

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 (SJCRC) received Proposition 1 funding support from the Sacramento-San Joaquin Delta Conservancy for the development of the *Paradise Cut Conservation and*

44 *Flood Management Plan (PCCFMP)*, and for
 45 the acquisition of flood and conservation
 46 easements in the Paradise Cut area.⁸ The
 47 PCCFMP focuses on planning for this new
 48 south Delta flood bypass to reduce flood risk,
 49 improve wildlife habitat, and sustain
 50 agricultural land in San Joaquin County along
 51 the San Joaquin River south of Paradise Cut.
 52 The project will also develop a compliance and
 53 permitting strategy; prepare a California
 54 Environmental Quality Act/National
 55 Environmental Policy Act required conceptual
 56 design and project description; quantify
 57 project costs and benefits; identify and
 58 advance near-term opportunities for
 59 restoration; and conduct outreach to
 60 agencies, officials, and landowners. PCCFMP is
 61 supported by an effective, cross-sector
 62 partnership with relevant expertise, local
 63 support, and a history of working together.
 64 The project is designed explicitly to address
 65 the resource demands of a changing climate,
 66 rooted in a scientific foundation that
 67 emphasizes the ecosystem
 68 benefits of floodplain restoration and modeling
 69 to demonstrate the flood attenuation benefits of the proposed bypass.

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

Source: <http://www.sjafca.com/pdf/ljirdsrfmp/PC2Bypass.pdf>

71 In addition, the potential for floodplain restoration and enhanced riparian corridors along the San Joaquin River
 72 have been assessed as part of the 2013 Bay
 73 Delta Conservation Plan Public Draft (BDCP).⁹
 74 The evaluation of conservation potential in the
 75 BDCP focused on a) increased inundation
 76 acreage to benefit listed fish species and b)
 77 increased frequency of inundation and
 78 residence time to improve production of listed
 79 fish species food resources.⁹ Overall, potential
 80 actions for riparian corridor and seasonal
 81 floodplain improvements include levee setback
 82 installation, creation of flood bypasses, riparian
 83 planting, and channel margin enhancement.

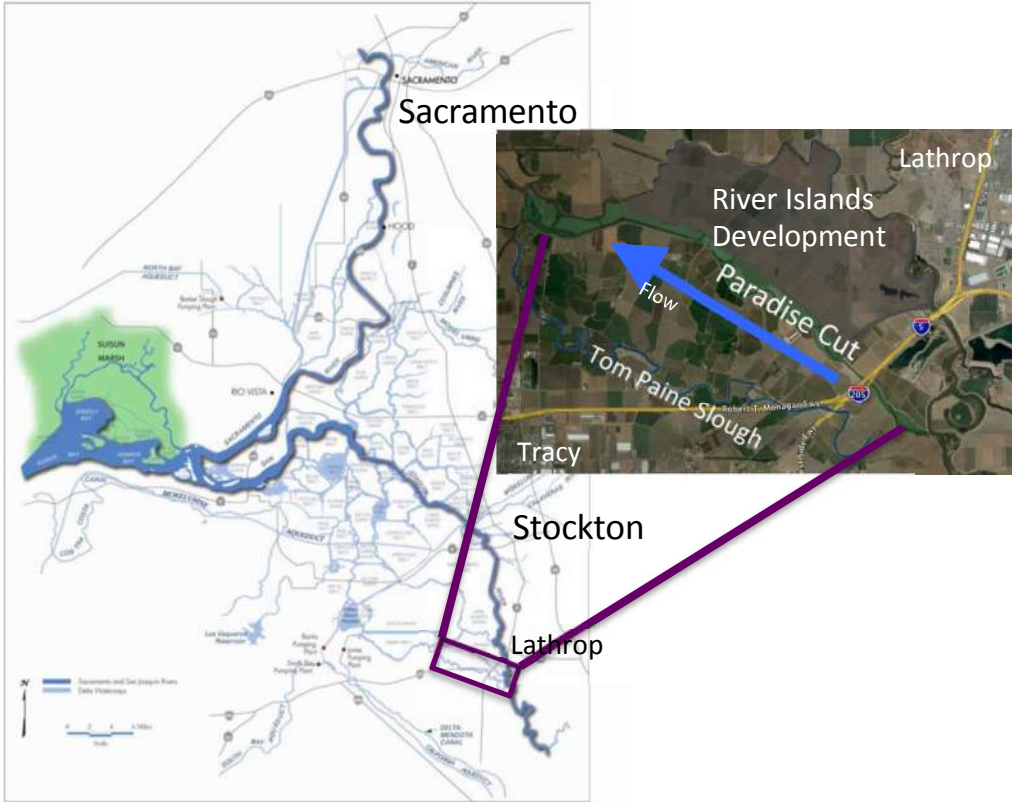


Figure 2: Old River at Victoria Island Photo: C. Sloop

85 **Opportunities for Conservation**

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

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



99
100 **Figure 3: Map of Paradise Cut floodway proposal - Base Map. Source: Delta Vision Strategic Plan**

101 Stakeholders at the 2016 Delta Conservation Framework workshops praised the conservation opportunities in
102 South Delta considered in the 2016 CVFPP Conservation Strategy and provided the following vision for a south
103 Delta conservation focus: A corridor of functional riverine and riparian ecosystems between Highway 5 and the San
104 Joaquin River National Wildlife Refuge near Vernalis, providing a connection to the floodplains in Paradise Cut and
105 restored channel margin habitat in the legal Delta. Previously proposed levee setbacks include both banks of the
106 San Joaquin River from Vernalis to Interstate 5, along Middle River on Union Island, along the San Joaquin River left
107 bank on Roberts Island, and a short reach of the Old River right bank.⁹ Riparian enhancement in the Vernalis to
108 Interstate 5 corridor would benefit threatened fish species and sensitive plant species like the Delta button celery
109 (*Eryngium racemosum*), and Slough thistle (*Cirsium crassicaule*).⁹

110 Potential Solutions to Recognized Challenges

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

121 Wildlife-friendly Agriculture

122 Like elsewhere in the Delta, agriculture in the south Delta agriculture has been the main way of life, industry, and
123 cultural linkage to the land for several generations of Delta residents. As a result of these strong cultural ties to the
124 land, local landowners are concerned about the potential to lose their livelihood and lifestyle if habitat restoration
125 displaces agriculture. Wildlife-friendly farming integrates conservation and agricultural production to benefit
126 wildlife and conserve biodiversity on land that is used to produce agricultural commodities. Wildlife-friendly
127 agricultural practices include farming crops that also benefit wildlife—such as rice, safflower, processed tomatoes,
128 corn, sunflower, and irrigated pasture—and provide drainage ditches, hedgerows, and trees for habitat value.¹⁰ At
129 present, predominately wildlife-friendly grazing, seasonal crops, and alfalfa are grown near Paradise Cut and in
130 most of the south Delta. Maintaining these wildlife-friendly agricultural practices alongside enhanced riparian
131 vegetation along the San Joaquin River and other south Delta streams would provide expanded wildlife habitat
132 benefits, because wildlife-friendly agricultural fields could provide movement corridors beyond the riparian zone.
133

134 Integrated Flood Management

135 Flood protection for the agricultural operations in the south Delta region is provided by levees and the Reclamation
136 Districts that maintain them. Extensive modeling analyses by DWR and others show that the proposed design
137 of the LSJRB would lower the San Joaquin River
138 flood stage by over two feet where Interstate Highway
139 5 crosses the river and substantially reduce flood risk
140 between I-5 and Stockton (J. Cain, pers. com).
141 Expanding the floodway at Paradise Cut will improve
142 sensitive species habitat without changing agricultural
143 production in most years, because farmland in the
144 expanded floodway would only likely be inundated
145 every 12 years. In addition to the LSJRB, proposals for
146 setback levees along the San Joaquin and Old rivers
147 would provide integrated benefits for agriculture in the
148 form of new stronger levees; for wildlife as enhanced
149 riparian vegetation along the old, decommissioned
150 levees; and a wider area for flood waters to spread out
151 over.
152
153



Figure 4: South Delta levee road

Photo: C. Sloop

154 Climate Change and Adaptation Opportunities for Long-term Sustainability

155 The Delta region is expected to experience more intense winter flooding and storm effects, causing greater erosion
156 of riparian areas and increased sedimentation in wetlands.^{11,12,13,14} In the south Delta, increased winter river flows
157 and more intense winter storms will significantly increase the hydraulic pressure on levees in agricultural areas
158 where subsidence is likely to increase over time. If key levees collapse during a storm, it could lead to catastrophic
159 flooding.¹⁵ In the summer, lower river flows are expected to increase the likelihood of saltwater intrusion farther
160 upstream in the Delta, disrupting ecosystem processes, food webs, agriculture, and local water supplies.^{13,16}
161 Winters will likely become wetter and warmer, with more extreme weather events earlier or later in the season,
162 reduced snow packs in the Sierra Nevada, earlier snowmelt with most precipitation falling as winter rain, and
163 increases in run-off quantity and velocity during storm events.^{13,16,17} Annual mean temperatures and precipitation
164 are expected to increase in San Joaquin County by 2100. Upland areas of the Delta, including portions of San
165 Joaquin County, are also projected to experience limited increases in wildfire frequency.¹⁴

166 Looking ahead, it is critical to incorporate projected long-term changes into Delta conservation planning by
167 developing actions that identify the resources needed to integrate climate change adaptation into management
168 practices. For example, Matella and Merenlender (2014) showed that only 4–17% of years are expected to produce
169 flow-related habitat conditions required for splittail and salmon rearing along the San Joaquin study reach through
170 2100.¹⁸ As a result, adaptation to global climate change at the regional scale will require novel approaches to
171 regionally integrated management of water, energy, food, and ecosystem processes over the long term, supported
172 by monitoring and scientific studies.¹⁹ The LSJRB and the proposed setback levees fit into this vision and allow a test

173 of the concept that increased flood capacity and shading of riverine areas through vegetation can provide multiple
174 benefits by reducing flood risk and reducing evapotranspiration when overhanging vegetation cools water
175 temperatures.

176 Scenario planning²⁰ is a critical tool that could be used to help anticipate impacts
177 of climate change on ecosystems, species, infrastructure, agricultural practices,
178 recreation, and other land uses and integrate these into the long-term
179 conservation planning picture.²¹ A scenario planning approach integrated within a
180 Structured Decision Making (SDM)²² process would also incorporate a decision
181 model and long-term adaptive management and funding needs to anticipate the
182 evolution of near-term conservation actions into the future. Planners and land
183 managers using these tools to look ahead will determine the best way to
184 prioritize conservation actions based on the likelihood of long-term effectiveness,
185 the potential for outcomes to evolve over time, and cost effectiveness. Regular
186 reevaluation of scenarios over time will allow land managers and planners to
187 reexamine how earlier projections played out and adjust conservation land
188 management over time.



189 **Figure 5: Riparian Brush Rabbit.**
190 *Photo: USFWS*

190 [Link to Delta Conservation Framework](#)

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

206 **Entities/Partnerships Important for Implementation (Now and Ongoing)**

207 The cornerstones for successful conservation planning and implementation in the Delta are: 1) establishing and
208 maintaining trust among stakeholders through continuous communication and evaluation of goal-based progress;
209 2) an agreed upon structure for roles and responsibilities to manage an implementation partnership; and 3)
210 science-based decision support. The San Joaquin Area Flood Control Agency; Southern Delta Levee Protection and
211 Channel Maintenance Authority; San Joaquin County; San Joaquin Farm Bureau; SJCRCD; River Islands
212 Development, LLC; American Rivers; and Natural Resources Defense Council are important partners in continued
213 planning for conservation and multi-benefit solutions in the south Delta. The SJRCD is emerging as a local
214 champion for planning with available funding. The South Delta Water Agency and Reclamation Districts 17 and
215 2062 are the primary leaders and entities that could engage landowners in the south Delta during
216 implementation of the LSJRB. The LSJRB would also benefit from an established permitting liaison to help
217 navigate through the permitting process, resolve issues as they arise, and potentially develop a Memorandum of
218 Understanding between participating entities to make permitting more efficient and collaborative.

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