



Storing Water for the Environment

Technical Appendix D: Legal Issues

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Introduction

As described at the outset of the main report, the proposal to store and administer water assigned to environmental uses through ecosystem water budgets (EWBs) builds on a series of previous PPIC studies of environmental water management. (Null et al. 2022) These studies explored the strengths and inadequacies of traditional regulatory strategies, and they concluded that environmental water would be deployed more effectively and efficiently using principles of ecosystem-based management. They also recommended that the environmental water—including water that is currently set aside for compliance with various regulatory standards—be managed in the form of EWBs and administered by a set of ecosystem trustees or other designated environmental water managers. (Mount et al. 2017a; Gartrell et al. 2017; Mount et al. 2019; Grantham et al. 2020; Gartrell, Mount, and Hanak 2022)

In the main report, we extend these strategies upstream to California’s most important reservoirs. These reservoirs have profoundly altered the volume and flow of California’s rivers, and they now serve as the principal sources of the water that is assigned to environmental uses. The state’s major reservoirs therefore are necessary components of integrated ecosystem-based management, and reservoir operations must be part of integrated ecosystem water budgets. (Null et al. 2022)

The application of principles of ecosystem-based management to California’s major reservoirs raises several important legal questions. These include:

1. Does existing law authorize reservoir operators to store and manage water for environmental purposes?
2. If so, can they manage this water through ecosystem water budgets?
3. What are the priorities for the storage and release of water held within an EWB?
4. How would the costs of storage and management of water within an EWB be allocated?
5. Are there significant legal constraints on the proposed governance options for the management of stored environmental water?
6. How can water currently managed for environmental purposes be incorporated into ecosystem water budgets?

As explained in the following pages, we conclude that reservoir operators do have authority to store and manage water for environmental purposes—both under project enabling legislation and under existing laws that require bypass or release of stored water to fulfill downstream environmental objectives. Within each watershed this water can be managed in the form of an ecosystem water budget, and the water assigned to the EWB generally would carry a senior priority vis-à-vis other water rights. The costs of storing and managing water within an EWB likely would be allocated consistent with existing accounting standards for each reservoir or water project. Finally, the alternative governance structures proposed in the main report for the administration of EWBs would be consistent with existing law. Indeed, there are examples of each of these structures in current reservoir administration.

In all cases, however, the storage and release of water assigned to an EWB would have to comply with other laws that govern flood control, water quality, species protection, and senior water and contract rights.

Authority to Store and Manage Water for Environmental Uses

All of California’s major water projects have authority to store and manage water for environmental purposes—both for instream uses downstream of project reservoirs and for wetlands water supply. This authority is set forth in the enabling legislation that created specific water projects, such as the federal Central Valley Project (CVP) and the State Water Project (SWP). Authority also derives from various laws and regulatory standards that govern

water rights and dam operations. In addition, several projects operate under special legislation, settlement agreements, and other arrangements that require the release of stored water to serve environmental uses downstream.¹

Environmental water management varies widely among projects. For example, the Bureau of Reclamation (USBR) stores, releases, and bypasses water from CVP reservoirs both to meet water quality and flow standards and to comply with the directives of two biological opinions that govern project operations. (CRS 2022) As required by the Central Valley Project Improvement Act of 1992, the bureau also annually manages 800,000 acre-feet of project water (about 20% of average project water supplies) for the primary purposes of protecting fish and wildlife and assisting California’s efforts to restore aquatic habitat throughout the Sacramento–San Joaquin River and Bay-Delta ecosystem. (CVPIA §§ 3406(b)(2); CRS 2022) In addition, USBR delivers stored project water to state and federal wildlife refuges and other managed wetlands in the Central Valley. (CVPIA § 3406(d); CDFW 2022)²

The Department of Water Resources (DWR), which coordinates both its SWP water supply and environmental compliance actions with those of the CVP, also stores and releases water to fulfill the projects’ water quality and federal endangered species obligations. (Gartrell and Gray 2017; SWRCB 2018; DWR 2020) In addition, SWP operations are governed by an incidental take permit issued by the California Department of Fish and Wildlife (CDFW) under the state endangered species act. (CRS 2022)

Several local reservoir operators also have created environmental water management programs. Pursuant to the Lower Yuba River Accord, adopted in 2008, the Yuba Water Agency (YWA) stores and releases water to create a functional flow regime below Englebright Dam. The quantity of the assigned environmental water varies by water year type. YWA releases this water to protect five species of fish (three of which are listed for protection under the state or federal Endangered Species Acts), while also providing municipal and irrigation water supply, hydroelectric power production, recreation, and flood control. (YWA 2022)³

Similarly, the San Francisco Public Utilities Commission (SFPUC) stores and releases water from its Hetch Hetchy Project reservoirs for downstream environmental uses in the Tuolumne River above Don Pedro Reservoir. (SFPUC 2020a) These instream flows, which vary by hydrologic year classification, are designed to “mimic the variation of the seasonal hydrology (e.g., magnitude, timing, duration, and frequency) of their corresponding watersheds in order to sustain the aquatic and riparian ecosystems upon which native fish and wildlife species depend.” (SFPUC 2006) The city’s environmental stewardship program is governed by agreements with the US Department of the Interior adopted pursuant to the Raker Act of 1913, which authorized the flooding of Hetch Hetchy Valley for water and power supply. (SFPUC n.d.; SFPD 2008)

The Turlock and Modesto Irrigation Districts, which own and operate Don Pedro and La Grange Dams on the lower Tuolumne River, are developing a watershed management program that includes storage and release of environmental water. These programs are a response to federal hydroelectric power relicensing requirements and related efforts to negotiate voluntary agreements for water quality and flow standards with the State Water

¹ Excerpts and summaries of some of the most important of these laws appear in the addendum to this Appendix. For a more thorough analysis of how many of these laws apply to the storage and management of environmental water, see Gray, Bork, and Harder (2019) and Gray, Harder, and Bork (2021).

² Two units of the CVP—Trinity and Friant—store and release water for downstream environmental uses pursuant to the terms of special watershed restoration programs that provide flows to support salmon migration and to repair decades of habitat degradation caused by project diversions to other uses. (TRRP 2021; SJRRP 2022a) The terms of these restoration programs are described in more detail in the text below.

³ The State Water Board incorporated the terms of the Yuba Accord into its 2008 order amending YWA’s water rights permits for the project. (SWRCB 2008) The Federal Energy Regulatory Commission is likely to include these terms in the renewed operating license for the project, which is now pending before the commission. (FERC 2019; YWA 2020)

Resources Control Board (SWRCB) and other stakeholders. (TID and MID 2018; SWRCB 2021b)⁴ The Merced Irrigation District also bypasses or releases stored water from its New Exchequer Reservoir to provide pulse flows for migrating salmon. (SWRCB 2020a)⁵

Indeed, the only significant water projects that do not store or release water for environmental purposes are the Tulare Basin reservoirs operated by the US Army Corps of Engineers. Although the statutory purposes of these facilities are limited to flood control, irrigation, and municipal water supply, the State Water Board has jurisdiction over the water rights permits and licenses for these projects. This includes authority to condition the exercise of these rights on the storage and release of water to protect downstream water quality, fish and wildlife, recreation, and other instream beneficial uses. (SWRCB 2020b, 2021c)

Stored Environmental Water and Ecosystem Water Budgets

The preceding PPIC studies in this series analyzed a variety of legal questions associated with ecosystem-based management and ecosystem water budgets. They concluded that these environmental water management strategies may be employed consistent with the panoply of laws that govern water quality, endangered species, dam operations, water rights, and water project licensing. The earlier studies also concluded that EWBs could incorporate water that these laws assign to instream flows, fish and wildlife, and other environmental purposes. In other words, EWBs could include both this “regulatory water” and water from other sources that is assigned to environmental uses. This other environmental water includes water that augments mandated instream flows or enhances water quality beyond the criteria specified in water quality control plans. It also may include water for wetlands and water that is designated for instream uses under section 1707 of the Water Code or through other agreements. (Mount et al. 2017a; Mount et al. 2019; Gray, Bork, and Harder 2019)⁶

The corollary question raised by the main report is whether water that is *stored* to fulfill these purposes also can be held and managed in the form of an ecosystem water budget. (Null et al. 2022)⁷ The answer to this question is yes, with two important caveats.

If water assigned to environmental purposes is to be effectively deployed through EWBs, it is essential that the same EWB management structure also apply to the reservoirs that control the volume and flow of that water. This is true both for the release of stored project water and for the bypass of flows that must pass through reservoirs to

⁴ In 2020, FERC staff completed the final environmental impact statement for the relicensing of the Don Pedro and La Grange Dam projects. (FERC 2020) The State Water Board issued its revised section 401 water quality certification in 2021. The certification requires TID and MID to release or bypass water to meet specified minimum base flows and spring and fall pulse flows that would also comply with the board’s 2018 water quality criteria. The certification also includes temperature criteria and habitat management requirements. (SWRCB 2021b). The districts have objected to the state certification, but FERC ruled that it was timely filed. The US Court of Appeals recently upheld FERC’s decision to accept the State Water Board’s certification of the projects. (US Court of Appeals 2022)

⁵ The Merced River Project is also undergoing FERC relicensing. FERC staff completed the final EIS in 2015 (FERC 2015), and the State Water Board issued section 401 certification in 2020. The certification establishes a minimum flow regime that varies with hydrologic conditions and includes spring and fall pulse flows. It also contains a variety of habitat management requirements. (SWRCB 2020a)

In addition, the State Water Board is endeavoring to create a Stanislaus, Tuolumne, and Merced Working Group (STM) “to act as a regional watershed group that will coordinate activities in the Lower San Joaquin River and the three eastside tributaries. The STM Working Group will assist with implementation of the LSJR tributary and base flow objectives, including coordination of tributary flows, monitoring and assessment, and evaluation of the LSJR flow objectives.” The board has stated that it will “seek recommendations from the STM Working Group on biological goals, compliance methods for the tributary flow objectives, procedures for implementing adaptive methods, annual adaptive operations plans, and the San Joaquin River Monitoring and Evaluation Program.” (SWRCB 2022a) The State Water Board also recently published notice that it is seeking public comment on proposed “initial biological goals” for fall-run Chinook salmon in the lower San Joaquin River and its tributaries. (SWRCB 2022b, 2022c)

⁶ Two recent PPIC studies have estimated the volumes of water assigned to environmental uses in several of California’s river systems and wetlands areas. Gartrell, Mount, and Hanak (2022) identify the quantities of Delta outflow needed to comply with water quality standards, endangered species limitations, and other environmental laws during water years 1980 through 2021. Hanak and Sencan (2022) estimate the amounts of water transferred or dedicated to instream uses, as well as water transferred to wetlands uses or terrestrial habitat restoration, from 1984 through 2019. For a comprehensive list of all approved section 1707 dedications through 2019, see SWRCB (2020c).

⁷ More specifically, the main report analyzes the question of how reservoir *capacity* can be better managed to integrate the storage, release, and bypass of water to meet downstream environmental objectives as defined in the EWB. (Null et al. 2022)

fulfill the priorities of the EWB vis-à-vis other water right holders. In other words, the EWB for a watershed must incorporate both the river *and* the dam operations that control the river. There are no categorical legal impediments to the creation of this type of integrated environmental water management structure.

As described in the preceding section, it is now common practice for reservoir operators to manage storage and releases both for water supply and to comply with applicable environmental regulations. Administration of the latter in the form of an EWB would not significantly alter these practices. In fact, as explained in both the main report and the earlier reports in this series, integrated water management through EWBs would improve both the planning and real-time administration of water devoted to environmental purposes. These strategies therefore would be likely to increase the reliability of water supplies while enhancing environmental stewardship and regulatory compliance. (Mount et al. 2017a; Mount et al. 2019; Grantham et al. 2020; Null et al. 2022)

There are two important limitations on the administration of environmental water, however, and EWBs that may be adopted for specific reservoirs and watersheds must take these into account. First, reservoir operators are legally required to store and release water to comply with water quality criteria, endangered species requirements, and other environmental laws. These include the terms and conditions of the water rights that govern the diversion and storage of waters and, for some facilities, FERC licenses that govern project operations. EWBs therefore must account for these regulatory standards and ensure that storage and deployment of ecosystem water achieve these standards. As discussed in the prior studies, this is likely to require advance consultation with the regulatory agencies in the formulation of the EWB and cooperative supervision that allows for some flexibility in the deployment of ecosystem water—with the proviso that water quality standards are fulfilled and listed species are not placed in jeopardy.⁸

Second, reservoir operators must comply with regulations promulgated by the US Army Corps of Engineers that govern flood control, address dam safety, and protect downstream navigation. These operating criteria, commonly called “rule curves,” define how storage within each reservoir must be allocated and managed throughout the year to fulfill these objectives and to ensure public safety. (33 C.F.R. § 208.11) The regulations are applicable to most of California’s major reservoirs, including those that comprise the CVP and SWP. (33 C.F.R. § 208.11(e))⁹

EWBs must account for these operating criteria, and the deployment of ecosystem water may be limited under certain conditions when reservoir operators must release water to create space for floodwater capture. These limitations should not create significant difficulties for EWB administration, however, as reservoir operators currently manage storage for flood control, water supply, and environmental compliance. Rather, the principal difference between current reservoir management and integrated management through EWBs is likely to focus on how stored water lost to flood control (i.e., spillage required to create storage capacity for anticipated floodwater inflow) is allocated among reservoir beneficiaries. This subject is best addressed in the broader context of priorities to water held in storage.

Storage and Release Priorities

As explained in an earlier PPIC report in this series, the principal source of water for ecosystem water budgets “is likely to be the water currently used to comply with the laws and regulations that protect water quality, fish and wildlife, and other instream beneficial uses.” (Mount et al. 2017a) These laws define the amount of water that

⁸ For a detailed analysis of the relationship between EWBs (including ecosystem-based management) and water quality and endangered species standards, see Gray, Stelle, and Szeptycki (2018) and Gray, Bork, and Harder (2019).

⁹ The Corps of Engineers has separate regulations for the principal Tuolumne River Reservoirs (Cherry, Eleanor, Hetch Hetchy, and Don Pedro). (33 C.F.R. § 208.82) In addition, because Trinity Dam was not authorized for flood control, the Bureau of Reclamation has adopted its own operating criteria for Claire Engle Reservoir. (USBR 1979) Finally, the Tulare Basin projects managed by the Corps itself are governed by separate water and flood control plans. (33 C.F.R. § 222.5 & App. E)

may lawfully be diverted by water right holders, and they place limits on water project operations—including restrictions on the timing of diversions and obligations to bypass or release water to fulfill downstream regulatory requirements. For this reason, the report recommended that EWBs “should designate at least a portion of the assigned ecosystem water as the first priority within the watershed.” Consistent with existing environmental standards, this “block of first priority ecosystem water [would] vary based on season and water year classification . . . and thus would adjust to system-wide water abundance and scarcity as do the existing regulatory standards.” (Mount et al. 2017a)

The report also explained that other environmental water within an EWB would likely have different priorities. This includes water that may be acquired “through purchases and donations . . . from existing water right holders under Water Code §1707,” which would “carry the same priority relative to other water rights as the priority held by the transferor.” (Mount et al. 2017a) As described below, water earmarked for wetlands also may have a different priority as defined in the contracts or regulatory standards that provide for the wetlands water supplies. These same principles would apply to environmental water held in storage.

Stored water within an EWB that is assigned to comply with downstream water quality, temperature, and flow standards therefore would hold first priority.¹⁰ This means that the reservoir operator must assign and maintain storage for this portion of the designated ecosystem water, deploy the water consistent with the flow schedules adopted pursuant to the EWB, and (perhaps most critically) hold sufficient water in storage throughout the water year to ensure compliance with applicable regulatory standards. These operational criteria are especially important during dry and critically dry periods when reservoir operators must make difficult decisions about how to manage reservoir capacity and storage to maximize usable water supplies and apportion the available water among all user categories in uncertain and variable hydrologic conditions.¹¹

Stored environmental water that serves other purposes—including augmentation of stream flows or water quality above minimum regulatory requirements—would have a lower priority. These operational priorities generally would be defined by statute or by contract. As noted above, environmental water within an EWB that derives from section 1707 dedications carries the same priority as that held by the transferor. In contrast, the priority of stored water that is assigned to wetlands purposes is usually defined by contract. For example, water that the Bureau of Reclamation supplies to state and federal wildlife refuges and other managed wetlands in the Central Valley has a fixed priority vis-à-vis most other CVP contractors. “Level 2” water, which is “the baseline water required for wildlife habitat management,” carries the same priority as the water the bureau delivers to the Sacramento River Settlement Contractors and the Exchange Contractors. (CDFW 2022; CVPIA § 3406(d)(4))¹²

¹⁰ Consistent with existing law and regulatory policies, this top priority would be shared with water required to fulfill essential public health and safety requirements. The CVP’s 2021–22 interim operations plan, described in the text below, defines this reservoir management priority as meeting “Municipal and Industrial Delta salinity requirements and minimum Municipal and Industrial deliveries for Public Health and Safety.” (Maven 2021; US District Court 2022) The State Water Board’s regulations governing water rights curtailments defines “minimum human health and safety needs” as “the amount of water necessary for prevention of adverse impacts to human health and safety, for which there is no feasible alternate supply.” These include “indoor domestic water uses including water for human consumption, cooking, or sanitation purposes,” as well as several other water uses to the extent required to minimize risks of electricity grid failure, fire, air pollution, and loss of infrastructure. (California Code of Regulations, Title 23, § 877.1(g))

¹¹ The consequences of operational decisions that ignore or minimize these priorities is well documented. (Mount et al. 2020) For additional analyses of these risks—including those associated with overly optimistic forecasting of likely precipitation and undervaluation of the potential for operational errors—see Mount, Gray, and Chappelle (2017); Mount et al. (2017b); Null et al. (2021).

¹² Level 2 water is supplied primarily from developed project supplies, and the costs of providing this water is borne by the CVP contractors. In times of shortage, Level 2 supplies may be reduced no more than 25 percent. The same is true for CVP deliveries to the Settlement and Exchange contractors. (CDFW 2022; CVPIA § 3406(d)(4)) In contrast, there is no limit on the drought-related reduction in supplies to the CVP water service and water repayment contractors. (Gartrell, Mount, and Hanak 2022)

“Level 4” water, which is “the additional increment of water required for optimal wetland habitat development,” has a priority that is lower than all other CVP contract rights. (CDFW 2022)¹³

These water use priorities also would affect the accounting for water that reservoir operators must “spill” to meet applicable rule curves of other operational requirements. Thus, environmental water needed to fulfill regulatory requirements should “spill last.” The same is true for environmental water stored to supply senior contract rights, such as the CVP’s Level 2 refuge water obligations. Stated differently, water that reservoir operators must release to comply with applicable rule curves should be assigned to other users before it is debited from these accounts within an EWB. This is consistent with existing accounting policies in which water stored for lower priority uses is spilled—and therefore lost to those users—before water assigned to high priority uses is released. (Osorio 2020)¹⁴

Although environmental water management practices vary, three aspects of CVP operations illustrate how these storage priorities may be put into practice. The first two are governed by the terms of river restoration agreements adopted to protect fisheries below project dams and to rehabilitate ecosystem functions that have been degraded by CVP water supply operations. The third is a recent (albeit temporary) change to CVP operations to ensure compliance with flow and temperature standards adopted under the federal Endangered Species Act.

The Trinity River Restoration Program requires the Bureau of Reclamation to release specified quantities of water each year that are designed to replicate pre-project flows in the Trinity River below Lewiston Dam. These defined blocks of water vary depending on water year classification. The flow schedules include base flows during most of the year, additional pulse flows to aid salmon migration from mid-May through mid-July, and seasonally variable temperature targets. The bureau’s obligation to store and release water to fulfill these requirements takes precedence over its water supply commitments to CVP contractors (Trinity River Restoration Program 2021; U.S. Court of Appeals 2017).

The San Joaquin River Restoration Program creates a similar priority structure for the bureau’s operation of Friant Dam. (2022a) The annual “restoration allocation”—i.e., the quantity of water assigned to downstream ecosystem uses—is based on forecasts of the unimpaired inflow to Millerton Reservoir and thus varies depending on hydrologic conditions. The Restoration Administrator then uses this allocation to make recommendations to the bureau on the volume and timing of reservoir releases based on current river conditions and restoration program objectives. The restoration allocation takes precedence over the bureau’s water supply obligations to its contractors in the Friant Unit of the CVP. (SJRRP 2022b; U.S. District Court 2006)¹⁵

The bureau has also clarified its priorities for water stored and released from Shasta Reservoir. In December 2021, in response to litigation over the 2019 biological opinions that govern CVP and SWP operations, the bureau adopted an interim operations plan (IOP) for water year 2021–22. The IOP requires the bureau to increase carryover storage in Shasta Reservoir to enhance its ability to make cold water releases to protect endangered winter-run Chinook salmon in the Sacramento River. The IOP also states that the bureau will operate the reservoir in accordance with the following priorities: (1) public health and safety; (2) winter-run habitat criteria; (3) senior water contracts (i.e., the Sacramento River Settlement Contract and the Exchange Contract) *and* CVPIA Level 2

¹³ Level 4 supplies “must be acquired through voluntary measures which do not require involuntary reallocation of CVP yield.” (CDFW 2022) These sources are uncertain, unreliable, and often expensive (especially when combined with conveyance costs), and the bureau has seldom made full deliveries of incremental Level 4 supplies. (Hertel 2016; CRS 2022)

¹⁴ Lower priority uses generally include intermittent or interruptible supplies, carryover storage, and sometimes junior water or contract rights. (Osorio 2020)

¹⁵ The San Joaquin River Restoration Settlement Act, which directs the bureau to implement the restoration program objectives and other terms of the settlement agreement, preserves the rights of certain CVP contractors that were not parties to the litigation. This means that the bureau must release water to maintain a “live stream” for the benefit of “Holding Contractors,” who had riparian rights along the San Joaquin River from Friant Dam to Gravelly Ford. The bureau also must release water from Friant Dam when CVP Delta water supplies are inadequate to fulfill the contractual rights of the Exchange Contractors. (SJRRSA § 10004(a)(2), (f) & (j))

wildlife refuge supplies); and (4) other CVP contracts. (Maven 2021) The federal court approved the IOP in March 2022. (U.S. District Court 2022)¹⁶

Unfortunately, these programs are the exception. Most water projects do not specify the volume of stored water assigned to environmental uses, nor do they have clear operational criteria that define the priority of ecosystem water vis-à-vis other water commitments. Yet, as described in the main report, water held in storage is usually the only viable source of late spring, summer, and fall supply for most of California’s fisheries and for its managed wetlands areas. Recognition of the priority of EWBs therefore is essential to ensure that ecosystem water is available when it is needed to meet downstream regulatory requirements and to fulfill other prescribed environmental uses.

Allocation of Costs

The main report also explores the question of allocating the costs associated with ecosystem water budgets between project beneficiaries and public sources, such as the state general fund or the CVP Restoration Fund. (Null et al. 2022) Although the answer to this question will vary from project-to-project, both existing law and long-standing practice delineate two types of ecosystem water: The costs of managing water that is stored and released for environmental protection or mitigation are assigned to the project beneficiaries, while the costs of managing water that is stored and released to improve environmental quality are paid from general funds—i.e., borne by state or federal taxpayers. It is likely that this same basic principle would guide the allocation of the costs of administering ecosystem water budgets.

State Water Project

The clearest cost allocation directive applies to the State Water Project. Section 11912 of the Water Code defines DWR’s authority to set rates and other charges for water and power produced by the SWP. It stipulates that DWR “shall include as a reimbursable cost . . . an amount sufficient to repay all costs incurred by the department, directly or by contract with other agencies, for the *preservation* of fish and wildlife and determined to be allocable to the costs of the project works constructed for the development of that water and power.” In contrast, costs “incurred for the *enhancement* of fish and wildlife or for the development of public recreation shall not be included in the prices, rates, and charges for water and power, and shall be nonreimbursable costs.” (Water Code § 11912, emphasis added)¹⁷

In practice, the distinction between fish and wildlife preservation and enhancement means that the costs of storing and managing project water to comply with Delta water quality criteria, endangered species standards, and other environmental regulatory requirements are allocated to the SWP contractors.¹⁸ The SWP contracts are “cost-recovery contracts” (Water Code § 11455), which means that contractors must pay for the fixed costs of the system regardless of whether they receive all, a portion, or none of their Table A water supplies each year.

¹⁶ DWR—which through the California Resources Agency is a plaintiff in the litigation—also recently announced that for the duration of the current drought, it will operate the SWP according to the following priorities: “water for health and safety needs and Delta salinity control; water for endangered species; water to reserve in storage; and water for additional supply allocations if the hydrology allows.” (Bacher 2021)

¹⁷ “Reimbursable” in this context means costs that are charged to the SWP contractors, while “non-reimbursable” means that the contractors are not legally required to reimburse DWR for these costs. Rather, non-reimbursable costs are paid from the general fund or from other sources, including the recipients of SWP supplies that are used for environmental enhancement. The largest non-reimbursable SWP costs are for flood control and recreation at Oroville Reservoir and other SWP facilities that are open to public use. The United States bears most of the costs of flood control. Federal funding paid approximately 22 percent of the construction costs of Oroville Dam for this purpose. Most recreation costs associated with SWP facilities are assigned to the state general fund. (O’Connor 1994)

¹⁸ These reimbursable costs also include the costs of fish hatcheries, fish-stocking, and other programs designed to mitigate the effects of reservoir construction and operation on fisheries and recreational uses in the Feather and Sacramento Rivers and in the Delta. (O’Connor 1994)

(O'Connor 1994; MWD 2020)¹⁹ In addition, the SWP delivers relatively small amounts of water to augment instream flows for fish and wildlife within several state parks and to support managed wetlands within the Kern National Wildlife Refuge. The costs of this “enhancement” water are not reimbursable—i.e., they are not charged to the SWP contractors. (DWR 2021)²⁰

Central Valley Project

The policies governing Central Valley Project accounting are a blend of statutory law that defines reimbursable and non-reimbursable costs and a set of accounting principles that allocate shares of project water supply costs where Congress has left room for administrative interpretation. Although they are complicated, these accounting principles generally follow the delineation between environmental mitigation and environmental enhancement that is the hallmark of the laws that govern SWP cost allocation.

The Bureau of Reclamation applies a “separable costs, remaining benefits” (SCRB) methodology for allocation of CVP costs among its various functions.²¹ For operation and accounting purposes, it has identified eight project purposes: water supply, power production, flood control, water quality, recreation, navigation, fish and wildlife mitigation, and fish and wildlife enhancement. “Costs of single-purpose facilities, such as canals to provide M&I water and irrigation water, are directly assigned to the purposes they serve. Costs of multipurpose facilities, such as dams and reservoirs that are designed to serve more than one authorized purpose, are allocated to the appropriate authorized purposes through the SCRB allocation technique.” (USBR 2020a) Unless directed by specific legislation, the bureau defines environmental protection and mitigation as joint costs, because “the burden for operating the project is shared project-wide and not solely by the reimbursable purposes.” (USBR 2020a)²²

Using the SCRB methodology, the bureau allocates the costs of storing and managing project water for environmental purposes as follows:

- The storage and management of water released to fulfill Delta water quality standards and to comply with the biological opinions governing CVP operations are classified as joint costs, which are allocated among all authorized project purposes in proportion to the benefits received by each purpose. According to the

¹⁹ Table A of the SWP contracts “sets forth the maximum amount of SWP water a contractor may request annually.” (DWR 2022) As DWR has noted, however, “the amount of SWP water available for delivery will vary yearly, based on hydrologic conditions, current reservoir storage, and combined requests from the SWP water contractors.” (DWR 2022) Each contractor pays a percentage of the capital and annual fixed operating costs of the Feather River and Delta facilities based on its Table A allocation. Each contractor also pays for the capital and fixed operating costs of the aqueducts and pipelines needed to transport project water to its service area. Costs that vary with the volume of water delivered to each contractor, including electricity costs, are charged only for actual water deliveries. For more detailed explanations of SWP cost allocation, see O'Connor (1994) and MWD (2020).

²⁰ Bulletin 132–2018, updated annually by DWR, contains a complete list of reimbursable Table A deliveries and other non-reimbursable deliveries. (DWR 2021, Table 9–6.) This report also contains an accounting of SWP non-reimbursable capital and O&M costs for fish and wildlife enhancement and recreation (FWER) associated with SWP facilities from 1952–2017. (DWR 2021, Tables 13–3 & 14–2) These data show that the state has only paid a small portion of this obligation. The cumulative deficit for non-reimbursable FWER O&M costs was \$332 million through 2017. (DWR 2021, Table 14–10) Although the state has been paying down that debt by about \$7.5 million annually, it has been accumulating additional deficits in the non-reimbursable FWER O&M costs account at an average rate of approximately \$35 million per year. In the meantime, these costs have been borne by the SWP contractors. Correspondence with Jennifer Pierre, General Manager for the State Water Project Contractors, July 12 and 18, 2022.

²¹ The bureau has explained that the SCRB methodology defines and allocates the “separable costs” of the project, which are “the costs incurred that only support one authorized purpose.” It then allocates all remaining “joint costs”—i.e., those that serve multiple authorized purposes—“among the appropriate authorized purposes proportional to the benefits received by each authorized purpose from the facility.” (USBR 2020a)

²² The Central Valley Project Improvement Act, which governs most aspects of CVP environmental water management operations, includes both specific and vague cost allocation directives. For example, in its lengthy list of new infrastructure, channel improvements, and habitat restoration projects designed to mitigate the impacts of project operations on fish and wildlife, Congress specifically defined the percentage of costs that would be reimbursable by CVP contractors, non-reimbursable and borne by the federal government, and non-reimbursable and paid by the state. (CVPIA § 3406(b)(4)-(6), (1)-(18) & (20)) Yet, for other important aspects of project operations—including the directive to comply with biological opinions issued under the Endangered Species Act, all decisions of the State Water Board, and the 800,000 afa environmental water dedication requirement—the Act is silent on cost allocation or provides only that “costs associated with this paragraph shall be reimbursable pursuant to existing statutory and regulatory procedures.” (CVPIA § 3406(b), (b)(1)(d) & (b)(2))

bureau's cost allocation formula, the CVP contractors bear approximately 94 percent of the costs of regulatory compliance. (USBR 2020a, Tables 7–1 to 7–3)²³

- Water that the bureau releases to fulfill the 800,000 afa dedication requirements of CVPIA § 3406(b)(2) is defined as a “water supply sub-purpose.” Most of the costs of storing and managing this water are reimbursable and “are sub-allocated to irrigation, M&I, and commercial power based on the proportion of reimbursable costs across the three sub-purposes.” (USBR 2020a)²⁴
- As required by the Central Valley Project Improvement Act, water delivered to state and federal wildlife refuges and other managed wetlands areas in the Central Valley is treated in two ways. The costs of storing and releasing Level 2 refuge water are classified as reimbursable, and they are “sub-allocated to irrigation, M&I, and commercial power based on the proportion of reimbursable costs across the three sub-purposes.” In contrast, incremental Level 4 refuge water is classified as non-reimbursable, and the storage and delivery costs “are sub-allocated 75 percent to the Federal government and 25 percent to the State of California.” (USBR 2020a; CVPIA § 3406(d)(3))²⁵
- The costs storing and managing water used for fish and wildlife enhancement are not allocated. This decision effectively renders these costs non-reimbursable, and they are not charged to the CVP contractors.²⁶

In accordance with the directives of the CVPIA, the bureau also charges all CVP water and power contractors a volumetric mitigation and restoration fee. The purpose of this fee is to “recover a portion or all of the costs of fish, wildlife, and habitat restoration programs and projects” established by the Act. (CVPIA § 3407(c) & (d)) In 2021, these fees were \$11.11 per acre foot and \$23.23 per acre foot for irrigation and M&I contractors, respectively. (USBR 202b) The bureau manages these fees through its administration of the Central Valley Project Restoration Fund. (CVPIA § 3407(a) & (d)) The Friant Unit contractors pay an additional \$7.00 per acre foot surcharge, which they contribute to the San Joaquin River Restoration Fund. (CVPIA § 3406(c)(1)) Finally, the Act imposes a special surcharge on water delivered to new M&I contractors and to M&I users who purchase project water from existing CVP contractors. (CVPIA § 3406(d)(2)). This surcharge was \$46.31 in 2021. (USBR 2020b)

Unlike the SWP contracts, CVP water service, water repayment, and other specialized contracts are not cost-recovery contracts. Stated differently, they do not require the contractors collectively to pay for all reimbursable annual system costs. Rather, the two primary sets of contracts take a hybrid approach to cost recovery.²⁷ Repayment contracts—which are used when specific cost obligations can be readily assigned to certain CVP contractors—generally require 40 fixed annual payments to repay a fixed repayment amount. (43 U.S.C. §

²³ This is a weighted average that encompasses all water year types. In dry and critical years—when the CVP deliveries to contractors decline and the benefits of reservoir releases for water quality and endangered species are relatively higher—the percentages of environmental water costs allocated to the CVP contractors are 87 percent and 78 percent, respectively. (USBR 2020a, Tables 7–1 to 7–3)

²⁴ The cost allocation of this “B2” water is “based on both the volume released for B2 actions during excess conditions and the reduction in Delta exports required to meet B2 actions during balanced conditions.” (USBR 2020) During most conditions, however, much of the water that the bureau releases for instream environmental uses under section 3406(b)(2) is rediverted by CVP contractors for their own water supplies. Therefore, “only those B2 releases that flow to the ocean because they could not be used for any other purpose [are] included as part of the water supply purpose.” (USBR 2020a) In other words, only the costs of storage and management of B2 releases that are subsequently rediverted and used by CVP contractors are allocated to the CVP contractors.

²⁵ The United States generally pays for water it acquires for Level 4 supplies through the Central Valley Project Restoration Fund established by the CVPIA. Because the restoration fund is itself funded by fees on project water deliveries (USBR 2020b), however, the CVP contractors effectively bear the costs of Level 4 supplies. (See text below.) The state usually pays for its share of Level 4 supply costs “through reimbursements or in-kind contributions.” (CDFW 2022) “In recent years, costs for the Refuge Water Supply Program (i.e., the costs for both Level 2 and Level 4 water) have ranged from \$11 million to \$20 million.” (CRS 2022)

²⁶ According to the bureau, the Federal Water Project Recreation Act of 1965, Pub. L. No. 89-72, 79 Stat. 213, prohibits it from allocating costs to the CVP's fish and wildlife enhancement purpose without “a commitment by a non-Federal entity to manage project land and water areas for fish and wildlife, as well as to pay a portion of the separable costs.” Because there are no such commitments, the bureau has determined that it does not have authority to “allocate joint project costs to the fish and wildlife enhancement purpose.” (USBR 2020a) It is not clear that this statute entirely supports the bureau's interpretation, however, as it applies to non-federal administration of “project land and water areas for recreation or fish and wildlife enhancement”—a term that may not apply to the management of project water for instream flows that enhance fish and wildlife resources. In any event, the statute specifies that the federal share of any such projects shall not exceed 50 percent of the costs allocated to recreation and fish and wildlife enhancement, and that the federal costs are non-reimbursable. (79 Stat. 214, § 2)

²⁷ For more detailed descriptions of the various types of CVP contracts, see USBR (n.d.).

485h(c) & (d)) In contrast, water service contracts are used “where the project includes multiple individual multipurpose facilities benefiting different project functions and many different contractors.” For these contracts, “costs are allocated to, and recovered from, [the contractors] based on the amount of water received.” (USBR 2021a) The bureau must set rates for water service contractors that “produce revenue at least sufficient to cover annual operations and maintenance (O&M) costs and the appropriate share of fixed charges (construction costs) of the project.” (43 U.S.C. § 485h(e))²⁸

In addition, the CVP contracts include an array of adjustments. These include a waiver of interest on capital investment, discounts based on “ability to pay,” a requirement to repay accumulated O&M deficits, special “full cost” pricing for water delivered to irrigated lands held in excess of the acreage limitation, special pricing for contractors who held pre-project water rights, and extended periods of repayment. (USBR 2021a)

The combined effect of these different contracts and rate-setting criteria makes it extremely difficult to calculate the percentage of annual environmental water costs that is *actually* paid by the CVP contractors. Nevertheless, the CVP cost allocation formulae and CVPIA environmental surcharges suggest that the contractors bear the lion’s share of regulatory compliance, environmental mitigation, and wetlands water supply.

Other Projects

The other water projects described in the preceding sections bear all of the costs of regulatory compliance, including water quality and flow criteria set forth in water rights permits, FERC licenses, and other agreements. For most projects, the largest costs are: (1) water that is unavailable for consumptive uses following its deployment to meet regulatory standards; and (2) power revenues that may be reduced as reservoir releases and bypass flows are directed to environmental compliance, rather than hydroelectric power production. Most of these projects also pay for additional environmental mitigation and enhancement measures.

For example, the Yuba Water Agency and its member units assume the costs of storing and releasing water to provide functional flows for fish in the Yuba River as required by the Lower Yuba River Accord and its state water rights permits.²⁹ YWA also funds a variety of environmental mitigation and enhancement projects. These include physical habitat restoration, installation of fish screens, and reintroduction of spring-run Chinook salmon to the North Yuba River above New Bullards Bar Reservoir. (YWA 2020b, 2022)³⁰ YWA pays for these measures with revenues from water deliveries to member units, the sale of hydroelectric power generated by project facilities, and out-of-county water transfers. “Yuba Water does not receive any revenue from taxes.” (YWA 2020b)

Similarly, San Francisco and its wholesale and retail customers bear all of the capital and O&M costs of storing and releasing water to support fish and wildlife habitat and other instream uses in the Tuolumne River below O’Shaughnessy Dam, as required by its agreements with the US Department of the Interior. Although the city is

²⁸ In 2016, Congress authorized the bureau, based on requests by individual CVP contractors, to convert water service contracts to repayment contracts. The legislation also authorized prepayment of the capital component of the new contracts if full repayment is made within three years of the contract conversion. (Water Infrastructure Improvements for the Nation Act of 2016, Pub. L. No. 114-322, 130 Stat. 1628, 1878, Title 3(J), § 4011(a)) The bureau has approved 74 conversion requests, and 12 others were pending as of October 2021. (USBR 2021b)

²⁹ As noted previously, these requirements are likely to be incorporated into the agency’s renewed FERC license. YWA estimates that it “will invest as much as \$230 million over the next 30 years to implement actions required to secure a FERC license.” (YWA 2020b) The agency is able to recoup the value of some of the water that it releases for fish flows in the Yuba River through a long-term transfer agreement with DWR, which runs from 2008 through 2025. The agreement allows DWR to use the transferred water to help meet Delta water quality standards to supply SWP contractors located south of the Delta, and to wheel water for delivery to some CVP contractors. (SWRCB 2008)

³⁰ In addition, some of the project water delivered to agricultural customers is used for flooding and post-harvest reflooding of rice fields. These diversions create “habitat for migrating waterfowl and . . . nutrient-rich water that [is] beneficial for anadromous fish when it is drained into downstream waterways.” The fall reflooding also “provides migrating waterfowl . . . along the Pacific Flyway with stable winter habitat.” (YWA 2021) Neither YWA nor the rice farmers are compensated for these incidental environmental benefits.

able to recapture most of the water that it releases for fish, wildlife, and recreational uses—either by direct diversions downstream or through its banking and exchange rights in Don Pedro Reservoir—it does lose power revenues when it bypasses flows below its three upstream reservoirs so that the water may remain instream. (SFPUC 2020a) The city also makes additional payments to the National Park Service for watershed protection and environmental stewardship, and the SFPUC has budgeted funds to pay the US Forest Service to support a variety of water quality projects in the Tuolumne River watershed. (SFPUC 2020b) San Francisco funds most of these activities through revenues derived from water sales to its own retail customers and from water deliveries to the 28 cities, water agencies, and investor-owned utility to which it sells water on a wholesale basis. (BAWSCA 2018; KPMG 2020)³¹

The Turlock and Modesto Irrigation Districts and their members also pay all costs of their Tuolumne River Management Plan, which includes fish protection infrastructure, habitat restoration, a fish hatchery, and releases of stored water to support salmon spawning and migration. (TID & MID 2018) As noted above, the districts are developing this plan in conjunction with the ongoing FERC relicensing of Don Pedro Reservoir and their voluntary agreement negotiations with the state. Both districts’ revenues derive exclusively from water and power sales and investment income, and neither receives state or federal funds to support, or offset, the costs of regulatory compliance and environmental mitigation and enhancement. (Moss Adams 2020; Baker Tilly 2020)

Finally, all environmental water costs of the San Joaquin River Restoration Program are borne by CVP Friant Unit contractors. These costs include the reduction in deliveries of project water that the settlement agreement allocates to stream flow restoration in the San Joaquin River. (Interviews with Tom Johnson, Restoration Administrator for the SJRRP, Dec. 22 and 29, 2021) Because the Friant Unit contractors have fixed rate repayment contracts—and thus do not pay for water deliveries on a volumetric basis—they also bear the capital and fixed O&M costs of storing the restoration water. (USBR n.d.) As noted above, the Friant Unit contractors also pay a surcharge on the project water that they do receive.³² These revenues go into the San Joaquin River Restoration Fund, which supports other restoration program actions. (CVPIA § 3406(c)(1)) The costs of these activities—which include infrastructure, restoration of physical habitat, stream channel improvements, salmon reintroduction, scientific analyses, and general program administration—are also funded by a combination of state and federal contributions. (SJRRP 2022a)

Governance Options

As discussed in the main report, there are a variety of options for structuring ecosystem water budget governance. One alternative is to vest this authority with the reservoir operator, who would administer the EWB in conjunction with its overall water supply responsibilities. A second option is to assign the authority to a regulatory agency, such as the California Department of Fish and Wildlife or the State Water Resources Control Board.³³ The third option is to create an independent trustee, who would have authority to administer the EWB in the form of a water right or contract right. This would include responsibility to define the goals and objectives of the EWB, to make

³¹ Many of the Hetch Hetchy Project facilities are used for both water supply and power production. The long-term contract between San Francisco and its wholesale water contractors, which governs Hetch Hetchy water supply operations, allocates capital and O&M costs between water and power functions based on “separable costs, remaining benefits” principles. The agreement then allocates water supply costs between the city’s direct retail customers and the wholesale contractors in proportion to the benefits that they receive from the wholesale components of the water supply system. These include all cost associated with “watershed protection.” (BAWSCA 2018, ¶5.01(A)(1)) San Francisco does not directly use power revenues to defray the costs of maintaining minimum flows in the Tuolumne River. As noted in the text, however, it does forego power revenues when it bypasses water upstream to provide these instream flows. (SFPUC 2020a)

³² This surcharge is in addition to the general mitigation and restoration fees that all CVP contractors must pay to the general restoration fund created by the CVPIA. As noted above, in 2021 these fees were \$11.11 per acre foot for irrigation deliveries and \$23.23 per acre foot for M&I uses. (USBR 202b)

³³ As described in more detail in an earlier PPIC report, both options offer a variety of advantages; but they also could create tensions between the administrator’s various water management responsibilities—including project water deliveries, ecosystem water supply, and regulatory oversight. (Mount et al. 2017a)

calls on releases from storage, and to decide when and where to deploy the ecosystem water in light of changing conditions. The trustee also would be able to purchase and sell water, to store ecosystem water in groundwater banks, and to engage in *in lieu* exchanges. (Mount et al. 2017a; Null et al. 2022)³⁴

With minor *caveats*, all three alternative governance structures would be consistent with existing law.

The first alternative would largely resemble the way that most reservoir operators administer their stored environmental water today. For example, the Bureau of Reclamation and Department of Water Resources manage CVP and SWP reservoirs to provide maximum deliveries of available project water to their respective contractors, while also complying with the water quality criteria and endangered species standards that limit project operations. With advice from scientific and technical advisors, project operators make these decisions based on hydrologic modeling and weather forecasting, and they use their best judgment about how much water to hold back in project reservoirs to meet environmental requirements. Reservoir managers often must make trade-offs between their water supply and environmental compliance objectives, however. This blended decisionmaking has placed inordinate risk on fish and wildlife. (Mount, Gray, and Chappelle 2017; Mount et al. 2017b; Null et al. 2021)

Other projects have attempted to reduce this potential for conflict between water management objectives, while still maintaining operator control of the assigned environmental water. They do this by more clearly defining the volume and priority of the stored environmental water and by requiring operator consultation with other stakeholders and experts in deciding how and when to deploy water for instream flows.

As described previously, the Yuba Water Agency releases stored water from New Bullards Bar Reservoir pursuant to a variable functional flow schedule. The agency manages the assigned environmental water with advice from a River Management Team, which includes representatives from CDFW, USFWS, NMFS, USBR, DWR, PG&E, and several environmental NGOs. YWA also has developed conjunctive use, water banking, and water transfer programs that provide operational flexibility in its management of the water assigned to functional flows. For example, it works closely with other water right holders to encourage them to pump project water stored in local groundwater basins in lieu of diverting from the river. This enables the agency to retain additional water in upstream reservoirs for instream flows. (Mount 2017b; YWA 2022)

Similarly, the Bureau of Reclamation stores and releases environmental water from Trinity Reservoir in accordance with the Trinity River Restoration Program, which it co-administers with the US Fish and Wildlife Service. Both agencies work closely with the Trinity Management Council, which includes representatives from the Yurok and Hoopa Valley Tribes, Trinity County, DWR, CDFW, the US Forest, and NMFS. The restoration program has several integrated elements: the first-priority flow schedule described above, integrated aquatic habitat and floodplain improvements, and monitoring and assessment to promote adaptive management, environmental compliance, and real-time protection of fisheries. (Mount et al. 2017b; TRRP 2021)

There is less precedent for the second alternative—assignment of EWB management authority to a regulatory agency. The Delta Watermaster, who is an independent officer of the state, “is responsible for overseeing the day-

³⁴ There are, of course, other possibilities. For example, in March 2022, the California Resources Agency, California EPA, DWR, USBR, CDFW, the State Water Contractors, and ten individual water agencies and users signed a memorandum of understanding that creates a template for negotiation of voluntary agreements within the Sacramento–San Joaquin River and Delta ecosystem. The “term sheet” for the MOU contemplates an “eight-year program that would provide substantial new flows for the environment to help recover salmon and other native fish, create new and restored habitat for fish and wildlife, and provide significant funding for environmental improvements and water purchases.” (Maven 2022) It also proposes a governance program “to direct flows and habitat restoration, conduct assessments, develop strategic plans and annual reports, [and] implement a science program.” (California Resources Agency 2022, ¶ 9) There would be two sets of “governance entities”: (1) A Systemwide Governance Committee would (presumably) include representatives from the parties to the voluntary agreement and “may include members from appropriate stakeholders who are not VA parties.” (2) The Delta and each participating tributary would be governed by an unspecified entity that would “include VA parties subject to the applicable agreement.” (California Resources Agency 2022, ¶ 9.1) The exact composition of these governing entities is likely to be fleshed out in subsequent negotiations.

to-day administration of water rights, and, when necessary, for taking enforcement action, related to water diversions within the Delta.” (SWRCB 2021d)³⁵ The watermaster does not have authority over reservoir operations upstream of the Delta, however. Nor does the watermaster control specific quantities of designated environmental water as contemplated in the main report.

To some extent, the California Department of Fish and Wildlife and the US Fish and Wildlife Service exercise authority as ecosystem trustees in their management of the state and federal wildlife refuges. They have contracts for water deliveries, which they deploy in managed wetlands areas. But they do not have operational authority over the reservoirs that store and release these contract supplies. (CDFW 2022)

The authorizing legislation for the SWP does assign certain environmental stewardship responsibilities to CDFW, however. It provides that the department “shall manage fish and wildlife resources at state water projects, including any such additional resources as are created by such projects, in a manner compatible with the other uses of such projects.” (Water Code § 11917) This legislation was focused on fish and wildlife resources in and around SWP facilities, including fish stocking and hatcheries. But it also could apply to more modern fish and wildlife habitat management programs, such as flow bypass, cold water releases from storage, maintenance of minimum stream flows, and provision of water to wetlands and other aquatic habitat. Under this interpretation of the statute, CDFW would be the appropriate ecosystem trustee to manage stored water assigned to environmental uses—at least for SWP reservoirs.

The third governance alternative—an independent ecosystem trustee—is supported by one important and illustrative precedent. The San Joaquin River Restoration Program (SJRRP) assigns authority to manage the water designated for restoration flows to a Restoration Administrator. The administrator works closely with the Bureau of Reclamation but is not affiliated with it. Rather, the parties to the settlement that created the program—the Natural Resources Defense Council and the Friant Water Users Authority—appoint the administrator, who serves for a term of six years. A Technical Advisory Committee, also appointed by the litigants, provides scientific, planning, and operational advice to the administrator. (US District Court 2006, Exhibit D) The Restoration Administrator and administrative staff are funded by the Department of Water Resources through a contract with the National Fish and Wildlife Foundation.

The Restoration Administrator, in consultation with a program management team composed of representatives from USBR, USFWS, NMFS, CDFW, and DWR, has primary responsibility for using the volume of water available to the SJRRP to best meet the goal of restoring a self-sustaining population of salmon in the river below Friant Dam. (SJRRP 2022c) These responsibilities include:

- Determination of the timing and magnitude of releases based on the best available science from the Technical Advisory Committee and other sources.
- Flexibility to alter deployment decisions based on current river conditions, operating limitations, and corresponding program needs.

Although the bureau retains ultimate control over reservoir operations, it generally defers to the Restoration Administrator’s decisions. (Interviews with Tom Johnson, Restoration Administrator for the SJRRP, Dec. 22 and 29, 2021)

In addition, the Restoration Administrator may recommend that the bureau take a variety of actions to effectuate the purposes of the program. These recommendations may include:

- Negotiation for the purchase of water from Friant Unit contractors when needed to compensate for unexpected seepage losses.

³⁵ The watermaster is appointed by the State Water Board for a four-year term and reports jointly to the board and to the Delta Stewardship Council. (SWRCB 2021d)

- Structural improvements to facilitate salmon passage and to advance the general purposes of the SJRRP.
- Acquisition of other water rights under Water Code 1707 to protect restoration flows in the San Joaquin River.
- Management of unused restoration water for the long-term benefit of salmon, including banking, storage, or exchanges of water for future use to supplement restoration flows.
- Negotiation for the sale of surplus water to generate revenues that may be used for future restoration activities.

(Correspondence with Donald Portz, Program Manager, Bureau of Reclamation, San Joaquin River Restoration Program, July 18, 2022)³⁶

This portfolio combines many of the attributes of ecosystem-based management and EWBs described in the main report. (Null et al. 2022) Indeed, the administrator manages the restoration allocation as a “restoration budget,” which includes base flows, spring flexible flows, riparian recruitment flows, and fall flexible flows. (SJRRP 2021, 2022b)

The Restoration Administrator’s recommendations—and the bureau’s authority to implement those recommendations—are limited in three important respects. First, the volume and timing of restoration flows may not diminish water deliveries to the Friant Unit contractors beyond the quantity specified in the restoration allocation. Second, restoration flow releases may not cause “material adverse impacts to third parties from groundwater seepage”—i.e., cause flooding of, or crop damage to, lands along the river below Gravelly Ford. Third, the bureau may alter the release schedule as required to provide storage for flood control, to ensure dam safety, and for operation and maintenance. (U.S. District Court 2006, ¶¶13 & 18; SJRRA § 1004(h)(3))³⁷

The last restriction is especially important for the creation of an independent ecosystem trustee. Retention of the bureau’s authority over flood control operations at Friant Dam protects the Restoration Administrator from potential liability for damages caused downstream flooding.

Creation of Ecosystem Water Budgets for Stored Water

For new projects, including those funded by Proposition 1, creation of ecosystem water budgets would be relatively straightforward. The water supply and ecological objectives of the project can be defined in advance, the criteria for determining the volume of project water and concomitant storage that will be assigned annually to ecosystem uses can be set forth in project operating documents, the structure and responsibilities of the ecosystem trustee can be similarly delineated, and the necessary regulatory approval can be obtained. As described in Appendix C, these processes are already underway for the Proposition 1 projects.

For existing facilities, the transition from constraint-based management to environmental management through EWBs would be considerably more complicated. Reservoir operators may be wary of encroachments on their operational authority. Water users may fear the loss of water and water supply reliability. Environmental advocates may distrust the more flexible ecosystem-based management described in this and previous studies, preferring the (often illusory) certainty of the existing regulatory standards. And regulators may be skeptical that

³⁶ The bureau’s role as lead agency of the SJRRP is also significant. In addition to the decisionmaking authority described in the text, it is responsible for forecasting annual inflow to Millerton Reservoir and allocating a portion of that water to restoration flows consistent with the terms of the settlement. The bureau also coordinates its actions with other water users and agencies in the San Joaquin River basin, manages the recapture of restoration flows at downstream locations, oversees surface water and groundwater seepage monitoring, and disseminates relevant program data and information to the public. (Correspondence with Donald Portz, Program Manager, Bureau of Reclamation, San Joaquin River Restoration Program, July 18, 2022.)

³⁷ The parties to the settlement also recognized that flood control releases “may accomplish some or all of the Restoration Flow purposes.” (U.S. District Court 2006, ¶13(d))

EWBs, administered principally by ecosystem trustees, would comply with the various laws that govern water quality and endangered species.

To allay, or at least minimize, these concerns, “transition from the existing system of environmental protection to EWBs would be best accomplished by negotiation among the interested parties within each watershed as part of the development of watershed ecosystem plans.” (Mount et al. 2017a) Negotiated EWBs could be tailored to the hydrology, ecology, and water uses of the individual watersheds. Equally importantly, they could benefit from local knowledge and gain acceptance through buy-in from the affected parties. Moreover, the State Water Board and other state and federal regulatory agencies could encourage negotiations both by providing technical assistance and by clearly defining the water quality and flow requirements that would apply if negotiations were to fail.³⁸ As noted in an earlier report, “the details of successful EWBs are likely to reflect a consensus among the interested parties, rather than a government mandate.” (Mount et al. 2017a)

Indeed, the best structured and generally most successful environmental water management programs bear this out. The Yuba Accord, the Trinity River Restoration Program, and the San Joaquin River Restoration Program were all the products of lengthy negotiations among the principal stakeholders—including the dam operators, significant water right holders, environmental and fishing advocates, state and federal regulators, water users, local and tribal governments, and potentially affected third parties. In each of these settings, the changes in reservoir operations, new flow schedules, related habitat improvements, and long-term management objectives were also the result of extensive and collaborative hydrologic, engineering, and scientific analyses that helped inform the programmatic goals and policy choices that the various parties were willing to accept. Not coincidentally, each of these programs was the result of pressure from regulators, resource administrators, or the courts.

The future adoption of ecosystem-based water management—whether in the form of EWBs or through some other formal arrangement—is likely to occur under similar conditions. For some projects, this could occur in the context of the State Water Board’s application of its 2018 revised Bay-Delta water quality standards to the Sacramento and San Joaquin River tributaries. Voluntary settlements—including those that are “nudged” by threats of regulatory revision of water rights—would provide a forum for negotiations (at least among those parties that are willing to work constructively toward a satisfactory solution). In other settings, new forms of ecosystem-based management could take shape through state certification and FERC licensing—although collaborative state-federal-stakeholder negotiations through the lens of state water quality certification has been problematic in practice. (Gray, Bork, and Harder 2020) Lengthy litigation and settlement, which were prerequisite to creation of the San Joaquin River Restoration Program, is also an option.

Whatever the forum, successful negotiation of EWBs is likely to occur only when the parties tire of an unsatisfactory *status quo*, agree to explore broader and more integrated strategies of ecosystem-based management, seek greater certainty (both for water deliveries and fulfillment of environmental objectives), and manifest a willingness to experiment and compromise. These negotiations will neither be simple nor easy, as they will require extensive hydrologic and engineering analysis, multi-stakeholder participation and outreach, and multi-agency regulatory review and approval.

But all of this can occur within the context of existing law.

³⁸ The board has done this in several important settings, including establishment of default flow criteria for the Yuba River (SWRCB 2003) and for the tributaries in the Sacramento–San Joaquin River and Delta Ecosystem. (SWRCB 2018)

Addendum: Selected Laws Governing Storage and Management of Water for Environmental Purposes

This selection of federal and state statutes highlights two sources of authority to store and manage water for environmental uses: project enabling legislation and statutory regulatory requirements. As noted at the outset of this Appendix, the statutes that authorize California’s major dams and reservoirs vary widely in their discussion of environmental water management. In contrast, the regulatory laws are of general applicability—although their effects on project operations will vary based on factors such as the existence of downstream water quality criteria, the presence of endangered or threatened species in areas affected by project operations, and the contributions of specific reservoir operations on fish and wildlife and other instream beneficial uses. For a more thorough analysis of these laws, see Gray, Bork, and Harder (2019).

Project Enabling Statutes

Central Valley Project Authorizing Legislation (as amended). “The entire Central Valley project . . . is hereby reauthorized and declared to be for the purposes of improving navigation, regulating the flow of the San Joaquin River and the Sacramento River, controlling floods, providing for storage and for the delivery of the stored waters thereof, for the reclamation of arid and semi-arid lands and lands of Indian reservations, and mitigation, protection, and restoration of fish and wildlife and other beneficial uses . . .

“*And provided further*, That the said dam and reservoirs shall be used, first, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses; and, third, for power and fish and wildlife enhancement.”

Rivers and Harbors Act of 1937, ch. 832, 50 Stat. 844, 850, as amended by the Central Valley Project Improvement Act of 1992, § 3406(a)(1) & (2)

CVP Fish and Wildlife Authorization. “The Secretary of the Interior is authorized to construct, operate, and maintain such works on waterfowl management areas and refuges owned and operated by the State of California or the United States as may be necessary or desirable for the development of a water supply by means of wells and the recovery of drainage, and to furnish water available from such works, and water available from Central Valley project sources, for wildlife management purposes”

“The Secretary of the Interior is authorized to contract for the delivery of water to public organizations or agencies for use within the boundaries of such organizations or agencies for waterfowl purposes in the Grasslands area of the San Joaquin Valley.”

Act of Aug. 27, 1954, ch. 1012, § 1, 68 Stat. 879, 16 U.S.C. §§ 695e & 695i

Central Valley Project Improvement Act of 1992. “The Secretary, immediately upon the enactment of this title, shall operate the Central Valley Project to meet all obligations under state and federal law, including but not limited to the federal Endangered Species Act . . . and all decisions of the California State Water Resources Control Board establishing conditions on applicable licenses and permits for the project. . . .”

Reclamation Projects Authorization and Adjustment Act of 1992, Pub. L. No. 102–575, 106 Stat. 4721, 4714, Title 34, § 3406(b)

CVPIA Environmental Storage and Instream Flow Requirements

“The Secretary, in consultation with other State and Federal agencies, Indian tribes, and affected interests, is further authorized and directed to . . .

(2) Upon enactment of this title dedicate and manage annually 800,000 acre-feet of Central Valley Project yield for the primary purpose of implementing the fish, wildlife, and habitat restoration purposes and measures authorized by this title; to assist the State of California in its efforts to protect the waters of the San Francisco Bay/Sacramento–San Joaquin Delta Estuary; and to help meet such obligations as may be legally imposed upon the Central Valley Project under state or federal law following the date of enactment of this title, including but not limited to additional obligations under the federal Endangered Species Act. . . .

(3) Develop and implement a program . . . for the acquisition of a water supply to supplement the quantity of water dedicated to fish and wildlife purposes under paragraph (2) of this subsection and to fulfill the Secretary’s obligations under paragraph 3406(d) (2) of this title. . . .

(7) Meet flow standards and objectives and diversion limits set forth in all laws and judicial decisions that apply to Central Valley Project facilities

(8) Make use of short pulses of increased water flows to increase the survival of migrating anadromous fish moving into and through the Sacramento–San Joaquin Delta and Central Valley rivers and streams. . . .

(19) Reevaluate existing operational criteria in order to maintain minimum carryover storage at Sacramento and Trinity River reservoirs to protect and restore the anadromous fish of the Sacramento and Trinity Rivers in accordance with the mandates and requirements of this subsection and subject to the Secretary’s responsibility to fulfill all project purposes, including agricultural water delivery.”

CVPIA § 3406(b)(2), (3), (7), (8) & (19)

CVPIA Wetlands Water Supply Requirements

“In support of the objectives of the Central Valley Habitat Joint Venture and in furtherance of the purposes of this title, the Secretary shall provide, either directly or through contractual agreements with other appropriate parties, firm water supplies of suitable quality to maintain and improve wetland habitat areas on units of the National Wildlife Refuge System in the Central Valley of California; on the Gray Lodge, Los Banos, Volta, North Grasslands, and Mendota state wildlife management areas; and on the Grasslands Resources Conservation District in the Central Valley of California.

(1) Upon enactment of this title, the quantity and delivery schedules of water measured at the boundaries of each wetland habitat area described in this paragraph shall be in accordance with Level 2 of the ‘Dependable Water Supply Needs’ table for those habitat areas as set forth in the Refuge Water Supply Report and two-thirds of the water supply needed for full habitat development for those habitat areas identified in the San Joaquin Basin Action Plan/Kesterson Mitigation Action Plan Report prepared by the Bureau of Reclamation.

(2) Not later than ten years after enactment of this title, the quantity and delivery schedules of water measured at the boundaries of each wetland habitat area described in this paragraph shall be in accordance with Level 4 of the ‘Dependable Water Supply Needs’ table for those habitat areas as set forth in the Refuge Water Supply Report and the full water supply needed for full habitat development for those habitat areas identified in the San Joaquin Basin Action Plan/Kesterson Mitigation Action Plan Report. . . . The quantities of water required to supplement the quantities provided under paragraph (1) of this subsection shall be acquired by the Secretary . . . in cumulating increments of not less than ten percent per annum through voluntary measures which include water conservation, conjunctive use, purchase, lease, donations, or similar activities, or a combination of such activities which do not require involuntary reallocations of project yield.”

CVPIA § 3406(d)

CVPIA Water Trading, Storage, and Groundwater Banking Authorization

“The Secretary is authorized to enter into contracts . . . with any Federal agency, California water user or water agency, State agency, or private non-profit organization for the exchange, impoundment, storage, carriage, and delivery of Central Valley Project and non-project water for domestic, municipal, industrial, fish and wildlife, and any other beneficial purpose . . .

“The Secretary, in consultation with the State of California, is authorized to enter into agreements to allow project contracting entities to use project facilities, where such facilities are not otherwise committed or required to fulfill project purposes or other Federal obligations, for supplying carry-over storage of irrigation and other water for drought protection, multiple-benefit credit-storage operations, and other purposes. The use of such water shall be consistent with and subject to State law. All or a portion of the water provided for fish and wildlife under this title may be banked for fish and wildlife purposes in accordance with this subsection.”

CVPIA § 3408(c) & (d)

San Joaquin River Restoration Settlement Act of 2009. “The Secretary of the Interior is hereby authorized and directed to implement the terms and conditions of the [Stipulation of Settlement dated September 13, 2006, in the litigation entitled Natural Resources Defense Council, et al. v. Kirk Rodgers, et al., United States District Court, Eastern District of California, No. CIV. S-88-1658-LKK/GGH] in cooperation with the State of California, including the following measures as these measures are prescribed in the Settlement:

- (1) Design and construct channel and structural improvements as described in paragraph 11 of the Settlement
- (2) Modify Friant Dam operations so as to provide Restoration Flows and Interim Flows.
- (3) Acquire water, water rights, or options to acquire water as described in paragraph 13 of the Settlement, *provided, however*, such acquisitions shall only be made from willing sellers and not through eminent domain.
- (4) Implement the terms and conditions of paragraph 16 of the Settlement related to recirculation, recapture, reuse, exchange, or transfer of water released for Restoration Flows or Interim Flows, for the purpose of accomplishing the Water Management Goal of the Settlement.”

Omnibus Public Land Management Act of 2009, Pub. L. No. 111-11, 123 Stat. 991, 1349-1350, Title 10, § 10004(a)

“Except as otherwise provided in this section, the implementation of the Settlement and the reintroduction of California Central Valley Spring Run Chinook salmon pursuant to the Settlement and section 10011, shall not result in the involuntary reduction in contract water allocations to Central Valley Project long-term contractors, other than Friant Division long-term contractors.

“Except as provided in the Settlement and this part, nothing in this part shall modify or amend the rights and obligations of the parties to any existing water service, repayment, purchase, or exchange contract.”

San Joaquin River Settlement Act § 10004(f) & (g)

Trinity River Fish and Wildlife Management Act. “The Secretary shall formulate and implement a fish and wildlife management program for the Trinity River Basin designed to restore the fish and wildlife populations in such basin to the levels approximating those which existed immediately before the start of the construction [of the Trinity River division of the Central Valley Project] and to maintain such levels. The program shall include the following activities:

The design, construction, operation, and maintenance of facilities to— (A) rehabilitate fish habitats in the Trinity River between Lewiston Dam and Weitchpec; (B) rehabilitate fish habitats in tributaries of such river below Lewiston Dam and in the south fork of such river; and (C) modernize and otherwise increase the effectiveness of the Trinity River Fish Hatchery.”

Act of Oct. 24, 1984, Pub. L. No. 98-541, 98 Stat. 2721, 2722, § 2(a)

Note: The CVPIA subsequently amended this directive to require the Secretary to “provide through the Trinity River Division, for water years 1992 through 1996, an instream release of water to the Trinity River of not less than 340,000 acre-feet per year for the purposes of fishery restoration, propagation, and maintenance” CVPIA § 3406(b)(23). This directive led to the Trinity River Restoration Program and minimum flow schedule described in the text. (Mount et al. 2017b)

State Water Project Authorizing Legislation (as amended). “The Legislature finds and declares it to be necessary for the general public health and welfare that preservation of fish and wildlife be provided for in connection with the construction of state water projects.

“The Legislature further finds and declares it to be necessary for the general public health and welfare that facilities for the storage, conservation or regulation of water be constructed in a manner consistent with the full utilization of their potential for the enhancement of fish and wildlife and to meet recreational needs; and further finds and declares that the providing for the enhancement of fish and wildlife and for recreation in connection with water storage, conservation, or regulation facilities benefits all of the people of California and that the project construction costs attributable to such enhancement of fish and wildlife and recreation features should be borne by them.”

California Water Code § 11900

“The department, in fixing and establishing prices, rates, and charges for water and power, shall include as a reimbursable cost of any state water project an amount sufficient to repay all costs incurred by the department, directly or by contract with other agencies, for the preservation of fish and wildlife and determined to be allocable to the costs of the project works constructed for the development of that water and power, or either. Costs incurred for the enhancement of fish and wildlife or for the development of public recreation shall not be included in the prices, rates, and charges for water and power, and shall be nonreimbursable costs.”

California Water Code § 11912.

“The Department of Fish and Game shall manage fish and wildlife resources at state water projects, including any such additional resources as are created by such projects, in a manner compatible with the other uses of such projects.”

California Water Code § 11917

Environmental Regulatory Statutes

California Porter-Cologne Act. “The Legislature finds and declares that the people of the state have a primary interest in the conservation, control, and utilization of the water resources of the state, and that the quality of all the waters of the state shall be protected for use and enjoyment by the people of the state.

“The Legislature further finds and declares that activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.”

California Water Code § 13000

“Beneficial uses’ of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.”

California Water Code § 13050(f)

State Water Resources Control Board Authority. “It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such water is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare. The right to water or to the use or flow of water in or from any natural stream or watercourse in this State is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or unreasonable method of use or unreasonable method of diversion of water.”

California Water Code § 100

“The board, subject to the provisions of Section 100 and whenever it is in the public interest, may approve appropriation by storage of water to be released for the purpose of protecting or enhancing the quality of other waters which are put to beneficial uses.”

California Water Code § 1242.5

“The use of water for recreation and preservation and enhancement of fish and wildlife resources is a beneficial use of water. In determining the amount of water available for appropriation for other beneficial uses, the board shall take into account, when it is in the public interest, the amounts of water required for recreation and the preservation and enhancement of fish and wildlife resources.”

California Water Code § 1243

“In determining the amount of water available for appropriation, the board shall take into account, whenever it is in the public interest, the amounts of water needed to remain in the source for protection of beneficial uses, including any uses specified to be protected in any relevant water quality control plan established pursuant to Division 7 (commencing with Section 13000) of this code.”

California Water Code § 1243.5

Instream Water Rights. “(a)(1) Any person entitled to the use of water, whether based upon an appropriative, riparian, or other right, may petition the board . . . for a change for purposes of preserving or enhancing wetlands habitat, fish and wildlife resources, or recreation in, or on, the water.

“(2) The petition may be submitted for any of the purposes described in paragraph (1) and may, but is not required to, be submitted in combination with a petition to make any other change authorized pursuant to this part. The petition shall specify the time, location, and scope of the requested change, and other relevant information relating thereto.

“(b) The board may approve the petition filed pursuant to subdivision (a), subject to any terms and conditions which, in the board’s judgment, will best develop, conserve, and utilize, in the public interest, the water proposed to be used as part of the change, whether or not the proposed use involves a diversion of water, if the board determines that the proposed change meets all of the following requirements:

- (1) Will not increase the amount of water the person is entitled to use.
- (2) Will not unreasonably affect any legal user of water.
- (3) Otherwise meets the requirements of this division.

“(c)(1) Upon the request of the petitioner, the board may specify, as part of its approval of the petition, that the water that is subject to the approval pursuant to this section shall be in addition to water that is required, if any, to be used for instream purposes to satisfy any applicable federal, state, or local regulatory requirements governing water quantity, water quality, instream flows, fish and wildlife, wetlands, recreation, and other instream beneficial uses. If the request is approved by the board, state and local agencies, as well as the courts, shall not credit the water subject to that petition towards compliance with any of the regulatory requirements described in this subdivision. A federal agency shall comply with the requirement imposed by this paragraph to the extent required by federal law, or to the extent that it chooses to comply.

“(2) For the purposes of this subdivision, “requirements” includes requirements or obligations that have not been formally established or allocated at the time of the petition, and obligations under any agreement entered into to meet those requirements. . . .

“(d) Except as provided in subdivision (c), water that is subject to a petition granted pursuant to this section shall be used to meet, in whole or in part, any requirement described in subdivision (c) if any of these requirements exist. The water shall be credited to the petitioner, or to any other person or entity designated by the petitioner, whenever that person or entity has, or may have, obligations to meet one or more of the requirements described in subdivision (c). The water shall be credited towards compliance with any requirements described in subdivision (c), by state and local agencies, as well as the courts. A federal agency shall comply with the requirement imposed by this subdivision to the extent required by federal law, or to the extent that it chooses to comply.”

California Water Code § 1707

Regulation of Dam Operations. “The owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam.

“During the minimum flow of water in any river or stream, permission may be granted by the department to the owner of any dam to allow sufficient water to pass through a culvert, waste gate, or over or around the dam, to keep in good condition any fish that may be planted or exist below the dam, when, in the judgment of the department, it is impracticable or detrimental to the owner to pass the water through the fishway.”

California Fish and Game Code § 5937

Federal Energy Regulatory Commission Licensing. “The Commission is authorized and empowered . . . to issue licenses . . . for the purpose of constructing, operating, and maintaining dams, water conduits, reservoirs, power houses, transmission lines, or other project works . . . for the development and improvement of navigation and for the development, transmission, and utilization of power . . . in any of the streams or other bodies of water over which Congress has jurisdiction under its authority to regulate commerce with foreign nations and among the several States.

“In deciding whether to issue any license under this subchapter for any project, the Commission, in addition to the power and development purposes for which licenses are issued, shall give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including

related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality.”

Federal Power Act, 16 U.S.C. § 797(e)

“Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate . . . that any such discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of this title.”

“Any certification provided under this section shall set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant for a Federal license or permit will comply with . . . any other appropriate requirement of State law set forth in such certification, and shall become a condition on any Federal license or permit subject to the provisions of this section.”

Clean Water Act § 401(a)(1) & (d), 33 U.S.C. § 1331(a)(1) & (d)

Federal Endangered Species Act. “Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary . . . to be critical In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available.”

“If after consultation under subsection (a)(2), the Secretary concludes that—

- (A) the agency action will not violate such subsection, or offers reasonable and prudent alternatives which the Secretary believes would not violate such subsection; [and]
- (B) the taking of an endangered species or a threatened species incidental to the agency action will not violate such subsection . . .

the Secretary shall provide the Federal agency and the applicant concerned, if any, with a written statement that—

- (i) specifies the impact of such incidental taking on the species,
- (ii) specifies those reasonable and prudent measures that the Secretary considers necessary or appropriate to minimize such impact, . . . and
- (iv) sets forth the terms and conditions . . . that must be complied with by the Federal agency or applicant . . . to implement the measures specified under clause (ii)”

Endangered Species Act § 7(a)(2) & (4), 16 U.S.C. § 1536(a)(2) & (4)

Note: The term “take” means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” ESA § 3(19), 16 U.S.C. § 1532(19)

California Endangered Species Act. “No person or public agency shall . . . take . . . any species, or any part or product thereof, that the [California Fish and Game Commission] determines to be an endangered species or a threatened species, or attempt any of those acts”

California Fish and Game Code § 2080

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