

1 collaborative science, monitoring, and adaptive management. For the purposes of analysis, it is
 2 assumed that the Collaborative Science and Adaptive Management Program (AMMP) developed for
 3 Alternative 2D would not, by itself, create nor contribute to any new significant environmental
 4 effects; instead, the AMMP would influence the operation and management of facilities and
 5 protected or restored habitat associated with Alternative 2D.

6 Collaborative science and adaptive management will support the proposed project by helping to
 7 address scientific uncertainty where it exists, and as it relates to the benefits and impacts of the
 8 construction and operations of the new water conveyance facility and existing CVP and SWP
 9 facilities. Specifically, collaborative science and adaptive management will, as appropriate, develop
 10 and use new information and insight gained during the course of project construction and operation
 11 to inform and improve:

- 12 • the design of fish facilities including the intake fish screens;
- 13 • the operation of the water conveyance facilities under the Section 7 biological opinion and 2081b
 14 permit; and
- 15 • habitat restoration and other mitigation measures conducted under the biological opinions and
 16 2081b permits.

17 In summary, the broad purposes of the program will be to: 1) undertake collaborative science, 2)
 18 guide the development and implementation of scientific investigations and monitoring for both
 19 permit compliance and adaptive management, and 3) apply new information and insights to
 20 management decisions and actions. For additional information on how the AMMP would be
 21 implemented, see Section 4.1.2.4 in this RDEIR/SDEIS.

22 **4.1.4 Description of Alternative 5A**

23 This section provides description of the components and operation of water conveyance facilities,
 24 ESA and CESA compliance process, and environmental commitments that will be implemented
 25 under Alternative 5A. Table 4.4-6 below, provides a brief summary comparison of these elements
 26 between Alternatives 4, 5, and 5A.

27 **4.1.4.1 Water Conveyance Facility Construction and Maintenance**

28 Under Alternative 5A, water conveyance facilities would be constructed and maintained similarly to
 29 those proposed and analyzed under Alternative 4 (including the modifications described in Section
 30 3, *Alternative 4: Conveyance Facility Modifications*, of this RDEIR/SDEIS); however, this alternative
 31 would entail one intake (Intake 2), rather than three. Water would be conveyed from the north Delta
 32 to the south Delta through pipelines and tunnels. Water would be diverted from the Sacramento
 33 River through one fish-screened intake on the east bank of the Sacramento River near Clarksburg
 34 (Intake 2). Water would travel from the intake to a sedimentation basin before reaching the tunnel.
 35 From the intake water would flow into an initial single-bore tunnel, which would lead to an
 36 intermediate forebay on Glannvale Tract. From the southern end of this forebay, water would pass
 37 through an outlet structure into a dual-bore tunnel where it would flow by gravity to the south
 38 Delta. Water would then reach pumping plants northeast of the Clifton Court Forebay, where it
 39 would be pumped from the tunnels into the north cell of the expanded Clifton Court Forebay. The
 40 forebay would be dredged and redesigned to provide an area that would isolate water flowing from
 41 the new north Delta facilities from water diverted from south Delta channels.

1 **Table 4.1-6. Comparison of Alternatives 4, 5, and 5A**

Element of Project Description	Alternative 4 (BDCP)	Alternative 5	Alternative 5A
ESA Compliance	Section 10 (DWR)/Section 7 (Reclamation)	Section 10 (DWR)/Section 7 (Reclamation)	Section 7
California Endangered Species law Compliance	NCCPA	NCCPA	2081(b) permit
Facilities	Modified Pipeline/Tunnel Alignment: 3 intakes, 9,000 cfs	Pipeline/Tunnel Alignment: 1 intake, 3,000 cfs	Modified Pipeline/Tunnel Alignment: 1 intake, 3,000 cfs
Operations	Dual Conveyance; Operational Scenarios H1-H4 with Decision Tree (see Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS); evaluated at LLT	Dual Conveyance; Operational Scenario C; evaluated at LLT	Dual Conveyance; Operational Scenario C without Fremont Weir modifications; evaluated at ELT
Conservation Measures/ Environmental Commitments	Conservation Measures 2-21; includes Yolo Bypass Improvements and 65,000 acres of tidal wetland restoration	Conservation Measures 2-21; includes Yolo Bypass Improvements and 65,000 acres of tidal wetland restoration	Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, and 16; includes up to 55 acres of tidal wetland restoration
CEQA Baseline	Existing Conditions	Existing Conditions	Existing Conditions
NEPA Baseline	No Action Alternative at LLT	No Action Alternative at LLT	No Action Alternative at ELT

2

3 A map and a schematic diagram depicting the conveyance facilities associated with the modified
4 pipeline/tunnel alignment are provided in Mapbook Figure M3-4 in the Mapbook Volume and
5 Figure 3-10 in Appendix A of this RDEIR/SDEIS (note, however, that these figures depict three
6 intake locations, rather than one). Construction of a single intake site (Intake 2) would preclude the
7 need for ancillary facilities and features associated with Intakes 3 and 5, including box conduits
8 under widened and raised levee sections, relocated segments of SR 160, sedimentation basins,
9 drying lagoons, outlet shafts, and elevated pads hosting an electrical substation, an electrical
10 building, and other storage buildings. During construction, temporary work areas, fuel stations, and
11 concrete batch plants associated with Intakes 3 and 5 would also not be required. Similarly,
12 Alternative 5A would not require construction of a single-bore tunnel between Intake 5 and the
13 intermediate forebay, nor temporary 69kV power line segments connecting to substations at Intakes
14 3 or 5. Under Alternative 5A, an operable barrier would not be constructed at the head of Old River.

15 As proposed for Alternative 4, a new pumping facility would be constructed northeast of the north
16 cell of the expanded Clifton Court Forebay, along with control structures to regulate the relative
17 quantities of water flowing from the north Delta and the south Delta to the Banks and Jones
18 Pumping Plants. Alternative 5A would entail the continued use of the SWP/CVP south Delta export
19 facilities.

20 All other aspects of water conveyance facility design, construction, and maintenance would be
21 similar to those described for Alternative 4 in the revised text in Chapter 3, Sections 3.4, 3.5.9, and

1 3.6.1 and Appendix 3C, as provided in Appendix A, *Revisions to the Draft EIR/EIS*, of this
2 RDEIR/SDEIS.

3 **4.1.4.2 Water Conveyance Facility Operations**

4 Operational components of the water conveyance facilities under Alternative 5A would be similar,
5 but not identical, to those described under Scenario C in Chapter 3, Section 3.6.4.2 of the Draft
6 EIR/EIS. Operational elements associated with Fremont Weir modifications would not be
7 incorporated as part of this alternative, because Yolo Bypass improvements contemplated for
8 Alternative 5 (under CM2) would not be implemented as part of Alternative 5A; instead, they would
9 be assumed to occur as part of the No Action Alternative because they are required by the existing
10 BiOps. For a detailed characterization of operational criteria, please refer to Chapter 3, Section
11 3.6.4.2 of the Draft EIR/EIS.²⁴

12 Implementation of Alternative 5A would include operations of both new and existing water
13 conveyance facilities once the new north Delta facilities are completed and become operational,
14 thereby enabling joint management of north and south Delta diversions. The north Delta intake
15 would be a new facility for the SWP and CVP and would be operated as described in Chapter 3,
16 Section 3.6.4.2 of the Draft EIR/EIS. Compliance with all other criteria included in the USFWS (2008)
17 and NMFS (2009) BiOps and State Water Resources Control Board Water Right Decision 1641 (D-
18 1641), including Fall X2, the E:I ratio, and operations of the Delta Cross Channel gates and the Suisun
19 Marsh Salinity Control Gates, will continue as part of the operation of the CVP and SWP. As such,
20 when compared with operations under the No Action Alternative, Alternative 5A includes modified
21 or new operations and criteria of only the following elements.

- 22 • North Delta intake facilities.
- 23 • Rio Vista minimum flow standard in January through August.

24 Alternative 5A operations include a preference for south Delta pumping in July through September
25 to provide limited flushing for improving general water quality conditions and reduced residence
26 times.

27 **Real-Time Operational Decision-Making Process**

28 RTOs are expected to be needed during at least some part of the year at the north and south Delta
29 diversion facilities. In making operational decisions, the RTO Team will take into account upstream
30 operational constraints, such as coldwater pool management, instream flow, and temperature
31 requirements. The extent to which real time adjustments that may be made to each parameter
32 related to these facilities shall be limited by the criteria and/or ranges is set out in Table 4.1-2 of this
33 RDEIR/SDEIS. Any modifications to the parameters subject to real time operational adjustments or
34 to the criteria and/or ranges set out in Table 4.1-2 shall occur only through the adaptive
35 management.

36 **North Delta diversions.** Operations for North Delta bypass flows will be managed according to the
37 criteria described in Table 4.1-2.

²⁴ Note that these proposed operational criteria would only take effect after the proposed conveyance facilities are operational. Until that time, operations would occur as described in the USFWS 2008 and NMFS 2009 BiOps or as modified by the outcome of ongoing ESA compliance processes pertaining to operation of the existing facilities.

1 **South Delta diversions.** The south Delta diversions will be managed under RTO to achieve OMR
 2 criteria, throughout the year based on fish protection triggers (e.g., salvage density, calendar, species
 3 distribution, entrainment risk, turbidity, and flow based triggers). Increased restrictions as well as
 4 relaxations of the OMR criteria may occur as a result of observed physical and biological
 5 information. Additionally, as described above for the north Delta diversion, RTO would also be
 6 managed to distribute pumping activities among the north Delta and two south Delta intake facilities
 7 to maximize both survival of covered fish species in the Delta and water supply.

8 **Timing for Implementation of Operations**

9 Implementation of Alternative 5A would include operations of both new and existing water
 10 conveyance facilities as described above, once the new north Delta facilities are completed and
 11 become operational, thereby enabling joint management of north and south Delta diversions. Until
 12 that time, operations will be governed by existing and applicable requirements and standards
 13 included in the NMFS (2009) and USFWS (2008) BiOps and D-1641, and any regulations that
 14 supersede those requirements.

15 **4.1.4.3 Environmental Commitments**

16 To achieve the applicable regulatory standards under ESA Section 7 and CESA Section 2081(b) while
 17 also complying with NEPA and CEQA, a subset of those activities proposed in Alternative 5 would be
 18 implemented under Alternative 5A. Specifically, portions of the actions proposed under CM3, CM4,
 19 CM6, CM7, CM8, CM9, CM10, CM11, CM12, CM15, and CM16 would be included in Alternative 5A.

20 As described in Section 4.1.2.3 for Alternative 4A, these repackaged and limited elements of the
 21 original BDCP Conservation Measures are instead referred to as “Environmental Commitments” for
 22 the purposes of Alternative 5A: Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, and 16, as
 23 summarized in Table 4.1-7. These commitments consist primarily of habitat restoration, protection,
 24 enhancement, and management activities necessary to offset—that is, mitigate for—adverse effects
 25 from construction of the proposed water conveyance facilities, along with species-specific resource
 26 restoration and protection principles to ensure that implementation of these commitments would
 27 achieve the intended mitigation of impacts (for a list of these standards, along with species-specific
 28 mitigation needs, see Table 4.1-8).²⁵ Where impact statements or mitigation measures refer to
 29 Conservation Measures, these statements have been changed in the analysis for Alternative 5A to
 30 refer instead to the parallel Environmental Commitments. Additionally, pertinent elements included
 31 as Avoidance and Minimization Measures and the proposed Adaptive Management and Monitoring
 32 Program would be implemented as applicable to the activities proposed under Alternative 5A.²⁶
 33 These, too, would serve a mitigation function under CEQA. All of these components would function
 34 as *de facto* CEQA and NEPA mitigation measures for the construction and operations-related impacts
 35 of Alternative 5A. Details regarding the implementation of these activities under Alternative 5A are
 36 provided below and in Table 4.1-7.

37 The RDEIR/SDEIS describes and analyzes Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15,
 38 and 16 at a level of detail consistent with that applied to these activities under other alternatives in

²⁵ While these are distinct from the environmental commitments described in Appendix 3B, *Environmental Commitments*, of the Draft EIR/EIS, both sets of commitments would apply to implementation of Alternative 5A.

²⁶ Specifically, AMMs 1–7, 10, 12–15, 18, 20–25, 30, and 37 would be carried forward under implementation of this alternative.

1 the Draft EIR/EIS. (See CEQA Guidelines, § 15126.4[a][1][D] [EIRs must discuss significant effects of
 2 mitigation measures, “but in less detail than the significant effects of the project as proposed”]; see
 3 also *California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal.App.4th 603, 621-625
 4 [lead agency did not violate CEQA by failing to identify the off-site location at which mitigation for
 5 impacts to on-site wetlands would be carried out].) Specific locations for implementing many of the
 6 activities associated with these commitments have not been identified at this time. Therefore, the
 7 analyses consider typical construction, operation, and maintenance activities that would be
 8 undertaken for implementation of the habitat restoration and enhancement and stressor reduction
 9 efforts. Where appropriate and necessary, implementation of individual projects associated with an
 10 Environmental Commitment would be subject to additional environmental review. (See CEQA
 11 Guidelines, §§ 15162–15164; 40 C.F.R. § 1502.9[c].)

12 Note that many of the actions formerly part of Alternative 5 but not proposed to be implemented
 13 under Alternative 5A would continue to be pursued as part of existing but separate projects and
 14 programs associated with (1) the 2008 and 2009 USFWS and NMFS BiOps (e.g., Yolo Bypass
 15 improvements, 8,000 acres of tidal habitat restoration), (2) California EcoRestore and (3) the 2014
 16 California Water Action Plan. Those actions are separate from, and independent of, Alternative 5A.
 17 Therefore, for the purposes of Alternative 5A, these elements (and their associated environmental
 18 effects) are considered either as part of the No Action Alternative, as described in Section 4.2,
 19 *Impacts of No Action Alternative Early Long-Term*, of this RDEIR/SDEIS, or as part of the cumulative
 20 impact analysis, as described in Section 5, *Revisions to Cumulative Impact Analyses*, of this
 21 RDEIR/SDEIS.

22 **Table 4.1-7. Environmental Commitments under Alternative 5A**

Environmental Commitment 3: Natural Communities Protection and Restoration	
Valley/Foothill Riparian	91 acres
Grassland	1,034 acres
Vernal Pool Complex and Alkali Seasonal Wetland Complex	150 acres
Nontidal Marsh	118 acres
Cultivated Lands	11,330 acres
Total:	Up to 12,724 acres
Environmental Commitment 4: Tidal Natural Communities Restoration	Up to 55 acres
Environmental Commitment 6: Channel Margin Enhancement	Up to 3.1 levee miles
Environmental Commitment 7: Riparian Natural Community Restoration	Up to 222 acres
Environmental Commitment 8: Grassland Natural Community Restoration	Up to 1,044 acres
Environmental Commitment 9: Vernal Pool and Alkali Seasonal Wetland Complex Restoration	Up to 34 acres
Environmental Commitment 10: Nontidal Marsh Restoration	Up to 826 acres
Environmental Commitment 11: Natural Communities Enhancement and Management	At sites protected or restored under Environmental Commitments 3–10
Environmental Commitment 12: Methylmercury Management	At sites restored under Environmental Commitment 4
Environmental Commitment 15: Localized Reduction of Predatory Fishes	At north Delta intake and at Clifton Court Forebay
Environmental Commitment 16: Nonphysical Fish Barrier	At Georgiana Slough

23

Environmental Commitment 3: Natural Communities Protection and Restoration

This action would consist of the acquisition of lands for protection and restoration of listed species habitat in perpetuity and would be implemented in the same way as described in Conservation Measure 3 in the Draft BDCP but over less area. For the purposes of Alternative 5A, this action would entail protection of approximately 12,724 acres, of natural communities and cultivated land, as shown in Table 4.1-7. This protection and restoration would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 4: Tidal Natural Communities Restoration

This action would consist of the restoration of tidal natural communities and transitional uplands and would be implemented in the same way as described in Conservation Measure 4 in Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS, but over less area. For the purposes of analysis of Alternative 5A, this action would entail restoration of approximately 55 acres (including transitional uplands), as shown in Table 4.1-7. This analysis assumes that none of these 55 acres of tidal restoration will occur in the Suisun Marsh area. Tidal habitat restoration would mitigate for the physical loss of aquatic habitat associated with construction of the north Delta intake facilities. The current proposed mitigation acreage is a total of 55 acres. However, actual acreage may change based on further discussions with NMFS, USFWS, and DFW pertaining to the actual value of the current habitat and/or the appropriate ratio of mitigation or based on footprint changes. Based on initial discussions, the maximum ratio applied to tidal wetland mitigation is 3:1, and therefore would not exceed 165 acres for this alternative.

Environmental Commitment 6: Channel Margin Enhancement

This action would consist of the enhancement of channel margin habitat and would be implemented in the same way as described in Conservation Measure 6 in the Draft BDCP but over less linear distance. For the purposes of Alternative 5A, this action would entail enhancement of approximately 3.1 levee miles, as shown in Table 4.1-7. This would mitigate for the loss of salmonid habitat associated with construction of the north Delta intake facilities.

Environmental Commitment 7: Riparian Natural Community Restoration

This action would consist of the restoration of riparian natural communities and would be implemented in the same way as described in Conservation Measure 7 in the Draft BDCP but over less area. For the purposes of Alternative 5A, this action would entail restoration of approximately 222 acres, as shown in Table 4.1-7. This would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 8: Grassland Natural Community

This action would consist of the restoration of grassland habitat and would be implemented in the same way as described in Conservation Measure 8 in the Draft BDCP but over less area. For the purposes of Alternative 5A, this action would entail restoration of approximately 1,044 acres as shown in Table 4.1-7. This would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 9: Vernal Pool and Alkali Seasonal Wetland Complex Restoration

This action would consist of the restoration of vernal pool and alkali seasonal wetland complex and would be implemented in the same way as described in Conservation Measure 9 in the Draft BDCP but over less area. For the purposes of Alternative 5A, this action would entail restoration of approximately 34 total acres of vernal pool complex and/or alkali seasonal wetland complex, as shown in Table 4.1-7. This would mitigate for the loss of species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 10: Nontidal Marsh Restoration

This action would consist of the restoration of nontidal marsh and would be implemented in the same way as described in Conservation Measure 10 in the Draft BDCP but over less area. For the purposes of Alternative 5A, this action would entail restoration of approximately 826 acres of nontidal marsh, as shown in Table 4.1-7. This would mitigate for the loss of species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 11: Natural Communities Enhancement and Management

This action would apply to all protected and restored habitats under Alternative 5A and would be implemented, where applicable, to manage and enhance these lands consistent with the approach described under Conservation Measure 11 in the Draft BDCP. These actions would support mitigation for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 12: Methylmercury Management

This action would minimize conditions that promote production of methylmercury in restored tidal wetland areas and its subsequent introduction to the foodweb, and to listed species in particular. Implementation of this action would be consistent with the revised description of Conservation Measure 12 (see Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS). The portions of the measure applicable to effects in the Yolo Bypass would not apply because Yolo Bypass improvements would not be implemented as part of this alternative.

Environmental Commitment 15: Localized Reduction of Predatory Fishes (Predator Control)

This action would reduce populations of predatory fishes at locations of high predation risk (i.e., predation hotspots) associated with construction and operation of the proposed water conveyance facilities. Implementation of this action would be consistent with the revised description of Conservation Measure 15 (see Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS); however, for the purposes of Alternative 5A, this action would be applied only to the reach of the Sacramento River adjacent to the north Delta intake and to Clifton Court Forebay. This commitment would mitigate for effects on salmonid predation associated with operation of new conveyance facilities. There is also a potential for incidental benefits to other listed species as a result of this commitment.

1 **Environmental Commitment 16: Nonphysical Fish Barrier**

2 This action would be implemented to address effects related to survival of outmigrating juvenile
3 salmonids by installing a nonphysical barrier at Georgiana Slough to redirect fish away from
4 channels and river reaches in which survival is lower than in alternate routes. Implementation of
5 this action would be consistent with the revised description of Conservation Measure 16 (see
6 Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS); however, for the purposes of
7 Alternative 5A, this action would be applied only to Georgiana Slough. This commitment would
8 mitigate for effects on salmonid survival associated with operation of north Delta intakes and
9 associated flows.

10 **Avoidance and Minimization Measures**

11 Actions associated with AMMs 1–7, 10–15, 18, 20–25, 27, 30, and 37–39 would apply to all
12 construction activities under Alternative 5A and would be implemented, where applicable, to avoid
13 and minimize impacts on listed species, consistent with the approach described in Appendix 3.C,
14 *Avoidance and Minimization Measures*, of the Draft BDCP, and in Appendix D of this RDEIR/SDEIS.
15 These actions would minimize the risk of impacts on species resulting from construction activities.

16 **Collaborative Science and Adaptive Management Program**

17 Considerable scientific uncertainty exists regarding the Delta ecosystem, including the effects of CVP
18 and SWP operations and the related operational criteria. To address this uncertainty, DWR,
19 Reclamation, DFW, USFWS, NMFS, and the public water agencies will establish a robust program of
20 collaborative science, monitoring, and adaptive management. For the purposes of analysis, it is
21 assumed that the Collaborative Science and Adaptive Management Program (AMMP) developed for
22 Alternative 5A would not, by itself, create nor contribute to any new significant environmental
23 effects; instead, the AMMP would influence the operation and management of facilities and
24 protected or restored habitat associated with Alternative 5A.

25 Collaborative science and adaptive management will support the proposed project by helping to
26 address scientific uncertainty where it exists, and as it relates to the benefits and impacts of the
27 construction and operations of the new water conveyance facility and existing CVP and SWP
28 facilities. Specifically, collaborative science and adaptive management will, as appropriate, develop
29 and use new information and insight gained during the course of project construction and operation
30 to inform and improve:

- 31 • the design of fish facilities including the intake fish screens;
- 32 • the operation of the water conveyance facilities under the Section 7 biological opinion and 2081b
33 permit; and
- 34 • habitat restoration and other mitigation measures conducted under the biological opinions and
35 2081b permits.

36 In summary, the broad purposes of the program will be to: 1) undertake collaborative science, 2)
37 guide the development and implementation of scientific investigations and monitoring for both
38 permit compliance and adaptive management, and 3) apply new information and insights to
39 management decisions and actions. For additional information on how the AMMP would be
40 implemented, see Section 4.1.2.4 in this RDEIR/SDEIS.