

**DRAFT  
IMPLEMENTATION  
STRATEGY**  
*for the*  
**CENTRAL VALLEY/  
SAN FRANCISCO BAY  
ECOREGION**

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## Mission of the Fish and Wildlife Service

The mission of the Fish and Wildlife Service is to conserve, protect, and enhance the Nation's fish and wildlife and their habitats for the continuing benefit of people.

This mission can be further served by adopting an ecosystem approach to conservation, for fulfilling the Service's trust resource responsibilities requires the long-term maintenance of healthy native ecosystems. In addition, an ecosystem approach will enable the Service to fulfill its mission with greater efficiency and effectiveness.

## Introduction

Region 1 has identified seven ecoregions within the states of California, Washington, Oregon, Nevada, Idaho, and Hawaii. These seven ecoregions become part of 52 proposed ecoregions delineated by the U.S. Fish and Wildlife Service nationwide. The dire circumstances facing many of our plant and animal species beg for strategies in solving the problems. To this end, each ecoregion has been assigned a team of experts to develop goals, priorities, objectives, and the actions required to achieve the primary ecosystem management goal of protecting or restoring the function, structure, and species composition of an ecosystem<sup>1</sup> while recognizing its sustainable socioeconomic uses. With this approach, emphasis is placed on the maintenance of biodiversity through reconstructing, stabilizing, and maintaining native communities and physical environments

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<sup>1</sup>For the purposes of this planning document, an ecosystem encompasses all of the environments (including physical and biological elements and their interactions) within a watershed. In some cases, an individual region will consist of only one ecosystem; in other instances, particularly in larger regions, many ecosystems or watersheds exist.

within which trust species can survive. The Service has adopted nine common principles to guide our ecosystem approach (Table 1).

This Implementation Strategy will spread its influence far beyond its boundaries to incorporate the needs of conservation cooperators across the nation. The Implementation Strategy creates significant challenges, but it also outlines the many opportunities we have to save California's unique natural heritage. This Implementation Strategy prioritizes Service activities within the Central Valley/San Francisco Bay Area and complements the roles, responsibilities, and jurisdictions of numerous partners. For this reason, ample discussion and input by our many cooperators is encouraged and anticipated. These Implementation Strategies are designed to be dynamic, although goals, priorities, and objectives will remain relatively constant, thus providing a better focus for future conservation activities.

As the Service carries out its mission and works toward its goal to protect and restore natural ecosystems, we seek involvement and assistance from our many partners - from every level of government, from private organizations, from business leaders, and individuals - to assist in this monumental task. It will take a concerted effort by all of us to meet this goal.

Table 1. Ecosystem Approach Principles

- An ecosystem approach is a critically important tool in promoting the conservation of biological diversity and an environmentally sustainable level of development.
- Environmental and socioeconomic factors and interests are considered.
- Natural resource goals must be established on an ecosystem-wide basis.
- Full participation of all partners (federal, state, local, tribal, public, and private) in setting and achieving resource goals is imperative.
- Service resources and tools must be integrated within the Service and leveraged with those of our partners to achieve greater resource results.
- Strategies and implementation actions must be based on the best available sciences.
- Efforts must be focused on discrete units of the landscape, of varying but manageable size and with similar resource issues, to promote local action and involvement.
- The Service must encourage flexibility and innovation to achieve greater resource results.
- Decisions must be delegated to the lowest appropriate level and Service employees must be given the maximum possible authority.

## Region 1 Ecosystem Approach: Regional Goals

As a result of the Regional Conference held in Portland in April 1992, a set of general goals were drafted as a start in guiding the Region's efforts toward application of ecosystem management. Participants recommended that the Region move from individual species management to ecosystem management, and improve cross-program communication and cooperation. Participants also expressed an associated need for a proactive, long-term approach to identification and resolution of key issues. A key element of both Regional Conference findings is that they should be cross-program and interdisciplinary. These goals have been further refined as we continue applying an ecosystem approach to management, as outlined in recent national guidance.

Objectives which are clearly defined and scientifically defensible are integral to ecosystem management. They will clarify our intentions and provide general benchmarks to guide and evaluate our efforts in furtherance of the Service's mission. These objectives are numerous and all are important, but must be ranked to facilitate implementation. A series of increasingly specific objectives, strategies, and actions must follow and should be reviewed regularly to assure consistency with the Region's goals. The resulting products will provide the needed guidance for making choices between multiple priorities, utilizing available resources. The resulting combination of regional and ecoregional goals will form the basis for establishing future priorities and allocation of funds.

## Why is Ecosystem Management Necessary?

An ecosystem approach provides a framework to deal more effectively and efficiently with the growing number and complexity of resource issues faced by the Service. In contrast to single species, site-specific, single-purpose protection strategies, management for healthy ecosystems involves recognition and management for all environmental and biological relationships among and within natural communities on a systematic basis.

Because of their fragmented and localized nature, single-species approaches to species and habitat management could be characterized as the "Band Aid" strategy. Priorities for restoration under the "Band Aid" strategy frequently are determined by identifying the most degraded sites and spending all available resources treating these "crisis" areas and issues rather than proactively addressing the underlying biological and physical causes of ecosystem decline.

### Benefits of an Ecosystem Approach

The benefits of an ecosystem approach range from improving efficiency and internal Service cooperation to sharpening our focus on conserving biological diversity and offering a broad range of improved resource values and products to the public. An ecosystem approach will build understanding and cooperative working partnerships between Service programs and between government agencies and the private sector. If done in cooperation with political and economic interests, this approach will improve resource

availability, enabling economic interests to better plan their activities and achieve their business objectives.

Conservation of biological diversity is perhaps the ultimate benefit of the comprehensive approach recommended in this strategy. It will be accomplished by maintaining ecosystem integrity, reflecting the number and variety of component species and the genetic variety represented within the ecosystem. This is the most significant legacy the Service can leave to generations that follow.

### **Role of the Service in Ecosystem Management**

At present, no single legal mandate clearly charges the Service to pursue an ecosystem approach in satisfying its legal responsibilities. In aggregate, however, numerous international treaties, federal laws, and executive orders do contain conservation of biological diversity as an underlying theme. The Endangered Species Act, in particular, encourages an ecosystem approach.

In addition, the Service's mission and supporting goal and policy statements directly address biological diversity. For example, conservation of biological diversity is one of four goals of the National Wildlife Refuge System. From a historical perspective, it is apparent that virtually all Service programs and initiatives have contributed to the conservation of biological diversity, either directly or indirectly, through past efforts focusing on river basins to the development of Regional Resource Plans.

### **Results of Implementation**

Effective ecosystem management and conservation of biological diversity will be implemented at the landscape level. Through the advisory, private lands, and regulatory processes of the Ecological Services Program; the land management, habitat protection, and acquisition processes of the Refuges and Wildlife Program; the restoration efforts of the Fisheries Program; the administration of grants to states through the Federal Aid Program; the enforcement activities of the Law Enforcement Program; as well as other efforts related to migratory birds, threatened and endangered species, and anadromous fish, the Service is uniquely positioned to offer leadership in ecosystem management.

# ECOREGION RESOURCE DESCRIPTION

## Central Valley/San Francisco Bay Ecoregion Description

The Central Valley/San Francisco Bay Ecosystem is one of the most biologically diverse, strategically important, and politically complex areas in the country. The diversity extends from glacially scoured alpine cirques above 10,000 feet elevation to coastal seabird islands 30 miles offshore. The region includes the richest and most productive agricultural area in the country, the Central Valley. This agriculture is supported by both a State and a Federal water project which, combined, are the largest and most complicated water delivery systems in the country.

The ecoregion winters over 60 percent of all the Pacific Flyway waterfowl and is home to over 30 endangered, threatened, or Federal candidate species. California currently has over 32,000,000 people and it is projected by the year 2020 it will reach 50,000,000 people. Urban planners anticipate that much of California's growth in the next quarter century will occur in the Central Valley, where land is plentiful and inexpensive relative to the Bay Area and southern California. This will place an accelerated burden on natural resources that, in many cases, are already on the verge of collapse.

This Implementation Strategy was a collaborative effort by the team members. The team recognizes the key to success in implementing this plan is a shared responsibility with other Federal, State, and private partners. To implement a comprehensive ecosystem plan that addresses all the facets of ecosystem health and vitality will require involvement with many agencies and groups who have legal mandates beyond the authorities of the U.S. Fish and Wildlife Service.

## Principal Physiographic and Geographic Features and Boundaries

The Ecoregion is bound on the north by the headwaters of the Sacramento River watershed (see Figure 1). The crest of the Sierra Nevada mountains is the east boundary and the Tehachapi Mountains is the south boundary. The east slope of the Coastal Range forms the west boundary for most of the ecoregion; with the exception of San Francisco Bay, where the ecoregion extends to the Pacific Ocean at the mouth of the Bay, and extends offshore to include the Farallon Islands.

### *Principal Ecoregion Subunits*

1. **Sacramento Valley:** That portion of the Central Valley and adjacent watershed north of the Cosumnes River.
2. **San Joaquin Valley/Tulare Basin:** That portion of the Central Valley and adjacent watershed from the Cosumnes River south to the Tehachapi Mountains.
3. **Bay-Delta:** The San Francisco Bay and adjacent bay area watersheds, plus the Sacramento-San Joaquin River Delta portion of the Central Valley and the Farallon Islands on offshore coastal rocks, and seastacks near the mouth of San Francisco Bay.
4. **Montane/Northeast Plateau:** A 6,000 square mile high desert plateau in northeast California, southeast Oregon, and northwest Nevada dominated by large alkaline lakes (e.g., Goose, Eagle, and Honey Lakes).

## Significant Fish, Wildlife, and Habitat Resources in the Ecoregion

### *Sacramento Valley and San Joaquin Valley/Tulare Basin Ecoregion Subunits*

The Central Valley is about 400 miles long, from Redding in the north to Bakersfield in the south, with an average width of 40 miles. The Valley has two components, the Sacramento Valley in the north which has a southward drainage, and the San Joaquin Valley in the south which has a northward drainage. The two river systems (Sacramento River and San Joaquin River) meet to form the Sacramento/San Joaquin Delta; their waters then flow into San Francisco Bay. A portion of the southern part of the San Joaquin Valley is essentially a closed system (a sump) known as the Tulare Lake Basin. During high runoff years, up to 40,000-50,000 acres of the former Tulare Lake and nearby areas become flooded.

With the exceptions of a few wetland areas, most of the Central Valley floor is now developed primarily for agriculture and smaller areas for industrial and urban uses. There are around ten million acres of irrigated croplands using about 30 million acre-feet of water annually (two to seven times the amounts used in any other of the western states). Of all the water consumed in California, 91 percent is used for agricultural purposes. California leads all states in agricultural production. This state also has the highest human population of all western states (32 million), with about 15 million living in or within a two-hour drive of the Valley.

The remaining wildlands and waters are few. Every major river or stream has been dammed or diverted. Prior to 1900, approximately four

million acres of wetlands existed. Today there are only about 292,000 acres. When first settled, 6,000 miles of stream, river, and associated riparian habitats complemented wetlands in the Central Valley. Today, because of major water developments, less than 950 miles of riparian woodland remain and fish and wildlife populations have declined dramatically along with their habitats. These reductions and alterations of native habitats have resulted in at least 16 animal and plant species classified as endangered (including the San Joaquin kit fox, California condor, three kangaroo rat species, blunt-nosed leopard lizard, winter-run chinook salmon, three vernal pool shrimp species, palmate-bracted bird's-beak, Antioch Dunes evening-primrose, Bakersfield cactus, Butte County meadowfoam, large-flowered fiddleneck, etc.). Federally listed threatened species include the southern bald eagle, Aleutian Canada goose, valley elderberry longhorn beetle, and a vernal pool shrimp. The State threatened and endangered species list additionally includes the yellow-billed cuckoo, willow flycatcher, greater sandhill crane, Swainson's hawk, and bank swallow.

Most native fish populations have declined dramatically with the loss of habitat, reduced water quantity and quality, and through the effects of water development and diversions. The Central Valley still supports a diverse fish fauna with nearly 20 endemic fish species along with about 50 native resident, anadromous, and euryhaline species. Anadromous salmon and steelhead spawning populations have declined from about 500,000 in the early 1950's to less than 130,000 in 1993 with most of the remaining populations located in the Sacramento River or its tributaries. The populations are currently supported by a large proportion of hatchery produced fish. Even with these declines, the

chinook salmon population is still one of the largest populations along the west coast and is unique with the occurrence of four separate distinct spawning runs; fall, late-fall, winter, and spring. Several of the endemic resident species--such as delta smelt, splittail, and modoc sucker--have been listed as threatened/ endangered; with a number of other native species also having listing potential. The anadromous green and white sturgeon have also seen declines with the full extent and reasons for the declines largely unknown. The aquatic ecosystem is also influenced by the occurrence of a large number of introduced/exotic fish species--such as largemouth bass, carp, American shad, and striped bass--that may have played some part in the decline of some of the endemic populations. However, striped bass, an important sport fish, have also seen major population declines paralleling the other anadromous fish declines.

Many neotropical bird species have experienced serious declines in recent times, especially those dependent upon riparian habitats. Grassland and riparian dependent species are often confronted by habitat fragmentation, degraded habitat, and less-than-optimum management practices. These species include yellow-billed cuckoos, black-headed grosbeaks, common yellowthroats, lazuli buntings, bank swallows, willow flycatchers, and several warbler species. Other non-riparian dependent neotropical migrants are also declining, such as burrowing owls. Wetland nesting tri-colored blackbirds have shown similar downward trends. Wetlands and agricultural lands in the Central Valley support 60 percent of the waterfowl wintering in the Pacific Flyway, about eight to ten million waterfowl. An additional 20 percent of the Pacific Flyway population may pass through the Central Valley, utilizing the

wetlands. Sacramento Valley alone winters 44 percent of the Pacific Flyway waterfowl. Of special importance, more than 65 percent of all pintails in the United States use the Central Valley and 76 percent of the pintails wintering in California winter in the Sacramento Valley. These habitats, along with adjacent uplands and riparian areas, also provide habitat for many other plants and animals. Sandhill cranes, American white pelicans, white-faced ibis, northern harriers, short-eared owls, great and snowy egrets, massive flocks of sandpipers and dowitchers, and many other upland, passerine, and wading birds share these habitats.

The importance of the Central Valley to wintering waterfowl has gained strong recognition in continental waterfowl management in recent years. Also, Californians now recognize the broad public values of wetlands and associated habitats and are launching efforts to reduce or reverse habitat losses. A State legislative action (SCR 28) in 1979 mandated that the existing wetland acreage in California be increased 50 percent by the year 2000. Since 1984, Californians passed two ballot measures (Propositions 19, 70) and a tobacco tax initiative (Proposition 99) to help finance programs for wildlife and habitat acquisition and enhancement. Other legislative and general public support activities are ongoing.

Wetland habitat, however, continues to decline. About 30 percent of the remaining wetlands are within national wildlife refuges and State wildlife areas; the remaining 70 percent are privately owned, and managed primarily as duck hunting clubs. About 40 percent of the private wetlands are protected through State legislation, Federal perpetual easements, or by conservation organizations. Protected lands must be intensively managed to

compensate for the loss of historic wetlands, grasslands, and riparian vegetation. The remaining 119,000 acres of wetlands are unprotected and are a priority objective of the Central Valley Habitat Joint Venture. In addition, there is a strong need to work more closely with the agricultural industry, primarily rice growers, in cooperative management efforts to meet the total food needs of waterfowl and enhance nesting habitat opportunities. The impacts to wildlife and its habitat base from toxic agricultural waste water and evaporation ponds are serious and must be solved through both short- and long-term changes in agricultural practices.

The need for firm-yield water supplies for State, Federal, and private lands managed for waterfowl was not adequately addressed in past Federal and State water resource development projects. The U.S. Bureau of Reclamation's Central Valley Project and California Department of Water Resource's State Water Project transect the Valley and, combined, represent one of the most sophisticated water management systems in the world. Historically, these projects served the needs of agriculture, power, and municipal-industrial water users while fish and wildlife needs have received minimal attention. Waterfowl management areas have traditionally operated primarily by using intermittent-yield CVP water supplies (surplus water in wet years) and irrigation return flows. With the Central Valley Project Improvement Act that passed into law in October of 1992, much of this problem will be alleviated.

#### *Bay-Delta Ecoregion Subunit*

The San Francisco Bay and Sacramento/San Joaquin Delta form the largest estuary on the Pacific Coast. This area is defined as the open water, tidal mudflats, surrounding wetlands,

and adjacent uplands draining into the Bay, and coastal habitats from Santa Cruz north to Bodega Bay. The Estuary conveys the waters of the Sacramento and San Joaquin Rivers to the Pacific Ocean, which drain over 40 percent of the State (60,000 square miles).

Over six and half million people live in the local counties. The Bay and Delta are one of the most severely modified estuaries in the world. Habitats have been severely reduced and degraded by industrial, residential, and agricultural developments. For example, 85 percent of the tidal salt marshes have been destroyed. Other habitat types have been similarly reduced. The watershed and aquatic systems have been degraded through fresh water diversions, sedimentation, and pollution. The remaining habitats are of crucial importance for sustaining an abundance of fish, wildlife, and plant communities.

As would be expected by large-scale habitat modification and loss, many endangered and rare species are found in the Bay and Delta. Several depend entirely on this area for survival, including the California clapper rail, salt marsh harvest mouse, San Francisco garter snake, Lange's metalmark butterfly, and Antioch Dunes evening primrose, among others.

Each year, two-thirds of the State's salmon pass through the Bay and Delta, and many marine species spawn in the Bay. Nearly half of the waterfowl of the Pacific Flyway migrate through or winter in the Bay and Delta, as do more than one million shorebirds—one of the largest concentrations found along the Pacific Coast. This area also supports a large diversity of colonial nesting bird colonies.

The adjacent marine environment is made up of the rocks and islands along the coast from

Santa Cruz north to Bodega Bay, the Farallon Islands, and the surrounding marine waters which include the Gulf of the Farallons National Marine Sanctuary. This area is part of the California Current system, which extends north along the Pacific Coast.

This unique area is located in close proximity to a huge metropolitan area. It is extremely vulnerable to such human impacts as hazardous spills, gill-net fishing, pollution, and disturbance. It hosts a rich diversity of fish, wildlife, and other marine life.

The Farallon Islands, located 28 miles west of San Francisco, is one of the largest and most diverse seabird breeding colonies along the Pacific Coast south of Alaska. It supports 12 seabird species, including the largest Brandt's cormorant, western gull, and ashy storm-petrel colonies in the world. Five pinniped species haul out or breed there, including a stable breeding colony of northern elephant seals and one of the few Steller sea lion breeding colonies in California, a Federally threatened species. Many of these populations have undergone severe declines from which they have not yet recovered. Common murre colonies throughout this area are severely depleted. A variety of seabird and pinniped breeding colonies are also located on the rocks and islands along the coast.

#### *Montane/Northeast Plateau Ecoregion Subunit*

The Sierra Nevada is the longest continuous mountain range in the coterminous United States. The Sierra Nevada lies almost entirely in California, extending into Nevada only along the eastern shore of Lake Tahoe. The range is more than 400 miles long north to south and 60 to 80 miles wide east to west, forming a massive barrier for the great Central

Valley from the more arid regions to the east. The Sierra's northernmost point is located a few miles south of Mt. Lassen, which is the southernmost point in the Cascade Range. The Sierra's southern terminus is the Tehachapi Pass.

More than a dozen major rivers, such as the Feather, Yuba, Mokelumne, Tuolumne, Merced, and Stanislaus, form drainage routes on the western front, cutting deep into the range and eventually through the Central Valley, Coast Range, and to the Pacific via the San Joaquin/Sacramento Delta and the San Francisco Bay.

The habitats of the Sierras contain a wide variety of soil types and climatic conditions that provide for many vegetative types. Starting on the Central Valley side, habitats range from annual grasslands, valley oak woodland, and blue oak/digger pine at the lower elevations, to chaparral, montane hardwood, and mixed conifer at mid-elevational levels. Upper elevational levels contain aspen, ponderosa pine, Jeffrey pine, white fir, and alpine meadows. Following down the eastern slopes, habitats include juniper, montane chaparral, and low sage. In all there are about 60 habitat types or associations recognized in the Sierras.

With a wide variety of soils, vegetation, and climatic conditions, the Sierras are home to an equal variety of fish and wildlife species. Unique mammals include bighorn sheep, wolverine, Sierra Nevada snowshoe hare, Sierra Nevada red fox, and river otter. Some species like the grizzly bear were once abundant but are now extirpated from their range in California, which included the Sierras. Unique reptiles and amphibians include the limestone salamander, foothill yellow-legged frog, Yosemite toad, mountain

king snake, and rubber boa. Unique birds include the California spotted owl, bald eagle, and western tanager. Unique fish species include the little Kern golden trout, Owen's Valley tui-chub, and redband trout.

The Northeast Plateau encompasses about 6,000 square miles and includes the northeast corner of California and very small sections of southern central Oregon and northwestern Nevada. The area is dominated by a number of natural alkaline lakes, the largest of which are Goose Lake in the north and Eagle Lake/Honey Lake in the south. Goose Lake, technically considered part of the Pit River/Sacramento River system, has only been directly connected twice in the last 150 years and should be considered as an isolated basin. The Eagle Lake/Honey Lake Basin, which is actually part of the old Lathontan Lake system, is now isolated from any other major river systems. The large land area between the two lake systems, located in a high desert plateau, consists mainly of gently rolling hills with the dominate mountain system being the Warner Mountains.

Both lake systems, because of the high degree of isolation, have developed somewhat unique endemic aquatic species assemblages that include several species that may qualify for threatened/endangered status. The Goose Lake system includes subspecies of lamprey, tui chub, sucker, and redband trout that can be considered as an aquatic diversity cluster and may qualify as a multi-species listing package. The Eagle Lake system also contains a mostly healthy endemic native fishes assemblage, except for the Eagle Lake rainbow trout that has recently been considered for listing under the Endangered Species Act.

This area serves as an important breeding area and migration stop for migratory water

birds, especially ducks, Canada geese, and greater sandhill cranes. The area also contains the largest population of antelope in California. Other significant species include white-faced ibis, osprey, bald eagles, goshawks, Swainson's hawks, prairie falcons, sage grouse, snowy plovers, willow flycatchers, bank swallows, and loggerhead shrikes.

## ECOREGION GOAL

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To restore, conserve, and protect the ecological systems and biological diversity of the Central Valley/San Francisco Bay Ecoregion for present and future generations.

## ECOREGION PRIORITIES

- \* Recover Threatened/Endangered Species and Avoid Future Listings
- \* Habitat Protection, Restoration, and Enhancement
- \* Human Resources and Outreach
- \* Research/Monitoring/Data Collection

**\* Recover Threatened/Endangered Species and Avoid Future Listings**

- *Protect species/habitats trending toward extinction*
- *Recover and delist species*
- *Identify and reduce impacts of introduced species*

**\* Habitat Protection, Restoration, and Enhancement**

- *Return waterfowl and shorebird populations to mid-1970's levels*
- *Protect/enhance habitats for native and neotropical bird species*
- *Protect/restore marine habitats and seabird populations*
- *Restore colonial waterbird populations*
- *Increase sustainable/natural anadromous fish populations*
- *Conserve sustainable non-anadromous, endemic fish populations*
- *Develop/implement hatchery management plan*
- *Coordinate with NMFS to protect/restore pinniped populations*
- *Coordinate with NMFS to protect/restore marine habitats and fish populations*
- *Ensure no further net loss of wetlands*
- *Restore/enhance wetlands and riparian areas*
- *Assure water quality/quantity to protect wetlands*

**\* Human Resources and Outreach**

- *Inform partners about ecosystem approach*
- *Involve partners in refining Implementation Strategy*
- *Inform key publics about priority issues*
- *Develop outreach program*

**\* Research/Monitoring/Data Collection**

- *Establish institute to coordinate research*
- *Provide information needed to support critical decisions*
- *Develop/implement comprehensive monitoring/assessment program*
- *Establish research institute as a repository/source of ecosystem information*
- *Develop/implement information storage/retrieval/dissemination system*
- *Develop evaluation models to predict consequences of management decisions*
- *Assure water quality/quantity is adequate*

## ECOREGION PRIORITIES, OBJECTIVES, AND STRATEGIES

**PRIORITY: Recover Threatened/Endangered Species and Avoid Future Listings**

**PRIORITY Recover Threatened/Endangered Species and Avoid Future Listings**

*The Central Valley/San Francisco Bay Ecosystem has been altered to the extent that currently 37 species have been Federally listed as endangered, 13 as threatened, and 30 are proposed for listing. In addition, over 1600 species are in candidate status in California; a large number of these are represented in this Ecoregion. The reduced population levels of these species is a direct reflection of the current health of the Ecoregion. Existing protective and regulatory mechanisms must remain in place to prevent imminent declines. Immediate implementation of measures to restore ecosystems of the area will provide the best opportunity to prevent further declines in species abundance.*

*Plant and animal species in the Central Valley/San Francisco Bay ecosystem continue to be threatened and their habitats lost and degraded because land uses and developments have not been comprehensively planned to protect vulnerable ecosystems and species. Existing protective and regulatory mechanisms still permit the piecemeal and cumulative loss of fish and wildlife resources and habitats. A lack of rangewide status reviews, conservation strategies, and management plans impairs the protection of many species.*

<b>OBJECTIVE NO. TE-1:</b> Protect plant and animal species and their habitats vulnerable to and trending towards extinction.	
<b>STRATEGY NO. TE-1A:</b> Coordinate with Federal, State, county, and local governments to encourage comprehensive planning for the protection of species and habitats.	<b>STRATEGY NO. TE-1B:</b> Pursue Conservation Agreements with Federal, State, and local governments, and the private sector where appropriate, to alleviate or preclude the need for listing.
<b>STRATEGY NO. TE-1C:</b> Develop cooperative Geographic Information System (GIS) program to map and inventory resources and species, design habitat preserve strategies, and coordinate protection of threatened Central Valley habitats.	<b>STRATEGY NO. TE-1D:</b> Develop ecosystem models and methodologies for assessing the success of and applying adaptive management to threatened and endangered habitats within the Central Valley.
<b>STRATEGY NO. TE-1E:</b> Monitor and conserve candidate species to avoid federal listing.	<b>STRATEGY NO. TE-1F:</b> * Restore tidal salt marsh habitat as described in the California Coastal Marsh Ecosystem Recovery Plan.
<b>STRATEGY NO. TE-1G:</b> * Restore native salt marsh species to viable population levels.	

PRIORITY: Recover Threatened/Endangered Species and Avoid Future Listings

*Progress towards recovery is not occurring for most listed threatened and endangered species. Fifty-four species have been listed within the Central Valley ecosystem but only \_\_\_ recovery plans addressing these species have been prepared.*

<b>OBJECTIVE NO. TE-2:</b> Recover and delist endangered and threatened species by restoring ecosystems within the Central Valley/ San Francisco Bay Ecoregion.	
<b>STRATEGY NO. TE-2A:</b> Develop and implement multi-species/multi-habitat recovery plans.	<b>STRATEGY NO. TE-2B:</b> Encourage the development of habitat conservation planning strategies for counties where planning efforts have not occurred.
<b>STRATEGY NO. TE-2C:</b> Implement the recovery planning strategies identified in the updated San Francisco Bay Species Recovery Plan.	<b>STRATEGY NO. TE-2D:</b> Implement the recovery strategies to be identified in the multi-species San Joaquin Valley Recovery Plan.
<b>STRATEGY NO. TE-2E:</b> Recover populations of bald eagles and peregrine falcons in the forest ecosystems.	<b>STRATEGY NO. TE-2F:</b> * Finalize the Delta Native Fishes Recovery Plan and implement the strategies identified.
<b>STRATEGY NO. TE-2G:</b> Develop a data base and tracking system to monitor and assess compliance with endangered species mitigation requirements.	<b>STRATEGY NO. TE-2H:</b> *? Increase the quantity and quality of the riverine sand dune system at Antioch Dunes NWR in order to recover three endangered species only found at the Refuge.

*A wide variety of exotic fish, wildlife, and plant species have been intentionally introduced or have invaded the Ecoregion. Non-native species have the potential to reduce the population levels of endemic and resident species through direct competition and predation.*

<b>OBJECTIVE NO. TE-3:</b> Identify and reduce the impacts of introduced species on threatened and endangered species.
<b>STRATEGY TE-3A:</b> Develop and implement programs to control the impact of exotic species on threatened and endangered species and avoid future introduction/invasion of exotics.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**PRIORITY:** Habitat Protection, Restoration, and Enhancement

*Population growth and associated economic development in California have destroyed or degraded many fish and wildlife habitats. Native terrestrial habitats have largely been replaced by lands devoted to agriculture, grazing, industrial uses, and expanding cities. Likewise, water flows, water quality, and wetlands have been drastically reduced or altered. Every major river or stream has been dammed or diverted. In the Central Valley/San Francisco Bay Ecoregion, 99 percent of the historic grasslands, 98 percent of riparian areas, and 92 percent of the former wetlands have been lost. As a consequence, many plant and animal populations and communities are threatened or endangered; and the list of these species and communities continues to grow.*

*A large majority of wetlands in the northeast plateau area have been at least partially - if not entirely converted to pasture and agricultural land. Water rights for almost every major stream have been fully allocated; except during flood events, no water is left for wildlife and little reaches terminal basins. All riparian corridors have been subjected to intense grazing pressure for well over 100 years. This has contributed to the decline of waterfowl, neotropical migrants, and resident species.*

*This Ecoregion remains one of the most biologically diverse areas in the country. The Central Valley of California supports over 60 percent of the wintering waterfowl in the Pacific Flyway and the San Francisco Bay area winters 10 percent. The waters of the Ecoregion support nearly 20 endemic and 50 native species. Hundreds of species of migratory birds breed, winter, and move through the area; the region supports several hundred thousand shorebirds during winter and migration periods.*

**OBJECTIVE NO. HP-1:**

Return waterfowl and shorebird populations to the mid-1970's levels by the year 2002.

**STRATEGY NO. HP-1A:**

By 2003, protect 80,000 acres of Central Valley wetlands through fee acquisition and/or perpetual conservation easements. The principal implementing parties are the Service (Sacramento Realty Field Office) and the Wildlife Conservation Board with assistance from private non-profit organizations such as The Nature Conservancy and Trust for Public Lands.

**STRATEGY NO. HP-1B:**

By 2003, restore 120,000 acres of former wetlands and protect through fee acquisition and/or perpetual conservation easements. Principal implementing parties include Fish and Wildlife Service, Natural Resources Conservation Service, California Department of Fish and Game, Ducks Unlimited, The Nature Conservancy, U.S. Army Corps of Engineers, Bureau of Reclamation, and the California Waterfowl Association.

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PRIORITY: Habitat Protection, Restoration and Enhancement

<p><b>STRATEGY NO. HP-1C:</b> By October 30, 2002 provide firm CVPIA Level 4 water supplies to Central Valley NWR's, WA's, and GRCD per BOR water studies and San Joaquin Action Plan. The principal implementation parties are the Service and Bureau of Reclamation.</p>	<p><b>STRATEGY NO. HP-1D:</b> By 2003, enhance 291,555 acres of existing Central Valley wetlands. Principal implementing parties are NRCS (Water Bank), DU, CWA, USFWS, and CDFG.</p>
<p><b>STRATEGY NO. HP-1E:</b> Enhance 443,000 acres of private agricultural land to support wintering and nesting waterfowl. The principal implementing partners are USFWS, CDFG, DU, and CWA.</p>	<p><b>STRATEGY NO. HP-1F:</b> By 1995 establish a wetland joint venture in the San Francisco Bay area that addresses habitat protection, restoration, and enhancement for waterfowl and shorebirds among other species. This effort is currently in the early stages of planning with the lead Organizer located at the California Coastal Conservancy. Quantified action items for acres and population goals will be deferred until the Regional Wetlands Goals Project can establish wetland goals for bay area waterfowl and shorebirds.</p>
<p><b>STRATEGY NO. HP-1G:</b> Develop and implement monitoring and research efforts in order to provide basic information on waterfowl and shorebird population trends and health in the San Francisco Bay - Delta area.</p>	<p><b>STRATEGY NO. HP-1H:</b> Incorporate the wetland protection goals identified in the California segment of the Draft Intermountain Habitat Joint Venture Implementation Plan.</p>
<p><b>STRATEGY NO. HP-1I:</b> Complete acquisition and development of existing or restorable freshwater and tidal wetlands, baylands, mudflats, and associated uplands within authorized refuge boundaries.</p>	

*Populations of many neotropical migrants throughout North America have been declining in recent years. Habitat loss and degradation is believed to be the major cause. In the Central Valley 99 percent of the historical grasslands, 98 percent of the riparian areas, and 92 percent of the wetlands have been lost. Similar losses have occurred in the San Francisco Bay Area.*

*A new Riparian Habitat Joint Venture is currently being formed as part of California Partners in Flight. The lead implementing parties are Point Reyes Bird Observatory, National Audubon Society, U.S. Forest Service, Kern River Research Center, The Nature Conservancy, U.S. Fish and Wildlife*

**PRIORITY:** Habitat Protection, Restoration and Enhancement

*Service, Bureau of Land Management, California Department of Fish and Game, Wildlife Conservation Board, State Lands Commission, and the Bureau of Reclamation. Their goal is to: "conserve, increase and improve riparian habitat throughout California in a common effort to protect and enhance habitats for both California's native birds and neotropical migratory birds in a manner consistent with other objectives of the California Chapter of Partners in Flight." Quantified action items for riparian neotropical birds will be deferred until the Riparian Habitat Joint Venture can develop and prioritize needs. Their objectives are outlined below as strategies.*

<p><b>OBJECTIVE NO. HP-2:</b>                  Protect and enhance habitats for both California's native birds and neotropical migrants in a manner consistent with the other objectives of the California Chapter of Partners in Flight.</p>	
<p><b>STRATEGY NO. HP-2A:</b>                  Compile existing data on riparian habitat throughout the State to identify key riparian areas, as well as information gaps. Promote and coordinate efforts to obtain needed information.</p>	<p><b>STRATEGY NO. HP-2B:</b>                  Develop guidelines for protection of existing habitat on public lands and recommend alternatives for protection on private land, including fee title or perpetual easement acquisition, long-term cooperative management agreements with landowners, and development of support for protective zoning and tax incentives to secure protective management. This would be accomplished by cooperative agreement, purchase, and initiation of zoning and tax incentives on private lands and management guidelines on public lands.</p>
<p><b>STRATEGY NO. HP-2C:</b>                  Restore riparian habitats on public and private lands using commonly accepted, scientifically valid restoration techniques. Incorporate restored habitat into a long-term protection and management program as discussed in Item 2B above.</p>	<p><b>STRATEGY NO. HP-2D:</b>                  Enhance the productivity and biodiversity of riparian communities using appropriate management techniques on public and private lands.</p>
<p><b>STRATEGY NO. HP-2E:</b>                  Establish a network of high-quality riparian habitats throughout California to enhance and protect native birds.</p>	<p><b>STRATEGY NO. HP-2F:</b>                  Educate the general public and resource managers about the value of California's riparian habitat to promote its protection and restoration.</p>

PRIORITY: Habitat Protection, Restoration and Enhancement

*More than 30 percent of the seabird breeding population of California is located in the Ecoregion. Many species are at depressed levels due to heavy impacts caused by egging, gill netting, oil spills and other contaminants, and human disturbance. Seabirds remain vulnerable to such impacts due to their proximity to a large metropolitan area. Actions to recover these unique populations should be aimed at protecting and restoring the marine habitats and seabird populations in the marine area.*

<b>OBJECTIVE NO. HP-3:</b> Protect and restore the biodiversity and functioning of marine habitats and associated seabird populations, providing for the recovery of depleted seabird species.	
<b>STRATEGY HP-3A:</b> Monitor and recover seabird populations at sustainable levels and provide for their recovery at the Farallon NWR and other coastal breeding colonies.	<b>STRATEGY HP-3B:</b> Measure populations and reproductive success of various seabird species in order to identify status and trends, with a special emphasis on declining or rare species, alcids, and cormorants
<b>STRATEGY HP-3C:</b> Reduce and minimize the impacts of pollution and hazardous spills on marine species and habitats.	

*Colonial nesting birds have declined throughout much of the ecoregion, due to their vulnerability to habitat loss, contaminants, disturbance, and predation, among other threats. Restoration should focus on improving habitat quality and reducing cumulative threats.*

<b>OBJECTIVE NO. HP-4:</b> Restore declining colonial waterbirds and enhance the quality and functioning of habitat associated with these species.
<b>STRATEGY HP-4A:</b> Restore declining colonial nesting birds throughout the Ecoregion.

**NEED STATEMENT OF THE 'PROBLEM' HERE....**

<b>OBJECTIVE NO. HP-5:</b> By the year 2002, make all reasonable efforts to increase the sustainable, natural production of anadromous fish in Central Valley rivers and streams to at least double the average levels during the years 1967-1991. This objective shall not apply to the San Joaquin River between Friant Dam and the Mendota Pool (per the CVPIA).
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PRIORITY: Habitat Protection, Restoration and Enhancement

<p><b>STRATEGY NO. HP-5A:</b>                  Evaluate production and survival at various life stages affected by restoration measures.</p>	<p><b>STRATEGY NO. HP-5B:</b>                  Seek knowledge from literature and other fishery restoration programs as to successful methods to document fishery benefits of habitat restoration.</p>
<p><b>STRATEGY NO. HP-5C:</b>                  Develop feasible implementation program that makes optimal use of both flow and facility measures to restore anadromous fish habitat.</p>	<p><b>STRATEGY NO. HP-5D:</b>                  Evaluate appropriate Service policies and revise to lessen or eliminate conflicts with doubling goal.</p>
<p><b>STRATEGY NO. HP-5E:</b>                  Meet with agency partners and request their support in revising their policies/regulations to lessen or eliminate conflicts with doubling goal.</p>	

*Many populations of resident and endemic non-anadromous fish species have, for the most part, not been extensively studied. Therefore, the current status of these populations, life history characteristics, and habitat needs remain unknown. The uniqueness of these species within the Ecoregion warrants full investigations of life histories and protection of their habitats.*

<p><b>OBJECTIVE NO. HP-6:</b>                  Conserve sustainable production of non-anadromous fish species with emphasis on endemic species.</p>	
<p><b>STRATEGY NO. HP-6A:</b>                  Identify life history and habitat needs of non-anadromous fish species.</p>	<p><b>STRATEGY NO. HP-6B:</b>                  Develop feasible implementation programs to restore, enhance, and manage the habitats of non-anadromous fish species.</p>

*Adult returns of hatchery salmon and steelhead to some river systems within the Central Valley have been estimated to have increased in recent years to dominate the total returns. However, this percentage increase is primarily due to a persistent decline in the wildstock population combined with a fairly stable hatchery population. Heavy reliance on hatchery production does not improve conditions for wildstock and may, in some instances, have both direct and indirect detrimental effects on wild populations. Ecological impacts or risks artificial propagation may pose on wild salmon populations include: 1) predation, 2) competition/displacement, 3) transmittance of diseases or parasites, 4) alteration of migratory responses, 5) increased harvest levels, and 6) potential genetic risks.*

**PRIORITY:** Habitat Protection, Restoration and Enhancement

*Currently there are five salmon/steelhead mitigation hatcheries operated by the California Department of Fish and Game or the Service with funding provide by the Bureau of Reclamation, California Department of Water Resources, East Bay Municipal Water District, and California Department of Fish and Game. No agreed-upon basin-wide management plan or strategy exists. Hatchery management objectives and actions may conflict at times and suffer from a lack of a system-wide approach. Certain hatchery practices (i.e. spawning and release strategies) may also conflict with an ecosystem approach.*

**OBJECTIVE NO. HP-7:**

By the year 1997, develop and implement a comprehensive hatchery management plan that integrates all salmon and steelhead hatcheries' operations and release strategies with an ecosystem approach and is designed to avoid detrimental effects on wild populations.

**STRATEGY NO. HP-7A:**

Complete hatchery related Service-wide and National policy development.

**STRATEGY NO. HP-7B:**

Develop a Central Valley specific comprehensive hatchery management plan utilizing an ecosystem approach.

*Five pinniped species are found in the marine habitats of the ecoregion, including the threatened Steller sea lion and one of the largest concentrations of breeding harbor seals in the State. Most of these species have been severely depleted by historic sealing and more recent impacts caused by oil spills, contaminants, fisheries depletions, and other human disturbances. Protection and restoration should focus on improving habitat quality and reducing cumulative threats. Generally, the Service will focus its efforts on Refuge lands, since the National Marine Fisheries Service maintains the lead for these species.*

**OBJECTIVE NO. HP-8:**

Coordinate with National Marine Fisheries Service to protect and restore pinniped populations at all breeding sites and improve the quality of marine habitats and essential food resources.

**STRATEGY NO. HP-8A:**

Manage and protect pinniped populations at sustainable levels, with special emphasis on providing undisturbed breeding and resting habitat.

**STRATEGY NO. HP-8B:**

Measure populations and reproductive success of pinniped species in order to identify status, trends, and potential management solutions; with a special emphasis on declining or rare species.

*The marine waters of the Ecoregion support a rich diversity of fish populations. Many of these species (e.g., rockfish, sardines) are also crucial to sustain and recover seabird and pinniped populations. Many of these fish populations have been severely depleted by the impacts of habitat degradation, contaminants, and overfishing, among other disturbances. Recovery should be directed at improving habitat quality and management of fisheries, that considers all of the ecological impacts.*

**PRIORITY:** Habitat Protection, Restoration and Enhancement

<p><b>OBJECTIVE NO. HP-9:</b>                  Coordinate with National Marine Fisheries Service to protect and restore the marine habitats and diverse fish populations of this part of the Ecoregion, taking into consideration ecological impacts in management decisions.</p>
<p><b>STRATEGY NO. HP-9A:</b>                  Assist in strengthening management of marine fisheries, taking into consideration ecological impacts to seabirds and pinnipeds.</p>

*Various Federal and State laws address wetland protection and the Federal Government has pursued a no-net-loss wetland policy; however, wetlands continue to be converted to other uses or degraded by various land use activities. Wetland data gaps still exist and inconsistent wetland policies and mitigation guidelines occur at the Federal, State, and local levels. Better cooperation and planning is needed between agencies and the private sector.*

<p><b>OBJECTIVE NO. HP-10:</b>                  Protect wetland habitats to ensure no further net losses.</p>	
<p><b>STRATEGY NO. HP-10A:</b>                  Complete a comprehensive effort to characterize and inventory the full range of wetlands and associated biological resources within the Ecoregion.</p>	<p><b>STRATEGY NO. HP-10B:</b>                  Cooperate with regulatory and resource agencies to enhance efficiency and cooperation and to establish consistent wetland policies, definitions, mitigation guidelines, and conflict resolution processes.</p>
<p><b>STRATEGY NO. HP-10C:</b>                  Identify available programs for landowners to preserve, enhance, or restore riparian wetlands.</p>	<p><b>STRATEGY NO. HP-10D:</b>                  Prevent further losses of significant vernal pool habitats and maintain the function and values of the remaining pools, including the genetic viability of the wildlife and plant resources.</p>
<p><b>STRATEGY NO. HP-10E:</b>                  Halt the current wetland and riparian loss trends within the San Joaquin and Sacramento River Delta as a result of current levee protection methods and increased erosion due to boating activities.</p>	

*Throughout California wetlands and riparian systems have been reduced to a remnant of historical conditions. Critical links between upland and riparian habitats have been severed. Also, severe losses of vernal pool habitats have occurred due to agricultural conversion and urban development.*

**PRIORITY:** Habitat Protection, Restoration and Enhancement

*Some specific vernal pool habitat types, such as volcanic mudflow pools, have experienced losses exceeding 30 percent of habitat area since 1989. Conversion of grazing land to intensive agriculture has resulted in significant losses of vernal pool habitat in Madera, Fresno, Merced, Kings, Tulare, and Stanislaus Counties. Correspondingly, plant and animal populations have been reduced and a number of wetland associated species have been listed as threatened or endangered, or are candidates for listing.*

**OBJECTIVE NO. HP-11:**

Restore the quantity and enhance the quality and diversity of wetlands and associated riparian areas.

**STRATEGY NO. HP-11A:**

Develop partnerships with Federal, State, and local agencies, and the private sector on wetland restoration and reestablishment projects.

**STRATEGY NO. HP-11B:**

Restore and reestablish riparian wetlands, emphasizing Central Valley Project Improvement Act (CVPIA) and Corps of Engineers authorities and cooperation with State and local programs.

**STRATEGY NO. HP-11C:**

Restore critically endangered vernal pool habitat types, including alkali vernal pools within the Sacramento and San Joaquin Valleys and northern mudflow vernal pools, to a level where further species listings on these pool types is not needed.

**STRATEGY NO. HP-11D:**

Restore and enhance wetland and riparian habitats on public and private lands using Federal, State, local agencies, and non-Governmental organizational programs. Emphasis will be on those critical riparian habitats identified by the Riparian Habitat Joint Venture.

*Water supplies have been largely committed to agricultural, urban, and industrial use—often at the expense of wetland and aquatic resources. Also, agricultural drainwater, sewage treatment discharge, spills, storm runoff, and other discharges into streams, rivers, and wetlands has caused mortality, reproductive problems, and other acute and chronic injury to fish and wildlife.*

**OBJECTIVE NO. HP-12:**

Assure water quantity and quality is adequate to protect existing and restored wetlands and aquatic and terrestrial resources.

**STRATEGY NO. HP-12A:**

Evaluate selenium-contaminated evaporation ponds in San Joaquin Valley that are a hazard to migratory birds.

**STRATEGY NO. HP-12B:**

Evaluate and minimize impacts of the San Luis Drain interim reuse project on Kesterson NWR, and San Luis NWR, and the San Joaquin River.

PRIORITY: Habitat Protection, Restoration and Enhancement

<p><b>STRATEGY NO. HP-12C:</b> Assess Delta water quality with respect to possible impacts on Delta smelt reproduction.</p>	<p><b>STRATEGY NO. HP-12D:</b> Initiate and complete Natural Resource Damage Assessments and restoration activities and coordinate with regulatory agencies to identify and mitigate natural resource injuries resulting from chemical releases.</p>
<p><b>STRATEGY NO. HP-12E:</b> Assess and minimize contaminant impacts to the resources of San Francisco Bay through monitoring, consultations, and coordination with Federal, State, and local agencies and groups.</p>	<p><b>STRATEGY NO. HP-12F:</b> Support pollution prevention activities of Federal, State, and local agencies by providing technical expertise and information through the NPDES, non-point source, pesticide labeling, and monitoring programs.</p>
<p><b>STRATEGY NO. HP-12G:</b> Assess the impacts of contaminants on vernal pool water quality and associated species.</p>	

**PRIORITY:** Human Resources and Outreach

**PRIORITY:** Human Resources and Outreach

*An ecosystem approach to natural resources management will be planned, implemented, and monitored. This will require communication, coordination, cooperation, and partnering. The Service recognizes that in implementing an ecosystem approach, it is just one member of a diverse group of partner agencies and organizations. The Service's ecosystem program and activities are, likewise, just one of many efforts at implementing the ecosystem approach. Management of natural resources is dependent upon awareness and support by our current and emerging publics.*

*Ecosystem management will require a great deal of dialogue, trust, and learning on all our parts. The Service has a need to identify partners in ecosystem approach, since accomplishments on the part of all cooperators are essential. These partners can then assist with implementation.*

*There is a need within the Service for team building, team management, and cross-program management in order to successfully implement strategies. The ecosystem approach to resource management is a new message which has yet to be developed and delivered to a variety of important targeted audiences. With an ecosystem approach, an unprecedented opportunity exists for agencies, organizations, and individuals to creatively develop efficient and effective partnerships to address ecological and conservation concerns. Lack of information on the part of selected publics can impede our success at developing efficient and effective partnerships with them, and therein impair the success of an ecosystem approach to fish and wildlife habitat management.*

**OBJECTIVE NO. HR-1:**

Inform our partner agencies and organizations about the U.S. Fish and Wildlife Service ecosystem approach to resource management in order to involve them in the management process.

**STRATEGY NO. HR-1A:**

Develop and deliver information to targeted audiences to generate an understanding of what ecosystem approach to wildlife management means and why the Service decided to implement it.

**STRATEGY NO. HR-1B:**

Develop and deliver information to targeted audiences to generate an understanding of how ecosystem approach will affect USFWS partner relationships.

*Successful accomplishment of the goal and resource priorities within the Central Valley/San Francisco Bay Ecosystem Implementation Strategy will require partnerships with other organizations. Partners need to be included in the development of final strategies and actions for the plan, in order to promote a common understanding of the actions needed and in order to develop complementary action plans within each agency/organization's planning process.*

**OBJECTIVE NO. HR-2:**

Involve targeted partner agencies and organizations in refining and participating in the implementation of the Central Valley/San Francisco Bay Ecosystem Implementation Strategy, focusing on what it is and how it will affect them.

<b>STRATEGY NO. HR-2A:</b> Develop and deliver information to targeted audiences to generate an understanding of the Central Valley/San Francisco Bay Ecosystem Implementation Strategy.	<b>STRATEGY NO. HR-2B:</b> Seek input from targeted audiences for development of strategies and actions to be included in the final Central Valley/San Francisco Bay Ecosystem Implementation Strategy.
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*Our current educational and media system is not providing effective natural resource management or ecology education, which has resulted in the problem that many fear and or misperceive ecosystem management and biodiversity. Reactive outreach is costly and can be avoided to a large extent through information distribution and public involvement in key resource issues. Resource management requires care and management of relationships with priority publics. Stewardship will require different and improved relationships and dialogue with emerging and existing publics.*

<b>OBJECTIVE NO. HR-3:</b> Inform key publics about the priority issues in the Central Valley/San Francisco Bay Ecoregion.	
<b>STRATEGY NO. HR-3A:</b> Develop and deliver appropriate information to two selected publics in 1995 on what wetlands are, and why they are important.	<b>STRATEGY NO. HR-3D:</b> Develop and deliver appropriate information to selected publics about the inter-relationships of water, fish, and wildlife; and the value of biodiversity.
<b>STRATEGY NO. HR-3B:</b> Develop and deliver appropriate information to two selected publics in 1995 about key fisheries issues, their associated problems, and possible solutions.	<b>STRATEGY NO. HR-3E:</b> Initiate or continue a public outreach effort to provide information that explains the resource problem, proposed action by the Service and its partners to address the problem, and solicit relevant input.
<b>STRATEGY NO. HR-3C:</b> Develop and deliver appropriate and regionally-specific information about listed species and their habitats to targeted audiences.	<b>STRATEGY NO. HR-3F:</b> Continue and emphasize public outreach efforts at the local facility level to involve the public in efforts to address this objective.

NEED STATEMENT OF 'PROBLEM' HERE...

<b>OBJECTIVE NO. HR-4:</b> Develop an outreach program throughout the Region to demonstrate significance and success of various agency programs.
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PRIORITY: Research/Monitoring/Data Collection

**STRATEGY NO. HR-4A:**

By 1997, designate an outreach coordinator position for contact at all local field office/facility level.

**STRATEGY NO. HR-4B:**

Encourage supervisors to utilize existing awards program to recognize employees for participation in non-traditional outreach activities such as publication of papers or articles in non-professional journals and other public media outlets or participation in local/service/educational programs.

**PRIORITY NAME:** Research/Monitoring/Data Collection

*There is no comprehensive ecosystem-wide research effort underway in the Central Valley/San Francisco Bay Ecoregion designed to answer important questions on ecosystem functions and the effects of human interactions. In addition, there is limited coordination among those monitoring conditions in the ecosystem, no agreement on standardized monitoring techniques or assurance of compatible data sets, and no single definitive source for data and information on the ecosystem, its functions, and the effects of human interactions. In spite of the lack of meaningful data on critical ecosystem functions, important--and sometimes permanent--decisions are being hurriedly made which may hamper, not help, our efforts to restore ecosystem function.*

**OBJECTIVE NO. RM-1:**

By the year 1999, establish a research institute to coordinate, help plan and implement, assist in obtaining funds, and to provide quality control, review, and advice for Central Valley/San Francisco Bay ecosystem research.

**STRATEGY NO. RM-1A:**

Gain widespread acceptance of the need for a single research institute that covers the entire watershed.

**STRATEGY NO. RM-1B:**

Formally establish the Central Valley Ecosystem Institute as a quasi-official public agency with State and Federal recognition.

NEED STATEMENT OF 'PROBLEM' HERE...

**OBJECTIVE NO. RM-2:**

Provide information needed to support critical decisions affecting the ecosystem anticipated over the next ten years.

PRIORITY: Research/Monitoring/Data Collection

<p><b>STRATEGY NO. RM-2A:</b>          In conjunction with other resource agencies, water development agencies, and others whose actions may have major impacts on ecosystem health, convene a forum to identify impending decisions and information needs.</p>	<p><b>STRATEGY NO. RM-2C:</b>          Fill data gaps using accepted techniques.</p>
<p><b>STRATEGY NO. RM-2B:</b>          Review existing available information and identify data gaps needed to support anticipated decisions and actions.</p>	

NEED STATEMENT OF 'PROBLEM' HERE...

<p><b>OBJECTIVE NO. RM-3:</b>          By the year 1999, develop and implement a comprehensive monitoring and assessment program to gather data on the health of the ecosystem and the effectiveness of actions taken to restore ecosystem health.</p>	
<p><b>STRATEGY NO. RM-3A:</b>          Under the authority of the Central Valley Project Improvement Act, conduct a status review of existing monitoring and assessment programs.</p>	<p><b>STRATEGY NO. RM-3C:</b>          Initiate new programs and, as appropriate, modify existing monitoring/assessment programs to conform to comprehensive program developed per Strategy 2B (above).</p>
<p><b>STRATEGY NO. RM-3B:</b>          Under the authority of the Central Valley Project Improvement Act, and in coordination with all organizations involved in or in need of monitoring and data collection, describe a comprehensive and consistent monitoring and assessment program that meets the needs for ecosystem information and employs standardized, generally acceptable monitoring techniques.</p>	

*Data on ecosystem health and function and the effects of human interactions, where available, is scattered, frequently incompatible, and not generally available. In addition, much of it has never undergone quality review. As a result, decisions affecting ecosystem health are frequently made with limited or flawed informational support.*

PRIORITY: Research/Monitoring/Data Collection

<p><b>OBJECTIVE NO. RM-4:</b>                  By 2002, establish the Central Valley/San Francisco Bay Ecosystem Institute as a repository and major source of credible information on the health and function of the ecosystem.</p>
<p><b>STRATEGY:</b>                  To be added later. !!!</p>

NEED STATEMENT OF 'PROBLEM' HERE...

<p><b>OBJECTIVE NO. RM-5:</b>                  Develop and implement a computerized system for storage, retrieval, and widespread dissemination and sharing of information on the health and function of the ecosystem.</p>
<p><b>STRATEGY:</b>                  To be added later.</p>

*The Central Valley/San Francisco Bay ecosystem is an incredibly complex and highly disturbed ecosystem. Even with development of information on ecosystem functions, predicting the ecosystem-wide consequences of site-specific actions is not possible at the present time. Consequently, the full impact of decisions may not be known until after the impact has occurred and, by then, may be irreversible.*

<p><b>OBJECTIVE NO. RM-6:</b>                  Develop evaluation models to predict the consequences of management decisions.</p>	
<p><b>STRATEGY NO. RM-6A:</b>                  Define a system of models (with supporting data bases) that meets the needs of ecosystem decision makers and which will have widespread acceptability as predictive tools and be readily available and useable.</p>	<p><b>STRATEGY NO. RM-6C:</b>                  Develop Decision Support System.</p>
<p><b>STRATEGY NO. RM-6B:</b>                  Evaluate existing models, their assumptions, and supporting data bases for utility in the "Decision Support System."</p>	

*Central Valley water supplies have been largely committed to agricultural, urban, and industrial use—often at the expense of wetland and aquatic resources. Also, agricultural drainwater, sewage treatment discharge, spills, storm runoff, and other discharges into streams, rivers, and wetlands has caused mortality, reproductive problems, and other acute and chronic injury to fish and wildlife.*

**PRIORITY:** Research/Monitoring/Data Collection

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***OBJECTIVE NO. RM-7:***

Assure water quantity and quality is adequate to protect existing and restored wetlands and aquatic and terrestrial resources.

***STRATEGY NO. RM-7A:***

Assess the impacts of wastewater oxidation ponds on wintering waterfowl in the Ecoregion.

# ECOREGION ACTION PLAN

**ECOREGION GOAL:** To restore, conserve, and protect the ecological systems and biological diversity of the Central Valley/San Francisco Bay Ecoregion for present and future generations.

**PRIORITY:** Recover Threatened/Endangered Species and Avoid Future Listings

**OBJECTIVE NO. TE-1:** Protect plant and animal species and their habitats vulnerable to and trending towards extinction.

**STRATEGY NO. TE-1A:** Coordinate with Federal, State, county, and local governments to encourage comprehensive planning for the protection of species and habitats.

**ACTION NO. TE-1A.1:** Pursue development of a revised General Plan for the County of Sacramento that addresses comprehensive planning for the protection of listed and candidate species, including the giant garter snake, valley elderberry longhorn beetle, and four vernal pool shrimp species.

**ACTION NO. TE-1A.2:** Pursue development of regional partnership between government at all levels and the various public interest groups including the San Joaquin Valley Partnership which is nearing completion and developing Sacramento Valley planning partnership.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**STRATEGY NO. TE-1B:** Pursue Conservation Agreements with Federal, State, and local governments, and the private sector where appropriate, to alleviate or preclude the need for listing.

**ACTION NO. TE-1B.1:** Complete Conservation Agreements with BLM and USFS for Category 1 candidates in forest and rangeland habitats.

**ACTION NO. TE-1B.2:** List all Category 1 taxa for which Conservation Agreements are not feasible.

**ACTION NO. TE-1B.3:** Develop prelisting agreements on species that lend themselves to this mechanism.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**PRIORITY:** Recover Threatened/Endangered Species and Avoid Future Listings

**OBJECTIVE NO. TE-1:** Protect plant and animal species and their habitats vulnerable to and trending towards extinction.

**STRATEGY NO. TE-1C:** Develop cooperative Geographic Information System (GIS) program to map and inventory resources and species, design habitat preserve strategies, and coordinate protection of threatened Central Valley habitats.

**ACTION NO. TE-1C.1:** Assess the decline of riparian habitat and oak woodland and similarly affected, e.g., California prairie, habitat declines within the Central Valley and develop a strategy for protection of these habitat types.

**ACTION NO. TE-1C.2:** Continue to support development of a San Joaquin Valley GIS system being developed by the San Joaquin Valley Endangered Species Recovery Planning Program, BLM, CDFG, and other entities.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**OBJECTIVE NO. TE-1:** Protect plant and animal species and their habitats vulnerable to and trending towards extinction.

**STRATEGY NO. TE-1D:** Develop ecosystem models and methodologies for assessing the success of and applying adaptive management to threatened and endangered habitats within the Central Valley.

**STRATEGY NO. TE-1E:** Monitor and conserve candidate species to avoid Federal listing.

**ACTION NO. TE-1E.1:** Assist other agencies in developing and implementing survey and management strategies to conserve and monitor candidate species.

**ACTION NO. TE-1E.2:** Provide staff and funding to assist Federal and State land management agencies and private landowners to gather biological information on candidate species.

**ACTION NO. TE-1E.3:** Provide staff and funding to assist Federal and State land management agencies and private landowners to prepare conservation agreements for candidate species.

**PRIORITY:** Recover Threatened/Endangered Species and Avoid Future Listings

**ACTION NO. TE-1E.4:** Provide staff and funding to assist local governments and private interests in preparing, implementing, and monitoring Habitat Conservation Plans through the Section 10(a)(1)(B) process.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. TE-1:** Protect plant and animal species and their habitats vulnerable to and trending towards extinction.

**STRATEGY NO. TE-1F:** Restore tidal salt marsh habitat as described in the California Coastal Marsh Ecosystem Recovery Plan.

**ACTION TE-1F.1:** Complete the California Coastal Marsh Ecosystem Recovery Plan.

**ACTION TE-1F.2:** Implement the Cullinan Ranch Restoration Plan developed by NBS.

**ACTION TE-1F.3:** Develop consistent regional standards and guidelines relative to mitigation and restoration monitoring and evaluation.

**ACTION TE-1F.4:** Acquire suitable existing and restorable wetland properties at a faster pace by exploring alternatives for funding and protection.

**ACTION TE-1F.5:** Develop a common definition of wetlands between Federal, State, and local governments, for use in regional planning throughout California.

**ACTION TE-1F.6:** Review the San Francisco Estuary Institute wetlands mapping project to ensure that wetland classification system addresses future planning needs.

**ACTION TE-1F.7:** Identify areas to be set aside as regional wetland preserves and areas suitable for restoration and enhancement as mitigation for unavoidable impacts through such mechanisms as mitigation banks, etc.

**ACTION TE-1F.8:** Develop and adopt joint State-Federal mitigation banking guidelines.



**PRIORITY:** Recover Threatened/Endangered Species and Avoid Future Listings

**ACTION TE-1G.5:** Implement a study to assess the success of marsh restoration for enhancement of endangered species and prepare guidelines for ensuring future success.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. TE-2:** Recover and delist endangered and threatened species by restoring ecosystems within the Central Valley/ San Francisco Bay Ecoregion.

**STRATEGY NO. TE-2A:** Develop and implement multi-species/multi-habitat recovery plans.

**ACTION NO. TE-2A.1:** Develop Participation Plans, per Service policy.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. TE-2B:** Encourage the development of habitat conservation planning strategies for counties where planning efforts have not occurred.

**ACTION NO. TE-2B.1:** Provide staff to participate in the implementation and monitoring of the Metropolitan Bakersfield HCP.

**ACTION NO. TE-2B.2:** Provide staff and funding to assist Kern County in completing and implementing the multi-species HCP it is developing for the valley floor covering over 3,000 square miles.

**ACTION NO. TE-2B.3:** Provide staff to assist in the continuing HCP efforts with multi-species and regional objectives including Tulare County, San Joaquin County, Yolo County, Natomas Basin, Kern Fan Element, and the California Aqueduct.

**PRIORITY:** Recover Threatened/Endangered Species and Avoid Future Listings

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. TE-2C:** Implement the recovery planning strategies identified in the updated San Francisco Bay Species Recovery Plan.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. TE-2:** Recover and delist endangered and threatened species by restoring ecosystems within the Central Valley/ San Francisco Bay Ecoregion.

**STRATEGY NO. TE-2D:** Implement the recovery strategies to be identified in the multi-species San Joaquin Valley Recovery Plan.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. TE-2E:** Recover populations of bald eagles and peregrine falcons in the forest ecosystems.

**ACTION NO. TE-2E.1:** Complete and implement the California Bald Eagle Management Plan.

**ACTION NO. TE-2E.2:** Implement the 1986 Pacific Bald Eagle Recovery Plan.

**ACTION NO. TE-2E.3:** Implement the 1982 Pacific Coast Recovery Plan for peregrine falcons.

**ACTION NO. TE-2E.4:** Gather data on population status.

**ACTION NO. TE-2E.5:** Eliminate sources of environmental contaminants.

**PRIORITY:** Recover Threatened/Endangered Species and Avoid Future Listings

**ACTION NO. TE-2E.6:** Cooperate with State and Federal agencies relative to review projects that may impact bald eagles and peregrine falcons.

**ACTION NO. TE-2E.7:** Acquire habitats essential for eagle and falcon nesting, roosting, and foraging.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. TE-2:** Recover and delist endangered and threatened species by restoring ecosystems within the Central Valley/ San Francisco Bay Ecoregion.

**STRATEGY NO. TE-2F:** Finalize the Delta Native Fishes Recovery Plan and implement the strategies identified.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. TE-2G:** Develop a data base and tracking system to monitor and assess compliance with endangered species mitigation requirements.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Recover Threatened/Endangered Species and Avoid Future Listings

**STRATEGY NO. TE-2H:** Increase the quantity and quality of the riverine sand dune system at Antioch Dunes NWR in order to recover three endangered species only found at the refuge.

**ACTION NO. TE-2H.1:** Strengthen partnership with PG&E and others to fund and accomplish management objectives for three endangered species at the site.

**ACTION NO. TE-2H.2:** Secure funding in order to improve recovery efforts for the three endangered species found only at the site.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. TE-3:** Identify and reduce the impacts of introduced species on threatened and endangered species.

**STRATEGY TE-3A:** Develop and implement programs to control the impact of exotic species on threatened and endangered species and avoid future introduction/invasion of exotics.

**ACTION TE-3A.1:** Secure long-term funding for the Predator Management Program at San Francisco Bay NWR Complex and throughout south San Francisco Bay Area.

**ACTION TE-3A.2:** Investigate the need for and, if appropriate, develop and implement a similar Predator Management Program for north San Francisco Bay Area.

**ACTION TE-3A.3:** Investigate and implement measures to reduce the impacts of other exotic species on threatened and endangered species throughout the Ecoregion.

**ACTION TE-3A.4:** Coordinate with Federal, State, and other key agencies in the development of a management plan to avoid future introductions or invasions of exotic species.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**OBJECTIVE NO. HP-1:** Return waterfowl and shorebird populations to the mid-1970's levels by the year 2002.

**STRATEGY NO. HP-1A:** By 2003, protect 80,000 acres of Central Valley wetlands through fee acquisition and/or perpetual conservation easements. The principal implementing parties are the Service (Sacramento Realty Field Office) and the Wildlife Conservation Board with assistance from private non-profit organizations such as The Nature Conservancy and Trust for Public Lands.

**ACTION NO. HP-1A.1:**

Basin Priority Order	Acres
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Yolo	5,000
American River	2,000
San Joaquin River	52,500
Tulare	5,000
Butte	10,000
Delta	3,000
Colusa	2,000
Sutter	500
<b>TOTAL</b>	<b>80,000</b>

Action Item	Due Date	FY 1 \$/FTEs	FY 2 \$/FTEs	FY 3 \$/FTEs	FY 4 \$/FTEs
1A.1		\$10M/8	\$10M/8	\$8M/8	\$8M/8

**OBJECTIVE NO. HP-1:** Return waterfowl and shorebird populations to the mid-1970's levels by the year 2002.

**STRATEGY NO. HP-1B:** By 2003, restore 120,000 acres of former wetlands and protect through fee acquisition and/or perpetual conservation easements. Principal implementing parties include Fish and Wildlife Service, Natural Resources Conservation Service, California Department of Fish and Game, Ducks Unlimited, The Nature Conservancy, U.S. Army Corps of Engineers, Bureau of Reclamation, and the California Waterfowl Association.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**ACTION NO. HP-1B.1:**

Basin in Priority Order	Acres
Sutter	11,000
American	10,000
Delta	19,500
Butte	29,100
Yolo	10,000
Colusa	13,100
San Joaquin	20,000
<b>TOTAL</b>	<b>*112,700</b>

\* Difference = acres already restored.

Action Item	Due Date	FY 1 \$/FTEs	FY 2 \$/FTEs	FY 3 \$/FTEs	FY 4 S/FTEs
1B.1		\$10M/8	\$10M/8	\$8M/8	\$8M/8

**STRATEGY NO. HP-1C:** By October 30, 2002 provide firm CVPIA Level 4 water supplies to Central Valley NWR's, WA's, and GRCD per BOR water studies and San Joaquin Action Plan. The principal implementation parties are the Service and Bureau of Reclamation.

**ACTION HP-1C.1:**

Basin in Priority Order	Acre Ft. Water
Tulare	35,150
San Joaquin	196,300
Sutter	30,000
Butte	36,000
Colusa	105,000
<b>TOTAL</b>	<b>402,450</b>

Action Item	Due Date	FY 1 \$/FTEs	FY 2 \$/FTEs	FY 3 \$/FTEs	FY 4 S/FTEs

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**OBJECTIVE NO. HP-1:** Return waterfowl and shorebird populations to the mid-1970's levels by the year 2002.

**STRATEGY NO. HP-1D:** By 2003, enhance 291,555 acres of existing Central Valley wetlands. Principal implementing parties are NRCS (Water Bank), DU, CWA, USFWS, and CDFG.

**ACTION NO.**

Basin in Priority Order	Acres
Sutter	3,090
American	3,150
Delta	9,350
Butte	26,150
Yolo	8,700
Colusa	5,985
San Joaquin	120,300
Tulare	36,380
Suisun	-0-
<b>TOTAL</b>	<b>291,555</b>

Action Item	Due Date	FY 1 \$/FTEs	FY 2 \$/FTEs	FY 3 \$/FTEs	FY 4 \$/FTEs

**STRATEGY NO. HP-1E:** Enhance 443,000 acres of private agricultural land to support wintering and nesting waterfowl. The principal implementing partners are USFWS, CDFG, DU, and CWA.

**ACTION NO. HP-1E.1:**

Basin in Priority Order	Acres
Sutter	57,758
American	20,948
Delta	68,392
Butte	108,832
Yolo	35,239
Colusa	112,285
San Joaquin	15,290
Tulare	25,345
Suisun	-0-
<b>TOTAL</b>	<b>443,100</b>

PRIORITY: Habitat Protection, Restoration and Enhancement

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-1:** Return waterfowl and shorebird populations to the mid-1970's levels by the year 2002.

**STRATEGY NO. HP-1F:** By 1995 establish a wetland joint venture in the San Francisco Bay area that addresses habitat protection, restoration, and enhancement for waterfowl and shorebirds among other species. This effort is currently in the early stages of planning with the lead participant being the San Francisco Estuary Institute. Quantified action items for acres and population goals will be deferred until the Regional Wetlands Goals Project can establish wetland goals for bay area waterfowl and shorebirds.

**ACTION NO. HP-1F.1:** By 1995 establish a wetland joint venture for the San Francisco Bay area.

**ACTION NO. HP-1F.2:** Adopt action items for acres and population goals established by San Francisco Bay Joint Venture.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HP-1G:** Develop and implement monitoring and research efforts in order to provide basic information on waterfowl and shorebird population trends and health in the San Francisco Bay - Delta area.

**ACTION HP-1G.1:** Develop and implement an annual monitoring program for shorebird populations.

**ACTION HP-1G.2:** Implement research project on the impacts of contaminants on wintering waterfowl in San Francisco Bay.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**STRATEGY NO. HP-1H:** Incorporate the wetland protection goals identified in the California segment of the Draft Intermountain Habitat Joint Venture Implementation Plan.

**ACTION HP-1H.1:** Protect 50% of the privately-owned wetlands and 100% of the publicly-owned wetlands in the Modoc/Pit Plateau Focus Area, through fee title or easement acquisition.

**ACTION HP-1H.2:** Protect 50% of the privately-owned wetlands and 100% of the publicly-owned wetlands in the Honey Lake/Sierra Focus Area, through fee title or easement acquisition.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-1:** Return waterfowl and shorebird populations to the mid-1970's levels by the year 2002.

**STRATEGY NO. HP-1I:** Complete acquisition and development of existing or restorable freshwater and tidal wetlands, baylands, mudflats, and associated uplands within authorized refuge boundaries.

**ACTION NO. HP-1I.1:** Acquire 18,000 acres at Stone Lakes NWR.

**ACTION NO. HP-1I.2:** Acquire 22,000 additional acres at San Francisco Bay NWR.

**ACTION NO. HP-1I.3:** Continue acquisition of appropriate restorable wetlands at San Pablo Bay NWR.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>
1H.1		\$6M/8	\$6M/8	\$6M/8	\$6M/8
1H.2		\$5M/8	\$5M/8	\$5M/8	\$5M/8
1H.3		\$2M/8	\$2M/8	\$2M/8	\$2M/8
1H.4		\$1M/8	\$1M/8	\$1M/8	\$1M/8

PRIORITY: Habitat Protection, Restoration and Enhancement

1H.5		\$5M/8	\$5M/8	\$5M/8	\$5M/8
1H.6		\$4M/8	\$4M/8	\$4M/8	\$4M/8
1H.7		\$4M/8	\$4M/8	\$4M/8	\$4M/8
1H.8		\$.5M/8	\$.5M/8	\$.25M/8	

**ACTION NO. HP-11.4:** Continue acquisition of lands in fee and perpetual conservation easement for Willow Creek-Lurline WMA.

**ACTION NO. HP-11.5:** Continue acquisition of lands in fee and perpetual conservation easement for San Joaquin River NWR.

**ACTION NO. HP-11.6:** Continue acquisition of lands in fee and perpetual conservation easement for Grasslands WMA.

**ACTION NO. HP-11.7:** Continue to acquire riparian habitat along the Sacramento River for Sacramento River NWR.

**ACTION NO. HP-11.8:** Acquire the 401 acres of land to be added to Humboldt Bay NWR.

**OBJECTIVE NO. HP-2:** Protect and enhance habitats for both California's native birds and neotropical migrants in a manner consistent with the other objectives of the California Chapter of Partners in Flight.

**STRATEGY NO. HP-2A:** Compile existing data on riparian habitat throughout the State to identify key riparian areas, as well as information gaps. Promote and coordinate efforts to obtain needed information.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**STRATEGY NO. HP-2B:** Develop guidelines for protection of existing habitat on public lands and recommend alternatives for protection on private land, including fee title or perpetual easement acquisition, long-term cooperative management agreements with landowners, and development of support for protective zoning and tax incentives to secure protective management. This would be accomplished by cooperative agreement, purchase, and initiation of zoning and tax incentives on private lands, and management guidelines on public lands.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-2:** Protect and enhance habitats for both California's native birds and neotropical migrants in a manner consistent with the other objectives of the California Chapter of Partners in Flight.

**STRATEGY NO. HP-2C:** Restore riparian habitats on public and private lands using commonly accepted, scientifically valid restoration techniques. Incorporate restored habitat into a long-term protection and management program as discussed in Item 2B above.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HP-2D:** Enhance the productivity and biodiversity of riparian communities using appropriate management techniques on public and private lands.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HP-2E:** Establish a network of high-quality riparian habitats throughout California to enhance and protect native birds.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**STRATEGY NO. HP-2F:** Educate the general public and resource managers about the value of California's riparian habitat to promote its protection and restoration.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-3:** Protect and restore the biodiversity and functioning of marine habitats and associated seabird populations, providing for the recovery of depleted seabird species.

**STRATEGY NO. HP-3A:** Manage and recover seabird populations at sustainable levels and provide for their recovery at the Farallon NWR and other coastal breeding colonies.

**ACTION NO. HP-3A.1:** Restore habitats and colonies to maximize seabird populations and reproduction, including at Farallon NWR.

**ACTION NO. HP-3A.2:** Reduce seabird mortality by gill net fisheries through improved enforcement coordination with CDFG and other involved agencies.

**ACTION NO. HP-3A.3:** Evaluate gill net fishery impacts in coordination with South Coast Ecoregion in Monterey Bay area and evaluate effectiveness of regulations.

**ACTION NO. HP-3A.4:** Reduce human disturbance at breeding colonies through improved enforcement and annual coordination meetings with land managing and regulatory agencies, including BLM, CDFG, NOAA, NMFS, and NPS.

**ACTION NO. HP-3A.5:** Prepare and distribute an educational brochure about seabirds, marine mammals, and disturbance impacts, in coordination with other coastal ecoregions (South Coast, Klamath/Central Pacific Coast, North Pacific Coast).

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**OBJECTIVE NO. HP-3:** Protect and restore the biodiversity and functioning of marine habitats and associated seabird populations, providing for the recovery of depleted seabird species.

**STRATEGY NO. HP-3B:** Measure populations and reproductive success of various seabird species in order to identify status and trends, with a special emphasis on declining or rare species, alcids, and cormorants.

**ACTION NO. HP-3B.1:** Conduct regular population monitoring of selected seabirds sufficient to document trends and reproductive success, including identifying an annual funding source to support aerial surveys.

**ACTION NO. HP-3B.2:** Conduct and complete status report of the ashy-storm petrel throughout its range sufficient to determine status and trends and evaluate the need to list.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**STRATEGY NO. 3C:** Reduce and minimize the impacts of pollution and hazardous spills on marine species and habitats.

**ACTION NO. 3C.1:** Improve hazardous spill response through coordination with other agencies, implementation of contingency plans, and training for Service personnel.

**ACTION NO. 3C.2:** Continue ongoing Natural Resource Damage Assessment cases and implement restoration projects.

**ACTION NO. 3C.3:** Monitor contaminant issues of concern in marine species, including LTMS and radioactivity, in coordination with other agencies.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**OBJECTIVE NO. HP-4:** Restore declining raptors, colonial waterbirds, etc. and enhance the quality and functioning of habitat associated with these species.

**STRATEGY NO. HP-4A:** Restore declining colonial nesting birds throughout the Ecoregion.

**ACTION NO. 4A.1:** Conduct predator management sufficient to recover colonial nesting bird colonies throughout south San Francisco Bay.

**ACTION NO. 4A.2:** Implement restoration projects, including use of social attractants to recover extirpated colonial nesting bird colonies in south San Francisco Bay.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**OBJECTIVE NO HP-5:** By the year 2002, make all reasonable efforts to increase the sustainable, natural production of anadromous fish in Central Valley rivers and streams to at least double the average levels during the years 1967-1991. This objective shall not apply to the San Joaquin River between Friant Dam and the Mendota Pool (per the CVPIA).

**STRATEGY NO. HP-5A:** Evaluate production and survival at various life stages affected by restoration measures.

**ACTION NO. HP-5A.1:** Evaluate survival and production of chinook salmon.

**ACTION NO. HP-5A.2:** Evaluate survival and production of white sturgeon.

**ACTION NO. HP-5A.3:** Evaluate survival and production of green sturgeon.

**ACTION NO. HP-5A.4:** Evaluate survival and production of American shad.

**ACTION NO. HP-5A.5:** Evaluate survival and production of striped bass - ongoing with Interagency Ecological Program (DFG-lead).

**ACTION NO. HP-5A.6:** Evaluate survival and production of steelhead - low population primarily hatchery stocks, low feasibility.

PRIORITY: Habitat Protection, Restoration and Enhancement

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-5:** By the year 2002, make all reasonable efforts to increase the sustainable, natural production of anadromous fish in Central Valley rivers and streams to at least double the average levels during the years 1967-1991. This objective shall not apply to the San Joaquin River between Friant Dam and the Mendota Pool (). (per the CVPIA).

**STRATEGY NO. HP-5B:** Seek knowledge from literature and other fishery restoration programs as to successful methods to document fishery benefits of habitat restoration.

**ACTION NO. HP-5B.1:** Lend contract to review restoration programs/methods of documenting benefits of restoration action.

**ACTION NO. HP-5B.2:** Meet with other Service program and consultants with successful benefit evaluation methods.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HP-5C:** Develop feasible implementation program that makes optimal use of both flow and facility measures to restore anadromous fish habitat.

**ACTION NO. HP-5C.1:** Develop Service policy document regarding implementation goals for Anadromous Fish Restoration Program (AFRP).

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**ACTION NO. HP-5C.2:** Meet with key agencies and interested parties to develop consensus on how best to achieve doubling goal in most cost-effective manner.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO HP-5:** By the year 2002, make all reasonable efforts to increase the sustainable, natural production of anadromous fish in Central Valley rivers and streams to at least double the average levels during the years 1967-1991. This objective shall not apply to the San Joaquin River between Friant Dam and the Mendota Pool (). (per the CVPIA).

**STRATEGY NO. HP-5D:** Evaluate appropriate Service policies and revise to lessen or eliminate conflicts with doubling goal.

**ACTION NO. HP-5D.1:** Evaluate and revise Service policy on hatchery practices to support AFRP goals.

**ACTION NO. HP-5D.2:** Evaluate and develop recommendations on ESA that allow for ecosystem management approach and that are supportive of AFRP goals.

**ACTION NO. HP-5D.3:** Draft decision document for RD and/or Secretary, relative to revising these policies.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HP-5E:** Meet with agency partners and request their support in revising their policies/regulations to lessen or eliminate conflicts with doubling goal.

**ACTION NO. HP-5E.1:** Meet with National Marine Fisheries Service on salmon harvest management.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**ACTION NO. HP-5E.2:** Meet with Club Fed and State agencies on framework agreement and long-term Delta solution that will support goals of AFRP.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO HP-6:** Conserve sustainable production of non-anadromous fish species with emphasis on endemic species.

**STRATEGY NO. HP-6A:** Identify life history and habitat needs of non-anadromous fish species.

**ACTION NO. HP-6A.1:** Conduct extensive literature search for life histories and habitat needs of non-anadromous species.

**ACTION NO. HP-6A.2:** Initiate field investigations to fill in data gaps identified above. Aside from basic life history information, these investigations should at a minimum, identify key habitat issues such as: 1) shaded aquatic riverine habitat needs, 2) water flow/temperature and other quality needs.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HP-6B:** Develop feasible implementation programs to restore, enhance, and manage the habitats of non-anadromous fish species.

**ACTION NO. HP-6B.1:** Meet with key agencies and private citizens to develop consensus on land/water acquisition.

**ACTION NO. HP-6B.2:** Where possible, implement measures to restore key habitats, such as restricting grazing in critical riparian zones.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**ACTION NO. HP-6B.3:** Work with State regulatory agencies to establish measures for water quality assurance.

**ACTION NO. HP-6B.4:** Evaluate the survival and production of non-anadromous fish species in response to habitat restoration measures.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO HP-7:** By the year 1997, develop and implement a comprehensive hatchery management plan that integrates all salmon and steelhead hatcheries' operations and release strategies with an ecosystem approach and is designed to avoid detrimental effects on wild populations.

**STRATEGY NO. HP-7A:** Complete hatchery related Service-wide and National policy development.

**ACTION NO. HP-7A.1:** Complete development by 1995 of a Service and National Marine Fisheries Service coordinated national policy for the use of artificial propagation under the Endangered Species Act in cooperation with the tribes and states.

**ACTION NO. HP-7A.2:** Complete by December 1995, the Service's outside expertise agency "blue ribbon panel" ecosystem approach review of the national fish hatchery system and incorporate relevant recommendations into a comprehensive hatchery management plan for Central Valley/San Francisco Bay Ecoregion.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**STRATEGY NO. HP-7B:** Develop a Central Valley specific comprehensive hatchery management plan utilizing an ecosystem approach.

**ACTION NO. HP-7B.1:** Meet in 1996 with Directors of the California Department of Fish and Game, National Marine Fisheries Service, Bureau of Reclamation, Department of Water Resources, and others to discuss and commit to the development of a comprehensive coordinated hatchery management plan utilizing an ecosystem approach.

**ACTION NO. HP-7B.2:** Establish by 1996, an interagency team (similar to the "Integrated Hatchery Operations Team (IHOT)" established on the Columbia River) to re-examine original objectives and develop policies and a plan for hatchery management and operations in the Central Valley. These policies would apply to existing and new hatcheries and address: fish health, genetic and ecological interactions, hatchery performance, and basin-wide hatchery coordination.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-8:** Coordinate with National Marine Fisheries Service to protect and restore pinniped populations at all breeding sites and improve the quality of marine habitats and essential food resources.

**STRATEGY NO. HP-8A:** Manage and protect pinniped populations at sustainable levels, with special emphasis on providing undisturbed breeding and resting habitat.

**ACTION NO. HP-8A.1:** Coordinate law enforcement efforts with CDFG, NMFS, and NOAA around Farallon NWR in order to maintain State boat restrictions and other regulations in waters around Farallon NWR; and reevaluate effects of regulations annually.

**ACTION NO. HP-8A.2:** Coordinate Steller sea lion recovery efforts more closely with NMFS and Recovery Team.

PRIORITY: Habitat Protection, Restoration and Enhancement

Action Item	Due Date	FY 1 \$/FTEs	FY 2 \$/FTEs	FY 3 \$/FTEs	FY 4 S/FTEs

**STRATEGY NO. HP-8B:** Measure populations and reproductive success of pinniped species in order to identify status, trends, and potential management solutions; with a special emphasis on declining or rare species.

**ACTION NO. HP-8B.1:** Monitor Steller sea lion populations and breeding effort to document trends at the Farallon NWR and other breeding locations.

**ACTION NO. HP-8B.2:** Continue monitoring and research on harbor seal populations, particularly where declines have been detected in San Francisco Bay.

*Also refer to Strategies No. HP-3A and No. HP-3C*

Action Item	Due Date	FY 1 \$/FTEs	FY 2 \$/FTEs	FY 3 \$/FTEs	FY 4 S/FTEs

**OBJECTIVE NO HP-9:** Coordinate with National Marine Fisheries Service to protect and restore the marine habitats and diverse fish populations of this part of the Ecoregion, taking into consideration ecological impacts in management decisions.

**STRATEGY NO. HP-9A:** Assist in strengthening management of marine fisheries, taking into consideration ecological impacts to seabirds and pinnipeds.

**ACTION NO. HP-9A.1:** Actively participate in the Pacific Coast Fisheries Council.

Action Item	Due Date	FY 1 \$/FTEs	FY 2 \$/FTEs	FY 3 \$/FTEs	FY 4 S/FTEs

PRIORITY: Habitat Protection, Restoration and Enhancement

**OBJECTIVE NO. HP-10:** Protect wetland habitats to ensure no further net losses.

**STRATEGY NO. HP-10A:** Complete a comprehensive effort to characterize and inventory the full range of wetlands and associated biological resources within the Ecoregion.

**ACTION NO. HP-10A.1:** Gather existing information on current and historical wetlands distribution and establish a wetlands database system accessible and usable to both public and private interests by 1996.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-10:** Protect wetland habitats to ensure no further net losses.

**STRATEGY NO. HP-10B:** Cooperate with regulatory and resource agencies to enhance efficiency and cooperation and to establish consistent wetland policies, definitions, mitigation guidelines, and conflict resolution processes.

**ACTION NO. HP-10B.1:** Develop a common definition of wetlands between Federal, State, and local governments for use in regional planning throughout California by June 1996.

**ACTION NO. HP-10B.2:** Develop consistent regional standards and guidelines relative to mitigation monitoring and evaluation.

**ACTION NO. HP-10B.3:** Develop and adopt joint State-Federal mitigation banking guidelines.

**ACTION NO. HP-10B.4:** Ensure coordinated, effective, and timely resolution of conflicts between agency, landowner, and conservation interests.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**STRATEGY NO. HP-10C:** Identify available programs for landowners to preserve, enhance, or restore riparian wetlands.

**ACTION NO. HP-10C.1:** Establish an outreach program to inform landowners about wetlands protection and restoration programs and financial incentives for participation in such programs.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**OBJECTIVE NO. HP-10:** Protect wetland habitats to ensure no further net losses.

**STRATEGY NO. HP-10D:** Prevent further losses of significant vernal pool habitats and maintain the function and values, of the remaining pools including the genetic viability of the wildlife and plant resources.

**ACTION NO. HP-10D.1:** Establish management priorities and goals for each vernal pool type by 1996. Priorities would be developed by interagency team with the cooperation of key vernal pool experts.

**ACTION NO. HP-10D.2:** Evaluate if a Mitigation Policy, Resource Category 1 designation, is appropriate for critical vernal pool habitat areas.

**ACTION NO. HP-10D.3:** Develop published guidelines for specific state-of-the-art construction and mitigation methods related to vernal pool replacement by 1995. Guidelines would be adopted by all governmental agencies which are signatories to regional planning efforts.

**ACTION NO. HP-10D.4:** Establish a team of managers and biologists from the COE, EPA, California Department of Fish and Game, and the Service who would meet with local planners and council members to provide information and lay the groundwork needed for the development of future management plans.

**ACTION NO. HP-10D.5:** Incorporate data for vernal pool habitats into existing GIS database.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

- ACTION NO. HP-10D.6:** Develop regional ecosystem based management plans with State, county, and local governments with vernal pool habitats within their sphere of influence. Plans would likely be developed on a county-by-county basis, but would be consistent with broader regional goals.
- ACTION NO. HP-10D.7:** Work with the Corps of Engineers to suspend the use of their Nationwide Permit No. 26 on vernal pool habitats.
- ACTION NO. HP-10D.8:** Identify potential large preserve areas throughout the Central Valley to serve as genetic reservoirs. Preserve areas would be established using conservation easements, land purchases, mitigation banks, and similar protection approaches.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-10:** Protect wetland habitats to ensure no further net losses.

**STRATEGY NO. HP-10E:** Halt the current wetland and riparian loss trends within the San Joaquin and Sacramento River Delta as a result of current levee protection methods and increased erosion due to boating activities.

**ACTION NO. HP-10E.1:** Habitat within the Delta area would be nominated for inclusion in "Natural Waterways" management plans. "Natural Waterway" areas within the Delta would be specifically managed for fish and wildlife resources by a variety of partners.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

- ACTION NO. HP-10E.2:** Develop a plan with partners to remove rip-rap within areas designated as "Natural Waterways" and improve habitat values.
- ACTION NO. HP-10E.3:** Develop alternatives to rip-rap which can be used on levees and other key resource areas.
- ACTION NO. HP-10E.4:** Develop formal Service policy and guidelines for levee maintenance, habitat restoration, boat docks, and dredging in order to streamline and ensure consistency during the Service's review process on Sections 10 and 404 permits within the Delta.
- ACTION NO. HP-10E.5:** Work with the COE and other partners to reduce the need for shoreline bank protection such as rip-rap through the use of more environmentally compatible methods, including setback levees and the use of natural streamside vegetation, specifically within reaches of the Delta which currently experience low flow velocities and minimal boat traffic.
- ACTION NO. HP-10E.6:** Implement Native Delta Fishes Recovery Plan.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-11:** Restore the quantity and enhance the quality and diversity of wetlands and associated riparian areas.

**STRATEGY NO. HP-11A:** Develop partnerships with Federal, State, and local agencies, and the private sector on wetland restoration and reestablishment projects.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

- ACTION NO. HP-11A.1:** Work with the State and other Federal agencies to maximize wetlands enhancement and restoration of public lands and private lands.
- ACTION NO. HP-11A.2:** Inventory potential riparian habitat areas and restoration sites.
- ACTION NO. HP-11A.3:** Monitor all riparian restoration and/or enhancement efforts.
- ACTION NO. HP-11A.4:** Identify available mechanisms to ensure successful riparian habitat restoration/reestablishment on non-Federal lands.
- ACTION NO. HP-11A.5:** Reconnect upland habitat to restored riparian corridors.
- ACTION NO. HP-11A.6:** Develop a joint management strategy for riparian wetlands with State, local, and other Federal agencies associated with flood management.
- ACTION NO. HP-11A.7:** Incorporate riparian and wetland protection strategies and features into Fishery Management Plans and Endangered Species Recovery Plans.
- ACTION NO. HP-11A.8:** Enter into short term agreement with private landowners to restore and/or enhance wetlands.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-11:** Restore the quantity and enhance the quality and diversity of wetlands and associated riparian areas.

**STRATEGY NO. HP-11B:** Restore and reestablish riparian wetlands, emphasizing Central Valley Project Improvement Act (CVPIA) and Corps of Engineers (COE) authorities and cooperation with State and local programs.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

- ACTION NO. HP-11B.1:** Pursue the setback levee program through COE flood control programs.
- ACTION NO. HP-11B.2:** Propose appropriate riparian habitat restoration and/or enhancement projects to the COE under the 1135 habitat restoration program.
- ACTION NO. HP-11B.3:** Expand the Anadromous Fish Doubling Plan to include riparian restoration and enhancement actions.
- ACTION NO. HP-11B.4:** Complete the San Joaquin River Comprehensive Plan which includes riparian habitat enhancement and restoration.
- ACTION NO. HP-11B.5:** Use the CVPIA's land retirement program funds to purchase available river edge and riparian zone land.
- ACTION NO. HP-11B.6:** Work with local agencies and private landowners to encourage use of conservation easements to protect existing non-Federal riparian habitat.
- ACTION NO. HP-11B.7:** Coordinate with habitat conservation planning efforts to reestablish riparian and upland habitat linkages.
- ACTION NO. HP-11B.8:** Increase shaded riverine aquatic habitat within the Delta according to the Delta Native Fishes Recovery Plan.
- ACTION NO. HP-11B.9:** Restore original San Joaquin river channel from intersection with Eastside Bypass to the San Luis NWR south boundary. Utilize CVPIA restoration fund to purchase a water supply for an annual in-stream flow regime.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**OBJECTIVE NO. HP-11:** Restore the quantity and enhance the quality and diversity of wetlands.

**STRATEGY NO. HP-11C:** Restore critically endangered vernal pool habitat types, including alkali vernal pools within the Sacramento and San Joaquin Valleys and northern mudflow vernal pools, to a level where further species listings on these pool types is not needed.

**ACTION NO. HP-11C.1:** Restore alkali vernal pools/wetlands within the San Joaquin Valley through the CVPIA land retirement program.

**ACTION NO. HP-11C.2:** Evaluate restoration of previously altered vernal pool habitats within federal refuges and state wildlife management areas. If appropriate, restoration and enhancement efforts should be prioritized, funded and initiated.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-11:** Restore the quantity and enhance the quality and diversity of wetlands.

**STRATEGY NO HP-11D:** Restore and enhance wetland and riparian habitats on public and private lands using Federal, State, local agencies, and non-Governmental organizational programs. Emphasis will be on those critical riparian habitats identified by the Riparian Habitat Joint Venture.

**ACTION NO. HP-11D.1:** Enter into short term agreements with private landowners to restore or enhance wetland and riparian habitats on their property.

**ACTION NO. HP-11D.2:** Restoration projects through the Partners for Wildlife Program will re-establish, to the extent technically feasible, the original natural community of the project site.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-12:** Assure water quantity and quality is adequate to protect existing and restored wetlands and aquatic and terrestrial resources.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**STRATEGY NO. HP-12A:** Evaluate selenium-contaminated evaporation ponds in San Joaquin + Valley that are a hazard to migratory birds.

**ACTION NO. HP-12A.1:** In cooperation with Federal, State, and local organizations, continue nest monitoring, egg collections, bird use, and water quality at evaporation ponds.

**ACTION NO. HP-12A.2:** Disseminate information in formal, informal, and peer reviewed forums to allow review of current knowledge base by all parties involved with the evaporation pond issue.

**ACTION NO. HP-12A.3:** In cooperation with co-petitioners, prepare and submit testimony to the State Water Resources Control Board hearing on the inadequacy of 14 evaporation pond waste discharge requirements.

**ACTION NO. HP-12A.4:** Work with landowners and evaporation pond owners on the development of alternative habitat and compensation habitat similar to Westlake Farms demonstration wetlands.

**ACTION NO. HP-12A.5:** Promote the use of other programs -- such as land retirement authorized under the CVPIA, alternative crops, and alternative irrigation practices -- to reduce the drainwater contaminant problem and threat to fish and wildlife.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**OBJECTIVE NO. HP-12:** Assure water quantity and quality is adequate to protect existing and restored wetlands and aquatic and terrestrial resources.

**STRATEGY NO. HP-12B:** Evaluate and minimize impacts of the San Luis Drain interim reuse project on Kesterson NWR and San Luis NWR, and the San Joaquin River.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

- ACTION NO. HP-12B.1:** Develop baseline database on current conditions in Salt Slough and Mud Slough through continued quarterly monitoring.
- ACTION NO. HP-12B.2:** In cooperation with State, Federal, and local agencies, evaluate impacts of selenium loading in San Joaquin River and Delta.
- ACTION NO. HP-12B.3:** Evaluate the impacts of San Luis Drain reuse on the San Joaquin River Restoration planning, CVPIA, etc.
- ACTION NO. HP-12B.4:** In cooperation with State and Federal agencies, assess the risks of selenium contaminated sediment in the Drain and it's removal.
- ACTION NO. HP-12B.5:** Intensively monitor the Drain and sloughs during the reuse period to assess impacts to aquatic resources.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**OBJECTIVE NO. HP-12:** Assure water quantity and quality is adequate to protect existing and restored wetlands and aquatic and terrestrial resources.

**STRATEGY NO. HP-12C:** Assess Delta water quality with respect to possible impacts on Delta smelt reproduction.

- ACTION NO. HP-12C.1:** Assess water toxicity of pesticides in Delta smelt nursery areas through bioassays and water analyses.
- ACTION NO. HP-12C.2:** In cooperation with the Fisheries Assistance Office and State agencies, determine selenium concentrations in salvaged Delta smelt and assess possible impacts.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-12:** Assure water quantity and quality is adequate to protect existing and restored wetlands and aquatic and terrestrial resources.

**STRATEGY NO. HP-12D:** Initiate and complete Natural Resource Damage Assessments and restoration activities and coordinate with regulatory agencies to identify and mitigate natural resource injuries resulting from chemical releases.

**ACTION NO. HP-12D.1:** Continue ongoing NRDA cases (Iron Mountain Mine, Apex Houston, Montrose, Cantara Loop)

**ACTION NO. HP-12D.2:** Maintain spill response preparedness through training and participation in exercises with the U.S. Coast Guard, CA Oil Spill Prevention and Response, industry, and other agencies and parties by participating in the development and review of Area Contingency Plans.

**ACTION NO. HP-12D.3:** Provide initial response/NRDA for oil spills and other hazardous material releases that threaten Department of the Interior trust resources.

**ACTION NO. HP-12D.4:** Initiate new NRDA cases at EPA and state Superfund sites where injuries to Department of the Interior trust resources have occurred.

**ACTION NO. HP-12D.5:** Develop and implement projects through the NRDA process to restore injured Department of the Interior trust resources.

**ACTION NO. HP-12D.6:** Support EPA by conducting Preliminary Natural Resources Surveys and participating in Ecological Risk Assessments at Superfund sites and Department of Defense and Department of Energy facilities.

**PRIORITY:** Habitat Protection, Restoration and Enhancement

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HP-12:** Assure water quantity and quality is adequate to protect existing and restored wetlands and aquatic and terrestrial resources.

**STRATEGY NO. HP-12E:** Assess and minimize contaminant impacts to the resources of San Francisco Bay through monitoring, consultations, and coordination with federal, state, and local agencies and groups.

**ACTION NO. HP-12E.1:** Continue the assessment of mercury impacts to clapper rail and least tern reproduction in the south Bay area.

**ACTION NO. HP-12E.2:** Assess the impacts of selenium loading from the San Joaquin River and industrial discharges in the marine environment.

**ACTION NO. HP-12E.3:** Provide technical expertise to the Regional Water Quality Control Board and the EPA on site specific water quality criteria for copper, selenium, and mercury in the Bay.

**ACTION NO. HP-12E.4:** Evaluate the use of dredged sediment for wetland restoration and the disposal of contaminated sediment in the Bay area.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Habitat Protection, Restoration and Enhancement

**OBJECTIVE NO. HP-12:** Assure water quantity and quality is adequate to protect existing and restored wetlands and aquatic and terrestrial resources.

**STRATEGY NO. HP-12F:** Support pollution prevention activities of Federal, State, and local agencies by providing technical expertise and information through the NPDES, non-point source, pesticide labeling, and monitoring programs.

**ACTION NO. HP-12F.1:** Conduct a formal Section 7 consultation with EPA on the development of State Water Quality Criteria in coordination with other Ecological Services field offices and California Department of Fish and Game staff.

**ACTION NO. HP-12F.2:** Provide technical expertise to the Regional Water Quality Control Board and the EPA on selenium loading to the San Joaquin River and San Francisco Bay/Delta.

**ACTION NO. HP-12F.3:** Provide technical expertise to the EPA and the CalEPA on pesticide use and labeling requirements for endangered species protection.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HP-12G:** Assess the impacts of contaminants on vernal pool water quality and associated species.

**ACTION NO. HP-12G.1:** Determine the concentration, toxicity, and potential impacts of urban storm runoff into vernal pools at Sacramento River NWR.

**ACTION NO. HP-12G.2:** Work with local and State officials on identifying and implementing measures that can minimize contaminant loading in urban runoff from the Chico area.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Human Resources and Outreach

**PRIORITY** Human Resources and Outreach

**OBJECTIVE NO. HR-1:** Inform our partner agencies and organizations about the U.S. Fish and Wildlife Service ecosystem approach to resource management in order to involve them in the management process.

**STRATEGY NO. HR-1A:** Develop and deliver information to targeted audiences to generate an understanding of what ecosystem approach to wildlife management means and why the Service decided to implement it.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HR-1B:** Develop and deliver information to targeted audiences to generate an understanding of how ecosystem approach will affect USFWS partner relationships.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HR-2:** Involve targeted partner agencies and organizations in refining and participating in the implementation of the Central Valley/San Francisco Bay Ecosystem Implementation strategy focusing on what it is and how it will affect them.

**STRATEGY NO. HR-2A:** Develop and deliver information to targeted audiences to generate an understanding of the Central Valley/San Francisco Bay Ecosystem Implementation Strategy.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HR-2B:** Seek input from targeted audiences for development of strategies and actions to be included in the final Central Valley/San Francisco Bay Ecosystem Implementation Strategy.

PRIORITY: Human Resources and Outreach

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HR-3:** Inform key publics about the priority issues in the Central Valley/San Francisco Bay Eco.region.

**STRATEGY NO. HR-3A:** Develop and deliver appropriate information to two selected publics in 1995 on what wetlands are, and why they are important.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HR-3B:** Develop and deliver appropriate information to two selected publics in 1995 about key fisheries issues, their associated problems, and possible solutions.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HR-3C:** Develop and deliver appropriate and regionally-specific information about listed species and their habitats to targeted audiences.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HR-3D:** Develop and deliver appropriate information to selected publics about the inter-relationships of water, fish, and wildlife; and the value of biodiversity.

PRIORITY: Human Resources and Outreach

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HR-3:** Inform key publics about the priority issues in the Central Valley/San Francisco Bay Eco.region.

**STRATEGY NO. HR-3E:** Initiate or continue a public outreach effort to provide information that explains the resource problem, proposed action by the Service and its partners to address the problem, and solicit relevant input.

**ACTION NO. HR-3E.1:** Work with Regional Office, Ecoregion, and local outreach staff to develop and implement public outreach plan for each subregion that addresses this objective.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. HR-3F:** Continue and emphasize public outreach efforts at the local facility level to involve the public in efforts to address this objective.

**ACTION NO. HR-3F.1:** Develop an Action Plan for public outreach that includes a timeline for open and proactive involvement by interested public agencies, organizations, and individuals.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. HR-4:** Develop an outreach program throughout the Region to demonstrate significance and success of various agency programs.

PRIORITY: Human Resources and Outreach

STRATEGY NO. HR-4A: By 1997, designate an outreach coordinator position for contact at all local field office/facility level.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

STRATEGY NO. HR-4B: Encourage supervisors to utilize existing awards program to recognize employees for participation in non-traditional outreach activities such as publication of papers or articles in non-professional journals and other public media outlets or participation in local/service/educational programs.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Research/Monitoring/Data Collection

**PRIORITY** Research/Monitoring/Data Collection

**OBJECTIVE NO. RM-1:** By the year 1999, establish a research institute to coordinate, help plan and implement, assist in obtaining funds, and to provide quality control, review, and advice for Central Valley/San Francisco Bay ecosystem research.

**STRATEGY NO. RM-1A:** Gain widespread acceptance of the need for a single research institute that covers the entire watershed.

**ACTION NO. RM-1A.1:** In conjunction with other resource agencies, water development agencies and interests, and the scientific community, establish a forum to discuss the need for coordinated research efforts to address the problems of ecosystem functions and human interactions in the Central Valley.

**ACTION NO. RM-1A.2:** Using the forum as a springboard, identify the need, efficiencies, and other benefits associated with the establishment and recognition of a Central Valley Ecosystem Institute.

**ACTION NO. RM-1A.3:** Negotiate with the existing San Francisco Estuarine Institute and the Interagency Ecological Studies Program on the Sacramento-San Joaquin Delta to merge all of the described institute functions in the Central Valley/San Francisco Bay Eco region into a single combined program.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 \$/FTEs</i>

**STRATEGY NO. RM-1B:** Formally establish the Central Valley Ecosystem Institute as a quasi-official public agency with State and Federal recognition.

**ACTION RM-1B.1:** Seek agency commitments to support an ecosystem-wide institute both politically and financially.

**ACTION RM-1B.2:** Generate support to establish the Institute.

PRIORITY: Research/Monitoring/Data Collection

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. RM-2:** Provide information needed to support critical decisions affecting the ecosystem anticipated over the next ten years.

**STRATEGY NO. RM-2A:** In conjunction with other resource agencies, water development agencies, and others whose actions may have major impacts on ecosystem health, convene a forum to identify impending decisions and information needs.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. RM-2B:** Review existing available information and identify data gaps needed to support anticipated decisions and actions.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. RM-2C:** Fill data gaps using accepted techniques.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. RM-3:** By the year 1999, develop and implement a comprehensive monitoring and assessment program to gather data on the health of the ecosystem and the effectiveness of actions taken to restore ecosystem health.

PRIORITY: Research/Monitoring/Data Collection

**STRATEGY NO. RM-3A:** Under the authority of the Central Valley Project Improvement Act, conduct a status review of existing monitoring and assessment programs.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. RM-3B:** Under the authority of the Central Valley Project Improvement Act, and in coordination with all organizations involved in or in need of monitoring and data collection, describe a comprehensive and consistent monitoring and assessment program that meets the needs for ecosystem information and employs standardized, generally acceptable monitoring techniques.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. RM-3C:** Initiate new programs and, as appropriate, modify existing monitoring/assessment programs to conform to comprehensive program developed per Strategy 2B (above).

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. RM-4:** By 2002, establish the Central Valley/San Francisco Bay Ecosystem Institute as a repository and major source of credible information on the health and function of the ecosystem.

**STRATEGY:** To be added later. !!!

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Research/Monitoring/Data Collection

**OBJECTIVE NO. RM-5:** Develop and implement a computerized system for storage, retrieval, and widespread dissemination and sharing of information on the health and function of the ecosystem.

**STRATEGY:** To be added later.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**OBJECTIVE NO. RM-6:** Develop evaluation models to predict the consequences of management decisions.

**STRATEGY NO. RM-6A:** Define a system of models (with supporting data bases) that meets the needs of ecosystem decision makers and which will have widespread acceptability as predictive tools and be readily available and useable.

**ACTION NO. RM-6A.1:** Canvas decision makers on their information needs and criteria for model acceptance.

**ACTION NO. RM-6A.2:** Establish a broad-based technical forum to translate decision makers' needs and criteria into a conceptual system of models that would meet the criteria for widespread acceptability.

**ACTION NO. RM-6A.3:** Obtain public review of conceptual system of models.

**ACTION NO. RM-6A.4:** After review, finalize conceptual system and obtain written commitment of the water resource community to accept it as a primary "Decision Support System."

**ACTION NO. RM-6A.5:** Widely advertise and disseminate approved "Decision Support System."

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**PRIORITY:** Research/Monitoring/Data Collection

**OBJECTIVE NO. RM-6:** Develop evaluation models to predict the consequences of management decisions.

**STRATEGY NO. RM-6B:** Evaluate existing models, their assumptions, and supporting data bases for utility in the "Decision Support System."

**ACTION NO. RM-6B.1:** Using the broadly-based technical forum previously established, conduct a review of existing models. Identify changes needed to meet criteria for Decision Support System.

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

**STRATEGY NO. RM-6C:** Develop Decision Support System.

**ACTION NO. RM-6C.1:** Modify existing models as previously identified.

**ACTION NO. RM-6C.2:** Supplement with additional models as necessary.

**ACTION NO. RM-6C.3:** Verify accuracy of the "Decision Support System." Revise as needed to meet criteria for predictive accuracy.

**ACTION NO. RM-6C.4:** Develop readily understandable handbook to support model usage.

**ACTION NO. RM-6C.5:** Publish and disseminate models.

**ACTION NO. RM-6C.6:** Establish a technical support system to maintain, modify, upgrade, explain, etc. , the "Decision Support System."

<i>Action Item</i>	<i>Due Date</i>	<i>FY 1 \$/FTEs</i>	<i>FY 2 \$/FTEs</i>	<i>FY 3 \$/FTEs</i>	<i>FY 4 S/FTEs</i>

PRIORITY: Research/Monitoring/Data Collection

**OBJECTIVE NO. RM-7:** Assure water quantity and quality is adequate to protect existing and restored wetlands and aquatic and terrestrial resources.

**STRATEGY NO. RM-7A:** Assess the impacts of wastewater oxidation ponds on wintering waterfowl in the Ecoregion.

**ACTION NO. RM-7A.1:** Determine abundance, species composition, and activity patterns of waterfowl using oxidation ponds during the winter.

**ACTION NO. RM-7A.2:** Determine food availability to and food habitats of waterfowl that use the oxidation ponds during the winter period.

**ACTION NO. RM-7A.3:** Determine contaminants levels and quality of water and foods consumed by waterfowl using these . oxidation ponds.

**ACTION NO. RM-7A.4:** Determine contaminant loads and body condition of waterfowl that feed on oxidation ponds during the winter.

**ACTION NO. RM-7A.5:** Work with local and state officials on identifying and implementing measures that can minimize use of oxidation ponds by wintering waterfowl.

Action Item	Due Date	FY 1 \$/FTEs	FY 2 \$/FTEs	FY 3 \$/FTEs	FY 4 S/FTEs

## U.S. FISH AND WILDLIFE SERVICE FACILITIES

### *ECOREGION SUBUNIT: Sacramento Valley*

#### NATIONAL WILDLIFE REFUGES

Sacramento NWR Complex  
752 Country Rd 99W  
Willows, CA 95988  
Project Leader: Gary Kramer  
(Ecosystem Team Member)  
Phone: (916)934-2801  
FAX: (916)934-7814  
ccmail: kramerg

The following are included in the Sacramento NWR Complex:

Sacramento NWR (10,870 acres), Delevan NWR (5,634 ~~5,794~~ acres), Sutter NWR (2,591 acres), Colusa NWR (4,040 acres), and Butte Sink NWR (733 acres), consist of seasonal marsh, permanent pond, watergrass, and upland habitats. They support up to two million ducks and one-half million geese during winter. Numerous bird and mammal species are year-round residents.

Sacramento River NWR (proposed 18,000 acres) is still in the acquisition stage. The habitat consists of a broad riparian corridor, and contains sloughs, rivers, and lakes, bordered by seasonal and permanent marsh. The purpose of the project is to preserve riparian habitat for threatened and endangered species, waterfowl and other migratory birds, anadromous fish, and plants. Significant

species include the osprey, western yellow-billed cuckoo, bank swallow, Valley elderberry longhorn beetle, peregrine falcon, and bald eagle.

Butte Sink WMA project size, when completed, will total 11,712 acres, mostly in conservation easements; but also includes the Butte Sink NWR. Habitat and species for both areas are similar to Sacramento NWR.

Willow Creek-Lurline WMA project size, when completed, will total 17,613 acres in conservation easements. Habitat and species are similar to Sacramento NWR.

North Central Valley WMA is newly established, and encompasses the entire Sacramento Valley. Habitat and species are similar to Sacramento NWR.

#### NATIONAL FISH HATCHERIES

Coleman NFH  
24411 Coleman Fish Hatchery Road  
Anderson, CA 96007  
Hatchery Manager: John T. Nelson  
Phone: (916)365-8622  
FAX: (916)365-0913  
ccmail: r1fr\_cole

**ECOLOGICAL SERVICES, FISHERY  
RESOURCES, LAW ENFORCEMENT  
OFFICES**

CA-NV Fish Health Center  
24411 Coleman Fish Hatchery Road  
Anderson, CA 96007  
Project Leader: J. Scott Foott  
Phone: (916)365-4271  
FAX: (916)365-7150  
ccmail: r1fr\_cole

Central Valley Fish and Wildlife  
Restoration Program Office  
2800 Cottage Way, Room E-1831  
Sacramento, CA 95825  
Team Leader: James J. McKeivitt  
(Ecosystem Team Member)  
Phone: (916)979-2760  
FAX: (916)979-2770  
ccmail: R1\_CVPIA

Division of Law Enforcement  
2800 Cottage Way - Room E-1924  
Sacramento, CA 95825  
Senior Resident Agent: Scott G. Pearson  
(Ecosystem Team Member)  
Phone: (916)979-2986  
FAX: (916)979-2991  
ccmail: hobbsj

Division of Law Enforcement  
P.O. Box 4401  
Chico, CA 95927  
Special Agent: Joseph R. Sandberg  
Phone: (916)342-8724  
FAX: (916)899-1633  
email: none

Ecological Services  
Sacramento Field Office  
2800 Cottage Way, Room E-1803c  
Sacramento, CA 95825  
Field Supervisor: Joel Medlin  
(Ecosystem Team Member)  
Phone: (916)979-2710  
FAX: (916)979-2723  
ccmail: medlinj

Northern Central Valley Fishery  
Resource Office  
10950 Tyler Road  
P.O. Box 667  
Red Bluff, CA 96080  
Project Leader: James G. Smith  
(Ecosystem Team Member)  
Phone: (916)527-3043  
FAX: (916)529-0292  
ccmail: nolank

**ADMINISTRATIVE AND OTHER  
FACILITIES/OFFICES**  
*(with ecoregion-wide responsibilities)*

Sacramento Realty Field Office  
2233 Watt Avenue Suite 375  
Sacramento, CA 95825-0509  
Chief: Howard Stark  
(Ecosystem Team Member)  
Phone: (916)979-2085  
FAX: (916)979-2092  
ccmail: starkh

Central Valley Habitat Joint Venture  
2233-Watt Avenue, Suite 275  
Sacramento, CA 95825-0509  
Joint Venture Coordinator: David G. Paullin  
(Ecosystem Team Member)  
Phone: (916)979-2085  
FAX: (916)979-2092  
ccmail: paullind

California Private Lands Office  
2233 Watt Avenue, Suite 275  
Sacramento, CA 95825-0509  
State Private Lands Coordinator:  
Debra Schlafmann  
Phone: (916)979-2085  
FAX: (916)979-2092  
ccmail: schlafmannnd

**ECOREGION SUBUNIT:  
San Joaquin Valley/Tulare Basin**

NATIONAL WILDLIFE REFUGES

San Luis NWR Complex  
P.O. Box 2176  
947 W. Pacheco, Suite C  
Los Banos, CA 93635  
Project Manager: Gary Zahm  
(Ecosystem Team Member)  
Phone: (209)826-3508  
FAX: (209)826-1445  
ccmail: zahmg

The San Luis NWR Complex sits within the historic Grasslands Ecological Area of the San Joaquin Valley. Eighteen natural communities and four agricultural types are located within this 65% upland and 35% wetland area, which includes 77 miles of streams, sloughs, and rivers. 95% of Aleutian Canada geese winter within the complex, joining company with the 30% of all migrating waterfowl using the Central Valley of California.

The following are included in the San Luis NWR Complex:

San Luis NWR 15,190 acres  
Merced NWR 4,572 acres  
Kesterson 10,621 acres  
Arena Plains NWR 2,464 acres  
San Joaquin River NWR 1,638 acres

Grasslands WMA (46,000 acres out of an 81,000-acre project area of private wetland habitat) is perpetually protected by conservation easement. Grasslands WMA is the largest contiguous block of wetlands within the Central Valley.

Kern NWR Complex  
P.O. Box 670  
Delano, CA 93216  
Project Leader: Thomas Charmley  
(Ecosystem Team Member)  
Phone: (805)725-2767  
(805)725-5284  
FAX: (805)725-6041  
ccmail:charmleyt

Kern NWR (11,000 acres) and Pixley NWR (6,000 acres) are components of the Kern NWR Complex and lie within the ecoregion boundary.

These two units in Kern NWR Complex are wintering areas for migratory waterfowl, shorebirds, marsh and waterbirds in the southern San Joaquin Valley. The refuges include natural valley grasslands and developed marsh, and also provide habitat for several endangered species, including the San Joaquin kit fox and the blunt-nosed leopard lizard. Blue Ridge NWR is a Satellite of the Kern NWR Complex.

#### NATIONAL FISH HATCHERIES

n/a

#### ECOLOGICAL SERVICES, FISHERY RESOURCES, LAW ENFORCEMENT OFFICES

Division of Law Enforcement  
2933 Larkin  
Clovis, CA 93612  
Special Agent: Roger W. Gephart  
Phone: (209)487-5773  
FAX: (209)487-5107  
ccmail: none

Sacramento/San Joaquin Estuary  
Fishery Resource Office  
4001 North Wilson Way  
Stockton, CA 95205  
Project Leader: Martin A. Kjelson  
(Ecosystem Team Member)  
Phone: (209)946-6400  
FAX: (209)946-6355  
ccmail: kjelsonm

#### ADMINISTRATIVE AND OTHER FACILITIES/OFFICES

n/a

**ECOREGION SUBUNIT:**  
*Montane/North East Plateau*

**NATIONAL WILDLIFE REFUGES**

Modoc NWR  
P.O. Box 1610  
Alturas, CA 96101  
Project Leader: David Johnson  
(Ecosystem Team Member)  
Phone: (916)233-3572  
FAX: (916)233-4143  
ccmail: johnsonda

Located at the western edge of the Great Basin Desert, this 6,386-acre refuge consists of irrigated meadows, natural floodplains, marsh communities, cereal grain croplands, and sagebrush/juniper uplands at 4,400 feet. Wildlife includes sandhill cranes (nesting on the refuge), large concentrations of waterfowl including tundra swans, white pelicans, mule deer, and pronghorn antelope.

**NATIONAL FISH HATCHERIES**

n/a

**ECOLOGICAL SERVICES, FISHERY RESOURCES, LAW ENFORCEMENT OFFICES**

n/a

**ADMINISTRATIVE AND OTHER FACILITIES/OFFICES**

n/a

**ECOREGION SUBUNIT:**  
**San Francisco Bay/Delta**

**NATIONAL WILDLIFE REFUGES**

San Francisco Bay NWR Complex  
P.O. Box 524  
Newark, CA 94560-0524  
Refuge Manager: Marge Kolar  
(Ecosystem Team Member)  
Phone: (510)792-0222  
FAX: (510) 792-5828  
ccmail: kolarm

Five of the refuges in this complex fall within the CV/SF Bay ecoregion boundaries:

Antioch Dunes NWR: 55 acres of sand dunes and former dune areas protect critical habitat for several endangered species as well as a unique assemblage of plants, insects, and reptiles.

Marin Islands NWR: 326 acres of tideland and 13 acres of upland compose the habitat on this unique island ecosystem. The refuge objectives include protecting nesting waterbirds and other wildlife from disturbance; increasing and enhancing native habitat for use by nesting and roosting birds; and protecting tidal mudflats on these unique islands which are home to great and snowy egrets, black-crowned night herons, black oystercatchers, and surf scoters. It is closed to all public use.

San Francisco Bay NWR: The refuge is authorized at 43,000 acres and is still in the acquisition stage. At present, the refuge consists of 21,000 acres of estuarine, upland, open water, mudflat, salt pond, and salt marsh habitat. Wildlife include saltwater fishes, harbor seals, migratory waterfowl, and shorebirds.

San Pablo Bay NWR: Approximately 13,000 acres of estuarine habitat includes uplands, open water, salt marshes, and mudflats. This is the primary wintering area for the Pacific Flyway canvasback population; a migration staging area and wintering area for a variety of waterfowl, shorebirds, and other waterbirds; and home to salt water fish populations. The Service is continuing to acquire lands at this refuge.

Farallon NWR: This 211-acre island refuge, located off the Pacific coast near San Francisco, is home to the California sea lion, Steller sea lion, northern elephant seal, California brown pelican, peregrine falcon, tufted puffin, and an assortment of marine species. The islands are closed to all public use to preserve important seabird nesting area, protect migratory birds, preserve and protect pinnipeds using the island, and protect endangered and threatened species.

Stone Lakes NWR  
2233 Watt Avenue, Suite 375  
Sacramento, CA 95825-0509  
Refuge Manager: Tom Harvey  
(Ecosystem Team Member)  
Phone: (916) 979-2085  
FAX: (916) 979-2092  
ccmail: harveyt

This newly established refuge will protect an 18,000 acre area and is located 10 miles south of Sacramento, in the northern portion of the Delta. The project area supports extensive seasonal and permanent wetlands, riparian forest, and grasslands as well as some of the last remaining freshwater lakes in the Central Valley. Utilizing the natural habitats and

agricultural lands within the project boundary are significant populations of migratory waterbirds including a major rookery for several colonial-nesting species, numerous special status species, and a warmwater fishery. The Service has purchased nearly 1,000 acres, and will be managing another 4,000 acres through cooperative agreements or donations, as well as conducting a major wetland restoration project during 1995.

NATIONAL FISH HATCHERIES

n/a

ECOLOGICAL SERVICES, FISHERY  
RESOURCES, LAW ENFORCEMENT  
OFFICES

Division of Law Enforcement  
1633 Bayshore Highway, Suite 248  
Burlingame, CA 94010  
Special Agent: Kenneth McCloud  
Phone: (415)876-9078  
FAX: (415)876-9701  
ccmail: none

ADMINISTRATIVE AND OTHER  
FACILITIES/OFFICES

n/a

USFWS Resource Facility Locations

Facility	Sacramento Valley	San Joaquin Valley	San Francisco Bay/Delta	Montane/ N.E. Plateau
National Wildlife Refuges				
Sacramento NWR	X			
Delevan NWR	X			
Colusa NWR	X			
Sutter NWR	X			
Sacramento River NWR	X			
Willow Creek-Lurline WMA	X			
Butte Sink WMA	X			
N. Central Valley WMA	X			
Stone Lakes NWR			X	
San Joaquin River NWR		X		
San Luis NWR		X		
Kesterson NWR		X		
Merced NWR		X		
Arena Plains NWR		X		
Grasslands WMA		X		
Kern NWR		X		
Pixley NWR		X		
San Francisco Bay NWR			X	

Facility	Sacramento Valley	San Joaquin Valley	San Francisco Bay/Delta	Montane/ N.E. Plateau
San Pablo Bay NWR			X	
Antioch Dunes NWR			X	
Marin Islands NWR			X	
Farallon NWR			X	
Modoc NWR				X
National Fish Hatcheries				
Coleman NFH	X			
Ecological Services, Fishery Resources, and Law Enforcement				
Div. of Law Enforcement	X	X	X	
CA/NV Fish Health Center	X			
San Joaquin ES Recovery		X		
Central Valley Fish & Wildlife Rest. Program	X	X		
Div. of Ecological Services	X	X	X	X
N. Central Valley Fish & Wildlife Resource Ofc.	X			
Sacramento/ San Joaquin Estuary Fish & Wildlife Resource Ofc.		X		
Administrative and Other Facilities/Offices				

Facility	Sacramento Valley	San Joaquin Valley	San Francisco Bay/Delta	Montane/ N.E. Plateau
Sacramento Realty Field Office	X	X	X	X
Ecological Services, State Office	X	X	X	X
Central Valley Habitat Joint Venture, Coord.	X	X		
California Private Lands Office	X	X	X	X

**ENDANGERED, THREATENED, PROPOSED,  
 AND CANDIDATE SPECIES**

Habitats of the Central Valley/San Francisco Bay Ecosystem have been altered to the extent that a large number of plant and animal species had been Federally listed as threatened or endangered species. The number of listed species is 50 with another 30 species formally proposed. In addition, over 1,600 species are in candidate status in California with a large number of these represented in this ecoregion. For a breakdown in the number species see the following table.

Number of species of listed and candidate species in the Central Valley/San Francisco Bay Ecosystem.

Class of Species	Threatened	Endangered	Proposed	Candidates	Totals
Mammals		6		?	6
Birds	4	6	1		11
Fish	2	1	1		4
Amphibians			1		1
Reptiles	2	2	1		5
Invertebrates	4	5	6	60	75
Plants	1	17	20	100+	38+
<b>TOTALS</b>	<b>13</b>	<b>37</b>	<b>30</b>	<b>1,600+</b>	<b>1,700+</b>