

1997-1999 HIGHLIGHTED ACTIVITIES

Statewide responsibilities for conservation and recovery of California's 293 listed species of rare, threatened, and endangered plants and animals are spread among the DFG's headquarters and regions (see map). The DFG is involved in many ways to conserve, protect, restore, and enhance California's rare, threatened, and endangered species. DFG biologists throughout the State provide biological expertise, coordinate research, management, and monitoring programs, review petitions to list and delist species, and participate in cooperative conservation plans. They work closely with other State and federal agencies, universities, private landowners, and members of the public on conservation and recovery of listed species. Without these conservation partners, many of these activities would not be possible.

In order to avert the need to list additional species, DFG biologists maintain information on other plants and animals of special concern, and plan for conservation of these species in cooperative conservation plans and other conservation programs where possible.

A variety of funding sources is available to the DFG to promote recovery of threatened and endangered species. Funding sources include the California Endangered Species Tax Check-Off fund, Federal Endangered Species Act Section 6 Funds [appropriated by Congress and administered by the U.S. Fish and Wildlife Service (USFWS)], the Environmental License Plate Fund, the Tobacco Tax and Health Initiative (Proposition 99), mitigation funds, funding under the CALFED Bay-Delta Program and the Central Valley Project Improvement Act (CVPIA), and other grant sources (e.g. federal Partnerships for Wildlife Act funds).

Some of the more important conservation efforts of the last three years are highlighted below.

Large Scale Conservation Planning and Partnerships

Natural Community Conservation Planning Conservation Efforts:

In December 1995, the DFG approved the subregional NCCP for San Diego Gas and Electric Company (SDG&E). The plan area includes a service area of over two million acres in western San Diego, southern Orange, and southwestern Riverside Counties. The plan provides for the conservation and long-term protection of 110 species through the implementation of operational protocols, acquisition of approximately 240 acres of mitigation credits, and conservation easements over certain fee-owned rights-of-way that provide wildlife corridors or otherwise contribute to other regional planning efforts. The plan does not cover extraordinary expansions of the gas or electric system, but provides certainty that the generally linear impacts are minimized and mitigated accordingly. The installation, operations, maintenance and repairs of utility systems are the focus activities involved in this plan.

The Orange County Central/Coastal Subregional Plan was approved in July, 1996. This plan encompasses more than 208,000 acres in the County and when fully implemented will have a 39,000-acre preserve. The preserve area provides for the protection and management of 13 vegetation communities including coastal sage scrub, chaparral and grassland, as well as 39 sensitive plant and animal species (many of them listed). The preserve is managed by The Nature Reserve of Orange County, a non-profit corporation. The Nature Reserve completed its grazing management plan and prepared a draft, reserve-wide, biological monitoring plan during 1997.

In 1996, the DFG approved the City of Poway's (San Diego County) HCP/NCCP. Their planning area covers approximately 25,000 acres and when fully implemented will have an 11,000-acre preserve. Eighteen vegetation communities and 43 plant and animal species are conserved under this plan. The City's plan, although prepared independently of the Multiple Species Conservation Program (MSCP) Subregional Plan, fully integrates with and functions as a subarea plan within MSCP.

In July of 1997, the USFWS and DFG approved the subregional Multi-Species Conservation Plan (MSCP) and the City of San Diego's subarea plan. The County of San Diego's subarea plan was approved in March of 1998. The MSCP covers 582,000 acres and, when fully implemented, will have a preserve area of 172,000 acres. The plan will provide for the long-term protection and management of 25 vegetation communities and 85 plant and wildlife species and benefit hundreds of more common plants and animals. Together, the City and County subarea plans cover 80 percent of MSCP planning area.

The preliminary biological analysis for the Multiple Habitat Conservation Program (MHCP) of northwestern San Diego County was completed in 1997, and a consultant's working draft MHCP plan was completed in summer of 1998. Species coverage evaluations based on conservation of habitat (acreage and configuration) were completed in 1999. A final MHCP Plan is expected to be produced by the end of 2000.

The planning agreement for the western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) was approved in 1997, and preliminary analysis was initiated on the status of selected, sensitive species within MSHCP's 1.2 million-acre planning area. The analyses were completed by the MSHCP Advisory Committee in 1998 and forwarded to the MSHCP Management Team. Evaluation of reserve design and size alternatives, and discussion of conservation strategies began in mid-1999. An independent Scientific Review Panel was established in November 1999.

During 1997, biological analyses continued to be developed for final NCCP conservation plans for western San Bernardino and southern Orange Counties and the Palos Verdes Peninsula in Los Angeles County. In 1999, southern Orange County changed their approach to integrate wetlands permitting through the Army Corps of Engineers and EPA with the NCCP process.

Local assistance funds (\$1.6 million each year) were appropriated by the Legislature in 1996, 1998, and 1999. These funds were made available to local jurisdictions to be used for urgent implementation projects. Projects submitted and approved by the DFG in 1996 included: support for biological data collection and preserve design, development

of a county Safe Harbor Plan, acquisition of sensitive and threatened habitat lands, preserve management and vernal pool enhancement, and a restoration and protection plan for San Diego ambrosia (*Ambrosia pumila*). Projects submitted and approved by the DFG in 1998 included: California least tern and burrowing owl management, critical habitat acquisitions, habitat tracking GIS support, monitoring amphibians and reptiles, restoration and enhancement of coastal sage scrub, and development of management plans for interagency preserve lands. Projects for 1999 grants included: critical habitat acquisitions, aerial digital imaging, monitoring of various species and habitats, wildlife corridor monitoring, coordination of regional monitoring and data management, development of a framework biological monitoring plan for the MHCP, restoration of coastal sage scrub and vernal pools, and management plans for Carmel Mountain, Del Mar Mesa, Crestridge, and the City of Carlsbad.

Habitat Acquisitions in Southern California under NCCP:

The State (WCB), in cooperation with the USFWS and the City and County of San Diego, has acquired a total of 10,236 acres of land for the assembly of NCCP preserves. Properties acquired within the Multiple Species Conservation Plan area include locations at Sycuan Peak, Rancho Jamul, the San Miguel Ranch, Crestridge, Lusardi Creek, and Boden Canyon. A parcel in Klondike Canyon within the Palos Verdes Peninsula was also acquired. The properties include significant coastal sage scrub and other habitats that will provide for the long-term protection for sensitive biological resources (including many state and federally listed species) and open-space requirements for local communities. These lands are in addition to existing State, federally, and locally owned public lands that will be managed consistent with NCCP objectives and goals.

CALFED Bay-Delta Program:

The CALFED Bay-Delta Program is a collaboration among state and federal agencies to develop a long-term comprehensive plan that will restore ecosystem health and improve water management for beneficial uses of the Bay-Delta system. The CALFED Program has the ambitious goal of achieving recovery of at-risk native species dependent on the Delta and Suisun Bay as the first step toward establishing large, self-sustaining populations of these species; supporting similar recovery of at-risk native species in San Francisco Bay and the watershed above the estuary; and minimizing the need for future endangered species listings by reversing downward population trends of native species that are not listed.

A programmatic Multi-species Conservation Strategy (MSCS) has been developed using the conservation strategies of the Natural Community Conservation Planning Act for the CALFED Bay-Delta Program as the foundation for compliance with the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA). The MSCS identifies and evaluates 244 special-status species and 20 natural communities that could be affected by CALFED actions. It identifies conservation goals and measures for each of the evaluated species and natural communities. Implementation of all CALFED actions evaluated in the MSCS and conservation measures over the 30-year project period is expected to result in recovery of populations of 19 evaluated species; partial recovery of 25 evaluated species; measurable benefits for populations and habitats for 44 evaluated species; maintenance of existing levels of populations and habitats for 156 evaluated species; substantial increases in the extent and quality of 12 natural communities; and protection, enhancement, or restoration of four natural communities.

Early implementation of CALFED ecosystem restoration projects began in 1996. Funding of restoration projects has come from many sources including state and federal agencies, stakeholders and the public. Ecosystem restoration funds are administered through the cooperative efforts of the CALFED agencies. The four primary sources include the California Urban Water Agencies, Proposition 204 State bond funds, Federal Bay-Delta Act funds and U.S. Environmental Protection Agency watershed funds. By the end of 1999, \$284 million had been appropriated for ecosystem restoration projects. Of this amount, \$250.4 million has been approved for a total of 284 projects. CALFED has funded fish protection projects such as the relocation, consolidation and screening of water diversions, dam removal and construction of fish ladders. CALFED has funded the

preservation and restoration of riparian and flood plain habitat in the Sacramento River Conservation Area and Consumnes River Preserve. In the San Francisco Bay area CALFED has funded projects to restore habitat, reduce contaminants, improve water quality. CALFED has also funded the expansion of the San Joaquin National Wildlife Refuge and acquisition of land in the Yolo Bypass which will contribute to building the proposed North Delta National Wildlife Refuge.

Vernal Pool Conservation:

Vernal pools constitute a unique ecosystem in California, occurring in far-reaching and diverse locations such as the Modoc Plateau, mesas in San Diego County, the Sacramento-San Joaquin Valley, and the Santa Rosa Plateau in Sonoma County. In 1997 the DFG participated in the Vernal Pool Policy Committee to develop the inter-agency Framework Agreement. Signed by 13 agencies, the agreement serves as the basis for a comprehensive ecosystem-based approach to the conservation and management of California's vernal pool ecosystems, and fosters better cooperation among the various State, federal, and local agencies responsible for protecting California's vernal pools. The Committee also addressed outreach to local communities, guidance for mitigation and deep ripping, permit streamlining, and training for agency personnel. Other Committee members include the Resources Agency, the California Environmental Protection Agency, CDFA, California State Water Resources Control Board (SWRCB), the federal EPA, the U.S. Army Corps of Engineers (Army Corps), USFWS, U.S. Bureau of Reclamation (BOR), BLM, the U.S. Geological Survey's Biological Resources Division (BRD), and the Natural Resources Conservation Service.

In early 1997, USFWS established its California Vernal Ecosystem recovery team. In response to USFWS's request, three DFG representatives were assigned to the team. The team provided USFWS with guidance and information for the drafting of a federal recovery plan for the vast majority vernal pool habitat in California and five invertebrate, two vertebrate, and 25 plant species which have a variety of federal and State designations. The area covered by the recovery planning extends from the Modoc Plateau south to Kern County and west to Santa Rosa. The draft recovery plan is scheduled to be completed in 2001.

The DFG has continued its role on the Interagency Vernal Pool Assessment Team through cooperative efforts to inventory and assess vernal pool habitats at local, regional, and statewide scales. In May 1998, the DFG released the *California Vernal Pool Assessment Preliminary Report*, a summary of the current state-wide body of knowledge for vernal pools based on scientific literature available at the time and maps of vernal pool resources. The report is useful to a wide audience involved in conservation of vernal pool resources, including scientists, government agencies, and the public. In June 1998 the DFG, with assistance from the U.S. Fish and Wildlife Service, released Dr. Robert Holland's latest revision to his seminal vernal pool habitat mapping first completed in 1996. The latest revision depicts vernal pool complexes over 40 acres in size throughout the Central Valley. This map has greatly assisted vernal pool conservation planners by providing more recent and consistent information on the extent of vernal pool complexes.

With financial assistance from the U.S. Environmental Protection Agency, DFG has contracted for the preparation of detailed maps of vernal pools and vernal pool complexes for use in three focused regional conservation planning efforts in the Central Valley. Such detailed maps are needed by planners making specific land-use decisions. A detailed map of vernal pool habitats has been completed for Sacramento County and is currently being used to support a Sacramento County Habitat Conservation Plan. A map for Tehama County has also been completed, and maps for portions of Fresno, Madera, Merced, Stanislaus, and San Joaquin Counties are presently being prepared. The detailed information provided by these maps will contribute to the development of regional habitat conservation plans.

Federal Recovery Plan for San Joaquin Valley Species:

In 1998, the USFWS released its *Recovery Plan for Upland Species of the San Joaquin Valley, California*. The Plan, which was developed with the participation of DFG biologists, addresses the recovery strategies for 34 species including 11 that are State-listed. Most

of the species occur in arid grasslands and shrub lands of the San Joaquin Valley and adjacent foothills. Conversion of native habitats to intensive agricultural and various kinds of development projects have contributed to the decline of these species. The ultimate goal of the Recovery Plan is to delist the 11 threatened and endangered plants and animals and to ensure the long-term conservation of the other species of concern thus obviating the need to formally list them.

An ecosystem approach to the recovery of the 34 species recognizes the interdependencies of the remnant plant and animal communities and the fact that the landscape is dominated by human activities. The success the Plan will be dependent upon the participation and collaboration of various stakeholders of the Valley ecosystem which include landowners, local governments, and conservation and land management agencies.

For information on other Recovery Plans, see Appendix B.

Conservation Banking Sustains Wildlife:

During the 1997 through 1999 period, the Natural Community Conservation Planning (NCCP) Program had a lead role in establishing and approving seven conservation banks within the southern California area, incorporating approximately 5,102 acres of various habitats. Numerous State and federal threatened and endangered species were conserved through the establishment of these banks. In addition, conservation of many of the bank lands was critical for sustaining regional wildlife corridors and habitat linkages that were needed to create biologically viable multi-habitat preserve systems, one of the primary goals of the NCCP Program. Included as one of the approved banks was the Daley Ranch property within the City of Escondido. This 3,058-acre parcel was purchased by the City of Escondido, with most of the land set aside as a conservation bank. This parcel is the largest publicly owned conservation bank in southern California, and will become the cornerstone for open space conservation within the City. The establishment of the 1,186-acre San Miguel Conservation Bank was also of great significance to the ongoing success of the NCCP Program. This parcel, now a part of the San Diego National Wildlife Refuge, supports the largest population of the federally-threatened California gnatcatcher in southern San Diego County. The assurance of the conservation of this population was critical to the approval of the Multiple Species Conservation Program, the southern San Diego County NCCP planning effort.

Cooperation on Forestry Issues:

The DFG continues to provide consultations for state listed and fully protected species to the California Department of Forestry and Fire Protection (CDF) in relation to timber harvesting plans and provides a liaison to the Board of Forestry and Fire Protection and CDF on anadromous salmonid and wildlife habitat. With an increase in program funding, the DFG has established additional THP review and timber operation monitoring and assessment positions along the north coast. The DFG has conducted several watershed academies for training and outreach on watershed and biological issues (including anadromous salmonids) throughout the State. The training thus far has been geared towards other State and local agencies, and may be expanded to the interested public in the future. In addition, the DFG has participated on committees and groups such as the two special focus groups - the Northern Goshawk Working Group and the Forest Reptile and Amphibian Working Group. The DFG, along with BOF, facilitates the Monitoring Study Group, which examines monitoring needs for timber management.

California Interagency Noxious Weeds Coordinating Committee:

Invasive, exotic plant species have become a primary threat to both natural and agricultural lands across the State. The DFG and the Resources Agency are members of the California Interagency Noxious Weeds Coordinating Committee (CINWCC), a group formed to implement the Interagency Memorandum of Understanding (MOU) regarding weeds on State and federal lands in California. Members signatory to the MOU also include representatives of the U.S. Forest Service (USFS), Bureau of Land Management

(BLM), Bureau of Indian Affairs, California Department of Food and Agriculture (CDFA), California Department of Transportation (CalTrans), among others. Stakeholder groups such as the California Cattlemen's Association and CNPS also attend CINWCC's quarterly meetings. CINWCC's goals are to: (1) reduce the impact of weeds on wildland habitats of State and federal lands; (2) seek funding for weed research; (3) educate the public about the impacts of weeds; and (4) simplify regulatory compliance for weed abatement projects. CINWCC has overseen the development of an internet-accessible database of weed control projects on public lands which is now online.

DFG Distributes Research Needs List:

The DFG distributed information to approximately 140 University of California and California State University (CSU) professors and researchers who may have an interest in studying the State's listed plant species. The package included a list of DFG research priorities, as identified in the DFG's recovery workshops, along with permitting information, and an invitation for the professors and their students to study rare, threatened and endangered plants.

More than 20,000 Acres of Threatened and Endangered Species Habitat Protected:

From 1997 through 1999 the DFG agreed to administer or manage more than 20,000 acres of habitat. Much of this was acquired by the WCB specifically in the interest of various threatened and endangered species. Easements or management agreements were obtained for almost 11,000 of these acres, and more than 9,000 additional acres were acquired in fee simple.

A wide range of habitats, from vernal pools in Lake County to desert uplands for Steven's kangaroo rat in Riverside County were protected. Eleven hundred acres were added to the San Jacinto Wildlife Area to protect sensitive plants including spreading navarretia, San Jacinto saltbush, and thread-leaved broadiaea, and to protect habitats including alkali sink scrub, freshwater marsh and southern willow scrub. More than 240 species of birds have been documented using this site, including 22 species of overwintering raptors. At Sycuan Peak in San Diego County, more than 500 acres were acquired in a DFG-designated significant natural area which is known habitat for 42 sensitive or listed species. The acquisition protects southern mixed chaparral vegetation which contains Gander's butterweed and the largest known population of dehesa nolina, both State-listed plants. It also provides continuous habitat connecting to the DFG's existing Sweetwater Ecological Reserve to the north.

The Nature Conservancy donated almost 3,000 acres of Carrizo Plains habitat, San Luis Obispo County, to the DFG to be managed for numerous sensitive species. These lands were added to the existing DFG Ecological Reserve in San Luis Obispo County, and together with the BLM's ownership, constitute over 80,000 acres of protected public lands at the Carrizo Plains. In the San Joaquin Valley, several hundred acres were acquired to benefit 11 listed species in the Bakersfield Metropolitan Conservation Planning area. Species that will benefit include the San Joaquin kit fox, blunt-nosed leopard lizard, California jewelflower, Bakersfield cactus, San Joaquin Adobe sunset, striped adobe lily, and Bakersfield saltbush. In southwest Merced County, over 400 acres were permanently protected for kit fox and Swainson's hawk at Salt Creek. In Lake County, the DFG is partnering with the Bureau of Land Management to manage almost 10,000 acres in the Cache Creek ACEC to protect tule elk, wintering bald eagles, rare plants, and riparian habitat. Such interagency agreements continue to be important for managing extensive wild lands.

Central Valley Project Conservation Program Protects Habitat for Threatened and Endangered Species:

Two programs managed jointly by the Bureau of Reclamation (BOR) and the U.S. Fish and Wildlife Service (USFWS) with participation by the DFG benefit primarily terrestrial threatened and endangered species within the Central Valley. The first, the Habitat Restoration Program, is funded through the Central Valley Project Improvement

Act (CVPIA) Restoration fund. The program focuses on mitigating past effects from the Central Valley Project by restoring and protecting native habitats and stabilizing and improving populations of native species. Funding for the Habitat Restoration Program has been approximately \$1.5 million per year. The second program, the Central Valley Conservation Program, is funded through base funding allocated to the BOR through Congress. The program focuses on protecting, restoring, and enhancing threatened and endangered species in an ecosystem manner. Funding for the Central Valley Conservation Program has been approximately \$2.5 million per year.

Large areas of vernal pools, grasslands, alkali sink, riparian, chaparral, and other habitats have been protected and restored through these programs, and research has been conducted and used to benefit listed species. State-listed species that have benefitted include riparian brush rabbit, San Joaquin kit fox, Tipton kangaroo rat, blunt-nosed leopard lizard, giant garter snake, large-flowered fiddleneck, palmate-bracted bird's-beak, as well as many other federally-listed species and other species of concern. Partnerships with other agencies, organizations, and landowners have greatly enhanced the success of these programs.

Animal Conservation Efforts

Birds

California condor:

Captive breeding success over the 1997 to 1999 period has continued to be good at the three breeding facilities. Fifteen to 21 pairs produced 54 chicks. The total population of condors increased from 119 at the beginning of 1997 to 158 in late December 1999. During 1997-1999, 56 more condors were released into the wild in northern Arizona, and in Monterey and Santa Barbara counties in California. At the end of 1999 there are 54 condors in the wild. Improvements continue to be made by cooperators in condor breeding and rearing methods, and in special behavioral training of young birds. Despite early training of birds to avoid humans and power poles, released condors occasionally approach people and are affected by these interactions and other human-related problems. The release program has had nine mortalities, two of which were the results of shooting incidents. Three other released condors were rescued and treated for lead poisoning and later released back to the wild.

Bald Eagle Proposed for Federal Delisting:

The bald eagle breeding population continued its long-standing population increase. The statewide survey in 1998 of 180 recently occupied territories yielded 146 occupied territories, an increase from the 124 territories found occupied in 1996. Annually each occupied territory, where reproductive success can be calculated, is averaging about 1.1 young.

On July 6, 1999, the USFWS officially proposed to remove the bald eagle from the list of endangered and threatened wildlife in the lower 48 states because nationwide reclassification goals for recovery of this species have been met and exceeded. DFG will assess the status of this species on the California list.

Peregrine Falcon Delisted from Federal Endangered Species List:

In 1998 the USFWS projected a figure of 167 nesting pairs of peregrine falcons in California. On August 25, 1999, USFWS officially removed the American peregrine falcon from the federal list of threatened and endangered species, based on continuing data indicating that this species was recovered. The State has yet to evaluate whether or not to propose to the Commission a change in the status of this California endangered species.

California Least Terns Increases Stalled:

The long-term increase in the number of nesting pairs in the State continued through 1998 but dropped off in 1999. The number of breeders in 1997 was 4,017 pairs, and that increased to at least 4,141 pairs in 1998. The 1999 population fell to about 3,600 pairs. Productivity in 1997 was good following several years of low breeding success but dropped again in 1998, primarily owing to limited prey availability. Productivity dropped precipitously in 1999 to only 0.2 fledglings per pair. Most of the population increase through 1998 was accounted for by robust growth in nine or 10 of the larger colonies which are intensively managed for predator exclusion or control.

Recovery of the Greater Sandhill Crane:

Under 1997 amendments to CESA (Article 7, Sections 2105-2116), the Legislature directed the DFG to develop and implement a recovery strategy pilot program for the greater sandhill crane, a State-listed threatened species that breeds and winters in California. A DFG led Recovery Strategy Team consisting of representatives from State and federal agencies, local landowners, environmental groups, and persons with scientific expertise, is developing the Recovery Strategy. One of the most critical components to

this strategy's success is outreach to local landowners, organizations, business, and industry. Local meetings with interested persons in the breeding (northeastern California) and wintering (Central Valley and Delta) habitat areas are being held to solicit input. Existing scientific information serves as the basis for the strategy, which will include interim and long-term recovery goals, and a range of alternative management goals and activities. The plan will also include estimates of the time and costs required to meet the goals, and methods of private and public cooperation. The DFG will submit the strategy for approval by the FGC when it is completed in 2001.

New Technique Aids in Understanding of Marbled Murrelet:

One major difficulty which has hampered studies of the State listed marbled murrelet, an elusive forest-nesting seabird, has been the inability to capture individuals for tracking via radio telemetry. Radio tracking is a common research tool which provides detailed information on habitat requirements and movement capabilities. Murrelet researchers have been more successful with capture techniques in British Columbia and Alaska where the birds are more numerous. However, even in those studies, transmitter life has been short, giving only a two-week glimpse into the life of this bird species.

This roadblock to murrelet research was overcome in 1997 when the DFG initiated nighttime capture efforts in Año Nuevo Bay in central California. This research was undertaken in cooperation with State, federal, and private entities and resulted in the capture of 41 murrelets from May to August. Twenty-eight birds were radio marked and tracked day and night, both inland and at sea. The capture technique involves spotlighting the birds from a small inflatable boat under cover of darkness and scooping them off the water with hand-held nets. A specialized attachment technique also was utilized which resulted in a longer tracking period of six weeks. For the marbled murrelet, the nest sites which were found and the movements which were documented provide important new insights into murrelet biology which will assist managers with recovery planning efforts.

Elf Owl Not Found in State:

No elf owls were located in DFG-conducted surveys for this desert owl during 1998 and 1999. In 1998 nocturnal surveys were conducted from mid-April through mid-June at 51 previously known site or potential locations throughout the species' range in California. All sites were in riparian forest or treed, desert wash habitats. In 1978/1979, 12 elf owls were found at two sites, and in 1987, 18 to 25 owls were located at 10 sites. In 1999, two follow-up surveys were made at major sites where elf owls had been previously detected along the lower Colorado River. One site which had previously supported as much as 83 percent of the known population was surveyed four times in 1998 and twice in 1999 without any detections.

The reason for the lack of responding elf owls is unknown. Overall habitat conditions appeared to be similar to those in previous years although the increasing domination of the invasive nonnative salt cedar in these riparian areas has not been monitored. The colder and moister conditions of El Niño might have interfered with elf owl migration north to the breeding areas in California. The number of calling Western screech owls seemed lower than in previous years, indicating that the same environmental conditions may be negatively impacting both species. However, at least some elf owls were present in Arizona, about seven miles up the Bill Williams River from the Colorado River just above Parker Dam.

Satellite Tracking of Swainson's Hawk:

During 1997-99 the DFG's staff assisted in the planning, authorizing and funding of a satellite telemetry study to determine the migration route and wintering area of Swainson's hawks that nest in the Central Valley. Most of the field work was done by volunteer raptor biologists who are members of the ad hoc Swainson's Hawk Technical Advisory Committee. Funding, in part, was from mitigation by DWR for development they proposed in the Delta. Birds from the counties of Yolo, Solano, and San Joaquin were fitted with back pack transmitters that send signals to satellites to track the move-

ments of the hawks during their several thousand mile migration southward in the fall. A significant finding of this ongoing five-year study indicates that the hawks remained in a few locales in the center and west coast of Mexico, rather than going on to South America where most of the rest of the North American population of Swainson's hawks winters. In this more northerly wintering area California birds may have less exposure to the deadly pesticides that have been poisoning thousands of birds of this species and other raptors in Argentina. This finding also points to the need to protect the breeding population and habitats in California where, apparently, the species faces the greatest threat to its continued existence, loss of habitat.

Fish

Artesian Well Constructed for Desert Pupfish Recovery:

An artesian well was constructed for refuge ponds at Oasis Springs Ecological Reserve to benefit the endangered desert pupfish (*Cyprinodon macularius*). Water flows from the old well had decreased so dramatically that during the summers of 1997 through 1999, pupfish were being stranded in shallow water areas. In August 1999, the flow situation was so dire that DFG hired a contractor to truck water from a nearby well to the ponds. Then, using Section 6 funding, DFG contracted the drilling of a new artesian well. The increased water flows from the new well have expanded the areas inhabited by desert pupfish and the population in the ponds is thriving. The DFG is considering expanding the refuge areas as funding and staff become available.

Coho Salmon Conservation:

During 1999, the DFG was active in efforts to conserve the coho salmon. The DFG has completed a draft strategic conservation/recovery plan for State listed coho populations south of San Francisco Bay. The DFG is working cooperating with the Monterey Bay Salmon and Trout Project to augment southern coho populations through a carefully designed spawning and rearing program. Also, the DFG has placed a high priority on identifying and implementing watershed restoration projects in southern coho watershed through its restoration grant programs (see below). Additionally, the DFG and the National Marine Fisheries Service (NMFS) entered into a Memorandum of Agreement for the protection of north coast steelhead trout. This agreement is designed to benefit other salmonid species including coho.

A New Rearing Facility for Sacramento River Winter-run Chinook Salmon:

In January 1998, the USFWS completed construction of a winter-run chinook salmon rearing facility, named Livingston Stone National Fish Hatchery, at the base of Shasta Dam. The facility was deemed necessary due to concerns about potential hybridization with spring-run chinook salmon and imprinting problems with juvenile winter-run chinook salmon propagated from USFWS's Coleman National Fish Hatchery on Battle Creek. There have been considerable advances in genetic analysis to assure genetic integrity of artificially propagated winter run and the imprinting problem has been solved by rearing the fish in Sacramento River water, ensuring that they return to the Sacramento River. Winter-run chinook salmon were collected for broodstock in 1998 and 1999, and their progeny were successfully reared at Livingston Stone National Fish Hatchery and released into the Sacramento River.

Battle Creek Restoration Project:

The Battle Creek Restoration Project (Project) is an example of a cooperative approach to solving environmental problems through CALFED's ecosystem restoration process. The final project was developed over the last two years in a public forum called the Battle Creek Working Group. This group includes representatives from fishery, environmental, local, agricultural, power, and urban stakeholders who recognized the tremendous potential to restore the watershed. The Project design provides future certainty for

both the environment and industry in a key watershed. The focus of the Project is to provide habitat essential to the recovery of species whose future existence is uncertain. There are unique physical attributes in this stream that make it suitable for supporting large self-sustaining populations of spring-run chinook, winter-run chinook and steelhead that still occur at remnant status in the creek.

Battle Creek is a cold, spring-fed stream with exceptionally high flows during the dry season making it the most drought resistant tributary of the Sacramento River below Shasta Dam and the salmon bearing tributary most similar to those blocked by Shasta Dam. The stream reaches being restored are located in the foothill reaches of Battle Creek where PG&E operates a series of nine hydroelectric dams and canals affecting 42 miles of habitat suitable for all five species of anadromous salmonids. Key elements of the Project are: a tremendous increase in the streamflow of the creek; decommissioning five dams to remove impairments to fish migration and streamflow; and screening of diversions and construction of fish ladders on three dams. The project is scheduled for completion of environmental documentation in 2000 and construction beginning in 2001. Funding will be provided by CALFED (\$27 million), PG&E (\$20 million), and the David and Lucille Packard Foundation (\$3 million).

Reptiles

Black Toad Genetics Investigated:

Genetic studies on both the Deep Springs and Death Valley National Park populations of the threatened black toad are being conducted by a student at the University of Nevada, Reno in cooperation with DFG. DFG initiated a population monitoring program in 1999, in cooperation with Deep Springs College, the owner of all remaining black toad habitat in the Deep Springs area (Inyo County). In late 1999, DFG and the college were working on a draft MOU to continue the college's cooperative management of the toad habitat, including annual monitoring of toad distribution by staff and students, fencing several areas to exclude livestock, and changing irrigation practices to minimize impacts on breeding toads, developing eggs, and larvae.

Ensuring Habitat for Coachella Valley Fringe-Toed Lizard:

Research during the 1990s found that sand movement due to winds may affect the long-term survival of the Coachella Valley fringe-toed lizard at two of its reserves; the dunes may be slowly moving out of the conservation areas. Conservation of these crucial blow-sand sources is being addressed in the development of a new Coachella Valley Multispecies HCP.

Giant Garter Snake Conservation Progressing:

Using Federal endangered species recovery funds (Section 6), DFG staff continued to evaluate the distribution and biological needs of the giant garter snake at the DFG's Mendota and Los Baños wildlife areas. Several DFG biologists were members of the giant garter snake recovery team, which produced a draft recovery plan for the snake in 1999.

The American Basin of Butte, Sacramento, Sutter, and Yuba counties provides some of the most important habitat remaining in California for the giant garter snake. In 1997, a federal HCP and CESA 2081 permit were developed for this area. Under the HCP/2081 permit, 8,750 of compensation acres would be preserved in perpetuity either as continued agriculture that benefits the snake (rice farming, for example), or as conversion to seasonal and slough wetlands. The plan allows for development of up to 17,500 acres of habitat. Similar HCPs will preserve giant garter snake habitat in San Joaquin and Yolo counties.

Plant Conservation Efforts

Ventura Marsh Milk-Vetch Rediscovered:

In June 1997, biologists from the DFG and USFWS discovered a population of Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*) near McGrath State Beach in Ventura County in a degraded coastal dune system in an area proposed for a residential development project. This species was last seen in the wild in 1967 and was thought to be extinct. The species has always been very uncommon - only a few collections verifying wild populations were ever made. Botanists have searched for this species repeatedly over the last century, but its coastal habitat south of Ventura County has been practically eliminated. Its rediscovery represents a remarkable opportunity to prevent extinction. Between 192 and 374 individuals have been observed at the known population. In 1997, the DFG received a petition to list this species as a threatened species, and in 1998 it was made a candidate. The FGC will make a decision as to whether it should be State-listed as endangered in April 2000. In the meantime, DFG is working with the project proponent to minimize impacts to the species and implement recovery actions.

San Fernando Valley Spineflower Rediscovered:

In May of 1999, consulting biologists discovered a population of the San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) along the southern rim of Laskey Mesa at the Ahmanson Ranch development site in eastern Ventura County. This small annual plant was last seen in the wild in 1940 and had since been thought to be extinct. It occurs in sparsely vegetated areas within coastal scrub and grassland on gently sloping benches of colluvium. The population grows in an area proposed for residential and commercial development. The DFG is working with the landowner to conserve the species on the site. In December 1999 the Fish and Game Commission received a petition to list San Fernando Valley spineflower as an endangered species. A petition for listing was also submitted to the USFWS.

Note: San Fernando Valley spineflower was designated a Candidate for endangered status by the Fish and Game Commission in June 2000, beyond the date of information included in this report. An additional population of the spineflower was discovered in 2000 in Los Angeles County. The species' status will be more thoroughly discussed in a subsequent report.

El Dorado Rare Plant Preserves:

The first phase of purchasing a 315-acre site in western El Dorado County, containing four State and federally listed plant species was completed in November of 1997, through a combination of federal, State, and local funding. This preserve is being established to protect Stebbins' morning glory (*Calystegia stebbinsii*), Pine Hill ceanothus (*Ceanothus roderickii*), Layne's butterweed (*Senecio layneae*), and El Dorado bedstraw (*Galium californicum* ssp. *sierrae*). This preserve, when complete, will also include a large number of species which are considered endemic to or characteristic of gabbroic and serpentine soils, including El Dorado mule ears (*Wyethia reticulata*), which is only found in the gabbro soil in western El Dorado County. The 315-acre preserve is one unit of a planned five-unit preserve system that is expected to total 3,400 acres. The other four units will be expanding around existing public lands, if private landowners are willing to sell or dedicate title or conservation easements and if the program continues to receive support from local public agencies.

Santa Cruz Tarplant Conservation:

The DFG prepared a conservation plan for Santa Cruz tarplant (*Holocarpha macradenia*), a State listed endangered plant. The plan identifies needed actions for protection of the remaining populations of the species and was formulated using input

from participants of several recovery workshops for the species. This plant was once found in Monterey, Santa Cruz, Alameda, Contra Costa, and Marin counties. Natural populations remain today only in Santa Cruz and Monterey counties. In 1998, Wildlife Conservation Board (WCB) acquired a conservation easement over the one natural population of Santa Cruz tarplant in Monterey County. This site has the advantage of being able to be grazed in an economically viable way, and the long-term prospects for the population are excellent.

In 1997, the DFG and the City of Santa Cruz entered into a MOU to continue the City's successful active management of the Arana Gulch population of Santa Cruz tarplant. This population once numbered over 100,000 plants. Cessation of grazing in the 1980s allowed non-native annual grasses to out compete the tarplant, and by 1994 no tarplants were observed. Although botanists believed that a substantial number of viable seeds were still present in the soil, the seeds would not last indefinitely. In 1996 the DFG and City experimented with mowing, raking, and hoeing techniques to remove the considerable amount of built-up thatch; more than 7,000 plants emerged. In 1997, 1998, and 1999 the City mowed a portion of the plant's habitat in the spring and conducted two fall controlled burns. These management actions resulted in increases in the number of tarplant onsite; however, the El Nino winter of 1998-99 appears to have depressed germination of tarplant, as numbers of tarplant in 1999 were very low.

DFG Recovery Workshops for Rare Plants:

In 1997, DFG held two recovery workshops involving agency and professional botanists to identify conservation and recovery actions for 12 plants known from serpentine-derived soils in the San Francisco Bay Area: Coyote ceanothus (*Ceanothus ferrisae*), fountain thistle (*Cirsium fontinale* ssp. *fontinale*), Marin dwarf flax (*Hesperolinon congestum*), Metcalf Canyon jewelflower (*Streptanthus albidus* ssp. *albidus*), Pennell's bird's-beak (*Cordylanthus tenuis* ssp. *capillaris*), Presidio clarkia (*Clarkia franciscana*), Mateo wooly sunflower (*Eriophyllum latilobum*), Santa Clara Valley dudleya (*Dudleya setchellii*), Tiburon Indian paintbrush (*Castilleja affinis* ssp. *neglecta*), Tiburon jewelflower (*Streptanthus niger*), Tiburon mariposa lily (*Calochortus tiburonensis*), and white-rayed pentachaeta (*Pentachaeta bellidiflora*). The workshops helped ensure that planning decisions affecting the species are made with an understanding of the species' long-term conservation needs. The workshops also helped both the DFG and USFWS set priorities for conservation of the species, and helped USFWS prepare their "Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area," published in 1998.

More Orcutt's Spineflower Found:

USFWS and San Diego State University staff discovered a previously unknown population of 170 plants of the State and federally-listed endangered, diminutive annual, Orcutt's spineflower (*Chorizanthe orcuttiana*) at a protected site in La Jolla. Additionally, 40 plants were observed in 1999 at Oakcrest Park in Encinitas, San Diego County, previously thought to be the last location of this endangered plant (this was more than twice as many individuals as have been observed recent years). Federal Section 6 funds are supporting work by San Diego State University to determine the current and historic extent of Orcutt's spineflower in western San Diego County, and to investigate certain aspects of the reproductive biology of the species, viability of seeds and seed germination requirements, and relationships of the populations to soils types and soil characteristics. This information will to formulate recommendations for ongoing conservation and management efforts for Orcutt's spineflower.

Education

***California's Wild Gardens: A Living Legacy* is Published:**

In 1997, the DFG, in collaboration with the CNPS and the California Academy of Sciences, produced *California's Wild Gardens, A Living Legacy*. This 236 page large format book, with more than 500 color photographs, showcases the diversity of California's native plants in their natural settings, and highlights some of the best and most floristically important sites in the State. More than 100 of California's knowledgeable botanists and ecologists contributed to this book. *California's Wild Gardens* views California as a series of ecological regions, each housing a specialized flora. Within these regions smaller localized areas, or "hot spots" are featured. This book is available through CNPS and at bookstores.