Action Specification Sheet:
Franks Tract Restoration

1 Short Description and Hypothesized Bottleneck

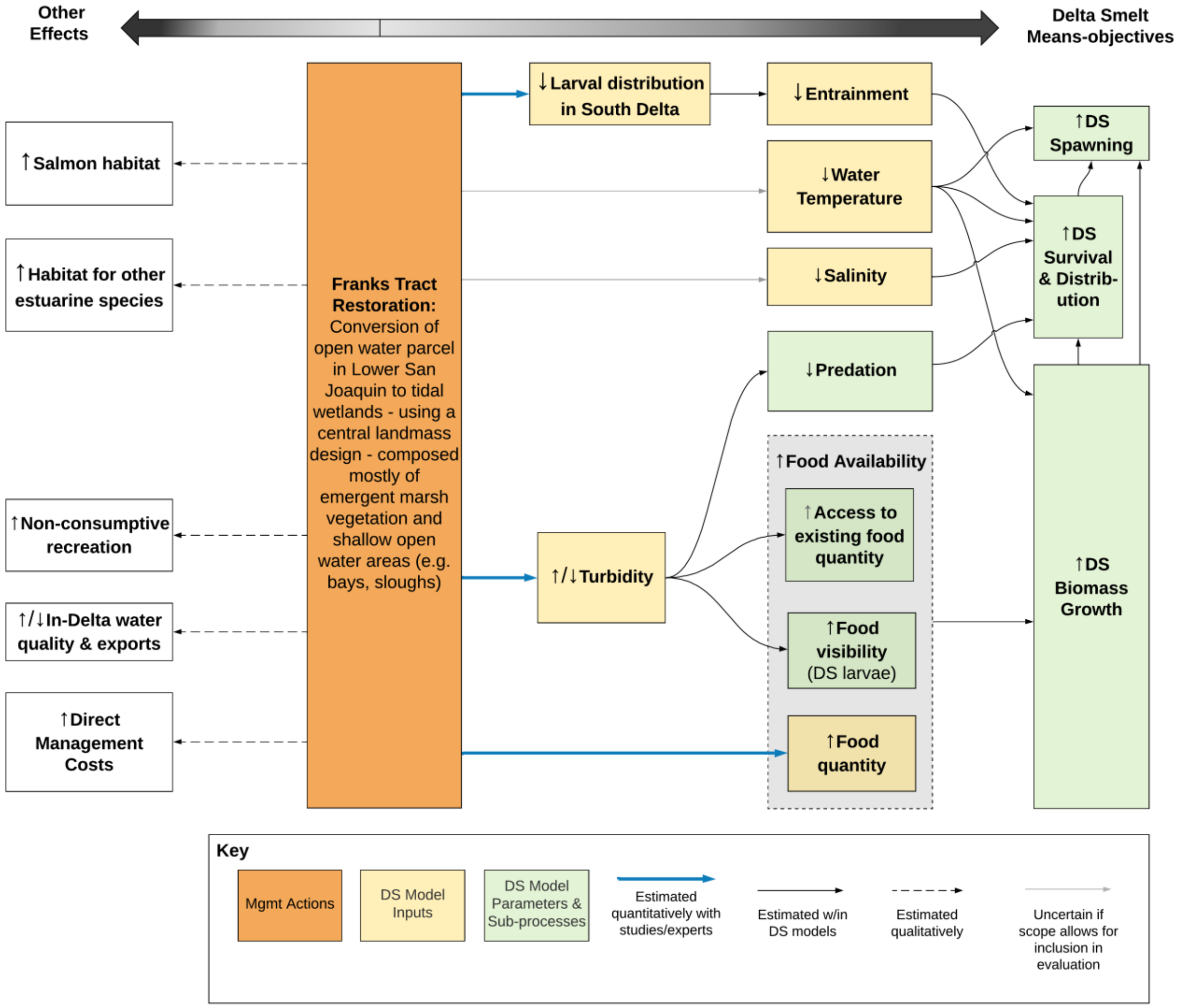
This action involves the restoration of a 3,000-ac+ area of Franks Tract and Little Franks Tract in the Lower San Joaquin River subregion in the Central Delta, which is currently a flooded island of shallow open water (CDFW, 2020). The area experiences high densities of invasive plants and predator fish species, as well as saltwater intrusion. Restoration of this area is designed to establish a large area of intertidal marsh with channels (1,370 ac), deepens open water areas to discourage nuisance submerged aquatic vegetation, and creates water and land based recreational opportunities (Figure 1).

Land use change in the San Francisco Estuary has decreased the area of tidal and other wetlands by >90%, resulting in roughly the same decrease in primary productivity for the Estuary region (SFEI-ASC 2020). Tidal wetlands are important for sustaining food webs that benefit Delta Smelt and other species, as well as providing suitable abiotic conditions (e.g., climate refugia) for species (Sherman et al., 2017; SFEI-ASC 2020).

See the Franks Tract Futures report (CDFW, 2020) for full details on the action and existing analyses on its effects.

Figure 1. Preferred design for Franks Tract restoration, chosen by stakeholders, advisors, and the public through a collaborative process (see CDFW, 2020).

2 Influence Diagram



3 Action Evaluation

#	Effect Hypothesis	Effect Characterization for Round 1 SDM
1	**Restoration of tidal wetlands → food quantity** **Zooplankton:** Converting agricultural or managed wetlands to tidal wetlands will provide a net increase in zooplankton simply through converting land to water. Depending on the design of a restored tidal wetland site, the shallow open water around and within the site may have higher productivity on account of having higher water residence time and greater land/water interaction (SFEI-ASC 2020). Mahardja et al. (2019) found food density was higher in tidal	We combined (added) the effects of two other actions (Aquatic Weed Control and Tidal Wetland Restoration) on food density to represent Franks Tract management. “Franks Tract restoration would create 1,370 ac of emergent marsh, tidal channels, and associated upland habitat and 1,000 ac of deep water (greater than 20 feet) habitat” (CDFW, 2020, pp. 4).” We could assume these values represent reducing SAV coverage by 1,000 ac and restoring 1,370 ac of wetlands. **Low bookend effects: removal of SAV**

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	wetlands in the Yolo Bypass relative to other regions, and Delta Smelt had higher growth rates. **Benthic Invertebrates:** Diet studies have found that Delta Smelt eat benthic invertebrates. The TWG for the SDM Demo project thought that the hypothesis that tidal wetlands provide greater access to benthic invertebrates (see #4) for Delta Smelt is more likely than the hypothesis that tidal wetlands have a higher density of benthic invertebrates (TWG call, Dec. 15, 2017). Overall, the loss and conversion of tidal wetlands since the early 1800s has decreased primary production by > 90% in the Delta (SFEI-ASC 2020).	Methods were developed for estimating effects of aquatic weed control on prey density. These methods used those developed for the Delta Smelt Demo Project that assumes total biomass of zooplankton in each strata increases linearly with the increase in open water areas. For Round 1 evaluation, we will assume no increase in herbicide use in this action, and therefore, no direct negative effect of this action (via herbicides) on zooplankton density. **High bookend effects: removal of SAV + high estimate of effects from tidal wetland restoration** High bookend effects of food captured the additive effects on prey density due to removal of SAV (described above) and the high bookend estimates used for the tidal wetland restoration action in the SDM evaluation. It is assumed that 50% of a wetland restoration project's footprint becomes shallow open water that could generate zooplankton (Randy Mager, DWR, online meeting with Compass, 21 Apr 2022). The high bookend effects ("SFEI-RMA" methods) from tidal wetland restoration combined two existing methods/analyses. First, changes in phytoplankton density, given scenarios of tidal wetland restoration in this process, were estimated using an analysis done by SFEI see (SFEI report [Vaugh et al. 2020], pp. 27 and Cloern et al. 2021). The methods and predicted changes in phytoplankton are further described in Section 6.3. Second, changes in zooplankton density, given the changes in phytoplankton from tidal wetland restoration, were based on RMA copepod modeling methods (RMA 2021, pp. 6-7). These were used by the DCG to evaluate changes in zooplankton density for the North Delta Flow Action and Deepwater Ship Channel Action. These methods were adapted for this process to estimate change in zooplankton density in a subregion, given tidal wetland restoration. The RMA study estimated the relationship between zooplankton and chlorophyll a, and the current SDM process assumes chlorophyll a is equivalent to phytoplankton.
2	**Restoration of tidal wetlands → decrease in aquatic weeds → increase in turbidity**	Applied same methods as Aquatic Weed Control action. Used relationships described in Hestir et

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	Increasing shallow open-water areas increases turbidity from wind and wave interaction with the sediment (Sherman et al., 2017). Mahardja et al. (2019) found turbidity was higher in tidal wetlands in the Yolo Bypass relative to other regions, and Delta Smelt had higher growth rates. Preliminary hydrodynamic modeling from RMA found the effect on turbidity varied based on specific location of restored wetland (S. Andrews, RMA, call with Compass, Aug. 25, 2021). Invasive submerged aquatic vegetation exists in high densities in this area and has been found to reduce local turbidity (CDFW, 2020).	al. (2016) to estimate how much turbidity would change in an area when aquatic weeds are removed. Hestir et al. (2016) provide trends for turbidity decline as a function of aquatic weeds and sediment supply. This is the method that was used in the SDM Demo Project. “Franks Tract restoration would create 1,370 ac of emergent marsh, tidal channels, and associated upland habitat and 1,000 ac of deep water (greater than 20 feet) habitat” (CDFW, 2020, pp. 4).” We could assume these values represent reducing SAV coverage by 1,000 ac and restoring 1,370 ac of wetlands. The report suggests deepening portions of the open water by dredging, which could discourage rooted SAV. Importantly, the report acknowledges the requirement for ongoing SAV maintenance.
3	**Turbidity → Increased Food Visibility** Studies have shown that Delta Smelt larvae benefit from turbidity to see their prey, which increases consumption and growth rates (Baskerville-Bridges et al., 2004; Hasenbein et al., 2016; Moyle et al., 2016).	Estimated/accounted for in IBMR. The IBMR indirectly incorporates effects of turbidity on increased food visibility. It includes a direct relationship between turbidity and consumption (which affects growth, and survival rates). It scales the effect of turbidity on these rates using the following relationship: rates are at their maximums (dependent on smelt length and other factors) when Secchi depth < 24 cm and rates decline to 85% of their maximum value when Secchi depth >84 cm (Smith 2022).
4	**Turbidity → Increased Food Access** Hammock et al. (2019) found that stomach fullness of Delta Smelt was positively associated with turbidity and tidal wetland area. Turbidity was expected to increase Delta Smelt access to food – especially through greater access to benthic invertebrates swept into pelagic zone through bottom water mixing into the water column (TWG, pers. comm., Demo Project).	Estimated/accounted for in IBMR. The IBMR indirectly incorporates effects of turbidity on increased food access. It includes a direct relationship between turbidity and consumption (which affects growth, and survival rates). It scales the effect of turbidity on these rates using the following relationship: rates are at their maximums (dependent on smelt length and other factors) when Secchi depth < 24 cm and rates decline to 85% of their maximum value when Secchi depth >84 cm (Smith 2022).
5	**Turbidity → Reduced predation** The translucent body color and small size of Delta Smelt may make them less visible to predators in moderately turbid water (Moyle et al., 2016). Ferrari et al. (2014) found that	Estimated/accounted for in IBMR. The IBMR includes equations for mortality and growth rates that represents the following pattern: Delta Smelt experience lower predation risk as turbidity increases. As turbidity

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	adult Delta Smelt predation was lower in more turbid water. Bennett and Burau (2015) also found Delta Smelt migration movements were positively associated with turbidity and hypothesized this was due to lower risk of predation.	increases and predation risk declines, Delta Smelt respond by increasing foraging rates and growth. The IBMR incorporates effects of turbidity on consumption, growth, and survival rates. It scales the effect of turbidity on these rates using the following relationship: rates are at their maximums (dependent on smelt length and other factors) when Secchi depth < 24 cm, and rates decline to 85% of their maximum value when Secchi depth >84 cm (Smith 2022).
6	**Restoration of tidal wetlands → Salinity** Tidal wetlands may influence local or regional salinity dynamics. Additional analyses found that higher salinities may influence the distribution of fish (e.g., "high salinity in November and December may induce movement of Delta Smelt away from productive spawning areas" [Hamilton *in prep*, Performance Analysis]). Salinity was also proposed to negatively influence Delta Smelt growth and survival (Smith et al. 2020).	This pathway was not captured in this SDM process. Possibilities for future evaluation: Hydrodynamic modeling was conducted that predicted changes in salinity in the Franks Tract area under the preferred design, relative to current (no action) conditions (Franks Tract report [CDFW, 2020], pp. 55-57; Appendix D). However, changes in salinity varied locally (CDFW, 2020, pp. 56), and additional data analysis would be required to summarize these changes by subregion. The magnitude of the changes was fairly small (± 200 µS/cm), relative to the range of "suitable" salinity conditions (0 – 2,000 µS/cm) during the larval/early juvenile life stages (as discussed and defined by the TWG, Sept 2021).
7	**Restoration of tidal wetlands → Reduce thermal stress** Tidal wetlands can provide pockets of thermal refugia for Delta Smelt – i.e., areas where temperatures do not exceed "lethal" conditions in summer months and "stressful" conditions in spring months (P. Stumpner, pers. comm., Temperature subgroup meeting, 11 June 2021). Additional lab and field studies found that higher temperatures exceeding certain thresholds can increase mortality (Komoroske et al. 2014, Swanson et al. 2000) and sublethal stress (Komoroske et al. 2015). Other studies have found correlations between lower temperature and higher Delta Smelt outcomes, such as consumption rates (Eder et al. 2013; Rose et al. 2013), occurrence (Sommer & Meija 2013), affinity and habitat suitability (Hamilton & Murphy, 2020) and population change (S. Hamilton, pers. comm.).	This pathway was not captured in this SDM process for this action. See information in the Tidal Wetlands Restoration action summary sheet for more details.

#	Effect Hypothesis	Effect Characterization for Round 1 SDM
8	**Franks Tract Restoration → Change in flows → Distribution in South Delta → Entrainment (Delta Smelt mortality)** Altered flow patterns from Franks Tract tidal wetland restoration could influence Delta Smelt distribution/movement into the South Delta, which could reduce Delta Smelt risk for entrainment in the South Delta.	Estimated with available data. Particle tracking was done in the Franks Tract report (CDFW, 2020, pg. 60, Appendix D) that showed a ~20-25% reduction in entrainment potential when comparing simulation results under the preferred restoration design to current (no action) conditions. Note that the simulations were conducted for three scenarios representing different conditions: 1) High outflow, OMR ~-4,400, from Feb 2010 [Below Normal water year] 2) Low outflow, OMR ~-3,200, from Feb 2015 [Critically Dry water year] 3) Low outflow, OMR ~-1,500, from May 2015 [Critically Dry water year]. The % reduction of entrainment was greater for particles coming from the west of Franks Tract, relative to those coming from the east. See CDFW (2020, Appendix D) for more details. These effects were quantified in the evaluation by reducing the % distribution in South Delta in Mar-May (larval life stage) in all years by 25%. This assumes the maximum reduction in distribution in the South Delta from simulation studies. It is important to acknowledge this assumptions is based on limited scenarios from particle tracking studies. The % change in South Delta distribution was then re-distributed (added) to the Lower San Joaquin subregion, representing an increase in fish distributions to this subregion. Particle tracking studies showed negligible changes in particle recovery in the West Delta (corresponding to the Confluence subregion) between scenarios with and without Franks Tract restoration. Therefore, the % of fish prevented from entering the South Delta due to the action are assumed to primarily end up in the adjacent Lower San Joaquin subregion. See Figure 3.
Financial and water resources		
	Restoration of tidal wetlands → Increased direct management costs **Upfront Costs:** Rule of thumb is that it costs between $20,000 to $30,000/acre to restore	Estimated with available data & expert judgment. The Franks Tract Futures report (CDFW, 2020) estimated a total project cost of $560M (initial cost). We also used the high estimate for annual

#	Effect Hypothesis	Effect Characterization for Round 1 SDM
	tidal wetlands. This includes planning, buying land, permitting and construction. A key factor in the upfront cost is the cost of land and how much land adjacent to the wetland needs to also be protected (pers. Comm., C. Wilcox, Aug. 10, 2017). • Assumption for capital costs used in the SDM Demo project was: Low end - $20,000 per acre • High end - $30,000 per acre **Operating costs:** If there's no levee, ongoing operational costs for tidal wetlands are low. Costs could include some policing of the site (access, dumping) and vegetation management. If there is a levee or water control structure, then costs would be quite a bit higher. If the site is designed well and water velocity through tidal channels is high enough, aquatic weeds will not establish themselves. The more saline sites (e.g., Suisun Marsh sites) will face less risk of aquatic weed intrusion than the fresher water sites (pers. Comm., C. Wilcox, Aug. 10, 2017). For the 8,000 acres that are mitigation for the water projects, the long-term operations and management of these projects will be covered by the projects. For additional acres identified under EcoRestore, long-term funding will be more challenging. The capital portion of these projects is payed for through bonds, which cannot be used for ongoing management. The McCormick-Williamson project is currently facing issues along these lines – it's owned by the Nature Conservancy, but they do not have operational funding so they are looking for a state agency to take over the land and manage (pers. Comm., C. Wilcox, Aug. 10, 2017). Assumption for operating costs used in the SDM Demo Project (C. Wilcox, Jan. 2018): • Low end – $250 / acre High end – $500 / acre	operating costs for tidal wetland restoration of $600 per ac. See Section 13 for details. **Final financial resource estimate: $28,587,400 per year per 100 ac**

We note that other pathways in the influence diagram above are accounted for in the structure of the IBMR and other models that will be used in the SDM evaluation. For example, the IBMR incorporates effects of temperature on consumption, growth, and survival rates. It scales the effect of temperature on these rates using the following relationship: rates are at their maximums (dependent on smelt length and other factors) when temperature < 23 °C, and rates decline to 0% of their maximum value when temperature >27 °C.

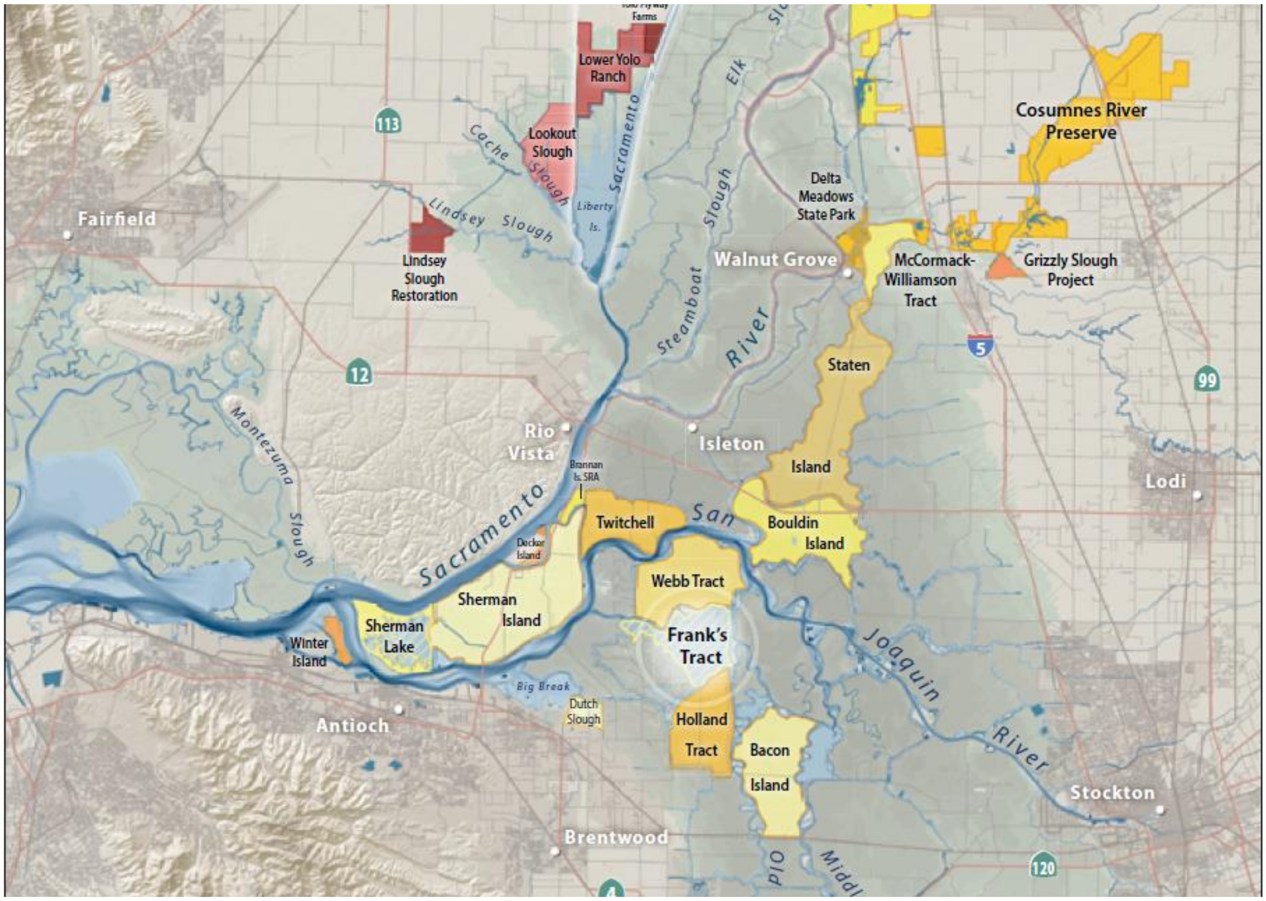
3.1 Implementation Notes

Implementation Need	Notes
Aquatic weed removal → improved navigation for recreational and other boaters (water skiing, sailing, etc.)	The presence of aquatic weeds inhibits the use of an area by boats. The specific benefits of aquatic weed removal for boaters would depend on the specific sites that are treated and the extent to which those areas are valued use areas for boaters.
Aquatic weed removal → Large mouth bass recreational fishing.	Large mouth bass fishery is more prominent in the central (e.g., parts of Lower SJ strata), east, and south Delta. Striped bass fishing is more prominent in the North Delta (Upper Sacramento strata). The areas where aquatic weed control would be targeted for delta smelt are expected to have low to no overlap with areas that are important for large mouth bass fishing, therefore, a healthy large mouth bass fishery can be expected to remain if this action is implemented (L. Conrad, pers. comm., Aug. 11, 2017).
Restoration of tidal wetlands → Increased habitat for other estuarine species	The Franks Tract report (CDFW, 2020) used a multi-party process to estimate increased benefits of other species, given the preferred restoration design, using quantitative, habitat-based criteria (Appendix B). Methods for this assessment will be discussed through CAMT. A constructed scale will likely be used to qualitatively describe the effects of this action to other native species.
Restoration of tidal wetlands → Increased non-consumptive recreation	The Franks Tract report (CDFW, 2020) used a multi-party process to estimate increased benefits of recreation, given the preferred restoration design, using multiple quantitative criteria (Appendix B).

4 Intensity & Locations

This action involves the restoration of a 3,000-ac+ area of Franks Tract and Little Franks Tract in the Lower San Joaquin River subregion in the Central Delta (Figure 2). The action would create ~ 1,370 ac of emergent tidal wetlands. Franks Tract is situated between False River and Bethel Island.
For the purposes of the Round 1 SDM evaluation, we applied effects (e.g., increase in turbidity) assumed to occur locally at Franks Tract from this action to the whole Lower San Joaquin subregion in Delta Smelt population models.

Figure 2. Map of Franks Tract restoration location in the Lower San Joaquin subregion in the Central Delta. From CDFW (2020, pg. 4).



5 Life stage

Restoration of stationary tidal wetland habitat will influence different life stages of Delta Smelt depending on where habitat is located. Merz et al. (2011) synthesized historical observation data for Delta Smelt across life stages and subregions. They reported subregions with the highest relative presence of Delta Smelt by life stage that could reflect priorities for restoration (see Merz et al. 2011, Fig 6 and Discussion). The Lower San Joaquin subregion – wherein Franks Tract is located – had lower observations of Delta Smelt, relative to other subregions. Within the Lower San Joaquin, higher percentages of fish were observed between March and May/June, relative to other times of the year. Therefore, this action may benefit spawning adults, larvae, and early juveniles more than other life stages.

To align with methods used to evaluate tidal wetland restoration and aquatic weed control, we assumed the effects of Franks Tract restoration on food and turbidity across all months and years in the Lower San Joaquin. We assumed the 25% reduction of Delta Smelt distribution into the South Delta would occur during the larval life stage (Mar-May) in all years.

6 Evidence / Examples

This section documents key references that have not yet been described in the above sections.

Figure 3. Effects on South Delta distribution and potential entrainment. From Franks Tract Futures report (CDFW, 2020, pp. 60). "…the fraction of neutrally buoyant particles injected at Jersey Point [close to False River] that were entrained at the pumping facilities is reduced from slightly over 40 percent to 30 percent".

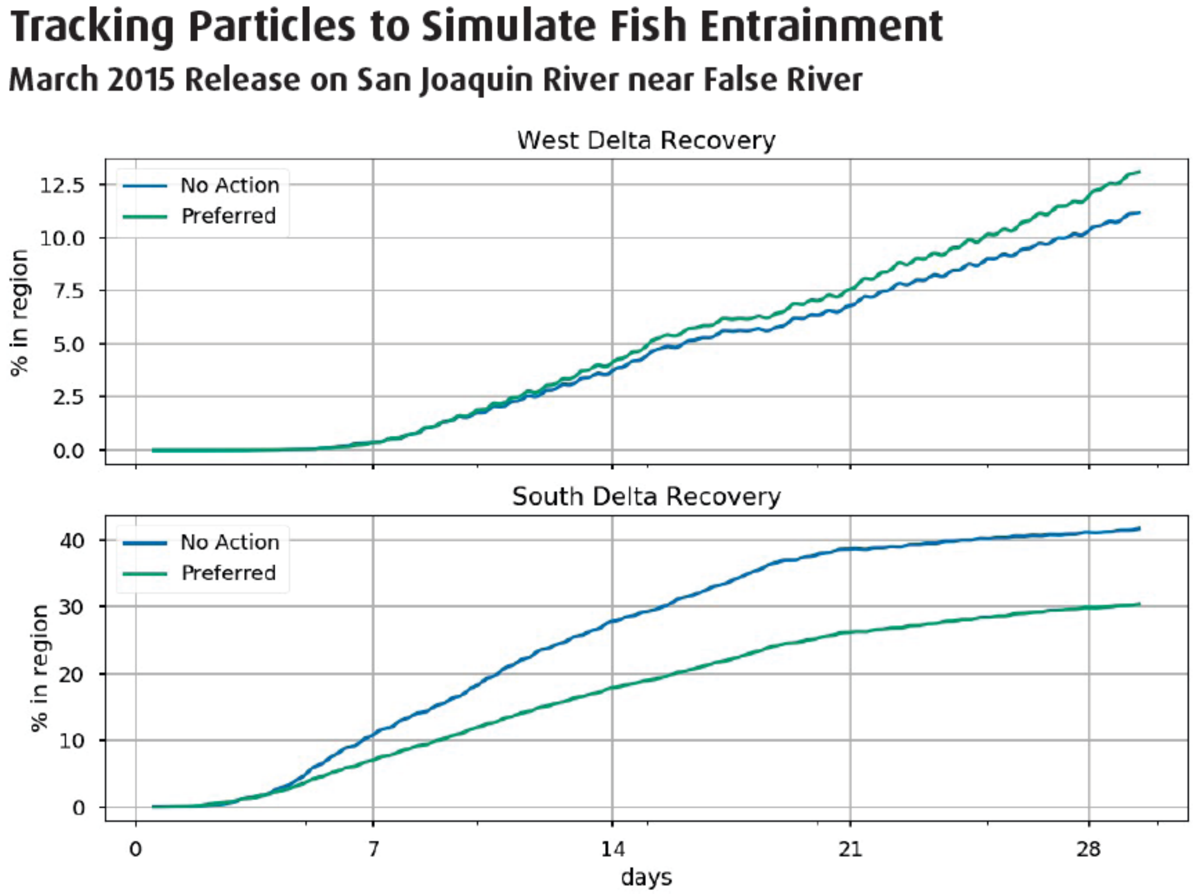
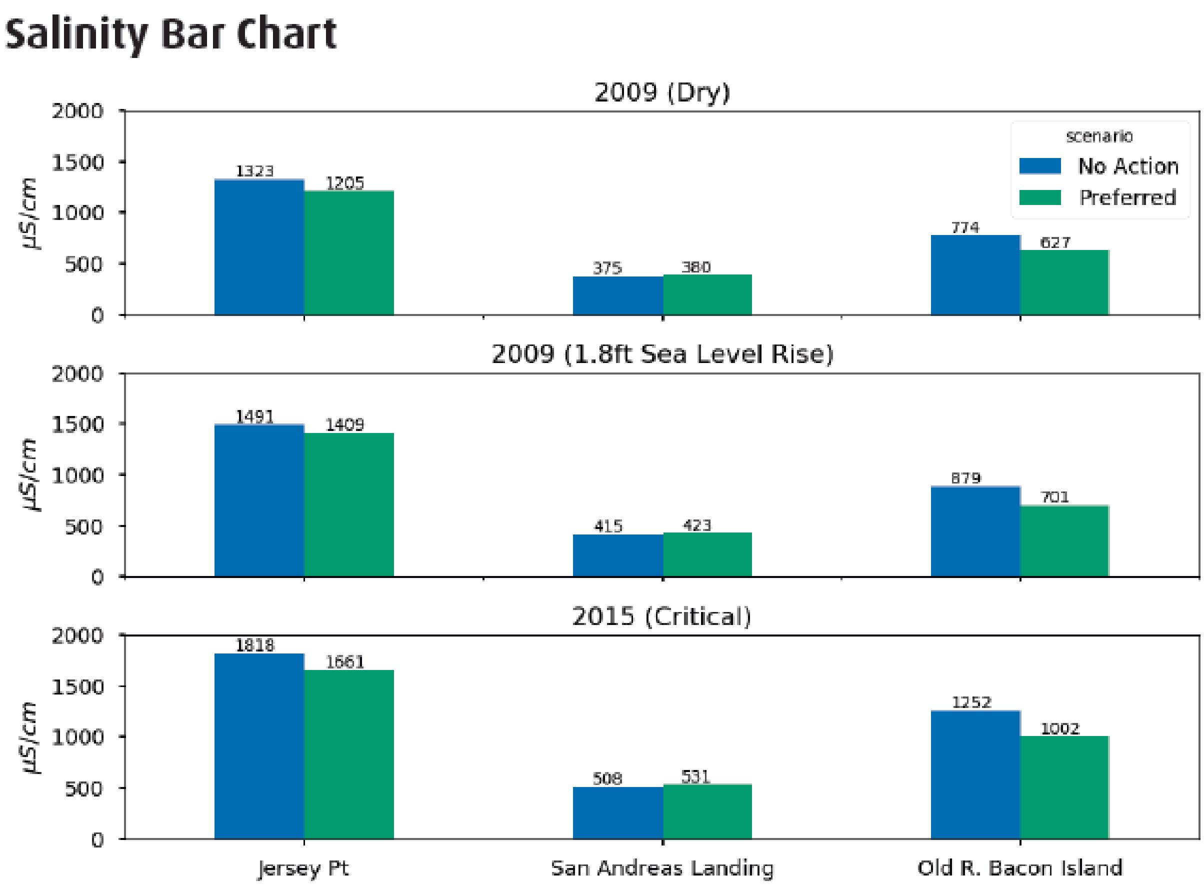


Figure 4. Effects on salinity and potential D-1641 compliance. From Franks Tract Futures report (CDFW, 2020, pp. 57). "The salinity bar chart compares model salinity changes at three locations…Results are averaged between August 1 and November 30, 2009, a large fraction of the season when salinity is a compliance issue in the region. The station on Old River at Bacon Island was used as the primary station to determine the effectiveness of the project. It is representative of the region of greatest benefit upstream (south) of Franks Tract, and is also proximate to Rock Slough, a D-1641 compliance point. Old River concentrations are also a predictor of ocean salinity effects farther south near the state and federal water projects. The persistent 150-200µS/cm freshening at this location represents an improvement compared to No Action as great as 20-25 percent."



6.1 Franks Tract Futures

Franks Tract Futures project information is available at: https://franks-tract-futures-ucdavis.hub.arcgis.com/.

Further information about Franks Tract restoration is available at: https://wildlife.ca.gov/Conservation/Watersheds/Franks-Tract.

7 Delta Smelt Model Results

The table below shows predicted population outcomes across the 20-year model timeframe for several versions of the action that were tested with all 4 Delta Smelt population models.

		Population Growth Rate		% Change in Population Growth Rate from Baseline	
		IBMR	LF	IBMR	LF
Action run ID	Scenario name	Average lambda (1995-2014)	Average lambda (1995-2014)	% change in average lambda (1995-2014)	% change in average lambda (1995-2014)
9.1	Franks DS dist	0.97	-	-1%	-
9.2	Franks Tract all low	1.14	0.98	16%	14%
9.3	Franks all high	1.16	-	18%	-
9.4	Franks all high - food only	1.00	-	1%	-
9.5	Franks all high - food+distribution (no turbidity)	1.00	-	1%	-
9.6	Franks all high - turbidity only	1.11	-	12%	-

- Multiple runs were used to explore population outcomes while varying the effects assumptions included in the action.
- Action runs 9.2 and 9.3 tested the low and high bookend food effects, respectively.
- Action runs 9.1, 9.4, 9.5, and 9.6 were exploratory runs to test the sensitivity of population outcomes when the action included subsets of effects on food, turbidity, and distribution.
- **Model run 9.2 was used as the "primary" run for the Round 1 portfolio evaluation and food, turbidity, and flow sensitivity analyses.**

8 Discussion & Next Steps

Considerations for future modeling and implementation include:

Franks Tract restoration:

- There is ongoing work to explore more cost-efficient designs of Franks Tract.

Tidal wetland restoration:

- Continued hydrodynamic monitoring at more restoration sites could be warranted to better understand and estimate effects of restored tidal wetlands on temperature, turbidity, and food.
- Continue to update databases on the status, locations, and acreage of habitat construction activities for wetland restoration projects.

Aquatic weed control:

- Revisit assumptions about 100% effectiveness and use a lower assumption (e.g., 20% effectiveness) in any future evaluation of actions or portfolios with aquatic weed control.
- Revisit assumptions about effects on food from the action, and consider removing food effects in future evaluation of actions and portfolios with aquatic weed control.
- Continue investigating feasible methods for aquatic weed control (see Action Specification section below).

9 Relationships with other actions

The preferred design for Franks Tract would establish a large area of intertidal marsh with channels (1,370 ac: CDFW, 2020, pp. 4). Therefore, this action may have effects similar in nature to tidal wetland restoration. Methods are in development for quantifying the effect of larger-scale tidal wetland restoration on zooplankton and temperature. These methods could be applied to this action, but translating those effects to the smaller scale of Franks Tract would need to be considered.

Invasive submerged aquatic vegetation (SAV) exists in high densities in Franks Tract and has been found to reduce local turbidity (CDFW, 2020). It is hypothesized that the preferred restoration design could reduce the establishment of SAV, but the extent to which these reductions would occur naturally is unknown. It is possible or likely that reducing SAV in this area would also require active SAV management. Methods are in development for quantifying the effect of reducing SAV through aquatic weed control on turbidity. These methods will be applied to this action.

10 Action Specification

Franks Tract restoration was included as one of thirteen priority actions listed in the 2016 Delta Smelt Resiliency Strategy (CNRA, 2016). CDFW initiated and completed a collaborative, multi-party process to develop a habitat enhancement plan and produce a broadly-supported restoration design for Franks Tract in 2020 – i.e., the Franks Tract Reimagined or Franks Tract Futures project (CDFW, 2020). To specify the action as documented here, the following steps have been taken:

- Compass reviewed the SDM Demo Project and additional resources (see References) to inform the specification of this action in this document.
- Compass met with the Stationary Habitat Sub-group on 16 April 2021 and the TWG on 7 May 2021.
- At the 18 Feb 2022 TWG meeting, the group discussed how to characterize effects of Franks Tract.
- Ching-Fu Change (CCWD) served as Action Lead and worked with Compass to develop proposals for which effects of this action are captured and how for the Round 1 SDM evaluation. This step was conducted between Mar and Apr 2022.

11 Key Contacts

Franks Tract restoration is being coordinated by multiple agencies/organizations.

Key contacts that can provide information on the implementation status and planning for tidal wetland restoration are:

- Carl Wilcox (CDFW; Carl.Wilcox@wildlife.ca.gov): EcoRestore and other current planned project acreage; BiOp ITP restoration project locations and acreage
- Charlotte Biggs (DWR; charlotte.biggs@water.ca.govmailto:Christy.bowles@wildlife.ca.gov): EcoRestore project acreage; BiOp ITP restoration project locations and acreage
- Erik Loboschefsky (DWR; erik.loboschefsky@water.ca.gov): VA restoration projects locations and acreage
- Dan Riordan (DWR; Dan.Riordan@water.ca.gov): Fish Restoration Program Agreement (FRPA) that focuses on BiOp project locations and acreage
- Randall Neudeck (MWD: rneudeck@mwdh2o.com): Potential MWD opportunities for restoration projects
- Tara Kerss (CDFW; Tara.Kerss@wildlife.ca.gov) and Stephanie Buss (CDFW; Stephanie.buss@wildlife.ca.gov): Conservation banks restoration projects locations and acreage

- Letitia Grenier (SFEI; letitia@sfei.org), Sam Safran (SFEI; sams@sfei.org): Overall scope and scale of restoration opportunities
- Monique Fountain (monique@elkhornslough.org; Elkhorn Slough National Estuarine Research Reserve) for restoration projects locations and acreage

Experts that could be contacted for quantifying effects pathways include:

- Jim Cloern (USGS; jecloern@usgs.govmailto:Christy.bowles@wildlife.ca.gov): effects of restored tidal wetlands on net primary productivity that could be used to model changes in zooplankton (prey density) for Delta Smelt.
- Christy Bowles (CDFW, FRP; Christy.bowles@wildlife.ca.gov): effects of restored tidal wetlands on temperature, turbidity, and prey density.
- John Durand and his lab (UC Davis; jdurand@ucdavis.edu): effects of wetlands on prey density and temperature.
- Ted Sommer (DWR; Ted.Sommer@water.ca.gov): effects of wetlands on prey density.
- Wim Kimmerer (SFSU; kimmerer@sfsu.edu): effects of wetlands on prey density.
- John Burau (USGS; jrburau@usgs.gov): effects of wetlands on turbidity.

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13 Appendix 1 – Financial Resource Cost Calculations

The table below provides cost estimates and assumptions used for the action. It shows the annualized calculation for the action, which was applied to Portfolios 3a and 3e in the Round 1 evaluation. The orange cell indicates the annualized cost used for this action in those portfolios.

Franks Tract Restoration
Portfolio(s) **3a, 3e**
Source: See table notes

Component		Notes	Quantity			Total	
Initial Cost							
	Best	[a]				$560,000,000	
Annual Operating Costs							
	Best	[b]	979	600	per acre	587,400	/yr
Undiscounted annual costs			20	years			
Best						28,587,400	/yr

Notes

[a] CDFW, 2020 - Franks Tract Future report
[b] High estimate for restored tidal wetland