- Restore natural, self-sustaining systems that can adjust to naturally occurring changes in physical processes with minimum ongoing intervention.
- Implement habitat restoration using adaptive management techniques.
- Recognize constraints, which are a driver in determining restoration objectives.
- Evaluate the restoration from a regional perspective, as not all regional objectives can be addressed within the project boundaries.
- Protect special-status species, to the extent possible, during the restoration process.
- Restore habitats in the NSMWA that will change over time as a result of inherent dynamic characteristics of the estuarine system (in terms of seasonal as well as longer-term changes).
- Phase the restoration in the project site and time the restoration in relationship with restoration projects throughout the NSMWA, particularly Cullinan Ranch and Skaggs Island, to reduce negative impacts (such as erosion of existing marshes and unintended breaching of levees) resulting from excessive changes in the tidal prism.
- Accelerate the speed of habitat restoration by conducting salinity reduction of the former salt ponds as quickly as is safely and financially possible.
- Meet as many of the goals and objectives of the *Baylands Ecosystem Habitat Goals* report as feasible, focusing on how this project's goals and objectives fit within the entire north bay region.

These goals were based on the *Baylands Ecosystem Habitat Goals* report (Goals Project 1999) (p. 97), which states:

> The overall goal for the North Bay is to restore large areas of tidal marsh and to enhance seasonal wetlands. Some of the inactive salt ponds should be managed to maximize their habitat functions for shorebirds and waterfowl, and others should be restored to tidal marsh. Tributary streams and riparian vegetation should be protected and enhanced, and shallow subtidal habitats (including eelgrass beds in the southern extent of this subregion) should be preserved or restored.
>
> Tidal marsh restoration should occur in a band along the bayshore, extending well into the watersheds of the subregion's three major tributaries—Napa River, Sonoma Creek, and Petaluma River. Seasonal wetlands should be improved in the areas that are currently managed as agricultural baylands. All remaining seasonal wetlands in the uplands adjacent to the Baylands should be protected and enhanced.
>
> …In total, the Goals for the North Bay subregion call for increasing the area of tidal marsh from the existing 16,000 acres to approximately 38,000 acres, and creating about 17,000 acres of diked wetlands managed to optimize their seasonal wetland function.

The project will also help achieve the California Bay-Delta Program multi-species conservation strategy targets by restoring slough, marsh, and deeper open-water areas. These restored habitats can aid many species that the Bay-Delta Program agencies have pledged to help recover.

2.3.2 Project-Specific Habitat Restoration Goals

Specific project-site habitat restoration goals developed by the project sponsors using recommendations for the Napa River and Sonoma Creek areas from the *Baylands Ecosystem Habitat Goals* report include:

- In a phased approach, restore large patches of tidal marsh that support a wide variety of fish, wildlife, and plants, including
  - special-status mammals and water birds, specifically the salt marsh harvest mouse, California clapper rail, and black rail;
  - endangered fish, specifically Delta smelt, splittail, steelhead trout, and chinook salmon, and other fish species; and
  - aquatic animals, including the dungeness crab, and other benthic and planktonic invertebrates.
- Ensure connections between the patches of tidal marsh (in the project site and with adjacent sites) to enable the movement of small mammals, marsh-dependent birds, and fish and aquatic species.
- Restore tidal marsh in a band along the Napa River to maximize benefits for fish and other aquatic animals.
- Manage water depths of ponds to maximize wildlife habitat diversity, with shallow-water areas for migratory and resident shorebirds and dabbling ducks and deepwater areas for diving benthivores.
- Manage salinity levels in ponds to support a rich diversity of biota.
- Break up unneeded levees to create refuges for roosting and nesting shorebirds.
- Manage invasive plant species, as feasible.

2.3.3 Beneficial Reuse of Recycled Water

The recycled-water-reuse goal for the project is to maximize use of available recycled water for salinity reduction ~~desalination~~. SCWA has formed a coalition of north bay water agencies with the intent of achieving 100% reuse (zero discharge) of recycled water. Minimizing discharge of recycled water is a requirement imposed by the State of California. It is the coalition’s goal to divert 15,000 acre-feet (af)/year of recycled water from discharge to surface water bodies to beneficial upland reuse.

The overall concept is to construct a pipeline from all of the major treatment facilities in the north bay region to the agricultural users in Napa and Sonoma Counties. In the long term, the ability to transport water from west to east through the proposed pipeline would mean that agricultural users would have access to recycled water rather than using surface water from small streams and creeks in the north bay. The use of recycled water is appealing to agricultural users because the supply is consistent from year to year. If the pipeline is not built, each wastewater treatment plant (WWTP) would look for local reuse opportunities, but these reuse opportunities may not be sufficient to achieve zero discharge.

In the short term, a portion of the recycled water could be made available to the Napa River Salt Marsh Restoration Project to enhance desalination. The pipeline would be constructed in stages, and the amount of water initially available would be between 6,000 and 7,000 af/year. While reuse of recycled water for the project would not meet the long-term goal of zero discharge (i.e., the recycled water would eventually still be discharged to the Napa River or San Pablo Bay), use of the recycled water for salinity reduction ~~desalination~~ would be a beneficial reuse. This water would be especially valuable as a means of further diluting bittern (i.e., increasing the allowable bittern discharge rate). Reusing the recycled water for salinity reduction ~~desalination~~ would ensure that sufficient discharge capacity is available to accommodate the available volume of recycled water. The availability of discharge capacity would be crucial in the early phases of the recycled water project, and would enable coalition members to participate. After the salinity reduction process is completed, the pipeline constructed to the ponds would be modified by SCWA to provide irrigation water to nearby agricultural lands.

If recycled water is not used for salinity reduction ~~desalination~~, it is likely that the pipeline would not be built. The timing for deciding to use recycled water is crucial, as the WWTPs are currently in need of immediate reuse opportunities for a portion of their water.

2.3.4 Recreation

The NSMWA currently provides limited recreational facilities, as described above. The project goals include enhancing recreational access to and use of the project area by providing improved recreational facilities. Proposed improvements to recreational facilities may include interpretive signs, an information kiosk, paved and lighted parking areas, a toilet, improved footpaths to the ponds, and a wildlife viewing blind.

2.4 Development of Options

2.4.1 Introduction

The Napa River Salt Marsh Restoration Project includes three primary components—salinity reduction, habitat restoration, and water delivery. Each of these components had numerous approaches to being implemented. The following sections describe the screening process that was used to focus the ~~EIR/~~EIS and define a reasonable range of alternatives.

2.4.2 Options as Components of Alternatives

Because of the complexity of the salinity reduction and habitat restoration processes and the project sponsors' desire to select the best salinity reduction and habitat restoration approaches, this ~~EIR/~~EIS separates the components of alternatives into salinity reduction, water delivery, and habitat restoration options. These options are screened and analyzed separately, then combined in Chapter 17, "Alternatives," to arrive at a reasonable range of alternatives.

2.4.3 Screening Process

Several approaches were used to develop and screen options, including using a restoration decision flowchart developed by the project team (Figure 2-4) and the Corps' *Economic and Environmental Principles and Guidelines for Water Related Land Resources Implementation Studies* identified in the Corps' *Planning Guidance Notebook (ER 1105-2-100)* (U.S. Army Corps of Engineers 2000a), which includes screening based on effectiveness, efficiency, completeness, and acceptability. Environmental, economic, and social screening criteria were also used to evaluate and screen restoration components. <u>This screening approach is relevant because the Corps will sponsor a portion of the project.</u>

A wide range of options was identified and evaluated at a screening level. Options that were identified as viable in the first round of screening were retained for more detailed evaluation. Salinity reduction options were further subdivided into two components—the salinity reduction process, and supplemental (fresh or recycled) water delivery.

Preliminary screening of the salinity reduction options was achieved by conducting initial hydrologic modeling runs to determine the feasibility of various salinity reduction approaches. The water delivery options were evaluated by assessing the economic and institutional feasibility. The habitat restoration options were screened by characterizing the evolution of the site over time with varying assumptions. The most viable options were carried forward for consideration as potential project options. Potential habitat restoration options

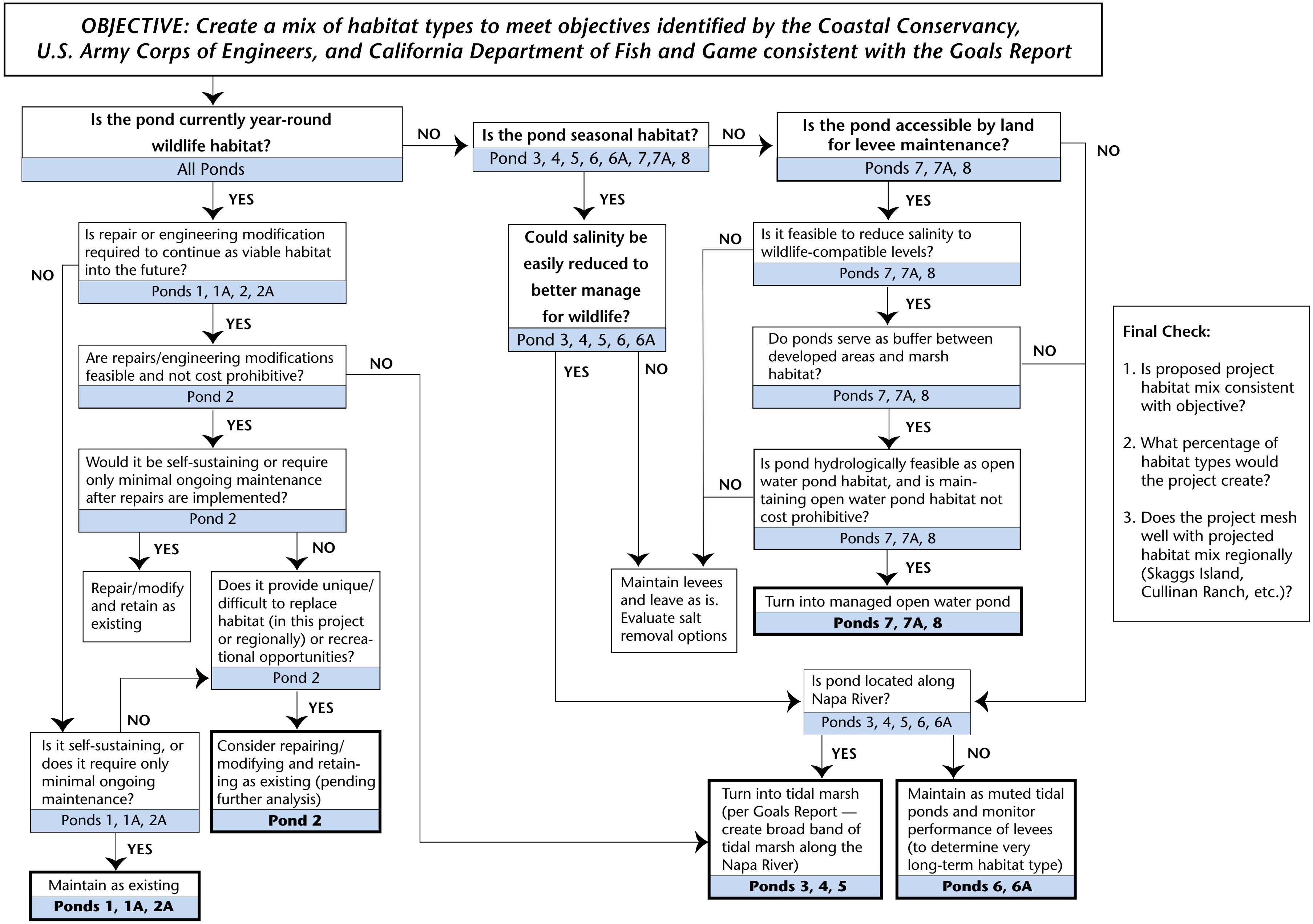

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Figure 2-4
Napa River Salt Marsh Restoration Project Decision Flowchart

were then presented to the Napa-Sonoma Marsh Restoration Group for review and critique.

2.4.4 Options Considered but Eliminated

Twenty-four salinity reduction, seven habitat restoration, and three supplemental water delivery options were considered at the screening stage. Of these, 21 salinity reduction options, three habitat restoration options, and two water delivery options were eliminated from further analysis because of criteria described above. These options are briefly described below.

2.4.4.1 Salinity Reduction Options

Reverse Operation of the Ponds

As described earlier, during the salt production process, bay water was moved from the southernmost ponds in sequence to the northern ponds. The initial salinity reduction options considered consisted of reversing the flow so that the higher salinity (northernmost) ponds would discharge into the lower salinity ponds (closest to the bay). Numerous permutations of this option were considered including reverse operation of all the ponds and reverse operation of selected ponds, as well as different discharge locations. Hydrologic modeling indicated that reverse operation would delay the salinity and habitat restoration process because desalination of the lower salinity ponds would be delayed until desalination of the higher salinity ponds had been completed. In addition, the salinity in the lower salinity ponds would increase initially as the water from the upper ponds is discharged to the lower ponds.

Concentration of Brine in One or More Central Ponds

Another option for conducting salinity reduction is to move brine from the lower and upper ponds to one or more centrally located ponds. The centrally located pond(s) would serve as a holding chamber(s) for the brine and would be used to discharge the brine over time. If all the brine were discharged to a small number of ponds, the remaining ponds could be restored sooner than under the reverse flow scenario. Several preliminary salinity reduction options used a version of this approach. Preliminary analysis of these options indicated that one or more ponds would have a very large increase in salinity, and (in several scenarios) one or more ponds could dry out completely. In addition, very high water volumes would be required for most of these options. The loss of habitat value and potential long-term damage to one or more ponds associated with desiccation made these options unacceptable.

Physical Removal of the Bittern

These options were developed to evaluate the potential for expediting the restoration of the upper ponds by speeding up the removal of bittern from Pond 7. Physical bittern removal would consist of pumping out and/or scraping up the contents of Pond 7 and then disposing of or reusing these materials off-site. Many variations of this option were considered, including ocean dumping, reuse, and land-based disposal. Cost and environmental effects made these options infeasible. If a purchaser can be found for bittern, this option may become economically feasible.

Use of Only Recycled Water to Desalinate All Ponds

This option was designed to eliminate potential impacts on aquatic life from use of Napa River, Napa Slough, or San Pablo Bay water for desalination. Water-balance calculations indicated that there would not be sufficient recycled water to compensate for net evaporation, much less to desalinate all ponds.

Flood Event Salinity Reduction

During high flow periods (i.e., flood events), a higher volume of water is available to dilute the brines from the ponds, and to carry the diluted discharge out of the river into San Pablo Bay. Under this option, brine could be discharged only during flood events, or, alternatively, could be discharged at a higher rate during flood events. This option is not a complete desalination option by itself, because this approach cannot be used for the bittern and may not be appropriate for the highest salinity ponds. The use of high-flow waters to help reduce salinity was integrated into Salinity Reduction Options 1B and 1C, as described below in Section 2.5.2.

Discharge of Diluted Bittern to San Pablo Bay

Another bittern dilution alternative considered was construction of a pipeline from Pond 7 directly to San Pablo Bay. This approach would result in discharge of more-concentrated effluent directly to San Pablo Bay. This option was considered infeasible for several reasons. First, the cost of constructing and operating such a system would be much greater than the costs associated with the other salinity reduction options. The costs would be associated with the multiple miles of pipeline itself, the chemically resistant materials required for the pipeline, the cost of constructing in areas that are not land-accessible (Ponds 6, 6A, and 2), the cost of boring through or under numerous levees (or creating engineered footings for an elevated pipeline), and the cost of pumping the heavy effluent from Pond 7 into San Pablo Bay. In addition, to ensure sufficient dilution, the discharge pipeline most likely would have to be extended to the deepwater channel (the relatively concentrated brine could not be discharged into the very shallow areas of San Pablo Bay immediately south of the project area).

This would further increase costs and construction challenges. Secondly, the environmental effects of constructing and operating such a pipeline would be significant for the reasons just discussed. Thus, this alternative was eliminated.

Mixing Bittern with High Salinity Brine to Reduce Toxicity

Testing indicated that mixing bittern with high salinity brine did not reduce the toxicity sufficiently to allow an increase in discharge rates (GAIA 2002); therefore, an alternative consisting of mixing bittern with high salinity brine was eliminated. (These results are discussed in more detail in Chapter 4, "Water Quality," Section 4.1.4.5).

Move Bittern to East Side Ponds

Because of the recent acquisition of the east side Napa River salt ponds by DFG, a new alternative has become available. This alternative consists of physically moving bittern from Pond 7 to one or more ponds on the east side of Napa River. However, transferring bittern from Pond 7 to the wash ponds on the east side of the Napa River was deemed infeasible. While this approach would accelerate restoration of Pond 7, it would create similar bittern removal concerns for the new storage location. In addition, the transfer of bittern to the east side of the river either would require costly construction of a pipeline or would spread the bittern through the entire canal between Pond 7 and the pipeline leading under the Napa River. Furthermore, while the land on the east side of the Napa River is now owned by DFG, Cargill is currently removing stockpiled salt in preparation for restoration of the property. This process requires access to all the ponds, including the wash pond, for approximately the next 7 years (Ransom pers. comm.). Using one or more of the ponds on the east side of the Napa River to store bittern would simply delay the restoration process for that project.

2.4.4.2 Water Delivery Options

Using fresh (nonsaline) water in the salinity reduction process would expedite the salinity reduction process, thus requiring less time to accomplish salinity reduction.

Maximum Recycled Water Delivery

As discussed earlier, recycled water is potentially available to the Napa River Salt Marsh Restoration Project from WWTPs in the north bay region. The Maximum Recycled Water Delivery Option assumes that the water/sanitary agencies in the region would provide a combined 15,000 af/year of recycled water for salinity reduction. This volume would require most of the recycled water that is not currently slated for other uses, and would also require the installation of a pipeline to allow for the delivery of water from as far away as eastern Marin County. The feasibility and timing of constructing a pipeline system to convey recycled water to the project site from all WWTPs in the north bay region have not been determined. As such, the Maximum Recycled Water Delivery Option is not considered feasible at this time; however, a portion of this option is currently feasible, as described below under Section 2.5.3, "Water Delivery Option."

Use of Site Groundwater

Another potential source of fresh water for salinity reduction is the groundwater beneath the site. Reportedly, when hay production was occurring in the project area, groundwater was used for irrigation. This option was eliminated from further consideration because of the relatively small volume of water available, the cost of installing the required wells and water distribution system, the risk of causing saltwater intrusion into the shallow aquifer, and the opposition of the San Francisco Bay RWQCB to use of limited potable water for desalination when other options are feasible. However, use of groundwater may be appropriate for select aspects of the long-term maintenance program for the project area.

2.4.4.3 Habitat Restoration Options

Species-Focused Options

Species-focused options consist of restoring the site for primary use by specific species such as waterfowl and shorebirds or by endangered species. If the site were managed primarily for diving benthivores and other waterbirds, it would remain entirely as ponds. If the restoration were focused primarily on endangered species such as the California clapper rail, the site would be converted to tidal marsh in its entirety.

Maximizing habitat for shorebirds and waterfowl would completely eliminate the largest likely potential for recovery of endangered species and the largest likely potential for increasing tidal marsh and associated ecosystem services (including benefits to the bay) anywhere in the north bay region. The Bay-Delta estuary has lost ~~79%~~ 85–90% of its tidal marshes, to the serious detriment of not only many tidal marsh species, but also the bay as an ecosystem. This loss of potential benefits would be grossly in conflict with the Habitat Goals and with federal and state plans for endangered species recovery, and would be widely considered unacceptable.

Maximizing habitat for endangered species would cause disproportionate negative impacts on shorebirds and waterfowl by eliminating excellent high tide refugia and feeding habitat for the former and substantial feeding and resting habitat for the latter. These impacts are particularly important because of the project's location on the Pacific Flyway. These impacts are considered unacceptable to the project sponsors and many others.

Thus, these two options do not provide suitable habitat for the large diversity of species currently residing in the NSMWA, and therefore do not meet project goals. In addition, species-focused options are particularly difficult to design and do not allow the flexibility needed to manage the multispecies project area. For example, managing ponds for shorebird use (i.e., maintaining shallow water levels) is very difficult given the large area of the ponds and the high evaporation rates that occur in the summer months. The habitat restoration options that were retained provide suitable habitat for a wide range of existing species.

Land Exchange

One possibility for optimizing habitat development in the region is to integrate activities at adjacent or nearby restoration sites. Specifically, Cullinan Ranch, which is owned by USFWS, is deeply subsided, yet is slated for redevelopment into tidal marsh. One possible option is to exchange the Cullinan parcel for a DFG parcel in the project area so that land more suitable for tidal marsh restoration is used to create tidal marsh and a deeply subsided area such as Cullinan Ranch is used to create pond habitat. This habitat restoration option, although technically and economically sound, is logistically infeasible because the terms underlying congressional funding and USFWS's purchase agreement mandated that Cullinan Ranch be restored to tidal marsh.

Sediment-Import Options

Habitat restoration could be accelerated and/or seasonal wetland and upland habitat could be created with the import of large quantities of sediment. The sediment would be placed into the ponds before breaching to avoid or minimize the need for sediment accretion prior to the establishment of marsh vegetation. In addition, imported sediment could be used to raise grades at the northern ponds to create upland or seasonal wetland habitat. Large-scale sediment import was eliminated from consideration because sediment import may not enhance the environmental values substantially over existing conditions and because DFG supports only limited use of sediment. Additionally, initial calculations have shown that existing sediment supply is greater than the predicted postrestoration demand, indicating that there may be sufficient sediments to restore the ponds naturally (Philip Williams and Associates 2002a). Creation of seasonal wetland or upland habitat is not part of the goals for this project.

2.4.5 Options Evaluated in This ~~EIR/~~EIS

As described earlier, three sets of options are evaluated in this ~~EIR/~~EIS. Because both salinity reduction and habitat restoration are required to complete the project, the habitat restoration options are combined with appropriate salinity reduction options and water delivery options (Chapter 17, "Integration of Options and Alternative Selection") to document the full extent of potential impacts associated with complete alternatives. In addition, ~~both CEQA and~~ NEPA requires evaluation of a no-project alternative. This section describes first the No-Project Alternative, then the salinity reduction options, the water delivery options, and the habitat restoration options. The options are described briefly below and in detail in Section 2.5, "Project Options."

- **No-Project Alternative.** Under the No-Project Alternative, site conditions would continue to deteriorate and salinity in the ponds closed to tidal influence would continue to increase. Additional No-Project Alternative assumptions are described in Section 2.5, "Project Options."
- **Salinity Reduction Option 1A: Napa River and Napa Slough Discharge.** This option proposes to conduct the salinity reduction process in a phased approach, decoupling desalination of the upper ponds from desalination of the lower ponds. Primary discharges from the upper ponds would be to Napa Slough, and primary discharges from the lower ponds would be to the Napa River. The use of recycled water for dilution of the upper ponds ~~may be is included in~~ can be added to this option.
- **Salinity Reduction Option 1B: Napa River and Napa Slough Discharge and Breach of Pond 3.** This option also proposes to conduct the salinity reduction by separating the upper and lower ponds. Primary discharges from the upper ponds would be to Napa Slough. Salinity reduction of the lower ponds would occur by creating a 50-foot breach on the Pond 3 levee during a high flow event and constructing an intake on Pond 5 and a discharge on Pond 4. The use of recycled water for dilution of the upper ponds can be added to ~~is included in~~ this option.
- **Salinity Reduction Option 1C: Napa River and Napa Slough Discharge with Breaches of Ponds 3 and 4/5.** This option is similar to Salinity Reduction Option 1B except that the Pond 4 levee would also be breached and the intake and discharge would not be constructed. Salinity reduction of the lower ponds would occur by strategically timing the levee breaches during a large storm event when the Napa River flow is high. The use of recycled water for dilution of the upper ponds can be added to ~~is included in~~ this option.
- **Salinity Reduction Option 2: Napa River and San Pablo Bay Discharge.** This option also proposes to conduct the salinity reduction process in a phased approach; however, desalination of the upper ponds is coupled with desalination of some of the lower ponds. Primary discharges from the upper ponds would be conveyed through Ponds 6A, 6, 2, and 1/1A, then under SR 37 to San Pablo Bay. Primary discharges from Ponds 3, 4, and 5 would be to the Napa River. The use of recycled water for dilution of the upper ponds could be included in this option.
- **Water Delivery Option.** This option focuses on project-specific and programmatic delivery of recycled water to the project area. Project-specific delivery would occur from the Sonoma Valley County Sanitation District (SCVSD) WWTP, the Napa Sanitation District (NSD) WWTP, and the City of American Canyon (CAC) WWTP. Programmatic delivery could come from other WWTPs in the north bay region.

- **Habitat Restoration Option 1: Mixture of Tidal Marsh and Managed Ponds.** This option provides a balanced mix of tidal marsh habitat and managed pond habitat, with an emphasis on restoring Ponds 3, 4, and 5 to tidal marsh and maintaining the remaining ponds as managed ponds. Ponds 6 and 6A would be managed as ponds in the short term (the initial 10–20 years). Adaptive management criteria would be used at that point to determine whether these ponds should also be opened to tidal action, or whether they should remain as managed ponds.
- **Habitat Restoration Option 2: Tidal Marsh Emphasis.** This option provides a larger amount of tidal marsh habitat and proposes to reconfigure the levee in Pond 2 because of deteriorating site conditions. Ponds 3, 4, 5, 6 and 6A, and the eastern half of Pond 2 would be restored to tidal marsh.
- **Habitat Restoration Option 3: Pond Emphasis.** This option provides a larger amount of pond habitat; only Ponds 3 and 4 would be restored to tidal marsh.
- **Habitat Restoration Option 4: Accelerated Restoration.** This option adds design features such as more extensive starter channels and berms, and the use of imported sediment to fill an area to near tidal marsh elevation, and to accelerate marsh restoration.

2.5 Project Options

2.5.1 No-Project Alternative

CEQA and NEPA requires the analysis of a no-project alternative. The No-Project Alternative for this project is depicted in Figure 2-5. Under this alternative, site conditions would continue to deteriorate and salinity in the ponds would continue to increase. DFG would manage the site to reduce day-to-day pond salinity, if possible, by taking San Pablo Bay water into Ponds 1 and 1A and Napa River water into Pond 8 and moving water through the pond system via water control structures. Annually there would be a net increase in the total salt load.

Water would be delivered to the system from two locations: the new intake at Pond 8 and the pump station that transfers water from Pond 1 into Pond 2. The Pond 8 intakes are estimated to provide an average (RMS) flow of 20 cubic feet per second (cfs); the pump station has two 15,000-gpm-capacity pumps. The flow from the intakes to the remaining ponds is driven by elevation (“head”) differential. Initially, the ponds would be expected to dry out more frequently as siphons continue to be or become inoperable as a result of increased salinity gradients. Other water control structures would continue to deteriorate, reducing DFG’s ability to manage water levels and pond salinity for wildlife habitat. Thus, the quality of wildlife habitat in the area would continue to deteriorate quickly.

However, even more significant than the deterioration in wildlife habitat is the increased ecological threat that would be posed to the ponds in the next 10–15 years. If DFG attempts to maintain the ponds' water levels by compensating for annual net evaporation, the salt mass in the ponds would increase dramatically from year to year. In the short term, depending on the amount of make-up water available for each pond, some ponds could dry out each year. In the long term, the increasing salinity in the ponds would reduce evaporation rates sufficiently that the estimated available amount of water would be sufficient to keep the ponds wet all year. If the amount of water delivered to the ponds was kept the same, water levels would then slowly start to rise, and eventually water intakes would have to be cut back to avoid overfilling the ponds. However, salinities in the ponds at this point would exceed 350 ppt (the approximate solubility of sodium chloride), and sodium chloride would start to precipitate. As the salinity would increase, the liquid in the ponds would gradually turn into bittern; the sodium chloride would precipitate, and the remaining brine would have the same composition as the bittern waste left over after the saltmaking process.

Thus, if DFG attempts to manage the water levels in the ponds without discharging to the Napa River or Napa Slough, sufficient salt would accumulate in the ponds that Ponds 4–8 would turn first into highly saline brine and then into bittern ponds with a large precipitated salt mass. Coupled with the deterioration of the levees, the ponds would present an ecological threat in the next 5–30 years.

Ongoing erosion of inboard levees by wind and waves and scour of outboard levees, in conjunction with high tides and high rainfall events, would likely result in one or more levee breaches. Figure 2-5 indicates potential breach locations. DFG would potentially fix the levees on an emergency basis as needed, requiring the mobilization of construction equipment to the site. Because of the remote locations and emergency contracting issues (i.e., permits, funding, contractor availability), these repairs often cannot be started in a timely manner, and much of the potential damage (i.e., possible fish kills) resulting from uncontrolled releases of highly saline water or bittern would be instantaneous. By the time the levees were fixed (approximately 3–4 weeks), most of the negative effects already would have occurred, as large quantities of highly saline pond water/bittern would have been released. The Pond 3 vandalism will not be repaired because adverse effects are not anticipated, and it is consistent with the general salinity reduction approach that the project sponsors are pursuing.

Allowing the ponds to dry out is considered to be even less environmentally acceptable than continuing to increase the mass of salt in the ponds over time. If the ponds are allowed to dry out, the sulfides in the sediment would convert to sulfuric acid and reduce the pH in the ponds. This occurred at Pond 8 in 2001, and the pH ~~at Pond 8 now~~ ranged~~s~~ from a low of 2.2 to a high of 4.2, depending on the quantity of water in the pond. Low pH also poses a substantial environmental risk, and could require even greater dilution prior to discharge than the bittern. The current pH in Pond 8 is normal due in part to the new water control structure built in 2002.

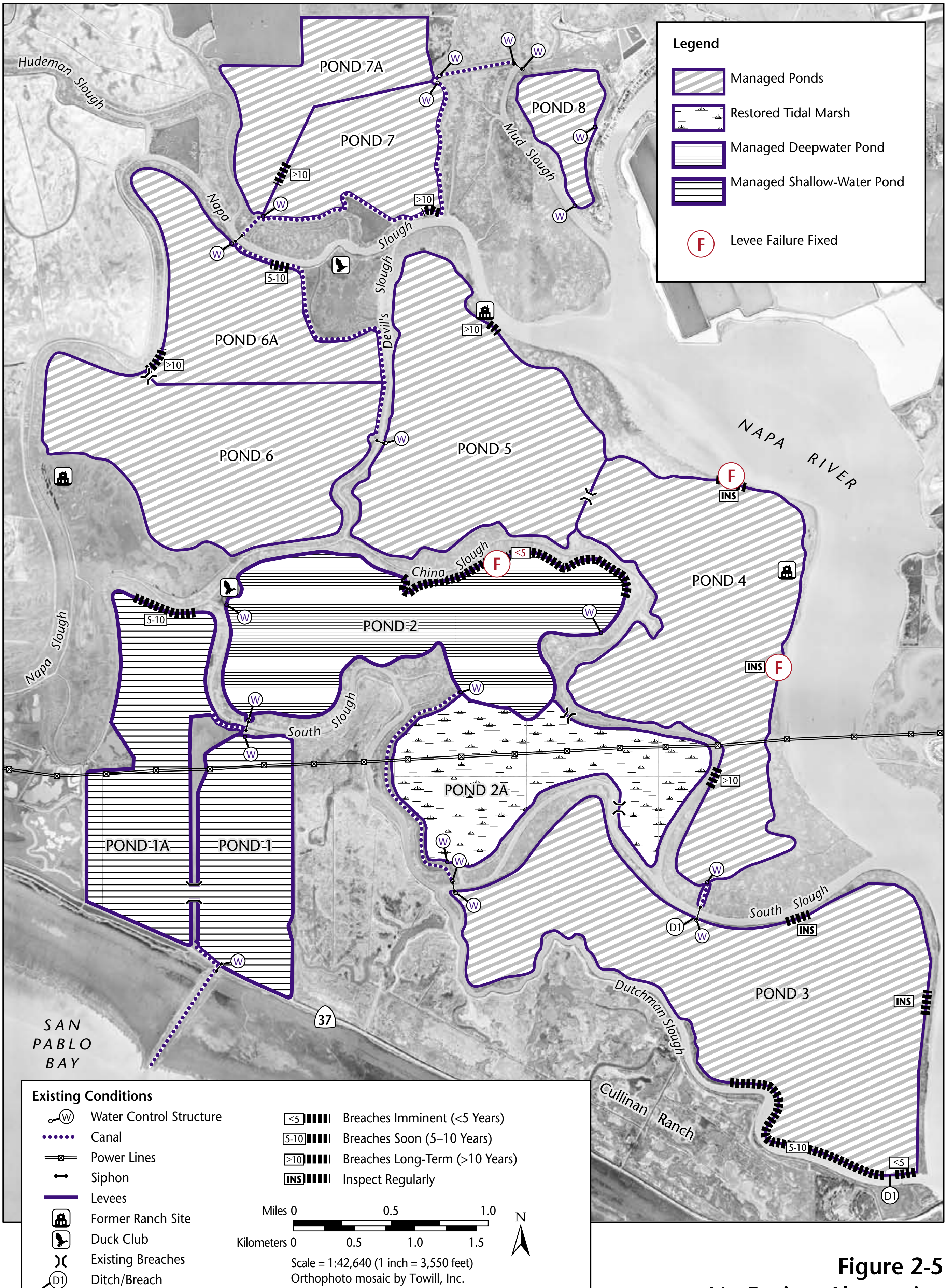

Figure 2-5
No-Project Alternative

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