

SAN FRANCISCO BAY AREA WETLANDS RESTORATION PROGRAM DESIGN REVIEW GROUP

LETTER OF REVIEW AUGUST 14, 2003

MARIN AUDUBON SOCIETY BAHIA TIDAL MARSH RESTORATION NOVATO, CALIFORNIA

IMPORTANT NOTICE: Please note that project review by the Design Review Group (DRG) does not constitute DRG endorsement of a project nor does it constitute a step in the regulatory and/or permitting process. Project proponents are free to pose questions to the DRG at their discretion and the DRG responds only to those questions deemed within its scope and realm of expertise. The Design Review Team does not intend to reach consensus in all of its feedback and dissenting opinions are included as expressed. All feedback is suggestive and non-obligatory; project proponents are not required to incorporate any or all of the feedback into their project design.

1. Project Team:

- a. Project Proponent(s): Marin Audubon Society (represented by Barbara Salzman, President, Marin Audubon Society Board of Directors)
- b. Project Presenter to Design Review Group: Michelle Orr (Philip Williams and Associates) and Barbara Salzman (Marin Audubon Society)

2. Design Review Group Participants:

- a. Dates Review Team met to discuss the project: The Design Review Group, including the Marin Audubon Society Bahia Tidal Wetlands Restoration Project Design Review Team, featured the first presentation of the project on July 14, 2003. Following the presentation, the Team discussed the project and inquired about further information.
- b. Review Team: Josh Collins - Geomorphology and monitoring (San Francisco Estuary Institute), Laura Hanson - Plants and ecology (Independent Biologist), Roger Leventhal - Engineering and hydrology (FarWest Engineering), Phillip Lebednik - Engineering and wetlands function (LFR Levine-Fricke, Inc.), and Stuart Siegel - Tidal marsh design (Wetlands and Water Resources)

All Review Team members were in attendance at the July 14, 2003 meeting.

- c. Non-Review Team Meeting Attendees: (07/14/03) Andree Breaux (San Francisco Bay Regional Water Quality Control Board), John Brosnan (Wetlands Restoration Program), Steve Cochrane (Friends of the San Francisco Estuary), Rich Elb (Bahia Homeowner), Jenn

Feinberg (San Francisco Bay Conservation and Development Commission), Arthur Feinstein (Bahia Homeowner), Nick Garrity (Philip Williams and Associates), Eric Hawk (Marin-Sonoma Mosquito and Vector Control District), Ron Keith (Marin-Sonoma Mosquito and Vector Control District), Chuck Krause (Marin-Sonoma Mosquito and Vector Control District), Marla Lafer (San Francisco Bay Regional Water Quality Control Board), Michelle Levenson (San Francisco Bay Conservation and Development Commission), Bill Lockett (Bahia Homeowner), Mike Monroe (U.S. Environmental Protection Agency), Michelle Orr (Philip Williams and Associates), Chris Potter (California Resources Agency), Barbara Salzman (Marin Audubon Society), Beverly Tarbell (Bahia Homeowner), Eric Tattersall (California Department of Fish and Game), and John Zentner (Zentner and Zentner)

3. Review Process:

- a. Assistance requested by project sponsor: Michelle Orr and Barbara Salzman, on behalf of the project's planning team, presented an overview of the proposed restoration project to the Design Review Team. Michelle reviewed the Desired Feedback requested, as submitted in the completed Project Summary form and posed during the project presentation. The Desired Feedback consisted of those issues on which she sought Design Review Team input. These were:
- i. What are possible designs for the East Bahia site in the event the Bahia Homeowners' Association (BHA) is able to build the lock dredge project? How should the project be designed if the lock/dredge project is not build and we are successful in purchasing the adjacent property?
 - ii. What design and/or design phasing would be most protective of the salt marsh harvest mice populations?
 - iii. Should the seasonal wetlands on the dredged material fill area parcel be converted to tidal marsh or retained as seasonal habitat features and enhanced?
 - iv. Should the 5-acre pond (formerly known as Tract 1) and the approximately 1-acre pond (formerly known as Tract 8) be retained?
 - v. What is the most beneficial method for placement the material excavated from the peninsulas (formerly known as Tracts 2, 3 and 4) to the West and Central Bahia parcels in the most beneficial marsh design and to minimize impacts to the salt marsh harvest mouse?
- b. Materials reviewed:
- Completed Design Review Group Project Summary Form
 - Project presentation to DRG, July 14, 2003
 - Additional Information Requested by the Design Review Team: Design Review Team members did not ask to review additional materials following the July 14 presentation.

The project is very conceptual in nature and those materials available for review have been presented to the group.

4. Design Review Group Findings and Comments:

The Design Review Team shared numerous comments and all feedback is captured in this section. The Team does not intend to reach consensus in all of its feedback and dissenting opinions are included as appropriate.

The following represents the professional opinions of the Design Review Team members. These opinions are provided for the benefit of the project proponent in direct response to those questions posed by the proponent. The project proponent is in no way obliged to incorporate any or all of the feedback herein into his project design.

a. Consistency with Habitat Goals:

The proposed project is located within the North Bay Subregion, in the Segment F - Petaluma River Area as defined in the *Baylands Ecosystem Habitat Goals Report*. This segment remains relatively undeveloped and contains the largest intact tidal marsh within the estuary, Petaluma Marsh. The system retains many features indicative of historical marsh conditions, including natural transitions to the adjacent oak woodlands. The proposed project, when completed, has the potential to create such a fine example of a tidal marsh/oak woodland interface.

The *Goals Report* notes Segment F "provides opportunities to restore extensive tidal marsh and natural marsh/upland transitions. It also provides opportunities to expand remnant populations of rare plants, such as Point Reyes bird's-beak, into restored tidal marshes." The proposed project site will incorporate such design features as tidal marsh restoration and natural marsh/upland transitions - particularly with oak woodlands - and has the potential to encourage expansion of rare plant populations.

One *Goals Report* recommendation of note specific to Segment F is to "control pepper grass invasions in otherwise intact tidal brackish marsh to prevent the loss of high marsh plant diversity."

Finally, the *Goals Report* recognizes the following Unique Restoration Benefits within Segment F: Significant benefits for tidal marsh species such as the California clapper rail, black rail, and salt marsh harvest mouse, could be achieved in this segment. Restoring tidal marsh also would improve nursery habitat for salmon, steelhead, starry flounder, Dungeness crab, and other aquatic species. Restoring tidal marsh/upland transitions would improve conditions for rare high marsh and ecotonal plant species."

The Marin Audubon Society's Bahia Tidal Marsh Restoration project team has made an apparent attempt to incorporate these opportunities and unique benefits into their early conceptual designs. The proposed project is consistent with the recommendations of the *Baylands Ecosystem Habitat Goals Report*.

b. Issues Addressed by the Review Team, Discussion and Findings:

The Design Review Team providing feedback on all questions posed. That feedback is provided in aggregate, following General Comments, below, provided by the members of the Design Review Team.

General Comments:

Comments shared at the July 14, 2003 Design Review Group meeting from Marin-Sonoma Mosquito and Vector Control District staff: Chuck Krause said to ensure water keeps moving through the site. Ron Keith said the seasonal wetlands in the RV area are less preferable. Chuck noted if Mahoney Spit is not incorporated into the design, than that could leave the Vector Control District with an access problem. Chuck suggested the team factor in the ability to establish circulation patterns on the site at the front end of project scoping.

Stuart Siegel suggested the team not be hesitant about enlarging Black John Slough and channels through marsh along the edges of Black John Slough, (if the intention is to establish tidal connectivity off of the slough) and discouraged overly relying on natural scour to widen the channels through this marsh. (Chuck Krause of Marin-Sonoma Mosquito and Vector Control District also felt it would be beneficial for circulation and for controlling mosquito populations by enlarging Black John Slough and the connector or boating access channel.)

Roger Leventhal brought up concerns that any connector channel through Black John Slough be large enough, even if dredging is required, to provide sufficient tidal prism to the project. Especially since this is an area of high natural sedimentation which will tend to close off channels unless sufficient tidal prism can be maintained. Also, that a tidal inlet to the west through Rush Creek be evaluated.

Josh Collins felt that one design objective should be to get the greatest amount of tidal action into the site as possible with the least amount of dredging and disruption of existing marsh and channel habitat. He noted that the connector channel tends to fill with sediment because it is much too large for the intertidal area that it services, and it is very near the large sediment supply that attends the Petaluma River. Since this channel needs to exist for boating, it needs to be dredged. By using it as the tidal source for the marsh project, it gets a larger tidal prism and thus needs less dredging over time, the project gets direct access to the sediment supply needed to create and sustain the marsh, and there is less stress on Black John Slough to serve as the tidal source, and thus less of the existing marsh along the Slough would be eroded. Josh noted that while there are many possible breach sites, only two meet this design objective. Josh suggested two breaches could be used, with a smaller one on Black John Slough at the far west end of the project to serve the West parcel and a larger one on the connector channel at the southwest end of the project to serve the Central parcel. The internal marsh design could accommodate a drainage divide, which might eventually have a drainage divide panne, between the two parcels. He noted that attention would need to be paid to the internal levees or berms and ditches that might either be accommodated into the

marsh design because they are consistent with the maximum tidal action achievable, or because they help separate one breach system from another, or removed because they don't help in these ways.

Phil Lebednik suggested considering the location of the historical channels when planning the channel locations for the tidal restoration. Phil noted that the project should emphasize the critical habitat requirements of the clapper rail and minimize the potential for predation. The Suisun and San Pablo Bay regions are somewhat unique in that clapper rails are known to inhabit brackish marshes in these regions, whereas they generally occur in more saline tidal marshes elsewhere in the Bay (USFWS 2003). The clapper rail utilizes a wide range of habitats from tidal mudflats up to and including the upland transition; however, of these habitats, two are particularly important to population maintenance: mudflats along sloughs and dense vegetation that is not completely inundated by high tides (Albertson 2000, USFWS 1984, 2003, Zembal 1982). Mudflats along sloughs are the predominant feeding habitat for rails; therefore, the project design should emphasize extensive slough and channel development with extensive intertidal mudflat creation. A large portion of this type of habitat will support a large and healthy population of clapper rails. If possible, dense vegetation should be developed immediately adjacent to the mudflats to provide cover for feeding rails. Dense cover near feeding habitat will reduce predation by avian predators. Because adult rails are subject to predation by terrestrial mammals such as foxes, the project should minimize the potential pathways of terrestrial predators into the preferred habitats of the rails in the marsh. In particular, the design should eliminate any areas contiguous with the upland transition that would not be inundated by most high tides. Nesting occurs preferentially in dense vegetation; however, nests must be located above the highest tide level. Egg predation by rats and other predators is a significant population factor. Accordingly, suitable nesting habitat should be created by establishing relatively higher areas in the mid- and outer marsh such that the sediment, but not the entire vegetation is inundated by most high tides. This will reduce the frequency of egg predation by terrestrial predators. The overall plan for the marsh should take into account the clapper rail's territorial size and channel location and distribute suitable habitats accordingly.

Phil also noted that, if there were methylation going on at the site, there could be higher mercury concentrations in invertebrates, which could lead to bioaccumulation in rails. USFWS 2003 indicated that mercury accumulation in eggs may be the most significant contaminant problem for this species because this chemical is extremely toxic to bird embryos. The project proponents indicated that the marsh was diked prior to estuary contamination by hydraulic mining, and therefore, mercury concentrations should not be elevated in the marsh sediments. Opening this marsh to tidal flows could result in the introduction of mercury-laden sediments into the marsh. Therefore, the project proponents should incorporate a mercury control plan into the project. This plan should include steps to minimize the potential for mercury contamination and a monitoring program to document mercury concentrations over time. This project represents an ideal "experiment" to assess movement of mercury and the effects of varying mercury concentrations on marsh biota that could have applicability to the entire Bay ecosystem; therefore, the proponents should consider obtaining funding to conduct studies and/or facilitating studies by others on these topics in the marsh before, during and after restoration. It is particularly critical

that data on mercury in sediment and biota are obtained in the marsh prior to any levee breaching to establish pre-breach conditions.

Josh Collins noted Mark M. Marvin-DiPasquale (mmarvin@usgs.gov) is conducting research on MeHg production in tidal marshes of South Bay, and that Don Yee (Don@sfei.org) has submitted a proposal with Mark and others at CALFED request to further these studies. Josh noted there is uncertainty on whether or not tidal marshes are sinks or sources of MeHg, and if they're sources, what parts or areas (or design features) within a marsh actually are a problem

Laura Hanson recommended a rare and endangered plant survey be done prior to project construction, given the large size of the seasonal wetlands at the site. She noted there is soft bird's beak in Petaluma Marsh and in Point Edith marsh complex. She also recommended the project team plan to control for *Lepidium latifolium* and noted spraying is the most effective method.

Stuart Siegel recommended the DRG review the proposed work plan for the project before data collection begins. He offered data to the team, such as tidal datums and suspended sediment data from Carl's Marsh; he added the group should define how the data would get used before collecting it.

Stuart also provided the following comments:

Design Ideas

Make every effort to include Mahoney Spur owned by the State Lands Commission. Addition of this parcel offers three benefits. First, it increases project size and thus associated ecological benefits. Second, since this parcel is located much closer to Black John Slough it offers a design option for creating a levee breach through a comparatively small amount of outboard tidal marsh. Third, mosquito abatement noted that excluding it creates an access problem as it is currently accessed via levees on the project site that are likely to be lowered and/or breached.

Levee breach numbers and locations and tidal access to the site. There are four logical places for levee breaches into the project site each of which varies in its conditions outside the levee and its overall feasibility. Distinct design alternatives should consist of various combinations of one or more of these options. Breaches could occur in the following locations with the described issues:

East via the Bahia tidal lagoon access channel. Would scour some of the recently-formed low tidal marsh in the access channel and such scour should be relatively easy due to it being recent low marsh. Potential for large breach close to Petaluma River and its abundant sediment source for natural accretion. Would reduce future dredging needs of lower access channel to Bahia HOA-proposed boat lock. Josh Collins agreed.

Northeast via Mahoney Spur if incorporated. Would require dredging through the least width of outboard marsh along the main reach of Black John Slough. Would be fairly close to Petaluma River sediment supply. Josh Collins disagreed and noted he felt it is not far enough from the other 1st good choice, it would involve more marsh loss than necessary, and depends on getting land not now in the project.

North via central reach along Black John Slough at meandering channel. There exists a distinct meandering channel through outboard tidal marsh along Black John Slough roughly in the middle of the site. Historical data shown at the DRG meeting indicate this channel formerly connected to extant channels on the project site and thus would offer a reconnection of portions of the historic channel network. Would require the greatest amount of dredging through the outboard marsh to provide unrestricted tidal exchange to the site. Again, Josh Collins felt it is not far enough from the other 1st good choice and involves more marsh loss than necessary.

West via upper end of Black John Slough near Rush Creek tide gates. Black John Slough is tidal west to the tide gates that serve Rush Creek and Cemetery Marsh. There is a small section of levee at the west end of the site at this location that could accommodate a breach. Issues to address would be extent of tidal exchange and sediment supply at this upper end of Black John Slough. Open question whether would want or need to widen Black John Slough mechanically to increase tidal exchange, or conversely whether such a breach would have insufficient tidal flows and silt in. Josh Collins agreed and proposed the breach be sized to minimize mechanical widening of the Slough, in part by pushing the internal drainage divide to the west, such that this breach serves much less of the project than the breach on the connector channel.

Discourage interim water control structures. The idea to include an interim water level management option (some form of a tide gate) to protect SMHM immediately post construction appears unsupported. CDFG (Larry Wyckoff), which now owns the site, expressed his preference that no control structures be included unnecessarily due to expense of maintenance and operation. The results of the SMHM discussion at the meeting indicated that such interim measures would not be needed, pending USFWS input.

Planning Suggestions

DRG review of data collection work plans prior to start of work. Given the size of the site and the design options available, it may be of benefit to the project team to have the DRG review work plans prior to data collection. DRG review would examine the relationship between application of newly collected data and the

nature of that data (extent, resolution, need, etc.) as well as identify possible data gaps.

Type of topographic data. Josh Collins suggested that aerial photogrammetry topographic data could be augmented or partially replaced by field topographic surveys, and I would second his recommendation. The issue to identify is data resolution needs for planning and baseline characterization at different scales. Aerial photogrammetry can cover large areas easily yet its vertical uncertainty is increased by vegetation, which is present over much of the site. Field surveying can greatly reduce vertical uncertainty and could be effective here in targeted locations where accurate data is more essential, such as along the site perimeter. The eastern peninsulas likely lend themselves well to photogrammetric data and since they will be graded it is important to be able to calculate volumes accurately. The costs and benefits of each method should be considered prior to collecting new data. Josh Collins agreed with this point.

Ensure all new site topographic data uses the NAVD 88 datum. As all new topographic data will be collected for planning purposes, this project has the opportunity to use the modern NGS datum from its inception. All topographic data should make clear its datum. (Josh Collins added the translation between NAVD 88 and the tidal datums, such as Mean High Water, should be locally derived. If possible, at least one tide gage should be run for at least six months between the connector channel and Black John Slough to reckon the local high tide datum. Instead, if the datum is transferred from another nearby project, such as Carl's Marsh, then the transferal should involve an analysis of corresponding slack high water levels between the two sites. Also, the surveyors need to report the location and all supporting documentation for their benchmarks (exact locations, dates of creation, dates of re-occupations, material used, depth inserted, responsible agency or person, identifying markings, data to support the integrity of the marks (that they haven't moved), elevation survey points, and closure (total vertical error) of the elevation surveys).

Coverage of aerial photography and photogrammetry. Need to ensure that new data covers project site plus Bahia peninsulas plus Mahoney Spur.

Channel cross sections in Black John Slough. Topographic cross sections should be acquired at the mouth and upper ends of Black John Slough and at a few locations in between, so as to characterize the tidal exchange potential of this slough. Vegetation descriptions should be included in the cross sections to help evaluate natural scour potential. Josh Collins noted all cross-sections must be tied to the same vertical datum.

Channel cross sections in Bahia access channel. Topographic cross sections should be acquired at the mouth and upper ends of this access channel for same purpose as above.

Data available for use by project. A few data sets exist that may be of great benefit to the project. I have and would share three data sets collected in the mid to late 1990's: tidal datum data for the Petaluma River Bridge NOS station and Carl's Marsh, suspended sediment data from Carl's Marsh, and possibly tidal datum data for the upper end of Black John Slough as part of MAS enhancement efforts at Rush Creek a few years ago (don't recall details of these data). The tidal datums would need to be updated to reflect the new tidal epoch that NOS recently implemented. USGS has suspended sediment data for the Petaluma River from the late 1990s.

- i. What are possible designs for the East Bahia site in the event the Bahia Homeowners' Association (BHA) is able to build the lock dredge project? How should the project be designed if the lock/dredge project is not build and we are successful in purchasing the adjacent property?

Members of the Design Review Team did not comment on this at this time due to prevailing uncertainty around this design feature. With the development of the project and its design, this question could be brought back to the DRG in the future.

- ii. What design and/or design phasing would be most protective of the salt marsh harvest mice populations?

Phil Lebednik suggested the team might consider more mouse habitat towards the oak woodlands with isolated areas away from the edges, toward Black John Slough. Josh Collins suggested taking some fill and spreading it along the upland edges, which would augment what was done historically during dredged material deposition and provide refuge for mice. Stuart suggested using the areas of highest elevation and enlarging/raising up those first.

Stuart Siegel suggested accommodating salt marsh harvest mouse immediately post construction. MAS will want to meet with USFWS endangered species staff at their earliest opportunity to obtain input. From the discussion that took place during the 14 July 2003 DRG meeting about current site conditions and population presence, it appears that the appropriate general strategy for the interim period between restoring tidal action and evolution of suitable habitat on the site is along the lines as follows. The objective is to provide refuge habitat for SMHM when the site is flooded so that existing populations have escape ground from which they can ultimately reach alternate habitat. This alternate habitat exists on immediately adjacent tidal marsh. Meeting this objective can be accomplished by creating vegetated high ground at various locations around the site perimeter and interior. Elevations can be roughly 0.5-1ft above local MHHW (reference Carl's Marsh outboard restored levee) with vegetation consisting of typical high marsh transitional species that offer refuge from extreme high tides (e.g., *Grindelia*, *Baccharis*, *Salicornia*, etc.). These areas can

be provided easily along the southern oak woodland edge, along lowered northern and eastern levees, and along portions of existing interior features (interior levees, etc.) that can be graded to target elevations. Lower-gradient slopes (roughly >4:1) provide for larger amounts of such habitat.

Josh Collins noted, if there is a need to prevent any temporal hiatus in SMHM habitat, one breach could be opened at a time, with the second only happening after the first produces habitat. Also, if dredged sediment is to be used, or if onsite sediment from breaches or levees is to be rearranged, then diked salt marsh can be created at sustainable tidal marsh elevations before the breaches are opened (i.e., get the pickleweed plant community happening at high marsh elevations before the tides are let in – this will require careful irrigation and drainage to prevent/control mosquito production under the diked condition).

Josh added reuse of sediment should probably focus on creation of the internal drainage divide and lateral extension of the upland/marsh ecotones. This ecotone is narrow now and historically because the upland topography is rather steep. Using available sediment to widen the ecotone has an advantage of giving the SMHM refuge (plus the refuge habitat is relatively easy to create), and it provides the ecotonal habitats for other species that are generally rare or uncommon in the region (note that the Goals Project calls for more restoration of upland transition because of its scarcity).

To minimize the expense and work of removing unwanted levees, the project might consider digging a few broad cuts across them and leaving the remainders in place. The cuts should be wide enough, and should occur close enough to both ends of the selected levees to discourage the transgressions of upland predators, especially red fox, skunk, raccoons.

With regards to Clapper Rails, Roger Leventhal pointed out that the tidal channel network is an important aspect of clapper rail habitat. Since much of the site appears to be relatively low in elevation (according to figure 5), low marsh habitat may be the dominant habitat type until natural sedimentation raises site grades or fill is brought in which is expensive.

- iii. Should the seasonal wetlands on the dredged material fill area parcel be converted to tidal marsh or retained as seasonal habitat features and enhanced?

Josh Collins suggested that, although the project description recognizes the unusual setting adjacent to blue oak woodlands, there is little in the design that relates specifically to this setting. He suggests that the project might not only increase its emphasis on lateral expansion of the upland ecotones, but also enhance the seep, slope, and depressional freshwater wetlands adjacent to the planned tidal marsh. A major attribute of the historical upland transition zone in this part of the region, and something recognized in the

Goal Project, was seasonal and perennial freshwater habitats that were botanically rich and that also served as breeding habitats for amphibians, including frogs, toads, newts, and salamanders that functionally link the oak woodlands to the wetlands. The potential to benefit the ecology of freshwater wetlands, tidal wetlands, oak woodlands, and the ecotones between them may be the most important design consideration for this project.

- iv. Should the 5-acre pond (formerly known as Tract 1) and the approximately 1-acre pond (formerly known as Tract 8) be retained?

Stuart Siegel suggested examining the potential to retain freshwater seasonal marsh along oak woodland edge. The oak woodland-wetland edge at this location is relatively steep, like at China Camp. Past filling of at least one of the coves along this interface has altered the historical condition and could provide an opportunity to support some freshwater seasonal wetland. These wetlands could benefit amphibians (e.g., red-legged frog, tiger salamander) and other species though they may create mosquito abatement concerns. Water source would be rainfall, watershed runoff and perhaps groundwater discharge.

- v. What is the most beneficial method for placement the material excavated from the peninsulas (formerly known as Tracts 2, 3 and 4) to the West and Central Bahia parcels in the most beneficial marsh design and to minimize impacts to the salt marsh harvest mouse?

See responses to ii., above.

- c. Issues Not Addressed by the Review Team and Rationale:

The Design Review Team provided feedback on all questions posed in the completed Project Summary form and during the project presentation, with the exception of i., above. Feedback was not provided on i., above, due to current uncertainty about the configuration of the Bahia Homeowners' Association lock project.

- d. Phasing and Coordination:

- e. Other issues:

5. Disclaimers:

- a. The recommendations of the Restoration Program are not binding on any permitting agency and they will not restrict any agency's authority.
- b. The Wetlands Restoration Program's Design Review Group makes every effort to provide guidance; we cannot guarantee issuance of permits by any regulatory agency.

- c. The Wetlands Restoration Program's Design Review Group is intended to provide comments and feedback on plans and designs. This assistance will necessarily be limited, and should not be expected to substitute for professionally prepared site evaluations, hydrological studies, final designs, and construction plans.
- d. The Restoration Program and the participating agencies will not be liable for the failure of any project.
- e. Project review by the Design Review Group does not constitute an endorsement of the project by the Design Review Group or by the Wetlands Restoration Program.

6. References

Albertson, J. D. 2000. California Clapper Rail (*Rallus longirostris obsoletus*) pp. 332-340 in: Olofson, P. R., and Jules G. Evens (eds.) (Goals Project), Baylands ecosystem species and community profiles: life histories and environmental requirements of key plants, fish and wildlife. SFB RWQCB, Oakland, CA. xvi+407 pp.

U. S. Fish and Wildlife Service 1984. Salt marsh harvest mouse and clapper rail recovery plan. Portland, OR. U. S. Fish and Wildlife Service. 141 pp.

U. S. Fish and Wildlife Service 2003. California clapper rail.
http://sacramento.fws.gov/es/animal_spp_acct/clapper_rail.htm (accessed 7/24/03).

Zemba, R. 1982. Habitat considerations for light-footed clapper rails in marsh design. pp. 103-104, in: Josselyn, M., and Massey, B. W. (eds.) Wetland restoration and enhancement in California. Calif. Sea Grant Coll. Prog., Univ. Calif. La Jolla, CA. 110 pp.

ATTACHMENT A
PROJECT DESCRIPTION

i. Project objectives:

The project objectives are to restore the maximum acreage of tidal marsh habitat, including upland refuge, to restore habitat for endangered clapper rail, other special status species and migratory species at Bahia. Planning also includes the retention of a five-acre pond and 2-acre pond.

Two tidal marsh restoration projects will be designed and implemented:

1. Restoration of an approximately 330 acres of diked baylands (Tracts 6 through 9*) that will be owned by the California Department of Fish and Game.
2. Restoration of 20 to 45 acres of tidal marsh on 60 acres (Tracts 1 through 5*) owned by the Marin Audubon Society.

This section of the North Bay is an ideal for tidal marsh restoration because it currently supports the largest population of endangered Clapper Rails in the North Bay. Clapper Rails are declining in all other North Bay locations (Jules Evens). The lower Petaluma River is also habitat for Salt Marsh Harvest Mouse, Steelhead, Sacramento Splittail, and Delta Smelt. It is also well used by Migratory waterfowl and shorebirds.

There is a large population of Salt Marsh Harvest Mice on the 330-acre diked bayland (Tract 6) which would need to be considered in planning the restoration. Measures will need to be taken to ensure they are not drowned as tidal waters are introduced to the site.

ii. Project location and map:

The Project Site is located on the west side of the Petaluma River, south of Black John Slough, and north of the Bahia neighborhood on the east side of the city of Novato, in Marin County. See attached map, Figure 1, below.

INSERT HARD COPY OF FIGURE 1, Regional and Project Location (pdf file)

iii. Type and acreage of habitats to be created or restored:

Marin Audubon Society (MAS) purchased the property - a total of 645 acres - in January 2003. Since then, it has been divided into different ownerships, with 330 acres to be restored to tidal marsh and managed by CDFG, 208 acres of oak woodlands to be managed by the Marin County Open Space District, and Marin Audubon Society retaining 20 to 45 acres of tidal marsh on 60 acres area to be restored to tidal wetlands. Approximately 215 acres are Blue Oak-dominated wooded hillsides and the remainder either seasonal wetlands either behind dikes or on filled baylands, and adjacent upland habitats. Currently, the site includes 350 acres of seasonal wetlands (diked baylands), which includes a 100' upland buffer; the former RV gravel parking lot has been vacated.

In order to raise the elevations of the site, fill will be imported from the East Bahia site to the West and Central parcels. Then, the levees will be lowered or breached to achieve tidal inundation and natural sedimentation will be relied upon to further raise the site elevations. Fill removed from the East parcel will allow a lowering of the peninsulas' elevations to tidal marsh level; however, the Homeowners' Association owns the lagoon and that will require close coordination between MAS and BHA.

iv. Past use and current condition of the site:

The tidal marsh restoration site has been diked off from tidal action for over 100 years and the lands were used for agriculture. The West and Central diked parcels have been pumped dry every year until this year, since the pump broke and fell into the channel. The standing water on the site is believed to be ponded rainwater; these sites have experienced a good deal of subsidence over the past 100+ years.

v. Description of any special features or issues:

a) Public access

Existing trails run along the edge of the proposed tidal marsh restoration site and buffers are included in the project in order to avoid flooding of the trails. No new trails are proposed as part of the project.

b) Flood control

Flood control is not an issue under consideration in this project.

c) Subsidence

The proposed project sites have experienced varying subsidence on the site for approximately 40 years.

d) Mitigation

Mitigation is not a component of the proposed project.

e) Other adjacent/nearby projects

The Bahia Homeowners' Association (BHA) project (that is planning to mitigate at the Twin House Ranch parcel) would result in the direct loss of 17 acres of tidal marsh inhabited by clapper rail. At least three pair inhabit this naturally restored tidal marsh habitat (Evens 2003). The BHA lock/dredge project would dredge the lagoon tidal marsh and convert it to deep-water to accommodate boats. These projects need to be coordinated and Marin Audubon would be willing to consider some other boat access for the homeowners, yet any alternative could compromise some planned restoration.

f) Opportunity for transitional habitats

The project offers the potential for the creation of transitional and upland habitats above tidal marsh elevations.

ATTACHMENT B

COMPLETED PROJECT SUMMARY FORM

PROJECT NAME: Bahia Wetland Restorations

Project Objectives:

The project objectives are to restore the maximum acreage of tidal marsh habitat, including upland refuge, to restore habitat for endangered clapper rail, other special status species and migratory species at Bahia. A five-acre pond and 2-acre pond are also planned to be retained.

Two tidal marsh restoration projects will be designed and implemented:

- (1) Restoration of an approximately 330 acres of diked baylands (Tracts 6 through 9*) that will be owned by the California Department of Fish and Game.
- (2) Restoration of 20 to 45 acres of tidal marsh on 60 acres (Tracts 1 through 5*) owned by the Marin Audubon Society.

Status of Project Planning:

The project is in a preliminary stage of conceptual planning for both restorations. There are no plans developed for either restoration project.

Both sites were just acquired by the Marin Audubon Society (escrow closed on January 16, 2003) and both are currently owned by the Marin Audubon Society pending completion of requirements for the last grants. MAS purchased the property after 20+ years of fighting off development, one and a half years of fund raising. Funding for the \$15.8 million acquisition was obtained from numerous state agencies, the California Coastal Conservancy, Wildlife Conservation Board, from CALFED, Caltrans, federal agencies (NAWCA and NOAA), Marin County and Marin Community Foundation and numerous small foundation, funds and individual donors.

The entire property purchased consists of 631 acres. Title to 361 acres will be transferred to the Department of Fish and Game pending agreement on final wording for an easement by the last funder. Marin Audubon Society is planning to retain ownership, at least for the near future, of 62 acres. The remainder of the property, 208 acres, will be permanently owned by the Marin County Open Space District. Approximately 215 acres are Blue Oak-dominated wooded hillsides and the remainder either seasonal wetlands either behind dikes or on filled baylands, and adjacent upland habitats.

MAS's CALFED grant included funding to acquire the property and restore approximately 330 acres of diked bayland to tidal action. Assumptions that formed the basis of this application were that most of the historic tidal marsh acres would be restored to tidal marsh, including all of the former RV parking lot which was filled. Possible exceptions would be two of the six coves that are formed by the oak-wooded hills extending into the seasonal wetlands. These coves were used as disposal areas for dredged material from the Bahia dredge. The last lagoon dredge occurred in 1987.

A major portion of a small (approximately four acre) cove on the 330-acre wetland has evolved

*See page 4 for explanation of Tracts.

into a fresh water pond (Tract 8) that provides habitat diversity. The second, approximately five acre, cove is well drained and uniformly vegetated with upland and wetland species (Tract 9). This cove could be enhanced as seasonal wetland habitat for diversity or restored to tidal marsh. It is at a higher elevation than the outer diked bayland.

To fund restoration/enhancement of Tracts 1 through 5, MAS has applied for a NAWCA grant. We expect to hear whether or not this grant was approved during the Summer 2003. Assumptions for this restoration were that the maximum amount of fill would be removed to restore the maximum amount of tidal marsh and related high-tide refuge habitat, and that a 5 acre pond (Tract 1) would be retained for diversity and migratory waterfowl habitat. The ultimate project design will be limited by what we must legally provide, based on a preexisting Agreement between the former Bahia property owner and the Bahia HOA (this Agreement runs with the land), and what we can negotiate with the HOA.

MAS has offered to purchase both lagoons and channel from the HOA, but there appears to be no serious interest in selling to us. The receiver, Marshall Levy, has valued the property at an excessive price.

Project site location:

The property is located on the west side of the Petaluma River near its mouth, in the City of Novato, at the end of Bugeai Drive/Bahia Drive and west end of Topaz Street. Further, the site is east of the Rush Creek Open Space Preserve and south of Black John Slough which is major habitat for California Clapper Rail and Black Rail.

The restoration areas are in two separate locations:

(1) Tract 6, the 330-acre diked baylands, is immediately adjacent to the 207 acre Blue-oak woodland and the 5 acre filled former RV parking lot (Tract 7). The baylands are bounded by Black John Slough to the north, the Rush Creek Open Space Preserve wetlands to the west, and to the east, the straight channel and the tidal lagoon owned by the HOA. This is the only known location where Blue Oak woodland interfaces with salt marsh. Dikes were placed around these wetlands about forty years ago to prepare for development. Tracts 8 and 9 are seasonal habitat and are described above.

(2) The 60 acre portion (Tracts 1 through 5) consists of three peninsulas created by placing fill for the purpose of constructing houses. These lands are located at the eastern end of Topaz and are separated from the 330-acre parcel by the tidal channel, owned by Bahia Homeowners Association and the houses of residents. The peninsulas surround the non-tidal lagoon owned by the HOA. The easternmost peninsula (Tract 2) borders the Petaluma River and the western edge of the western peninsula (Tract 4) borders the HOA tidal channel.

Issues:

This section of the North Bay is an ideal for tidal marsh restoration because it currently supports the largest population of endangered Clapper Rails in the North Bay. Clapper Rails are declining in all other North Bay locations (Jules Evens). The lower Petaluma River is also habitat for Salt

Marsh Harvest Mouse, Steelhead, Sacramento Splittail, and Delta Smelt. It is also well used by Migratory waterfowl and shorebirds.

There is a large population of Salt Marsh Harvest Mice on the 330-acre diked bayland (Tract 6) which would need to be considered in planning the restoration. Measures will need to be taken to ensure they are not drowned as tidal waters are introduced to the site.

The Bahia HOA project (that is planning to mitigate at the Twin House Ranch parcel) would result in the direct loss of 17 acres of tidal marsh inhabited by clapper rail. At least three pair inhabit this naturally restored tidal marsh habitat (Evens 2003). The Bahia HOA lock/dredge project would dredge the lagoon tidal marsh and convert it to deep-water to accommodate boats

Issues on 330 Acre parcel (Tracts 6 through 9):

- the HOA lock/.dredge project proposes to construct an access road extending through the former RV parking lot (Tract 7), owned by MAS, and connect it to the access road across Tract 4 to the lock. This would restrict our ability to restore this entire area to tidal marsh and upland refuge habitat. We would also have to deal with the ongoing impacts of access. This roadway is proposed to extend through Tract 4 to the lock to provide access for construction and maintenance.
- protection of the population of Salt Marsh Harvest Mice. We are considering placing temporary tide gates to allow tidal waters to be gradually introduced so the population is not destroyed with tidal inundation.
- the reuse of material excavated from Tracts 2, 3 and 4 to assist with raising the elevation of the diked baylands. Should this material be used? If so, it should be placed so as to speed restoration of tidal marsh and to minimize impacts to harvest mice.
- enlarging one or more of the outboard channels to allow tidal waters to enter the 330 acres.
- integration with Mahoney Spur.

MAS ability to restore Tracts 2 and 4 would be severely constrained by the proposed lock/dredge project. Issues on the 60 acres:

- The HOA project will restrict the restoration options available to MAS because we would need to take actions to ensure their lagoon remains. The acreage of wetlands and uplands habitat MAS can restore will be reduced by the features proposed by the HOA project:
- To provide a levee at Tract 2, on the eastern side of the enclosed lagoon, the HOA proposed that the existing levee be raised to +8 feet which would require fill in a diked wetland.
- Filling to raise a section of Tract 4, the western peninsula, to allow access to manage the lock. This access road is proposed to be 12 feet wide and 2 foot higher than existing grade.
- Habitat degradation by the presence of walkers and boaters extending into the marsh.
- Impact of boat use, including boats landing on our habitat, including erosion caused by boat wakes, and walkers access the remnants of Tracts 2, 3 and 4.

This section of the North Bay will benefit from the subsequent restoration of tidal marsh. Because of the MAS purchase the property, there is no longer a threat of development, the site will remain free of degraded water quality and there are no flooding constraints. Our purchase will permanently protect the 330 acre diked wetland. This is an opportunity to restore a tidal marsh blue oak woodland landscape that is unique in the world. The MAS will protect forever

for passive recreation uses and wildlife habitat these important lands

MAS has offered to purchase the HOA property as an alternative that would benefit the homeowners and not destroy significant habitat. However, whether this is a viable option is uncertain.

Questions:

- What are possible designs for the Tracts 2 and 4 in the event the HOA is able to build the lock dredge project? How can a restoration project be designed on the 60 acre parcel that will have no or minimal impact on our goals and property if the HOA can build their project? How should the project be designed if the lock/dredge project is not build and we are successful in purchasing the adjacent property?
- What design would be most protective of the SMHM that inhabit Tract 6?
- Should the seasonal wetlands on Tracts 9 acre parcel be converted to tidal marsh or retained as seasonal habitat features and enhanced? Would restoration offer a significant habitat benefit?
- Should the 5-acre pond (Tract 1) and the approximately 1-acre pond (Tract 8) be retained?
- What method should be used to place the material excavated from the peninsulas (Tracts 2, 3 and 4) onto Tract 6 result in the most beneficial marsh design and to minimize impacts to the SMHM? Removing the material offsite would be extremely expensive.

Explanation of Tracts:

Tract 1 - 5 acre pond

Tract 2 - western peninsula consisting of a low levee surrounding low-lying filled area

Tract 3 - inner peninsula also consisting of a levee surrounding a lower filled area

Tract 4 - filled peninsula on which shallow ponded seasonal wetlands have developed

Tract 5 - historic area of upland and fill on which upland refugia, transition area and public access areas will be created

Tract 6 - 330 acre diked historic bayland

Tract 7 - former RV parking lot consisting of filled land covered with gravel

Tract 8 - small cove, historic dredge disposal area on which an approximately one-acre fresh water pond has developed

Tract 9 - cove/seasonal wetland with no ponding; most recently used (1987) for disposing of dredged material.

**SAN FRANCISCO BAY AREA WETLANDS RESTORATION PROGRAM
DESIGN REVIEW GROUP**

CONFLICT OF INTEREST STATEMENT

The San Francisco Bay Area Wetlands Restoration Program Design Review Group (the Group) attempts to have those reviewers who participate as members of the Group avoid any conflict of interest. Conflict of interest, as it relates to the Group, is distinguished into two categories: financial and personal/institutional. The two distinct types of conflict of interest warrant two distinct courses of action of the part of each Group member. All those members having a *financial* conflict of interest with a project will NOT be allowed to evaluate proposals for which they have a financial connection and/or provide guidance and comment on that project, without exception. However, those Group members having a *personal/institutional* conflict of interest are required only to disclose any relationship, yet are not disallowed from project review and comment.

Regardless of the type of conflict of interest, each Group member has the personal obligation to avoid a conflict as well as the personal obligation to disclose any such conflict, whether real or apparent, to the Group as a whole.

Financial Conflict of Interest. The Wetlands Restoration Program expects that Group members will not review proposals in whose development they have assisted or if they would receive a financial benefit from the funded project. A conflict of interest would be considered to exist whenever a member of the Group **or** a relative of a Group member (including, for instance, a spouse, sibling, parent or child) has a personal, material, or financial interest in a transaction or project under consideration by the Group.

Personal/Institutional Conflict of Interest. If a Group member has a personal or institutional connection with a project sponsor in any way, but there is no conflict of interest, the member will be allowed to participate in the project review provided that any connection is disclosed prior to project review. A personal connection with a project sponsor is considered worthy of disclosure if any of the following relationships were applicable during the **past four years**: collaboration on research, pilot, or implementation proposal or project; co-authorship; thesis or postdoctoral advisorship; and/or supervisor/employee relationship. An institutional connection – such as between employers and their employees – will be considered worthy of disclosure. For example, an employee of a state or federal agency is considered to have an institutional connection with a proposal submitted by that agency, even if the project sponsor is in a different division of the agency than the reviewing Group member. Similarly, a university faculty member is considered to have an institutional connection with a proposal submitted by that university, even if the applicant is in a different department of that university campus.

To avoid any problems with conflict of interest or appearance of bias, scientific and technical reviewers are expected to review proposals independently and without delegating the review task in whole or in part to any other person. Any efforts to delegate review will be considered a conflict of interest. If you are uncertain about a potential conflict of interest, please contact John Brosnan at (510) 622-5048.