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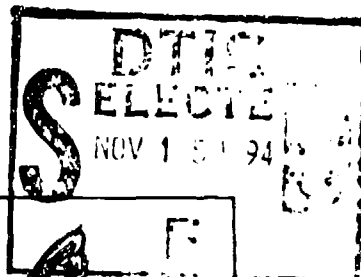
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Proceedings — Interagency Endangered Species Symposium

Washington, DC, 26 and 28 April 1994

edited by
David J. Tazik, Catrina Martin, Philip Pierce, and Janet Ruth



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This proceedings is the product of a symposium held 26 and 28 April 1994 in Washington, DC. Representatives from invited agencies presented papers addressing the following topics: agency mission, jurisdiction, information needs, process, issues of interest, current agency activities, information gaps/problems, and products/results. Findings and recommendations were generated through facilitated discussions during the second day of the symposium.

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Foreword

This proceedings was prepared based on a symposium held 26 and 28 April 1994 in Washington, DC. The symposium was co-sponsored by the Department of the Army, U.S. Fish and Wildlife Service, and the National Biological Survey. The U.S. Army Construction Engineering Research Laboratories (USACERL) participation was funded by the Office of the Directorate of Environmental Programs (DAIM-ED) under Military Interdepartmental Purchase Request (MIPR) No. E8799930530, work unit DN3, "RCW Guidelines and Interagency Coordination."

The report was prepared by the Natural Resources Division (EN) of the Environmental Sustainment Laboratory (EL), USACERL; the Division of Endangered Species, U.S. Fish and Wildlife Service; the Research Division, National Biological Survey; and the Conservation Division, Directorate of Environmental Programs (DAIM-ED-N). Dr. Thomas Hart, U.S. Army Corps of Engineers Directorate of Research and Development (CERD-M), assisted in planning the symposium. Chester Martin, U.S. Army Engineers Waterways Experiment Station (USAEWES) assisted in conducting the symposium and reviewing the proceedings. Shelia Mochel (USACERL) assisted in compiling the proceedings. The USACERL principal investigator was David J. Tazik. Dr. William Severinghaus is Chief, CECER-EN, and William Goran is Chief, CECER-EL.

LTC David J. Rehbein is Commander and Acting Director of USACERL, and Dr. Michael J. O'Connor is Technical Director.

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1 Introduction

Background

The Endangered Species Act of 1973, as amended (ESA), is one of the most significant pieces of conservation legislation ever passed in the United States. Through passage of the ESA, Congress intended to provide a means to conserve the ecosystems upon which threatened and endangered species depend and to establish a program to identify and conserve these species. The ecosystem and habitat-oriented intent of the ESA sometimes is overshadowed by activities that focus on listing and protecting individual species. A critical feature of the ESA is the responsibility it places on all Federal agencies to protect those listed species that occur on agency lands, as well as those species that may be affected by agency actions and decisions.^{*}

Section 7 of the ESA directs Federal agencies to "utilize their authorities in furtherance of the purpose of this Act by carrying out programs for the conservation of endangered species and threatened species,"^{**} and to "insure that any action authorized, funded or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species."[†] Therefore, Federal agencies have the responsibility to determine if their proposed activities may affect listed species and, if so, to consult with the U.S. Fish and Wildlife Service or National Marine Fisheries Service as appropriate.

Federal lands provide significant habitat for a wide variety of more than 850 listed plant and animal species. Federal agencies manage 660 million acres of land in the United States, nearly one third of U.S. land area. These lands support about half of all listed species, with as many as 25 percent found nearly exclusively there.^{††} Many additional category 1 and 2 candidate species and state listed species are present as

^{*} See extensive reviews by M.J. Bean, *The Evolution of National Wildlife Law: Revised and Expanded Edition*, (Praeger Publishers, New York, 1983); and Rohlf, D.J., *The Endangered Species Act, a Guide to its Protections and Implementation* (Stanford Environmental Law Society, Stanford, CA 1989).

^{**} 16 U.S.C. § 1536(a)(1).

[†] 16 U.S.C. § 1536(a)(2).

^{††} Natural Heritage Data Center Network. *Perspectives on Species Imperilment: A Report from the Natural Heritage Data Center Network*, The Nature Conservancy, Arlington, VA (1993)

well. Presence of these species sometimes places significant management responsibilities on Federal land management agencies and constrains their primary mission activities.

The Department of the Army (DA), the U.S. Fish and Wildlife Service (USFWS), and the National Biological Survey (NBS) are committed to the conservation of threatened and endangered species (TES) and their habitats, consistent with individual agency missions. These agencies are also committed to forging new partnerships among Federal, state, and local agencies, the environmental community, and private, commercial, and industrial landowners in order to more effectively and efficiently address TES technical and policy issues. A significant part of this commitment involves endangered species conservation programs and the related research necessary to fulfill obligations under the ESA. Other agencies face similar challenges and are actively pursuing or planning endangered species research and management activities.

Objectives

The principal objectives of the interagency endangered species symposium were to: (1) provide Federal agencies the opportunity to become better acquainted with each agency's endangered species program and needs, (2) share information on current and future endangered species-related research and management activities, and (3) identify issues requiring future meetings, such as regional and technical workshops. Understanding the mutual needs and capabilities of the various Federal programs will enable us to improve coordination and form new partnerships, thus increasing the individual and collective efficiency and effectiveness of our species and habitat conservation programs.

Approach

The symposium was conducted in two parts. On day one, each agency had the opportunity to present information regarding its endangered species program. Participants are listed in Appendix A. Each agency was asked to address the following topics: agency mission, jurisdiction, information needs, process, issues of interest, current agency activities, information gaps/problems, and products/results. Presentations were approximately 15 minutes long with a 5 minute question and answer period.

A facilitated brainstorming session was conducted during day two to produce a set of findings and recommendations. The approach used is further described in Section 3 of this report.

2 Agency Presentations

U.S. DEPARTMENT OF THE INTERIOR

U.S. Fish and Wildlife Service

Robert Ruesink

MISSION/JURISDICTION: The U.S. Fish and Wildlife Service (Service), on behalf of the Department of the Interior, has responsibility for administration of the Endangered Species Act (ESA) as it applies to terrestrial and freshwater species and migratory birds.

INFORMATION NEEDS/GAPS: The Division of Endangered Species comprise three branches: Listing and Candidate Assessment, Recovery and Consultation, and Information Management. Needs will be addressed relative to each of these branches.

Listing/Candidate Assessment: In order to make listing determinations, the Service must have access to the best current information regarding the taxonomy and population status of the species under consideration. This information is also necessary for the Service's candidate conservation efforts.

In evaluating species for listing, the best available information is needed to address the five factors of section 4 of the ESA:

1. The present or threatened destruction, modification or curtailment of species' habitat or range
2. Overutilization for commercial, recreational, scientific or educational purposes
3. Disease or predation
4. The inadequacy of existing regulatory mechanisms

5. Other natural or manmade factors affecting the species continued existence.

Recovery and Consultation: The ultimate goal of the program is the recovery of species to the point that they no longer require protection under the ESA. To accomplish this goal, the recovery program must:

1. Identify those ecosystems and organisms that face the highest degree of threat;
2. Determine tasks necessary to reduce or eliminate the threats;
3. Apply available resources to the highest priority recovery tasks.

Recovery goals and management needs are generally laid out in a recovery plan. The information needs for a listed species would include its life history and current status, habitat requirements and availability, limiting factors, conservation measures currently in place, and specific management objectives that will facilitate recovery. Access to these types of data, particularly through computer databases, will help expedite the recovery planning and implementation process. Recovery has to be a cooperative process, and therefore must involve partnerships involving Federal and State agencies, as well as the private sector, to ensure successful recovery and delisting of endangered and threatened species. The Service needs the expertise found in other agencies when developing recovery plans.

An important component of the recovery program is the consultation process. Under section 7 of the ESA, all Federal agencies must consult with the Service when any activity permitted, funded or conducted by that agency - including the Service - may affect a listed species or designated critical habitat.

To conduct a consultation, the Service must have current environmental baseline information on the species, the effects expected to result from the agency action on the species and habitat, and how to minimize those effects. The ESA requires the action agency to provide the best available scientific and commercial information concerning the impact of the proposed project. When information and analyses are not provided or available, the Service gives the benefit of the doubt to the listed species.

The prohibition of take under Section 9 of the ESA generates great concern among state and local governments, private landowners, and developers. In 1982, Section 10(a) of the ESA was amended to allow for issuance of an incidental take permit

when governments, developers or landowners prepared "Habitat Conservation Plans" (HCP). The development of HCPs is still a relatively new implementation process under the ESA and considerable experimentation with what works and what doesn't is being done. HCPs are developed with assistance from and implemented at the Service's field office level.

An HCP can only be approved if the taking will be incidental to an otherwise lawful activity, the applicant will minimize and mitigate the impacts of take, the applicant will ensure that the necessary funds are available, and the taking will not appreciably reduce the likelihood that the species will continue to survive in the wild. An approved HCP must at a minimum specify the following: the impact that will result from the taking, the steps that will be taken to minimize the impacts, funding that will be available to implement the HCP, the alternative actions that were considered, and why alternatives were not chosen.

Information Management: This new branch will support the Listing and Recovery Branches, and address other information needs of the Division. Access to current information and technology for outreach activities and overall policy development is needed to help facilitate the integration of endangered species data into other data systems. We also will need articles and information for the Endangered Species Technical Bulletin, various reports to Congress and data management efforts.

PROCESSES: To make listing determinations, the ESA requires the Service to use the best available scientific and commercial information. Information is obtained from a variety of sources, including the Code of Federal Regulations, Service policies, other agency policies and regulations, state laws and regulations, international treaties, notices of review, Convention on International Trade in Endangered Species (CITES) list, status surveys, scientific journals and publications, scientific societies, scientific symposium proceedings, special agency reports, affected agencies and landowners, recognized experts, public hearings, and comments received during public comment periods.

The Service publishes notices of review announcing species under consideration for listing under ESA. Typically, notices for animal species and plant species appear in alternate years. The species identified in these notices come to the Service's attention in several ways, including formal petitions, information forwarded by researchers, and reports from heritage programs and other state agencies. Category 1 candidates are those for which sufficient information is available to support proposals to list. The Service sets priorities for Category 1 species to determine the order in which they will be proposed for listing. Category 2 candidates are those for which proposing to list is possibly appropriate, but that are still under investigation

to determine whether they should be included in Category 1. Former candidates are included in Category 3 when the Service is satisfied that their listing would not be appropriate because they are extinct, are more abundant or at less risk than had originally been suspected, or are not entities that would satisfy ESA's definition of "species".

Recovery planning may involve a team of experts who prepare the draft recovery plan, or the plan may be prepared by Service biologists or contracted to outside experts. The Service strives to strike a balance between research and management expertise in appointing recovery teams and developing plans, including the involvement of experts from other agencies. The team may include not only species experts, but land managers in the area of recovery actions. The information sources used in recovery planning are basically the same as those used in the listing process. There is usually a need for additional research and monitoring information that is obtained during the recovery process.

The Service regional and field offices have the ultimate responsibility to oversee plan development and implementation. Service policy requires that a recovery plan be completed within 2 1/2 years of the listing action. A recovery plan delineates, justifies and schedules the research and management actions necessary to support recovery of a species. Once a recovery plan has been finalized, the goal is to review and revise recovery plans at least once every 5 years.

The consultation process also involves gathering data from the action agency, other relevant sources and research efforts. Prior consultations are sources of species status and environmental baseline data.

ISSUES OF INTEREST: To implement the provisions of the ESA, the Service needs all available information on listed, proposed and candidate species and their habitats. Current habitat management information and associated technologies, such as Geographic Information Systems (GIS) and National Gap Analysis, are vital to recovery planning efforts. Access to any comprehensive databases currently available would be of particular value. As the Service moves towards an ecosystem approach to managing fish and wildlife resources, information about the habitat management activities of other public and private land managers will become a necessary part of the management planning process. Technologies and databases that allow for mapping and planning at landscape levels will be an increasingly important part of this process. Innovative partnerships for the conservation of both candidate and listed species, joint research and monitoring opportunities, and the sharing of information are of interest to the Service.

CURRENT AGENCY ACTIVITIES: Over 800 species have been listed since inception of the ESA (figure 1). The Service is currently reviewing a candidate species list of over 3,000 species (figures 2 and 3). There are presently about 300 U.S. species that the Service believes warrant proposal to be listed. Over 1,500 candidates were monitored during 1993; a similar effort will be done in 1994 and 1995. In recent years, more than 100 species have been added to the list annually with a similar number proposed for listing. Once added to the list, the recovery process is initiated which includes a recovery plan, consultations, law enforcement of take prohibitions, and Section 10 HCPs.

In addition, the Service has a number of programs designed to conserve habitat and stabilize and improve the status of sensitive plant and animal species. One of the larger programs, the Partners for Wildlife Program, provides advice, funds and other incentives to private landowners to conserve species and habitats. The Service is also participating in large scale, habitat-oriented conservation initiatives like the Partners in Flight program for the conservation of neotropical migratory birds. Memoranda of agreement, cooperative agreements, conservation planning and partnerships are being pursued. The new Branch of Information Management will greatly aid the Service's ability to gather and disseminate information on habitats, species and the listing and recovery processes. The branch will allow for more efficient access to and management of databases as they are developed or obtained.

INFORMATION GAPS/PROBLEMS: Many species, such as cave spiders, are not necessarily charismatic. The Service often knows very little about the biology of cryptic and/or unattractive species and it is often difficult to find the funds needed to recover these species. The Service has limited ability to conduct large scale research and monitoring efforts, and relies on other agencies and contract sources for much of this data. Receiving needed information, and receiving it in a timely fashion, are problems with ramifications for both the listing and recovery processes.

To be successful, the recovery process has to result from a joint effort of all parties concerned. Too often, gaining the assistance of other agencies to assist in the recovery effort has been difficult. Another problem is the public perception of the ESA. Special interest groups often play on the public's fears that private land will be taken or economic growth will be halted. These fears, and the difficulty in correcting the misconceptions, can drastically slow, and sometimes halt, both the listing and recovery processes.

LISTED SPECIES BY STATE/TERRITORY As of December 31, 1993

(Omits "similarity of appearance" and some extirpated species)

(* indicates changes/delistings from Nov. 30, 1993 map)

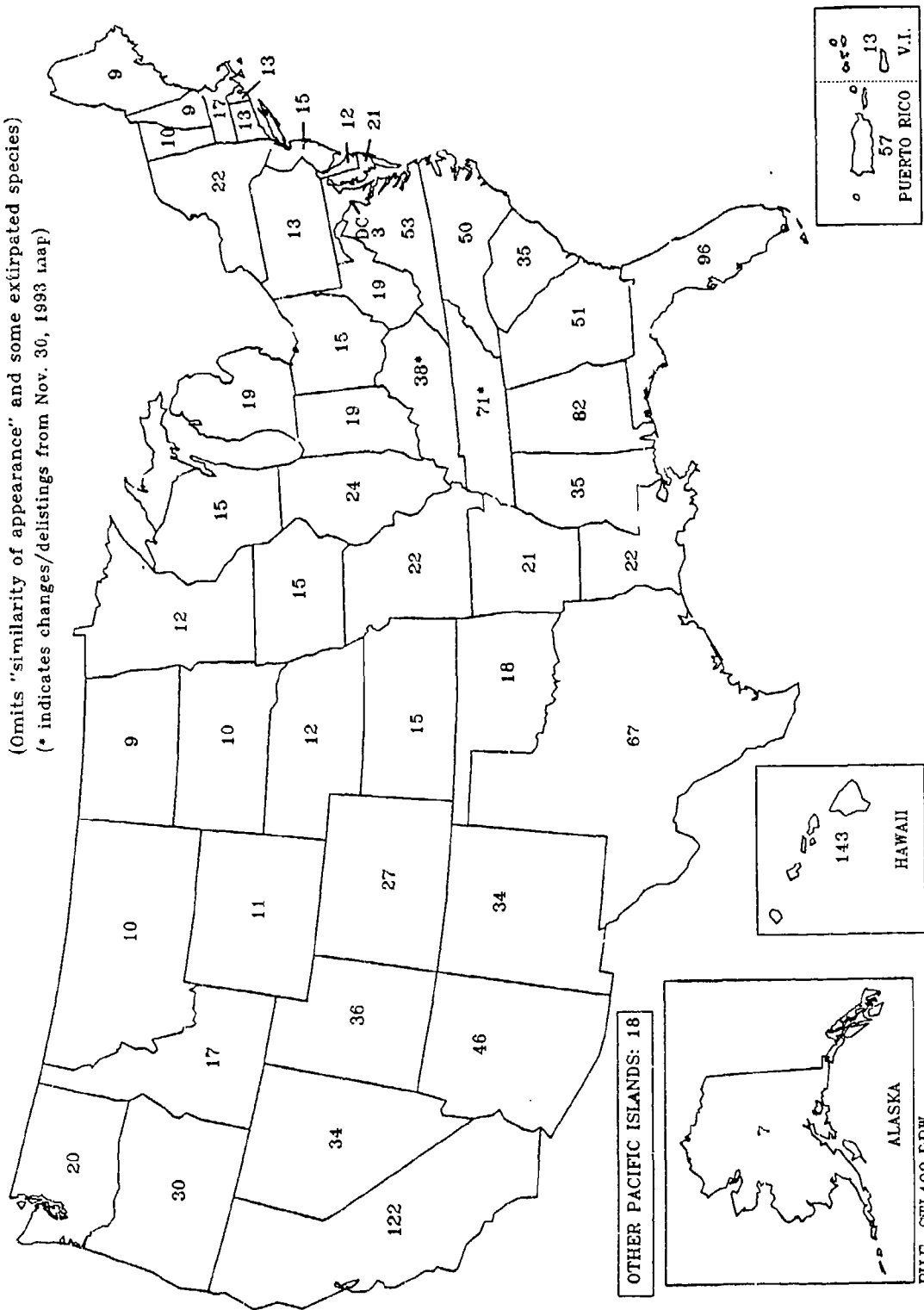


Figure 1.

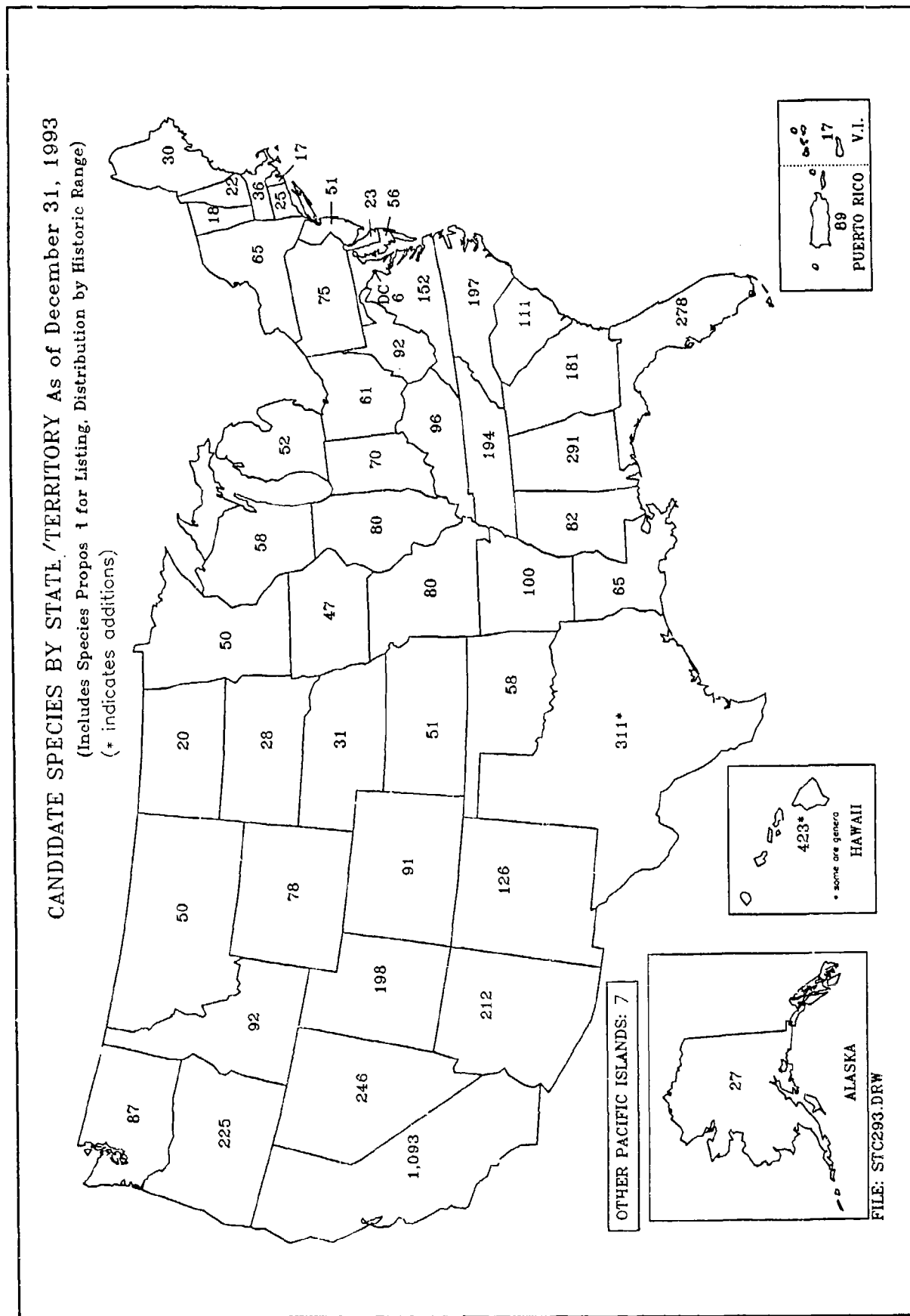


Figure 2.

The Service is probably not fully aware of the broad range of technologies and databases available through other agencies that could contribute to overall implementation of the ESA. As such, there is potential for duplication of effort in conducting and developing these information sources.

PRODUCTS/RESULTS: The list of Endangered and Threatened Wildlife and Plants is produced and updated through the listing process. The original listing package is a source of basic biological information on the species and its status at the time of listing. Status surveys and candidate monitoring programs are conducted as part of the pre-listing process. Candidate conservation activities may include the development of prescriptions for conservation action which may include habitat protection, management and/or restoration, species management; education and information transfer; legal and economic incentives; formal interagency conservation agreements; and research.

Recovery plans are a required element of the recovery process, and a source of information on the species and the management actions needed for recovery. Interested parties may consult the plans to determine what role is appropriate for them to take in the recovery process. The research and monitoring done as part of the recovery effort are also valuable information sources.

Consultation activities result in the development of biological opinions (BO) regarding the effects of specific projects on listed species within the project's area of impact. These BOs include information on conservation actions to mitigate the effects and are sources of ecological information on listed species. Habitat Conservation Plans developed under Section 10(a) are an additional source of information regarding impacts of specific activities and land use practices.

Reports to Congress, such as the biennial Recovery Report, provide information on the status of species and recovery efforts. The Service produces general information on ESA for public information and education efforts. Training opportunities also exist, particularly regarding compliance with the ESA.

National Biological Survey

Albert Sherk

MISSION/JURISDICTION: The mission of the NBS is to gather, analyze, and disseminate biological information in support of biological resources management; to inventory, monitor, and report on the status and trends of the Nation's biotic resources; and to develop the ability and resources to transfer the information gained in research and monitoring to resource managers and others concerned with the care, use, and conservation of the Nation's natural resources. The role of the NBS in endangered species activities is threefold:

1. Creation of new knowledge through interdisciplinary research on biological resources
2. Coordination and integration of existing information among agencies and organizations
3. Dissemination of information.

INFORMATION NEEDS: Assembling of information held or gathered by federal, state, local, and private entities as well as development of a national status and trends effort will help identify critical ecosystems and declining species before they require Endangered Species Act protection. The National Biological Information Infrastructure (NBII) will be a source of information about, and access to, data and information on the nation's biological resources, including endangered and threatened species and candidates for listing. The NBII will be a network of many distributed data bases and technologies, implemented and maintained by a diversity of data owners, working with data managers, technologists, and data providers both inside and outside of the NBS. Specific needs include:

1. What data bases are available/accessible in other agencies that could/should be included in the NBII?
2. What are the priority endangered or declining species information needs of other agencies that NBS scientific expertise could address?

PROCESSES: The NBS functions as a non-advocacy, independent, biological science arm for the Department of the Interior. It provides data that should allow understanding of ecosystem functioning and enables managers to recognize ecosystems in trouble. The results of NBS research, inventory, monitoring and

technology transfer activities will be available to all interested parties and should aid significantly in resolving natural resource issues before they become intractable. NBS conducts research at 12 Centers and 59 Cooperative Units and through some contracting. Major in-house expertise includes fish and wildlife research biologists, forestry and range scientists, botanists, and social scientists. In addition to internally generated data, the NBII will allow users the world over to discover, access, and analyze data located in files, publications, and computers in Federal, State, and local governments and in non-government organizations such as universities, museums, libraries, corporations and conservation and natural heritage groups. NBS internally generated data are provided by reports directly to the client bureau and to the professional community through the NBS publication series and other refereed journals.

ISSUES OF INTEREST: When taxa are listed under the Endangered Species Act, populations often are so depleted that recovery can be in doubt, direct costs of recovery action become prohibitive, and human and economic impacts may occasion unacceptable difficulty. How to anticipate and avoid these ecological "train wrecks" is a major issue for NBS. Other issues include dealing with multiple species at one time, accurately predicting economic costs and benefits from designating endangered species critical habitat, when to use captive propagation, and when to transfer research results to operations.

CURRENT AGENCY ACTIVITIES: Approximately \$11 million in research is conducted by NBS scientists in support of the endangered species recovery efforts, as identified in approved recovery plans, including the northern spotted owl, endangered cranes, Hawaiian forest birds, the Puerto Rican parrot, eastern timber wolf, desert tortoise, and West Indian manatee. In concert with client agencies, NBS is developing scientific information and recommending short term actions to assist land managers in protecting Category 2 species at risk and their habitats. Activities include cooperative research, data analysis, surveys, and monitoring that may prevent the need for listing.

INFORMATION GAPS/PROBLEMS: Native freshwater mussels, plants and insects; identification of data bases for comprehensive inclusion in the NBII; and low level of funding.

PRODUCTS/RESULTS: Peer-reviewed scientific publications, standard methods for endangered crane propagation, capture/release protocols for the California condor and sea otter, NBII distributed network, new partnerships for species at risk management, reduction of the backlog of species awaiting status determinations, new information for status determinations.

Bureau of Indian Affairs

Gary Rankel

MISSION/JURISDICTION: The Bureau's mission is to enhance the quality of life, promote economic opportunity and carry out the Secretary of Interior's responsibilities to American Indians. This mission is accomplished through a network of 12 area offices and 83 agency offices located at the reservation level, by delivering services, maintaining government-to-government relationships with tribes and promoting Indian self-determination. More than 98 percent of the Bureau's Fish, Wildlife and Recreation Program, and sizeable portions of other natural resources programs, are contracted to promote the development of tribal staffs, capabilities and programs.

INFORMATION NEEDS: On the order of 50 threatened or endangered plant and animal species occur on more than 100 Indian reservations nationwide. In some cases, tribes have developed programs and are actively engaged in the recovery of listed species. In others, tribes have expressed concern about listing, recovery and other ESA related processes relative to their associated impacts on water and land resource development, and on the exercise of treaty rights.

PROCESSES: The large degree to which fish and wildlife, forestry, agriculture and other natural resource programs have been contracted by tribes raises the question of Bureau roles and responsibilities, versus those of tribal governments, in addressing the Endangered Species Act (ESA) as carried out by the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS), and creates a degree of uncertainty among FWS and NMFS staffs relative to how those agencies should deal with tribes on ESA related matters.

ISSUES OF INTEREST: Noting that nothing in the language or history of the ESA indicates that Congress considered tribal treaty rights, or chose to preempt the reserved rights or authority of tribes to manage their reservation lands and fish, wildlife and other natural resources, some tribes question the scope of ESA applicability on Indian lands and activities. They further argue that the economic consequences to Indian tribes of listing and recovering species have not been adequately factored into ESA related frameworks and processes, and suggest that both the Government-to-Government approach in dealing with tribes, and the Federal Government's trust responsibilities to them, have not been applied in meaningful ways.

CURRENT AGENCY ACTIONS: The Bureau has assisted tribes achieve ESA compliance, thereby avoiding conflict which might test such ESA applicability. Bureau roles have focused on facilitating government-to-government communications between the affected tribes and federal agencies, with leads having generally been assigned on a species-by-species basis depending upon specific programs affected.

Bureau officials agree that the views and concerns of tribal governments must be factored into ESA related decision-making. To this end it has developed, and the Assistant Secretary - Indian Affairs has forwarded for consideration by Departmental officials, a set of eight Indian doctrines and principles that might serve as the foundation for a comprehensive statement of policy describing how tribes should be consulted and dealt with in addressing ESA and related fish and wildlife resource issues. The principles are summarized below.

- (1) **Tribal Sovereignty and Jurisdiction:** the right to make and enforce laws and administer justice; the right to manage and control water, land and associated natural resources; the right to regulate member and non-member hunting, fishing and gathering on-reservation, and related member uses in some off-reservation areas.
- (2) **The Government-to-Government Relationship / Consultation:** the unique and distinctive political and constitutionally based relationship existing between the United States and Indian tribes which differentiates tribes from other customers and constituencies, and which extends to all Federal agencies; entails going beyond the old unilateral approach of seeking "after-the-fact" tribal comment on internal policies and decisions which may affect the rights and status of tribal governments to meaningful consultation with tribes, involving their direct participation in bilateral or multi-lateral consensus seeking negotiations and decision making forums; entails pursuing working relationships with tribal infrastructures and resource management authorities in addressing issues of mutual interest and common concern.
- (3) **Indian Self-Determination / Self-Sufficiency / Self Governance Policies** which reject Federal paternalism in favor of empowering tribes and supporting tribal missions and objectives in assuming regulatory and program management roles and responsibilities through contracting and other mechanisms; policies promoting the development of reservation economies and sustainable homelands.
- (4) **Indian Trust and Rights Protection Responsibilities** of the United States, extending to all federal agencies and departments to: (a) protect and manage

Indian fish, wildlife and gathering resources to the highest degree of fiduciary standards; (b) absent a clear expression of Congressional intent to the contrary, administer Federal fish and wildlife conservation laws in a manner consistent with the United States' obligation to honor and protect the reserved treaty rights of Indian tribes; and (c) interpret federal statutes and regulations affecting Indian fish and wildlife resources in accordance with the trust responsibility.

(5) **The Unique Character and Special Status of Indian Lands** under federal law as "private trust assets" which were set aside for exclusive Indian use pursuant to treaties, statutes and executive orders; the principal resource available for the economic and social advancement of Indian people as beneficial owners.

(6) **The Unique Character of Indian Fish, Wildlife and Natural Resources** to which tribes have superior treaty rights to hunt, fish and gather in off-reservation settings; the cultural, religious and economic significance of many listed species to Indian tribes.

(7) **The Status of Tribes as Resource Co-Managers** of fish and wildlife resources along with the Federal and state governments, with shared responsibilities for such resources as a function of treaties, statutes, judicial decrees and other legal instruments; the need to develop partnerships and constructive working relationships between resource management jurisdictions and authorities.

(8) **The "Reasonable and Necessary" and "Clear Intent" Principle** for restricting the use or development of Indian fish and wildlife resources or the exercise of Indian hunting, fishing or gathering rights, or for imposing any conservation burden on tribes. Consistent with court rulings pertaining to the exercise of treaty fishing rights, such restrictions/burdens may be applied only when: (a) they are reasonable and necessary for species preservation, (b) they are the least restrictive available to achieve the required conservation purpose, (c) they do not discriminate against Indian activities, and (d) their purpose cannot be achieved solely through the regulation of non-Indian activity. Such measures should also be applied only when voluntary tribal conservation measures are not adequate to achieve the conservation purpose.

Bureau of Land Management

Ken Berg and Joseph Kraayenbrink

MISSION/JURISDICTION: The Bureau of Land Management (BLM) is responsible for the balanced management of the resources and values on more than 270 million acres of public land. Management is based upon the principals of multiple use and sustained yield; a combination of uses that takes into account the long term needs of future generations for renewable and nonrenewable resources.

The conservation and recovery elements of Endangered Species Act (ESA) is the primary place where BLM policy complies with ESA. The BLM's objectives are to conserve T&E species and the ecosystems on which they depend, and to ensure that actions do not contribute to the need to list additional species. BLM lands support habitat for more than 200 Federally listed and 1100 candidate species.

INFORMATION NEEDS: Information on populations and habitats. Readily accessible information on distribution, listings, habitat use and impact, and responses to management activities is critical. Interagency/organization data base sharing, unity in definitions and common standards and guidelines are critical for consistent and ecosystem based management.

PROCESSES: Historically, the primary method of collecting data has been through on site visitation to complete environmental document preparations in compliance with National Environmental Protection Act (NEPA). However, more recently with proactive emphasis, information is gathered in support of interdisciplinary activity level planning, and contacts with other agencies and specialists, literature, publics and symposiums.

ISSUES OF INTEREST: Multi-jurisdictional ecosystem planning for recovery of listed species and the conservation of sensitive species. Interagency and public collaborative efforts to prioritize areas and species for conservation strategies.

CURRENT AGENCY ACTIVITIES: The FY 1995 President's Budget for BLM provides for a total of \$31 million; \$18 million of Public Domain and \$13 million for Oregon and California (O & C) revested lands in Western Oregon. This represents an increase of \$4.5 million over the 1994 funding level. The primary T&E workload is in Section 7 consultations and recovery plan coordination with critical habitat designations. A majority of BLM efforts are associated in regional areas such as the Pacific Northwest forests, Pacific anadromous fisheries and desert associated populations. Several species represented in these efforts include: spotted owl,

marbled murrelet, bull trout, various salmon and steelhead runs, various desert plant species and desert tortoises.

There is a lot of emphasis taking place in interagency coordination. Recently a Memorandum of Understanding (MOU) was signed with other federal agencies to collaborate in the conservation of sensitive species. Watershed and provincial management plans are being initiated to promote ecosystem management concepts.

BLM is a major contributor to several proactive biodiversity conservation initiatives. These include the North American Native Plant Conservation Strategy, Partners in Flight (neotropical migratory birds), and Bring Back the Natives (fish).

INFORMATION GAPS/PROBLEMS: Basic access to data on the distribution and listing status of species. Habitat use information in a form available to field biologists and managers. More emphasis on interagency ecosystem management conservation strategies is needed. Additional coordination among land management agencies and the compliance agencies for consistent priorities.

PRODUCTS/RESULTS: There is some data network sharing between agencies and conservation organizations. There are interagency MOUs, conservation strategies and ecosystem management initiatives. Numerous Section 7 consultations, biological assessments, biological opinions and recovery planning are taking place. The BLM has automation initiatives coming on line; i.e., the Special Status Species Tracking (SSST) system.

U.S. Bureau of Reclamation

William Rinne and Fred L. Nibling

MISSION/JURISDICTION: "To manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public." Reclamation has played a major role in the development of water resources in the seventeen Western States. Historically, the Reclamation program emphasized development of safe and dependable water supplies and hydropower resources to foster the settlement and economic growth of the West. Today's increased environmental knowledge and awareness require greater emphasis on improving the operation and management of existing projects and facilities to meet the growing demands for water and related resources. Changing social values and increased environmental knowledge have placed an even greater emphasis on the protection of natural resources. The wise stewardship of natural resources entails conservation and enhancement of fish and wildlife assets in conjunction with the development and management of water and land interests. This includes pursuit, in cooperation with Federal, state, and other interests, the objectives and regulatory requirements of the Endangered Species Act (ESA), Migratory Bird Act, Fish and Wildlife Coordination Act, and other pertinent acts as they relate to Reclamation lands and facilities. Threatened and endangered species issues and challenges are having a profound influence on the direction and refinement of Reclamation programs. For example, Arizona has more threatened or endangered fishes than any other state. Reclamation's complex Central Arizona Project, which can provide most of the state's 2.8 million acre/feet share of Colorado River water extensively overlays the habitats and systems where these species occur. The ability to meet the goals of both the ESA and the Central Arizona Project greatly affect one another.

INFORMATION NEEDS: Often very little is known regarding an endangered species' critical habitat needs or the more complex questions concerning its interaction with native and non-native species. Long term data bases seldom exist. With varying management approaches, the optimization of sport game species, and the introduction of exotic species, ecosystems are rarely in a state of equilibrium. If research is conducted, it is often aimed at a "moving target". Once a species is listed it has often declined to the point that traditional "hands on research" of its biology and habitat requirements is very difficult because of the inherent risks involved. Better coordination of data bases including the so-called "gray" literature in agencies and institutions needs to be linked and identified so that resource managers and regulatory agencies have access to it in decision-making and consultations.

PROCESSES: Reclamation's program activities with endangered species fall in two main categories:

1. Required or consultation driven [Section 7 (a)(2)] associated with a proposed Reclamation Project;
2. Informal and voluntary actions [Sections 2, 4, 5, and 7 (a)(1)] to further the purposes of the ESA through conservation and recovery actions (e.g. Recovery Improvement Programs).

Reclamation has extensive experience with consultation driven ESA activities, but has begun to concentrate more on informal and voluntary activities since 1987 as the agency has placed more emphasis on comprehensive resource management.

ISSUES OF INTEREST: Balanced and comprehensive management of ecosystems and watersheds for a variety of purposes including endangered species is a key area of interest in Reclamation. Most of Reclamation's projects involve management of regulated aquatic and riparian ecosystems that include uses that depend upon both natural and developed features (e.g. wetlands, endangered species, urban areas, and irrigated agriculture). As a result it is extremely challenging to develop ways to conserve and protect endangered species that have much of their historical habitats modified and often face threats from a variety of introduced species and other by-products of man's development. Management of regulated systems which contain introduced species (e.g. cold and warm water reservoir and tailwater fisheries) which compete with endangered species and their habitats is a major issue for Reclamation.

Reclamation would like additional consideration given to initiating activities that focus on non-traditional or non-recovery approaches as a way of sustaining endangered species by preserving and replenishing genetic stocks and/or populations as interim measures to assist in long-term plans for recovery. Some examples include experimental populations, hatcheries or captive propagation, artificial replenishment.

Specific issues in the various regions of Reclamation include:

Mid Pacific Region

Salmon -- The Sacramento River is unique in that four races (runs) of anadromous Chinook salmon exist. All runs have declined in recent years due to multiple factors. One run, the "winter run", is listed as endangered. Dams and water diversions are identified as major problems, and many programs are either being

carried out by or are funded by Reclamation to increase populations. Reclamation is experimenting with advanced technology to provide better quantification of populations. New methods for diverting water to irrigators are being pursued that do not remove young salmon from the river. Behavioral barriers (acoustic barriers) are being tested to determine if downstream migrating juvenile salmon can be moved towards their ocean destination instead of having them exposed to large water export pumps at the southern end of the Sacramento-San Joaquin River Delta area. Predator removal programs are being carried out to help minimize predation on young salmon by exotic species in the southern Delta.

Delta smelt -- This is a native species of the Sacramento-San Joaquin River Delta system and has recently been listed as endangered. All life stages are being monitored and Reclamation cooperates with other agencies (FWS and California Department of Fish and Game, CDFG) in information sharing and reviews of all assessment programs.

Pacific Northwest Region

Most of the endangered species efforts for Reclamation in the Pacific Northwest occur on two species, salmon and bald eagles. Other species occasionally involved are: spotted owl, grizzly bear, peregrine falcon, and wolves.

The issues associated with the endangered salmon species of the West involve Native American fishing rights, multi-billion dollar hydropower systems, commercial and sport fishing, irrigation diversions, and minimum instream flows. Reclamation has one major on-stream structure, Grand Coulee Dam (hydropower and diversion dam) and several tributary dams involved. One attempt at remediation entails four dams on the Snake River operated by the Army Corps of Engineers which are periodically opened to allow passage of juvenile salmon. Reclamation will provide water necessary to flush the salmon downstream and supplement the water needs of Idaho Power. Numerous river diversions into irrigation systems are equipped with multimillion dollar fish protection structures.

Recently, five species of threatened and endangered freshwater snails and limpets have raised concern over water project operation in the middle Snake River. Water development within the Snake River ecosystem has transformed it from a primarily free-flowing, cold-water lotic system to a slow-moving, intermittently-impounded system. This, along with the introduction of exotic fish and snail species, water diversions and groundwater pumping, and generally degraded water quality, has resulted in less suitable habitat and conditions available for these native species. Multi-agency supported studies are in progress to determine the life histories of

these species, habitat requirements, the impacts of exotic species, and the effects of water project operations.

Occasionally, there are conflicts in the requirements of different species under the Endangered Species Act. Water released from dams for flushing salmon young and assisting their downstream migration conflicts with the needs of bald eagles.

Lower Colorado Region

One major issue facing the Lower Colorado Region is the long-term operation and Management of the Colorado River consistent with the needs of Colorado River endangered fishes and associated critical habitat. Managing the last 500 miles of the Colorado River for the four "big river" native fishes and their critical habitat is especially challenging because, although extensive modification has occurred, this area has by far the largest population and pure stock of razorback suckers and bonytail chub of any part of the basin.

Long-term management to sustain the viability of the wetlands of the "Cienega de Santa Clara" (Cienega), Mexico in order to protect United States endangered species is another key issue of importance to this region. Since 1976 the Cienega has been maintained as a result of by-passing of pumped groundwater from the lower Gila River valley in Arizona. The area of the Cienega has expanded from a few hundred to over 6000 acres of wetland which provides the best habitat for endangered and other species in the norther Gulf of California.

Great Plains Region

Tongue River Fish Passage Evaluations, Montana: Reclamation has recently begun to assess the potential for fish passage of native, non-salmonid, fish species around several small diversion dams that have been blocking in-river migrations of natives for many decades. The hundreds (perhaps thousands?) of small diversion dams on many western river systems have been limiting fish habitat for decades and are recognized as a potential leading cause of diminishing western native fish populations. Reclamation is searching for new technology to allow extensive fish passage while allowing reasonable diversions for agricultural use.

CURRENT AGENCY ACTIVITIES: Many activities are under way that are the result of Section 7 consultations or as voluntary conservation actions by Reclamation. Most all of these are done in conjunction with other Federal and state regulatory and/or management agencies. Examples include:

1. Upper Colorado Recovery Implementation Plans for the Colorado and San Juan Rivers: This involves multiple agency actions to recover four species of

Colorado River Fishes and their habitat, including studies of the biology of individual species, maintaining natural habitats, and self sustaining natural populations.

2. Lake Mohave, AZ/NV Native Fish Rearing Project on the Lower Colorado River: This activity involves replenishment of an existing stock of two species of Colorado River endangered fish to preserve the genetic integrity of the species basin-wide. The focus of efforts include on-site rearing, propagation and release of fish at sizes that can survive the impact of predation by non-native sport fish in the Colorado River system.
3. Long-term monitoring of the humpback chub in the Little Colorado River and establishment of a second population of humpback chubs in the Grand Canyon area of the Colorado River.
4. Monitoring, research and recovery activities are being planned for the Gila River System in Arizona and New Mexico for several endangered fish species. Efforts will include studies of biology, life history, and habitat requirements to augment recovery of these species.
5. Red Bluff Research Pumping Plant, Sacramento River, California: This new program is under construction and will provide a program for testing "fish friendly" pumps (Archimedes and internal helical screw types) to lift water from the River into the Tehama-Colusa Canal. If successful, this will allow the gates at Red Bluff Diversion Dam to be removed for much of the year, which will assist the upstream and downstream migratory needs of the four races of Chinook salmon. A multi-year biological and engineering evaluation program will determine the feasibility for this activity and possibly at numerous other diversion dams sites throughout the West.
6. Tracy Fish Collection Facility (TFCF) Tracy, California: Biological evaluations have been underway at TFCF since 1991 to improve operations and physical facilities to assure that healthy fish are returned back to the Sacramento-San Joaquin River Delta waters. Aggressive predator removal programs have been successful in minimizing build-up of exotic fish within TFCF, which for years have been residing within TFCF and preying on native and endangered species.

INFORMATION GAPS/PROBLEMS: There is a need for basic understanding of the biology of endangered species and how Reclamation's land and water management activities impact their survival. The bulk of knowledge available is generally

on physical habitat and much less is known about biological requirements and interactions with other species.

There is sometimes the perception that there is never enough information available. A balance must be struck between conducting perpetual studies in attempt to eliminate any risks relative to endangered species and acquiring enough scientific data to use in management decisions affecting endangered species before they are lost because of lack of action.

PRODUCTS/RESULTS: The following are examples of products/results from Reclamation endangered species research and other field activities:

Research, Survey and Monitoring Reports on Specific Species
Biological Assessments Associated with Consultations
Environmental Impact Statements and associated mitigation plans

New Technology and Methods Development:

Propagation and culture of endangered species
LIDAR - Laser Image Detection and Recognition equipment is being evaluated for monitoring fish migration
Video imaging techniques are being tested to determine ability to count quantities of fish eggs and larvae present in water samples
Hydroacoustics techniques are being used in conducting surveys of fish in large reservoirs
Computer databases are being compiled with extensive data from fish surveys
Real-time fish egg and larvae sampling equipment and techniques have been developed to monitor reproductive status of fish populations. Techniques have potential as way of adjusting water diversion operations in response to fish reproductive events.
Replacement of an endangered species population - Razorback Sucker
Facilitate modernization of a fish hatchery to propagate endangered species
Public Information - videos, brochures, displays

Minerals Management Service

Jackson Lewis

MISSION/JURISDICTION: MMS administers leasing and associated operations involving oil, gas, and hard minerals in Federal waters of the U.S. Outer Continental Shelf. It also oversees the collection and distribution of rents and royalties for mineral commodities removed from Federal and Indian lands. MMS must ensure that the activities it administers will not jeopardize the continued existence of listed species or modify their critical habitat. It also advises offshore operators about activities that may violate the ESA and the need and ways not to do so.

INFORMATION NEEDS: To maximize protection of listed species and to minimize adverse effects of MMS-administered activities on endangered and threatened species, MMS conducts ESA Section 7 formal consultations and develops with the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) appropriate operational restrictions and mitigation measures. MMS also funds or collects information for environmental impact statements. It may also require and/or conduct monitoring of operations to determine precise effects on listed species, to ensure that effects are minimal, and/or to improve or increase the effectiveness of mitigation.

PROCESSES: MMS acquires needed biological information through ESA Section 7 formal consultations and through contracted scientific research with government, university, and private organizations (by cost-plus contracts, interagency agreements, cooperative agreements, etc). Lease stipulations protecting specific species, habitats, and resources are developed as part of the lease sale process. Following a sale, the stipulations are attached to lease documents and become legally enforceable. Protective Notices to Lessees and Operators are comparably enforceable. Information to Lessees clauses in lease sale notices, while not enforceable, may provide information essential to the protection or conservation of protected species. MMS works cooperatively with FWS and/or NMFS, as appropriate, to ensure mitigative terms and conditions of Section 7 biological opinions are effective, appropriate, and within MMS' jurisdiction to require or enforce.

ISSUES OF INTEREST: These include the distribution and migration paths of bowhead whales in the Beaufort, Chukchi, and Bering Seas, and the behavioral responses of these and other animals to oil and gas-related operational and sound stimuli. Others are the abundance and distribution of great whales and marine turtles in the Gulf of Mexico (GOM) and the severity and responses of these animals to operational and other stimuli. National Academy of Science reports and

concerns, as well as some State concerns, have focused attention on physical oceanography and variation in locations and characteristics of currents and water bodies in the GOM, the South Atlantic off North Carolina, and the eastern Pacific off southern California.

CURRENT AGENCY ACTIVITIES: As a bureau within DOI, MMS has contributed staff and funds to the formation of the National Biological Survey (NBS). The MMS Environmental Studies Branch is in the process of developing a Memorandum of Understanding with the NBS that will help fulfill the Secretary's initiatives as well as clarify that MMS' concerns and information needs are specific to potential impacts from oil and gas activities on marine species.

On a broad scale, studies under the MMS Environmental Studies Program (ESP) address habitats, distribution, abundance, and environmental needs of marine mammals, birds, turtles, fish and benthos. Studies are geared not only toward threatened or endangered species but also species for which industry activities have raised concerns. The ESP supports studies in many disciplines and is interested in funding more multidisciplinary studies such as the MMS-funded distribution and abundance of marine mammal and sea turtle study in the GOM. This study addresses marine mammal habitats in relation to physical oceanographic features. It is an interagency agreement with the NMFS as well as a cooperative agreement with Texas A&M University. Changes in industry interest and moratoriums have dictated that areas for MMS study concentration are in three of the four MMS regions--the Gulf of Mexico, Pacific, and Alaska Regions. The MMS supports and would like to develop more partnerships with other agencies and participate more in data-sharing processes.

In support of oil spill trajectory analysis, MMS is conducting observational, drifter, and modeling studies to determine currents in the GOM and Southern California Bight. In cooperation with Canada, MMS supported a real-time, full-scale oil spill burning at sea study, and operates an oil and hazardous material experimental test facility in New Jersey where oil containment and recovery equipment is developed and tested. MMS also develops and conducts oil spill risk analysis to simulate the likely behavior of potential oil spills. Plans exist to create a desktop computer display system for GOM protected species results. Contractors are creating a national user-friendly interactive bibliography and abstract database of most MMS ESP documents, including protected species studies.

INFORMATION GAPS/PROBLEMS: MMS experiences difficulties in providing a rapid easy means to identify and obtain reports and data available from past protected species studies. There is also difficulty recognizing throughout the

bureau the need for and commitment to consistent Technical Information Management System (TIMS) information and for securing and providing the funding needed. Another perpetual problem involves the high cost of research in the Arctic which remains fixed and costly whether or not weather conditions permit the research to proceed.

PRODUCTS/RESULTS: MMS has or can calculate oil spill risk and trajectory analyses for marine and coastal habitats where endangered and threatened species may occur. TIMS will be a powerful informational tool when it becomes fully operational; integrated and separate data should include geography, bathymetry, oceanography, and biology. Processing and consolidation of information of MMS-funded research reports (gray literature), especially when peer reviewed, is significantly broadening readily available information resources. Synthesized abstracts of MMS-funded environmental studies facilitate users' accessibility to information in the gray and other literature. Environmental impact statements likewise synthesize considerable information that is not otherwise readily available.

DEPARTMENT OF DEFENSE**Office of the Deputy Under Secretary of Defense
(Environmental Security)
Conservation and Installations Division**

Peter Boice

MISSION/JURISDICTION: The Office of the Deputy Under Secretary of Defense (Environmental Security), Division of Conservation and Installations (ODUSD[ES]CI) is responsible for policy development and program oversight of the Military Departments' conservation programs. ODUSD(ES)CI also manages the Legacy Resource Management Program. This program is intended to promote innovative ways of identifying, conserving, restoring and enhancing sensitive and significant natural and cultural resources on DoD lands.

ISSUES OF INTEREST: Know what we have, where. We are investing heavily in inventories, and have keyed identified inventories as one of our major "measures of merit." Emphasize multi-species management rather than focusing on single species of interest.

Move to ecosystem-based management on all of our lands. This is a goal-driven approach to restoring and sustaining healthy ecosystems and their functions and values, using the best science available. It entails working collaboratively with State, tribal, and local governments, community groups, private landowners, and other interested parties to develop a vision of desired future ecosystem conditions. This vision integrates ecological, economic, and social factors affecting a management unit defined by ecological, not political, boundaries.

CURRENT AGENCY ACTIVITIES: We are promoting a number of important efforts, including:

1. The Mojave Ecosystem Management Initiative, a collaborative effort with the Department of the Interior and others, to identify and implement programs which will promote ecosystem management throughout the region.
2. A Biodiversity Initiative, in partnership with The Nature Conservancy and The Keystone Center, to develop recommendations for managing biodiversity on DoD lands.

3. A Panama Initiative, working with The Nature Conservancy, to conduct a rapid ecological assessment of all DoD installations in Panama.
4. Development and implementation of an Action Plan for the conservation and management of neotropical migratory birds and their habitat, in cooperation with Partners in Flight.
5. Contributions to the U.S. Fish and Wildlife Service's ongoing GAP Analysis program. Other issues discussed at the Workshop, including Information Needs, Processes, Information Gaps/Problems, and Products/Results are discussed as applicable for each of the Military Department's endangered species programs.

U.S. Army

David J. Tazik and Phillip Pierce

MISSION: The Army's primary peacetime mission is soldier training and the testing of weapon systems and related material. The intent of training and testing is to ensure that soldiers attain proficiency in military tasks with the best available weapons and equipment, maintain readiness, and minimize the likelihood of casualties and reversals on the battlefield. Simultaneously, the Army must also comply with a diverse array of environmental regulations including those addressing threatened and endangered species (TES). We further recognize the critical need to conserve natural resources in order to maintain a sustainable base of land upon which to carry out our mission. In effect, our soldiers must and will remain trained and combat ready while protecting our environment, including TES and the ecosystems upon which they depend, as an integral part of the mission.

To accomplish its mission, the Army needs large blocks of land with varied natural terrain. These landscapes provide the environment essential to meeting training standards and testing equipment and weapons under realistic conditions. They are the soldiers "classroom." Presently, there are increasing pressures on these lands as the range, speed, capability and engagement distances of our weapon systems increase. Also, movement from a forward deployed force to a U.S. based force, and realignment and closure of bases further intensifies the pressure on existing installations.

TES do impact mission activities. Their presence has affected our ability to train to standard, degraded training realism, decreased the scope of unit training, fragmented training, increased the cost of training, and curtailed individual training events.

JURISDICTION: The U.S. Army manages nearly 12 million acres of land on approximately 120 major military installations in ecoregions throughout the United States. These installations are the equivalent of small cities and towns, ranging in size from thousands of acres to over two million acres. This does not include approximately 12 million acres of Corps of Engineers' civil works project lands and waters, nor the more than one million acres of mostly state-owned lands used by the Army National Guard.

Presently, over 100 federally listed species and nearly 200 candidate species are known or suspected to occur on Army military lands. An additional 142 exclusively state-listed species, and 153 species of concern have been reported as well. Based

on data summarized by The Nature Conservancy, it appears that DoD as a whole harbors a disproportionate number of listed species relative to the land base (3.8 species/million acres) compared to other federal agencies (0.4-1.3 species per million acres).

Army military reservations, while representing less than 2% of all Federal lands, are ecologically significant because they do provide refugia for a broad spectrum of rare and endangered plants and animals. Yet, our installations are becoming habitat islands, increasingly isolated from regional TES populations, due to the onward march of urban and agricultural development on surrounding lands. As a result, resident populations are subject to a higher probability of local extinction events. We do recognize the unique opportunity the Army has to contribute to national biological diversity goals. However, we are increasingly concerned about potential conflicts with national defense preparedness goals.

INFORMATION NEEDS: Our information needs are simple. First, what species occur on our lands, including listed, candidate, and especially "likely to be listed" species? Second, what are the impacts of our activities on these species? Third, what are the most efficient and cost-effective alternatives for mitigation and management that also have the least impact on the mission? Finally, we recognize the complexity and regional/landscape nature of the problem. As such, we are increasingly interested in partnering with others in an attempt to contribute most effectively to species recovery while minimizing mission constraints. Such partnerships should include research, technology transfer, and monitoring and management.

PROCESSES: Chapter 11 of Army Regulation 200-3 details requirements and processes for complying with the Endangered Species Act. It is proactive in specifying development of installation TES management plans, and encouraging interagency coordination and cooperation and participation in recovery planning and execution.

Environmental research within DoD is planned, programmed, and carried out via the Tri-Service Reliance program. This program establishes lead services for the major environmental R&D program areas. The Army is the lead for Conservation, including natural and cultural resources, and TES in particular. Furthermore, the four Army Corps laboratories[†] have established an Interlaboratory Reliance effort

[†] Cold Regions Research and Engineering Laboratory, Construction Engineering Research Laboratories, Topographic Engineering Center, and Waterways Experiment Station.

to ensure coordination, leveraging, and avoidance of duplication of effort among the labs.

ISSUES OF INTEREST: The Army natural resources management community developed a prioritized list of TES-related technical issues as follows: (1) impact of military operations on TES (especially blast and helicopter noise, smokes and obscurants, and maneuver disturbance), (2) standardized inventory and monitoring protocols, (3) mitigation of Army-unique impacts, (4) monitoring and management in danger zones, (5) characterization and evaluation of TES habitats, and (6) establishing appropriate installation population goals. We are here today in large part because we want to identify capabilities that already exist or are in development to address these issues before we begin to expend scarce resources to deal with them in a research mode.

CURRENT AGENCY ACTIVITIES: On the management side of the house, TES surveys, assessments, and management activities continue at the installation level, with expenditures of over \$7 million dollars per year. At the Department of Army (DA) level, we recently completed development of an endangered species management strategy for Army lands. Major goals of the strategy are to establish a DA capability to address TES issues, provide for effective scientific and technical support, engender proactive attitudes within the Army, and establish coordination and partnership with other agencies. Recent results of this effort include Army-wide management guidelines for the Red-cockaded Woodpecker, and a model installation TES management plan.

On the research side, we recently completed development of a complimentary TES R&D strategy that focuses on: (1) identification and prioritization of Army requirements, completed in recent months; (2) design of a coordinated R&D program responsive to user needs, which is underway; (3) technology transfer planning to get products/results to the field quickly; (4) interagency coordination, per today's objectives; and (5) programmatic coordination among the various available funding sources. Anticipated FY94 funding to address Army military TES R&D requirements under Tri-Service Reliance is approximately \$2.3 million.

INFORMATION GAPS/PROBLEMS: Major gaps relative to issues of interest include: (1) full knowledge of (a) existing solutions to current technical problems, and (b) anticipated products of on-going and planned research; and (2) mechanisms to (a) avoid unnecessary duplication of effort, and (b) enhance opportunities to leverage limited resources in areas of research and development, technology transfer, and site-specific monitoring and management.

PRODUCTS/RESULTS: Within the military, we have developed and implemented the Integrated Training Area Management (ITAM) Program. The objectives of this program are to evaluate the condition of Army lands, balance use with land capability, and establish a stewardship approach to ensure maintenance of realistic training lands. It consists of Army-wide natural resources inventory and monitoring, land rehabilitation and erosion control, threatened and endangered species management, environmental awareness training for military and civilian personnel, and systematic identification of short- and long-term training requirements. The Army was also the primary developer of the GRASS geographic information system, a public domain GIS used by many individuals and other agencies. It is used extensively, although not exclusively, throughout the Army in the ITAM program.

A variety of agency documents may be of interest including lab technical reports and installation management plans. Finally, we have not fully explored the potential for application of various military-developed technologies to TES and related problems.

U.S. Army Corps of Engineers

William Klesch, John Bushman, and Chester O. Martin

MISSION/JURISDICTION: The primary mission of the U.S. Army Corps of Engineers is to provide engineering support to the total Army and to provide for the development, management, and protection of the nation's water resources. In its Civil Works role, the Corps manages approximately 11.7 million acres of land and water on approximately 460 operational projects constructed for the primary purposes of flood control, water supply, hydropower, navigation, fish and wildlife, and recreation. These multipurpose projects contain a wealth of natural resources subjected to a variety of land uses and activities.

Corps of Engineers projects may generally be characterized as linear parcels of land located along major waterways. The basic structural feature is usually a lock and/or dam with an associated reservoir where water is retained and released as governed by the project's Operation Management Plan. Corps reservoir projects are high-use areas that support over 370 million visitors annually. The Corps is also responsible for approximately 12,000 miles of navigable waters including coastal (deep-draft) and inland waterway harbors, and local flood protection, erosion control, hurricane protection, and beach renourishment projects. The Corps is the principal Federal agency responsible for regulating activities in wetlands under Section 404 of the Clean Water Act, obstructions to navigation under Section 10 of the Rivers and Harbors Act, and the transport of dredged material under Section 103 of the Marine Protection, Research and Sanctuaries Act.

INFORMATION NEEDS: Endangered and threatened species information generally needed for Corps Civil Works projects and activities include:

1. Identification of impacts upon listed species caused by project construction and operation
2. Collection of critical data to prepare biological assessments
3. Management of projects to minimize or prevent impacts to listed species.

PROCESSES: It is Corps of Engineers policy that all Civil Works projects/activities, whether in the planning, construction, or operational phases, must comply with regulations implementing Section 7 of the Endangered Species Act (ESA). In order to carry out the formal consultation process, the District environmental staff collects pertinent data/information from available sources,

which may include project files, literature surveys, contracts, staff field studies, etc. Permit applicants are required to consult with the appropriate agency - U.S. Fish and Wildlife Service (FWS) and/or National Marine Fisheries Service (NMFS) - where a permit action may have a potential impact on listed species or habitat.

ISSUES OF INTEREST: The following areas/issues present major challenges to the Corps, FWS, NMFS, and other Federal and State agencies in the definition of needs and establishment of management goals that will comply with the Biological Opinion and contribute to the recovery of specific species:

1. Protection of sea turtles in navigable waters. Dredging to maintain navigable waters is a Corps mission, and sea turtles are found on the Atlantic Coast from Norfolk, VA to Florida and waters of the Gulf of Mexico. Eight Districts in eight States are involved in the protection of sea turtles.
2. Interior least tern (*Sterna antillarum antillarum*) protection in the Missouri-Mississippi-Arkansas River Basins. Eight Districts in eleven States manage over 3,000 miles of river where populations of interior least terns occur.
3. Pallid sturgeon (*Scaphirhynchus albus*) protection in the Missouri and Mississippi River Basins. Sturgeons are also found in rivers of the eastern and western U.S.
4. California least tern (*Sterna antillarum browni*) are found along the California coast and adjacent areas from San Francisco Bay to the Mexican border.
5. The least Bell's vireo (*Vireo bellii pusillus*) is found in riparian growth along rivers in southern California.
6. Three runs of salmon occur in the Snake and Columbia Rivers. The Corps operates four hydropower facilities on approximately 140 miles of the Snake River and another four facilities on approximately 325 miles on the lower Columbia River.

CURRENT AGENCY ACTIVITIES: The Corps Districts responsible for activities in their respective geographical areas have been conducting field studies necessary to provide critical data needed to comply with the Biological Opinion issued for each specific project. The Corps has expended over \$100 million during years FY89 through FY92 to implement the ESA. A significant portion was spent for collection

of data from existing sources and contracts to gain information regarding distribution, migration, seasonal occurrence, life requisites, etc., for selected species.

The Corps has had some significant successes over the years, many of which have resulted from cooperative efforts with Federal and State agencies and environmental organizations. The Corps is convinced that our greatest successes have been achieved through cooperative partnerships. Selected examples of success stories are noted below:

1. Benefits of projects to both wintering and nesting populations of bald eagles (*Haliaeetus leucocephalus*) across the nation; significant success has resulted from hacking programs on some Corps projects.
2. Benefits of coastal dredged material islands to brown pelicans (*Pelecanus occidentalis*) and other species; the first recorded nesting of brown pelicans in Alabama was documented from Gaillard Island in Mobile Bay in the 1980's.
3. Reductions of losses of sea turtles and marine mammals during dredging operations and beach nourishment.
4. Impact assessment, habitat creation, methodology for population studies, and relocation of freshwater mussels in navigable waterways.

INFORMATION GAPS/PROBLEMS: Major gaps in required information include:

1. Consensus among Federal and State agencies, Indian tribes, and conservation organizations in the Pacific Northwest regarding operation of hydropower facilities and management of salmonids
2. Methods to determine habitat use and potential project impacts to listed fish species, especially sturgeons (nationwide)
3. Data bases on salmonids, marine mammals, and West Indian manatees (*Trichechus manatus*)
4. Data bases that include critical information for the development of management objectives and recovery plans with ecosystem orientation for many listed species.

PRODUCTS/RESULTS: Summary information on fish and wildlife (included endangered and threatened species) may be published in Corps bulletins and newsletters. Current environmental issues and concerns, which may include listed species, are often printed in the proceedings of the annual meetings of the Chief of Engineers Environmental Advisory Board. Results of District studies are included in the project Biological Assessment, Environmental Assessment, General Design Memorandum, Environmental Impact Statement, Operation Management Plan, and Special Study Reports.

The Dredged Material Research Program included 20 years of studies of man-made islands throughout waterways of the U.S. Information produced on design, construction, and management of these islands addressed many species of waterbirds, including listed species. Within the Wetlands Research Program, several wetland demonstration sites consist of study components that include habitat development and management for sensitive species. Several projects sponsored by the Environmental Impact Research Program have included studies to evaluate habitat and develop management plans for fish and wildlife, including endangered and threatened species.

U.S. Navy

Thomas Egeland

MISSION/JURISDICTION: The Navy has approximately two million acres on 200 installations with natural resources management responsibilities. Many Navy installations are located in coastal areas near urban centers, and over half are under 1000 acres. Undeveloped Navy lands have become biological islands which host 164 different endangered species and offer potential habitat to support 231 additional endangered species. In addition, the Navy must deal with endangered species issues in the world's oceans.

The Navy's "undeveloped" lands are used to support its national defense mission such as military training, equipment testing and repair, safety buffers, weapons testing, and other shore-based facilities. A modern military requires constant training with today's complex weaponry to be ready for the array of situations it may be asked to confront. As an additional complication, new weapons frequently require even larger areas for effective training. Use of Navy and other DoD lands are further constrained by the political realities which do not allow more land to be withdrawn for military use, and the economic realities which demand closing of existing bases.

The Endangered Species Act has had a significant effect on the way the Navy conducts its mission. Actions that have been continuing for 30 or 40 years have been restricted, delayed or modified. Simply setting aside lands for endangered species habitat or suspending training for six months of each year is less frequently an option for the Navy. To coexist with endangered species, the Navy requires effective techniques for active management of the ecosystem.

INFORMATION NEEDS: The Navy's major need for information is for basic biological and behavioral data about endangered species, including marine species. It is important to be able to scientifically evaluate an action's potential effect, which cannot be done without a full understanding the species ecological needs. More information about ecosystem and species management techniques is necessary to enable the Navy to effectively compensate for military actions.

PROCESSES: The Navy's endangered species compliance process is not unique; it begins with surveys for endangered species. Many of these surveys are paid for by money earned by agricultural outleases of Navy lands and, more recently, congressionally appropriated DoD Legacy Resources Management Program funds. Integrated Natural Resource Management Plans developed under the Sikes Act

include management of endangered or threatened species found on the installation. Species location and habitats are included in base Master Plans, so that all personnel are alerted to their presence. Larger Navy facilities incorporate species information into GIS systems as well.

Navy operations are evaluated for any "may affect" situations. Formal or informal section 7 consultations usually resolve the issues, but may result in elaborate compensation packages, with long-term studies to determine the effects. These mitigation programs often advance the state of knowledge about the species, so that the Navy's need to continue its land uses, results in endangered species research.

ISSUES OF INTEREST: (1) The Navy supports regional ecosystem, multi-species planning to avoid Secretary Babbitt's "train wrecks." (2) The Navy would prefer to have the resource agencies lead effective recovery efforts, emphasizing science rather than assumptions, and adopting a less adversarial regulatory role. (3) The Navy would like to participate in exchange of research findings about endangered species with other agencies.

CURRENT AGENCY ACTIVITIES: The Navy has many ongoing endangered species investigations, using partnerships with other agencies and universities, contracts, and our own inhouse talent. Some examples include: development of techniques for a captive rearing program for the San Clemente Island loggerhead shrike; seven years of a management program for the California least tern which includes studies of foraging and mortality, and techniques for deterring raven predation; developing techniques for propagation of endangered plants on San Clemente Island and restoration of vernal pools for endangered plant recovery in Southern California; monitoring of the northern right whale on its calving grounds off the coasts of Florida and Georgia; and, participating in an interagency, cooperative effort of habitat protection and predator control to protect endangered species and other wildlife resources on the island of Guam in the Western Pacific.

INFORMATION GAPS/PROBLEMS: Lack of knowledge about species biology and management techniques are major problems from the Navy's perspective. Individual biologists from regulatory agencies use their best judgements in providing biological opinions about our endangered species, but these judgements often suffer from a lack of scientific evidence. To achieve effective cooperation of all concerned, the cause and effect relationship between the agency action and species decline must be substantiated. For effective recovery of species, knowledge is required. Funding is another problem, since DoD has taken over a 20% cut in the last two years.

PRODUCTS/RESULTS: Results of some work funded by the Navy is published in the scientific literature, but most is presented in documents prepared by the researchers. The Navy does not maintain a centralized library of these studies. The Navy also has worked with the Nature Conservancy to provide each installation with a handbook of its endangered species. However, the most important result of Navy efforts has been increasing the population of an endangered species.

U.S. Marine Corps

Marlo Acock and LTC Lyn Creswell

MISSION/JURISDICTION: The Marine Corps is the Nation's naval fighting force, "first to fight." The Marine Corps maintains a combined air-ground warfighting capability, ready to respond quickly to national security requirements.

An important peacetime responsibility of the Marine Corps is combat unit training. This training takes place on Department of the Navy lands, and on other federal lands, such as Forest Service and BLM lands. Training must assure Marines are ready for any task assigned them by the National Command Authority (the President and the Secretary of Defense).

The Marine Corps must also manage its lands as good stewards, upholding the public trust in the conservation of natural resources. The conservation of endangered and threatened species is an important part of this stewardship responsibility.

INFORMATION NEEDS: To fulfill its species conservation duty, the Marine Corps needs current, accurate information about the species on its lands. The Marine Corps needs to know not only which listed species are on our lands, but also what candidate species are present. Marines also need information about the relationship between these species and the common uses of training lands. Also, the Marine Corps must determine which conservation alternatives provide installation commanders the greatest flexibility in supporting their training and training support missions.

PROCESSES: The Marine Corps has experienced wildlife biologists and foresters at many of its installations. These specialists work with military planners and land use managers to develop species conservation plans. These plans are then integrated into installation natural resource plans.

The Marine Corps contracts out much of its biological work: surveys and biological assessments. The Naval Facilities Engineering Command administers many of these contracts. The Marine Corps consults with the United States Fish and Wildlife Service when major actions may affect listed species.

ISSUES OF INTEREST: The following are species related issues of interest to Marine Corps commanders:

1. The Marine Corps wants to move from a single species management approach to a multi-species management effort. However, such a transition is costly, and requires scientific and technical information not presently available to the Marine Corps.
2. The Marine Corps has several installations which are "islands of biodiversity" surrounded by intensely-developed urban and agricultural lands. The Marine Corps fears that its bases will be obliged to pay a disproportionately high price for the conservation of species, which might have been saved with earlier action on private and non-federal lands.
3. The Marine Corps is concerned about the affects of training related wildland fires on species habitat. The Corps wants to develop best management practices to conserve species on lands prone to such fires.
4. The Marine Corps is concerned about the competition for habitat among the several listed and candidate species on its lands. Also, the Marine Corps is concerned about the competition between species requirements and other natural resource requirements, such as water quantity and water quality mandates.

CURRENT AGENCY ACTIVITIES: The Marine Corps is conducting surveys, and completing biological assessments as necessary on its lands. Many of these projects are funded by the Department of Defense Legacy Resources Management Program. Each year bases submit proposals for biological work to Headquarters, Marine Corps. Headquarters then funds those projects best able to further the land management needs of the Marine Corps.

Marine Corps bases are also working with other federal facilities in their geographic regions, and with state and regional planning agencies. These coordinated efforts include mapping of biological resources on Marine Corps and adjacent lands. In addition, the Marine Corps is cooperating with BLM in preparation of coordinated management plans for the western Mojave and northern and eastern Colorado deserts.

INFORMATION GAPS/PROBLEMS: The Marine Corps could benefit from lessons learned by other Defense land managers and by other federal agency land managers. The Marine Corps also needs to know who, within the Department of

Defense among the other agencies, has the scientific and technical expertise necessary to solve species issues on its lands. Also, the Marine Corps wants to develop better planning and management processes, which will integrate the several land use requirements while preserving the Marines' essential mission capabilities.

PRODUCTS/RESULTS: The Marine Corps has land use and biological data bases at several of its installations. These data bases provide local commanders important information to plan and manage listed species consistent with other land use requirements. These data bases may be useful to other agencies within the regions in which Marine Corps bases are located.

The Marine Corps has no in-house natural resource conservation research expertise. The Marine Corps relies on the Naval Facilities Engineering Command and the Army Corps of Engineers for such support.

U.S. Air Force

LTC Thomas Lillie

MISSION/JURISDICTION: The mission of the United States Air Force (USAF) is to defend the United States through control and exploitation of air and space. This is accomplished with the world's most respected air and space force, more than 100 installations and training ranges, and over 9 million acres of land around the world. A constant objective is to conduct the mission while protecting and enhancing the priceless natural and cultural resources that make this great nation worth defending.

The land used by the USAF includes some of the only areas in the world where certain species are known to exist. The Endangered Species Act requires that the USAF and all Federal agencies avoid actions that jeopardize the continued existence of threatened or endangered species or species proposed for listing as threatened or endangered.

Over 70 listed species are known to occur on USAF land and this has affected the way we conduct our mission. For example, (1) we have positioned targets at 4 USAF ranges in the southeastern United States so that approaching aircraft do not disturb Red-cockaded Woodpeckers; (2) we have fenced portions of Nellis range in Nevada to protect the Desert Tortoise; (3) we have curtailed launches of Delta rockets from Vandenberg AFB, California, during Least Tern nesting season; (5) we have modified flying routes and altitudes to avoid Peregrine Falcon nesting sites in Alaska; and (6) we have adjusted the lights on launch pads at Cape Canaveral, Florida, to protect nesting sea turtles and newly hatched young.

The USAF spends about \$3.5 million each year directly for the protection of threatened and endangered species. Additional funds are spent for indirect actions such as the preparation of environmental compliance documents and mitigation measures.

INFORMATION NEEDS: The most pertinent data that the USAF needs is basic information about the species we have on our installations, maps showing the location of their habitat, potential impact of our actions on the species, and management techniques to ensure their continued existence. Ecosystem management holds the most promise for coexistence of the military mission and threatened and endangered species. Basic information about the critical components of ecosystems on our installations and the impacts of military actions on the components is needed to develop a long-term management strategy.

PROCESSES: The Endangered Species Act was passed to protect species that are near extinction (i.e., endangered) or likely to become endangered in the future (i.e., threatened). The designation of endangered or threatened is made by the U. S. Fish and Wildlife Service through a process of consideration of available data, announcement in the Federal Register of the intent to list a given species as endangered or threatened, and comment from the public. Additionally, habitat required for the continued existence of a listed species can be designated as critical habitat.

The USAF must ensure that any activities it authorizes, funds, or carries out do not jeopardize the continued existence of endangered or threatened species or result in the destruction of critical habitat. Furthermore, the USAF must consult with the U. S. Fish and Wildlife Service or the National Marine Fisheries Service, as appropriate, prior to implementing proposed actions.

Consultation usually begins as an informal process by sending a letter to the regional office of the U. S. Fish and Wildlife Service. The letter includes a brief description of the proposed action, the opinion of the USAF regarding the potential impact to endangered or threatened species, and a request for the U. S. Fish and Wildlife Service to provide a preliminary determination of effect. The outcome of informal consultation may be a finding by the U. S. Fish and Wildlife Service that: (1) the proposed action is not likely to affect listed species or critical habitat adversely; (2) the proposed action should be modified to avoid adverse impacts; or (3) the USAF must prepare a biological assessment and begin formal consultation in accordance with Section 7 of the Endangered Species Act.

The U. S. Fish and Wildlife Service has 90 days to review a biological assessment, after which they may request additional information or issue a formal biological opinion. They may take up to 45 days to issue their opinion after the 90-day review process. A no-jeopardy opinion means the USAF can proceed with the proposed action. A jeopardy opinion means the USAF can mitigate the adverse effect or cancel the proposed action. If the proposed action could affect marine organisms, the consultation process would involve the National Marine Fisheries Service.

ISSUES OF INTEREST: The USAF has an interest in addressing the following issues:

1. Potential impacts of noise, low altitude flight and chaff on endangered and threatened species

2. Mitigation measures for reducing potential impacts to endangered and threatened species
3. Standard methods for inventorying and monitoring endangered and threatened species
4. Managing biodiversity in concert with the military mission
5. Ecosystem management as a strategy for protecting and preserving habitat critical to endangered and threatened species survival. The USAF recognizes that partnership with Federal, state, and interested stakeholders is essential to achieving long term protection of endangered and threatened species.

CURRENT AGENCY ACTIVITIES: The USAF is working in partnership with The Nature Conservancy to develop a Natural Heritage management system to consolidate information regarding endangered and threatened species throughout the USAF. The system will include information about the occurrence of endangered and threatened species, management recommendations to contribute to species recovery, and a geographic information system to map the location of existing and available habitat on USAF installations. In addition to this effort, the USAF has several projects (such as those described below) directed toward the protection and recovery of individual species.

Dare County Air Force Range, North Carolina, has played a major role in the success of efforts to reintroduce the Red Wolf on the Alligator River National Wildlife Refuge. A Memorandum of Agreement between the USAF and the U. S. Fish and Wildlife Service authorized release of wolves onto the 46,600-acre air-to-ground range. Availability of a large land mass with limited public access was vital to the success experienced during the early part of the reintroduction program. A family unit of 4 to 5 adults has occupied approximately 30,000 acres of the range since 1987. The USAF also provides assistance by conducting field surveys, monitoring the wolves, and periodically closing roads to protect active den sites.

Eglin AFB, Florida, is home to a major population of the Red-cockaded Woodpecker. As USAF natural resources management personnel carried out management activities to protect the species, they soon determined that successful protection could not occur without focusing on ecosystem restoration. The management strategy incorporates: (1) prescribed fire to control invading hardwoods and promote regeneration of longleaf pines; and (2) artificial cavity construction to increase Red-cockaded Woodpecker populations until forest structure becomes more suitable for the species. Increasing the population enhances recovery of the species

and gives the USAF more latitude in its land-use planning. Combining short term species specific projects and long term ecosystem-based actions that guide forest changes toward habitat enhancement, demonstrates the effectiveness of planning within the framework of the Endangered Species Act.

Avon Park Air Force Range in central Florida has extensive areas that may be potential habitat for the Florida Scrub Jay. The USAF, in partnership with the Archbold Biological Research Station, has begun using computerized infrared aerial photographs to aid in identification of current and potential habitat. The purpose of the survey is to identify suitable habitat for increasing the scrub jay population and minimizing the impact of military operations on the species.

The Nature Conservancy was invited onto Nellis Air Force Range, Nevada, to inventory the plant species. They found high populations of the Merriam Bearpaw Poppy. Prior to that time this Poppy was thought to be rare and was being considered for listing as an endangered species. The Poppy thrives on Nellis Range because it is protected from pressures and impacts it has suffered in other areas.

INFORMATION GAPS/PROBLEMS: Much of the information available on endangered and threatened species on USAF installations has been gathered in support of National Environmental Policy Act compliance for specific projects. As a result, inventories, mitigation measures, and management activities can vary considerably on a single installation.

PRODUCTS/RESULTS: Environmental compliance documents such as environmental impact statements, environmental assessments and biological assessments contain detailed information about the endangered and threatened species on portions of some installations. This information is usually retained at the installation affected by proposed projects. The USAF also provides input to annual congressional reporting requirements for endangered and threatened species on Federal lands.

U.S. DEPARTMENT OF AGRICULTURE

U.S. Forest Service

Ron Escano

MISSION/JURISDICTION: Achieve quality land management under the sustainable multiple-use concept to meet the diverse needs of people. The conservation element of ESA is a primary part of the agency's mission. The protection portions (Sections 7 and 9) of ESA are superimposed as compliance elements on the multiple-use concept.

INFORMATION NEEDS: Basic information on populations and extinction processes. The national TES research program was funded at \$8.96 million in FY 93. Work is currently conducted on 75 species, including plants. General direction to broaden the array of taxa researched. Readily accessible information on distribution, habitat use, and responses to various management activities is critical. This information must be available to our field units to be usable. Interagency management strategies, standards, and guidelines and information sharing systems would be helpful.

PROCESSES: The primary avenue for gathering new data is through the research arm of our agency. Monitoring may be done with our own biologists or through contracts with universities, other agencies, etc. General information is gathered through contacts with other agencies, publics, literature research services, or word-of-mouth dissemination of information. The latter is the most common.

ISSUES OF INTEREST: Development of multi-agency conservation strategies, T&E Species integration with community management and restoration programs, multi-species approaches, and habitat capability/activity response modeling to help in the biological assessment process.

CURRENT AGENCY ACTIVITIES: T&E Species expenditures totaled almost \$23 million, including about \$4.2 million in research in FY 92. Our primary emphasis is on development of Habitat Conservation Assessments for seven multi-regional species (PACFISH, bulltrout, cutthroat trout, small forest carnivores, forest owls, goshawk, and marbled murrelet). These are efforts to consolidate existing information on these species or species groups to form the basis for development of conservation strategies.

INFORMATION GAPS/PROBLEMS: Basic distribution and habitat use information in a form available to field biologists for biological assessments; especially for invertebrates. Ecosystem conservation and restoration techniques for multiple species. Inter-agency development of conservation strategies. Development of expert models to aid in management and biological assessments.

PRODUCTS/RESULTS: Tremendous number of biological assessments, literature reviews, etc., that should be available through our Regional Offices. Forest Service research products available through the Research Stations. Published literature lists available. Major planning documents and EIS (e.g., Pacific Northwest Forest Plan--Spotted Owl and old-growth associates) good place to start. Underground literature difficult to assimilate. Annual monitoring reports published as part of the Forest Planning process. Some linkage to Natural Heritage Database systems.

Soil Conservation Service

Jeri Berc

MISSION/JURISDICTION: The mission of the SCS is to provide leadership and administer programs to help people conserve, improve and sustain our natural resources and environment. It is SCS policy to assist in the conservation of threatened and endangered species and avoid or prevent activities detrimental to such species. This policy applies to state as well as federally listed species.

SCS uses informal and formal consultation with the Fish and Wildlife Service for agency projects that may affect listed species or their critical habitat. When the installation of conservation practices on private lands may affect a listed species or critical habitat, SCS will advise the land user of the requirements of the Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if one of the alternatives is selected, or if formal consultation with FWS or NMFS is initiated at the request of the landowner.

SCS seeks to work with other agencies, organizations, institutions, and individuals to:

1. Prepare or maintain state threatened and endangered species lists
2. Determine the geographic occurrence of listed species, the nature of their habitat, and the portion that is critical
3. Discuss measures to preserve habitat
4. Provide a monitoring program for actions or conditions that could further endanger listed species in order to enable protective action
5. Assist recovery teams in preparing species recovery plans.

INFORMATION NEEDS: SCS has specific information needs in the following areas:

1. T&E species locations and habitat requirements
2. Potential harmful effects of soil or water conservation practices

3. Technical information to enable SCS to help landowners comply with ESA
4. Ecosystem based approach techniques for multiple species protection and habitat enhancement.

CONCERNS: Confidentiality of T&E information that SCS gains in the conservation planning process on private lands.

INFORMATION GAPS/PROBLEMS: These include:

1. Need to develop technical land management alternatives
2. Anticipate need for alternative pest management systems where pesticides are restricted under the pesticide program of the Act
3. Need FWS agreement on alternatives
4. Need to resolve effects monitoring issues - who will monitor
5. T&E species populations after application of alternative.

PRODUCTS/OPPORTUNITIES: SCS field personnel work with private landowners on a daily basis. Ecosystem based plans that address T&E species should involve SCS in plan implementation and development. Various landuse incentives, disincentives, and program planning capabilities are available to help accomplish ESA objectives.

For example, the Conservation Reserve Program (CRP) has been viewed as an "Endangered Species Act neutralization program" by conservationists. Benefits to endangered species and to declining populations have been documented by the FWS in many areas of CRP enrollment. Areas of significant benefit include California, which ranks only thirtieth in the nation in CRP acreage (187,499 acres), where CRP is providing much of the new habitat base for reintroduced Tule elk and pronghorn. The endangered San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat are also benefitting from CRP grassland habitat. Ten million acres of grasslands restored in CRP land in North and South Dakota, Montana, and Minnesota are responsible for stabilizing and increasing formerly declining populations of non-game grassland nesting birds. The continuation and better targeting of CRP could restore many declining populations and head off future listing. In addition, the Wetlands Reserve Program selection criteria include the

national environmental ranking factor which gives priority to restoring endangered species habitat.

SCS also has a Plant Materials program that can develop recovery technology for plant species and critical habitat. This authority has not yet been fully utilized by SCS in implementing the ESA, though it has been identified as an emerging issue for strategic development. We are looking for opportunities with land managing entities to cooperate on the development of technology in support of endangered species recovery.

NATIONAL MARINE FISHERIES SERVICE

Robert Ziobro

MISSION/JURISDICTION: The National Marine Fisheries Service (NMFS) has 6 Headquarter's Offices -- Enforcement, Fisheries Conservation and Management, International Affairs, Trade and Industry Services, Research and Environmental Information, and Protected Resources in Silver Spring, Maryland. There are 5 Regional Offices and 5 Science Centers (Northeast, Southeast, Southwest, Northwest, and Alaska).

The Office of Protected Resources consists of the Permits Division, Marine Mammal Division, Endangered Species Division, and the Restoration Center. The ESA is mainly administered through both the Marine Mammal Division and the Endangered Species Division. Major activities include section 10 permitting, section 7 consultations, recovery plan development and implementation, and status review coordination for the 30 species presently under NMFS jurisdiction. In addition, NMFS has proposed the Gulf of Maine Harbor Porpoise and Johnson's Sea Grass for listing under the ESA. Status reviews are also being conducted on a number of anadromous fish species along the west coast.

NMFS shares jurisdiction with the FWS for implementation of the ESA. NMFS is responsible for most marine mammals, anadromous fish, and sea turtles in the marine environment.

One of the initiatives in the National Oceanic and Atmospheric Administration's Strategic Plan is the Strategy to Recover Protected Species. The Strategy includes:

1. Reducing impact of human activity on protected species
 - a. Manage marine activities that result in interactions
 - b. Develop environmentally safe technology and transfer technology to users
2. Assessing protected species status
 - a. Conduct traditional status assessment research
 - b. Use other programs to assist in assessments
 - c. Use assessments to resolve conflicts over impacts of different causes of mortality
 - d. Focus management actions on important causes of mortality

3. Developing and implementing Conservation and Recovery Plans
 - a. Develop recovery plans and conservation plans for all endangered , threatened, or depleted species
 - b. Implement all new recovery plans and conservation plans
 - c. Evaluate success and revise plans as needed
 - d. Take actions to fully achieve recovery:
 - (1) Interact Energetically with other Federal agencies
 - (2) Develop International agreements
 - (3) Work cooperatively with states
4. Taking a proactive approach to avoid future listings
 - a. Act before species decline necessitates listing
 - b. Initiate status reviews from independent list
 - c. Act to identify causes of decline
 - d. Do advanced, broadly-based planning to remedy problems and execute plans

INFORMATION NEEDS: Information on listed species, and on the potential impact of human activities on the species. Information from other Federal agencies on their operations early in the planning stage on how the activity may impact listed species.

PROCESSES: NMFS acquires information concerning its species through re-search conducted by the Science Centers, other Federal agencies, state agencies and private research organizations. NMFS is in the process of conducting status reviews, long term surveys, stock determinations, reproductive studies, distribution, migration and habitat studies on species under its jurisdiction. Information is also acquired through section 7 conservation recommendations or reasonable and prudent measures in an Incidental Take Statement, implementation of recovery plans.

ISSUES OF INTEREST: Major areas of interest include the following:

1. West Coast salmon - 4 listed species of Onchorhynchus

Habitat - modification and destruction, *e.g.* logging, grazing, mining, agriculture/water withdrawal, chemical contamination, dredging

Harvest - Directed fisheries, bycatch, and incidental take

Hydropower - Juvenile passage: Dams -- turbine mortality, gas bubble disease; Reservoirs -- predation, increased travel time. Adult passage: Dams -- delayed passage, fall back, Reservoirs -- temperature

Hatcheries - Overcrowding of habitat, mining of wild stocks, genetic impacts, stock transfers, smolt quality

2. Sea turtles

Fisheries interactions (net fisheries and longlines)
Dredging activities

3. Marine mammals

Fishery interactions
Vessel interactions
Subsistence
Impacts related to other activities
 Ship shock testing
 Global warming detection techniques

CURRENT AGENCY ACTIVITIES: These include status assessments, section 7 consultations, monitoring activities, implementation of recovery plans.

INFORMATION GAPS/PROBLEMS: More information is needed to better assess the impacts of activities on listed species. These needs include information on the ocean phase of the life cycle of anadromous fish and the pelagic needs of marine mammals and sea turtles.

PRODUCTS/RESULTS:

Biological opinions
Conservation regulations
 Sea turtles - TEDS, Area closures
 Steller sea lion - Buffer zones around rookeries and haulouts
 Hawaiian monk seal - Area closures around Northwest Hawaiian Islands
Status reviews
NOAA Technical Memoranda
ESA Biennial Report
Marine Mammal Protection Act Annual Report
Northern Fur Seal Conservation Plan

Recovery Plans for:

Hawaiian Monk Seal

Humpback Whale

Northern Right Whale

Steller Sea Lion

Kemp's Ridley Sea Turtle (U.S. Atlantic/Caribbean/Gulf of Mexico)

Leatherback Sea Turtle (U.S. Atlantic/Caribbean/Gulf of Mexico)

Loggerhead Sea Turtle (U.S. Atlantic)

Green Sea Turtle (U.S. Atlantic)

Hawksbill Sea Turtle (U.S. Atlantic)

Hawaiian Sea Turtles -- Interim Plan

Snake River Salmon -- Draft Plan Pending

Gulf Sturgeon -- Draft Plan

ENVIRONMENTAL PROTECTION AGENCY

Molly Whitworth

MISSION/JURISDICTION: EPA regulates environmental pollution and is responsible for protection of the health of humans and the environment under several major environmental statutes; in addition, EPA has review authority under Section 309 of the Clean Air Act for all Environmental Impact Statements under NEPA. The major statutes include broad protection for air, water, hazardous waste disposal and treatment and pesticide and toxic substances registration.

As the federal agency established to protect the total environment, EPA has a vital role to play in managing biological diversity and ecosystems. Part of that role is supporting efforts to protect and recover federally-listed threatened and endangered (T&E) species. Indeed, in a seminal report on environmental risk presented to EPA, the Science Advisory Board identified species extinction as among the four highest risks to our ecological systems.

Resources protected by EPA statutes are of critical importance to T&E species. For example, eighty-five percent of all such species utilize wetlands and aquatic habitats. Moreover, there are many opportunities for EPA to assist with the protection of T&E species. A preliminary analysis by the Environmental Defense Fund and the Wilderness Society indicates that fifty-two percent of the 920 listed and proposed species they examined are affected by, among other threats, pollutants regulated by EPA or EPA-approved environmental programs.

INFORMATION NEEDS: EPA, like all other action agencies, needs to access locations and distributions of protected species, and candidate species, if we are expected to be full partners of the ESA. Consistency among Service field offices would help greatly in anticipating consultation requirements and in our ability to prevent actions which may effect T&E species. Shared data bases and species information are not readily available and must be laboriously accessed through a number of Service offices. Delays in responses are extremely difficult due to the fact that many of EPA regulatory responsibilities are dictated by statutory or court-ordered deadlines, which often conflict with ESA deadlines; this situation may encourage the use of formal consultations in lieu of informal ones, even if they are not necessary.

PROCESSING: In October, 1993, and again in March, 1994, Administrator Browner issued directives to the Agency to develop internal procedures and policies for implementing our responsibilities under the ESA. She established an Endan-

Endangered Species Coordinating Committee (ESCC), under the direction of Deputy Administrator Robert Sussman, to assist the Regions and Programs at EPA in designing implementation plans to assure consistent compliance with all aspects of the law.

In addition to these implementation plans, EPA will be pursuing other options including ecosystem approaches and counterpart regulations with the Services as a way to codify statutory-specific procedures for carrying out our ESA responsibilities. Implementation Plans should be completed within the year.

To date, EPA's Office of Pesticide Programs and Office of Water have been the most active in Section 7 consultations with the Services. Both of these Offices have formal Programs or agreements with the Services which are pending final approval. Other EPA Offices are also expanding their efforts to consider impacts to T&E species and their habitats, including The Office of Emergency and Remedial Response (Superfund) which includes ESA responsibilities in their operating policies.

ISSUES OF INTEREST: Several fundamental environmental protection approaches being implemented at EPA will need to accommodate ESA concerns within their designs. A short discussion of the relationship between ecological risk assessment and ecosystem management and ESA requirements follows.

Ecological Risk Assessment and the ESA

EPA's approach to ecological risk assessment focuses primarily on populations and communities of organisms without considering effects to individual organisms and is not designed to support EPA management actions regarding T&E species. Widely used water quality criteria, for example, are formulated based on general protection assumptions (e.g. 85% of all aquatic species would be protected by those criteria), and are not formulated to specifically protect all species or individuals. As EPA begins to increase dramatically its response to T&E species needs, traditional risk assessment approaches will need to be modified to assist in determining risks to listed species.

Benefits to ESA from Ecosystem Management

Early in 1994, Administrator Browner established an Ecosystem Management Council at the Assistant Administrator level, to begin a program for integrated, cross-media protection of ecological resources. There are two major responsibilities under the ESA which EPA's Ecosystem Management Initiative

can facilitate: 1) the affirmative action responsibilities under Section 7(a)(1); and 2) the federal consultation requirements of Section 7(a)(2).

Section 7(a)(1) affirmative action obligations are EPA's best opportunity to use ecosystem management planning to further the goals of the ESA. Two obvious opportunities are to: (1) build in protections to rare, sensitive and candidate species before they are listed, assisting in pre-listing recovery by incorporating conservation actions into ecosystem plans; and (2) incorporating measures to protect and recover listed species; this might include participation in Habitat Conservation Plans (HCP's) under Section 10 of the ESA or commitments to institute actions necessary for recovery of species. It is important to remember that, while land management agencies are often limited to conservation actions on their lands, EPA mandates require the Agency to oversee vast numbers of activities on state and private lands, as well as federal.

The federal consultation requirement of the ESA, Section 7(a)(2), may, in some cases, lend itself to broader, ecosystem approaches. Although "ecosystem" consultation has not been tried before with the Services, a recent attempt to consult at a "programmatic" level is being considered for the Great Lakes Initiative (GLI). Presumably, after consulting on a large plan, such as the GLI, individual consultations at the species level would be facilitated. The GLI consultation may also contain provisions for candidate species. This idea has wide support at EPA for both efficiency and effectiveness reasons, and the demonstration ecosystem management plans currently being implemented at EPA might be an appropriate testing ground for this approach.

CURRENT AGENCY ACTIVITIES: The Office of Pesticides Programs, in conjunction with the FWS Environmental Contaminants experts, are charting the course in making toxicity-based risk assessments relevant to ESA assessments. New efforts in modifying water quality criteria may also be of help in supporting EPA's responsibilities to protect listed species.

Scientists involved in the Agency's research and risk assessment process can assist by developing appropriate extrapolation methodologies for inter-species toxicity determinations, determining appropriate uses for safety factors, etc. Although the biological determination of "harm" and "jeopardy" will most often be the province of the Services, EPA will be better placed to take the necessary protective measures for listed species and candidate species if we advance our knowledge and capabilities in these areas.

INFORMATION GAPS/PROBLEMS: As EPA assumes a more active partnership in species protection and management, numerous unresolved issues will need attention, including: (1) data needs and interpretive guidelines; (2) differences between EPA and the Services in scientific methodologies and data requirements; (3) conflicts between EPA regulatory deadlines and ESA timeframes, and (4) potential for achieving efficiencies and more meaningful consultations on larger geographic scales, including watersheds or multiple species communities and ecosystems.

DEPARTMENT OF ENERGY

Jerry Elwood

MISSION/JURISDICTION: The mission of the Department of Energy (DOE) is to provide the scientific foundation, technology, policy, and institutional leadership necessary to achieve efficiency in energy use, diversity in energy sources, a more productive and competitive economy, improved environmental quality, and a secure national defense. DOE's interests and activities related to endangered species are primarily centered around its stewardship responsibilities for the nearly two and one half million acres of DOE land and the associated resources in 33 states and the required actions of the research, testing, and production facilities on these lands to fully comply with the Endangered Species Act and other related Acts.

INFORMATION NEEDS: The DOE information needs with respect to endangered and threatened species include information on listed species and the potential effects of natural processes and human activities on the listed species. The Department facilities generally include landscape patches within larger areas of specific ecosystems. Accordingly, endangered species are seldom limited to the geographic area for which the Department has responsibility. As a consequence, the responsibility for, and interest in, endangered species that occur on DOE lands tends to be fragmented among different government agencies and public and private interests, including different Federal and state agencies, local governments, and private property owners and resource users. The Department needs related to the Endangered Species Act center around the development and implementation of broad regional plans for actions to protect and sustain the habitats of endangered species, integrated with the missions of all organizations included in the region.

PROCESSES: The Department of Energy has no regulatory responsibilities for endangered and threatened species. Most of DOE's relevant research and management activities are focused on the acquisition of information essential to compliance with the Endangered Species Act. The Department obtains most of the data needed to manage and assess the status of endangered species from its own research, inventories, and surveys; although additional information is actively pursued through cooperative agreements with governmental and private organizations such as the U.S. Fish and Wildlife Service, U.S. Forest Service, State wildlife management organizations, and the Nature Conservancy. The intent is to establish the useful collaborations and access the most complete information available. The Department generally uses contractors to obtain information needed to manage and protect the natural resources on DOE lands.

Responsibility for management of some resources on these lands (e.g., forest, wildlife) is sometimes held by other agencies (U.S. Forest Service at the Savannah River Site) or closely linked with resource management activities of the State (State of Tennessee Wildlife Management Unit for the DOE Reservation located near Oak Ridge, Tennessee). The Department is actively developing ecosystem-based management plans for all of its lands and facilities. These activities require close coordination with local and regional organizations, and other agencies (stakeholders) having habitat and endangered species interests and responsibilities.

ISSUES OF INTEREST: Issues of primary interest to DOE are those concerned with the environmental effect of activities associated with the Department's energy- and defense-related missions. Because energy-related activities have the potential to influence the environment over a broad range of spatial scales, ranging from local to global, the Department's interests in endangered species extend beyond the boundaries of the Department's lands and facilities. The Department's interests in sustaining endangered species fall into three general categories: (1) the effects of patch dynamics and the influence of metapopulation dynamics in sustaining endangered species, (2) the effects of environmental (atmospheric, terrestrial, aquatic) disturbances and contaminants on the sustainability of endangered species, and (3) the management of ecosystems as the focal support system to protect and enhance the sustainability of threatened and endangered species.

CURRENT AGENCY ACTIVITIES: DOE is currently involved in both research on and management of threatened and endangered species on DOE lands. A comparable level of effort is devoted to work on species currently considered as "candidates" for listing. Examples of some species important to the Department's compliance obligations are the: Red-cockaded Woodpecker, Wood Stork, Bald Eagle, American Peregrine Falcon, San Joaquin Kit Fox, Desert Tortoise, Blunt-nosed Leopard Lizard, Colorado Squawfish, and several other animal and plant species. The Department is also actively involved in research on the restoration of Tall Grass Prairie, Black Land Prairie, Shrub-steppe (Palouse Prairie), and Southern Desert Shrub habitats. An initiative to establish ecosystem-based management at all of its facilities is central to the overall Department effort to sustain endangered species and habitats. When fully implemented, this management plan will include: (1) coordination with all relevant local governments, citizen interest groups, and agencies; (2) assistance in developing a regional ecosystem management plan that will include DOE's ecosystem-based management plan; and (3) a research and management focus that addresses specific DOE environmental problems, such as contamination and energy-related disturbances.

INFORMATION GAPS/PROBLEMS: DOE is confronted with both technical and procedural problems in complying with the Endangered Species Act. The technical issues center around the criteria for listing and de-listing species as threatened and/or endangered species on DOE lands, i.e., criteria used to confirm recovery and delist species, and criteria used to list a species. Population size and distribution are not adequate in themselves, and reliance on model output is often not biologically meaningful. Population dynamics (changes in reproductive success, life tables, genetic variation, etc.) should become a part of the criteria. Also, technical information within other agencies, but not yet reported, is problematic when it is not generally available and yet it is used in decision making by the U.S. Fish and Wildlife Service. Networking information across all agencies is essential to successful implementation of the Endangered Species Act. Objective procedures are needed, including: (1) objective use of data to validate species listings, and (2) the terms and conditions used to assess "reasonable alternatives" planned to reduce risks to endangered species.

PRODUCTS/RESULTS: Scientific periodicals; technical books; NEPA compliance documents; reports in the "grey" literature; GIS analyses; and technical reports at various Department, national, and international meetings.

3 Findings and Recommendations

A brainstorming session was conducted during day two of the symposium to generate a set of findings and recommendations. Participants were divided into two subgroups. Each was asked to address a series of questions in response to the first day's presentations. The questions were:

1. Based on the presentations of the previous day and the agency handouts, what are the agency information needs/gaps? A summary of the information needs/gaps identified on Tuesday was provided on Thursday morning, but each subgroup listed any additional items that were identified by participants in the subgroup.
2. What processes/opportunities are available for exchanging information between agencies and for encouraging interagency cooperation? (Examples include memorandums of understanding [MOUs], informal meeting communication, recovery teams and plans, public comments, data bases, publication of research findings).
3. What are the restrictions/bottlenecks which currently prevent our agencies from exchanging information or cooperating? (Examples include classification of some information; complications imposed by the dispersed nature of the information of interest; lack of knowledge about who to contact in another agency).
4. Starting with the list developed in Question #1 and taking into consideration the lists developed in Questions #2 and #3, what are the common needs/gaps that can be *realistically* met through sharing of information or interagency cooperation (e.g., lack of standardized inventory and monitoring methods; recovery plan information held by USFWS that might be of interest to agency X; need for research on ecosystem level management of endangered species; need for data from agencies A and B for the compilation of a data base)?

Draft recommendations were developed for consideration by all symposium participants. These were to address the common information needs/gaps identified

in Question #4. For example, using the examples in 4, hold an interagency technical workshop to develop standardized inventory and monitoring methods; USFWS should provide a list of Regional office contacts that an interested agency could contact if they want information on Recovery plans; NBS and agencies W and Z should develop a joint research project on the ecosystem management of endangered species; agencies A, B, and C should develop a memorandum of agreement to share data for the compilation of a data base.

Through a facilitated meeting process, the subgroups developed and presented recommendations to the entire group. Following a facilitated discussion, the participants approved the set of findings and recommendations presented below.

Findings

Interagency coordination and communication should be addressed at the national, regional, and local levels to deal with TES issues. Specific attention should focus on:

- data collection methodologies
- database management and access
- monitoring
- data analysis
- jointly conducted and coordinated research
- policy guidelines
- appropriate fora to facilitate coordination/communication efforts
- ecosystem management.

Recommendations

The following 18 recommendations were approved by the symposium participants as ways to address the above findings. The order in which the recommendations are presented does not reflect priorities.

Interagency Organizational Recommendations

- Establish a national-level agency coordination task force to identify specific TES-related issues of mutual interest, and to facilitate establishment of interagency working groups, coordination meetings and workshops.

- Establish interagency working groups to address inventory, monitoring, management, and research tasks related to TES issues at national, regional, and/or local levels.
- Conduct national and regional workshops on TES issues of interagency interest such as ecosystems management and multispecies applications.
- Explore the feasibility of using existing interagency coordination capabilities within the White House.
 - For example, (1) promote the need for "species" biological research through the National Science and Technology Council (NSTC)/Committee on the Environment and Natural Resources (CENR) and (2) more fully realize CEQ/EPA responsibilities for environmental enhancement.

Interagency Information Exchange Recommendations

- Establish a national clearinghouse for biological information, including TES data.
- To facilitate communication, publish a directory of agency TES personnel that documents individual expertise, responsibilities, and interest areas.
- Develop a directory for gray literature pertinent to TES conservation, such as biological opinions, internal reports, non-refereed publications, and contractor reports. Several models already exist, including the World Conservation Monitoring Centre and the Center for Plant Conservation.
- Agencies providing training to their staffs/managers on TES issues should encourage participation by staff and key managers from other agencies.
- Establish interagency public education and outreach programs for TES.
- Develop an interagency "lessons learned" procedure to facilitate interagency sharing of successes and failures regarding TES conservation initiatives.
 - This includes successes and failures in interagency coordination as well as lessons learned regarding specific TES research and management activities.

Interagency Cooperation/Coordination Recommendations

- Establish an interagency "small problems program" to allow an agency to take advantage of expertise available in another agency in dealing with a specific TES issue.
 - As an example, agencies with appropriate expertise might agree to detail staff on a limited basis (from a few hours to a week) in response to a request from a partner agency.
- Encourage agencies to identify internal planning processes that could benefit from and are appropriate for interagency input and cooperation.
- Establish partnerships, such as challenge cost share programs, to leverage agency resources. Partnerships may apply to a broad range of inventory, monitoring, management and research endeavors.
- Establish an interagency process to address private land/mixed ownership issues related to TES.
- Develop a means to establish regional, interagency priorities for listing prevention programs (candidate conservation).
- Request that the National Academy of Sciences (NAS) recommend standards for database management systems that allow for easy, controlled access to TES information.
- Request that the NAS evaluate current interagency efforts to develop a standardized ecosystem classification scheme and make appropriate recommendations.
- Facilitate interagency discussions regarding the controversial issue of confidentiality as it relates to the specific locations of TES.

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