SANTA CLARA RIVER ESTUARY

FLOOD MANAGEMENT OPTIONS FOR McGRATH STATE BEACH

Prepared by:

Los Angeles Regional Water Quality Control Board

With Input from:

CITY OF VENTURA

California Department of Parks and Recreation

NOAA FISHERIES
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

California Department of Fish and Wildlife

US Army Corps of Engineers

Watershed Protection District
VENTURA COUNTY

CALIFORNIA COASTAL COMMISSION

Heal the Bay

VENTURA COASTKEEPER®

1. OBJECTIVE

This report ranks options to manage flooding of the Santa Clara River Estuary (Estuary) to allow camping at McGrath State Beach between May and October.

2. BACKGROUND

The Santa Clara River flows through an ecologically rich wetland before discharging to the Ocean. A beach berm develops during dry weather periods at the mouth of the river, dams the water and creates a lagoon that is the Santa Clara River Estuary. The McGrath State Beach campground, located just south of the estuary, typically floods between November and March. Flooding during the summer months, however, started in 2011 and has occurred more frequently each summer thereafter, limiting recreational use (Refer to Figure 1). The Ventura Water Reclamation Facility (VWRF) adds a constant discharge to the estuary at an average flow rate of 7.5 million gallons per day (MGD). During the summer of 2013, the County of Ventura conducted estuary pumping on an emergency basis to dewater the campground during dry weather inundation.

The City of Ventura has conducted several studies relevant to both interim and long term management solutions to flooding at McGrath State Beach campground. The studies include a Recycled Water Market Study, Treatment Wetlands Feasibility Study, and Subwatershed Studies that compare the benefits and adverse impacts of various discharge levels on beneficial uses and sensitive, endangered, or threatened species in the estuary. The City is required by the NPDES permit for the VWRF to complete the final phase of studies and submit reports by January 1, 2018.

The Ventura NPDES Order R4-2013-0174 directs the discharger to " convene a stakeholder group of all interested parties, including resource agencies, to recommend interim management solutions to the flooding at McGrath State Beach. This recommendation shall be presented to the Regional Water Board at a regularly convened meeting by December 31, 2014." Interim and long term options were already developed and were ranked by the participants of this stakeholder group. This report provides the results of the ranking and stakeholder discussions. Nothing discussed or recommended in this report is intended to comment on liability, ownership or funding responsibilities.

Stakeholder Group: In addition to the Regional Water Board staff (Staff) and the City of Ventura (City), the group included representatives from the California Department of Parks and Recreation (CA State Parks), National Marine Fisheries Services, U.S. Fish and Wildlife, California Fish and Wildlife, U.S. Army Corp of Engineers (Corp), and Ventura County Watershed Protection (County). Recently, the Coastal Commission, Heal the Bay and Ventura Coast Keeper/Wishtoyo Foundation were invited to participate and also provided comments. The stakeholder group first met on January 22, 2014. On February 2, 2014, Staff distributed supporting materials collected by the stakeholders. The group reviewed and discussed those materials during a teleconference on April 18, 2014, ranked possible remedies on June 24, and discussed the results on July 22, 2014. This report was updated and provided to the group for comments to be submitted by August 8, 2014. The final report will be presented to the public during an information item scheduled to be heard by the Regional Water Board on September 11, 2014.

Study Design: The stakeholder group considered the following seven possible remedies to flooding of the McGrath State Beach campground.

- Pumping water from the estuary into the ocean when the campground is flooded.
- Mechanically lowering the beach berm (called "grooming") before winter storms so natural breaching will create a low annual water table.
- Pumping groundwater to lower the water table.
- Constructing a levee to separate the campground from the river/estuary during flood.

- Relocating the campground, without restoration of the estuary within the current footprint.
- Relocating the campground, with restoration of the estuary within the current footprint.
- Recycling water discharged from the waste treatment plant instead of discharging to the estuary.

3. RESULTS

All options to alleviate campground flooding were considered and ranked, regardless of the duration of the remedy. The results of the ranking are summarized in Table 1. In addition to calculating an average of the rankings, standard deviations of the rankings are also calculated. The purpose of calculating the standard deviation of the rankings is to indicate the level of agreement amongst the stakeholders. A low standard deviation means a high level of agreement, whereas a high standard deviation indicates a low level of agreement. The results have been separated into interim and long term solutions and are discussed below.[1]

Interim Remedy: As shown in Table 1, National Marine Fisheries, California Fish and Wildlife, CA State Parks, and the Army Corp of Engineers preferred estuary pumping to the ocean for the interim remedy.. The second ranked interim option was grooming the berm, which was preferred by the City of Ventura, Ventura County Watershed Protection and U.S. Fish and Wildlife. The options of estuary pumping and grooming the berm both shared the same lowest average of the rankings (3.6) but the estuary pumping option had the lowest standard deviation of the results. A temporary levee was the least favored interim option with the highest average of 5.6 as well as the highest standard deviation of 2. Several participants reported they did not have sufficient information to determine if lowering the overall water table with groundwater pumping could be accomplished to prevent flooding, so the groundwater pumping option did not receive high or low ratings.

Long-Term Remedy: The highest ranking long-term option was relocating the campground, followed by moving the campground and restoring the estuary on the existing footprint, recycling the wastewater, and, if considered a long-term remedy, replacing the levee. Relocating the campground and restoring the estuary were the highest ranking long-term options, favored by the National Marine Fisheries, U.S. and CA Fish and Wildlife, and the Corps of Engineers. The City, on the other hand, ranked the recycling option as the preferred long term remedy since it provides the greatest benefit to the City of Ventura.

Comments: At the June 22 meeting, the participants offered comments on the draft final report. Final written comments on this report were received on August 8. The CA Department of Fish and Wildlife is the only participant to change their ranking. The National Marine Fisheries Service offered additional discussion maintaining and describing their rankings. The Coastal Commission reported that they had approved construction of a permanent levee in 2001 to protect the campground from further flooding but the project was not pursued further by CA State Parks. Heal the Bay and Ventura Coast Keeper commented that emergency permitting to allow pumping of water from the estuary, as was allowed in 2013, should not be repeated; and commented that ranking does not necessarily identify the optimal ecological solution and the ecological risks of beach grooming are very high. During this review, the City of Ventura also provided comments and additional background information.

[1] When the stakeholders ranked the options, they assigned a number to each option, with 1 being the option most preferred and 7 being the option least preferred. The group's overall level of 'support' was the average value, with low values being most preferred. In addition, the group's overall level of agreement was the standard deviation, with low numbers being the option with the most similar ranking among the stakeholders.

Stakeholder input for each of the Santa Clara River Estuary Flood Management Options, as well as the required frequency, when the option could first be implemented and an approximate cost, are summarized below. The options are organized based on how soon the option could first be implemented.

Table 1: Ranking Input and Averages

	CA State Parks	City of Ventura	Nat'l Marine Fisheries	US Fish & Wildlife	Ventura Co. Watershed Protection	Corps of Engr	CA Fish & Wildlife	Standard Deviation	Ranking Average	Overall Ranking based on Avg & Std Dev
INTERIM OPTIONS										
Pump estuary	1	4	4	5	3	4	4	1.2	3.6	1
Groom	4	2	5	3	1	5	5	1.5	3.6	2
Pump GW	7	5	2	6	2	3	6	1.9	4.4	3
Levee	2	3	6	7	4	7	7	2.0	5.1	4
LONG TERM OPTIONS										
Relocate	6	6	1	2	5	1	2	2.1	3.3	1
Relocate & Restore	5	7	3	1	6	2	1	2.3	3.6	2
Recycle	3	1	7	5	7	3	3	2.1	4.1	3

Option	CA State Parks	City of Ventura	Nat'l Marine Fisheries Service	US Fish & Wildlife	CA Fish & Wildlife	Ventura County Watershed Protection	Corps of Engineers	Cost
Pump Estuary[2] **Time:** Annually if natural breaching does not occur. **When:** Spring 2015	**Pro:** Proven concept used in 2013. Can provide relief for entire summer if pumping starts in April-May rather than in July. Achieves immediate interim flood relief. **Con**: Intense permitting; monitoring required; costly. **Rank= 1/7**	**Pro**: Proven alternative, although pumping did not eliminate camp-ground flooding in 2013. **Con:** Expensive and labor intensive equipment monitoring. Estuary refills once pumping stops. Cost not reflective of entire summer period. Emergency permits may not be available for initial pumping and may not be obtainable for continual pumping. Pumps threaten legally protected fish even when exclusion measures are deployed. Multiple approvals requiring a significant period of time would be needed. **Rank=4/7**	**Pro:** If the same pumping methods are conducted under the same conditions and timing, NMFS would not need to conduct a new impact analysis. Pumping is likely the best approach for protection of steelhead since it can be carefully/hourly monitored and stopped if necessary. **Con:** Isn't sustainable to reach the goal of reducing the flooding impact for an entire summer season. **Rank= 4/7**	**Pro:** Limits take of Tide-water Goby. **Con**: Could affect Tidewater Goby critical habitat. **Rank= 5/7**	**Pro:** Useful as an interim option over 2-5 year period because limits take of Tide-water Goby. **Con:** Could affect Tide-water Goby habitat; not sustain-able. **Rank= 4/7**	**Pro:** No breach needed to lower water surface. Daily pumping resulted in removal of many non-native aquatic organisms from the estuary (e.g., carp, African clawed frog). Depending on duration of pumping, could allow campground to function throughout the peak summer recreation season. **Con:** Observers cannot be on beach during endangered bird nesting season. Intensive biological and water quality monitoring required. Fish exclusion nets may require replacement one or more times depending on length of operation. **Rank= 3/7**	**Pro:** Minimal impacts; No permanent structures or fills in waters/ wetlands. **Con:** Not a viable long-term solution. Continuous maintenance and monitoring required. Take of Tidewater Goby is unavoidable. **Rank= 4/7**	$350,000 /~78 days

[2] Pump estuary water into ocean during summer flooding. Requires permitting from RWQCB, California Coastal Commission (CCC), U.S. Army Corps of Engineers (USACE), CA Department of Fish and Wildlife (CDFW), US Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS), and implementation and funding. First impact date assumes emergency permitting for spring 2015. One-time funding was provided in 2013 by the Ventura County Watershed Protection District (VCWPD). Endangered Tidewater Goby (fish) were screened out during pumping over about 78 days, where a stable level was achieved after 30 days at about 9.8 feet NAVD88 for approximately $350,000 (exact figure not determined). The extent of the campground that could be used as a result of the pumping was not documented. Estuary and Pacific Ocean water surface elevations were not sufficiently different to allow siphoning into the Ocean without pumping. Initial estuary water surface elevation was approximately 11.5 feet. Reduction of 20 inches achieved with generally 24-hour daily pumping (with some outages for system refinement, repair, and refueling) for the first 30 days, and then maintained with 12-hour pumping for an additional 45 days, approximately.

Option	CA State Parks	City of Ventura	Nat'l Marine Fisheries Service	US Fish & Wildlife	CA Fish & Wildlife	Ventura County Watershed Protection	Corps of Engineers	Cost
Groom Berm[3] **Time:** Annually, every winter **When:** First Wet Period in 2015-2016	**Pro:** Quick and cheap to implement. May facilitate wet weather breaches by smaller storm events. **Con:** No ability to implement during dry weather when bulk of current flooding issues occurs. **Rank= 4/7**	**Pro:** Least costly option. Would directly reduce lagoon elevation and flooding. **Con**: Not controllable as flowing water erodes the berm to the streambed elevation. Must be done on a yearly basis to be effective. Avoidance and minimization measures must be implemented to mitigate fish stranding impacts. Can only be implemented in wet weather, and then only reduces the period of campground inundation, but does not prevent inundation. Requires a year with wet weather. Doesn't eliminate dry season flooding. **Rank 2/7**	**Pro**: None **Con:** No biological triggers in place to implement this option to avoid adverse effects to steelhead. **Rank= 5/7**	**Pro:** Could simulate a natural breaching event. This option should only be implemente d when forecast calls for substantial rain. **Con:** could adversely affect listed species and critical habitat if/when berm breaches artificially. **Rank= 3/7**	**Pro:** Could stimulate breaching, should only be implemente d prior to storm events. **Con:** Potential impacts to steelhead through stranding when breaching at unnatural times of the year or during smaller storms. **Rank= 5/7**	**Pro:** Half a day, and low cost. Grooming does not directly cause a breach, storm runoff does, mimics the natural process. Fall/winter grooming does not disturb nesting endangered birds. During breaches, freshwater non-native aquatic organisms are flushed from the estuary, temporarily lowering their populations. **Con**: Action cannot be taken unless a storm is forecast. Beach grooming can only occur outside the bird nesting season. Berm can rebuild somewhat rapidly depending on tides, storm surges, or lack of rainfall. **Rank= 1/7**	**Pro:** Similar operation successfully implemented at Ormond lagoon. Minimal direct impacts **Con:** May adversely affect steelhead (not present at Ormond). Would be difficult to implement in conjunction with high flow event to mimic natural breach. **Rank= 5/7**	$5,000/year

[3] Mechanically maintain 100 feet by 100 feet of beach berm crest between ocean and estuary. Grooming would take place immediately before winter storms to allow natural breaching, leading to diminished lagoon volume, water table reductions and less flooding during the following summer. Requires permitting from CCC, USACE, CDFW, USFWS, NMFS, and implementation and funding. First impact date assumes grooming in first wet period following the summer of 2014, (potentially the winter of 2014-15). Implemented at Ormond Beach in 2013 by VCWPD where endangered Tidewater Goby requirements were used to set lowest berm elevation. Grooming was allowed only when berm closed and elevation exceeded a pre-determined target, a rain storm was pending, and with biological monitoring. Costs quoted are associated with use of heavy equipment at Ormond Beach, with permitting and staffing costs absorbed by VCWPD for that location.

Option	CA State Parks	City of Ventura	Nat'l Marine Fisheries Service	US Fish & Wildlife	CA Fish & Wildlife	Ventura County Watershed Protection	Corps of Engineers	Cost
Pump Ground water[4] **Time:** Annually **When: Summer 2015 - subject to permit approval**	**Pro:** None **Con:** Would likely result in ground-water impairments as relatively clean ground-water is pumped out and poor quality surface waters are allowed to infiltrate into water table. May cause seawater intrusion. **Rank= 7/7**	**Pro:** City will complete Phase 3 groundwater balance and nutrient studies 1/18 providing information needed for the implementation of this option. **Con:** McGrath lake drain not always connected to the estuary. No technical data exists showing that groundwater pumping would be effective. Multiple environmental approvals would be necessary. Quality of lake water is poor[5]. NPDES studies to date show poor quality of groundwater. Could present discharge permitting issues for pumped discharge. **Rank=5/7**	**Pro:** Can easily monitor and control for impacts to water levels and estuary stage level. **Con:** May disrupt groundwater levels and indirectly influence critical habitat. More information is needed. **Rank= 2/7**	**Pro**: No direct effects to listed species. **Con:** Potential indirect effects to listed species by reducing habitat. Could affect Tidewater Goby critical habitat. **Rank= 6/7**	**Pro:** No direct effect to sensitive species. **Con**: Potential indirect affects to habitats. **Rank= 6/7**	**Pro**: Less intensive biological monitoring requirements, minimal interference with nesting endangered birds, no direct impacts to fish. **Con:** More pumping would likely be required before a lowering of estuary water surface elevation could be measured, as compared to direct pumping from estuary. Would not protect the campground from winter floods. **Rank= 2/7**	**Pro:** Can be implemented with no or minimal impacts to waters/ wetlands. May not require Army Corp permit depending on how it's implemented . **Con**: May not effectively maintain lagoon elevation. **Rank= 3/7**	$200,000/yr.

[4] Eliminate or redirect McGrath Lake pumping during flooding or use existing groundwater wells to lower the water and discharge the water outside the estuary watershed. The new outfall is the largest expense, if the existing pumping frequency is changed. The cost quoted is estimated from the portion of VCWPD estuary pumping to Ocean project in 2013 used for pumping alone and does not include the groundwater well modifications. Permitting requirements of new outfall are dependent on location. RWQCB McGrath Lake TMDL implementation plan might be modified to address this issue. First impact date assumes permitting of new outfall in 2015.

[5] McGrath Lake water has been sampled and contains toxic legacy pesticides. The City's comment is a reminder that it will be difficult to arrange disposal of polluted ground water, like that which fills the Lake.

Option	CA State Parks	City of Ventura	Nat'l Marine Fisheries Service	US Fish & Wildlife	CA Fish & Wildlife	Ventura County Watershed Protection	Corps of Engineers	Cost
Build Levee[6] **Time:** Tempo-rary or Perma-nent **When:** Summer 2015	**Pro:** Parks obtained approval from the Coastal Commission for a levee in 2001. **Con:** Many permitting and regulatory requirements in order to implement. Parks faced significant resistance when it tried to build in 2004. **Rank 2/7**	**Pro:** Levee did protect the campground in the past. Temporary and permanent levees may provide short-term and long-term solutions. Both temporary and permanent would result in an immediate change and provide year-round protection. **Con:** Potential destruction during high flow events. Must have permits, but State Parks obtained necessary permits in 2001 including Coastal Commission. Permanent levee would permanently remove wetland uses. **Rank = 3/7**	**Pro**: Both the temporary and permanent levee will have some nature of impact to the critical habitat and NMFS would have to consider the degree and magnitude of those impacts for both scenarios. **Con**: Even if temporary, doesn't promote natural restoration of the estuary and will significantly modify designated critical habitat. **Rank = 6/7**	**Pro:** If temporary could prevent the need for an emergency breach. Would not adversely affect listed species or their critical habitat. **Con**: only temporary. Could preclude or substantially delay restoration opportunities **Rank = 7/7**	**Pro:** If tempo-rary could prevent the need to emer-gency breach. **Con:** only tempo-rary, could delay restora-tion opport-unities. **Rank= 7 /7**	**Pro**: Would keep estuary surface waters from entering campground. Temporary version may be more quickly permitted and built **Con:** Permanent version may not be a quickly implementable as interim. Reduces potential aquatic habitat for endangered fish species. If groundwater is high, campground may be saturated despite levee protection. Operation throughout the peak summer recreation season may not be guaranteed. Intensive biological monitoring may be required. **Rank 4/7** for temporary levee	**Pro:** Protects campground and public access. May avoid waters/ wetlands depending on setback **Con:** Expensive (100K seems optimistic). Aesthetic impacts. May have substantial impacts to waters/wetlands depending on alignment. May not be effective against rising groundwater **Rank 7/7**	$200,000

[6] Construct a seasonal or permanent barrier separating campground from the estuary. Such a levee existed before being washed out by a flood in the winter of 1997-98. Requires permitting from California Coastal Commission, USACE, NMFS, CDFW, USFWS, and implementation and funding. Cost based on construction of berm by heavy equipment and permitting costs and does not include any mitigation measures. First impact date assumes permitting in 2014.

Option	CA State Parks	City of Ventura	Nat'l Marine Fisheries Service	US Fish & Wildlife	CA Fish & Wildlife	Ventura County Watershed Protection	Corps of Engineers	Cost
Re locate Camp[7] **Time:** Perma-nent **When:** 2018-2020	**Pro: None** **Con**: Not a plan to address interim flooding of existing facilities. **Rank= 6/7**	**Pro:** Provides year round protection from flooding if camp is moved above Harbor Blvd or to a sufficiently high elevation. Provides a long-term solution that will also address sea level rise. Allows regulatory agencies the most flexibility in determining appropriate discharge volume to protect ecology and assure enhancement. **Con**: Costly unidentified funding source, though a variety of grant funding sources could be used to implement this alternative (see Grant Funding Memo attached) **Rank= 6/7**	**Pro:** Promotes habitat restoration and floodplain connectivity **Con**: None **Rank= 1/7**	**Pro:** long-term solution, benefits wildlife including Goby, Plover, & Least Tern. Would not adversely affect listed species or critical habitat. **Con:** Will take a long time to implement **Rank= 2/7**	**Pro:** Provides long-term solution/ benefits Tidewater Goby, Western Snowy Plover, & CA Least Tern Would not significantly impact listed species or habitats. **Con:** Long implementa tion timeline. **Rank= 2 /7**	**Pro:** No need to protect existing campground from either summer or winter flooding if location is properly selected. Provides resiliency with respect to sea level rise. **Con:** Expensive and no quick implementation. Depending on new location, may displace sensitive upland habitat, such as coastal dunes serving as endangered bird nesting grounds. More extensive sewer and water pipe needs **Rank= 5/7** (most rapidly implemented long-term solutions; campground can remain open year round)	**Pro**: Best "avoidance" alternative. Allows for more habitat restoration **Con:** expensive. May reduce public access. Viable location available? **Rank= 1/7**	$14 million

[7] Construct replacement park facilities at higher elevation. 1979 McGrath State Beach Park Plan assumes periodic flooding, recommends that flood management measures be adopted and integrated into the Park Plan and includes design for additional campground facilities on higher park property. A new location could also be sought. California Park's estimate is $14,262,374 required for campground construction. Costs for campground relocation, which are quoted here, do not include wetland restoration.

Option	CA State Parks	City of Ventura	Nat'l Marine Fisheries Service	US Fish & Wildlife	CA Fish & Wildlife	Ventura County Watershed Protection	Corps of Engineers	Cost
Re locate Camp/ Re store Estuary[8] **Time:** Perma-nent **When:** 2019-2020	**Pro:** Parks seeks to restore the estuary with camp relocation and has developed costs **Con:** Not a plan to address interim flooding of existing facilities. **Rank= 5/7**	**Pro:** Eliminates flooding year round if the camp is moved above Harbor Blvd or to a sufficiently high elevation**.** Provides a long-term solution that will also address sea level rise. Allows regulatory agencies the most flexibility in determining appropriate discharge volume to protect ecology and assure enhancement. **Con:** Could diminish beach connectivity. Very expensive. No identified funding source, though grant funding might be pursued. See memo on grants. Many environmental approvals needed. **Rank= 7/7**	**Pro:** Promotes habitat restoration and floodplain connectivity **Con:** None **Rank= 3/7**	**Pro:** Provides long-term solution and benefits Goby, Plover, Least Tern. Restoration could improve habitat. Would not adversely affect listed species or their critical habitat. **Con:** Will take a long time to implement **Rank= 1/7**	**Pro:** Provides long-term solution and would benefit wildlife including Tidewater Goby, Western Snowy Plover, and Cal. Least Tern. **Con:** long timeline. **Rank= 1/7**	**Pro**:Best ecological solution. Provides resiliency with respect to sea level rise. Widens existing floodplain at river mouth. **Con**: Expensive and not immediately implementable (i.e., not an "interim" measure, which was the RWQCB's mandate). More extensive infrastructure required, e.g. more sewer and water pipe than existing. **Rank= 6/7** (not an interim solution; more rapidly implemented than the recycling solution; campground can remain open year round)	**Pro:** avoidance and restoration of habitat **Con**: excessive cost (though $20 million seems high), reduced public access. Viable location available? **Rank= 2/7**	$20 million[9]

[8] Not a short-term option for flood control. 1979 McGrath State Beach Park Plan assumes periodic flooding and recommends that flood management measures be adopted and integrated into the Park Plan. . California Park's estimate is $14,262,374 required for campground construction and wetland restoration costs are estimated at $6,912,000. The construction of replacement park facilities at a higher elevation would take place before the rehabilitation of the estuary tidal wetlands at the existing camp location. Estuary restoration would not be initiated until after the level of the Ventura Water Reclamation Plant discharge for optimal estuary management is established, and no sooner than 2018. The cost quoted is by State Parks and includes estuary rehabilitation based on Malibu lagoon work in 2012. Impact date assumes 2016 funding-design, 2017 campground construction and 2018 estuary rehabilitation.

[9] Refer to Attachment 1 for the CA state Parks cost estimate to relocate the campground and restore the estuary

Option	CA State Parks	City of Ventura	Nat'l Marine Fisheries Service	US Fish & Wildlife	CA Fish & Wildlife	Ventura County Watershed Protection	Corps of Engineers	Cost
Recycle Water/ Reduce Dis charge[10] **Time:** Perma-nent **When:** After 2020	**Pro:** long term goal for City regardless of flooding. Necessary to provide customers with quality service in future **Con:** Can't implement in reasonable timeframe, no immediate interim flood relief **Rank= 3/7**	**Pro**: Elimination of the City's discharge reduces the period of inundation, and may reduce the level of high water, but does not preclude inundation. Provides alternative water supply desired by City. Pilot studies to expand recycled water use are planned, so additional information will be available in 2014. **Con:** Expensive infrastructure costs in terms of diversion and treatment equipment. Cannot begin to implement until 2018, regulatory decisions based on Phase 3 studies. **Rank= 1/7**	**Pro**: May promote improved water quality within the estuary **Con**: Discharges of less than 3.5 to 5 mgd pursuant to implementation of this option, could adversely affect steelhead and critical habitat in the estuary. **Rank= 7/7**	**Pro**: limits take of Tidewater Goby **Con**: could affect Tidewater Goby critical habitat. **Rank= 5/7**	**Pro**: could provide good conditions Goby depend ing on discharge **Con:** could reduce habitat for Tidewater Goby, Cal. Least Tern **Rank= 3/7**	**Pro**: Improves local water supply self-sufficiency, helps resolve drought shortages. Helps stabilize summer estuary water surface elevation and thus may allow the existing campground to remain open during peak recreation season. **Con**: Expensive and not immediately implementable (i.e., not an "interim" measure). More extensive infrastructure required. Will not protect the existing campground from flooding during storm events. **Rank= 7/7**	**Pro:** Avoidance of impacts and improvement s to water quality. **Con:** Expensive; Not likely to be implemented anytime soon; Dependent on outcome of City's WWTP plan. **Rank= 3/7**	$60 to 140 million[11]

[10] This is not a short-term option for flood control because the optimal level of discharge to support estuary beneficial uses must first be established per Phase 3 studies required by Ventura's NPDES permit and then permitted by RWQCB, NMFS, USFWS, CDFW, and possibly USACE. Phase 3 studies will be completed in 2018. As part of the NPDES Phase 2 studies, City of Ventura developed conceptual design options and estimated costs for recycled water systems (2013). The costs are to identify the stage height which would support steelhead rearing, goby and aquatic life habitat. Expert consultation continues to assess if the 9.8 NAVD88 estuary water level achieved by VCWPD pumping in 2013 provides sufficient habitat and leaves park properties dry. Already completed studies show estuary protections might be identified as early as 2018, coinciding with the renewal of the NPDES permit for the Ventura Water Reclamation Plant. (Refer to Attachment 2 for a summary of the NPDES studies which have been completed and are pending.) The impact date assumes a two year permitting period, and a 4 year financing and construction period following the new permit in 2018.

[11] The planning level cost estimates from the Phase 2 NPDES *Recycle Water Market Study*, Carollo 2010, are as follows: Urban Recycle Water Use, existing system expansion with VWRF pump station, $62 million; Groundwater Recharge to United spreading grounds, without MF/RO treatment, $36 million; with MF/RO treatment ($98 /$36 respectively) $134 million; Agriculture Recycle Water Use, expansion East and West of the 101 freeway with VWRF pump station, $145 million. So the range is $60 to $145 million. The Study Report and stakeholder and regulatory comments are available on the City of Ventura Estuary Study website.

4. RANKING SUMMARY

A. **Ranking all Options**: The ranking for all options is indicated below. The approximate implementation date was also plotted against the individual ranks as shown in Figure 2.

- Relocate the Campground rank is 1 (with the lowest average of 3.3) [standard deviation of 2.1];
- Estuary pumping rank is 2 (average is 3.6) [with the lowest standard deviation of 1.2];
- The Beach Grooming rank is 3 (average is 3.6) [standard deviation of 1.5];
- Relocate the Park and Restore the Estuary rank is 4 (average is 3.6) [with the highest standard deviation of 2.3];
- Recycling and withdrawal of water is 5 (average is 4.1) [standard deviation of 2.1];
- Groundwater pumping is 6 (average is 4.4) [standard deviation is 1.9]; and,
- Levee rank is 7 (with the highest average of 5.1) [standard deviation of 2.0]

B. **Ranking Interim and Long-term Options.** The annual or total costs were also plotted against the interim or long term rank (Refer to Figures 3 and 4).

<u>Interim;</u>

- Pumping estuary rank is 1, (sharing the lowest average of 3.6), [with the lowest standard deviation is 1.2];
- Beach grooming rank is 2, (sharing the lowest average of 3.6), [standard deviation is 1.5];
- Pumping groundwater rank is 3, (average is 4.4), [standard deviation is 1.9] and,
- Temporary Levee rank is 4, (the highest average is 5.1), [with the highest standard deviation is 2).[12]

<u>Long Term;</u>

- Relocate the campground rank is 1, (the lowest average is 3.3), [standard deviation is 2.1];[13]
- Restore the estuary rank is 2, (average is 3.6), [the highest standard deviation is 2.3]
- Recycle the discharge rank is 3, (average is 4.1), [standard deviation is 2.1]; and,
- Permanent Levee rank is 4, (the highest average is 5.1), [the lowest standard deviation is 2][14] .

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[12] Participants had different interpretations of the levee option during the ranking, but were invited to change their results when they learned that the Coastal Commission approved a proposal by Parks in 2001 to construct a levee after a conflict resolution process. The temporary levee is a rubber dam, which is permanently installed, but only deployed when summer flooding threatens.

[13] Parks comments that they ranked the option to relocate the campground 6 of 7 because they consider it a long-term option and do not interpret the Regional Board's direction to staff as including evaluation of long term options.

[14] This levee is a permanent earth structure equivalent to that approved by the Coastal Commission in 2001. At the time of the ranking, the participants did not know that this option included mitigation and enhancement measures within the estuary.

5. CONCLUSION

A resolution to the summer time flooding issue at McGrath State Beach campground is complicated by many factors including the discharge from the Ventura Water Reclamation Facility, the estuary water level, the groundwater elevation, the elevation in McGrath Lake, and the sensitive, endangered or threatened species in the estuary.

The City of Ventura has completed 6 studies since 1995 characterizing the estuary hydrology, four of which provided information on endangered species and habitat, three on metals and toxicology and two on recycled water. Work plans proposed for 2014 to 2018 will include analysis of the role of groundwater in estuary processes, an updated assessment of habitat and toxicity, and a more complete summary of water quality changes with morphology and discharge. By 2018, the City of Ventura is required, by a consent decree, to identify the most viable long term option to attain the Maximum Ecologically Protective Diversion Volume (MEPDV) which enhances the estuary. Together, these studies will identify the best long-term parameters for estuary enhancement. The Interim Options to diminish campground flooding were identified by 2001, and pumping was implemented in 2013. This Stakeholder review of the interim options shows that funding, not the lack of alternatives, prevents immediate action.

To identify a cost effective, environmentally supportive long-term solution to the flooding at McGrath State Beach that takes into account the needs of all of the stakeholders, the ongoing studies will need to be completed and recommendations made. Implementing one or more of the interim options identified above, however, will require permitting and funding and assurance that the interim solution will not preclude long term remedies for estuary enhancement.

FIGURE 1
Campground Flooding Frequency

McGrath State Beach campground closure information was provided by the CA State Parks Staff. The darkened months show when the campground was closed due to flooding.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1997	No data											
1998												
1999												
2000												
2001												
2002												
2003												
2004												
2005												
2006												
2007												
2008												
2009												
2010												
2011												
2012												
2013												
2014				No data					No data			

Figure 2

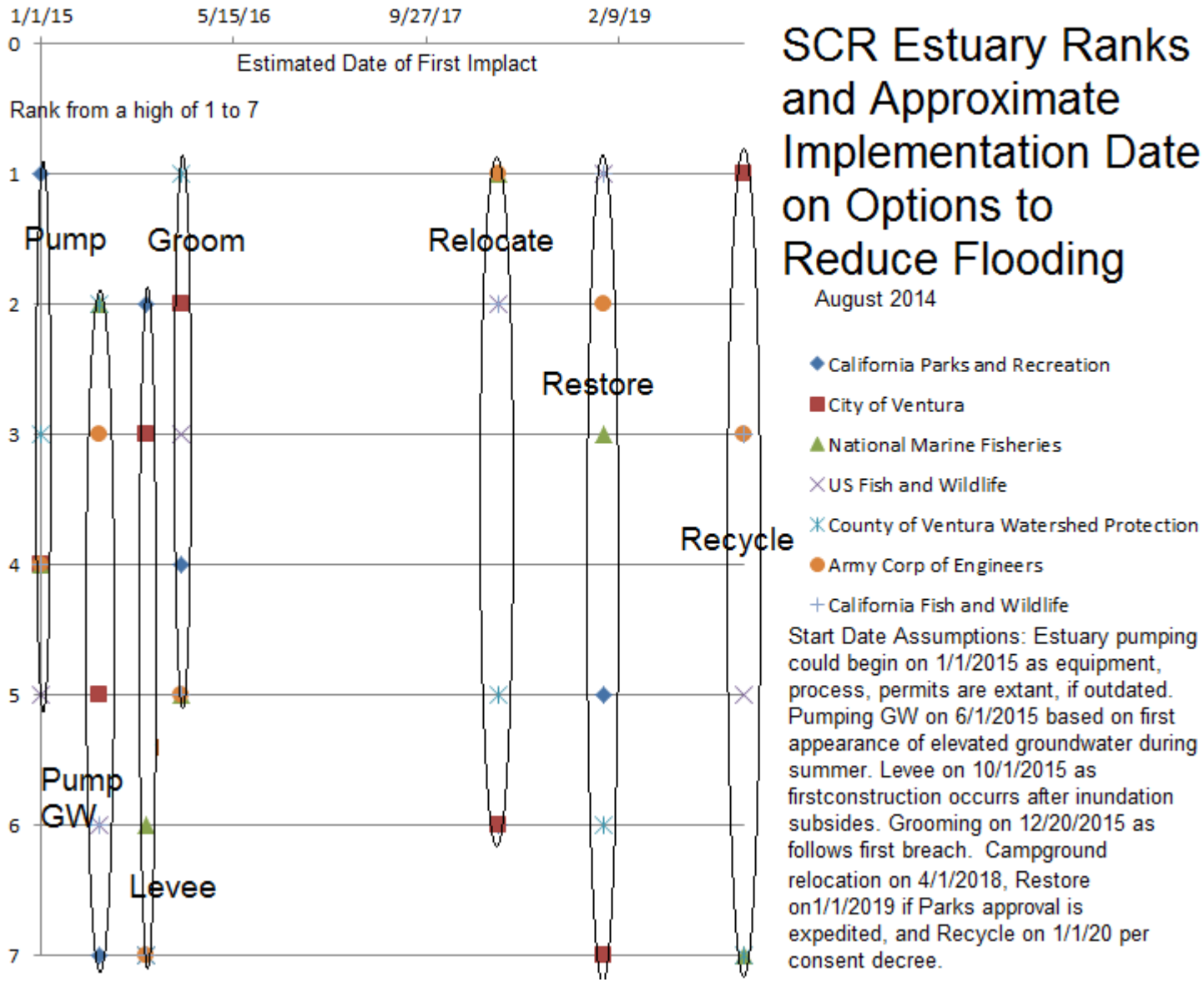
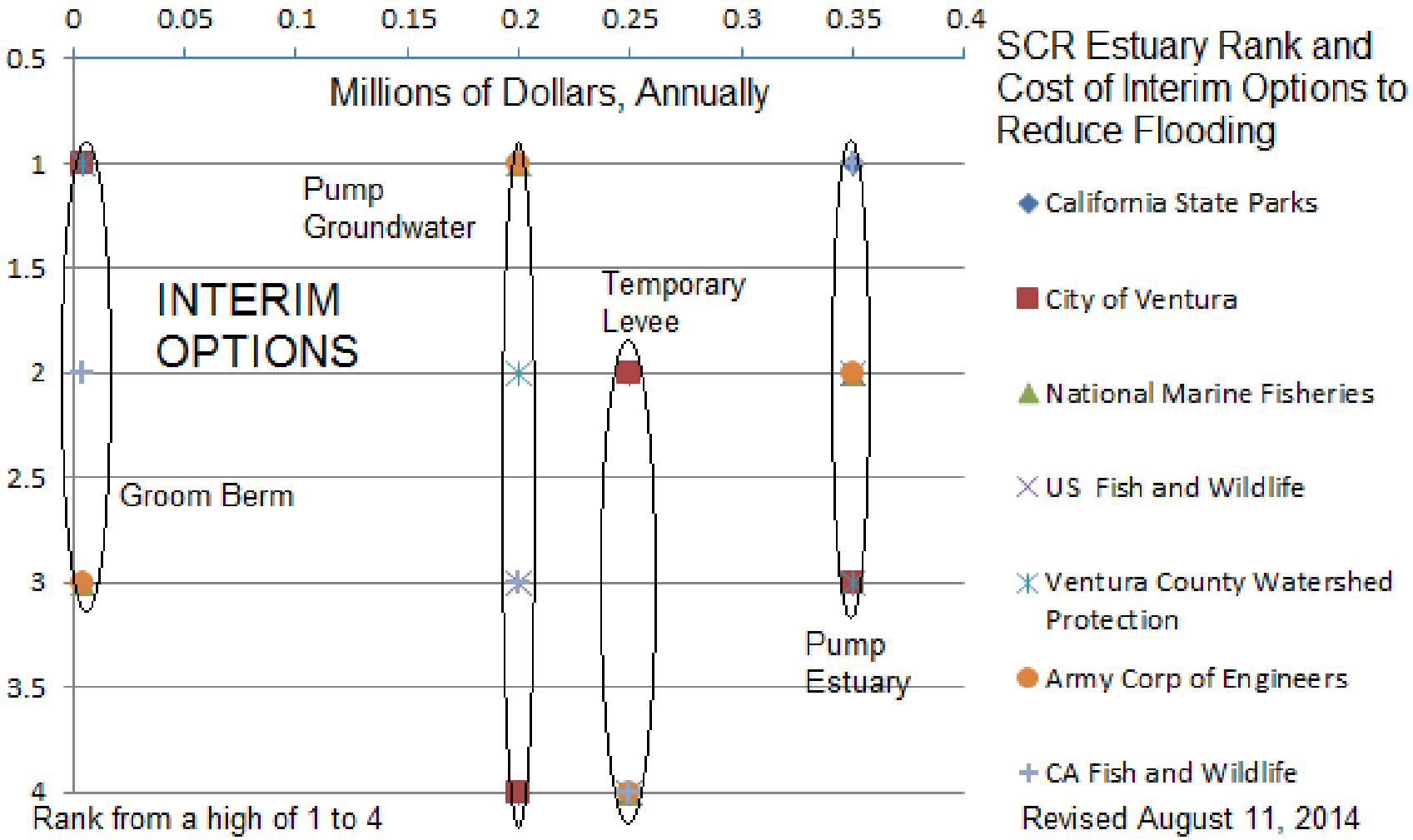
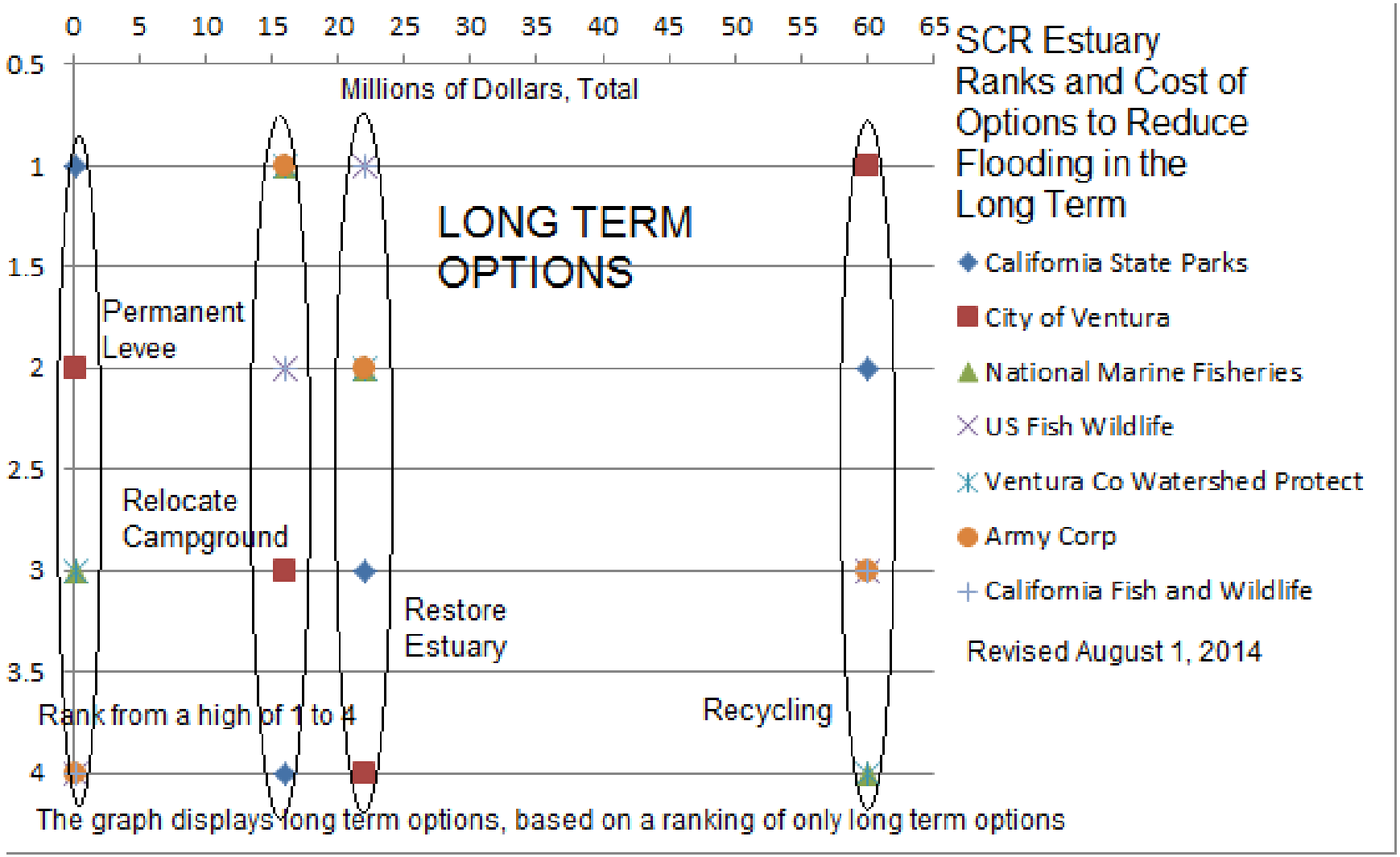

1/1/15
5/15/16
9/27/17
2/9/19
0
Estimated Date of First Implact
Rank from a high of 1 to 7
1
2
3
4
5
6
7
Pump
Groom
Relocate
Restore
Recycle
Pump GW
Levee
SCR Estuary Ranks and Approximate Implementation Date on Options to Reduce Flooding
August 2014
California Parks and Recreation
City of Ventura
National Marine Fisheries
US Fish and Wildlife
County of Ventura Watershed Protection
Army Corp of Engineers
California Fish and Wildlife
Start Date Assumptions: Estuary pumping could begin on 1/1/2015 as equipment, process, permits are extant, if outdated. Pumping GW on 6/1/2015 based on first appearance of elevated groundwater during summer. Levee on 10/1/2015 as firstconstruction occurrs after inundation subsides. Grooming on 12/20/2015 as follows first breach. Campground relocation on 4/1/2018, Restore on1/1/2019 if Parks approval is expedited, and Recycle on 1/1/20 per consent decree.

Figure 3



The graph displays interim options, based on a ranking of only interim options

Figure 4


SCR Estuary Ranks and Cost of Options to Reduce Flooding in the Long Term
0 5 10 15 20 25 30 35 40 45 50 55 60 65
Millions of Dollars, Total
0.5
1
1.5
2
2.5
3
3.5
4
LONG TERM OPTIONS
Permanent Levee
Relocate Campground
Restore Estuary
Recycling
Rank from a high of 1 to 4
California State Parks
City of Ventura
National Marine Fisheries
US Fish Wildlife
Ventura Co Watershed Protect
Army Corp
California Fish and Wildlife
Revised August 1, 2014
The graph displays long term options, based on a ranking of only long term options

ATTACHMENT 1

CA STATE PARKS COST ESTIMATE

California Parks Cost Estimate April 15, 2012 for Campground Relocation and Wetland Restoration

CONSTRUCTION CONTRACT ESTIMATE					
	DEMOLITION			87,552	
	SITE WORK			1,456,128	
	UTILITIES			2,939,904	
	BUILDING			5,955,840	
	LANDSCAPING			3,822,950	
	WETLAND RESTORATION			6,912,000	
ESTIMATED TOTAL CURRENT COSTS on			**April 15, 2012**		14,262,374
	Escalate to Constr Start	**52**	months at 0.42%/mo		3,114,900
	Escalate to Constr Midpoint	**6**	months at 0.42%/mo		359,400
ESTIMATED TOTAL CONSTRUCTION CONTRACTS					17,736,674

SUMMARY OF COST BY PHASE						
DOF Cost by Phase Reporting Category	**Study**	**Preliminary Plans**	**Working Drawings**	**Construction**	**Equipment Signs**	**TOTAL**
Construction (PW) CONTRACT COSTS						
PW Contract				**17,736,674**		**17,736,674**
PW Contingency				**1,241,600**		**1,241,600**
SUBTOTAL PW CONSTRUCTION COSTS				***18,978,274***		***18,978,274***
Architecture & Engineering SERVICES						
A & E Design	**0**	**615,000**	**1,200,000**	**315,000**		**2,130,000**
As-Built Drawings				**3,500**		**3,500**
Inspection Services				**226,000**		**226,000**
Other	**0**	**0**	**0**	**0**		**0**
SUBTOTAL A&E SERVICES	***0***	***615,000***	***1,200,000***	***544,500***		***2,359,500***
OTHER PROJECT COSTS						
Accessibility Review			**2,100**	**0**		**2,100**
Construction Management		**0**	**15,000**	**85,000**		**100,000**
Contract Administration	**0**	**0**	**2,500**	**2,500**		**5,000**
Estimating	**0**	**5,000**	**10,000**	**2,000**		**17,000**

Contract Administration	**0**	**0**	**2,500**	**2,500**		**5,000**
Estimating	**0**	**5,000**	**10,000**	**2,000**		**17,000**
Fees	**0**	**0**	**45,000**	**65,000**		**110,000**
GIS	**0**	**10,500**	**2,200**	**2,200**		**14,900**
HAZMAT	**0**	**20,000**	**0**	**0**		**20,000**
Office Administration	**0**	**0**	**0**	**2,000**		**2,000**
Other	**0**	**0**	**0**	**0**		**0**
Permits	**0**	**11,840**	**0**	**0**		**11,840**
Project Management	**0**	**35,000**	**35,000**	**17,000**		**87,000**
Public Communications	**0**	**0**	**0**	**0**		**0**
Specialty Consult Cntrcts	**0**	**70,000**	**0**	**0**		**70,000**
Testing	**0**	**0**	**0**	**0**		**0**
SUBTOTAL OTHER PROJECT COSTS	**0**	**152,340**	**111,800**	**175,700**		**439,840**
TOTAL CONTRACTING AGENCY COST	***0***	***767,340***	***1,311,800***	***19,698,474***		***21,777,614***
AGENCY RETAINED ITEMS						
ARI Consultant Contracts	**0**	**0**	**0**	**0**		**0**
Cultural Heritage	**0**	**56,516**	**7,080**	**45,200**		**108,796**
Environmental Review	**0**	**30,000**	**1,400**	**1,400**		**32,800**
Equipment/Material					**0**	**0**
Furniture/Fixtures					**0**	**0**
General Plan	**0**	**0**	**0**	**0**		**0**
Monitoring	**0**	**0**	**0**	**0**		**0**
Museum & Interpretive	**0**	**30,600**	**20,400**	**310,600**		**361,600**
Natural Resources	**0**	**82,000**	**73,200**	**66,120**		**221,320**
Other Expense	**0**	**0**	**0**	**0**		**0**
Signs				**0**	**145,000**	**145,000**
Site Furnishings				**100,000**		**100,000**
Site Surveys	**0**	**0**	**0**	**0**		**0**
TOTAL AGENCY RETAINED ITEMS	***0***	***199,116***	***102,080***	***523,320***	***145,000***	***969,516***
TOTAL ESTIMATED PROJECT COSTS	**0**	**966,456**	**1,413,880**	**20,221,794**	**145,000**	**22,747,130**

ATTACHMENT 2

SPECIAL STUDIES SUMMARY

Summary of Estuary Studies Completed and/or Planned by the City of Ventura:

A summary of the estuary studies and the corresponding permit is included below. A figure illustrating the scheduling of these studies and the permitting processes is attached.

Studies completed in conformance with 95-074

- 1999: Estuary Characterization and NPDES Limits Achievability Studies (Phase 1, 2 and 3)

Studies completed in conformance with 00-143

- 2002 metal translater (lead, silver, nickel, copper)
- 2004 Estuary : Tidewater Goby habitat and distribution and estuary hydrology
- 2005: Toxicology and estuary hydrology
- 2007: Toxicology, Hydrology, Ecology, Water Budget, Salinity, Recycled Water Market, Resdient Species Study, Metal Translator renewal, Copper water effects ratio

Studies completed in conformance with R4-2008-011

- 2010: Recycled Water Market Study, Treatment Wetlands feasibility
- 2011: Phase 1 Estuary: impacts of multiple discharge conditions
- 2013: Infrastructure and diversion alternatives and habitat/species impact

Phase 3 Workplans[15] proposed in conformance with R4-2013-0078

1) Water balance, especially estimating groundwater flows for 2 water years
    a. Surface water inflows to estuary
    b. Groundwater inflow/outflow
    c. Beach berm/closure dynamics
    d. Lagoon morphology for 2000, 2005/2009 and 2012 bathymetric surfaces
    e. McGrath lake inflow
    f. Pond and berm seepage
2) Water quality with special variation in groundwater for 2 water years
    a. Spatial and temporal impact of effluent on estuary water quality
    b. Estimates of groundwater loading to estuary
    c. Spatial and temporal variation of estuary water quality (including critical DO)
3) Habitat analysis under different discharge scenarios for 1 water year
    a. Endangered fish species composition and abundance (quarterly open and closed)

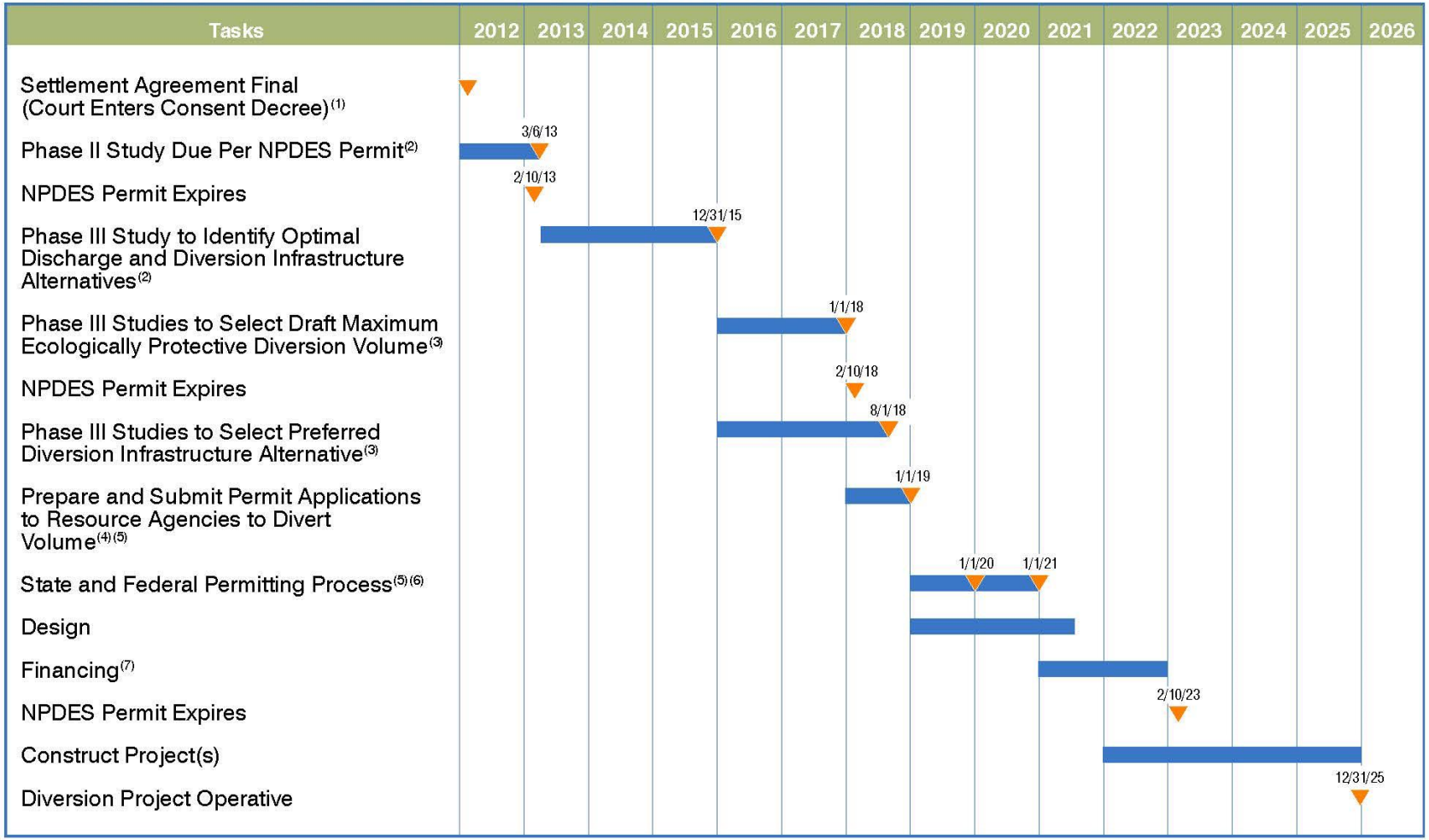
[15] Permit requirements for Phase 3:1) Sufficient studies to determine enhancement and quantify water budget (flow) needed to sustain native species, 2) Nutrient Toxicity studies to identify cause of nutrient, DO and toxicity impairments and if discharge related, propose a N or toxicity reduction plan, 3) Groundwater studies to document interaction of water in estuary, discharge and groundwater and determine if MUN should apply to water impacted by discharge. New monitor will include outflow from ponds, McGrath Lake surface water flow and quality into estuary and 15 groundwater wells.

   b. Habitat mapping for depth, substrate, cover, water quality
   c. Benthic macro invertebrate sampling (quarterly open/closed)
4) Nutrient and toxicity
   a. Review and compile previous DO, N, toxicity, including copper and zinc
   b. Toxicity testing for two additional species (3 events)
   c. Integrate with water quality data collected as above.
5) Groundwater
   a. Review and compile previous studies on hydrogeologic condition.

Studies required in conformance with 2012 Consent Decree (HTB, Wishtoyo, VCK, City of Ventura)

1) Find the Maximum Ecologically Protective Diversion Volume (MEPDV) using NPDES special studies.
2) Create opportunities to use between 50-100% of the treated water for landscaping, agricultural, or other reclamation uses to stretch water supplies and reduce or eliminate the amount of effluent released into the Estuary
3) Build treatment wetlands to further improve water quality if treated water is released into the Estuary.
4) Work together with Ventura Water's customers to arrive at the most responsible and sustainable solution for the health of the Estuary and Ventura's water supply by 2018, and to fully implement this solution by 2025

CITY OF VENTURA
ADDITIONAL SANTA CLARA RIVER ESTUARY STUDIES AND PERMITTING PROCESSES



(1) Estimated date of 2/1/2012.

(2) Studies suggested by final Estuary Report are too complex and numerous to be completed by 3/6/13 (permit renewal date). Additional studies/tasks are prioritized into Phase II and post-March 2013 Phase III studies.

(3) Additional studies will be undertaken to further plan, evaluate feasibility, environmental impacts and benefits, and select preferred alternative.

(4) Draft permit applications for MEPDV and preferred infrastructure alternative due.

(5) Permits process includes use of CEQA/NEPA analysis prepared to select MEPDV and preferred infrastructure alternative. Permits may include ESA permits, CWA Section 404, CA DFG Section 1602, Coastal Act and NPDES permits.

(6) 1/1/2020 requested date permits issued; 1/1/2021 last date to issue permits without delaying construction.

(7) Financing Plan, Rates, Bonds, 218 votes...

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