SOUTH DELTA

Conservation Opportunity Region Overview

Regional Setting

The south Delta region is predominately characterized by agriculture, bordered by the cities/towns of Brentwood, Discovery Bay, Tracy, and Vernalis to the west and Manteca, Lathrop, and Stockton to the east. The main aquatic features include the San Joaquin River, and the Middle and Old Rivers, connecting the south Delta to the central Delta islands and confluence with the Sacramento River. Most of the island areas in the northern portion of the south Delta are subsided, while land in the southern portion is predominantly at current intertidal elevations or above sea level.¹ The San Joaquin River National Wildlife Refuge² is located southeast of Vernalis along the San Joaquin River, and Caswell Memorial State Park is situated east of the Stanislaus River confluence.³ Paradise Cut is a slough west of Lathrop that, with sufficient flow, bounds Stewart Tract on the south and connects the San Joaquin River with Old River downstream. Historically, it was one of the chief distributary branches of the San Joaquin River. Twice during the 19th century, the main floodwaters of the San Joaquin River flowed through Paradise Cut and will likely do so again during exceptionally high-flow years. Paradise Cut plays a critical role in protecting the River Islands development from flooding and directing floodwaters away from the urbanizing floodplains in Lathrop and Stockton.⁴ An extended floodway also provides opportunities to restore lost Delta wildlife habitat. In order to protect new development, new levees could be built, set well back from the bank of Paradise Cut, with a strip seven miles long and at least 1,000 feet wide, open to seasonal inundation.⁵ This could offer the potential for riparian forests to reestablish, as well as for large areas of restored freshwater marsh downstream from Paradise Cut, into which floodwaters could feed.

Planning History

The Paradise Cut Expansion, also called Lower San Joaquin River Bypass (LSJRB), represents a multi-benefit project in the south Delta that could provide increased flood protection and alleviate constrained riparian reestablishment along the San Joaquin River, thereby enhancing river and floodplain ecosystems.⁶ A suite of studies, spanning 15 years, evaluated its feasibility (see text box below). In 2007, Senate Bill 5 directed the DWR and Central Valley Flood Protection Board to evaluate the feasibility of significantly reducing flood stage in the San Joaquin River watershed upstream and south of Paradise Cut, through bypasses or floodways. The 2013 Delta Plan also recommends implementation of the LSJRB and prohibits encroachments in the LSJRB planning area.⁷ The 2017 Central Valley Flood Protection Plan further proposes construction of the LSJRB, dependent on the evaluation of potential major physical and operational elements.⁴ In 2016, the San Joaquin County Resource Conservation District (SJCRCD) received Proposition 1 funding support from the Sacramento-San Joaquin Delta Conservancy for the development of the Paradise Cut Conservation and
Flood Management Plan (PCCFMP), and for the acquisition of flood and conservation easements in the Paradise Cut area. The PCCFMP focuses on planning for this new south Delta flood bypass to reduce flood risk, improve wildlife habitat, and sustain agricultural land in San Joaquin County along the San Joaquin River south of Paradise Cut. The project will also develop a compliance and permitting strategy; prepare a California Environmental Quality Act/National Environmental Policy Act required conceptual design and project description; quantify project costs and benefits; identify and advance near-term opportunities for restoration; and conduct outreach to agencies, officials, and landowners. PCCFMP is supported by an effective, cross-sector partnership with relevant expertise, local support, and a history of working together. The project is designed explicitly to address the resource demands of a changing climate, rooted in a scientific foundation that emphasizes the ecosystem benefits of floodplain restoration and modeling to demonstrate the flood attenuation benefits of the proposed bypass.

In addition, the potential for floodplain restoration and enhanced riparian corridors along the San Joaquin River have been assessed as part of the 2013 Bay Delta Conservation Plan Public Draft (BCP). The evaluation of conservation potential in the BCP focused on a) increased inundation acreage to benefit listed fish species and b) increased frequency of inundation and residence time to improve production of listed fish species food resources. Overall, potential actions for riparian corridor and seasonal floodplain improvements include levee setback installation, creation of flood bypasses, riparian planting, and channel margin enhancement.

Opportunities for Conservation

The Paradise Cut LSJR has been termed the “cornerstone of South Delta restoration,” with the goals to afford flexibility for future conservation; retain multi-benefit solutions by integrating flood management, conservation, and agricultural land protection; provide major habitat benefits for a variety of sensitive species, including riparian brush rabbit (Sylvilagus bachmani riparius) and Swainson’s hawk (Buteo swainsoni); and to increase the area of floodplain habitat for fish by giving the river more room. By expanding the floodplain, the LSJR will sustain wildlife-friendly agriculture and also provide seasonal aquatic inundation in support of giant garter snake (Thamnophis gigas) and native fish such as Sacramento splittail (Pogonichthys macrolepidotus), juvenile rearing of Chinook salmon (Oncorhyncus tsawytshcha) and Central Valley Steelhead (O. mykiss). The reestablishment of riparian and grassland ecosystems in and along...

Previous Studies of Lower San Joaquin River Bypass

- 1998 Flood Evaluation Action Team
- 1999 CALFED
- 2002 Comprehensive Study
- 2004 South Delta Water Agency Flood Plan
- 2005 River Islands Paradise Cut Improvement Plan
- 2007 River Island, Natural Resources Defense Council, NHI, Central Valley Flood Protection Board settlement analysis
- 2010 Department of Water Resources (DWR) analysis for the 2012 Central Valley Flood Protection Plan (CVFPP)
- 2012 DWR Bay Delta Conservation Plan analysis
- 2012 American Rivers analysis
- 2013 DWR analysis
- 2013 U.S. Army Corps of Engineers Lower San Joaquin Feasibility Study analysis

the Paradise Cut floodplain will be based on soil type and habitat needs of sensitive species. Project design will be focused to minimize roughness in lower elevation areas to improve hydraulic performance during flood flows.

Figure 3: Map of Paradise Cut floodway proposal - Base Map. Source: Delta Vision Strategic Plan

Stakeholders at the 2016 Delta Conservation Framework workshops praised the conservation opportunities in South Delta considered in the 2016 CVFPP Conservation Strategy and provided the following vision for a south Delta conservation focus: A corridor of functional riverine and riparian ecosystems between Highway 5 and the San Joaquin River National Wildlife Refuge near Vernalis, providing a connection to the floodplains in Paradise Cut and restored channel margin habitat in the legal Delta. Previously proposed levee setbacks include both banks of the San Joaquin River from Vernalis to Interstate 5, along Middle River on Union Island, along the San Joaquin River left bank on Roberts Island, and a short reach of the Old River right bank. Riparian enhancement in the Vernalis to Interstate 5 corridor would benefit threatened fish species and sensitive plant species like the Delta button celery (Eryngium racemosum), and Slough thistle (Cirsium crassicaule).³

Potential Solutions to Recognized Challenges

There are three primary challenges in the South Delta that should be considered when planning and implementing conservation: 1) Improved flood control is needed to protect new and existing urban areas; 2) The cities of Manteca, Lodi, and Stockton have disadvantaged community status, with frozen urbanization and increased foreclosures; and 3) Very little public land exists in the south Delta, especially public land managed for conservation or parks. The LSJRB could provide a solution to the challenge of flood control in the south Delta through supporting conservation and the local agricultural economy together. The LSJRB goals include maintaining existing agricultural operations; restoring shaded riparian aquatic habitat along decommissioned levees; providing riparian cover for riparian brush rabbit, riparian woodrat (Neotoma fuscipes riparia), and valley elderberry longhorn beetle (Desmocerus californicus dimorphus); removing revetment to restore geomorphic process along decommissioned levees; and restoring the southern portion of the current in-channel bar for floodplain rearing habitat.
Wildlife-friendly Agriculture

Like elsewhere in the Delta, agriculture in the south Delta agriculture has been the main way of life, industry, and cultural linkage to the land for several generations of Delta residents. As a result of these strong cultural ties to the land, local landowners are concerned about the potential to lose their livelihood and lifestyle if habitat restoration displaces agriculture. Wildlife-friendly farming integrates conservation and agricultural production to benefit wildlife and conserve biodiversity on land that is used to produce agricultural commodities. Wildlife-friendly agricultural practices include farming crops that also benefit wildlife—such as rice, safflower, processed tomatoes, corn, sunflower, and irrigated pasture—and provide drainage ditches, hedgerows, and trees for habitat value.  

At present, predominately wildlife-friendly grazing, seasonal crops, and alfalfa are grown near Paradise Cut and in most of the south Delta. Maintaining these wildlife-friendly agricultural practices alongside enhanced riparian vegetation along the San Joaquin River and other south Delta streams would provide expanded wildlife habitat benefits, because wildlife-friendly agricultural fields could provide movement corridors beyond the riparian zone.

Integrated Flood Management

Flood protection for the agricultural operations in the south Delta region is provided by levees and the Reclamation Districts that maintain them. Extensive modeling analyses by DWR and others show that the proposed design of the LSJRB would lower the San Joaquin River flood stage by over two feet where Interstate Highway 5 crosses the river and substantially reduce flood risk between I-5 and Stockton (J. Cain, pers. com.). Expanding the floodway at Paradise Cut will improve sensitive species habitat without changing agricultural production in most years, because farmland in the expanded floodway would only likely be inundated every 12 years. In addition to the LSJRB, proposals for setback levees along the San Joaquin and Old rivers would provide integrated benefits for agriculture in the form of new stronger levees; for wildlife as enhanced riparian vegetation along the old, decommissioned levees; and a wider area for flood waters to spread out over.

Climate Change and Adaptation Opportunities for Long-term Sustainability

The Delta region is expected to experience more intense winter flooding and storm effects, causing greater erosion of riparian areas and increased sedimentation in wetlands. In the south Delta, increased winter river flows and more intense winter storms will significantly increase the hydraulic pressure on levees in agricultural areas where subsidence is likely to increase over time. If key levees collapse during a storm, it could lead to catastrophic flooding. In the summer, lower river flows are expected to increase the likelihood of saltwater intrusion farther upstream in the Delta, disrupting ecosystem processes, food webs, agriculture, and local water supplies. Winters will likely become wetter and warmer, with more extreme weather events earlier or later in the season, reduced snow packs in the Sierra Nevada, earlier snowmelt with most precipitation falling as winter rain, and increases in run-off quantity and velocity during storm events. Annual mean temperatures and precipitation are expected to increase in San Joaquin County by 2100. Upland areas of the Delta, including portions of San Joaquin County, are also projected to experience limited increases in wildfire frequency.

Looking ahead, it is critical to incorporate projected long-term changes into Delta conservation planning by developing actions that identify the resources needed to integrate climate change adaptation into management practices. For example, Matella and Merenlender (2014) showed that only 4–17% of years are expected to produce flow-related habitat conditions required for spilitail and salmon rearing along the San Joaquin study reach through 2100. As a result, adaptation to global climate change at the regional scale will require novel approaches to regionally integrated management of water, energy, food, and ecosystem processes over the long term, supported by monitoring and scientific studies.
of the concept that increased flood capacity and shading of riverine areas through vegetation can provide multiple
benefits by reducing flood risk and reducing evapotranspiration when overhanging vegetation cools water

Scenario planning\(^{20}\) is a critical tool that could be used to help anticipate impacts
of climate change on ecosystems, species, infrastructure, agricultural practices, recreation, and other land uses and integrate these into the long-term
conservation planning picture.\(^{22}\) A scenario planning approach integrated within a
Structured Decision Making (SDM)\(^{22}\) process would also incorporate a decision
model and long-term adaptive management and funding needs to anticipate the
evolution of near-term conservation actions into the future. Planners and land
managers using these tools to look ahead will determine the best way to
prioritize conservation actions based on the likelihood of long-term effectiveness,
the potential for outcomes to evolve over time, and cost effectiveness. Regular
reevaluation of scenarios over time will allow land managers and planners to
reexamine how earlier projections played out and adjust conservation land
management over time.

Link to Delta Conservation Framework

The Delta Conservation Framework is a high-level conservation planning framework to 2050 with a landscape-scale
focus across the entire Delta, Suisun Marsh, and Yolo Bypass. Implementation of its overarching goals and
strategies is recommended in the context of regionally focused, multi-stakeholder partnerships that develop
Regional Conservation Strategies with finer scale regional objectives and implementation actions. Integrating the
LSJRB proposal with a formal multi-stakeholder partnership could facilitate the development of a long-term south
Delta Regional Conservation Strategy (RCS) aligned with other regional conservation, flood management, and
wildlife-friendly agricultural efforts within the Delta Conservation Framework’s landscape-scale goals and
strategies. For example, Goals C to F in the Delta Conservation Framework focus on developing multi-benefit
conservation solutions through integrative data analysis and scenario planning. Strategies and objectives within
these goals suggest utilizing best available datasets to implement actions that help reestablish ecological function;
assist species recovery; and integrate conservation benefits with flood protection, wildlife-friendly farming
operations, and recreation at the local and landscape scales. A south Delta focused RCS could also present a unique
opportunity to address conservation-related permitting through a general regional permit (Goal F), and develop
short- and long-term funding via bond initiatives and other opportunities (Goal G).

Entities/Partnerships Important for Implementation (Now and Ongoing)

The cornerstones for successful conservation planning and implementation in the Delta are: 1) establishing and
maintaining trust among stakeholders through continuous communication and evaluation of goal-based progress;
2) an agreed upon structure for roles and responsibilities to manage an implementation partnership; and 3)
science-based decision support. The San Joaquin Area Flood Control Agency; Southern Delta Levee Protection and
Channel Maintenance Authority; San Joaquin County; San Joaquin Farm Bureau; SJCRC; River Islands
Development, LLC; American Rivers; and Natural Resources Defense Council are important partners in continued
planning for conservation and multi-benefit solutions in the south Delta. The SJRCD is emerging as a local
champion for planning with available funding. The South Delta Water Agency and Reclamation Districts 17 and
2062 are the primary leaders and entities that could engage landowners in the south Delta during
implementation of the LSJRB. The LSJRB would also benefit from an established permitting liaison to help
navigate through the permitting process, resolve issues as they arise, and potentially develop a Memorandum of
Understanding between participating entities to make permitting more efficient and collaborative.
Endnotes


