



INFORMATION ITEM

Lead Scientist Report

Summary

The Delta Plan specifies sub-goals for providing bird habitat and migratory corridors, yet analyses on how birds use different habitats in the Delta have been scarce. In this article, the research team uses bird survey data from over 10,000 surveys and sophisticated statistical modeling to map the presence/absence of 55 bird species throughout the Delta. The team then identifies the top 5% of land areas used by riparian landbirds (i.e., birds that use wooded habitat adjacent to waterways) and waterbirds and evaluates characteristics of those priority bird conservation areas. They find that while there is much overlap with the priority habitat conservation areas identified in the Delta Plan, many of these priority bird conservation areas are unprotected and dependent on agricultural land uses (i.e., corn cropping) or will be vulnerable to inundation by rising sea level by 2050.

Priority Bird Conservation Areas in California's Sacramento–San Joaquin Delta

Dybala, K. E, Sesser, K. A, Reiter, M. E, Shuford, W., Golet, G. H, Hickey, C., & Gardali, T. (2023). Priority Bird Conservation Areas in California's Sacramento–San Joaquin Delta. San Francisco Estuary and Watershed Science, 21(3).

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Determining how to prioritize restoration at a landscape scale requires consideration of how restoration alternatives will achieve multiple benefits and address vulnerabilities to climate change. Among those multiple benefits, the Delta Plan specifies that bird habitat and migratory corridors should be considered. While bird survey data are abundant, few studies have attempted to synthesize information about species distributions that could inform conservation and restoration prioritization.

To fill this knowledge gap, Kristen Dybala from Point Blue Conservation Science and coauthors performed a synthesis study using data from 2,547 surveys of riparian landbirds

and 7,820 surveys of waterbirds. They used sophisticated statistical modeling techniques to predict the probability of presence of nine species of riparian landbirds and 46 species of waterbirds as dependent on the land-use, climate, and hydrologic characteristics of each point in space, as well as of the distance to nighttime roosts or to waterways. Subsequently, they used the modeled probability of presence of each species at each location to identify locations that are the most probable for finding most species within each group (riparian landbirds and waterbirds). Within each group, the 5% most important locations for landbirds and waterbirds were mapped. The research team then evaluated how many of these areas fell into areas prioritized for conservation in the Delta Plan or areas that are already preserved, the land uses that they overlapped with, and how many areas are likely to be inundated through sea-level rise by 2050 as identified in the Delta Adapts Vulnerability Assessment.

The priority areas for conservation of riparian landbirds and waterbirds together totaled 26,019 hectares (about 100 square miles), of which 601 hectares (2.3 square miles) were identified as priorities for both landbirds and waterbirds. Of the total 26,019 hectares, 39% fell within existing protected areas or conservation easements. Another 28% fell within the priority habitat restoration areas identified in the Delta Plan and 18% occupied areas identified as at high risk of inundation by 2050. Agricultural lands represented 46% of the total priority bird conservation areas, half of which were in corn cropping, with the remaining land-use types split between wetlands and riparian lands. While most of the wetlands overlapping with the priority bird conservation areas are currently protected, most of the riparian and agricultural lands are not.

The research team pointed out that forthcoming changes in crops due to climate change may have adverse effects for Delta birds. Their analysis underscores the importance of land farmed for corn for waterbird presence. In the central Delta, many of these lands are flooded following the fall harvest to provide habitat and forage for waterbirds, which the data demonstrate are using these areas. In the future, however, corn yields in the Delta may decline, encouraging farmers to shift to higher-valued perennial crops, which do not provide similar habitat value. This analysis suggests where this shift might have the highest consequences for bird conservation, as well as which additional, currently unprotected areas may be most important for meeting bird conservation goals.

Delta Science Program Activities

[Delta Independent Science Board Decision-Making Under Deep Uncertainty Workshop](#)

The Delta ISB, with support from the Delta Science Program, is hosting a seminar series to explore concepts from decision-making under deep uncertainty and present tools that can help managers and stakeholders evaluate and plan for a wide range of plausible futures in the Sacramento-San Joaquin Delta. This seminar series will help inform the Delta ISB's decision-making under deep uncertainty review. Experts have been speaking on sources of and approaches for managing uncertainties and incorporating human behavior in anticipatory planning efforts. The next virtual seminar will be on January 18, 2024, and will feature speakers from the Deltares Institute, including Dr. Marjolijn Haasnoot (also affiliated with the University of Utrecht), Dr. Keren Bolter, and Dr. Kathryn Roscoe. The seminar will focus on Dynamic Adaptive Planning (DAP), when it's most useful, and how it might be relevant for management in the Delta under deep uncertainty. A save-the-date flyer and registration will be released soon. You can watch recordings of previous seminars via this link:

<https://www.youtube.com/playlist?list=PLqTHClIW1Hhp3mADP60KecSq3wCiyndN2>.

Collaborative Science and Peer Review Unit Peer Reviews

The Collaborative Science and Peer Review unit at the Council's Delta Science Program (DSP) – the unit responsible for administering peer review to support Delta decision-making – has been extremely busy with peer reviews in 2023 and will continue with more reviews going into 2024.

Recently completed reviews:

1. Department of Water Resources (DWR) Delivery Capability Report: The DWR manages the State Water Project (SWP) to deliver water to nearly two-thirds of Californians for residential, agricultural, municipal, and industrial uses. The SWP's current and projected future water supply is estimated every two years in a Delivery Capability Report (DCR), issued by the DWR and used extensively by SWP contractors and others to plan their water uses. For the first time, the DCR was produced using new data and methods to account for climate change. DWR requested an independent peer review of these new analytical approaches. Three reviewers completed individual letter reviews of 1) the use of climate adjusted historical hydrology to account for climate change in the current DCR, and 2) using multiple risk-informed climate change scenarios to model future water supply for future DCRs. Reviewers unanimously agreed that the new data and methods make for an improved DCR that provides more and better information for water users. They suggested a few changes and additions to further improve future DCRs, including accounting for effects of the Interdecadal Pacific Oscillation, being explicit about what level of sea level rise could affect SWP operations, and using monthly (instead of annual) mean changes in

temperature and precipitation. DWR will make some of these changes in the current DCR, to be released at the end of 2023, and will incorporate other changes in future reports.

2. US Bureau of Reclamation (USBR) Water Temperature Modeling Platform (WTMP):

The final report for the peer review of the USBR's WTMP was made available in late October, following a public meeting in September. This peer review is the second of two on this topic; the previous midterm review occurred July 2022. Temperature management is a key parameter for protection of species with specific cold water needs and is one of the most complex subjects related to Central Valley Project operation. The WTMP, called for in the 2019 Biological Assessment Proposed Action, can provide suggestions for short- and long- term monitoring to assist resource managers of major Central Valley Project reservoirs with balancing water resources for downstream uses as well as instream temperature needs. The peer review panel included five hydrogeologist and engineering experts from across the United States. Reviewers found that the modeling platform was developed in a transparent manner that engaged relevant stakeholders along the way, made use of a state-of-the-art data management system, and provides detailed, high-quality documentation of the model's development and implementation.

Reviews underway:

3. USBR Fish and Aquatic Effects: USBR reinitiated Endangered Species Act (ESA) Section 7 consultation for the long-term operations (LTO) of the CVP and SWP in September of 2021. The Fish and Aquatic Effects Analysis is a portion of the Environmental Impact Statement, a report mandated by the National Environmental Policy Act, that is being developed by USBR for the LTO of the CVP and SWP as part of the reinitiation of consultation. The analyses inform a Biological Assessment, which USFWS and the National Marine Fisheries Service will then evaluate to determine whether the Proposed Action will jeopardize listed species. The intent of this peer review is to evaluate the analytical approach and use of methods and tools taken by USBR to assess how the LTO of the CVP and SWP affect the aquatic environment and the exposure, response, and risk to select ESA-listed species (individuals and populations). The peer review panel consists of five experts who will review the project's materials and provide a letter report to USBR. The review kicked off in late November, and the letter report will be available in early 2024.

4. DWR Summer-Fall Habitat Action (SFHA): The California Department of Fish and Wildlife (CDFW) issued an Incidental Take Permit (ITP) to DWR for the continued operation of the SWP in March 2020. The SFHA is a critical component of an adaptive management plan for the SWP that involves a suite of actions, including pulsed flows through the north Delta and operation of the Suisun Marsh Salinity Control Gates and managed wetlands. It is

designed to improve habitat conditions for the critically endangered Delta Smelt, including the overlap of key physical and biological attributes (e.g., salinity, turbidity, and food availability), to enhance their growth, survival, and recruitment. DWR and USBR through collaboration with the Delta Coordination Group (DCG) have developed Monitoring and Science Plans for the SFHA that are updated annually, with several additional action-specific monitoring and research plans (e.g., Suisun Marsh Salinity Control Gates reoperation, North Delta Food Subsidy, and Sacramento Deepwater Ship channel studies). In addition, a Problem, Objectives, Alternatives, Consequences & Tradeoffs (PrOACT) model and structured decision-making (SDM) approach was adopted to determine the suite of Summer-Fall actions to recommend in a given hydrologic year based on a transparent and standardized tradeoff assessment of key objectives and performance metrics. The purpose of this 4-member panel and the individual letter reviews that panel members will produce is to assist the DCG and ITP Adaptive Management Team in making improvements for the evaluation and adaptive management of the SFHA. The review will kick off in late January, and the final letters will be available in May 2024.

The Collaborative Science and Peer Review unit continues to manage requests for new peer reviews and ongoing interagency agreements to administer peer reviews. The unit is also developing a more robust process for documenting and sharing key takeaways from peer reviews. The goal is to improve the process of highlighting the value of peer reviews administered by the DSP and disseminate the outcomes of peer reviews more broadly.

Tidal Wetland Restoration Symposium

On November 1st, the State Water Contractors and the California Department of Water Resources jointly hosted a symposium focused on emerging tidal wetland science in the Delta and Suisun Marsh, with an emphasis on restoration projects being implemented and monitored by the Fish Restoration Program, a joint effort led by the California Department of Water Resources and the California Department of Fish and Wildlife. The region has lost over 90% of its historic tidal wetlands, and the Fish Restoration Program is working to restore over 8,000 acres of these unique ecosystems to meet the requirements of the US Fish and Wildlife Biological Opinions for Delta smelt. To create effective restoration projects that accomplish program goals in a cost-effective manner, sound science is required to inform adaptive management activities.

To promote information sharing between the science and management community, this symposium brought together stakeholders to discuss the state of the science for tidal wetland restoration. Project implementation began in 2018, and speakers presented preliminary data including but not limited to water quality, fish habitat use, and

invertebrate communities. Results show that restoration projects are supporting fish and invertebrate communities similar to adjacent areas, and the shape and size of wetland channels determine which fish are found where. Delta Science Program Environmental Program Manager Dr. Dylan Chapple led a session on adaptive management, linking science to on-the-ground implementation of projects. Restoration projects can take decades to develop, and more research is needed to address many related uncertainties, but early results presented at this symposium indicate that these projects are likely to fulfill their objectives and provide additional support for a healthy Delta ecosystem.

On Your Radar

California Sea Grant State Policy Fellowship Program

In October 2023, staff from the Delta Science Program (DSP) and Planning and Performance Division participated in the annual matching workshop for the California Sea Grant State Policy Fellowship Program. State Policy Fellows are recent post-graduates interested in exploring a career path in the public sector at the science-policy interface. Fellows are matched with municipal, state or federal agencies for 12-month fellowship periods to gain 'hands-on' experience in marine, coastal, and/or watershed resources and decisions affecting those resources in California. The contract to support the 2024 and 2025 classes of fellows was approved by the Council at the September 2023 meeting.

The Council has hosted a total of 39 fellows through this program for the past eleven years. Previous work performed by fellows includes working with the Delta Lead Scientist on monthly Lead Scientist Reports to the Council; supporting the Delta Independent Science Board; participating in the Delta Science Plan and Science Action Agenda updates; and assisting in Delta Plan amendments and updates. The Council's 2023 cohort of fellows includes:

- Pooja Balaji, Science Communication, Synthesis, and Decision-Support unit (DSP)
- Eduardo Martinez, Collaborative Science and Peer Review unit (DSP)
- Sam Pyros, Interagency Ecological Program (IEP)
- Kaira Wallace, Adaptive Management unit (DSP) and Independent Science Board support (ISB)
- Charnelle Wickliff, Planning and Performance Division

The 2024 class of fellows will join the Council early next year (between January and March). Fellowship placements for this next class include:

- Margot Mattson, a current San Diego State University student working toward a master's degree in Watershed Science, will join the Adaptive Management unit (DSP) and support the Independent Science Board (ISB).
- Megan Nguyen, a current California State University Fullerton student working toward a master's degree in Biology, will join the Science Funding unit (DSP).
- Alex Stella, a recent graduate from Moss Landing Marine Laboratories (San Jose State University) with a master's degree in Marine Science, will join the Collaborative Science and Peer Review unit (DSP).
- Jessica Weidenfeld, a current San Diego State University student working toward a master's degree in Ecology, will join the Science Communication, Synthesis, and Decision-Support unit (DSP).
- Dane Whicker, a recent graduate from the Scripps Institution of Oceanography at UC San Diego with a master's degree in Marine Conservation and Biodiversity, will join the Planning and Performance Division

Delta Research Solicitation Update and Connections to Delta Tribes and Communities Survey

An important core function of the Delta Science Program is to fund research aligned with management needs vis a vis the Science Action Agenda. The Delta Science Program is preparing to release its next solicitation for Delta Research in Winter 2023/2024 (website here: <https://deltacouncil.ca.gov/delta-science-program/delta-science-proposalsolicitations>). Although proposals that address any science action in the 2022-2026 Science Action Agenda (available here: <https://scienceactionagenda.deltacouncil.ca.gov/>) may be eligible for funding following a competitive review process, the upcoming solicitation emphasizes participatory research, in which information is co-produced by both the researchers and the communities (including Tribes) affected by the research. Through a co-production approach, communities are engaged in the research process early and often. In addition, proposals with a substantial social science component will be eligible for additional points during the review process.

In recognition of the fact that co-production takes time and that there are often challenges in identifying appropriate partnerships, the Delta Stewardship Council launched a survey (available here: <https://www.surveymonkey.com/r/N7X8S9FI>) to help connect interested researchers with California Native American Tribes and/or community-based organizations. The survey has been extended and will be open for at least one month into the solicitation. Although successful matches are not guaranteed for all survey respondents, the intention

is that this process will generate new partnerships that will result in proposals for the forthcoming solicitation.

By the Numbers

Science Program staff will summarize current numbers related to Delta water and environmental management. The summary (Attachment 1) will inform the Council of recent counts, measurements, and monitoring figures driving water and environmental management issues.

List of Attachments

Attachment 1: By the Numbers

Attachment 2: Visual Summary of Article

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