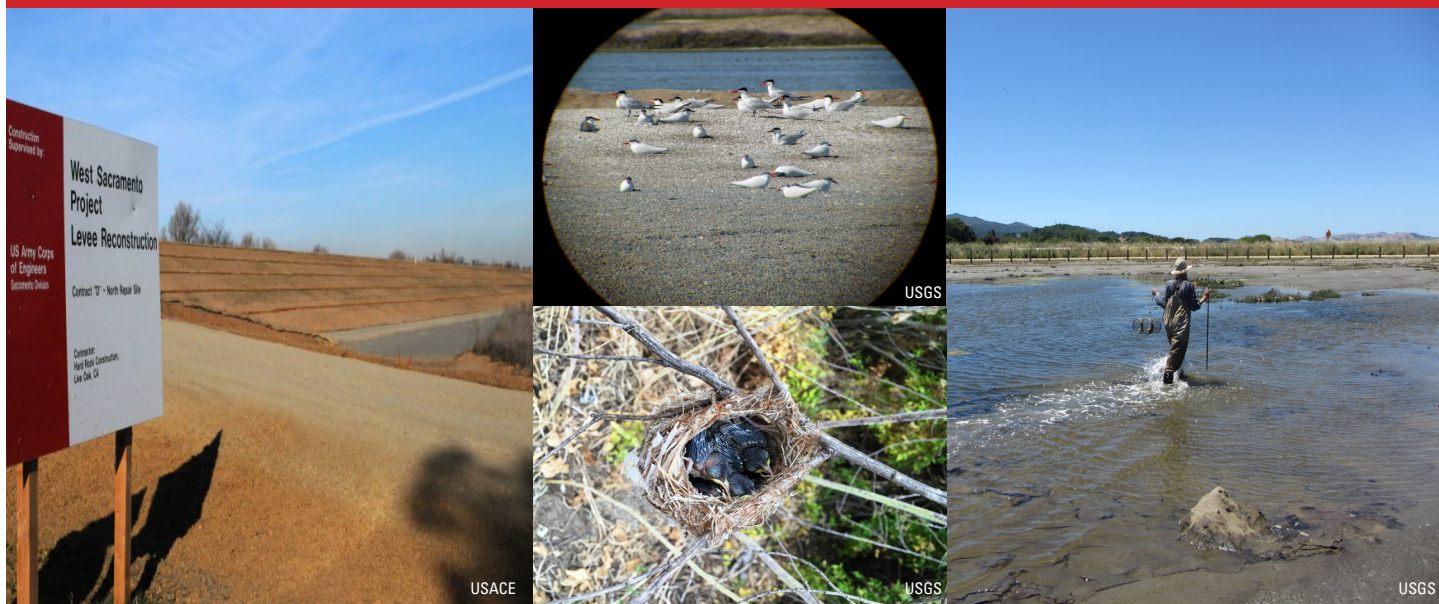


Collaborations with U.S. Army Corps of Engineers



Our shared projects help protect endangered animals, identify toxic pollutants in wetlands — and more.

The Western Ecological Research Center (WERC) is a USGS science center serving California, Nevada, and the greater Pacific Southwest — the most ecologically diverse geographic region in the U.S. Our researchers are stationed across California and Nevada, studying iconic landscapes like the misty redwoods of the North Coast, the mountain habitats of Yosemite, the arid Mojave Desert, and the suburban wilderness bounding Southern California. We are uniquely situated to provide our clients and federal partners with the research, scientific understanding, and technology needed to support sound management of ecosystems in these regions. Four Science Themes define the research of WERC scientists: Ecosystem Response to Human Activity, Stressors to Species Recovery, Ecosystem Processes and Long-Term Trends, and Applications and Tools for Resource Management Use.

WERC researchers have been invited to participate in planning discussions of concern or interest to the U.S. Army Corps of Engineers (USACE), including the Los Angeles River Ecosystem Restoration project, Arroyo Seco Restoration project, and Aliso Creek Restoration project. WERC researchers serve on ecosystems teams that collaborate on these important programs along with other federal partners that include the U.S. Fish & Wildlife Service. The following page highlights eight current, collaborative projects between WERC and USACE. These projects provide the science for USACE representatives to make sound adaptive management decisions regarding sensitive habitats that support species of concern from the Napa-Sonoma marshes to San Luis Obispo.

RESEARCH CONTACTS

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WERC-USACE Research Collaborations



WILDLIFE CORRIDOR STUDY FOR SARMP

The ongoing Santa Ana River Main Stem Project (SARMP) provides flood risk reduction for communities along the Santa Ana River from San Bernardino Mountains to Newport Beach. Since 2009, multiple major construction projects have most likely altered wildlife connectivity between Chino Hills and the Santa Ana Mountains. WERC research ecologist **Erin Boydston** is leading studies on whether mammalian carnivores (e.g. coyotes and bobcats) and mule deer have experienced changes in movement behavior and population health in response to SARMP.

HAMILTON ARMY AIRFIELD MERCURY STUDY

Hamilton Army Airfield closed in 1988 and was slated for conversion back to tidal and seasonal wetland by USACE. However, wetlands are a breeding ground for methylmercury. WERC research wildlife biologist **Josh Ackerman** is leading a study with USGS National Research Program scientist Mark Marvin-DiPasquale to assess changes in water chemistry and mercury concentrations in sediment, surface water, and fish tissue as tidal action returns to the airfield site. The data will steer adaptive management steps for the restoration effort.

CASPIAN TERN MITIGATION IN COLUMBIA RIVER BASIN

Caspian terns have emerged as a USACE management issue in the Columbia River basin, given their significant predation on federally listed salmon species. To enhance habitat elsewhere that would attract and establish new Caspian tern colonies, WERC research wildlife biologist **Josh Ackerman** is studying nesting success requirements and habitat attraction methods (e.g. sound, decoys) to entice displaced Caspian terns.



NAPA-SONOMA MARSH RESTORATION

Since 1999, WERC wildlife biologist **Susan De La Cruz** has been conducting research on waterbirds and habitat characteristics of former salt production ponds at Napa-Sonoma Marshes. As part of the final restoration phases, USACE has funded USGS to assess waterbird and habitat changes over time and evaluate the impact of different restoration actions on waterbird populations and habitat. In particular, USGS will evaluate how salinity has changed as a result of management actions and how this in turn affects waterbird community composition and abundance.

SAN LUIS REY FLOOD RISK MANAGEMENT PROJECT AREA

The San Luis Rey Flood Risk Management Project Area in San Diego County was authorized in 1970. USACE mows excess vegetation from the San Luis Rey flood control channel to facilitate rapid water flow and prevent floods over the sides of the levee. However, this vegetation is also critical habitat for federally listed songbirds like the least Bell's vireo. USGS research ecologist **Barbara Kus** is conducting surveys to assess the baseline trends in songbird habitat use and nesting trends, to help assess potential effects of USACE vegetation removal.

WESTERN POND TURTLE CONSERVATION

USACE is engaged in several critical infrastructure and restoration projects that will impact and eventually benefit the western pond turtle in Orange and Riverside Counties. This species is currently being assessed by the USFWS for listing under the ESA. WERC research biologist **Robert Fisher** is working on two projects where assessing the turtle status and translocating turtles will be critical to ensuring population viability.



GIANT GARTERSNAKE ECOLOGY AND HABITAT USE

Giant gartersnakes are a state and federally threatened species that occur in wetlands, rice fields, and canals within California's Central Valley. Levee maintenance is key to protecting giant gartersnake habitats, but has the potential to harm giant gartersnakes sheltering in burrows in and along levees. WERC research wildlife biologists **Brian Halstead** and **Michael Casazza** are conducting radio telemetry studies of these snakes' habitat use and surveys for giant gartersnake occurrence and abundance. This research will inform management of California and USACE-maintained levees to minimize potential harm to individual giant gartersnakes while maximizing long-term benefits of levee maintenance for giant gartersnake populations and habitats.

CAMP SAN LUIS OBISPO RED-LEGGED FROG MONITORING

Camp San Luis Obispo provides live, virtual, and constructive training for Army National Guard and Reserve Units, but it also contains a good number of buried, unexploded ordinances (UXO's). The property also provides valuable habitat for federally listed California red-legged frogs. WERC research biologist **Robert Fisher** works closely with the Corps to ensure that the habitat and population health of the species at Camp San Luis Obispo is protected while these critical UXO clearance projects are completed.

WERC partners on these projects include: U.S. Fish and Wildlife Service • USGS National Research Program • South Bay Salt Pond Restoration Project

The USGS Western Ecological Research Center (WERC) is an Ecosystems mission science center of the U.S. Geological Survey serving California, Nevada and the greater Pacific West. Online at www.werc.usgs.gov