

Tijuana River National Estuarine Research Reserve (TRNERR)

Program Manager Reports

Report Period: January 1, 2021 through June 30, 2021 **unless noted*

TASK: REFUGE MANAGER REPORT

**Brian Collins, Refuge Manager, San Diego Bay NWR
and Tijuana Slough NWR**

*Period: February 1, 2021 through July 31, 2021

1. PERSONNEL

No changes to report on personnel other than the USFWS Directorate expects that more resources may be allocated to the Service in fiscal year 2022, that may enable us to address some of our staffing issues.

2. WILDLIFE

Nesting season for our threatened and endangered birds is in its peak season, as of late July. As a reminder, nesting season starts around February 15th for light-footed Ridgway's rails and Belding's savannah sparrows, March 15th for western snowy plovers and April 15th for California least tern, least Bell's vireo, and California gnatcatcher.

Actively nesting California least terns and western snowy plovers are present on our beaches and back dunes on both sides of the river. Small chicks may be present west of the twine lines we place seasonally to delineate the nesting areas, so visitors to our beaches should be aware of this fact and help to recover these species populations by keeping dogs on leash and observing from a distance.

So far this season California least terns have established 183 nests total at Tijuana Estuary and western snowy plovers have established 33 nests in total. Fledgling production has been poor for both species so far this season although yearly total estimates are not available at the time of this report. Human associated disturbance sources evidenced this season include pedestrian and dog and bicycle tracks through the nesting areas, observations of persons on ebikes speeding along beach, Border Patrol agent responses to border incursions on the beaches mostly west of the demarcated nesting areas, dogs off leash on our beaches etc. The Refuge Manager patrols the north side of the river several times per week to contact individuals to inform them of the presence of threatened and endangered species and to request compliance with leash laws. Most people encountered are happy to cooperate in the recovery of our listed species once informed of their presence.

Refuge staff continue working as part of a consortium of scientists, NGOs and resource agencies investigating possible reintroduction sites for the critically endangered Pacific pocket mouse. You can read about ongoing conservation efforts for this species here <https://institute.sandiegozoo.org/species/pacific-pocket-mouse>. Note that the 'type

location' for the species when it was initially described in the scientific literature was for a specimen taken from the Tijuana River Valley.

We are continuing the second year of our telemetry work with colleagues from USGS and the University of Idaho tracking the survivorship and movements of young light-footed Ridgway's rails at Tijuana Estuary and other southern California wetlands in 2021. We also are continuing our work with Team Ridgway's Rail in a zoological breeding effort between State and Federal wildlife agencies, San Diego Zoo Wildlife Alliance, SeaWorld San Diego and the Living Coast Discovery Center. If you have observed folks in orange vests in the marsh this time of year, some of them are working to live-capture rails in Oneonta Slough as well as in other wetlands up the coast. Birds captured are banded, have body measurements and a small blood or feather sample taken as part of a range-wide genetics project that we are collaborating on with staffers from USGS and the University of Idaho. Some of the young of the year juvenile birds captured are fitted with small satellite or VHF radio tags. These are paired with young of the year birds produced in our captive breeding program in order to track movements and survivorship of wild and zoologically bred young rails. So far this season, we have released 6 young Ridgway's rails at Tijuana Estuary produced from pairs at the Living Coast Discovery Center and SeaWorld.

3. MULTI-AGENCY PLANNING EFFORTS

Refuge staff continue our participation in the USMCA Eligible Public Entities Coordinating Group (EPECG) team that is tasked with consulting with the USEPA on prioritizing actions to implement improvements to water quality treatment infrastructure to reduce the magnitude of flows of sewage, sediment and trash into the Tijuana River Valley. See <https://www.epa.gov/newsreleases/epa-announces-two-near-term-clean-water-projects-tijuana-river>.

The Refuge Manager continues participating (along with the Reserve Manager, Research Coordinator and Coastal Training Program Coordinator) as a member of the Technical Advisory Committee for the City of Imperial Beach's Sediment Management Planning efforts. This project is funded by the California Coastal Conservancy https://scc.ca.gov/webmaster/ftp/pdf/sccbb/2020/2006/20200618Board13_Tijuana_River_Valley_Sediment_Plan.pdf.

FWS is also collaborating with the City of Imperial Beach by providing them background information on Refuge resources as they may relate to preliminary fact-finding planning efforts being undertaken by the City on an upcoming Bayshore Bikeway Resiliency Planning project to assist the City in its determination of feasible project options moving forward.

The San Diego NWR Complex continues work as a co-lead agency for NEPA on the Tijuana Estuary Tidal Restoration Program II Phase I, and we are on track to complete the environmental regulatory documentation for the upcoming EIR/EIS for the program.

We also are in the final stages of regulatory permitting and compliance for the upcoming construction of the Otay River Estuary Restoration Project (ORERP) to restore approximately 120 acres of intertidal habitat in south bay. The ORERP project team is closely coordinating with the Port of San Diego given the Port's plans for the development of a mitigation bank funded wetland restoration of the former Pond 20 salt pond off of Palm and east of 13th Street. We expect both projects in south San Diego Bay to be under construction in the next few years. These projects will serve to transform an abandoned salt pond, former agricultural areas, and one active salt evaporation pond into native intertidal salt marsh habitats, similar to what the Refuge created in the former western salt ponds west of 7th Street and east of Highway 75. The marsh and mudflat habitats in that restoration area will be 10 years old in October of this year and they are maturing into highly valuable fisheries, and waterbird supportive habitats that are now starting to be occupied by endangered light-footed Ridgway's rails while supporting many other native species.

The Refuge Manager continues to coordinate on both actively permitted and incipient research programs with Reserve staff and outside researchers.

4. TIJUANA RIVER MOUTH AND WATER QUALITY DATA

The Reserve's automated telemetry stations are back in operation. These links are a useful proxy to get a glimpse of some water quality parameters in the system which in turn provide us information relative to mouth closure likelihood.

Oneonta Slough datalogger link: <https://tijuana.river.trnerr.org/OS.html>

And here is a link with a camera view northwest in Oneonta channel with Tijuana Estuary and Scripps tides. This datalogger system is located near the end of the river mouth trail. <https://tijuana.river.trnerr.org/BocaRio/>

5. WILDLAND URBAN INTERFACE

Refuge natural resources continue to be faced with impacts associated with proximity of the urban environment and all that follows from that proximity. Refuges recently worked with the California Conservation Corps (CCC) crews to trim vegetation in areas near the Tijuana Estuary Visitor Center to reduce cover to limit the likelihood for illegal encampments to remain undetected, and to reduce the dry brush bordering the Visitor Center and parking lots and trails. The CCCs will return to work on the Refuge later this fall on the Southern Border Fuels Reduction Initiative, funding by the Department of Homeland Security. We are reducing cover of non-native flammable vegetation including stands of giant reed (*Arundo donax*), Tamarisk, castor bean, and other species). Refuges hopes to complete its obligation for work funded under this initiative within an approximate 230 acre treatment area west of Sunset Ave. and south of the Outlying Landing Field Imperial Beach in 2021.

TASK: OVERSIGHT AND IMPLEMENTATION OF RESERVE OPERATIONS
Chris Peregrin, TRNERR Reserve Manager, California State Parks

1. Coordinated Implementation of Reserve Programs

The Reserve Manager worked to respond to the Necessary Action and the Recommendations identified in the Reserve's 312 findings.

The Reserve Manager contributed to virtual NERRA board meetings, January 26, March 16.

The Reserve Manager attended the virtual NERR Managers Meetings, January 27, February 11, March 9 and 11, May 18, June 28 and 29.

The Reserve Manager worked with the TRNERR Program Management Team to host the quarterly TRNERR Advisory Council meetings. Advisory Council meetings were held virtually with shorter format than previous in-person meetings.

- February 9. New business topic included a brief presentation from Nancy Torres, TRNERR Margaret A. Davidson Research Fellow, with an update on her project, Assessing Ecosystem Health Through Status and Trends of Contaminants.
- May 4. New business topic included presentation from County of San Diego with an overview of the newly opened Tijuana River Valley Regional Park Campground.

The Assistant Reserve Manager continued role of Cooperating Association Liaison for the Southwest Wetlands Interpretive Association (SWIA) and is attending the regular SWIA Board Meetings.

The Reserve Manager continued coordination with CA State Parks Peace Officers and seasonal lifeguards to support Reserve operations through public safety.

The Reserve Manager and the Assistant Reserve Manager, Research and Coastal Training Program coordinators continued regular communication with State Parks San Diego Coast District (SDCD) Natural Resources team to further align programmatic support and integration, with additional outreach to CA State Parks Natural Resources program headquarters staff out of Sacramento. During this period, efforts focused on climate change resilience and adaptation planning, with work toward a CA State Parks grant application to OPC for San Diego Coast District, as well as a NERRS Science Collaborative grant application to support California Reserves with vulnerable infrastructure in wetlands. Additionally, the Reserve Manager and Assistant Reserve Manager contributed to a follow-up workshop of the CA State Parks 'Estuaries Initiative', and effort that seeks to align and focus CA State Parks commitment to estuary management across the state.

The Reserve Manager continued work with the Education Coordinator and TRNERR Program Managers to further the development of the Reserve's Interpretive Master Plan

(IMP). During this period, focus included additional outreach to Native American representatives and also the San Diego County staff.

The TRNERR Program Managers met approximately weekly in virtual format for this term of the grant to ensure programmatic coordination.

The Reserve Manager attended weekly CA State Parks SDCD Manager Team Meetings. One of the goals of this engagement is to ensure effective integration of Reserve programs with CA State Parks operations.

2. Management of Reserve Budget

The Reserve Manager continued work with the Assistant Reserve Manager and CA State Parks Administration staff to manage the NOAA & CA State Parks operating budgets. The Reserve Manager supported the Assistant Reserve Manager and CA State Parks Administration staff to manage the Nelson Sloan Quarry Restoration Project grants and administration process. The Nelson Sloan Quarry project is funded through three grant allocations from the State of California- one from CA Department of Water Resources (via San Diego County Water Authority) and the other two through CA Coastal Conservancy.

The Assistant Reserve Manager coordinated TRNERR Program Managers development of the NOAA Operations award application for FY 21. The award goes to CA State Parks San Diego Coast District management for review and approval prior to submittal to NOAA.

3. Protection and Restoration of the Tijuana River Valley

The Reserve Manager worked with CA State Parks Contract Specialists locally and in Sacramento to exercise contract amendment option to extend work through the existing contract for an additional year. Due to rainy season and breeding bird season, no excavation or sorting of material occurred during this reporting period.

The Reserve Manager continued work with the Assistant Reserve Manager, design staff from CA State Parks Southern Service Center, CA State Parks Administrative staff, and the State's project consultant (Dudek) to continue on-the-ground studies and design work for the completion of the final design and environmental review for the Nelson Sloan Quarry Restoration Project. During this period, significant focus was placed on development of the environmental impact report analyses and Native American consultation (*see also Stewardship*).

The Reserve Manager continued work with the TRNERR Research Coordinator, SWIA Project Management, US Fish and Wildlife Service, and project consultants to further the design for the Tijuana Estuary Tidal Restoration Program (TETRP). This project seeks to restore roughly 80 acres of salt marsh within the Reserve. During this period the Notice of Preparation/Notice of Intent was published and the team held a public scoping meeting (*see also Stewardship and Research*).

The Reserve Manager continued engagement with USEPA to identify issues with water and wastewater infrastructure that contribute toward cross-border pollution, and to prioritize improvements that will address the wastewater and freshwater discharges into the Tijuana River. During this award period, efforts were continued toward identifying priority projects for the \$300million allocation in the federal government through the United States-Mexico-Canada Agreement. The Reserve Manager serves on the Eligible Public Entities Coordinator Group (EPECG; formerly the Inter-Agency Consultation Group) for this effort, representing the CA Natural Resources Agency and the Tijuana River National Estuarine Research Reserve.

The Reserve Manager Continued collaboration with the TRNERR Binational Liaison and a representative from the City of Tijuana department of planning to support the International Boundary and Water Commission Minute 320 sediment working group.

The Reserve Manager contributed to the technical advisory committee toward the development of a Tijuana River Valley Sediment Management Plan. This effort is led by the City of Imperial Beach, with consultant Dudek, and funded by the CA Coastal Conservancy.

The Reserve Manager continued work with the TRNERR Research Coordinator, CA State Parks resource managers, and external researchers to collaborate on project planning for a dune restoration research project (“Using Green Engineering Techniques to Restore Coastal Sand Dunes in Border Field State Park, San Diego, California”) involving California Ocean Protection Council, California Sea Grant Program, and the University of Southern California Sea Grant Program. During this award period site monitoring continued.

The Reserve Manager continued work with the Assistant Reserve Manager, CTP Coordinator and Binational Liaison to coordinate the NOAA Marine Debris 2018 grant efforts.

The Reserve Manager worked with the Assistant Reserve Manager, CTP Coordinator, Research Coordinator, and Binational Liaison to develop and submit a grant application of roughly \$600k to the NOAA Marine Debris North American Marine Debris Prevention and Removal grant opportunity. This effort is funded through USMCA funds. We hope to hear official response from NOAA in Fall 2021.

The Reserve Manager, Assistant Reserve Manager, and Research Coordinator continued collaboration with the Tijuana River Valley Recovery Team (TRVRT).

4. Development of TRNERR Partnerships

The TRNERR Program Managers worked with CA State Parks SDCD team to host a visit for CA State Parks Director Armando Quintero. Director Quintero is newly appointed and selected San Diego Coast District as among his first district visits of the system. We look forward to working with him in the future.

5. Oversight of Reserve Facilities and Public Access Opportunities

The Reserve Manager worked with State Parks Administration staff, and State Parks maintenance crew, to manage and maintain the TRNERR headquarters and reserve facilities. During this period, the parking lot, restrooms, and visitor center went from closed to open status following COVID-19 considerations. The trails adjacent to the visitor center remained open. Border Field State Park was opened to trail use in April, then week-end vehicular access in June.

The Reserve Manager worked with the TRNERR Education Coordinator and CSP staff to develop concepts for the upcoming 50th anniversary of Border Field State Park.

The Reserve Manager worked with CA State Parks law enforcement and San Diego County Parks to ensure operational alignment with the opening of the new County campground in the Tijuana River Valley.

The Reserve Manager coordinated with CA State Parks Southern Service Center design team to further efforts focused on the repair of Monument Road in Border Field State Park.

6. Reserve Updates Comprehensive Management Plan

TRNERR Core staff committed weekly program manager working sessions towards development and progress on the CMP.

TASK: EDUCATION PROGRAM

Anne Marie Tipton, TRNERR Education Coordinator, California State Parks

1. Development and Implementation of Education Programs

A. Formal and Non-formal Teacher Training

Due to the continued closure of the Tijuana Estuary Visitor Center (through June 22nd) and no in-person programming, neither Tijuana Estuary Explorers nor MARSH curriculum teacher trainings occurred during this period. Teachers who attended virtual programs were sent digital material ahead of their virtual programs to help prepare students.

B. Student-centered Formal and Informal programs

No in-person, student-centered programs were held during this time. Reserve Educators instead continued carrying out their 3 virtual programs through California State Parks, Parks Online Resources for Teachers and Students (PORTS). The Reserve delivered one high school level *Detecting a Changing Climate* (DACC), ten *Salt Marshes and Climate Change* to middle schoolers, and 128 *Salt Marsh Secrets* to elementary students. The programs were mostly conducted as PORTS on-demand programs serving individual classrooms, however there were a handful of Home Learning Programs that serviced large audiences. A total of 5,215 students were reached through these programs.

The Reserve's virtual programs developed for PORTS are available on their own landing page on the PORTS website: <https://www.ports-ca.us/ports-programs/ports-on-demand/tijuana-estuary-natural-preserve>.

C. Interpretation

Lunchtime Live, a weekly Facebook Livestream that began in April 2020, continued during this period. There were 24 programs delivered with a typical length of 20-30 minutes each and totaling 7642 views. The program was designed to provide outreach and interaction with the public since in-person bird and nature walks had ceased. The series has developed a regular following of watchers who engage with questions, comments, and suggest topics for future programs. All videos are captioned later and are made available on the [Reserve's YouTube page](#).

The Education Specialist participated in World Wetlands Day in February on Facebook live with other CA State Park Interpreters. There were 132 views of this multi-park livestream. We had an engagement of 243 users tuning in for an average of 41 minutes on the CA State Parks Facebook page and an engagement of 27 users tuning in for an average of 31 minutes on the PORTS Program Facebook page.

Education staff provided one webinar-style Speaker Series, A Bird in Hand, about MAPS monitoring on April 14, 2021 with 303 views.

Border Field State Park's 50th anniversary is August 21, 2021. Planning for an in-person event is underway. The reserve will launch a podcast and Stqry App to be used by visitors who visit Border Field State Park at the special event.

The Interpretative Master Plan is being reviewed at State Parks headquarters. Hopefully, it will be signed by Interpretive Division Chief by the fall.

D. Visitor Services

The Tijuana Estuary Visitor Center closed on March 12, 2020 due to COVID-19 and but was re-opened on June 23, 2021. The Visitor Center parking lot and restrooms have been closed intermittently during this period as well.

2. Production of Outreach Materials

Reserve Education Staff produced an e-newsletter every month of this reporting period including highlighting volunteers, other special events, and accomplishments. TRNERR volunteers were recruited to write species spotlights for the eNews as well as for social media posts.

3. Volunteer Capacity Building

Bringing back volunteers in person and volunteer training were still on hold during this period. Volunteers are encouraged to provide digital content for digital materials (i.e., eNewsletter), and the Reserve's Facebook page as posts.

4. Environmental education and interpretive capacity and leadership roles

The Reserve's Education Coordinator collaborated with California State Parks Interpretive Division at Headquarters in developing a Climate Change Training for California State Parks. The Education Coordinator was the course leader until she was selected to be a contact tracer from late December to early March. The multi-day training took place in late March 2021.

Task: Coastal Training Program (CTP)

**Dr. Kristen Goodrich, TRNERR CTP Coordinator,
Southwest Wetlands Interpretive Association**

1. Assess the regional need for equity trainings to inform climate planning

The [Regional Adaptation Needs Assessment](#) developed in partnership between CTP, SDRCC, and The San Diego Foundation, was funded by the Caltrans SB 1 Adaptation Planning Grant Program (through SANDAG). It identified information gaps regarding existing risks and adaptation needs, including in the area of equity. In May 2019, SANDAG was awarded additional funding through SB 1, with SDRCC as a sub-recipient. This funding will support the development of tangible guidance on how to address identified risks and needs by holistically implementing projects that link mitigation, adaptation, and broader community benefits. An implementation toolkit, economic guidance document, and equity prioritization document will be developed to help local planners with this complex decision-making.

With SDRCC, in this reporting period, CTP reviewed draft 'equity in adaptation' curriculum that stems from the California Adaptation Planning Guide 2.0, academic research, and other reports. CTP also supported the recruitment for the University of San Diego's Leaders for Outdoor Equity leadership program which aims to build the next generation of land managers, conservationists, outdoor educators and recreational outfitters to promote more diverse and inclusive access to public lands. This program was developed by Outdoor Outreach, The Nonprofit Institute at the University of San Diego, and the US Fish & Wildlife Service. As a result, land managers in the County of San Diego and California State Parks applied and were invited to participate in the leadership institute that begins in late July.

Additionally, CTP continued to participate in the California CTP Equity Workgroup with the two other CA CTPs and CA NERR Liaison to explore opportunities to elevate equity trainings in our state-wide and regional portfolios and evaluate state agency resources for regional application. In this reporting period, with support from TRNERR's Margaret A. Davidson Fellow, TRNERR's DEIJ training inventory was updated and combined with a [DEIJ resource](#) that the CTP Equity Workgroup developed. We expect this resource to be a living document and help to support identification and fit for equity training for SDRCC and other partners and serve to support other California CTPs in their training delivery.

2. Identify training topic targets for SDRCC, as official network training provider

CTP continued to participate in SDRCC Adaptation Planning Working Group (APWG) meetings in period 2 to assess - with SDRCC staff and Working Group members - opportunities for developing training and technical assistance topics in support of adaptation implementation. In addition, recurring meetings were established between SDRCC, CTP, and NOAA OCM west coast learning services to evaluate the new virtual training portfolio for fit. The need was assessed for a training for SDRCC members on equity in [plan alignment](#) and the development of the content, process, and audience identification has commenced in anticipation of a 2022 delivery.

3. Leverage efforts to reduce plastic pollution in the Tijuana Estuary

The [Scripps Ocean Plastic Pollution Challenge](#) was a 6-month accelerator program focused on identifying effective, evidence-based approaches that will curb the flow of plastic into the ocean, with a specific focus on marine conservation and marine cultural preservation areas along California's coast. The inaugural program was launched in this reporting period and participants engaged in a series of virtual short courses, team-based research, and a final two-day challenge to pitch solutions to an expert panel. CTP developed and moderated the first course and served on the panel to evaluate proposals that would make a significant impact in curbing the flow of plastic in the region. Teams had been given less than 3 days to develop the pitches in this hackathon-style challenge, however this finale was the culmination of six months of intensive work.

CTP continued to convene a single-use plastic waste working group in Baja California that meets every two weeks. CTP facilitates these meetings among government and NGO representatives from Tijuana, Tecate, Rosarito, Ensenada, and Mexicali, focusing on informing municipal and State policies. Additionally, CTP has convened a working group on establishing a plastic circular economy that includes representation by the Environmental Commission of the Baja California Congress and is working with the state/federal initiative Modelo de Norma Ambiental para Productos Desechables Compostables y Bolsas Reutilizables. In April, CTP presented on efforts to develop single-use plastics policy at the Baja Peninsula Plastics Summit 2021: "Challenges and Opportunities Creating a Circular Economy in the Baja Peninsula."

CTP continued to leverage its partnership with NOAA Marine Debris Program and implement its project deliverables including the development of 2-day workshop, [Binational Management of Solid Waste and Flooding](#) held in March. It was attended by nearly 200 participants representing the United States and Mexico. 100% of participants reported that binational coordination on the topic was 'very important' thus CTP will continue to convene and facilitate efforts related to emergency preparedness and response to flooding that is both exacerbated by debris blockages and carried by flood waters.

4. Continue to provide strategic CTP technical assistance and workshop/training

CTP delivered trainings in this reporting period and are documented in the performance monitoring database. Notably, CTP co-developed and facilitated the first California

Shore & Beach Preservation Association [webinar series](#) “The Changing Landscape & Future of California’s Shores and Beaches.” Three webinars were hosted in this reporting period: (1) Climate and our coastal future; (2) Economics and the value of our coast; and (3) Lessons learned on resilience and considerations for future sediment solutions.

Various technical assistance was provided to coastal decision-makers in this reporting period including facilitating meetings, providing survey and evaluation assistance, assisting organizations with grant writing, plan/policy revisions, and strategic/action planning. In this reporting period, CTP facilitated virtual TRNERR Advisory Council meetings and the Tijuana Estuary Tidal Restoration Program (TETRP) scoping process for the preparation of the draft TETRP II Phase I environmental impact report/environmental impact statement. TETRP II Phase I would restore approximately 80 to 85 acres of salt marsh, mudflat, tidal channel, transitional/upland habitats on portions of both Border Field State Park and the Tijuana Slough National Wildlife Refuge. (*see also Research and Stewardship*)

Additionally, CTP co-developed a manager-scientist workshop delivered in June to identify needs and opportunities for better alignment of natural and social science research and coastal regional sediment management and adaptation for BEACON. CTP also presented on the role of collaborative science during that meeting and facilitated breakout sessions. Next steps include supporting the revision of a draft science research agenda.

A detailed technical assistance catalog by award year and performance period can be found [here](#).

The CTP Coordinator also continues to serve on the NERRS Science Collaborative and California Shore and Beach Preservation Association boards, among other binational, state, and regional committees/advisory boards.

TASK: STEWARDSHIP PROGRAM

**Lorena Warner-Lara, TRNERR Assistant Reserve Manager,
California State Parks**

1. Habitats downstream of the Goat Canyon Sediment Basin protected from catastrophic sedimentation and trash inundation

The State contract for maintenance of the Goat Sediment Basin was amended for 1 year to use the same contractor, Engineering/Remediation Resources Group, Inc. (ERRG). Work to process and haul approximately 20,000 cubic yards of material off-site will begin in July and run through August. In September, ERRG will begin to excavate an additional 20,000 cubic yards of deposition material from the basins, and initiate work to haul off-site.

Assistant Reserve Manager continues working on the Nelson Sloan Quarry Restoration Project with State Coastal Conservancy and consultant (Dudek) on final design and

environmental review. This project will help with long-term stabilization of Goat Canyon activities (*see also Oversight & Implementation*).

2. Sensitive plant and animal species habitat protected

The Stewardship Program maintained fencing and signage along dunes and coastal bluffs with US Fish and Wildlife Service.

3. Critical monitoring needs identified to maintain habitat health and monitor impacts to sensitive species and restoration projects

The Stewardship Program facilitated continued monitoring of California gnatcatcher, least Bell's vireo, California least tern, and Western snowy plover in the Reserve. Biologists from CA State Parks Southern Service Center conducted the California gnatcatcher and least Bell's vireo protocol surveys for the 2021 survey season. Regular plover and tern monitoring began in March 2021 and will continue until September 2021. This work is largely accomplished through contract with a private consultant and through our partnership with the U.S. Fish and Wildlife Service staff at Tijuana Slough National Wildlife Refuge.

4. On-going restoration and enhancement projects continue trajectory toward healthy vegetation communities and integrate into functional ecosystem components with continued outreach opportunities

The Stewardship program continues to be down staff, the Stewardship Associate position has not been filled yet, and there are hiring delays due to COVID-19. The Assistant Reserve Manager also works as an Environmental Scientist for the Stewardship Program, however, is not funded by this award or counted as match.

Retired Annuitant Environmental Scientist continued maintenance of priority restoration sites.

CSP San Diego Coast District Natural Resources Staff continue work on a stewardship project focused on monitoring, site protection, invasive plant control, seed collection, propagation for restoration of rare plant habitat for Orcutt's liveforever (*Dudleya attenuata ssp. attenuata*) within the Reserve.

Assistant Reserve Manager continued to work with Reserve Manager and Research Coordinator, SWIA Project Manager, USFWS, and project team to support the preparation of the joint EIR/EIS document for the Tijuana Estuary Tidal Restoration Program (TETRP) II Phase I. During this reporting period, the California Department of Parks and Recreation and the U.S. Fish and Wildlife Service initiated the [scoping process for the preparation of the draft TETRP II Phase I](#) environmental impact report/environmental impact statement. TETRP II Phase I would restore approximately 80 to 85 acres of salt marsh, mudflat, tidal channel, transitional/upland habitats on portions of both Border Field State Park and the Tijuana Slough National Wildlife Refuge. (*see also CTP and Research*)

The Assistant Reserve Manager facilitated Tijuana River Action Network meetings with various land managers, public stakeholder groups, and the Reserve's Binational Liaison (CTP), Volunteer Coordinator, and Education Specialist. Planning for the 2021 Tijuana River Action Month (TRAM) has begun. TRAM is a month-long community-based clean-up and outreach event within and adjacent to the Tijuana River NERR. TRAM 2021 will run September 18 through October 16; hybrid events are planned for this year. A portion of the Binational Liaison's time is funded through the NOAA Marine Debris grant.

5. Identify public access and safety issues within the Reserve

Stewardship staff supported the Reserve Manager in coordination with public and Reserve partners to identify high priority access issues and, where feasible, worked to maintain and enhance public access at key locations throughout the Reserve.

In response to the COVID-19 pandemic, Reserve Manager continues to work with State Parks District staff to incorporate County and State guidelines in development of Public Safety closures and protocols for the Tijuana Estuary Visitor Center, grounds, and Border Field State Park. Border Field State Park opened most of its trails and Monument Mesa to pedestrian access on April 30, 2021, and to weekend vehicular access on June 11, 2021. The Park had been closed to all public access since March 2020. The Tijuana Estuary Visitor Center re-opened on June 23, 2021; the parking lot and restrooms were closed intermittently during this period.

State Parks maintenance staff worked to maintain public use facilities at Monument Mesa.

US Fish and Wildlife Service worked to get the fire crew to clear vegetation around priority public access trails around the Visitor Center.

The Reserve Manager worked with the TRNERR Program Managers, and State Park District Chief Ranger, to improve communication around water quality issues and beach closures initiated by the San Diego County Department of Environmental Health.

TASK: INVASIVES

Lorena Warner-Lara, TRNERR Assistant Reserve Manager,
California State Parks

1. High quality nesting habitat for CA Least Tern and Western Snowy Plover

CSP Retired Annuitant Environmental Scientist treated 386 colonies of ice plant (*Carpobrotus edulis*) throughout the dune systems at Border Field State Park. The table shows a comparison over the last nine years. The work was completed in February 2021 using a glyphosate-based nonselective herbicide approved for use near water.

Year	# ice plant treated
2021	546 colonies
2020	386 colonies
2019	418 colonies
2018	Too many to count
2017	375 colonies
2016	310 colonies
2015	500 individuals
2014	886 individuals
2013	1,600 individuals

Foliar applications involve spraying the leaves of target species with a low concentration mixture (1.5-5%) of herbicide in accordance with label instructions. Foliage is covered thoroughly, but not to the point of run-off.

Treatment days are determined based on the weather forecast, ideally when there is little to no wind (5 mph or less) and rain is not expected for 8 to 12 hours. These conditions minimize drift and allow the sprayed vegetation to dry completely.

2. High Quality Habitat for Riparian Birds

CSP Retired Annuitant Environmental Scientist, primarily treated castor bean (*Ricinus communis*), giant reed (*Arundo donax*), and tamarisk (*Tamarix ramosissima*) throughout the Goat Canyon drainage this period. Roundup Pro Concentrate, and Pathfinder II, post-emergent, broad-spectrum herbicides were used. Some annual forbs were mowed before herbicide treatment to reduce seed production and increase plant diversity while also creating some fuel reduction. This year an area that was previously mowed, populated naturally with purple needle grass (*Nassella pulchra*), the state grass of California.

Annual weeds were hand-pulled around native plantings. Other plants treated included fennel (*Foeniculum vulgare*), lens-pod white top (*Lepidium draba*), and black mustard (*Brassica nigra*), bristly ox-tongue (*Helminthotheca echioides*), black mustard (*Brassica nigra*), and globe daisy (*Glebionis coronaria*). CSP District Natural Resources staff assisted in annual treatment of approximately two acres of St. John's wort (*Hypericum ssp.*).

TASK: TEACHERS ON THE ESTUARY

Anne Marie Tipton, TRNERR Education Coordinator, California State Parks

1. Educators increase their knowledge of and appreciation of estuarine and watershed environments, as well as the necessary skills, to act as stewards of estuarine and watershed resources.

Reserve educators created a flyer and started advertising for a Fall 2021 TOTE.

TASK: RESEARCH COORDINATION

**Dr. Jeff Crooks, TRNERR Research Coordinator,
Southwest Wetlands Interpretive Association**

1. Research by TRNERR staff increases local knowledge

Given COVID-19 restrictions, much of Research Program's work continued to be done remotely, although we now are able to do limited field and lab work. This in-person work has focused in core research and monitoring efforts, such as SWMP. We also continue to use community science platforms, such as iNaturalist, both by contributing observations during (socially-distanced) outings as well tracking what others are finding in local systems of interest.

Most of our volunteer programs is still suspended due to COVID-19. However, the Reserve has been able to host a summer intern through the California State University COAST program, Alexa Buss, from Cal Poly Pomona. She is largely working remotely but is able to join us for field work. We are also happy to have our Davidson Fellow, Nancy Torres, continue on with us. Both Alexa and Nancy are helping to assess status and trends of pollution in the estuary, using historical data and current sampling (supported in part by the matching NFWF grant). Alexa is also working on community science (especially iNaturalist) as a research and monitoring tool.

Given COVID-19 restrictions, much of our office work continued to be done remotely, although field and lab work is largely back to normal (with the exception of volunteer-based efforts).

2. Restoration offers opportunities for coupled science / management

Planning associated with the Tijuana Estuary Tidal Restoration Project (TETRP) has advanced during this reporting period. We held a Notice of Preparation / Notice of Intent public meeting to formally kick off the EIR/EIS process and continue to work on that document. As part of this, we have been analyzing how water levels will change in the restoration site with sea level rise, taking tidal hydraulics into account (led by David Cannon at Anchor QEA). This will be used to further refine marsh response, in an effort led by the Karen Thorne and Kevin Buffington at the USGS (as part of a grant to the State Coastal Conservancy from the NCCOS Effects of Sea Level Rise Program – see below). We are also beginning to prepare for fall pre-restoration monitoring in the TETRP footprint and are preparing for fall sampling at the South Bay Salt Ponds site in San Diego Bay.

3. TRNERR is used as a reference site

Salt marsh monitoring, conducted by scientists at the University of California Santa Barbara as part of the mitigation project in north San Diego County, occurred in fall of 2020, and results were reported during this reporting period. The Oneonta Slough SWMP station is used to assess the relative performance of the San Dieguito Lagoon mitigation site in terms of dissolved oxygen. The program description and past monitoring reports are available at:

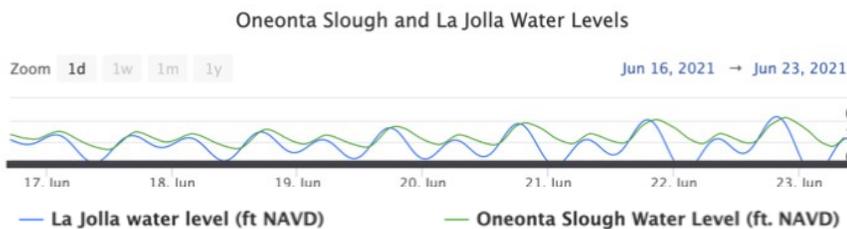
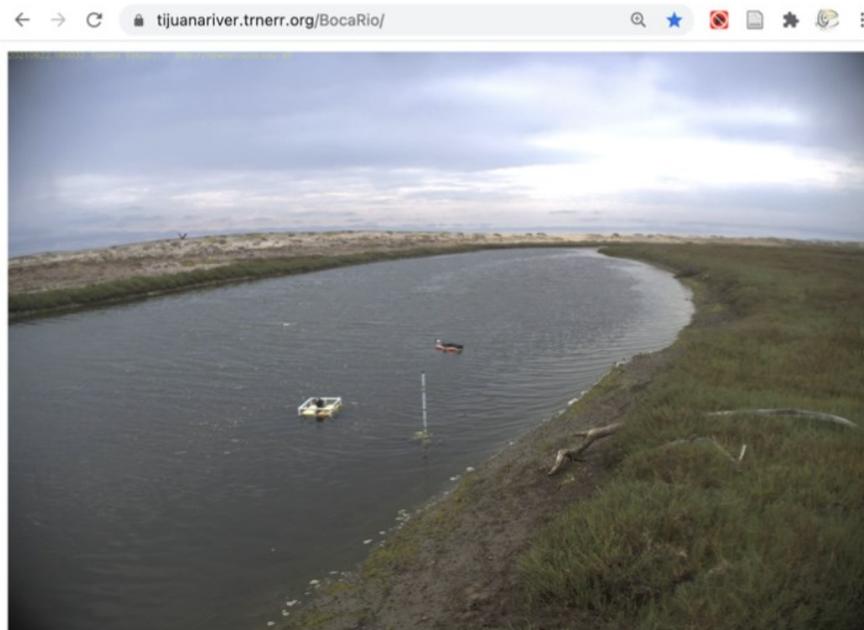
http://marinemitigation.msi.ucsb.edu/mitigation_projects/wetland/index.html.

4. The Reserve offers attractive opportunities for researchers

Research activities in the Reserve continued to be impacted by COVID, but water quality has improved, which has allowed more work to continue. Several projects are underway (often with the Reserve as a collaborator), and these are listed in the Research and Monitoring Database. Examples of work conducted during this reporting period include:

- Partnering on a project on hypoxia dynamics, led by Scripps with funding from NCCOS Coastal Hypoxia Research Project (with SWIA/TRNERR as a sub-awardee). This project is leveraging long-term TRNERR-based monitoring in both the Tijuana Estuary and Los Peñasquitos Lagoon. We continue to deploy mussel biosentinels in the Tijuana Estuary, in conjunction with the Oneonta Slough SWMP site. This work is also being conducted in partnership with researchers in the Biology Department at San Diego State University. These mussels are wired to track shell gape and heart rate, and this information will be coupled with abiotic monitoring (including SWMP) to better understand the relationship between environmental conditions (such as hypoxia) and biological responses of individual organisms. This is being used as a pilot for recently awarded NERRS Science Collaborative grant (Luke Miller, SDSU, as PI), which will expand the use of these biosentinels to other contexts (e.g., aquaculture).
- The NCCOS Ecological Effects of Sea Level Rise (EESLR) project led by the State Coastal Conservancy and with TRNERR as a partner, continues at the Reserve. This is focused on assessing marsh response to climate change in wetlands throughout Southern California, and the focus for the Tijuana Estuary is determining how habitats to be created as part of TETRP might respond to sea level rise and sediment input from the watershed. The USGS is currently refining their WARMER model to project habitat change in the two restoration alternatives, taking into account the modelled hydraulics at this site. This is being informed by a Science Advisory Team.
- Studies of contamination in the river and estuary continue, led by researchers in the Geography, Public Health, Engineering, and Field Station programs at San Diego State University. This work includes deployment of sensors that can track a broad suite of parameters, including CDOM and tryptophan, which can be indicative of anthropogenic impacts. This also includes infrastructure to deliver this information in real-time as part of the High Performance Wireless Research and Education Network (HPWREN). We have deployed a web cam at the Oneonta Slough SWMP site, which shows the tidal channel and deployed instrumentation (the mussel biosentinels and SDSU logger). In addition, we are using this to visually track tides in the estuary, which are plotted alongside water levels at the Oneonta Slough SWMP station and open coast at the Scripps pier. This shows attenuation of tides in the estuary, and is being [displayed on the](#)

[TRNERR website.](http://trnerr.org)



In addition, Dr. Crooks is involved advising or supporting a number of graduate student research projects. Dr. Crooks is committee chair for three students at the University of San Diego, and serves on two additional committees there. He is involved in supporting students from SDSU, Scripps, UCLA, CSU Fullerton, and UC Irvine.

5. Communication of key research findings and perspectives

Dr. Crooks has continued to be virtually involved in various steering committees and virtual field trips. Activities during this reporting period include:

- California Estuary MPA Monitoring Project
- San Diego Bay Living Shoreline
- Los Peñasquitos Lagoon Restoration Planning (with separate funding)
- HiTIDER (History and Topography to Improve Decision-making for Estuary Restoration) - NERRS Science Collaborative project
- NOOC (Native Olympia Oyster Collaborative) – NERRS Science Collaborative project
- Southern California Wetlands Recovery Project

6. Reporting and Database Entry

Progress reports were prepared and submitted, and projects were entered into the Research Database.

TASK: IMPLEMENTATION OF THE SYSTEM-WIDE MONITORING PROGRAM

**Dr. Jeff Crooks, TRNERR Research Coordinator,
Southwest Wetlands Interpretive Association**

1. High quality meteorological and water quality data

NOAA SWMP funding allows SWIA and TRNERR to substantially leverage partnerships to maintain a robust monitoring program that address issues relevant to the Reserve specifically, and the region as a whole. Our partners and funders include California State Parks, the USFWS, the State Coastal Conservancy, the Los Peñasquitos Lagoon Foundation, and National Fish and Wildlife Foundation. We now operate three stations in the Tijuana River Estuary, two of them formal SWMP and one is associated with TETRP (and is being maintained in accordance with SWMP protocols). Two sites are monitored in South San Diego Bay, both SWMP. We also maintain three telemetered sites in Los Peñasquitos Lagoon, which are also being operated in accordance with SWMP protocols. This data is available at <http://torreypines.trnerr.org/>. We continue to have extended deployments and some missing nutrient samples in the Tijuana Estuary associated primarily with transboundary flows (which is a particular concern because of the presence of SARS CoV-2 in wastewater). QAQC and post-checks, however, indicate that the loggers are performing well even with extended deployments. This information is being documented (e.g. as metadata) and shared with the CDMO.

Dr. Crooks continues to serve as Chair of SWMP Oversight Committee, which helps ensure that high-quality data is produced by the Reserves. Disruptions to monitoring programs due to COVID-19 have been a theme since the beginning of the pandemic, and the Oversight Committee and CDMO are addressing these.

2. Understanding of long-term vegetation dynamics and SSAM-1

We were able to conduct spring vegetation monitoring and soil sampling. We also are working on completing our SSAM-1 plan, and have been in contact with our geodetic advisor about that.

3. Integration of monitoring with education and outreach programming

The TOTE training has again been postponed, but we are working with the Education Program on an event for the fall. We have been working with education staff, however, to incorporate research and monitoring into virtual events, such as “Lunchtime Live.”

TASK: PROFESSIONAL DEVELOPMENT, TRAINING, PRESENTING
Dr. Jeff Crooks, TRNERR Research Coordinator,
Southwest Wetlands Interpretive Association

1. NERRs Integration and Leadership Development

This activity did not occur during this reporting period.

2. Staff development

Participation in conferences has been limited due to COVID-19, and, when it has occurred, it remains virtual.

3. CZMA Integration and Leadership Development

This activity did not occur during this reporting period.

4. TRNERR Staff Program Support and Enhancement

Travel to field sites has been limited during this reporting period, although there has been local travel to field sites.

TASK: INVASIVE SPECIES - APPLICATION OF RESEARCH TO MANAGEMENT
Dr. Jeff Crooks, TRNERR Research Coordinator,
Southwest Wetlands Interpretive Association

1. Improved understanding and management of local invaders

We continue to track invasive species as part of our vegetation monitoring, using baited minnow traps, and with iNaturalist We have also received external funding from the Navy (via the US Fish and Wildlife Service) to do work on the Kurushio Shot Hole Borer, an invasive beetle that has dramatically impacted riparian habitats in the valley. Dr. Crooks also advises two students at the University of San Diego who work on invasive species, one on the invasive Japanese oyster, *Crassostrea gigas*, and the other on freshwater invasions into Los Peñasquitos Lagoon.

2. Improved regional, national, and international information sharing

Dr. Crooks is Co-President of the Society for the Study of Marine Bioinvasions, and we continue to work with the Local Organizing Committee (at the Smithsonian Environmental Research Center scientists) and the Scientific Steering Committee on the meeting to be held in May 2022. This may be hybrid virtual / in-person (in Annapolis, MD). Dr. Crooks will be working to engage NOAA and the NERRS in the conference.

TASK: MARGARET A. DAVIDSON FELLOWSHIP SUPPORT
Dr. Jeff Crooks, TRNERR Research Coordinator,
Southwest Wetlands Interpretive Association

1. Successful implementation of Davidson Fellowship

Nancy Torres, our Margaret A. Davidson Fellow, has been actively conducting her research and working on broader issues of relevance to the Reserve. She completed her first round of ecotoxicology fieldwork in May and is currently waiting on the lab results. She presented at the [SoCal and DSW SETAC 2021 Annual Meeting](#) last April and received the "Best Graduate Student Lightning Talk" award. Her abstract was recently accepted to be presented at the Coastal Estuarine and Research Federation's (CERF) [2021 Conference](#) and the Society of Environmental Toxicology & Chemistry's (SETAC) [North America 42nd Annual Meeting](#). Additionally, she was recently elected to be the student board member of the SoCal SETAC Board of Directors. For the Margaret A. Davidson fellowship, she is part of the NERRS DEIJ committee, geared towards supporting the organization's efforts to reach out to minority-serving organizations and groups about the Davidson Fellowship program.

N.Torres has also ensured to give back to the community in hopes of inspiring other young scientists from underrepresented backgrounds by presenting alongside TRNERR's Education Coordinator to [elementary school students](#) on her career pathway and her work with the Reserve. Similarly, she has presented to elementary school kids through the Ocean Discovery Institute's (ODI) [Science Leader program](#). Through ODI, she also accepted the position to be an on-call Writing Mentor for their mentorship program. She is also an Equity & Environment Fellow for [The Nonprofit Institute](#), and has started collaborating with the TRNERR's CTP Coordinator to add on a social science chapter to her thesis on how to actionize her scientific results to best guide future management at the Reserve.