



U.S. Fish & Wildlife Service

Carlsbad Fish & Wildlife Office

Highlights

A snapshot of our work with partners to conserve fish, wildlife and plants for the continuing benefit of the American people.

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Clockwise from top: A chocolate lily in bloom in San Diego County; Downingia bella in bloom on Santa Rosa Plateau Ecological Reserve in Riverside County; and orange and yellow California poppy blooms transform the land at Gavilan Hills in Riverside County.

All images courtesy of USFWS unless otherwise noted.
Front and back cover: A meadow on San Bernardino National Forest

Who we are

The Carlsbad Fish and Wildlife Office is part of the U.S. Fish and Wildlife Service's Ecological Services program. The ES program helps lead conservation across the nation and administers the Endangered Species Act.

The Carlsbad Office has two office locations: one is Carlsbad and the other in Palm Springs. With our partners, our goal is to establish a system of conserved, managed and enhanced habitats to support native wildlife, including 107 federally listed species, across more than 50,000 square miles of Southern California.



What we do

Southern California is a land of contrasts. From the sandy coast along the Pacific Ocean, to the Transverse and Peninsular mountain ranges, to the Mojave Desert, these diverse geologic and climatic shifts support a multitude of plants, animals and fish, some of which are found nowhere else in the world.

The Carlsbad and Palm Springs offices work with a diverse array of partners and use a variety of conservation tools to conserve these habitats and species for future generations.



Clockwise from top left: Anza Borrego Desert State Park with wildflowers in bloom; Vernal pool on Santa Rosa Plateau Ecological Reserve; California sister butterfly at James Reserve; View of Tijuana River Valley; Santa Ana River on San Bernardino National Forest; and San Clemente Island lotus on San Clemente Island.

Dunes rise again in Cardiff Beach

Tidal impacts have affected Cardiff Beach in the City of Encinitas for decades and they are expected to increase with sea level rise. To protect infrastructure like Highway 101 and local businesses, the City, California State Coastal Conservancy, California Department of Parks and Recreation, Nature Collective and the U.S. Fish and Wildlife Service formed a partnership to recreate sand dunes along Cardiff State Beach. This Living Shoreline project is one of many throughout the world that is experimenting with restored dune systems to absorb heavy wave action.



Newly created sand dunes at Cardiff State Beach are designed to protect local infrastructure from sea level rise.



Sand verbena plantings across the dunes as part of the Living Shoreline project.

A new node of owls in San Diego County

Burrowing owls have been declining in San Diego County. To reverse this trend, the Carlsbad Office established a working group that includes the San Diego Zoo Global's Institute for Conservation Research, California Department of Fish and Wildlife, and the California Department of Transportation to facilitate coordination and implementation of recovery actions to benefit owls across the County.

Funding for these conservation efforts comes from multiple sources, including mitigation. In 2019, the group continued efforts started last year, to establish a population of owls at the Rancho Jamul Ecological Reserve.

Nine owls (4 pairs and a single female) were translocated from the US/Mexico border wall area to the Reserve, along with two owls produced at the San Diego Zoo Safari Park

There are now approximately 30 owls at the site, including both adults and fledglings, which is a very encouraging sign.



Top image: A pair of burrowing owls that are part of San Diego Zoo Global's breeding effort for the species. Photo credit: San Diego Zoo Global

Bottom image: Adult burrowing owl on the alert.

Conservation in action

Keeping communities safe while protecting species

Consultations with federal agencies and development of Habitat Conservation Plans (HCP) with non-federal landowners are two of the ways we work with others to meet our conservation mission, and help businesses and local communities move forward with important projects.

In 2019, the Carlsbad and Palm Springs offices completed several HCPs that covered a variety of projects, from solar farms to sand and gravel mining.



The Chandler Mine HCP addressed conservation of the federally endangered least Bell's vireo (pictured above), associated with the filling in of an abandoned open pit mine in the City of Orange. This project will improve safety for surrounding homes.



An HCP completed with Pacific Gas & Electric provides for conservation of the threatened desert tortoise, while enabling PG&E to move forward with ongoing remediation work.



The Whittier Narrows Dam was completed in 1957. Photo credit: Luciano Vera/Army Corps of Engineers

For tens of thousands of Los Angelenos, the Whittier Narrows Dam provides important protection from flooding. Nearing 60 years of age, the dam was found to no longer meet risk tolerance guidelines and significant changes and improvements are needed to maintain its effectiveness for large-scale flood events.

The Army Corps of Engineers consulted with the Carlsbad Office on a very short timeline to address impacts of the structural work on the endangered least Bell's vireo and threatened coastal California gnatcatcher.

The project will provide for restoration of more than 100 acres of high-quality coastal sage scrub and riparian habitat that is anticipated to support gnatcatchers and vireos, while ensuring people and businesses will continue to be protected from catastrophic flooding.

The Carlsbad office's Federal Projects Division and Los Angeles/Orange County Division worked to complete this consultation.

Transit planning done right

An ambitious transportation planning effort is underway in San Diego County. It includes building additional lanes along I-5, double-tracking train rails and providing pedestrian and bicycle lanes.

Capitalizing on an innovative, collaborative approach, multiple partners in this effort have developed a Resource Enhancement and Mitigation Program (REMP) that includes habitat conservation and restoration that is phased in ahead of project impacts. There is also a Scientific Advisory Committee that can address issues that arise during implementation of the REMP.

This large-scale transportation project includes bridge construction over five lagoons. Extensive modeling was done on bridge design over the San Elijo Lagoon to ensure it will enhance and promote ecological function and will not constrain future restoration opportunities aimed at maximizing tidal and fluvial processes within the lagoon.



California least terns are among the species that the REMP addresses in the North County Corridor project.

In 2015, Fixing America's Surface Transportation (FAST) Act was signed into law. Its purpose is to improve the efficiency and transparency of the environmental review process for certain infrastructure projects covered by the FAST Act.

The Palm Springs Office completed review and consultation for two projects on the FAST Act list: Desert Quartzite, a utility-scale solar project; and TenWest Transmission, a 114-mile electrical transmission line.



From left to right: Mojave fringe-toed lizard (credit: BLM); Cheesebush (Credit: Hannah Schwalbe/NPS); An Ironwood tree in microphyll woodland.

Conservation in action

Ensuring healthy habitats

The Carlsbad offices Contaminants Division provided technical assistance to the San Diego Bay National Wildlife Refuge Complex on DDT risk associated with upland habitat on the Otay Floodplain. DDT persistence was analyzed and the potential risk it poses to terrestrial wildlife along the Otay River floodplain.

Although there is some risk, the species using upland and riparian habitat are not exposed to the same concentrations of DDT that would have occurred if the area was restored to tidal marsh.

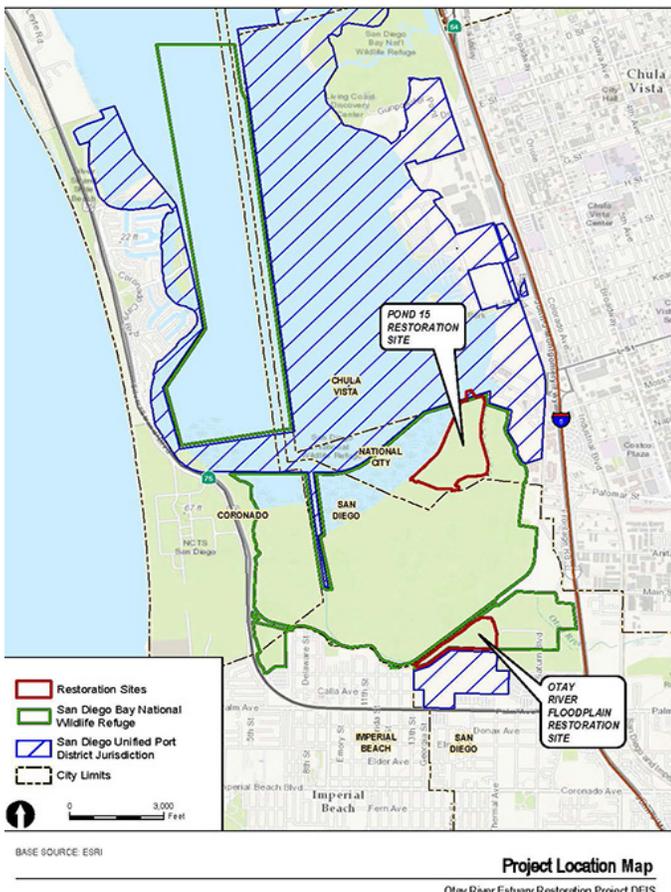
The office also provided technical assistance to the Refuge regarding restoration of south San Diego Bay Pond 20. The Unified Port of San Diego plans to restore Pond 20 to 95 acres of marsh habitat. Actions at Pond 20 may affect resources on adjacent Refuge land. Guidance was provided to the Refuge in terms of minimization measures that will reduce any contaminant-related effects.

Saving the dirt

In 2019, the Carlsbad Office spent more than \$8.9 million in funds awarded through the Endangered Species Act's section 6 grants to states program to conserve about 740 acres of diverse habitats in Southern California.

At the west end of the City of Palm Springs four parcels were acquired within Snow Creek/Windy Point and the Santa Rosa and San Jacinto Mountains Conservation Areas of the Coachella Valley MSHCP. Totaling about 479 acres, the property contains core essential habitat for the Peninsular bighorn sheep, Coachella Valley milkvetch, Coachella Valley fringe-toed lizard, Coachella Valley, Palm Springs pocket mouse and other species.

Approximately \$2.7 million in funds through section 6 and matching funds from the Coachella Valley Mountains Conservancy made the purchase possible.



Map of restoration site on the South San Diego Bay unit of San Diego National Wildlife Refuge Complex.



Top and Bottom: Views from two of the four parcels purchased with section 6 funding. Credits: Coachella Valley Mountains Conservancy.



Hands on their land

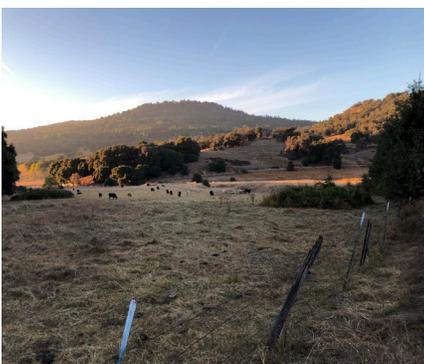
The Oakstone Ranch in northeastern San Diego County sits high above Lake Henshaw, in Mesa Grande. The ranch is a model of hands-on conservation and a laboratory for species recovery efforts. Beginning in 2007, owners Chuck and Judy Wheatley signed their first conservation easement with The Nature Conservancy to manage their ranch for cattle, along with a philosophy of strong land stewardship principles. This beautiful 410 acre parcel nestled among rolling oak woodland savannah benefits from the owners' thoughtful management practices and a beneficial partnership with the Carlsbad Office and other conservation groups.

The Wheatleys have worked with the Carlsbad Office's Partners for Fish and Wildlife Program since 2011. Starting small, efforts on the Ranch have been expanded, making it a stronghold of conservation firsts in Southern California.

Initially, the Wheatleys worked with the Partners Program to eradicate Medusahead from the property. This non-native plant is detrimental to grazing, and eradicating it from Oakstone Ranch was imperative to prevent its spread to other areas of the County. With the help of the Wheatleys actively surveying for new sprouts and aid from the Partners program, Medusahead was controlled. Next, the Wheatleys and the Partners Program started work to convert a 10-acre meadow to bunch grass, blue-eyed grass, and other native forbs. Restoring grasslands is difficult and this project failed to meet its goals. However, learning from the experience, this multi-year project is off to a new start based on fencing small areas in the meadow to establish native plants, propagated from seed collected nearby, in the enclosures. In subsequent years, seed should spread from these established islands to the rest of the meadow.

In 2014, the Wheatleys asked what more can be done. They dredged their pond of silt and lined it with bentonite clay to retain water during drought periods. Their pond, sitting atop a major watershed in San Diego County, is perfect habitat for sensitive herptofanua. In 2019, the pond was free of invasive predatory species. This allowed the Service to translocate 12 western pond turtles to the pond creating a breeding node for conservation. In the future, the pond might be suitable to reintroduce a population of threatened California red-legged frogs in an effort to re-establish breeding populations in Southern California.

Chuck and Judy Wheatley have a conservation vision and work with a variety of conservation partners: The Nature Conservancy, US Geological Survey, San Diego State University, UC San Diego, San Diego Natural History Museum, Fauna del Noroeste and the Service.



Top left: The pond on Wheatley Ranch
Bottom left: Cattle grazing at sunset
Center: The Wheatleys, supporters of numerous species conservation efforts, pose with a California condor puppet
Top right: A bee fly on blue-eyed grass
Bottom right: Western pond turtle outfitted with a transmitter

Species recovery

This past year, the Carlsbad Office had a significant recovery workload that included updating numerous recovery plans with quantifiable recovery standards. In addition, the office supported numerous projects across Southern California to improve the status of threatened and endangered species.

Quino checkerspot butterfly recovery efforts showing results

For the past four years, the Carlsbad Fish and Wildlife Office has worked with San Diego Zoo Global's Institute for Conservation Research to rear and release Quino checkerspot butterflies on San Diego National Wildlife Refuge and other preserve areas, to boost species abundance.

Funding for this effort is provided by the Disney Conservation Fund and the Service.

Other partners include: the California Department of Transportation; Conservation Biology Institute; Creekside Center for Earth Observation; and RECON Environmental.

In 2019, more than 2,772 caterpillars were reared from twelve wild females collected in March. They were released at two locations on the Refuge in August.

Since the inception of the captive rearing program in 2016, more than 10,000 caterpillars have been released, to help advance recovery of this endangered native butterfly.



Adult Quino checkerspot butterfly.



A tiny Quino checkerspot caterpillar is placed inside a protective container that will be attached to a host plant.

Rare dune plant gets roadmap to recovery

Peirson's milk-vetch, a member of the legume family, was listed as threatened in 1998. The plant has delicate pale purple flowers and produces large fruits containing seeds. Peirson's milk-vetch occurs in the Algodones Dunes, managed by the Bureau of Land Management as the Imperial Sand Dunes Recreation Area. This year, the Carlsbad Office completed a Recovery Plan for the plant. The goal of the plan is to ensure adequate habitat remains available for the plant. The BLM balances recreation in the Dunes with areas set aside to conserve the plant.



Peirson's milk-vetch plants have a long tap root that provides an anchor in shifting sands and enables the plant to reach water



A mature Peirson's milk-vetch showing the large fruits that contain seeds. Older plants produce more fruits

Technology provides new tools to save desert tortoises

Desert tortoises face a growing threat from increased populations of ravens in their habitat. Ravens are highly adaptable and have moved into areas of human habitation in the desert. More ravens means juvenile tortoises will be more likely to be eaten.

To humanely reduce raven predation, the Service is looking to innovative technological solutions such as aerial egg oiling, and the use of 3D printed tortoises to create an opportunity to use adverse conditioning on ravens.

3D printed replicas of juvenile tortoises are also being tested as part of an effort to deter raven predation. These 'techno-torts' are filled with harmless, but bitter tasting liquid. If a raven punctures the shell, it gets an unpleasant consequence. It is hoped that ravens may learn to avoid tortoises and pass that aversion to their young.



Above left and center: A drone delivers a load of oil to eggs in a nest atop an electrical tower. Oiling the eggs does not damage them structurally, and the ravens continue incubating which precludes them from re-nesting. Credit: K.Holcomb/USFWS



Carcass of a juvenile desert tortoise eaten by a raven. Credit: B.Sutton/Joshua Tree National



Replica tortoises that discharge a bad tasting liquid are being used by researchers as part of an aversion training experiment. Credit: Hardshell Labs

These efforts involve many partners that manage land across the tortoise's habitat in California, including: U.S. Department of Defense - Air Force Flight Test Center, Edwards Air Force Base; Army National Training Center, Ft. Irwin; Marine Air Ground Task Force Training Command, Twentynine Palms; Marine Corps Logistics Base, Barstow; Naval Air Weapons Station, China Lake; Bureau of Land Management; and National Park Service; and Transition Habitat Conservancy.

Species recovery

Vernal pool restoration on Otay Mesa

We worked with the San Diego County Association of Governments to complete five years of vernal pool restoration and maritime succulent scrub enhancement.

The restoration site is 5.5 acres and is located on Otay Mesa, San Diego County. This restoration effort offsets impacts to vernal pools associated with the San Ysidro Rail Yard Expansion Project.

San Diego fairy shrimp have been detected in 14 of the 18 pools on the restoration site, with an additional 3 pools supporting unidentified fairy shrimp. The site also supports Otay Mesa mint, San Diego button celery, coastal California gnatcatcher, and spreading navarretia and its critical habitat. The site will be turned over to the City of San Diego for long-term management under its Vernal Pool Habitat Conservation Plan, once the restoration is deemed complete.



Restored vernal pool on Otay Mesa



Close up of vernal pool with native plants around the margins

Working hand in fin



This spring in Zzyzx, California, now supports a population of federally endangered Mohave tui chub

The Mohave tui chub got a little help from human friends this past year. Biologists from the Palm Springs Office worked with the U.S. Navy, the National Park Service, and the California Department of Fish and Wildlife to help this endangered fish expand its distribution. Fish from existing populations at China Lake and at Zzyzx in the Mojave National Preserve were trapped and translocated to an additional pond refugium at Zzyzx that was restored by the National Park Service.



Approximately 250 Mohave tui chub were transferred as part of recovery efforts.

Building partnerships

Cooperative conservation

In August 2019, the Palm Springs Office completed a programmatic consultation with the National Park Service to address a variety of activities across the 1.6 million-acre Mojave National Preserve.

The biological opinion issued by the Service will streamline the Park's ability to undertake numerous actions including habitat restoration, control of invasive species, scientific studies, and construction and maintenance of structures and facilities while ensuring conservation of the threatened desert tortoise.



*Wallace's woolly daisy is one of many native plants that can be found in the Mojave National Preserve.
Photo credit: National Park Service*



One of the stunning landscapes the public can find within the Mojave National Preserve. Photo Credit: National Park Service

In March 2019, the Palm Springs Fish and Wildlife Office completed formal consultation with the U.S. Navy for military training and other activities in the 26,509-acre Cuddeback expansion area at the Naval Air Weapons Station at China Lake. The biological opinion issued by the Service will enable the Navy to achieve its operational mission while implementing protective management actions for the conservation of desert tortoises and their critical habitat. These include but are not limited to: the management and control of invasive plant species, wild horses and burros; restriction of public access to the Cuddeback area; and the joint implementation of desert tortoise recovery actions with the Bureau of Land Management and the Desert Tortoise Preserve Committee in the Cuddeback area and in adjacent lands.



Wild burros are found on a variety of federally managed lands including the Naval Air Weapons Station, China Lake. Credit: Department of Defense

Building partnerships

Celebrating tortoises

Thanks to the hard work of many partners, the First annual Desert Tortoise Week was celebrated April 13-22, 2019.

The purpose of Desert Tortoise week is to raise public awareness and interest in conservation of the federally threatened Mojave desert tortoise.

Staff from our Palm Springs Office were behind this week long celebration in the Coachella Valley.

Participants in Desert Tortoise Week included: the Bureau of Land Management, The Living Desert Zoo and Botanical Garden, Joshua Tree National Park, Mojave Desert Land Trust, California Department of Fish and Wildlife, Friends of the Desert Mountains, Coachella Valley Conservation Commission, California State Parks, San Bernardino National Forest, and San Bernardino County.

More than 2,000 people enjoyed tortoise-themed events like interpretive hikes, lectures, film showings, a native plant sale, a desert tortoise exhibit and a habitat restoration day.

The hope is to expand the celebration beyond the Coachella Valley in 2020, encompassing communities in additional areas of the tortoise's range, including in the Mojave desert and perhaps even into southern Nevada.



The Bureau of Land Management hosted a clean up of desert tortoise habitat. Above: the area was littered with dozens of expired butane fuel canisters. Below: the site is much more safe and welcoming to tortoises



The Maturango Museum in Ridgecrest, California, was one of the participants in Desert Tortoise Week. The Museum provides a habitat area for several adopted desert tortoises



Family friendly hikes were among the offerings during the First Desert Tortoise Week

Building Partnerships

Cultural connections with monarch butterflies

The Fish and Wildlife Service office in Flagstaff, Arizona, initiated the Saline Valley Monarch Count, a citizen-science effort to survey monarch butterflies overwintering in the slick-rock canyons that drain into the Saline Valley.

In 2019, the Carlsbad Office's Public Affairs Division participated in the annual count. Being part of the butterfly survey provided an opportunity to meet Spike Jackson, tribal member and Environmental Director for the Timbisha Shoshone Tribe who brought his family to volunteer for the survey.

Through this connection, we learned about the Jackson family's historical connection to the land and this iconic butterfly. You can read the whole story online at: https://www.fws.gov/cno/newsroom/highlights/2019/butterfly_basket_lessons/



A lone Monarch butterfly sits atop a bush in the Saline Valley



Spike Jackson, right, with other volunteers and Service personnel at the survey site.

Fairgoers get up close with pollinators



The Carlsbad Office participates annually in the San Diego County Fair staffing a pollinator exhibit with numerous partners including: The Butterfly Farms, Resource Conservation District of Greater San Diego County, USDA -Natural Resources Conservation Service, California Native Plant Society - San Diego Chapter, Sky Mountain Permaculture Institute, and State of California's 22nd District Agricultural Association.

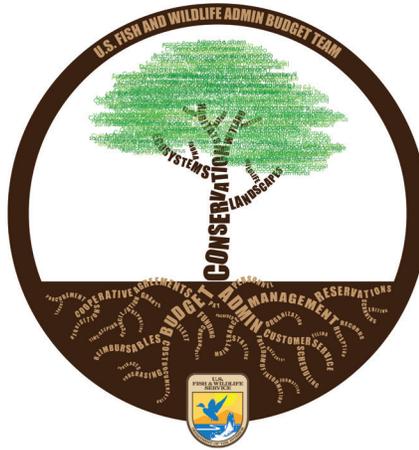


More than 1.5 million people attended the Fair in 2019

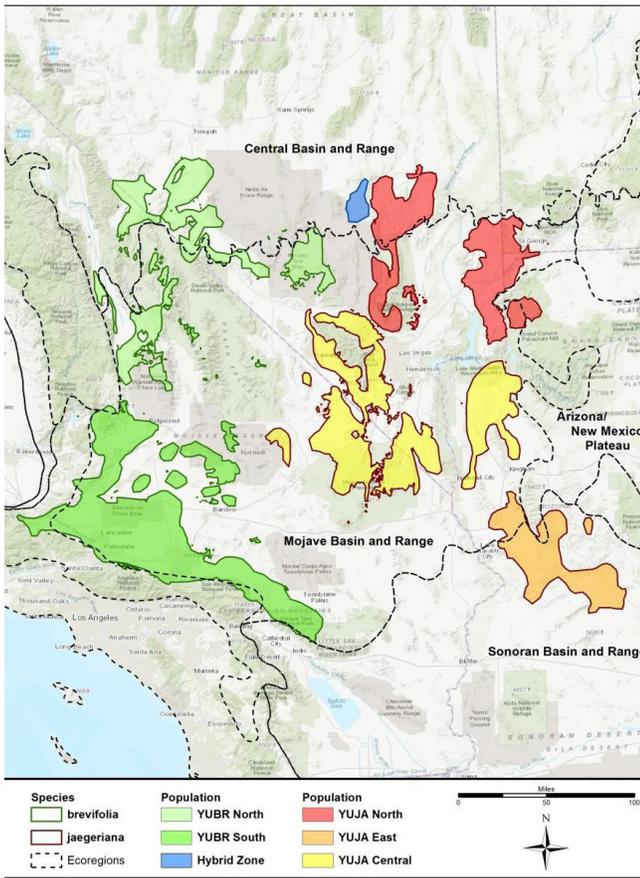
Our people in the field and behind the scenes make conservation possible.

The strength of any organization is its workforce and the Carlsbad Office is fortunate to have a cadre of dedicated and skilled staff that keep things humming along. From processing cooperative agreements to fulfilling Freedom of Information Act requests, our GIS, IT, Public Affairs and budget and administrative staff are integral to achieving our conservation mission.

In FY19, we completed 18 Freedom of Information Act requests, sent more than 162 boxes of project documents to the National Archives and Records Administration for proper storage



The Carlsbad Office processed 14 new Cooperative Agreements that will provide more than \$500,000 to accomplish on-the-ground conservation. Species that will benefit from these grants include Salt Marsh bird's beak and the California red-legged frog.



In 2019, the Palm Springs office completed a 12 month finding on a petition to list Joshua tree under the Endangered Species Act. The Service identified two species of Yucca - brevifolia and Jaegeriana and analyzed both to determine their conservation status. Based on a thorough review of available science, neither species requires protection under the ESA at this time.

The work of our Geographic Information Systems Division was crucial in providing mapping data on distribution of these species across their ranges.



Above: Staff of the Carlsbad Fish and Wildlife Office
Below: Staff of the Palm Springs Fish and Wildlife Office





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Learn more at www.fws.gov/carlsbad