

# Central Valley Refuge Needs

April 2020

There are two types of Refuge needs in the Central Valley – water and funding. Funding needs for the refuges can be further refined to the following categories: infrastructure, conveyance costs, water purchase and studies/project design. It is assumed that each of the refuges will need to secure funding for water acquisition and conveyance/wheeling costs as well as general maintenance funding over time.

A current study has estimated that to permanently purchase all the remaining water supplies needed for full water deliveries to these refuges, it would cost \$485 million (\$300 million south of Delta and \$185 million north of Delta). In addition to water acquisition funds needed, there is roughly \$130-165 million still needed for infrastructure to deliver the water to the four refuges that do not have adequate conveyance and \$10-20 million needed annually for conveyance costs.

PHOTO: Steve Emmons

## North of Delta

The total Incremental Level 4 water allocation for the five north of Delta refuges is 27,750 acre-feet. The average wheeling costs for surface refuge water for north of Delta refuges through Reclamation conveyance agreements is approximately \$29 per acre-foot.

### Sacramento NWR

Internal main delivery canal improvements needed. On the refuge property, Lateral 26-2 needs excavation, re-sloping and raised levees its entire length to achieve needed delivery capacity. Water control structures also need to be replaced. Cost will be more than \$1 million.

### Delevan NWR

Internal canal improvements are needed to increase capacity. Central Lateral and West Lateral need to be excavated, re-sloped and levees raised to achieve needed capacity. Cost will be around \$1 million.

The refuge would benefit from an exchange between Maxwell ID and Glenn-Colusa ID to receive water from Maxwell ID for the southern part of the refuge.

### Colusa NWR

Needs some conveyance infrastructure improvements to relieve pinch points within the refuge that need to be defined and develop a cost estimate. Need to reestablish a lift pump in the RD 2047 Drain and 2 miles of water delivery canals to provide water to approximately 1,500 acres in Tract 27 in the southeastern corner of the refuge. Cost is approximately \$750,000 to \$1,000,000.

### Sutter NWR

External Improvement – Proposition 1 funded lift pump. It will be completed in 2021 in time for fall flood-up. It requires revegetation work that was not included in the original estimate that will cost an estimated \$1.2 million.

Water needs are sub-divided into the needs for the refuge to get to Level 2 (or the water necessary for baseline habitat values) and incremental Level 4 (the water necessary to maximize the habitat value of the refuge).

## North of Delta Continued

In a multi-year pilot project with Reclamation District 1004 to determine the ability of the district to get water to Sutter NWR. The third and final year of the pilot study will run from September 2019 to January 2020. If the pilot is successful, a long-term contract with RD 1004 will be needed and RD 1004 will also need about \$3-4 million in infrastructure improvements to supply the water. Sites are being investigated to install additional flow meters.

### Gray Lodge WA

The Proposition 1 grant awarded to Gray Lodge will fund infrastructure needs for full Level 4 supplies. The Proposition 1 project is under construction and scheduled for completion by May 2022.

A separate recirculation project is partially completed and is awaiting electrical hook-up.

## North of Delta Non-CVPIA Refuges

### Llano Seco Unit (FWS unit, state wildlife area, and conservation easements)

The property receives water from a diversion in the Sacramento River shared with M&T Ranch. As the water is conveyed it must go through the siphon to get under Angel Slough, and the siphon has failed. Estimated siphon replacement cost is \$3-4.5 million. \$1.5 million has been secured through DWR.

### Butte Sink Unit

The unit has a lift station on Butte Creek that needs its fish screen and lift stand repaired. Estimated repair cost is \$100,000.



PHOTO: Leslie Morris



PHOTO: Jim Morris



PHOTO: Jim Morris

## South of Delta CVPIA Refuges

The total incremental Level 4 water south of Delta is 105,514 acre-feet. The Incremental Level 4 needs for the region are pooled. The average wheeling costs for south of Delta refuges is approximately \$50 per acre-foot for surface water conveyance. New Incremental Level 4 delivery projects may incur additional charges. For state and private wetlands, SGMA fees are expected to have an impact on operating budgets.

### Grassland RCD

Funding need for dedicated long-term conveyance. Need for ~ 30,000 acre-feet of incremental Level 4 water. Potential water supplies include Los Banos Creek Reservoir Water Resource Management Program and groundwater development projects.

Los Banos Creek Reservoir Phase I project was completed and is now operational producing 5,000 acre-feet in wet years. A temporary water right permit change was issued by the SWRCB to USBR for a 1-year pilot of the Phase II project to store CVP water in Los Banos

Creek Reservoir. The Phase II project construction, design, and environmental cost is estimated to be ~ \$3.5 million. One quarter of the storage would preserve south of Delta Incremental Level 4 water supply for the refuges. The project also increases the yield and regularity of Project I performance. The source of funding has not been identified.

Patterson Irrigation District is in the process of improving its conveyance system into the Delta-Mendota Canal to match its newly finished 200 cfs pump station off the San Joaquin River. This project has the potential to recapture south of Delta refuge water as a new source

of Incremental Level 4 supply. Phase 1 is fully designed, has all environmental coverage for construction and is shovel ready. To finalize Phase 1, PID needs \$19 million to complete. Phase II is estimated to cost \$25 million. Any federal or state funding could be used to develop additional Incremental Level 4 water through the recapture of refuge water. This project will also expand transfer opportunities for SOD refuges.

There are 3 wetland recharge and groundwater conjunctive management projects proposed that would cost ~ \$3 million total.

Grassland Water District water cost increases were recently adopted.

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### North Grasslands WA

The China Island Unit needs an additional 1,400 acre-feet in Incremental Level 4 water and the Salt Slough Unit needs an additional 1,400 acre-feet in Incremental Level 4 water.

Internal delivery canal capacity improvements are needed. Excavator and operator to excavate, reshape and reslope 10 miles of canal is estimated to cost \$75,000.

Water efficiency pipeline extension needed to improve cross canal capability to the Gadwall Unit would cost \$130,000.

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### Volta WA

Is in good shape for Level 2 supplies. A Wildlife Conservation Board grant was awarded to improve water measurement.

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### Los Banos WA

Internal delivery canal capacity improvements are needed. Excavator and operator to excavate, reshape and reslope 10 miles of canal is estimated to cost \$75,000.

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### San Luis NWR

#### San Luis Unit

Receives full Level 4 water supplies.

#### Kesterson Unit

Build lift pump to move water from Eagle Ditch to Santa Fe Canal to supplement delivered water – estimated cost: \$150,000. Receives full Level 4 water supplies.

#### Freitas Unit

Receives full Level 4 water supplies.

#### East Bear Unit

Preliminary design study to install fish screen on pumping plant - estimated cost: \$50,000. Extend internal pipeline to Oxbow wetlands west of Channel 5 - estimated cost: \$500,000.

#### West Bear Unit

Needs no infrastructure improvements.

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### Merced NWR

Install new lift pump, and repair damaged wells for water supply to benefit northern wetlands of refuge – estimated cost: \$750,000

Repair irrigation well #2 – estimated cost: \$40,000

Repair irrigation well #4 – estimated cost: \$35,000

Merced NWR should benefit from the ongoing FERC relicensing of the Merced Irrigation District's Merced River and Merced Falls Hydroelectric Projects project.

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### Mendota WA

External Improvements – Water conveyance study in progress with the Bureau of Reclamation. Study underway has 4 alternatives: \$29 to \$70 million in capital costs. A separate concrete drain pipe project will cost \$180,000 and needs to be done but would cut off water supply to the refuge when under construction. \$35,000 per year average cost for replacing water control structures. Subsidence is impacting 5,000 acres on the south end of the refuge.

Internal delivery canal capacity improvements are needed. Excavator and operator to excavate, reshape and reslope 10 miles of canal is estimated to cost \$75,000.

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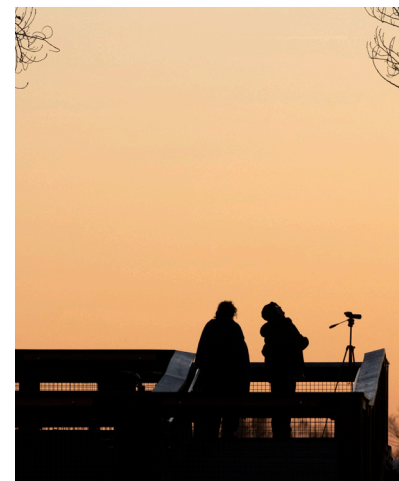
### Pixley NWR

External Improvements – Reliant upon three wells for full Level 2 supplies. Long-term goal is to acquire surface water. The 2004 EA recommended construction of a 10-mile pipeline from Delano-Earlimart to Pixley, and recent estimate for that is \$30 million. A proposed water supply study was funded in the BOR's FY19 budget.

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### Kern NWR

CWA completed work with a WCB grant to recirculate water within Kern NWR by installing a lift pump and recirculation ditch dirt work. A meter for the lift pump was not included – estimated cost: \$20,000 (includes McCrometer, grounding kit, and flange).



PHOTOS: Jim Morris

## South of Delta non-CVPIA refuges

### Lone Tree

Wetlands water conveyance, building conveyance (including lift pump) through Cinnamon Slough to re-use drain water – estimated cost: \$100,000

### Snowbird Units of Merced NWR (non-CVPIA)

Replace irrigation well and add solar panel array – estimated cost: \$300,000 (well \$250,000 and solar panel \$50,000).

### Arena Plains Unit of Merced NWR (non-CVPIA)

Replace irrigation well and add solar panel array – estimated cost: \$300,000 (well \$250,000 and solar panel \$50,000)

### San Joaquin River NWR (non-CVPIA)

The Refuge operates two diversion pumps on the Stanislaus River. This is a critical water source for the refuges' wetlands and croplands, supporting over 100,000 geese, cranes, and other migratory birds. One of these pumps has a fish screen which in need of repairs, and is currently inoperable. The second pump is in need of a fish screen – estimated cost of \$225,000 includes \$50,000 for the fish screen and needed pump motor, and \$175,000 for installing a fish screen on the second diversion pump.

Approximately 250 acres of Vierra Unit wetlands and riparian floodplain habitat currently lacks gravity drainage through levee back to the river. With drainage lacking, wetland habitat is compromised, and endangered species – riparian brush rabbits – are increasingly jeopardized by flood waters – estimated cost of \$60,000 includes \$25,000 for replacing the nonfunctioning pump and \$35,000 installing a gravity drain pipe through the levee

Repair lift pump which provides water supply for White Lake, Oxbow wetland, and up to 150 acres of riparian habitat, including critical natural high ground for riparian brush rabbits – estimated cost: \$30,000

Funding for pumping costs. Approximately 300 acres of wetlands are not flooded due to lack of funding. However, sumps and water conveyance infrastructure is currently in place- estimated cost: \$45,000 annually (\$30/acre x 300 acres x 5 feet)



PHOTO: Sharon Barker

## Potential New Water Sources

### Los Vaqueros Reservoir Expansion & Transfer Bethany Pipeline

Conveyance costs would need to be funded for proposed water from Los Vaqueros Reservoir for South of Delta refuges. Average 43,000 acre-feet a year of Incremental Level 4 south of Delta refuge water supply. Transfer Bethany Pipeline is proposed to be 300 cfs of additional south of Delta conveyance capacity.

### Pacheco Storage Project

Project could help with operational flexibility and water supply – up to 2,000 acre-feet/year in below normal years to south of Delta refuges as Incremental Level 4 water supply.

### Sites Reservoir

A long-term average of 26,000 to 31,000 acre-feet of incremental Level 4 water to National Wildlife Refuges (mostly south of Delta).

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