

Table 1. Ballona Wetlands Restoration Phase 1 options summary and assessment. ESA PWA 10/20/11 draft for discussion.

	Smaller Phase 1	Current Phase 1	Expanded Phase 1	Long-term Plan / Phase 2	
Name	Fiji Channel or Southeast Area B managed wetland	Area A with levee breaches	Levee removal with Culver levee		
Figure	Figure 1	Figure 2	Figure 3	Figure 4	
Habitat restoration components (Main differences in bold, Possible sub-phases in italics)	1- South Area B drainage improvements 2- See options below	1- Area A wetlands & channel meander 2- Levee breaches 3- Area C & B fill placement 4- <i>Fiji Channel</i> 5- South Area B drainage improvements	1- Levee removal 2- Culver & West Area B levees 3- North & West Area B wetlands 4- Area A wetlands 5- <i>Fiji Channel</i> 6- Area C fill placement 7- South Area B drainage improvements	<i>Following Current Phase 1:</i> 1. Area B levee(s) & raised road(s) 2. Levee removal 3. North & West Area B wetlands 4. South Area B wetland (see options) 5. Southeast Area B managed wetland	<i>Following Expanded Phase 1:</i> 1. Raise road(s) 2. South Area B wetland (see options) 3. Southeast Area B managed wetland
Public access components	1- South Area B access road 2- See options below	1- Area A trail & boardwalks 2- South Area B access road 3- Area C trails & park	1- Area A trail & boardwalks 2- Culver levee trail 3- West Area B boardwalk 4- Area C trails & park	1- Southeast Area B boardwalk & access	(Completed in Phase 1)
Optional components	1- Fiji Channel wetland & public access 2- Southeast Area B managed wetland with tide gates or similar & public access 3- Area A excavation, Area C fill placement & public access	1- Bridges over breaches 2- North Ballona Creek levee removal	1- Existing straight channel alignment 2- Channel realignment 3- Tie in Culver levee with west upland peninsula & existing levee, maintain West Area B as managed wetland 4- <i>Southeast Area B managed wetland & public access (shown in Fig 3)</i> 5- South Area B managed wetland enhancement 6- Area C wetland	1. Existing straight channel alignment 2. Channel realignment 3. Consolidate Culver onto Jefferson & relocate section of power transmission line (remove section of Culver levee in Expanded Phase 1) 4. Consolidate Jefferson onto Culver (avoid transmission line relocation in Current Phase 1, raise Culver onto Culver levee in Expanded Phase 1) 5. South Area B tidal wetland & levees (shown in Figure 4 & incl. in cost estimate), or maintain or enhance managed wetland 6. Area C wetland	
Goal 1: Habitat function (connectivity)	Low (culverts)	Medium (levee breaches)	High (levee removal)	High (levee removal)	
Goal 2: Public access opportunities	Low	Medium	High	High	
408 Permit: degree of modification to existing flood protection system	No 408, or low-level 408 or other USACE approval process	Medium: maintains flood control channel	High: removes flood control channel	Medium/high: 408 for Phase 2	No 408 for Phase 2 assumed
Excess soil volume ¹	NA	1,080,000 CY	Up to 1,200,000 CY	860,000 CY	
Uncertainties & risks	Phase 2 within timeline of programmatic EIR/S	408 approval	408 approval, channel dynamics, , sensitive species habitat, option of new Southeast Area B tide gate or similar	408 approval, channel dynamics, sensitive species habitat, traffic impacts, power line relocation; reduces road flood risk	Traffic impacts; reduces road flood risk

¹ Soil volume to place in Area C upland and Area B between the three roads. Total available placement volume is approximately 1,700,000 CY (1,200,000 CY not including optional Area C wetland area) as follows:
Area C: 1,150,000 CY with placement up to approximately 50 ft NAVD (above average existing grade of approx. 15 ft NAVD, with portions at 20 ft NAVD); includes 390,000 CY in the optional Area C wetland (760,000 available in other portions of Area C)
Area B: 540,000 CY with placement up to approximately 20 – 25 ft NAVD (above average existing grade of approx. 13 ft NAVD)

Table 2. Ballona Wetlands Restoration Phase 1 options cost comparison. ESA PWA 10/20/11 draft for discussion.

	Smaller Phase 1	Current Phase 1	Expanded Phase 1	Long-term Plan / Phase 2	
Name	Fiji Channel or Southeast Area B managed wetland	Area A with levee breaches	Levee removal with Culver levee	Following Current Phase 1	Following Expanded Phase 1
Earthwork estimate ²		\$43	\$83	\$90	\$90
Revegetation & public access allowance ^{3 4}		\$7	\$10	\$10	\$10
Road relocation allowance ⁵		NA	NA	\$10	\$10
Phasing allowance ⁶		NA	NA	\$10	NA
Total- construction		\$50	\$93	\$120	\$110
Estimated design & permitting		\$5	\$7	\$9	\$8
Total cost	\$10 -\$15+/- possible depending on options	\$55	\$100	\$129	\$118

² Based on itemized, conceptual-level costs estimate for earthwork and water control structures by ESA PWA. Includes 35% contingency.

² Allowances are order of magnitude construction cost estimates. Allowances are provided for those items which have not yet been estimated in detail to allow comparison of alternatives.

³ Allowance for public access improvements (trails, pedestrian bridges, etc.) and revegetation.

⁴ Allowance for relocation of Culver Road onto raised embankment, including undergrounding of overhead power lines. Does not include optional component of relocating power transmission line in the Long-term Plan / Phase 2 (approx. \$10M).

⁵ Allowance for additional earthwork handling due to project phasing. Assumes that under Expanded Phase 1 the Culver levee is built as future roadway embankment, minimizing earthwork rehandling under Expanded Phase 1.