

## LOWER DEER CREEK FLOOD AND ECOSYSTEM IMPROVEMENT PROJECT – 2D HYDRODYNAMIC MODEL NORTH CANAL CUTOFF RESULTS ADDENDUM

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DATE: October 2021

### PURPOSE

This is an addendum to the Lower Deer Creek Flood and Ecosystem Improvement Project 2D Hydrodynamic Model technical memorandum (April 2019) and the Project Alternatives Results Addendum (April 2021). The purpose of this addendum is to document model results for the proposed Stanford-Vina Ranch Irrigation Company (SVRIC) Dam north diversion canal high flow cut-off structure and embankment installation. This component was added to address stakeholder flooding concerns on the lands to the North-Northwest of SVRIC Dam and has been carried through to the project description of the Lower Deer Creek Flood and Ecosystem Improvement Project Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR).

### MODEL SCENARIO DESCRIPTION

The model scenario covered in this memo evaluates the addition of a high flow cutoff structure and new embankments along the diversion canal running from the north side of the SVRIC dam. These elements are shown as the “North Canal Cutoff Structure Installation” and “New Embankments” to the north and west of SVRIC in Figure 1. The model was run for the largest setback option (Figure 2) at the 50-yr design flow (21,000 cfs).

FIGURE 1: PROJECT DESCRIPTION

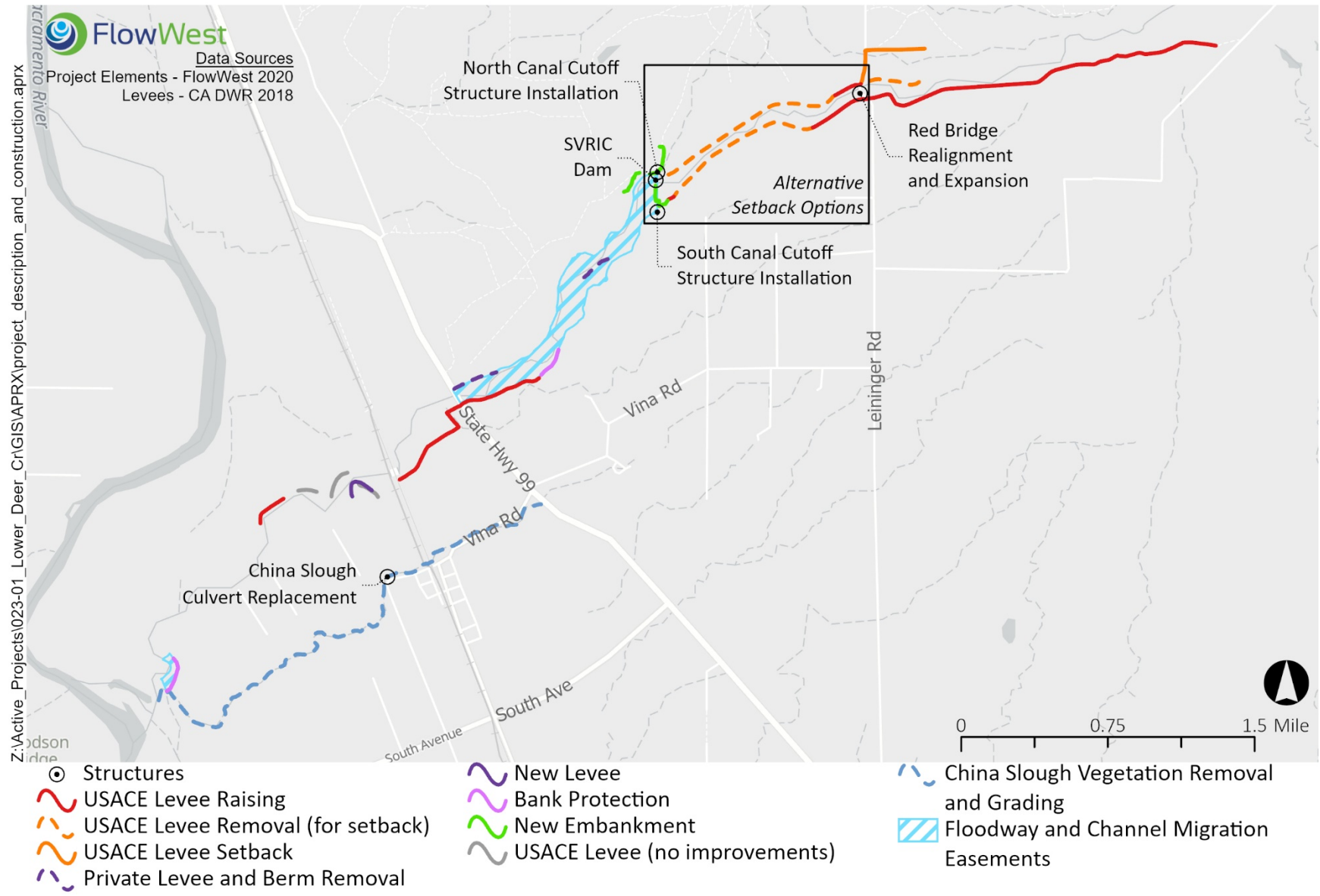
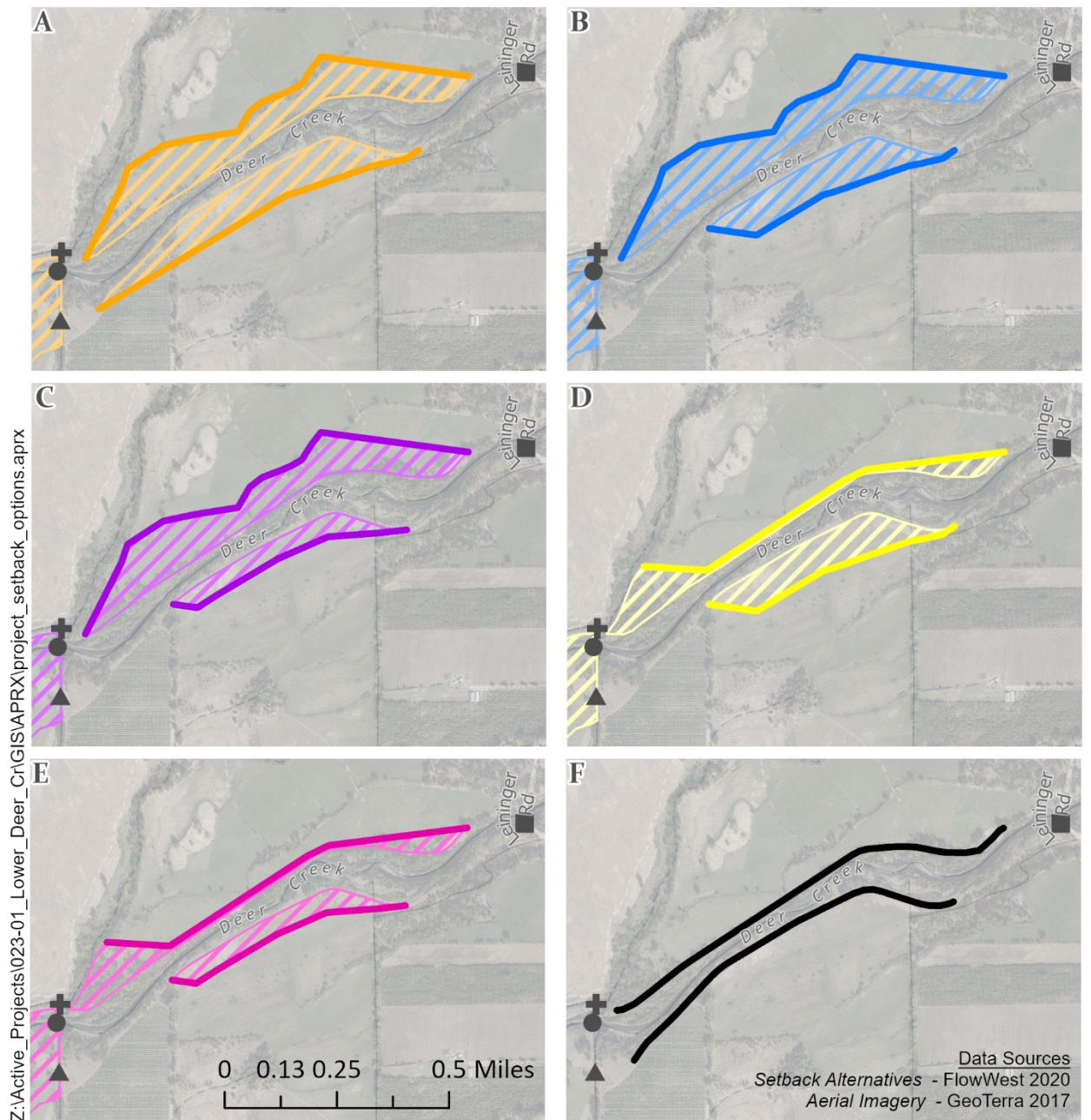


FIGURE 2: ALTERNATIVE SETBACK OPTIONS



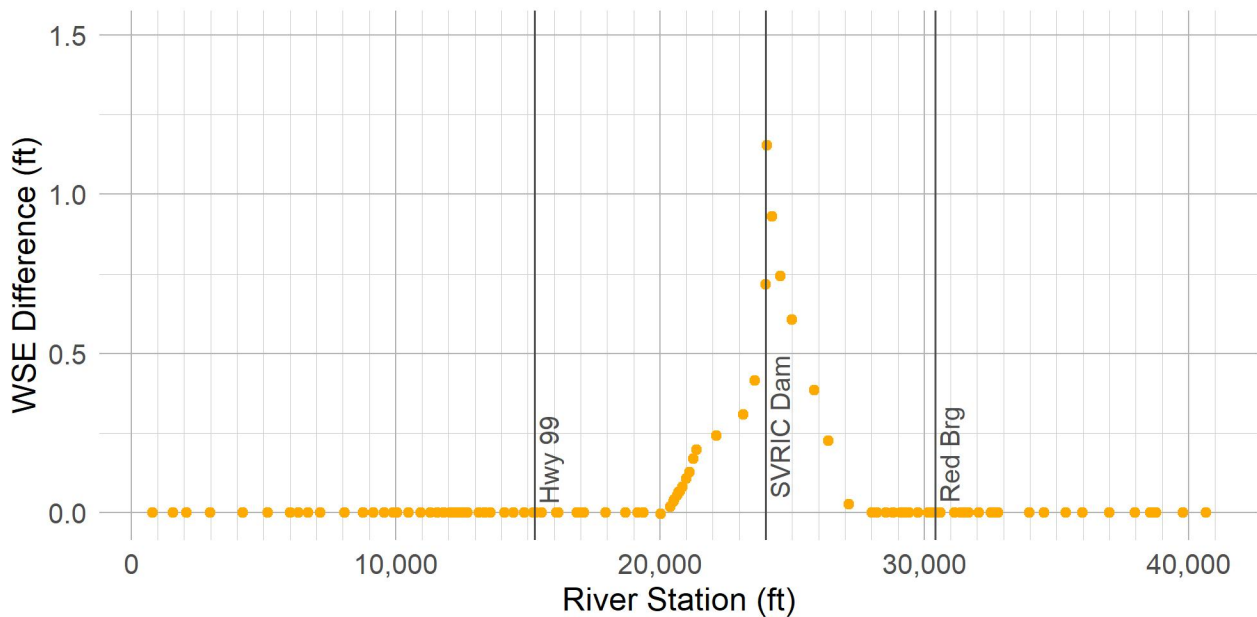
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- |                        |                                  |                                      |
|------------------------|----------------------------------|--------------------------------------|
| Levee Setback Option A | Levee Setback Option D           | Red Bridge Realignment and Expansion |
| Option A Easements     | Option D Easements               | North Canal Cutoff Structure         |
| Levee Setback Option B | Levee Setback Option E           | SVRIC Diversion Dam                  |
| Option B Easements     | Option E Easements               | South Canal Cutoff Structure         |
| Levee Setback Option C | USACE Levee Raising (No setback) |                                      |
| Option C Easements     |                                  |                                      |

## MODEL RESULTS

Effects of the proposed project changes on water surface elevations and inundation were analyzed using the 50-yr return interval flow, which corresponds to the original USACE design flow for the Deer Creek Flood Control Project. Inundation maps are provided in Appendix D (Figure D-1 through Figure D-4). Model results show that the north canal high flow cut-off structure and associated embankments would increase water surface elevations in the vicinity of SVRIC Dam by up to 1.2 ft relative to the original Alternative 1a design (Figure 3). The largest changes are localized within 1,000 ft upstream of the dam. Outside of that extent, increases are less than 0.5 ft and diminish to zero within approximately 6,000 ft upstream and 4,000 ft downstream of the dam. The project design will incorporate these increases into the levee and embankment elevations, as necessary.

FIGURE 3: DESIGN FLOW (21,000 CFS) WATER SURFACE ELEVATION DIFFERENCES RESULTING FROM ADDITION OF NORTHERN HIGH-FLOW CUT-OFF STRUCTURE AND EMBANKMENTS



## APPENDIX D

Lower Deer Creek Flood and Ecosystem Improvement Model Alternative 1a inundation depth maps including North Canal Cutoff Structure and associated embankments at 21,000 cfs. This is the design flow for the Deer Creek Flood Control Project (USACE 1957).



Figure D-1. Deer Creek Alternative 1a Inundation Depth Map for Abbey Reach

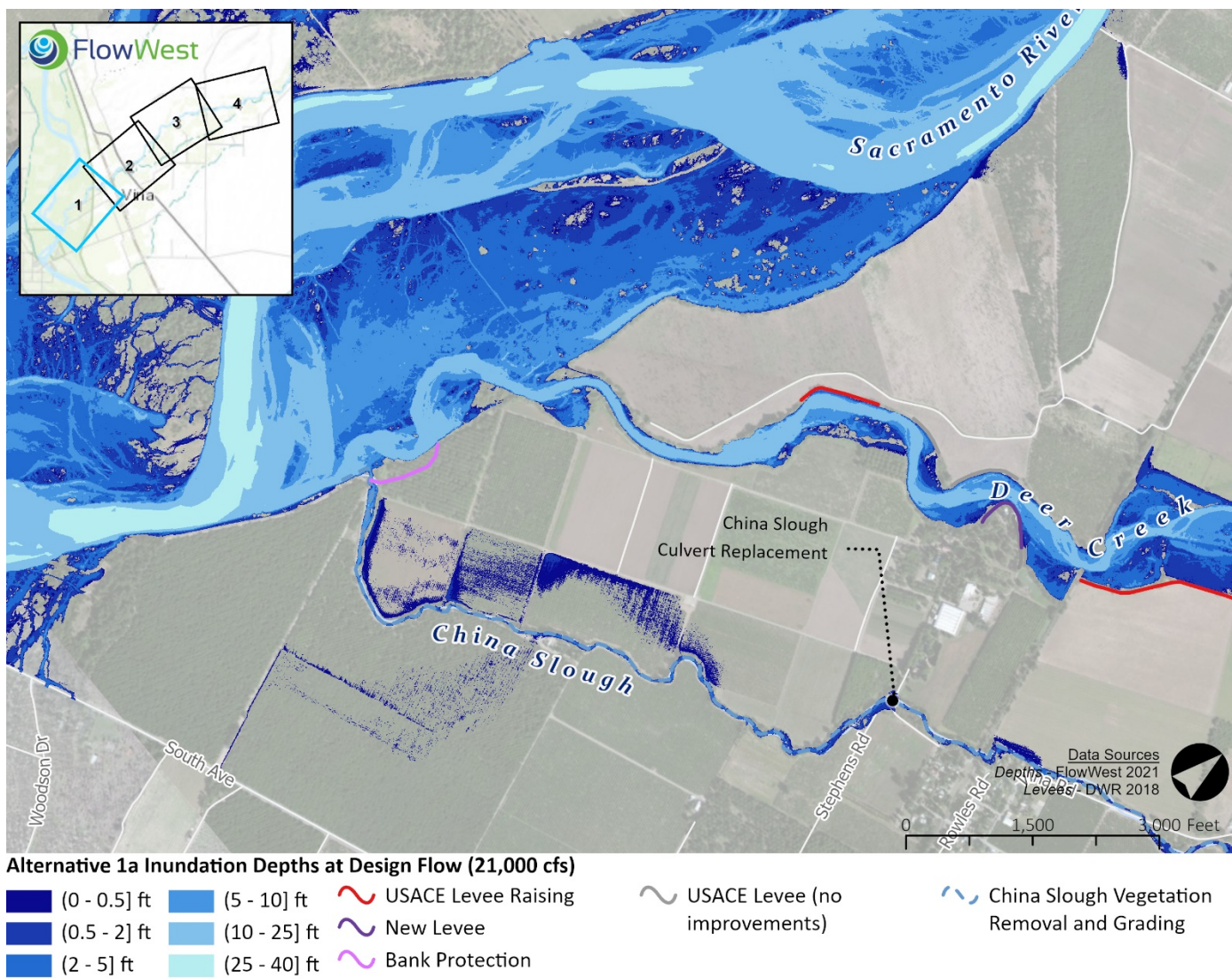
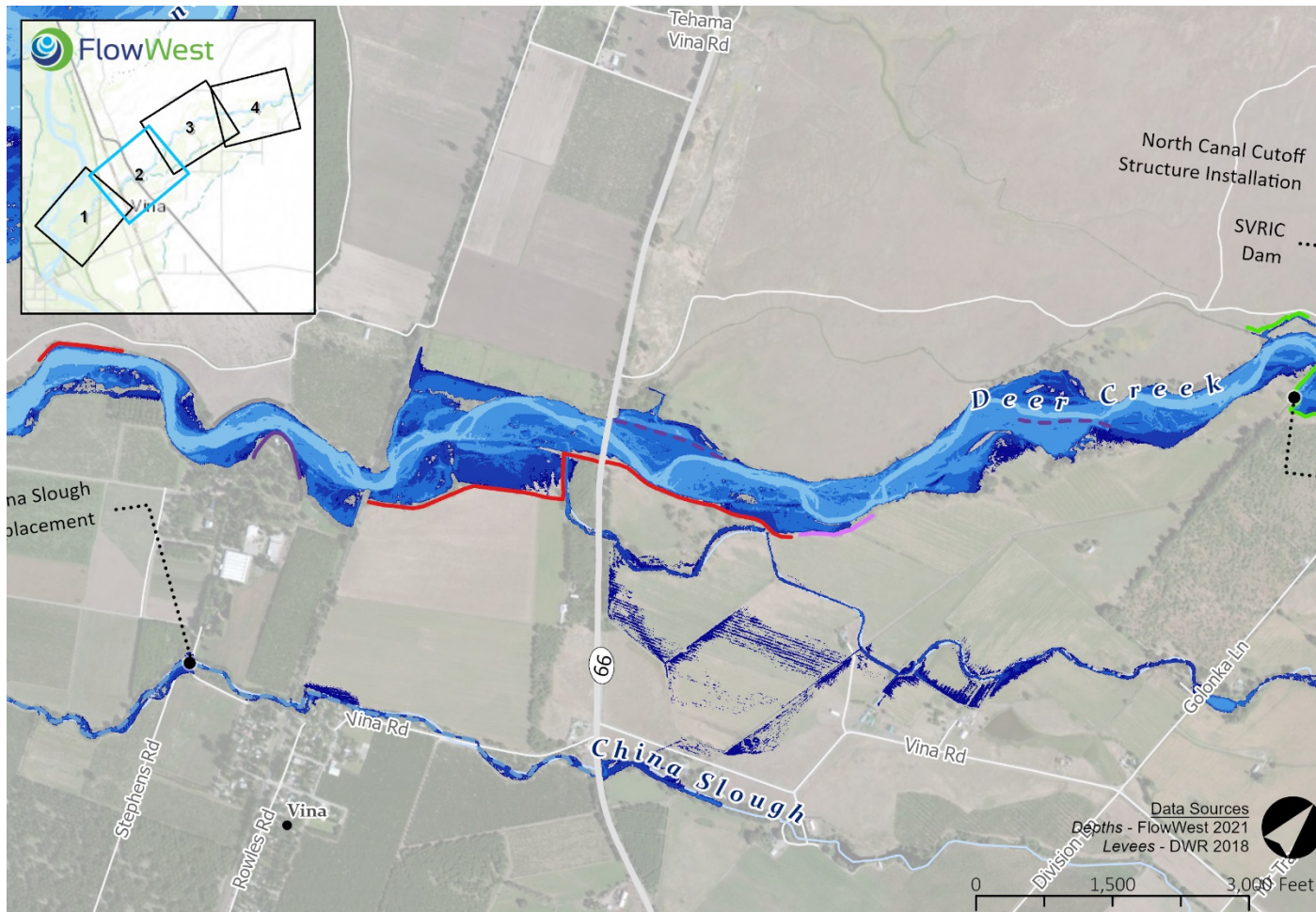


Figure D-1. Deer Creek Alternative 1a Inundation Depth Map for Abbey Reach

Figure D-2. Deer Creek Alternative 1a Inundation Depth Map for Ramsey and Wood Reach



**Alternative 1a Inundation Depths at Design Flow (21,000 cfs)**

- |  |  |  |  |   |
|--|--|--|--|---|
|  (0 - 0.5] ft |  (5 - 10] ft  |  USACE Levee Raising            |  Bank Protection               |  China Slough Vegetation Removal and Grading |
|  (0.5 - 2] ft |  (10 - 25] ft |  Private Levee and Berm Removal |  New Embankment                |   |
|  (2 - 5] ft   |  (25 - 40] ft |  New Levee                      |  USACE Levee (no improvements) |   |

**Figure D-2. Deer Creek Alternative 1a Inundation Depth Map for Ramsey and Wood Reach**



Figure D-3. Deer Creek Alternative 1a Inundation Depth Map for Setback Reach

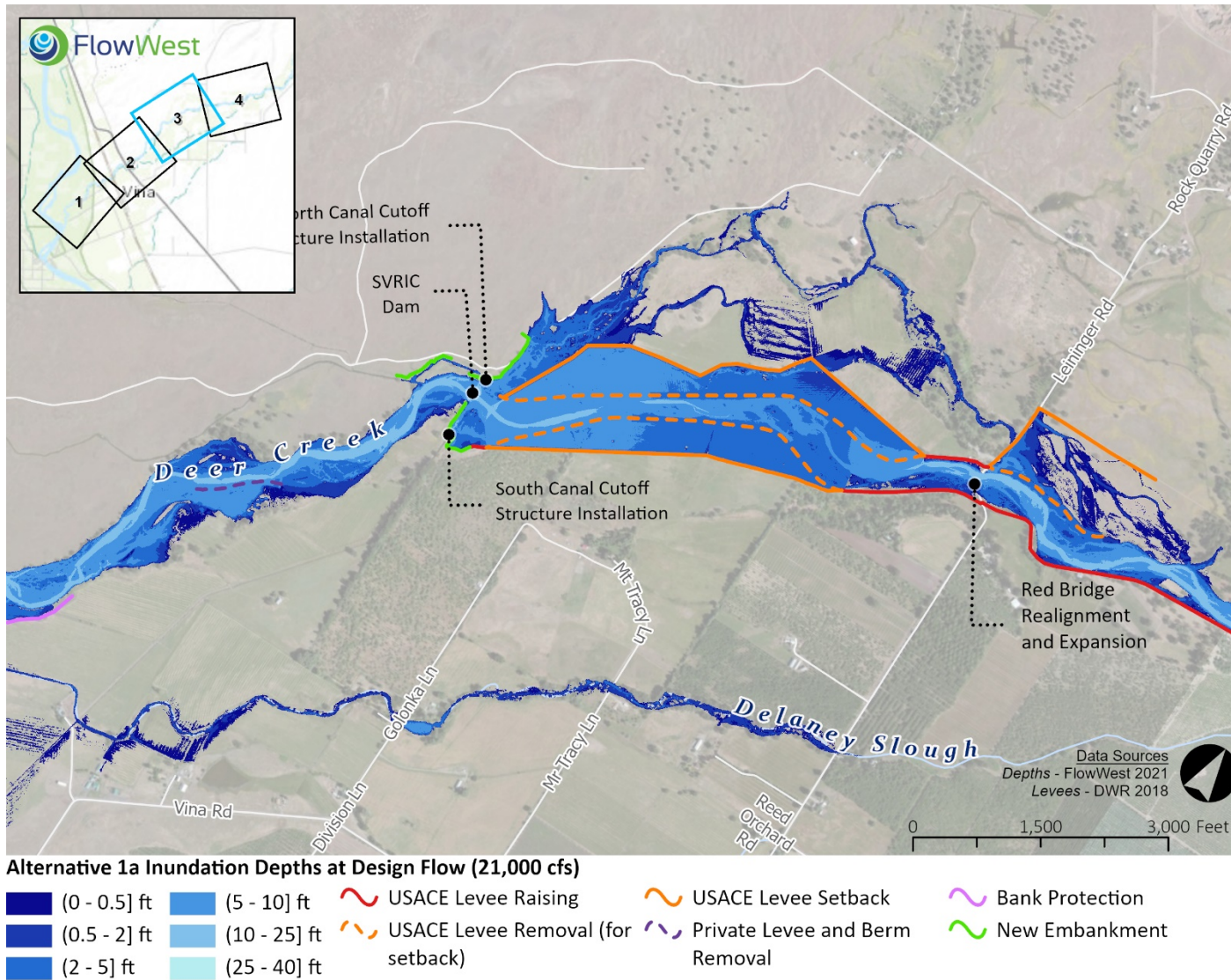
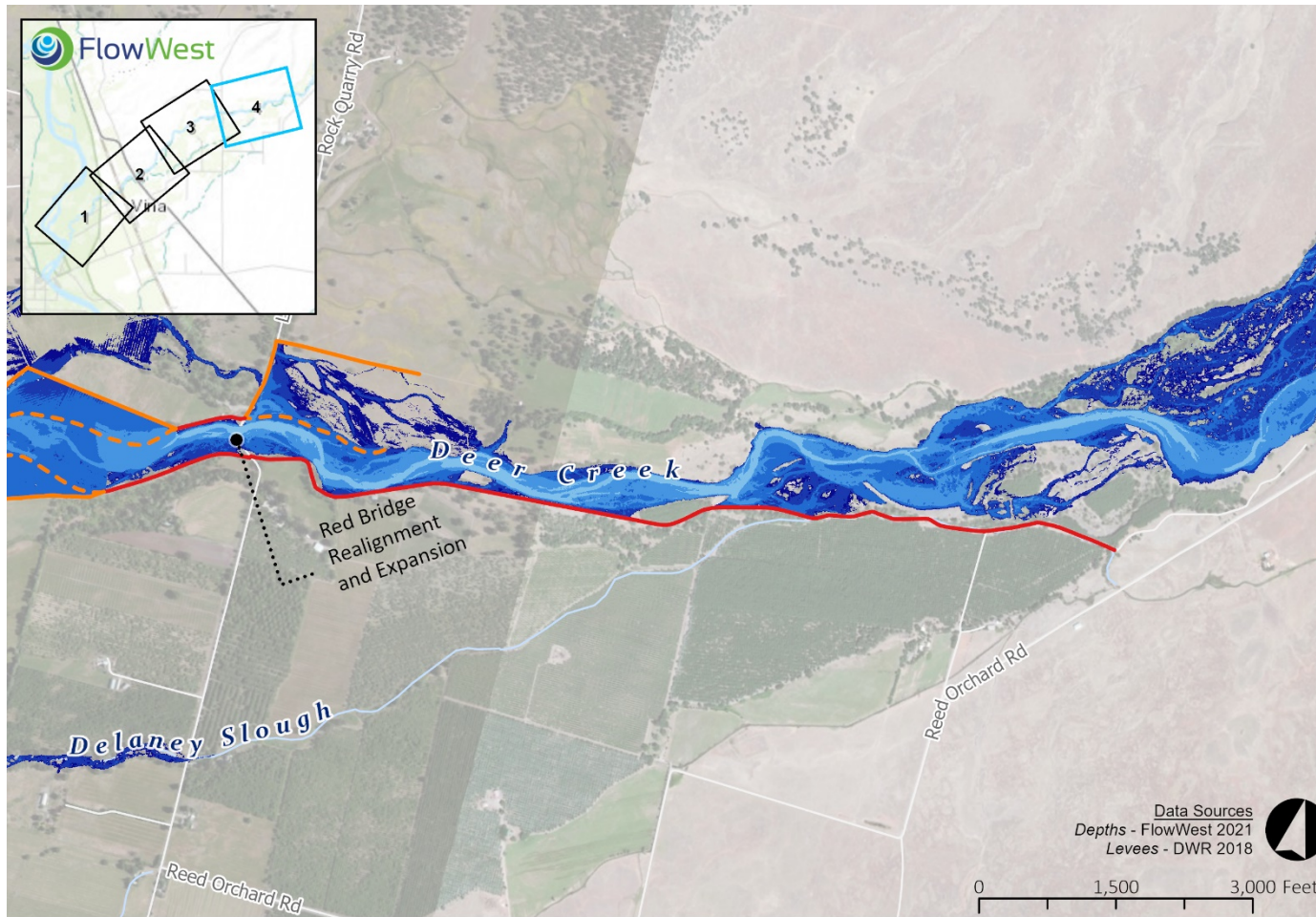


Figure D-3. Deer Creek Alternative 1a Inundation Depth Map for Setback Reach



Figure D-4. Deer Creek Alternative 1a Inundation Depth Map for Upstream Reach



**Alternative 1a Inundation Depths at Design Flow (21,000 cfs)**

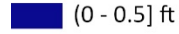
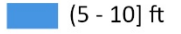



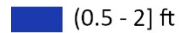
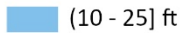
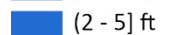
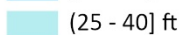
- |  |  |   |  |   |
|--|--|---|--|---|
|  (0 - 0.5] ft |  (5 - 10] ft  |  USACE Levee Raising |  USACE Levee Removal (for |  USACE Levee Setback |
|  (0.5 - 2] ft |  (10 - 25] ft |   | setback)   |   |
|  (2 - 5] ft   |  (25 - 40] ft |   |  |   |

Figure D-4. Deer Creek Alternative 1a Inundation Depth Map for Upstream Reach