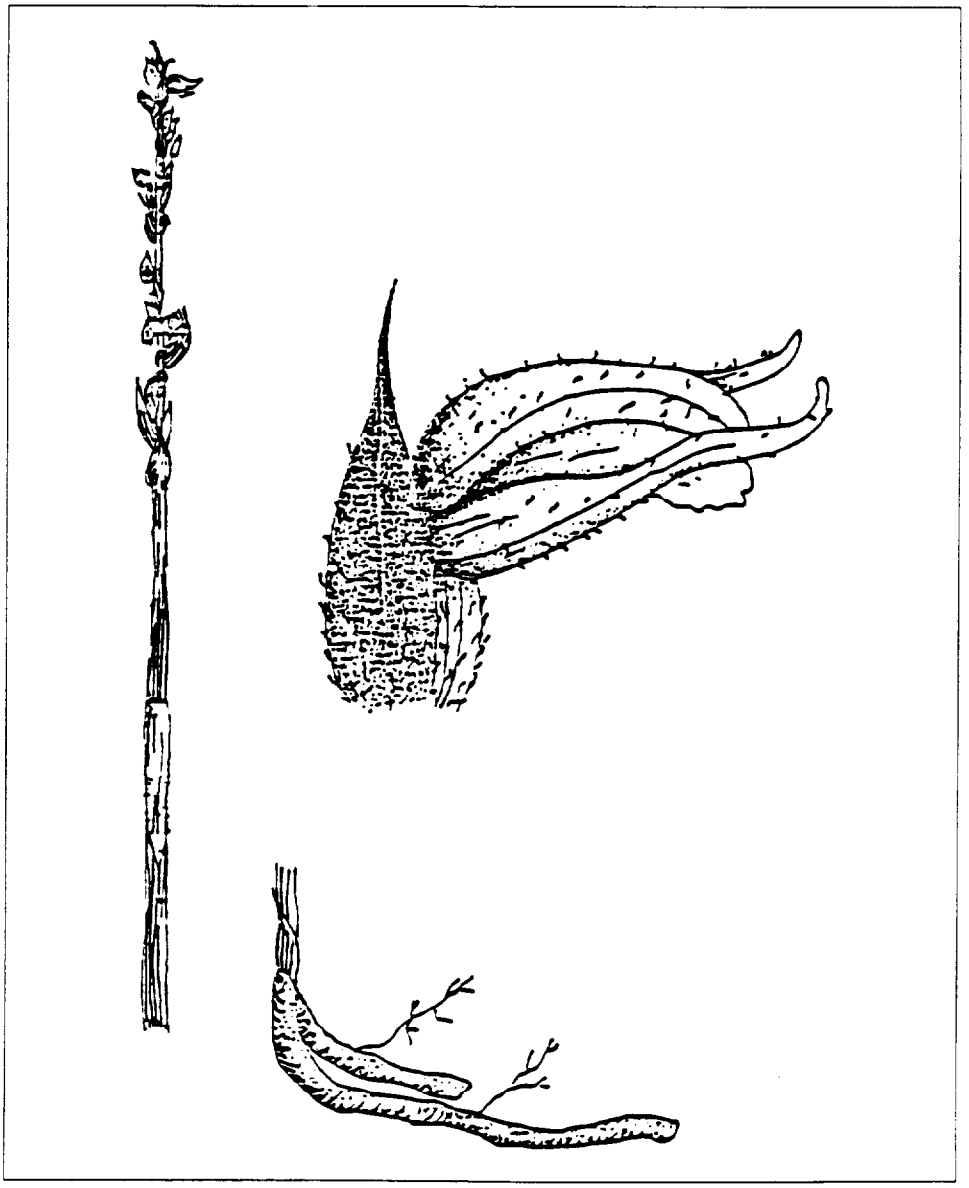
Recovery Progress

At the time of the plan's approval, the number of existing ferrets was unknown. Currently, the only known population is in captivity. A small population discovered in South Dakota in 1964 had died by 1974. A wild population identified in 1981 in Meeteetse, Wyoming, had an estimated population ranging from 59 ferrets in 1982 to 129 ferrets in 1984. However, canine distemper diminished much of that population in 1985, at which time the Wyoming Game and Fish Department began captive breeding efforts. Currently, a captive population of 25 animals exists at the Sybille Wildlife Research Unit. This population consists of 18 animals captured at Meeteetse and 7 young ferrets (the first to be born in captivity) born in 1987. Although additional ferrets are suspected of existing in the wild, and recovery efforts encourage people to report any sightings, no other populations have been confirmed. The success of captive breeding is considered essential for the black-footed ferret's survival.

Navasota Ladies' Tresses

The Navasota ladies' tresses is a small, white-flowered orchid and is considered to be the rarest one in North America. The species was originally discovered in 1945 in one Texas county and is currently found in four Texas counties. The Navasota ladies' tresses was listed on May 6, 1982, as an endangered species.

Figure I.15: Navasota Ladies' Tresses



Primary Threats

Three primary threats to the Navasota ladies' tresses are (1) human modification of the habitat as a result of urban development and mining, (2) collection by orchid fanciers, and (3) artificial maintenance of the habitat. Because the species may require natural environmental disruptions such as fire or grazing, complete protection of the habitat could potentially threaten the species.

Recovery Plan

Approved on September 21, 1984, the Navasota ladies' tresses recovery plan cites a goal of reclassifying the species as threatened once two safe sites are established. The plan's near-term objective is to protect the species' habitat until more is known about stabilization measures. Because of the species' small numbers and limited range, removal from the endangered and threatened list is not deemed feasible in the foreseeable future. The plan's estimated cost for the first 3 years of recovery actions was $146,000 for 10 of the 12 recovery plan tasks. The remaining two tasks did not have cost estimates. The estimates cover only FWS' costs.

Recovery Actions

The three recovery efforts initiated to date have focused on protecting the known populations of Navasota ladies' tresses. To meet agreements resulting from consultations with FWS, area utility companies initiated several recovery plan tasks. These included surveying, developing a management plan for one safe site, and studying species' propagation and relocation dynamics. In addition to these activities, FWS contracted one survey effort before the recovery plan was approved, and the Institute of Museum Services funded an additional propagation study. Table I.13 shows funding sources and estimated expenditures through September 1987.

Table I.13: Navasota Ladies' Tresses Funding and Estimated Expenditures
(Through September 1987)

	Expenditures			
Funding source	**Preplan (10/83-9/84)**	**Postplan (10/84-9/87)**	**Total**	**Percent of total**
FWS	$1,000	$0	$1,000	1
Other	0	127,719	127,719	99
Total	**$1,000**	**$127,719**	**$128,719**	**100**

Source: GAO compilation of FWS documents and estimates.

Recovery Progress

Approximately 26 Navasota ladies' tresses plants were identified at the time the species was listed as endangered in 1982. Additional surveys have identified a current population of about 2,000. However, an FWS

botanist believes that the actual number of plants may be higher. Nonetheless, the recovery plan states that it is likely that the plant will require protection under the act in the foreseeable future.

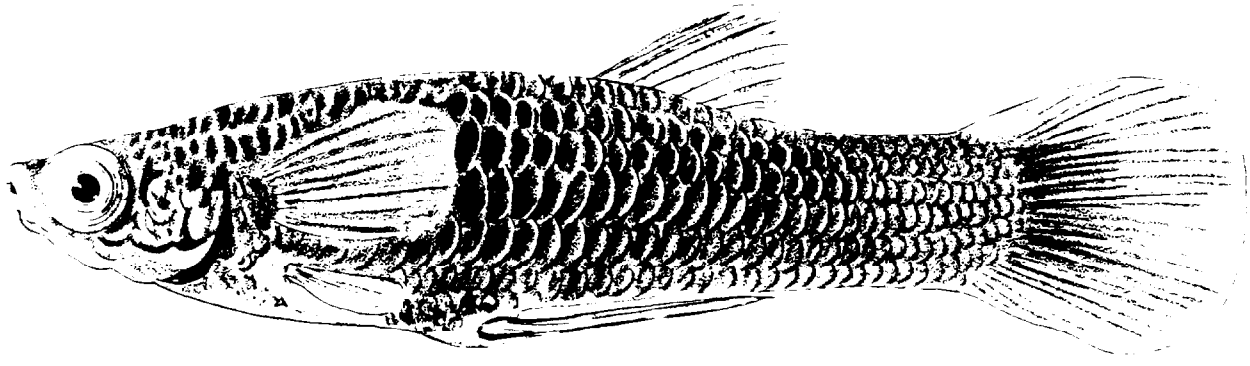
Special Concerns

All known populations of Navasota ladies' tresses are located on private land. Thus, habitat protection requires the private landowners' support. For example, in 1987 FWS found that a landowner cleared an area containing the plants to provide visibility to his business.

Gila Topminnow

The Gila topminnow is a small, live-bearing fish with a historic range in the Gila River system of Arizona, New Mexico, and northern Mexico. Currently, the species' range is south-central and eastern Arizona. The Gila topminnow was listed on March 11, 1967, as an endangered species.

Figure I.16: Gila Topminnow



Primary Threats

Primary threats to the Gila topminnow include (1) habitat loss and destruction and (2) nonnative predatory fish.

Recovery Plan

Approved on March 15, 1984, the Gila topminnow recovery plan cited a long-term goal of removing the species from the threatened and endangered list. According to the plan, the species will be removed when either (1) 50 populations have been successfully reestablished in the wild, within the historic range, and have survived for at least 3 years or (2) 30 populations have been successfully reestablished and have survived for at least 5 years. The plan's near-term goal was to reclassify the species as threatened when 20 populations had been successfully reestablished in the wild, within the historic range, and had survived for at least 3 years. The estimated cost for the first 3 years of recovery actions was $279,900 for 21 of the 25 recovery plan tasks. The plan did not include cost estimates for the remaining four tasks.

Recovery Actions

To date, FWS, the Arizona Game and Fish Department, the Forest Service, the Bureau of Land Management, and Arizona State University have initiated 13 recovery plan tasks. These include (1) monitoring populations, (2) managing habitat, (3) preventing invasion by nonnative

fish, (4) maintaining stocks of Gila topminnows at Dexter National Fish Hatchery, and (5) reintroducing Gila topminnows into the historic range. Eleven of the 13 recovery tasks were initiated before the recovery plan was approved. Table I.14 shows funding sources and estimated expenditures through September 1987.

Table I.14: Gila Topminnow Funding and Estimated Expenditures (Through September 1987)

Funding source	Expenditures: Preplan (10/72-3/84)	Expenditures: Postplan (4/84-9/87)	Total	Percent of total
FWS	$12,575	$16,332	$28,907	26
Forest Service	35,600	1,000	36,600	34
BLM	3,375	4,600	7,975	7
State	25,575	9,468	35,043	32
Other	375	200	575	1
Total	**$77,500**	**$31,600**	**$109,100**	**100**

Source: GAO compilation of FWS documents and estimates.

Recovery Progress

Since its March 1967 listing as endangered, the Gila topminnow species has increased from 9 to 43 populations (33 reintroduced populations and 10 natural ones). Because the plan's criterion for reclassifying the species as threatened has been met, FWS plans to reclassify the topminnow this year.

North Park Phacelia

The North Park phacelia is a flowering biennial or short-lived perennial plant with a historic and current range in the North Park region of Colorado. The North Park phacelia was listed on September 1, 1982, as an endangered species.

Figure I.17: North Park Phacelia

Primary Threats

Primary threats to the North Park phacelia and its habitat include (1) motorcycle and off-road vehicle activity, (2) livestock grazing and trampling, and (3) coal, oil, and gas development.

Recovery Plan

Approved on March 21, 1986, the North Park phacelia recovery plan cites a long-term goal of removing the species from the threatened and endangered list after securing 15 populations, each with 500 mature flowering plants. The species may be considered for reclassification to threatened when five populations are secured. The estimated cost for the first 3 years of recovery actions was $66,600 for 17 of the 24 recovery plan tasks. The recovery plan did not include cost estimates for the remaining seven recovery tasks.

Recovery Actions

To date, FWS, the Colorado Natural Areas Program, and the Bureau of Land Management have initiated 8 of the 24 recovery plan tasks. The initiated tasks include (1) conducting field surveys, (2) monitoring known occurrences of the population, (3) studying reproductive biology, and (4) writing a habitat management plan. Three of the eight recovery plan tasks were initiated before the recovery plan was approved.

As of September 30, 1987, an estimated total of $19,135 had been spent on recovery efforts. Table I.15 shows funding sources and estimated expenditures through September 1987.

Table I.15: North Park Phacelia Funding and Estimated Expenditures (Through September 1987)

	Expenditures			
Funding source	**Preplan (9/82-3/86)**	**Postplan (4/86-9/87)**	**Total**	**Percent of total**
FWS	$8,041	$5,425	$13,466	70
BLM	600	400	1,000	5
State	2,961	1,708	4,669	24
Total	**$11,602**	**$7,533**	**$19,135**	**99[a]**

[a]Total is less than 100 percent due to rounding

Source: GAO compilation of FWS documents and estimates

Recovery Progress

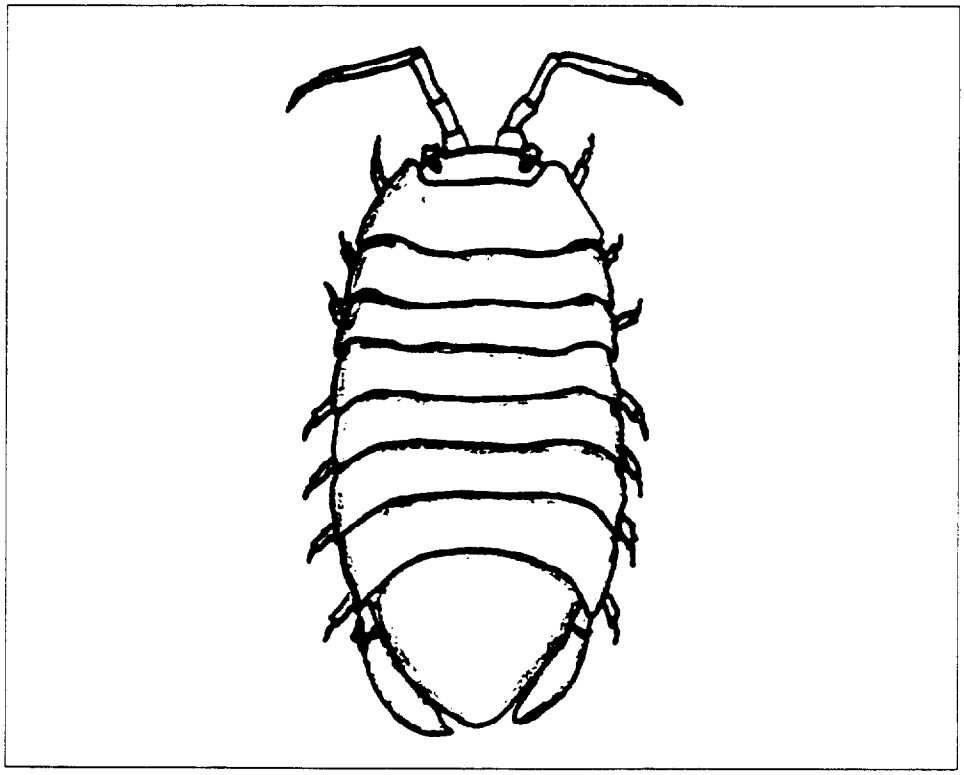
Since its September 1982 listing as endangered, the North Park phacelia species has increased from seven populations to nine verified populations plus one unverified site. Although the species is on an upward trend due to the additional populations, the number of individual plants

within the populations has remained stable. Most of the populations consist of fewer than 20 individual plants.

Socorro Isopod

The Socorro isopod is a tiny, aquatic crustacean distantly related to the common terrestrial "roly poly" found in many yards and gardens. The species is endemic to three warm springs in New Mexico, but it now exists in the small flow of one stream in a 1 by 2 meter cement horse-watering trough and in approximately 40 meters of open irrigation pipe. A second, captive population is maintained at the University of New Mexico. The Socorro isopod was listed on March 27, 1978, as an endangered species.

Figure I.18: Socorro Isopod



Primary Threats

The primary threat to the Socorro isopod is loss of habitat due to municipal and private water development. Because the isopod's current habitat is located on private land and the landowner is unsympathetic to the species' endangerment, the species' status is deemed "very precarious."

Recovery Plan

Approved on February 16, 1982, the Socorro isopod recovery plan cites a long-term goal of reclassifying the species as threatened after at least

two additional wild populations and all three populations are stable and protected. The plan's near-term goal is to prevent the species' extinction by stabilizing and enhancing the existing habitat. The estimated cost for the first 3 years of recovery actions was $69,000 for 13 of the 17 recovery plan tasks. The plan did not show cost estimates for the remaining 4 tasks.

Recovery Actions

To date, FWS and the New Mexico Game and Fish Department have initiated 6 of the recovery plan's 17 tasks: (1) monitoring the existing populations, (2) maintaining captive populations, (3) enforcing laws protecting the species, (4) expanding the current habitat, (5) acquiring additional flows of water, and (6) disseminating information about the species. The first three tasks were begun before the recovery plan was approved, while actions related to the other three tasks began the year the plan was approved. Also, the University of New Mexico has studied captive populations.

Between the species' 1978 listing and September 30, 1987, an estimated total of $28,227 had been spent on three recovery plan tasks. FWS could not estimate the costs for the other three tasks. (The New Mexico Game and Fish Department had spent an additional $3,225 prior to the listing date.) Table I.16 shows funding sources and estimated expenditures from the listing date through September 1987.

Table I.16: Socorro Isopod Funding and Estimated Expenditures (Through September 1987)

	Expenditures			
Funding source	**Preplan (4/78-2/82)**	**Postplan (3/82-9/87)**	**Total**	**Percent of total**
FWS	$400	$10,210	$10,610	38
State	4,706	12,911	17,617	62
Total	**$5,106**	**$23,121**	**$28,227**	**100**

Source: GAO compilation of FWS documents and estimates.

Recovery Progress

In 1976 and 1977, the Socorro isopod population was estimated at about 2,400, and no counts have since been published. Although the current population is unknown, it is thought to have remained stable since the listing date. In addition, after several attempts, a captive population was successfully established in 1983.

Special Concerns

At least five recovery plan tasks have been indefinitely delayed because (1) lack of landowner cooperation has restricted management of the current site and (2) plans to establish another site were cancelled because of a new FWS policy prohibiting site establishment outside a species' historic range.

Comments From the Department of Commerce

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Administration
Washington D C 20230

SEP 2 1 1988

Mr. John H. Luke
Associate Director
Resources, Community and
Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Luke:

This is in reply to GAO's letter of August 22, 1988, requesting comments on the draft report entitled "Endangered Species: Management Improvements Could Enhance Recovery Program."

We have reviewed the enclosed comments of the Under Secretary for Oceans and Atmosphere and believe they are responsive to the matters discussed in the report.

Sincerely,

Kay Bulow
Assistant Secretary
for Administration

Enclosure

75 Years Stimulating America's Progress ★ 1913-1988

UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary for
Oceans and Atmosphere
Washington, D.C. 20230

SE-

Mr. John H. Luke
Associate Director
Resources, Community and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Luke:

Thank you for your letter requesting the Department's comments on the draft General Accounting Office report entitled "ENDANGERED SPECIES: Management Improvements Could Enhance Recovery Program."

Measuring the success of a recovery program is extremely difficult because each species represents a unique case. Many of the factors affecting species are unknown or are beyond the control of the Federal Government. In some cases, slowing the rate of decline while investigating the factors affecting the species may, in the short term, be the best that can be done. Also, limited funding restricts actions that can be taken. I believe we have made important progress in our recovery efforts, but agree that certain changes would enhance our overall program.

The report provides useful guidance on managing and tracking the recovery process. Maintaining centralized data on species, plan implementation, and funding would be useful in evaluating the success of recovery programs and in planning future actions. Maintaining updated recovery plans and following an established priority system would help ensure limited funds are appropriately used. Your specific recommendations are discussed below.

Measuring Recovery Program Success

Up-to-date trend data for species provide a better measure of the success of a recovery program than the number of species listed, delisted, or reclassified. The problems faced by most species are complex, making recovery a slow and difficult process. I agree that maintaining centralized information on the status of all listed domestic species would be beneficial. Therefore, we will evaluate the type of system that can be developed and maintained within our available budget.

75 Years Stimulating America's Progress ★ 1913-1988

THE ADMINISTRATOR

Recovery Plans Have Not Been Developed Or Implemented For Many Species

National Oceanic Atmospheric Administration is placing a higher priority on developing recovery plans than in the past. In 1989, we will complete plans for the right and humpback whales. We also plan to begin development of at least one recovery plan each year and to review and update other plans as necessary.

Since systematic tracking of recovery plan implementation is important for the effective management and success of a recovery program, I agree that a tracking system of all initiated recovery activities, identified by recovery plan task number and cost, should be maintained. We are drafting recovery planning guidelines which will address, among other things, reporting and tracking of the status of recovery actions.

Established Guidelines And Priority Systems Should Be Followed Or Amended

NOAA believes that following an established priority system will allow the most effective use of the limited resources available. Our proposed listing and recovery priority guidelines, currently at the Office of Management and Budget for clearance, will be published shortly in the Federal Register for public comment. Although annual review may not be necessary, I agree that recovery plans should be periodically reviewed and updated and contain appropriately classified high-priority task designations. The recovery planning guidelines will address allocation of funds, approval of plans and priority designations, and periodic review and updates of plans. Draft guidelines are expected to be available for public review next year.

We appreciate this opportunity to comment on the draft report.

Sincerely,

William E. Evans

The following are GAO's comments on the Department of Commerce's letter dated September 21, 1988.

GAO Comments

1. Commerce agreed that following an established priority system will allow the most effective use of the limited recovery resources available and expects its draft recovery planning guidelines to be available for public review next year. While Commerce's letter stated that the guidelines will address allocation of funds, it did not respond to our concern about confusing language in its draft guidelines. The guidelines do not explain how the priority system can recognize species approaching recovery while at the same time give priority to the most endangered species. We believe that prior to releasing the guidelines for public review, Commerce should resolve this apparent contradiction.

Comments From the Department of the Interior

Note GAO comments supplementing those in the report text appear at the end of this appendix.

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240
October 4, 1988

Mr. James Duffus III
Associate Director, Resources, Community, and
Economic Development Division
General Accounting Office
Washington, D.C. 20548

Dear Mr. Duffus:

This responds to your August 22, 1988, letter to Secretary Hodel, asking the Department of the Interior to provide comments on the General Accounting Office's draft report entitled "Endangered Species: Management Improvements Could Enhance Recovery Program," (Report No. GAO/RCED-88-185).

See comment 1.

The Department of the Interior (Department) disagrees with the General Accounting Office's interpretation of the responsibilities of the Secretary of the Interior for developing and implementing recovery plans. Those responsibilities are set forth in section 4(g) of the Endangered Species Act (Act), as amended. The Secretary is charged with giving priority to species most likely to benefit from recovery plans "...to the maximum extent practicable..." (emphasis added). The Department believes this provision was inserted by the Congress to guide the Secretary's efforts and to provide reasonable flexibility in formulating and administering recovery programs.

In this context, the Department has administered its endangered species recovery program within the requirements and intent of section 4(g). The program's goal has been to give priority to species that would benefit most from Federal assistance, to undertake actions that would best serve those species, and to balance the opportunities and challenges of implementing recovery programs against the prescriptions of recovery plans and priority systems developed earlier under less dynamic conditions. The Department has always maintained that this balanced approach is what the Congress envisioned when it crafted section 4(g).

Furthermore, the Department (through the Fish and Wildlife Service) has formally discussed this approach in the Federal Register and invited comments. On September 21, 1983, the Fish and Wildlife Service (Service) published Endangered and Threatened Species Listing and Recovery Priority Guidelines in the Federal Register (Vol. 48, No. 184, pp. 43098-43105). Under the subtitle of Supplementary Information, the Service stated:

> "The Service recognizes that it is necessary to assign priorities to listing, delisting, reclassification, and recovery actions in order to make the most appropriate use of the limited resources available to implement the Act. The following priority systems are based on an analysis of such factors as degree and immediacy of threat faced by a

species, needs for further information, and species' recovery potentials. Inasmuch as such assessments are subjective to some degree, and individual species may not be comparable in terms of all considerations, the priority systems presented must be viewed as guides and should not be looked upon as inflexible frameworks for determining resource allocations" (emphasis added).

The Department believes that differences of opinion concerning implementation of the endangered species recovery program may be traced to differences in perspective regarding section 4(g) of the Act. The Department is proud of its implementation of the program and at the same time recognizes that opportunities exist to make the program even stronger. These opportunities are being pursued as vigorously as possible, with a keen sensitivity toward the requirements of the Act, Congressional directives and appropriations, and the partnership that the Federal Government shares with State and local governments, the private sector, and the public in protecting and recovering endangered species. The Secretary is administering the recovery program with the flexibility necessary to reflect the proper importance of these factors in shaping program implementation.

The Department recognizes the benefits that may accrue to listed species as a result of achieving public support and acceptance of the recovery program. If successful results are measured solely on the basis of the number of species recovered and subsequently removed from the Endangered and Threatened Species Lists, it may prove difficult to gain public confidence in the Service's management of the recovery program. The Service believes there are numerous examples of recovery actions taken that have improved the status of listed species, short of fully achieving the goals and objectives as stated in recovery plans. To effect a better public awareness and acceptance of the Service's recovery efforts, these accomplishments should be recognized. To this end, the Department agrees with the draft report's conclusion that trends in the status of listed species may provide a better measure of recovery program success. As indicated in the enclosure, a centralized status trend database will be developed to monitor species movements toward or away from recovery.

The Department appreciates the opportunity to comment on the Office's draft. Specific comments concerning conclusions and recommendations in the report are enclosed.

Sincerely,

Acting Assistant Secretary for Fish and Wildlife and Parks

Enclosure

Fish and Wildlife Service's Response to
Conclusions and Recommendations in the
General Accounting Office's Draft Report on the
Endangered Species Recovery Program

The draft report of the General Accounting Office (Office) contains specific conclusions and recommendations concerning the endangered species recovery program of the Fish and Wildlife Service (Service). Those conclusions appear verbatim below, along with the Service's responses.

1. The Service does not maintain centralized information of species movements toward or away from recovery.

See comment 2.

The draft report states that "...centralized trend data would provide program managers with a better performance indicator by which to gauge program successes. Measured against the logical, absolute standard, the small number of domestic species officially declared recovered would suggest that the program has been of limited success in recovering species."

The Service agrees with the stated conclusion but not with its implications for assessing the success of the recovery program. If the success of the recovery program is measured in terms of the number of species actually recovered to the point where they are delisted, a likely conclusion (based on the small number of delisted species) may be that the recovery program has not been successful. However, the Service believes that there are more appropriate ways to determine the program's success. The population and range have decreased over a long period of time, and it is unreasonable to expect that improvements in status resulting from positive recovery actions will take place quickly. Therefore, trend data for listed species are probably a more accurate index of the success of recovery programs than actual delistings (or reclassifications from endangered to threatened).

The Service is currently field-testing an automated Endangered Species Information System adaptable to maintaining current status information for listed species. It is impractical and prohibitively costly to complete systematic, detailed status surveys for each listed species each year. Thus, beginning in FY 1989, the system would assign listed species to status categories (Improving, Stable, Declining, Unknown, Extinct) similar to those used in Table 2.1 of the draft report.

2. The Service is not systematically tracking undertaken recovery tasks.

The draft report contends that a centralized tracking system would promote additional effectiveness and accountability in the recovery program. The report's authors determined that the Regional and field offices maintain files containing various pieces of information on activities associated with listed species but that these files are incomplete, do not relate accomplishments to recovery plans, and rarely contain cost information. The draft report also recognized that the

Service attempted to develop an automated recovery implementation tracking system in 1983, but that funding shortfalls and the "press of other work" resulted in abandoning all tracking efforts by 1985.

See comment 3.

The Service agrees that a more systematic tracking of recovery activities and expenditures could improve the effectiveness and accountability of the recovery program. However, the Service questions the feasibility and utility of developing a detailed cost accounting of recovery implementation expenditures. Dividing staff time into increments by species, and identifying precise recovery task activity elements implemented by the various Service program areas (Endangered Species, Research, Refuges, etc.) may prove extremely costly and inconclusive for determining accurate allocations of recovery resources. Similar to our comments on tracking and updating individual species populations, the Service recognizes the benefits of developing a recovery implementation tracking system, but favors a system designed to provide information about general funding trends and recovery plan accomplishments rather than detailed accounts of the costs of specific recovery tasks, species-by-species. The Service is completing development and will implement this general information system in FY 1989 and it should be valuable in determining the extent to which investments in recovery actions accomplish goals and objectives in recovery plans. The Service intends to examine the Endangered Species Information System to determine the feasibility of modifying that existing database to include tracking recovery plan implementation.

3. The Service is not adhering to the established priority system to guide the expenditure of limited recovery funds as set forth in Service guidelines.

The draft report contends that the Service is concentrating recovery efforts and funds on species with "high public appeal" or species on the threshold of recovery. The report also states that Congressional earmarking of funds has contributed to the Service's deviation from its established priority systems. The report recommends that the Service use species and task priority components together to ensure that resources are distributed to the most endangered species.

See comment 4.

The Service disagrees with the General Accounting Office's findings that funds are being largely directed to species with high "public appeal". The Service acknowledges that some recovery resources are being committed to work on species that happen to have high "public support". While the Service is certainly interested in achieving a positive public perception of its recovery program, it has not attempted to do so by focusing on popular species. The Service's concern with public interest is in maximizing public participation in recovery efforts that may be derived from such interests. The Service agrees with the General Accounting Office's conclusion that Congressional earmarking of funds has contributed to departures from the established priority system, but recognizes that directing such funds to certain species' recovery are the more appropriate response to the public's

interest in those species. Such species are oftentimes "highly visible" or associated with well publicized projects. Such directives do negate the need for the Service to use public appeal as a factor in obligating funds.

Existing priority systems are used as guides in allocating recovery resources. Other factors considered include: the opportunities available, funding available, State priorities, other Regional priorities (such as a cooperative project with a national wildlife refuge), Congressional directives and appropriations, and the potential for recovery success. The process is flexible and provides for many factors to be included in the decision-making process. The Service believes that decisions regarding expenditures of limited recovery funds should take into account the priority systems, scientific information, expert opinion, opportunities, Congressional and public interest and support, and cost effectiveness.

See comment 1.

4. Recovery plans have not been developed or implemented for many listed species.

The draft report concludes that only about 60 percent of the listed domestic species have approved recovery plans and that only about half of the tasks in approved recovery plans reviewed by the General Accounting Office have been initiated. The General Accounting Office recognizes that several factors have lead to this situation. These include a growing workload (species being added to the list require additional recovery plans, increased consultation, etc.) and reduced availability of staff and resources for plan preparation and execution.

The Service believes that the resources allocated to listing, recovery, research, consultation, and enforcement activities represent the proper balance of the needs of the wildlife and plant resources. The Service has focused on developing plans for high priority species and implementing high priority recovery tasks, whenever practicable. The draft report indicates that in some instances high priority recovery actions can be undertaken before recovery plans are finalized, particularly when unique opportunities to benefit the species arise. A dynamic planning/recovery implementation process is critical to maximize recovery opportunities. The Service is currently reviewing its recovery planning guidelines to insure that process is as efficient as possible. Such guidelines are scheduled to be revised by February 1989.

The Service is frequently asked to identify the number of recovery plans that are being implemented fully. This question is often confusing because few, if any, recovery plans were crafted with an expectation that all the tasks within a plan would be implemented simultaneously. Recovery plans identify all tasks germane to the recovery of the species and frequently include tasks of considerable time and expense. Consequently, tasks are intended to be initiated as resources, opportunities and constraints permit. For example, the

revised recovery plan for the Florida panther would require expenditures of $2.825 million annually to fund all the plan tasks. Congress appropriated $7.528 million for the entire recovery program in Fiscal Year 1988. Full implementation of just one plan could require 37.5 percent of the Service's total recovery budget. Obviously this would have serious consequences for efforts to recover other species.

The General Accounting Office found that approximately half of the tasks in its sample of approved recovery plans had been initiated. Considering the fiscal resources available for recovery actions, which include development of new plans, and the timing and coordination necessary to initiate certain tasks, the Service believes that this is not inappropriate.

5. The Service is not closely following existing guidelines and priority systems for preparing and updating recovery plans.

The draft report presented two reasons in support of its conclusion that the Service appears to be departing from existing guidelines and priority systems. It determined that "...plans may contain inflated task priority numbers. If too many tasks are assigned high priority, then essentially there is no functioning priority system." It also criticized the Service for not keeping plans up to date and stated that "FWS' recovery plan guidelines stress that plans must be annually reviewed and should be continuously updated or revised as the plans move from initial implementation to completion."

The Service is cognizant of the trend toward inflation of recovery task priority numbers. Current Recovery Planning Guidelines provide the following instructions to individuals who prepare recovery plans: "...the narrative description of any priority 1 task should include a strong explanation of why or how this action is required to prevent extinction in the foreseeable future" (emphasis in the Guidelines). The Guidelines recognize that "...inflated priorities defeat the purpose of assigning priorities and reduce the credibility of the ranking system and the recovery plans."

The Service recognizes that recovery guidelines and priority systems could be followed more closely and also recognizes that additional guidance is necessary to help those who prepare plans to be more discriminating when they assign priorities to recovery tasks. There has been a tendency for some plan preparers to confuse their enthusiasm to assist in the recovery of endangered species with their responsibilities to prioritize recovery tasks. Those tasks have sometimes been viewed as equally important, when in fact they are not. This has been compounded by legitimate uncertainties and differences of opinion over which recovery tasks are more important than others for individual species. Plan preparers have tended to resolve these uncertainties by assigning equally-high importance to tasks at issue.

The Recovery Planning Guidelines are presently being revised to address these needs and are scheduled for issuance in February 1989. These revisions will assist the Service in making its recovery program even stronger.

The Service does not believe that recovery plans need to be formally revised or updated as often as the General Accounting Office indicates. The Recovery Planning Guidelines require the Regions to review approved plans annually and determine if changes are needed. The Service tries to review recovery plans annually and to revise them whenever practicable. This sometimes requires that the Service choose between allocating its limited resources to these activities or other activities that also help protect endangered species or promote their recovery. Revising or updating recovery plans is sometimes deferred in favor of actions that benefit endangered species more directly. The Service has sometimes committed resources to help a species in danger of extinction rather than revise its recovery plan or the recovery plan of a species in far less immediate danger.

See comment 5.

6. The Service is not accurately tracking and reporting expenditures.

The draft report maintains that the Service is not accurately tracking and reporting funds expended on the major components of the overall endangered species program. These include listing, consultations, research, law enforcement, and recovery. The report cautions that the Service may not be complying with Congressional reprogramming procedures and encourages the Service to ensure that priority systems are used in allocating funds. It further encourages the Director to ensure that funding reallocations within the endangered species program comply with budgeting reprogramming procedures.

The Service, as noted in comments in Item 2 above will be improving its tracking and accounting for recovery activities and funds during FY 1989. The Service will continue to advise its managers of reprogramming guidelines to insure compliance with Congressional direction.

The following are GAO's comments on the Department of the Interior's letter dated October 4, 1988.

GAO Comments

1. We recognize that the Endangered Species Act and Interior's guidelines provide for some flexibility in developing and implementing recovery plans. However, both the act and the guidelines emphasize that recovery plan development and implementation should be directed by a priority system. Further, most of the reasons Interior cites for deviating from its priority system—state priorities, the potential for recovery success, scientific information, and expert opinion—are already recognized and taken into account by the act and the priority system itself. Regarding state grant funding, the act states that "immediate attention will be given to those resident species of fish and wildlife . . .which the Secretary and the State agency agree are most urgently in need of conservation programs." Interior guidelines reflect the act's language in stating that "State Federal Aid proposals . . . will be examined against the recovery plan's Implementation Schedule." As discussed in the report, the potential for recovery success is already a key factor taken into account by the established priority system. Scientific information and expert opinion are also fundamental factors already incorporated into the recovery plans and the priority system. While we recognize that circumstances arise that justify periodic deviation from the established priority system, these should be case-by-case exceptions rather than frequent occurrences. Therefore, we believe that Interior should more closely adhere to its existing priority system. If Interior finds it can no longer adhere to its existing priority system, it should amend the system and notify the public as required by the act.

2. The passage cited by Interior was not intended to imply that the recovery program has been of limited success. Rather, we are stating that if one used only the absolute standard of recovery, one might conclude that the program has been of limited success. We believe that the relatively few species officially reclassified or declared recovered or extinct provide little information by which to gauge the program's success and that centralized trend data would provide a better program performance indicator.

3. While developing a detailed cost accounting of recovery implementation expenditures may be difficult and costly, there are opportunities for Interior to track major portions of recovery-related funding by species and project with relative ease. For example, in fiscal year 1986, Interior was able to track about 76 percent of its recovery, research, and

state grants funding by species and project. However, the cost tracking was abandoned in fiscal year 1987 when the Office of Endangered Species was abolished. We believe that this level of expenditure tracking combined with a complete record of task implementation is important for the effective management and accountability of the recovery program.

4. While Interior's concentration of recovery funding on relatively few species results in part from congressional earmarking of funds, we found that a significant portion of its discretionary recovery funds have been directed toward a small percentage of species generally acknowledged as having high public appeal. For example, in fiscal year 1986, nearly 25 percent of Interior's discretionary recovery funds (where no congressional earmarking of funds was involved) were spent on only 4 species—the American peregrine falcon, southern sea otter, gray wolf, and Aleutian Canada goose. These 4 species have been classified as facing a low or moderate degree of threat throughout most of their range. The heavy concentration of funding for these species supports our statement that funds are being largely directed to species with high public appeal.

5. While we recognize that limited resources may sometimes delay the reviewing and updating of recovery plans, we believe that Interior needs to increase its efforts in this area. In section 4 of its enclosure, Interior acknowledges that "A dynamic planning/ recovery implementation process is critical to maximize recovery opportunities." However, of the 15 Interior recovery plans we reviewed in depth, only 1 has been updated even though the plans are, on average, over 4 years old. In order to reflect dynamic conditions, the recovery plans should be reviewed annually and updated more frequently than at present.

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