Tijuana River National Estuarine Research Reserve (TRNERR)

Program Manager Reports
Report Period: 1 March through 30 September 2026

TASK: REFUGE MANAGER REPORT

Sally Brown, Wildlife Refuge Manager, San Diego Bay NWR
and Tijuana Slough NWR

1. Nesting Shorebirds

In 2026, between 50 and 92 breeding pairs of California least terns established 105 total nests with 159 eggs on the Tijuana Slough National Wildlife Refuge beach north of the river mouth. Of these, 54 eggs from 35 nests hatched and only one chick survived to fledge, as compared to between 5-8 chicks last year. In addition, 10 female and 13 male Western snowy plovers established 32 total nests with 96 eggs on the Refuge beach. Of these, 51 eggs from 21 nests hatched and 7 chicks survived to fledge, as compared to between 12-16 last year.

On the beach at Border Field State Park, between 68-102 breeding pairs of California least terns established 128 nests with 194 eggs. Of these, 62 eggs from 38 nests hatched and only 2 chicks survived to fledge as compared to 4 chicks last year. In addition, 10 female and 10 male Western snowy plovers established 26 total nests with 47 eggs at the State Park. All 47 eggs hatched, but only 2 chicks survived to fledge as compared to 10 chicks last year.

The reduction in numbers has been attributed to predation by coyotes, canids, ravens, kestrels, harriers, gull-billed terns, peregrines, night-herons, and black-bellied plovers. There have also been reports of limited prey fish availability due to warm waters. In addition, eleven nests were flooded by high tides. The numbers documented this year are part of an ongoing long-term trend of limited fledging success.

Human associated disturbance observed this season included pedestrian, dog, and bicycle tracks through the nesting areas, bicyclists on ebikes speeding along the beach, and dogs off leash chasing tern and plover chicks. In addition, one Western snowy plover nest was lost due to trampling following human encroachment into the fenced nesting area.

With the help of the Bird Alliance and the Friends of San Diego Wildlife Refuges, the BARK Rangers program conducted this year resulted in nesting shorebird outreach to 183 members of the public and the swearing in of 45 dogs as new bark rangers. Our four-legged friends and their caretakers were invited to take the BARK Rangers pledge to

Bag your pet's waste,
Always leash your pet,
Respect wildlife, and
Know where you can go.

Newly sworn in Bark Rangers earned bandanas and a treat.

2. Light-footed Ridgway's Rail

We are continuing our work with Team Ridgway's Rail in a captive rearing effort between State and Federal wildlife agencies, San Diego Zoo Wildlife Alliance, SeaWorld San Diego and the Living Coast Discovery Center. We've revised our propagation plan to address the genetics of the captive population based on the results of a genetic study conducted by the U.S. Geological Survey. The genetic study produced an estimate of the effective population size throughout the species range of only 158 reproducing adults. To improve the genetics of our captive rearing population, trapping was conducted in December and January, and egg collection was conducted in the spring. Four adult females were collected, and four chicks (two males and two females) have hatched at Sea World from collected eggs. Based on the results of the USGS study, collections were targeted for the most genetically diverse rail populations, and rails have been incorporated into the captive rearing program from three different north San Diego County marshes this year.

A new survey protocol for the rail annual census is being tested by the U.S. Fish and Wildlife Service this year as well that includes a standardized level of effort and randomly selected survey points to produce results are statistically comparable and allow for the estimation of detection probabilities and calculation of population size. Surveys have been completed and data analysis is being conducted.

The Zembal Rail Census data recorded 81 pairs and 10 unpaired males as compared to 132 pairs last year; however, call playback was not used at most of the census points this year which is likely to have affected results.

3. Other Wildlife

Refuge staff continue to work as part of a consortium of scientists, NGOs and resource agencies investigating possible reintroduction sites for the critically endangered Pacific pocket mouse. Refuge staff attended the pacific pocket mouse working group meeting in January. Researchers conducted a habitat assessment on the refuge in August; access routes were cleared during the winter months. The Refuge Manager attended a pacific pocket mouse release organized by the San Diego Zoo Wildlife Alliance and USGS at North San Mateo, Orange County, in May.

Surveys for endangered salt marsh bird's-beak were conducted in the marsh in 2026 as part of the Rare Plant Inspect and Manage Monitoring effort by the San Diego Management and Monitoring Program. You can read about this management and monitoring effort here: https://sdmmp.com/view_project.php?sdid=SDID_sarah.mccutcheon%40aecom.com_57cf0196dff76#data-files-tab

Following winter rains, the presence of San Diego fairy shrimp was documented within a vernal pool on the refuge for the first time since 2008.

4. Tijuana River Inlet Maintenance

Refuge staff are working to obtain all of the documentation necessary to maintain the inlet of the Tijuana River so inlet maintenance can be conducted to reopen the inlet in the event that it closes. Previous closure of the inlet has led to severely degraded water quality as nutrient rich influxes of freshwater led to anoxic and hypoxic conditions in the estuary, resulting in substantial mortality within fish and benthic invertebrate communities.

Refuge staff have completed National Historic Preservation Act 106 Review, Request for Cultural Resource Compliance, Sacred Lands File Contact Form Request, Essential Fish Habitat Memo (Concurrence has been received), and Endangered Species Act Section 7 consultation. The 401 Pre-Application meeting has been held with the Regional Water Quality Control Board, and the inlet maintenance program has been determined to meet the definition of a restoration project for the Statewide Restoration General Order. The Environmental Action Statement has been drafted. Tribal consultation under Section 106 of the National Historic Preservation Act is in process. Once tribal consultation has been completed, the Coastal Consistency Determination, 401, and 404 applications will be submitted.

TASK: EDUCATION PROGRAM

Haley Calhoun, TRNERR Education Coordinator, California State Parks

1. Implementation of Education Programs

A. *Formal and Non-formal Teacher Training*

School Programs Training: Self-guided training materials are now available to help teachers prepare for their field trips. When teachers book through the Acuity booking system, they automatically receive an informational packet and training video. Eliminating the requirement for teachers to attend hours of training before bringing their students to the Reserve has increased accessibility for both teachers and students.

B. *Student-centered Formal and Informal programs*

During this reporting period, the education team led seven in-person school programs: one elementary school program, one middle school program, and five college class tours.

For two weeks in July, the Reserve hosted a summer STEM camp for 20 high school girls in partnership with local nonprofit, EcoLogik Institute. Reserve education staff led a walking tour, delivered vegetation monitoring and weather station ground-truthing activities, demonstrated and discussed remotely operated underwater vehicles (ROVs), and hosted/tabled a STEM fair featuring other local organizations.

The Education Specialist facilitated virtual field trips through California State Parks' Parks Online Resources for Teachers and Students (PORTS). The third through fifth-grade program, *Salt Marsh Secrets*, was delivered to three schools, reaching 93 students. In September, with the start of a new school year and PORTS semester, the

team transitioned to a webinar format that allows multiple classrooms to participate in a single presentation. This format provides greater scheduling flexibility for teachers and expands student reach. In September, staff delivered three webinars, reaching 20 classrooms and approximately 500 students.

The Reserve's virtual programs are available through the PORTS website: https://ports.parks.ca.gov/

C. *Interpretation*

TRNERR Tours: TRNERR continued to offer one to two public walks each weekend, including general nature walks, bird walks, and sensory-focused walks led by a blind docent. These walks provide visitors with opportunities to explore the Reserve through different interpretive approaches and continue to attract up to 10 visitors per walk.

Jr Rangers: The statewide program is designed for children ages 7–12 and helps them discover the natural and cultural heritage preserved in California's state parks. The Reserve previously offered the program to children ages 8–12 but expanded the age range last spring to include seven-year-olds, aligning with the statewide program. During this reporting period, the program was offered 24 times, generating 74 child visits from both returning and new participants. New lesson plans were written for the program.

Interpretive Outreach Events: Throughout Spring, education staff, with volunteer support, participated in four local outreach events with a combined attendance of 1,440 people.

In June, the Reserve hosted *All Are Welcome: Celebrating Accessibility at the Tijuana Estuary* in recognition of California State Parks Week. The event highlighted recent accessibility improvements, including the launch of a NaviLens wayfinding and interpretation system. The system uses colorful codes that can be detected by a smartphone camera from a distance, allowing users to access audio directions and interpretive information as they explore the Reserve.

The event attracted 77 attendees, including members of the blind, low-vision, deaf, and neurodivergent communities. Participants joined guided nature walks with American Sign Language interpretation, tested the NaviLens system, and learned about accessibility resources available for visitors to borrow from the Visitor Center. These resources include sensory kits and a social narrative designed to help neurodivergent visitors prepare for their visit.

Also in June, the education team promoted and hosted a sea turtle presentation by NOAA scientists studying Eastern Pacific green sea turtles in San Diego Bay. The presentation attracted 25 attendees.

In September, TRNERR celebrated the 17th annual Tijuana River Action Month. An event to celebrate the start of TRAM & Latino Conservation Week was attended by 101 people, followed by Coastal Cleanup Day in the Tijuana River Valley which attracted 65 participants.

Digital Learning: Education staff maintained the *Divided Together* podcast for public use and collaborated with the Training & Engagement team to produce an educational video funded by NOAA's Marine Debris Program. Additionally, the NaviLens installation added a new form of digital learning to the Reserve.

Border Field State Park: The education team supported preliminary planning for Monument Mesa improvements by assisting with a community input event.

D. Visitor Services

The Tijuana Estuary Visitor Center remained open Wednesdays through Saturdays and welcomed 3,073 visitors from April 1 through September 30.

2. Production of Outreach Materials

The education team produced monthly e-newsletters highlighting volunteers, new staff, special events, and accomplishments. Since April 1, the education team has collaborated with the Reserve's new communications specialist to increase social media outreach, posting two to three times per week. The team also collaborated on website updates and public messaging regarding the ongoing multinational sewage crisis affecting the Reserve.

Education staff created flyers and newsletters to promote programs to local teachers, including teachers who attended TOTE in May.

The Education Coordinator collaborated with Research staff to develop an ArcGIS StoryMap to help visitors navigate and explore the Reserve.

3. Volunteer Capacity Building

The Volunteer Coordinator resigned at the end of April, and a replacement was hired in September. During the five-month vacancy, existing volunteers continued supporting stewardship, education, and research activities, while onboarding for new volunteers was paused.

During this period, the Education Coordinator and Education Specialist worked with the Reserve's Assistant Manager and Training & Engagement staff to plan and host Tijuana River Action Month in collaboration with Tijuana River Action Network partners (see Stewardship and CTP).

4. Environmental education and interpretive capacity and leadership roles

The CSP Interpreter II H.Calhoun transitioned into the Education Coordinator role. J.Looney continued serving part-time as an Interpreter I/Education Specialist, and S.Shaffer continued as

a Park Interpretive Specialist. During this reporting period, the second Park Interpretive Specialist left, and the Senior Park Aide for Visitor Services retired.

In response to these staffing changes, the interpretation team decided not to refill the vacant Park Interpretive Specialist position. Instead, the Reserve hired two Park Aides for Visitor Services, allowing interpretive staff to dedicate more time to education programs and interpretive activities rather than Visitor Center coverage. A full-time Interpreter I position should be advertised and filled within the next year. These changes are intended to strengthen the Reserve's capacity for education and interpretation while maintaining Visitor Center operations.

Task: TRAINING AND ENGAGEMENT PROGRAM (*formerly COASTAL TRAINING PROGRAM (CTP)*)

Dr. Kristen Goodrich, TRNERR Training and Engagement Director,
Tijuana Estuary Foundation, *formerly Southwest Wetlands Interpretive Association*

1. Deliver training and technical assistance to coastal decision-makers

During this reporting period, TRNERR's Training and Engagement Program (TEP) continued to deepen its role as a convener and connector across communities, disciplines, and borders informing environmental management throughout the Tijuana River Watershed.

TEP continued efforts to elevate cultural heritage in planning for environmental changes. In partnership with National Geographic Society's *Preserving Legacies Project* and *Heritage Adapts!*, TEP conducted four workshops in June which convened 84 individuals representing various agencies, organizations, and communities from the Kumeyaay Nation, the U.S., and Mexico. These workshops worked toward developing a community-designed public mural that simultaneously depict heritage values and generate actionable, community-informed inputs that will strengthen, expand, and amend the Reserve's existing climate adaptation plan by integrating cultural heritage. Additionally, TEP supported the efforts of the Reserve's first Indigenous fellow, who informed the mural design process and co-facilitated a design workshop on the reservation for the San Pasqual Band of the Kumeyaay Nation.

Building on TRNERR's marine debris prevention and removal work, TEP successfully launched the Marine Debris Leadership Coalition in April. Within this reporting period three quarterly meetings were held, and all aimed to support continued alignment and action among alumni of the Marine Debris Leadership Academies. Additionally, TEP presented this progress and other project accomplishments at the National Sea Grant Marine Debris Symposium. In August, TEP also conducted a workshop among MDLC and NERRS Marine Debris Roadmap partners as part of the NERRS Science Collaborative Initiative to Understand Impact that aimed to demonstrate to the MDLC planning partners how to utilize storytelling techniques for measuring and communicating the impact of projects and efforts in the region around addressing marine debris.

In preparation for the potential impacts of El Niño to the region, TEP convened participants for a conversation around disaster preparedness during a September workshop, "A Workshop on El Niño in a Trinational Context." Through presentations, interactive activities, and a panel, this workshop focused on featuring multi-jurisdictional cross-border and Indigenous perspectives on disaster preparedness and recovery. TEP provided presentations, and led facilitation and engagement methods to coordinate cross-border communication and response capacity for disaster preparedness in support of the *Cross-Border Debris-Related Flooding Response Guide.* In May, the Guide underwent a validation process through a workshop delivered by TEP engaging over 40 participants with roles in preparedness, response, and recovery.

During this period, TEP continued to co-lead Tijuana River Action Month coordination for over 40 organizations and agencies in the U.S. and Mexico. These efforts included facilitating space for Indigenous stewardship perspectives, and coordinating activities with Mexican organizations and agencies to continue fostering environmental stewardship through active involvement with local communities and organizations in the Mexican section of the Watershed. As part of this effort, the TEP presented its ReCREA Project, funded by NOAA's Marine Debris Program, as a model for waste reduction at the source and reached approximately 60 students, faculty members, and invited researchers at the Universidad Autónoma de Baja California (UABC) Tecate campus.

TEP also provided targeted technical assistance services to a wide range of decision-makers through:

- Applied social science;
- Collaborative leadership;
- Committee leadership;
- Community engagement in decision-making;
- Evaluation;
- Facilitation and process design;
- Instructional design or applied learning science;
- Needs assessment;
- Risk communication;
- Science translation and communication;
- Strategic planning;
- Survey design; and
- Tool demonstrations and application

Of note during this reporting period, technical assistance to advance efforts to integrate green infrastructure principles and nature-based solutions into the state of Baja California's policies continued. TEP completed the final report for the Binational Resilience Initiative (BRI) project *Green Infrastructure for Environmental and Community Resilience in Tijuana and Playas de Rosarito*. The project's principal outcomes include:

- Phase 1 Green Infrastructure Manual for Baja California: A technical resource for planners and decision-makers.

- Pilot installation at Escuela Primaria Corregidora de Querétaro (Los Laureles, Tijuana): The installation uses biomats and rainwater-infiltration measures to reduce erosion and runoff in a sub-watershed that drains toward the Tijuana River Estuary.

Additionally, TEP was awarded a San Diego Foundation / Binational Resilience Initiative grant *Integrated Water Solutions to Reduce Transboundary Flows in the Tijuana River Watershed* to build upon previous efforts on the topic. Led in partnership with Fundación La Puerta, A.C. and UABC's Valle de las Palmas campus, it advances comprehensive watershed planning in Tecate through integrated stormwater management, wastewater treatment, and water reuse. Planned activities include:

- Green Infrastructure Master Plan: An executive-level plan for the UABC Tecate campus.
- Wastewater-treatment monitoring: Monitoring and optimization of the community wastewater-treatment system at Rancho Tres Estrellas, which serves Lomitas del Cuchumá.

Additionally, TEP shared perspectives on challenges in the Tijuana River watershed and downstream effects on TRNERR, including water quality, sediment, and solid waste at various convenings including the 4th Baja California Environmental Network Session and binational forums such as the Binational Forum on Water Reuse convened by the Institute of the Americas.

The TEP Director continues to serve as President of the Board of the National Estuarine Research Reserve Association; on various local, regional, and national advisory bodies; and as the Reserve mentor for the Margaret A. Davidson Fellow. TEP Coordinators also serve on regional advisory and networking bodies including the City of Tijuana's Environmental Subcommittee.

2. Report training and technical assistance outcomes

Related to reporting outcomes in this reporting period:

- Using various methods, TEP evaluated projects and related convenings and technical assistance and analyzed and submitted resulting data including but not limited to NERRS priority issues and focus areas, purpose, format, services, key partners, participation, contact hours, and outcomes among other metrics and indicators of success.
- TEP continues to participate in training on new program standards and reporting for more efficient implementation and submits entries to the updated performance monitoring database in accordance with the FY reporting requirements and timeline.

TASK: TEACHERS ON THE ESTUARY

Haley Calhoun, TRNERR Education Coordinator, California State Parks

1. Educators increase their knowledge of and appreciation of estuaries

The Education Coordinator worked with NAT Geo Explorer partners to create and distribute promotional materials for May 15-17, 2026 TOTE training. The Reserve's Research Coordinator also helped to plan the first TOTE designed specifically for bilingual educators, scientists, and

storytellers. The training emphasized bilingual education, environmental literacy, and trinational collaboration. Held from Friday evening through Sunday afternoon, the training included follow-up work and sessions on Estuaries 101, California State Parks' educational offerings (in-person field trips and PORTS), data literacy, climate literacy through play-based learning, and cross-border environmental work led by the Reserve's Training & Engagement program. Participants also toured Border Field State Park with the Reserve's Research Coordinator and Michael Connolly Miskwish, a Kumeyaay historian, author, and environmental consultant.

TASK: RESEARCH COORDINATION AND IMPLEMENTATION

Dr. Crooks, TRNERR Research Coordinator,
Tijuana Estuary Foundation, *formerly Southwest Wetlands Interpretive Association*

1. Research by TRNERR staff increases local knowledge

The Research Program currently includes four full-time staff: the Research Coordinator and three Research Associates. The program is also supported by a part-time Research Assistant who also works part-time with California State Parks. This cross-program role helps strengthen coordination, communication, and integration across TRNERR programs. The Research Program is also supported by our new Restoration Coordinator, Dr. Michelle Shaffer. In addition, M.Cordrey, a former Research Associate, continues to support GIS and SWMP-related work through a contract, providing continuity and technical expertise for core monitoring and data-management efforts.

The Research Program is focused on the Tijuana Estuary, with particular emphasis on wetland restoration, as well as ecosystem health related to transboundary flows of polluted water. This work includes long-term monitoring, targeted field studies, data synthesis, and applied research designed to better understand how water quality, hydrology, habitat condition, and biological communities respond to chronic and episodic stressors. During this reporting period, we have also been focused on the current El Niño event, including evaluating past events and using SWMP to track changes in parameters such as water level and temperature. Research on invasive species continues to be a priority as well (see Task 4).

We also use the Tijuana Estuary as a focal system to better understand broader patterns and management challenges across Southern California coastal wetlands. This broader perspective is supported by research and monitoring in other local estuaries, including South San Diego Bay (managed by the U.S. Fish and Wildlife Service), Mission Bay, and Los Peñasquitos Lagoon (managed by California State Parks). The team also collaborates on projects throughout the region and beyond, helping connect site-based monitoring with regional management questions, restoration planning, and coastal wetland science. These activities are described in greater detail below.

Volunteers continue to play an important role in the Research Program by increasing field capacity and supporting long-term monitoring efforts. They participate in field sampling for the State of California's Marine Biotoxin Monitoring Program and assist with other field efforts,

including minnow trapping, vegetation monitoring, and soil assessments. Their contributions help sustain regular monitoring activities while also strengthening community engagement with the science and stewardship of the Reserve.

2. The Reserve offers attractive opportunities for researchers

The Reserve served as a living laboratory for external researchers whose work supported management needs at various scales, from local to international. Within the region, TRNERR continued to provide an especially valuable research platform because of its diverse habitats, transboundary watershed setting, long-term monitoring record, and strong science-to-management partnerships. Jeff also maintains adjunct faculty status at local universities including Scripps Institution of Oceanography (UCSD), San Diego State University, and University of San Diego. This helps strengthen relationships between TRNERR and university faculty and students.

During the reporting period, we continued to facilitate a range of externally funded research projects at the Reserve. A number of these efforts focused on the environmental and public health dimensions of transboundary pollution, including studies that characterized pollutant loads and exposure pathways, documented impacts to habitats and biological communities, and improved understanding of potential human health risks for people who live, work, or recreate in and around the Tijuana River Valley. Much of this work is led by researchers at San Diego State University and Scripps Institution of Oceanography (UCSD).

Other external research projects address broader ecological and management questions in the Tijuana Estuary and other local systems. These include:

- A graduate student from the University of San Diego characterized mosquito use of estuarine ecosystems
- A PhD student at San Diego State University / UC Davis is studying crab use of salt marsh habitats
- A graduate student at Cal State Long Beach examined the relationship between suspended sediment, accretion, and marsh vegetation communities.
- A researcher from UC Santa Barbara is studying dune dynamics at State Parks throughout the state, including Border Field State Park.
- A graduate student from the University of San Diego studied spider distribution in the marsh and upland transition zone.
- A graduate student from the University of San Diego studied patterns in fish and invertebrate communities in four San Diego lagoons, including the Tijuana Estuary.
- A graduate student at Scripps is focusing on dissolved oxygen dynamics in Los Peñasquitos Lagoon, including the use of our long-term monitoring data
- A researcher from UC Santa Cruz is examining carbon stocks in wetlands, and we supported her sampling effort
- We are working with two high school students as part of the Conservation Leadership Program at Scripps.

3. Restoration offers opportunities for coupled science / management

The Tijuana Estuary Tidal Restoration Program (TETRP) continued to provide an important opportunity to integrate restoration implementation with applied research and adaptive management. The Tijuana Estuary Foundation has received funding from the California State Coastal Conservancy for final design, permitting, and pre-restoration monitoring, which will be completed in the coming months. Pre-restoration monitoring continued to build the scientific foundation needed to evaluate restoration outcomes and inform management decisions. The Research Program assessed nekton communities using traps and also monitored vegetation using SWMP Biomonitoring protocols. We also deployed camera traps to assess terrestrial organisms. Together, these efforts helped establish baseline conditions and created a framework for tracking ecological responses once restoration is implemented.

The Coastal Conservancy has allocated a significant portion of the implementation funding, and we were awarded a competitive NOAA NERRS BIL award to further support this work. We are hoping for construction to begin in fall 2027 to allow enough time for permitting as well as to wait until after the El Niño is over, given the potential for disruptions associated with high sea levels, large waves, and river flow.

In addition to TETRP, we are continuing work with the California Marine Sanctuaries Foundation to assess water quality (with EXO sondes) associated with two marsh restoration sites (former salt ponds) and one reference site in the San Diego Bay National Wildlife Refuge. We will also be helping them spin up their new lab once they are ready to take over monitoring. This work is part of a compensatory mitigation monitoring program being conducted under the auspices of our CZM partners, the CA Coastal Commission.

We continue to support the mitigation monitoring being led by the University of California Santa Barbara, also overseen by the Coastal Commission. Los Peñasquitos Lagoon is a reference site for the restoration in nearby San Dieguito Lagoon, and we helped support the addition of this as a reference site (to replace the Tijuana Estuary due to poor conditions). They now conduct much of the faunal monitoring (except minnow traps), but we continue water quality monitoring and these data are used by UCSB for their assessments. We have also assisted UCSB researchers in establishing a YSI sonde site in San Dieguito Lagoon.

4. Communication of key research findings and perspectives

During this reporting period, we presented to a variety of audiences and venues. Examples of the work Jeff did during this reporting period include:

- Presentation at the RAE Conference in San Francisco on the impacts of anthropogenic freshwater in San Diego lagoons
- Regular participation in the Tijuana River Valley Recovery Team, led by the San Diego Regional Water Quality Control Board
- Participation in an Imperial Beach Town Hall on the Tijuana River Pollution Problem
- Tours provided to groups from local schools (e.g., USD, Scripps, UCSD) and non-profits.
- Participation in the preparation of a technical report associated with the regional monitoring program led by the Southern California Coastal Water Research Project - Bight 23

- Contribution to California's 5th Climate Assessment, San Diego Regional Report
- Participation in an InSite Art event called Pacific Wanderlust, talking about connectivity in the Pacific Ocean
- Participation in a forum on pollution issues in the Tijuana River, led by Scripps
- Planning for the annual Love Your Wetlands Day event at Kendall-Frost Marsh in Mission Bay, led by UCSD Natural Reserve System and San Diego Bird Alliance
- A KPBS Radio interview with Kristen Goodrich and Haley Calhoun

Papers published during this time period include:

Anidjar, N., S. Giddings, C. Neira, G. Sugihara, L. Levin, K. Goodrich, J. Crooks, D. Wheeler, L. McCormick & L. Miller Behavioral Response of Oyster Valve Gape to Ecological Conditions in an Intermittently Closed Estuary. Estuaries and Coasts 49, 175 (2026). https://doi.org/10.1007/s12237-026-01759-6. This is a product associated with the NERRS Science Collaborative effort - Habitat Heartbeats.

Walker, J.B., R. Smith, K. Beheshti, K. Johnston, C. Whitcraft, J. Crooks, M. Grubbs, H.M. Page, S. Schroeter, E.D. Stein & K. Uyeda Comparison of Coastal Wetland Vegetation Assessment Methods in Southern California. Estuaries and Coasts 49, 162 (2026). https://doi.org/10.1007/s12237-026-01779-2. This leveraged our long-term SWMP Biomonitoring program.

5. Reporting and Database Entry

Research projects were entered into the Research Database, and reports submitted to NOAA.

TASK: IMPLEMENTATION OF THE SYSTEM-WIDE MONITORING PROGRAM

Dr. Crooks, TRNERR Research Coordinator,
Tijuana Estuary Foundation, *formerly Southwest Wetlands Interpretive Association*

1. High quality meteorological and water quality data

NOAA SWMP funding allowed TEF and TRNERR to leverage partnerships and maintain a robust monitoring program that addressed Reserve-specific priorities as well as broader regional management needs. This work was supported through partnerships and funding from California State Parks, the U.S. Fish and Wildlife Service, the State Coastal Conservancy, the Los Peñasquitos Lagoon Foundation, and the National Fish and Wildlife Foundation.

During the reporting period, we operated two SWMP stations in the Tijuana River Estuary. One of these sites, Boca Rio, was associated with an enhanced suite of partner-supported monitoring, including a web camera deployed through the High Performance Wireless Research and Education Network (HPWREN). We also operated two SWMP stations in South San Diego Bay. In addition to these formal SWMP stations, we deployed supplemental loggers at additional sites to expand spatial coverage and address specific management questions. These included one additional site in the Tijuana Estuary and three telemetered stations in Los Peñasquitos Lagoon, with data made available through torreypines.trnerr.org. We have also

deployed sondes at three sites associated with the Otay River Restoration, in our effort to help the California Marine Sanctuary Foundation get their mitigation monitoring program going (see Task 1).

Jeff continued to serve as Chair of the SWMP Oversight Committee, supporting system-wide efforts to ensure that the National Estuarine Research Reserve System produces high-quality, consistent, and useful monitoring data.

2. Understanding of long-term vegetation dynamics

We conducted SWMP biomonitoring of marsh and upland transition zone vegetation in the spring, which included sites associated with restoration as well as reference sites. Information from this program was included in a recent peer-reviewed publication (see Task 1).

3. Integration of monitoring with education and outreach programming

During this reporting period, researchers participated in education and outreach events, including a Teachers on the Estuary training. This included a "paint with data" exercise, in which we used SWMP data for acrylic pouring, with the ratios of colors corresponding to observed data. (see the State Parks Education Task for more details).

TASK: PROFESSIONAL DEVELOPMENT, TRAINING, PRESENTING

Dr. Crooks, TRNERR Research Coordinator,
Tijuana Estuary Foundation, *formerly Southwest Wetlands Interpretive Association*

1. NERRs Integration and Leadership Development

This task did not occur during this reporting period.

2. Staff Development

The RC attended the Restore America's Estuaries conference in San Francisco.

3. TRNERR Staff Program Support and Enhancement

Travel associated with field work and meetings occurred during this reporting period.

TASK: INVASIVE SPECIES - APPLICATION OF RESEARCH TO MANAGEMENT

Dr. Crooks, TRNERR Research Coordinator,
Tijuana Estuary Foundation, *formerly Southwest Wetlands Interpretive Association*

1. Improved understanding of local invaders

TRNERR continued to improve understanding of local invasive species through long-term monitoring, targeted field studies, and collaboration with students and regional partners. Vegetation monitoring documented the distribution and abundance of invasive plants in local wetlands, providing information that supports restoration planning and management. The Research Program also tracked invasive species through nekton monitoring, which provided

information on fish and mobile invertebrate communities and helped identify changes in species composition over time. Together, the vegetation and nekton monitoring efforts supported a broader understanding of how invasive species interact with hydrology, habitat condition, restoration actions, and other stressors in Southern California wetlands.

This work was further strengthened through academic partnerships. Jeff continued to serve as adjunct faculty in the Department of Environmental and Ocean Sciences at the University of San Diego, where he advised students working on invasive species and related coastal wetland ecology questions. He also provided a lecture at USD on marine invasions.

2. Improved regional, national, and international information sharing

The Society for the Study of Marine Bioinvasions is an international society focused on sharing information about invasive species research and management worldwide. A primary vehicle for this information sharing is the International Conference on Marine Bioinvasions series. Jeff is Co-President of the Society, and planning for the 2027 meeting in Cape Town is underway. Jeff also represents the NERRS, along with Chris Kinkade, in the Smithsonian Environmental Research Center's BRIDGE (Bioinvasions Research across Dynamics Global Ecosystems) effort.

TASK: MARGARET A. DAVIDSON FELLOWSHIP SUPPORT

Dr. Crooks, TRNERR Research Coordinator,
Tijuana Estuary Foundation, *formerly Southwest Wetlands Interpretive Association*

1. Successful implementation of Davidson Fellowship

Our Davidson Fellow, S.Sylman, conducted a social science project, including assessment of cultural ecosystem services. She is working closely with our Training & Engagement Coordinator. We also prepared for the advertisement associated with the current Davidson Fellowship call for proposals.