Building a healthy and sustainable global community for people
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October 18, 2013

Planning Department
ATTN: Sarah B. Jones
San Francisco Planning Commission
1650 Mission Street, Suite 400
San Francisco, CA 94103

RE: Case No. 2012.1427E. APPEAL OF THE MITIGATED NEGATIVE DECLARATION FOR THE SAN FRANCISCO RECREATION AND PARK DEPARTMENT'S PROPOSED "SHARP PARK PUMPHOUSE SAFETY AND INFRASTRUCTURE IMPROVEMENT PROJECT"

Dear Ms. Jones:

The letter constitutes the Wild Equity Institute's appeal of the Preliminary Mitigated Negative Declaration ("PMND") the Planning Department intends to adopt for the Sharp Park Pumphouse Safety and Infrastructure Improvement Project ("Pumphouse Project"), Case No. 2012.14727E. We also attach and incorporate by reference our comments on the Pumphouse Project which we submitted to the Planning Department on January 29, 2013, and which I observed in the Planning Department's case file for this project on October 10, 2013.

Preeminent herpetologists, coastal ecologists, and hydrologists have reviewed the revisions and mitigation measures announced in the PMND. Below you will find the facts, reasonable assumptions predicated upon those facts, and expert opinions that explain how, even as revised and mitigated, the Pumphouse Project will cause significant adverse effects on the threatened California red-legged frog (*Rana draytonii*), the endangered San Francisco gartersnake (*Thamnophis sirtalis tetrataenia*), and Sharp Park's hydrology and water quality.

This evidence makes clear that there is, at the very least, a fair argument that the Pumphouse Project may have a significant effect on the environment—which in turn requires the Department to prepare an Environmental Impact Report ("EIR") before approving the project. Cal. Pub. Res. Code § 21151; *Sierra Club v. County of Sonoma*, 6 Cal. App. 4th 1307, 1316 (1992) ("Section 21151 creates a low threshold requirement for initial preparation of an EIR and reflects a preference for resolving doubts in favor of environmental review when the question is whether any such review is warranted. [citations] For example, if there is a disagreement among experts over the significance of an effect, the agency is to treat the effect as significant and prepare an EIR."). An EIR is particularly important here, because there are feasible alternatives to the proposed project that would reduce or avoid the Pumphouse Project's significant environmental effects: and only an EIR can provide the Department with the analytical framework necessary to consider alternatives to the proposed project.

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I. BY EXCLUDING PUMPHOUSE OPERATIONS FROM THE PROJECT DESCRIPTION THE DEPARTMENT HAS FAILED TO CONSIDER AND MITIGATE SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PUMPHOUSE PROJECT.

An accurate project description is an indispensible element of informed and legally sufficient environmental review processes under CEQA. *Cnty. of Inyo v. City of Los Angeles*, 71 Cal. App. 3d 185, 193, (Ct. App. 1977) (Calling an accurate project description the "*sine qua non*" of CEQA review). The PMND's project description, however, has failed to include the Pumphouse Project's key objective: to operate the pumphouse more extensively than it has ever been operated before. This increase in pumphouse operations is likely to have significant, adverse consequences on Sharp Park's threatened and endangered species, its water quality, and its hydrology. Because these significant effects exist, the Department must conduct an EIR to make an informed decision about the Pumphouse Project.

A. THE PUMPHOUSE PROJECT'S PRIMARY PURPOSE IS TO INCREASE PUMPHOUSE OPERATIONS, YET THE EFFECTS OF PUMPHOUSE OPERATIONS HAVE BEEN EXCLUDED FROM ENVIRONMENTAL REVIEW.

The Pumphouse Project's record reveals that expanding pumping operations is the very purpose of the project. For example, the project description explains "*operation* of the flood control pump system is necessary to manage floodwaters both on Sharp Park and adjacent properties." PMND, p. 4 (emphasis added). It then explains that "[t]wo factors *adversely affect the operation of the pumps*. First, *pump operation is impaired* by sediment buildup and vegetation growth around the pump intake structure and along the connecting channel between [Horse Stable Pond and Laguna Salada]. Second, *pump operation is impaired* by the buildup of vegetation on the pump intake screens." *Id.* (emphasis added). The PMND then describes what the Pumphouse Project will do to expand pump operations: "[s]ediment and emergent vegetation, including cattails (*Typha angustifolia*) and bulrush (*Scirpus americanus*), near the existing pumphouse *would be removed in order to reduce obstructions to water flow into the pump intake structure. . . .*" PMND, p. 6 (emphasis added); *see also id*. (A primary purpose of the Pumphouse Project is to "remove impediments to water flow within the wetland complex.").

A logical consequence of accelerating water flow to the pumphouse is that pumphouse operations will expand. But the PMND does not consider the effects of expanded pumphouse operations, because the Department expressly excludes all pumphouse operations from the project description:

> Although ongoing golf course operations, such as pump management and operation, mowing, and golf cart use, are discussed in the Biological Opinion, *these ongoing operations and maintenance activities are not considered part of the proposed project for purposes of this CEQA analysis, but rather are considered part of the existing, or baseline, conditions. No changes to golf course operations and maintenance, including operations of the pumps, are proposed as part of this project.*

PMND, p. 9 (emphasis added). Yet the project sponsor, San Francisco's Recreation and Park Department ("SFRPD"), has consistently acknowledged that the Pumphouse Project will in fact result in enhanced pumphouse operations. Specifically, SFRPD has acknowledged that (1) the wetland complex's aquatic vegetation moderates the flow of water from Laguna Salada to the pumphouse[1, 2], and (2) if the aquatic vegetation was removed the pumphouse would drain more of the wetland complex, and at faster rates. For example, in a recent deposition John Ascariz, the Recreation and Park Department's Station Engineer for the pumphouse, explained that the Laguna Salada wetland complex moderates pumphouse operations at Sharp Park, and that pumphouse operations would increase if aquatic vegetation were removed from the system:

> Q. So I guess one thing I'm still trying to understand, if we can, is how the growth of the tules over time is impacting that number?
>
> A. To not let the water come into the pump station.
>
> Q. It's keeping the water out of the pump station?
>
> A. Keeping it way up above. All those tules is keeping like a dam and keeping all that water all up in the golf course instead of letting it flow down. You were saying through that channel creek is all grown where it's stopping the water from draining to our pump station.
>
> Q. It's your understanding that at some point the pump is no longer draining the golf course; is that right?
>
> A. Very slow.
>
> . . .
>
> Q. Do you recall seeing the golf course flooded last winter?

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[1] Letter from Sean Sweeney, Recreation and Park Department Golf Program Director, to Chris Nagano,

[2] The project description in the Pumphouse Project's Biological Opinion—which "was provided by SFPRD in the *Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project Biological Assessment"* and upon which the PMND heavily relies—also recognizes that the Laguna Salada wetland complex moderates pumphouse operations:

> California red-legged frog breeding and deposition of egg masses coincide with winter storm events (Storer 1925, Service 2002) which cause water levels to rise in Horse Stable Pond, Laguna Salada, and surrounding wetlands (SFRPD 2012). Although water levels may be lowered in advance of winter storms to provide additional water storage capacity, the pumps are not able to *instantaneously lower water levels throughout the site as storm water runoff accumulates from the surrounding watershed* (Geomatrix 1987; Kamman Hydrology and Engineering, Inc. 2009; Hayes 2012).

U.S. Fish and Wildlife Service (USFWS). Formal Endangered Species Consultation on the Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project in San Mateo County, California. 08ESMF00-2012-F-0082-2. October 2, 2012. p. 33 (emphasis added).

A. Yes.

Q. And why did it flood if you had the pump set at this low level?

A. Because all the tules.

MR. CLEMENTS: Objection. It's an incomplete hypothetical. It's vague. You can answer.

THE WITNESS: Because the tules are growing and stopping our water from coming to the pumps. Then it floods all out. It's holding the water all out at the golf course instead of letting it come to our pumps for we can pump it out.

. . .

Q. Again, as best you understand from your experience, if the tules were removed, then the pumps would be able to get the water out more efficiently; is that right?

A. Yes.

Q. And do you think that you would be able to keep the course from flooding if the tules weren't there?

A. Yes.

Q. Even in a winter like last winter where there was a lot of rain?

MR. CLEMENTS: Objection. Calls for speculation.

MR. CRYSTAL: Q. Based on your experience.

A. Yes. It would do good with the pumps running. It would pump that water out.

Ascariz Dep. pp. 62, 80-81 Dec. 14, 2011. (Exhibit B). Mr. Ascariz's testimony explains how baseline conditions in the Laguna Salada complex moderate the rate and extent of pumphouse operations, and also explains how the activities called for in the Pumphouse Project—dredging sediment and aquatic vegetation from Horse Stable Pond and the connecting channel—will expand pumphouse operations. Thus, the PMND's assumption that the Pumphouse Project will have no effect on the rate and extent of baseline pumping operations is unsupported by the record: indeed, the assumption is flatly contradicted by the project sponsor itself.

B. INCREASING PUMPHOUSE OPERATIONS WILL HAVE SIGNIFICANT ENVIRONMENTAL EFFECTS ON ENDANGERED SPECIES, WATER QUALITY, AND HYDROLOGY.

> When a change occurs in one part of the circuit, many other parts must adjust themselves to it. Change does not necessarily obstruct or divert the flow of energy; evolution is a long series of self-induced changes, the net result of which has been to elaborate the flow mechanism and to lengthen the circuit. Evolutionary changes, however, are usually slow and local. *Man's invention of tools has enabled him to make changes of unprecedented violence, rapidity and scope.*

Aldo Leopold, *A Sand County Almanac* 181 (Oxford University Press 2001) (1949).

The Project Sponsor predicts that the Pumphouse Project will increase the rate water flows to the pumphouse, and keep Laguna Salada hydrologically connected to the pumphouse throughout a greater portion of the year. This will expand pumphouse operations at Sharp Park, which will in turn cause significant environmental effects on a variety of resources that are already stressed by the existing rate and scope of pumphouse operations. Yet none of these effects have been assessed, let alone mitigated, by the Department. This is a violation of CEQA, and the Department must remedy this violation by preparing an EIR for the Pumphouse Project.

1. EXPANDING PUMPHOUSE OPERATIONS WILL HAVE SIGNIFICANT ADVERSE EFFECTS ON THE CALIFORNIA RED-LEGGED FROG.

For two decades, the City has known that its operation and management of Sharp Park Golf Course takes large numbers of California red-legged frogs. For example, in 1992 consultants reported to the City that "pumping of water out of Horse Stable Pond and the resultant exposure of shoreline was causing massive frog egg mass mortality." Exhibit C, p. 24. Nonetheless, the City has continued to drain Sharp Park's wetlands to ameliorate chronic Golf Course flooding. As expected, the City stranded and desiccated numerous California red-legged frog egg masses in subsequent years, with the City's consultants and staff documenting multiple mortality events in 2003, 2004, 2005, and 2008.[3]

Then on January 3, 2012, before the first large rain of the 2011-12 frog breeding season, the City ordered the pump house engineer to reduce the water level at Sharp Park by .5 feet. Exhibit B, p. 36. Once egg-masses were observed, SFRPD attempted to maintain a water level for Horse Stable Pond that will keep the eggs masses submerged in water.

Nonetheless, approximately 47 California red-legged frog egg masses were stranded, fragmented, or otherwise taken at Sharp Park between January 27, 2012, and March 8, 2012 (Campo et al., Summary p. 1-4). This is approximately 1/3 of all egg masses observed at Sharp Park between those dates. Stranded egg masses were observed in nearly all portions of Sharp Park's wetland

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[3] Swaim Biological Incorporated. *Sharp Park Wildlife Surveys and Special Status Reptile and Amphibian Restoration Recommendations*, December 4, 2008, p. 4-4.

features, including the northern and western potions of Horse Stable Pond, and the northern, eastern, and western portions of Laguna Salada.[4]

This level of take alone would present a fair argument of significant environmental affects from the proposed project. Alarmingly, when the Pumphouse Project is implemented regulators believe the City will take *virtually all egg masses* laid at Sharp Park each year that it operates—up to 130 egg masses every winter breeding season, roughly equivalent to the entire number of egg masses laid in the frog's most prolific and fecund breeding seasons.[5]

The Pumphouse Project's extraordinary amount of take is a logical consequence of the increased pumphouse operations the project will cause. Dr. Vance Vredenburg, a world-renowned herpetologist based at San Francisco State University has explained why this is so:

> [The California red-legged frog] has evolved over millions of years towards a strategy of egg-laying that balances water depth, water temperature, predator avoidance, and pond desiccation. The most successful frogs maximize the contrasting pressures of pond desiccation and water temperature. For example female frogs that choose to lay their eggs in deeper water are minimizing risk to desiccation but also exposing eggs to cooler water temperatures, which translate into slower growth and development. Deeper, more permanent water also harbors a more diverse food web which is more likely to contain aquatic egg and tadpole predators. Females that lay eggs in the shallowest water on the margin of ponds are maximizing growth potential (warmer temperatures) and minimizing exposure to aquatic predators, but are also exposing egg masses to higher probability of desiccation. *If the rains continue and the pond does not dry too quickly the strategy pays off and eggs in shallow waster hatch faster, tadpoles grow faster and outcompete other eggs and tadpoles from other frogs laid in deeper water*.
>
> *Ponds fill and dry seasonally and although it can seem rather dramatic from wet to dry years, the change over the course of days is not rapid because water levels decrease mostly due to evaporation from heat and use by terrestrial and emergent plants during photosynthesis. The pumping of water to dry up fairways at Sharp Park, however, is well outside the natural rate of pond drying and the frogs are not adapted to this type of rapid change in pond depth. Therefore, because these frogs have evolved a breeding strategy over millions of years that is cued in on natural rates of desiccation, the pumping of the ponds by the golf course will inevitable lead*

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[4] Campo et al. 2012, pp. 22, 26, 33, 36, 39, 49, 54, 62, 67. Submitted to the Department by Wild Equity during the public comment period and observed in the case file for the Pumphouse Project on October 10, 2013. Wild Equity incorporates these previously submitted documents by reference.

[5] U.S. Fish and Wildlife Service (USFWS). In Reply Refer To: 08ESMF00-2012-F-0082-2, Formal Endangered Species Consultation on the Sharp Park Safety, Infrastructure Improvement, and Habitat Enhancement Project in San Mateo County, California, October 2, 2012. p. 40.

to a much higher mortality rate for the eggs that the females lay at the margins of the pond, in the shallowest water.

Vredenburg Decl., p. 11-12 (Exhibit E) (emphasis added). There is a fair argument supported by substantial evidence and expert opinion that clearing vegetation and sediment from Horse Stable Pond and the connecting channel so that water flows to the pumphouse even faster than it does presently will significantly reduce survivorship of California red-legged frog egg masses, a threatened species protected by the Endangered Species Act. This significant environmental effect cannot be ignored: the Department, through a thorough and complete EIR, must consider it.

2. EXPANDING PUMPHOUSE OPERATIONS WILL HAVE SIGNIFICANT ADVERSE EFFECTS ON THE LAGUNA SALADA WETLAND COMPLEX'S HYDROLOGY.

The connecting channel between Laguna Salada and Horse Stable Pond is shallow, with bed elevation ranges between 3.1 and 6.2 feet. When water surface elevations recede below 6.2 feet, Horse Stable Pond and Laguna Salada become hydrologically disconnected. Letter from Greg Kamman, Kamman Hydrology & Engineering, Inc., to Ryan Olah, Chief—Coastal Division Branch, U.S. Fish and Wildlife Service (August 3, 2012) (Exhibit F, p. 4). When the two water bodies are hydrologically disconnected, the pumphouse's ability to drain the Laguna Salada wetland complex is reduced, and the negative environmental affects on the wetland system's hydrologic resources are arrested.

However, the Pumphouse Project proposes to remove 96,948 liquid gallons (480 cubic yards) of sediment from the connecting channel. The portions of the connecting channel to be dredged include the highest point (6.2 feet) along the longitudinal profile of the channel: the area near the culvert passing under the 12th fairway of the golf course.[6] If this area is dredged, Laguna Salada will remain hydrologically connected to the pumphouse for a greater portion of the year: which will in turn result in expanded pumping operations that drain Laguna Salada's wetland complex. Exhibit F, p. 4.

This increased hydrological connectivity may result in significant adverse environmental effects in one of two ways. First, if the Project Sponsor is correct and the connectivity permits SFRPD to drain the Laguna Salada wetland complex more rapidly and thoroughly, the hydrological resources presently preserved in the Laguna Salada complex will be adversely affected. For example, draining wetlands is known to increase tule and cattail populations, and as these species become more numerous Laguna Salada's open water habitats would decrease in size. Dr. Peter Baye, *Critical Review of the Biological Assessment for the "Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project"* May 2012. p. 5 (Exhibit G, p. 9). However, this effect is not considered by the PMND: even though this threat is considered so significant at Horse Stable Pond that SFRPD is proposing to destroy the frog's cover habitat to create open water breeding habitat.

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[6] Kamman Hydrology & Engineering, Inc. Report for the Hydrologic Assessment and Ecological Enhancement Feasibility Study: Laguna Salada Wetland System, Pacifica, California, March 30, 2009. p. 16.

Second, it is also possible that the Project Sponsor is not correct, and that the Pumphouse Project will actually reverse the flow of water from Laguna Salada to Horse Stable Pond. Exhibit F, p. 4. Kamman Hydrology is the author of the Hydrologic Assessment that the Department relies upon to justify the PMND's hydrology conclusions. But Kamman has explained that SFRPD and the Department are not accurately interpreting his hydrologic study. In his Aug. 3, letter, Kamman explains that storm runoff into Horse Stable Pond is roughly double the amount of storm runoff into Laguna Salada. Because Horse Stable Pond's margin is much more steeply sloped than Laguna Salada, the storm runoff causes Horse Stable Pond's surface level to rise much more rapidly than the surface level of Laguna Salada, which tends to spread outward across it's shallow margins, rather than upward. Because of this, initial storm surges tend to drive water from the high-elevation Horse Stable Pond through the connecting channel and into the lower-elevation Laguna Salada. *Id.* at 5.

The practical consequences of this analyses are two-fold: first, removing vegetation from the connecting channel will increase flooding at Sharp Park Golf Course compared to present conditions as waters from Horse Stable Pond are driven into Laguna Salada and extend outward along Laguna Salada's shallow margin. *Id.* Second, as waters flow from Horse Stable Pond into Laguna Salada (and therefore away from the pumphouse), the pumphouse will not function as waters flow away from its intake pipe.

As explained in *Sierra Club v. County of Sonoma*, "if there is a disagreement among experts over the significance of an effect, the agency is to treat the effect as significant and prepare an EIR." 6 Cal. App. 4th at 1316. Here, the expert that prepared the hydrologic study relied upon by the PMND has informed the Department that the Project Sponsor has misinterpreted the expert's results, and provided the Department with the correct interpretation of his expert reports and opinions about the Pumphouse Project's probable impacts. Under such circumstances, CEQA requires the Department to prepare an EIR to fully consider the significant environmental impacts that may arise from the Pumphouse Project.

3. EXPANDING PUMPHOUSE OPERATIONS WILL HAVE SIGNIFICANT ADVERSE EFFECTS ON THE LAGUNA SALADA WETLAND COMPLEX'S WATER QUALITY.

The PMND suggests that Sharp Park's berm was completed in the 1940s and enhanced habitat conditions for California red-legged frogs and San Francisco gartersnakes by "eliminat[ing] the hydrologic connection between the Pacific Ocean and the wetland complex." PMND, p. 3. This suggestion is based on the presumption that Laguna Salada was once a tidal lagoon, influenced daily by ocean tides. Both the suggestion and presumption are inconsistent with the best available science.

Laguna Salada was never a tidal lagoon, nor was it daily or regularly influenced by ocean waters.[7] The most extensive natural history investigation ever conducted of Sharp Park concludes that

[7] The City's belief is based on (PWA 1992), which is relied upon to advance proposals in this and other Department projects at Sharp Park. However, the successor of this study—ESA-PWA 2011—thoroughly reviewed the 1992 report and determined it was deficient and out of date in numerous ways, ultimately rejecting the 1992 report's assumptions about the historical condition of the site (ESA-PWA 2011, p. 39-40). The Department's continued reliance on a discredited report that is more than two decades old—and

Laguna Salada was, under natural conditions, a fresh-to brackish backbarrier lagoon system surrounded by freshwater wetlands, separated from the ocean by a protective dune-like beach system.[8] Lagoons with these structures and ecological characteristics provide suitable habitat for frogs and snakes throughout the state—as did Sharp Park's lagoons before the berm was completed in the 1980s.

Aerial photos from the 1940s through the 1980s indicate that Sharp Park's berm was not completed until after the mid-1980s.[9,10] Nonetheless San Francisco gartersnakes were recovering at Sharp Park until the mid-1980s.[11] The City has previously suggested that an ocean storm surge brought high salinity levels to Laguna Salada in 1986 and alone halted this recovery,[12] but this seems unlikely give the fact that Sharp Park's California red-legged frog and San Francisco gartersnake populations survived ocean storm surges as large or larger in the 1930s,[13] 1950s (see Figure 1), and 1970s. Exhibit I, p. 18-19.

The persistence of both species at Sharp Park through 1986 despite (a) an incomplete sea wall and (b) several coastal storm surges that inundated Sharp Park indicates that declines in the late 1980s are unlikely to be attributable to coastal processes. For example, "when aquatic habitat (ponds and streams) is abundant as a result of adequate rainfall, the California red-legged frog can produce large numbers of dispersing young, resulting in an increase in the number of occupied sites. In contrast, the California red-legged frog may temporarily disappear from an area during periods of extended drought." Revised Critical Habitat for *Rana Draytonii*, 75 Fed. Reg. 12816 (Mar. 17, 2010). From 1987-1992 California faced a severe drought, and "it is possible that the most severe impacts have been on the environment and the fish and wildlife that depend on the

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its complete failure to reference a modern study by the same authors—is a prejudicial abuse of discretion that "precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals" of CEQA review." *Al Larson Boat Shop, Inc. v. Board of Harbor Commissioners,* 18 Cal. App. 4th 729, 748 (1993).

[8] ESA-PWA. 2011 *Conceptual Ecosystem Restoration Plan and Feasibility Assessment: Laguna Salada, Pacifica, California* 39. (available at http://wildequity.org/versions/3921).

[9] *Id.* at 40.

[10] Arup North America. Sharp Park Sea Wall Evaluation, February 5, 2010. Figures 3-7 (Exhibit J).

[11] SFRPD. Biological Assessment, Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project, August 16, 2012. p. 39.

[12] *Id*. at 31.

[13] The earliest of these storms occurred shortly after golf architect Alister McKenzie leveled the natural dune-like barrier protecting Laguna Salada from ocean storms. He did so to place several golf links on the beach. All of these links were destroyed in subsequent storms, and eventually the course was redesigned, moving many of these holes to the east side of Highway 1. Exhibit I, p. 18-19.

rivers for their sustenance."[14] Specifically, the drought severely degraded wetland habitats, and endangered species populations declined significantly.

Figure 1 April 4, 1958 flooding of Sharp Park. Caused by storm water runoff and wave overtopping of berm.
Geomatrix Consultants. Feasibility Study, Restoration of Coastal Embankment,
Sharp Park Golf Course, Pacifica, California. November 1987. p. 20.

[14] Dziegielewski, B.; Garbharran, H. P.; Langowski, J.F. Jr. *Lessons Learned from the California Drought (1991-1992)* IWR Report 93-NDS-5 (1993) p. 118.

Figure 2 1966 Photo of the USS George Johnson beached at Sharp Park, with no seawall or berm present.

Figure 3. 1972 Coastal Records Project photo showing incomplete berm at Sharp Park.

Figure 4 1979 Coastal Records Project photo showing incomplete berm at Sharp Park.

Figure 5 1987 Coastal Records Project photo showing incomplete berm at Sharp Park.

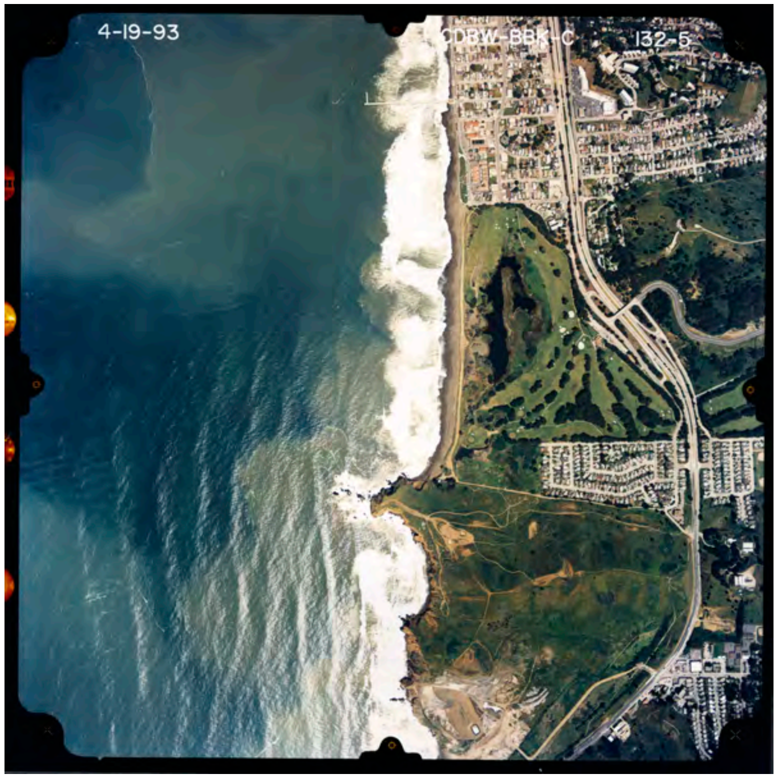

Figure 6 1993 Coastal Record Project photo showing completed berm.

This fundamental misunderstanding of Laguna Salada's ecological underpinnings has led the Department to overlook significant environmental effects of the Pumphouse Project, and to consider harmful project activities as mitigation measures. For example, retaining the sea wall while pumping Sharp Park's wetlands will exacerbate, not prevent, saltwater intrusion from the Ocean as marine waters are pulled through the existing groundwater (hydrologic) interface with the Ocean, eventually making the entire lagoon inhospitable to California red-legged frogs (ESA-PWA 2011, p. B-13). Moreover, the project's dredging proposal, rather than improving breeding habitat for listed species, will put them at risk by encouraging listed species to breed in the areas most vulnerable to pumping-induced saltwater intrusion. *Id.*

Given the substantial evidence that the Department's basic ecological presumptions are flawed—and the resulting significant environmental effects that were ignored or exacerbated because of this flawed presumption—the Department must consider the best available information about Sharp Park's natural history and ecology, and ensure that the Project is both biologically and ecologically sound through a complete EIR.

II. THE PUMPHOUSE PROJECT HAS AN UNSTABLE, SHIFTING PROJECT DESCRIPTION, FRUSTRATING INFORMED DECISIONMAKING AND PUBLIC OVERSIGHT OF SHARP PARK.

The project description for the Pumphouse Project "includes elements that are required under a Biological Opinion issued by the U.S. Fish and Wildlife service." PMND, p. 5. But the project description also segments several of the Biological Opinion's required elements from the Pumphouse Project. The Department then declares that these segmented elements of the

Pumphouse Project are either categorically exempt from environmental review, or includes the element's effects in the environmental baseline. In either case, the Department is "chopping a large project into many little ones . . .which cumulatively may have disastrous consequences." *Bozung v. Local Agency Formation Commission* (1975) 13 Cal.3d 263, 283-284. Specifically, the action subject to the Biological Opinion has now been segmented into at least three projects for purposes of CEQA: (1) a .5 acre upland habitat restoration project that the Department declared categorically exempt from CEQA on August 5, 2013, thus evading environmental review;[15] (2) pumping operations that the Department deems to be a component of the environmental baseline, thus evading environmental review; and (3) the remainder of the Pumphouse Project: which the Department has refused to review through a complete EIR.

CEQA forbids such "piecemeal" review of the significant environmental impacts of a project. This rule derives, in part, from Cal. Pub. Res. Code § 21002.1(d), which requires lead agencies to "consider[ ] the effects, both individual and collective, of all activities involved in [the] project." In the instant case, SFRPD declared to the Fish and Wildlife Service just a few months ago that the upland habitat restoration, pumphouse operations, and the rest of the Pumphouse Project was a single action. In response, the Fish and Wildlife Service imposed mandatory terms and conditions on SFRPD in exchange for authorization to kill threatened and endangered species. Those terms and conditions included (1) completing the upland restoration project, (2) operating the pumphouse pursuant to specific protocols, and (3) implementing other terms and conditions four the Pumphouse's construction actions. Thus, each of these three projects have been treated as a "crucial functional element of the larger project such that, without it, the larger project could not proceed." *Communities for a Better Environment v. City of Richmond* (2010) 184 Cal.App.4th 70. Indeed, the Biological Opinion expressly states that each element of the project description, reasonable and prudent measure, and each term and condition are "non-discretionary," and must become "binding conditions . . . in order for the [take exemption] to apply." Biological Opinion, p. 39. Thus, these segmented activities are "conditions of approval" for the Pumphouse Project as a whole, and as such it is improper for the Department to segment these elements of the project and evade stringent environmental review. *See Tuolumne County Citizens for Responsible Growth, Inc. v. City of Sonora* (2007) 155 Cal.App.4th 1214, 1224.

The adverse consequences of this piecemealing is already evident at Sharp Park. Laguna Salada has traditionally been a place for birdwatchers to observe wildlife, and several unique birds have been observed there in recent years. But a few months ago SFRPD removed a fencing project from the Pumphouse Project, and constructed a large fence that eliminated all access to Laguna Salada to watch birds. Similarly, SFRPD attempted to segment a so-called "grading" project for the path along Sharp Park's berm, but then proceeded to place rip-rap and armoring along the berm, resulting in a stop work order from the Coastal Commission.

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[15] One practical consequence of the Department's decision to take a condition of approval in the Biological Opinion and implement it in advance of the Pumphouse Project's review is that the upland restoration project can no longer serve as a mitigation or conservation measure for the Pumphouse Project. Instead, it must be considered a part of the environmental baseline for the Pumphouse Project, and provide additional mitigation for the Pumphouse Project's significant environmental effects.

If these project had not been piecemealed, informed decisionmaking with public oversight almost certainly would have prevented these significant environmental effects.

III. THE PUMPHOUSE PROJECT IS INCONSISTENT WITH SEVERAL PLANS, RESULTING IN SIGNIFICANT PHYSICAL ENVIRONMENTAL EFFECTS.

The Pumphouse Project is inconsistent with several plans in ways that either cause significant physical environmental effects or frustrate mitigation measures designed by the Department to ameliorate significant environmental effects. Because of this, the Department must prepare an EIR for the Pumphouse Project.

A. THE PUMPHOUSE PROJECT IS INCONSISTENT WITH THE 1995 AND 2006 SIGNIFICANT NATURAL RESOURCE AREA MANAGEMENT PLANS.

From 2005 until 2011, SNRAMP contained a project-level proposal for Sharp Park's wetland complex, largely based on PWA's 1992 Laguna Salada Resource Enhancement Plan. Although public comments suggested RPD should consider restoring habitat over the entire Sharp Park Golf Course area, the City refused to do so, explaining in 2009 that "[s]hould changes to the Sharp Park Golf Course be proposed, they would undergo a separate regulatory review, including CEQA environmental review."

The Pumphouse Project is inconsistent with the 2005 proposed SNRAMP. The Pumphouse Project will enhance pumping operations at Sharp Park and dredge Sharp Park's Natural Areas to ease the conveyance of water out of the Laguna Salada wetland complex, into the pumphouse, and ultimately out to sea. None of these activities are proposed in the original SNRAMP proposal for Sharp Park. The PMND implicitly recognizes that the Pumphouse Project is inconsistent with SNRAMP, because the Department did not make a consistency finding in the PMND. The Department must therefore be aware that there are significant, unmitigated environmental effects from this inconsistency, and the Department must therefore conduct further environmental review.

B. THE PUMPHOUSE PROJECT IS INCONSISTENT WITH THE SAN FRANCISCO BAY BASIN WATER CONTROL PLAN.

The Pumphouse Project will disturb oligohaline sediments in the Laguna Salada wetland complex, which in turn results in the oxidative formation of acid sulfates. This impact is substantially certain to occur, because experts have directly observed these sediments in the area proposed for dredging: these soils are ubiquitous and conspicuous throughout the wetland complex. Exhibit G, p. 4-5. Experts have also explained the pathway by which the sulfates will harm water quality, wildlife, and endangered species, Exhibit G, p. 10, and explained why these effects will be significant, lethal effects. *Id.*

The primary mitigation measure proposed is M-BIO-2A, which would require SFRPD to disturb sediments outside of the California red-legged frog breeding season. But this is not a sufficient mitigation measure for this threat. First, California red-legged frog tadpoles are known to overwinter before metamorphosing under certain conditions. Exhibit K, p. 2. Thus, it is likely that tadpoles and other sensitive receptors will be present during the dredging activity, even during the frog's non-breeding season. Second, oxidative formation of acid sulfates is a relatively lengthy process: it can take many days or weeks to occur, and therefore there is no indication in the mitigation measure that there is an adequate buffer to ensure acid sulfates disturbed towards the end of the construction period do not affect breeding frogs.

The Department has also proposed a deferred, byzantine, and ultimately unenforceable mitigation proposal called Mitigation Measure M-BIO-2B to address significant effects of disturbed oligohaline sediments. The measure proceeds through a voluntary, non-binding, multi-step assessment process. As a preliminary matter, the deferral of mitigation until this process is complete is holy unnecessary, because it is indisputable that oligohaline sediments are present in the Laguna Salada wetland complex. The process eventually concludes with three possible remediation outcomes: addition of lime to the wetland complex, the injection of sodium nitrate into the wetland complex, or the use of suction dredging to reduce the rate of re-suspension of oligohaline sediments.

However, mitigation measure M-BIO-2B is not fully enforceable, and therefore is not adequate to mitigate the significant environmental effects of oligohaline soils. The Department must ensure that "measures to mitigate or avoid significant effects on the environment are fully enforceable through permit conditions, agreements, or other measures." CEQA Guidelines § 21081.67(b). is not fully enforceable. Public agencies therefore may not defer mitigation measures unless the agency commits itself to mitigation and articulates specific performance criteria or standards that must be met for the project to proceed. *Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 793-794. The Department has failed to meet both criteria here. First, there is no commitment to mitigation within the meaning of CEQA. Nowhere does the mitigation measure specify that an authoritative body will mandate the mitigation measures through a permit, agreement, or other measure. Instead, the measure relies upon voluntary reviews and comments throughout the mitigation process. While the forth and fifth stage of the measure (Toxic Pathways Analysis and Remediation) suggest that either the U.S. Fish and Wildlife Service or the California Department of Fish and Wildlife will "approve" SFRPD's toxicity standards or its remediation measures, the Department does not identify any permit, agreement, or other measure that could in fact serve as the vehicle for these approvals.

Moreover, the PMND suggests that discharges from Sharp Park's pumphouse are authorized under an existing San Francisco Bay Region Water Quality Control Board Permit. However, no such permit exists, so it will not be possible to make any provision of this mitigation measure binding through an amendment of any existing permit. Similarlly, the Army Corps of Engineers—the action agency for the Pumphouse Projects Section 7 Consultation—to date still has not agreed to incorporate the Biological Opinion into a wetland fill permit issued to SFRPD for this project. Unless and until the Army Corps of Engineers agrees to be bound by the Biological Opinion and incorporate the terms of the Biological Opinion into non-discretionary permit terms, the Army Corps cannot provide the fully enforceable permits or measures that would be necessary to make this mitigation measure lawful.

Second, the mitigation measure does not articulate specific performance criteria or standards that must be met for the project to proceed. There are no thresholds of significance identified, and no other specific measure that would alert the agency or any member of the public that a performance criterion had not been met. Instead, the mitigation measure orders study after study to occur, but leaves the actual triggers for remediation and the remediation objectives completely undefined.

Moreover, at least one of the remediation measures—suction dredging—will likely cause new and significant environmental effects if it is implemented. Suction dredging will remove large amounts of both sediment and water from the wetland complex—much more than the clam shell or bucket type dredging equipment identified in the project description, which typically contain 80-90% solids. Suction dredging will require distinct technologies to dispose of watery dredged materials: it would not be permissible to allow these waters to drain back into the wetland complex given that they are likely acidic or hypoxic to begin with. Yet the PMND does not discuss any proposed mitigation measure for suction dredging: CEQA requires at least some discussion in situations such as this. *Stevens v. City of Glendale* (1981) 125 Cal.App.3d 986.

C. THE PROJECT IS INCONSISTENT WITH THE COASTAL ACT.

The Coastal Act, as well as Pacifica Zoning Code Section 9-4.4302, defines an "environmentally sensitive area" as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activity or developments."[16] The Act states that "[e]nvironmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas."[17]

Sharp Park constitutes an ESHA under this definition because both the CRLF and SFGS are rare, and their presence is regularly documented at Sharp Park; because Sharp Park's habitats are both rare and especially valuable to these species, because they constitute a rare coastal lagoon ecosystem that is the northern-most known habitat for the SFGS; and because the species and their habitats are disturbed and degraded under existing conditions, and the Project will cause additional degradation and disturbance.

However, the PMND does not recognize ESHA at Sharp Park, nor any of the implications this status has on the Pumphouse Project. Therefore fails to ensure that the Pumphouse Project is consistent with the Coastal Act.

D. THE PUMPHOUSE PROJECT IS INCONSISTENT WITH THE CALIFORNIA RED-LEGGED FROG RECOVERY PLAN.

The Sanchez Creek Watershed is a Priority 2 watershed for CRLF recovery. Priority 2 Watersheds provide the necessary habitat connectivity between core areas and is an important contribution to the recovery of the California red-legged frog throughout its range. These watersheds have Watershed Management and Protection Plans that address, among other things, restoration, controlling water flow, assess suction dredging impacts on water quality and thus the frog (sedimentation increases are cited as a possibility), flood control activities, and recreation activities. Recovery Plan p. 53. The PMND makes no mention of this planning process at all.

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16 *Id.* § 30107.5.
17 *Id.* § 30240.

E. THE GOLF COURSE REDEVELOPMENT PROJECT IS A PROJECT LEVEL CEQA DOCUMENT, AND DOES NOT MERELY GUIDE MANAGEMENT AT SHARP PARK.

The City's plan to reconstruct Sharp Park Golf Course is reasonably certain to occur, will adversely affect Sharp Park, and is interrelated with this proposal: it's effects must therefore be assessed as part of this CEQA process. However, throughout the PMND, the Department suggests that this project level review will merely "guide" management at Sharp Park in the future. This is a significant error, and indicates that the Department must reassess the interrelatedness of these projects and consider them as one project.

1. The City's Golf Course Construction Plan Has Been Significantly Changed.

In 2009, the San Francisco Board of Supervisors unanimously passed an ordinance ordering RPD to study restoration alternatives at Sharp Park. The report RPD ultimately released contained a radical new golf course construction plan for Sharp Park guised as a "recovery" effort for listed species (TetraTech 2009).

After scientists criticized the plan's several significant flaws (Davidson et al. 2011, pp. 1-2), the City convened the fact-finding Sharp Park Working Group (Holland 2011, p. 4-5). When the Working Group released findings that adopted many of (ESA-PWA 2011) recommendations,[18] RPD announced it would abandon a core element of its golf course construction plan—armoring Sharp Park's seawall—but continued to insist that Sharp Park's 18-hole golf course would remain in its historic footprint, even as it acknowledged that sea level rise will erode the seawall and force it inland, squeezing endangered species habitats in a narrow area between the golf areas and the advancing ocean (Holland 2011, pp. 4-5).

Contemporaneously the City was preparing a Draft Environmental Impact Report ("DEIR") for the City's Significant Natural Resource Areas Management Plan ("SNRAMP").

However, when the DEIR was released in 2011 the PWA-based Laguna Salada plan had been replaced with the TetraTech golf course construction plan.[19] Under this plan, 60,000 cubic yards of material would be dredged from the Laguna Salada's wetland complex, creating 12,100,000 gallons of water storage capacity (PRD 2011, p.99). Four golf links surrounding Laguna Salada would be raised by up to 3.5 feet, creating additional (although unquantified) water storage

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[18] The penultimate draft of the Sharp Park Working Group's findings did not make any conclusion about Sharp Park Golf Course's integrity or compatibility with the site. However, shortly before its scheduled release, Dave Holland, then director of San Mateo County Parks, leaked a copy of the document to golf advocacy groups (Holland 2011, p. 1-3). These advocates demanded that Mr. Holland "insert something along the following line: 'None of the foregoing is incompatible with preservation of the historic 18 hole golf course that exits on the property.'" *Id.* Mr. Holland agreed to do so, and was able to insert a single line at the end of the document: "These habitat enhancements and golf could be compatible." *Id.*

[19] The plan was attached to the DEIR as Appendix I, and will be referred to throughout this document as (TetraTech 2009) or (RPD 2011) interchangeably.

capacity in the lagoon system (TetraTech 2009, p. 43). Another link would be narrowed, and another removed[20] (RPD 2011, Figure 3). It also calls for filling ½ acre of Sharp Park's wetlands to create an island in Laguna Salada (RPD 2011, p. 99) and landfilling areas where California red-legged frogs breed to "prevent localized ponding" and "to allow more complete drainage to Laguna Salada" (RPD 2011, p. 377).

2. The Golf Course Construction Plan and the Project are Interrelated.

The DEIR's golf course construction project is interrelated with the proposal here. Both are designed to reduce golf course flooding, and depend upon each other to implement this larger action. The City's larger plan to reduce golf course flooding is composed of (1) ensuring maximum pump rates are reliably achieved, (2) increasing water flow rates towards the pumps, (3) increasing water storage capacity by deepening lagoons and (4) increasing storage capacity by elevating the rim of the lagoon. If any one of these components fails or is not achieved, pumping rates will decrease and golf course areas will flood.

While there is some overlap, this project is primarily designed to accomplish the first and second elements of this plan (RPD 2012, p. 6) while the DEIR is primarily designed to implement the third and fourth elements of the plan (RPD 2011, p. 99). But the elements are expressly interlinked: the DEIR repeatedly states that the golf course construction project is dependent on efficient pump operations (RPD 2011, pp. 146, 361, 374, 377), and further explains that the golf course construction plan is designed to meet flood control objectives while reducing wear-and-tear on the pumps (TetraTech 2009, p. 43).

The City's statement that the golf course construction plan is wholly separate from the Project (Wayne 2011b, p. 2) is belied by its recent permitting strategy discussion with other agencies (Anonymous 2012, p. 1). The agenda from this discussion indicates the Project and the golf construction project are two temporal phases of a single management strategy. Effects from the later phases are classic indirect effects, because they are caused by the proposed action and are later in time, but still reasonably certain to occur. They also derive, either directly or indirectly from an interrelated element of the City's larger flood management strategy. In either case, by law the City must review these effects during this CEQA process, regardless of the City's colloquial assertion that the projects are separate.

3. The Golf Course Construction Plan is Reasonably Certain to Occur.

The City's proposal has already been approved by several oversight bodies, and in each case the City made clear that it would not review or consider restoration alternatives at Sharp Park. The City's single-minded approach to Sharp Park and its completion of many steps in its approval process show that the golf course construction project is reasonably certain to occur.

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[20] Although Hole 12 will be removed at Sharp Park, the DEIR requires the City to rebuild the link in another location at Sharp Park (RPD 2011, p. 28). The DEIR proposes two locations for this link: west of Laguna Salada, between the seawall and frog breeding areas, or east of Highway 1. The DEIR suggests that surrounding Laguna Salada with golf links would have fewer significant impacts because it would retain historic integrity of the golf course, even thought it would negatively affect wildlife and intrude on protected natural areas. However, the DEIR defers the ultimate decision to subsequent environmental review.

The City's proposal to rebuild Sharp Park Golf Course's original layout was endorsed by San Francisco's Recreation and Parks Commission in December of 2009, to the exclusion of all other options for Sharp Park's future (RPD 2011, p. 2). In the SNRAMP DEIR, the City concluded that only an 18-hole Golf Course at Sharp Park was a feasible alternative for the property, and refused to consider other restoration options that would provide additional benefits to listed species (RPD 2011, p. 3). Moreover, the DEIR contains a mitigation requirement that will force the City to rebuild a golf link in one of two places in subsequent environmental review (RPD 2011, p. 28). Thus, the City's existing approvals and contemporaneous permitting procedures create a binding requirement to implement the golf course construction plan.

Furthermore, when the San Francisco Board of Supervisors passed an ordinance requiring the City to negotiate with the National Park Service to implement a restoration plan for the property, the Mayor vetoed the ordinance (Lee 2011, p. 1) again indicating the City's intent to ensure the golf course construction project occurs. And with the City's encouragement, San Mateo County passed a resolution calling for San Francisco to "maximize recreation opportunities" at Sharp Park by implementing the golf course construction plan (San Mateo Co. 2011, p. 2).

These actions by the City are all that is necessary to show that the golf course construction plan is reasonably certain to occur. While there may be some ambiguity about what the ultimate Golf Course design may be the City's CEQA documents must give consideration of the effects of interrelated and interdependent activities whether or not all of the activities' impact is known.

IV. THE CUMULATIVE EFFECTS ANALYSIS IS INADEQUATE.

The Pumphouse Project PMND fails to address the cumulative impacts—or any impacts at all—on the San Francisco garter snake, which has been greatly impacted by the golf course for many decades. This is particularly troubling given Sharp Park's role in the recovery of the species, and SFRPD's failure to aid in that recovery.

V. THE CITY MUST CONSIDER ALTERNATIVES TO THE PROJECT.

The project description does not indicate the City will consider alternatives. In a case like this where public concern and controversy is high, evidence of alternatives is widespread, and when massive take has occurred under existing protocols, the City cannot ensure that there will be no significant adverse environmental impacts without at least considering alternatives to the project proposal.

In particular, (ESA-PWA 2011) contributor Dawn Reiss has contributed a restoration model for Sharp Park that is based on the best scientific data available at Sharp Park and addresses all of the above deficiencies in the project. For example, where the projects suggests that both species are "conservation reliant" due to their isolation, Ms. Reiss' proposal emphasizes connective habitat corridors across Sharp Park.

Where the project suggests it will continue to drain and fertilize Sharp Park's wetlands on the one hand, and then dredge excessive tule and cattail growth on the other, Ms. Reiss' mitigation model constrains pumping so that water levels will rise high enough to drown excessive vegetation growth, and ensures that water levels rise and fall slowly so that Sharp Park's entire wetland feature remains hydrologically connected and contains sufficient water for egg masses to develop into adult frogs.

Where the project ignores the fundamental changes climate change will bring to this landscape, Ms. Reiss' plan provides mitigation and recovery areas upland and inland from areas that will be immediately impacted by catastrophic flooding events, and then creates natural defenses around these areas by restoring wetlands and vegetative features between the rising sea and the restored habitats. These features will absorb and slow the rate of water if intrusion ever does occur.

Where the project blames the frog for an apparently indiscriminant breeding behavior and for laying eggs in 'unsustainable' habitats, Ms. Reiss' mitigation and restoration plan recognizes that the California red-legged frog can successfully breed under natural conditions at Sharp Park, so long as the velocity, rapidity, and scope of the wetland draining project implemented by San Francisco is curtailed.

All of these outcomes would provide greater conservation and public benefits than the project disclosed in the notification, yet the City does not seem prepared to consider alternatives to the project proposal. Such reluctance is inconsistent with sound environmental review and the strictures of CEQA.

VI. THE PROJECT WILL DESTROY COVER HABITAT TO ENHANCE BREEDING HABITAT, EVEN THOUGH BREEDING HABITAT IS NOT A LIMITING POPULATION GROWTH FACTOR AT SHARP PARK, CAUSING UNNECESSARY AND SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS.

The California red-legged frog and the San Francisco garter snake require multiple habitat conditions to survive. For example, "essential habitat for a breeding [San Francisco gartersnake] population includes open grassy uplands and shallow marshlands with adequate emergent vegetation, and the presence of both Pacific tree frog (*Pseudacris regilla*) and California red-legged frog breeding populations." "Emergent and bankside vegetation such as cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), and spike rushes (*Juncus* spp. and *Eleocharis* spp.) apparently are preferred and used for cover."[21]

Similarly, the "California red-legged frog requires a variety of habitat elements with aquatic breeding areas embedded within a matrix of riparian and upland dispersal habitats."[22] The frog "spend[s] considerable time resting and feeding in riparian vegetation when it is present" and can be "found up to 30 meters (100 feet) from water in adjacent dense riparian vegetation for up to 77 days."[23] "Overall, [California red-legged frog] populations are most likely to persist where multiple

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[21] U.S. Fish and Wildlife Service (USFWS). Consultation for the Proposed Sharp Park Golf Course Storm Drain Repair Project, Pacifica, San Mateo County, California. 81420-20008-F-1952. October 7, 2008. p. 8.

[22] U.S. Fish and Wildlife Service (USFWS). Recovery Plan for the California Red-legged Frog. p. iv. (2002).

[23] *Id.* at p. 13-14.

breeding areas are embedded within a matrix of habitats used for dispersal."[24] Recent studies demonstrate that in both breeding and non-breeding periods, California red-legged frogs predate almost exclusively on terrestrial species, Vredenburg Decl., p. 7 (Exhibit E), indicating uplands are also essential habitat for California red-legged frog prey.

Sharp Park currently provides the habitat mixture both species require.[25] However, the project proposal would transform one essential habitat type—emergent vegetation—into open water habitat "to improve water flow to the pumps"[26] so Sharp Park's wetlands can be rapidly drained during the California red-legged frog's breeding season. The City suggests this transformation is justified because "areas along the connecting channel and [Horse Stable Pond] that contain dense cattail growth are considered to be very low quality breeding habitat for the [California red-legged frog]"[27] and presumes the transformation will therefore cause frog populations to increase, ultimately providing more prey for the San Francisco gartersnake.

The City's position is not supported by available evidence. If, as the City hypothesizes, emergent vegetation limits growth of California red-legged frog and San Francisco gartersnake populations at Sharp Park, the City's records should show a decline in egg masses as the extent of emergent vegetation has increased. But the evidence indicates California red-legged frog egg mass counts have been generally increasing at Sharp Park/Mori Point since 2004[28]; indeed, during the 2010-11 breeding season the City "recorded more than 3 times the eggmasses [SIC] than any other year."[29] Similar numbers were observed during the 2011-12 breeding season. Exhibit D, p. 4.

Nor does available evidence indicate that Sharp Park's San Francisco gartersnake population is limited by prey availability. If Sharp Park's California red-legged frog population were too small to support its predator, City records should show a decline in adult frogs at Sharp Park. But while testifying against endangered species conservation measures at Sharp Park on behalf of golf advocacy groups, Dr. Mark Jennings stated "it has been common for the past couple of years at Sharp Park to find dozens and dozens of juvenile and adult [California red-legged frogs]," and concluded that "there are relatively few sites within the current geographic range of the species that have such large populations of adult [California red-legged frogs]".[30] Furthermore, "trapping

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[24] *Id.* at 12.

[25] SFRPD. Biological Assessment, Sharp Park Safety, Infrastructure Improvement and Habitat Enhancement Project, August 16, 2012. p. 34.

[26] *Id.* at 12.

[27] *Id.* at 48.

[28] *Id.* at 42.

[29] E-mail from Jon Campo, Recreation and Park Department Natural Areas Program, to David Kelly, U.S. Fish and Wildlife Service (Jan. 21, 2011) (Exhibit D, p. 5).

[30] Jennings Decl., p. 16 (Nov. 18, 2011). However, as pointed out by Dr. Marc Hayes, Dr. Jennings wrongly attributed his observations to Sharp Park Golf Course management and operations. "[I]t is my professional opinion that any increase in egg masses observed in the Sharp Park/Mori Point complex reflects continued increases in recruitment from the Mori Point ponds. Yet because defendants' activities at Sharp Park are

studies at Mori Point and Sharp Park since 2004 suggest that the [San Francisco gartersnake] population again may be increasing, at least at Mori Point."[31] "[C]apture rates for 2006 and 2008 reflected an increase over the 2004 rate of 104% and 5%, respectively . . . we observed an overall increase in the number of [San Francisco gartersnakes] trapped per unit effort within the project area."[32]

While neither the availability of open water habitat nor frog population sizes limits productivity at Sharp Park, the best available science does indicate that egg mass and juvenile *survivorship* limits the California red-legged frog's population growth "pumping expose[s] California red-legged frog eggs to desiccation,"[33] and that destruction of upland habitats limit the San Francisco gartersnake's population growth:

> Nearly all of the areas surrounding Laguna Salada and Horse Stable Pond are mowed regularly by the Golf Course, very near or immediately adjacent to the wetland edge. This leaves a very narrow band of emergent wetland habitat between the open water areas of the lagoon and the Golf Course links, and no protected upland in which SFGS can bask, breed, or seek refuge in a burrow. Beyond the narrow band of emergent vegetation, SFGS would face a very high likelihood of being taken directly by mowing operations.

Dexter Decl., p. 10 (Exhibit K).

These effects are significant by any measure, and cause adverse environmental impacts that require thorough environmental review and mitigation.

VII. Specific Significant Adverse Environmental Impacts of the Project Proposal.

The following comments are specific to particular elements of the project proposal. Each indicates that there is, at least, a fair argument that the project will cause significant adverse environmental impacts at Sharp Park:

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taking the CRLF in several ways, including by adversely altering habitat conditions at Sharp Park, defendants activities are in fact having negative population-level impacts on the entire Mori Point/Sharp Park CRLF population" Hayes Expert Report, p. 26-27 (Jan. 20, 2012) (Exhibit H).

[31] Swaim Biological Incorporated. *Sharp Park Wildlife Surveys and Special Status Reptile and Amphibian Restoration Recommendations*, December 4, 2008, p. 1-4.

[32] Swaim Biological Incorporated. *San Francisco Garter Snake Habitat Improvement Project at Mori Point, Pacifica, California 2004-2008*, January 31, 2009, pp. 14, 19.

[33] U.S. Fish and Wildlife Service (USFWS). Formal Consultation on the Mori Point Restoration and Trail Plan in the Golden Gate National Recreation Area, U.S. National Park Service, San Francisco, California. 1-1-06-F -1575 (July 13, 2006) p. 22.

The proposed pumping protocols do not describe the biological screens to prevent listed species from being entrained. Biological monitors at Sharp Park have observed crayfish entrained by Sharp Park's pumping operations, and stated that "[I]f crayfish can become entrained in pump than frogs might also" (Swaim 2008b, p. 1). (Hayes 2012) makes recommendations on screening at Sharp Park.

Sincerely,

Brent Plater

EXHIBIT A

City and County of San Francisco
Recreation and Park Department
Golf Division

McLaren Lodge in Golden Gate Park

501 Stanyan Street, San Francisco, CA 94117

TEL: 415.831.6310 FAX: 415.753-7262 WEB: http://parks.sfgov.org

November 30, 2006

Christopher D. Nagano
Chief – Endangered Species Division
2800 Cottage Way, Rm. W-2605
Sacramento, CA 95825

Dear Chris Nagano:

Your e-mail to the Natural Areas Program of the San Francisco Recreation and Park Department concerning pumping activities at Sharp Park Golf Course was forwarded to me yesterday. You requested that your office be notified as soon as possible should the pumps at Sharp Park be turned on due to flooding. We have not yet had a significant rain event that would cause flooding to Laguna Salada or Horse Stable Pond. We have been pumping down Horse Stable Pond on a controlled basis for the past three weeks and are installing a" by pass" pump to bring down the level of Laguna Salada to hopefully prevent the flooding that occurred last winter. The channel draining Laguna Salada into Horse Stable Pond is completely choked with tules and bulrush which have dramatically slowed the natural drainage from Laguna Salada. Our plan is to increase the water holding capacity of the Laguna Salada basin prior to any large winter storms.

I have been in contact with the Natural Areas group and they are monitoring for Red-Legged Frog activity and egg masses and there have not been any egg masses reported to my office this season. As soon as any egg masses are reported we will follow the protocol established last season keeping the masses hydrated and the water levels above the egg masses until we receive word from the Natural Areas that the hatch is complete.

We are holding a meeting with the City of Pacifica, San Francisco Recreation and Park Department, State Fish and Game and representatives from GGNRA on January 10, 2007 at 10 AM. The meeting will be held at the Calera Creek Waste Water Treatment Plant conference room at 700 Coast Highway in Pacifica. You are invited to attend or send a representative. The Laguna Salada basin is rapidly infilling with tules and bulrush, large areas of water that used to be open are now vegetated and the habitat is being altered to the potential detriment of the Red-Legged Frog, the San Francisco Garter Snake and the San Francisco Forktail Damselfly. We are looking for acceptable solutions and would welcome your expertise.

Sincerely,

Sean K. Sweeney

Sean K. Sweeney
Golf Program Director

c: Scott Holmes, City of Pacifica
Dave Johnston, State Fish and Game

Dennis Kern, Director of Operations, SFRPD
Terry Schwartz, Superintendent, SFRPD
Sue Gardner, Golden Gate National Parks Conservancy
Christopher Campbell, Natural Areas Program, SFRPD

EXHIBIT B

TOTAL WATER PUMPED FROM SHARP PARK WETLANDS: 12/21/10 – 1/13/12

Date	Water Level at Vault Gauge	Water Level Converted to NAAVD	Small Pump Hour Reading	Large Pump Hour Reading	Water Pumped Since Last Reading in gallons	Total Gallons Pumped Since 12/21/10	Notes
12/21/10	2.6	8.5	140.6	21.8	n/a	**0.00**	RPD orders station engineer to pump down pond before rains and frog lays eggs.
12/26/10	2.0	7.9	220.8	50.9	15,288,000.00	**15,288,000.00**	First egg masses observed for the season.
1/6/11	2.1	8.0	411.9	78.1	21,258,000.00	**36,546,000.00**	RPD moves 16 egg masses. Engineer told to shut pumps off.
1/7/11	n/a	n/a	n/a	n/a	n/a	**n/a**	RPD moves 28 egg masses.
1/10/11	2.5	8.4	411.9	78.1	0.00	**36,546,000.00**	Engineer turns pumps back on.
1/11/11	2.1	8.0	427.5	78.9	1,224,000.00	**37,770,000.00**	Engineer told to raise water levels.
1/14/11	2.5	8.4	427.5	78.9	0.00	**37,770,000.00**	RPD moves 28 egg masses.
1/21/11	n/a	n/a	n/a	n/a	n/a	**n/a**	RPD moves 35 egg masses.
2/21/11	3.0	8.9	539.4	174.9	41,274,000.00	**79,044,000.00**	Snavely finds egg mass at risk at Horse Stable Pond.
2/22/11	2.6	8.5	540.6	197.6	8,244,000.00	**87,288,000.00**	Bowie observes egg mass stranded at Horse Stable Pond.
2/23/11	2.5	8.4	550.1	209.2	4,746,000.00	**92,034,000.00**	Dr. Vredenburg confirms stranded egg mass is CRLF.
2/24/11	2.6	8.5	571.3	211.1	1,956,000.00	**93,990,000.00**	FWS Informed of egg mass stranding.
3/2/11	2.3	8.2	680.2	218.1	9,054,000.00	**103,044,000.00**	On 3/1/11, Snavely observes stranded Horse Stable Pond egg mass completely desiccated partially frozen.

TOTAL WATER PUMPED FROM SHARP PARK WETLANDS: 12/21/10 – 1/13/12

Date	Water Level at Vault Gauge	Water Level Converted to NAAVD	Small Pump Hour Reading	Large Pump Hour Reading	Water Pumped Since Last Reading in gallons	Total Gallons Pumped Since 12/21/10	Notes
6/24/11	2.6	8.5	1199.4	411.2	100,668,000	**203,712,000**	Lisa Wayne directs water levels dropped to 2.2.
1/3/12	1.9	7.8	1296.8	413	6,492,000	**210,204,000**	City orders water level dropped to 1.5.
1/27/12	n/a	n/a	n/a	n/a	n/a	**n/a**	First egg masses observed this season.
1/28/12	1.4	7.3	1407.5	420	9,162,000	**219,366,000**	Ely observes egg masses stranded at Laguna Salada.
1/30/12	1.4	7.3	1415.7	420	492,000	**219,858,000**	Ely informs SBI employees of stranded egg masses they missed during surveys. RPD orders pumps turned off.
2/1/12	n/a	n/a	n/a	n/a	n/a	**n/a**	Ely returns to observe stranded egg masses, discovers it missing.
2/2/12	n/a	n/a	n/a	n/a	n/a	**n/a**	Stringer observes more egg masses stranded at Laguna Salada.
2/8/12	n/a	n/a	n/a	n/a	n/a	**n/a**	Stranded egg masses all removed from Laguna Salada.
2/11/12	1.8	7.7	1415.7	420	0.00	**219,858,000**	RPD orders pumps on and set to turn off at 1.9.
2/17/12	n/a	n/a	n/a	n/a	n/a	**n/a**	Ely observes Horse Stable Pond egg mass stranded.
2/29/12	2.0	7.9	1415.7	420	0.00	**219,858,000**	
3/11/12	2.0	7.9	1416.5	420	48,000	**219,906,000**	Last Pump House log entry available.

TOTAL WATER PUMPED FROM SHARP PARK WETLANDS: 12/21/10 – 1/13/12

NOTES:

- Hour readings indicate the total number of hours the pump has been running. Numbers derived from Sharp Park Pump House Log.
- John Ascariz, Station Engineer, estimates that the small pump operates at 1,000 gallons per minute (maximum capacity 1,500 per minute) and the large pump at 6,000 gallons per minute (maximum capacity 10,000 gallons per minute). All figures are based on Ascariz estimates, not actual capacity of pumps.
- Pump house vault gauge is not calibrated to any reference point. Kamman 2012 calibrated the instrument and created a conversion factor for NAAVD88 heights.
- Whenever cell indicates n/a, pump engineer did not make a recording for that day.

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
--o0o--

WILD EQUITY INSTITUTE, a
non-profit corporation,
et al.,
Plaintiffs,
vs. No. 3:11-CV-00958 SI
CITY AND COUNTY OF
SAN FRANCISCO, et al.,
Defendants.
/

`

Deposition of
JOHN ASCARIZ,
Wednesday, December 14, 2011

Reported by:
KIMBERLEE SCHROEDER, CSR, RPR, CCRR
License No. 11414
Job No.: 33712

A. That's for the small one can't keep up with the runoff that's coming from Sharp Park.
Q. Okay. She'll give you a level to set them at. Does she tell you both levels or just the small one?
A. You still only have one level. That's maintained in the shutoff at 2.0. The level goes over that, it's just a big pump. That's not the concern, is to try to get out the water, to maintain that 2.0 at all times.
Q. So she gives you sort of the lowest number?
A. That's where she wants to maintain that level. Anything over 2, we try to get rid of.
Q. Right. In terms of setting, I think if I'm understanding, there's sort of three floats. There's the lowest level, there's the shutoff for the small pump, and then there's the turn on for the large pump. Do I understand that right?
A. Yes, yes.
Q. In terms of the shutoff for the small pump, does she tell you what level to set that at?
A. 2.0.
Q. That's the lowest level? The next one up I'm trying to understand.
A. 2.3.
Q. Does she tell you 2.3?

A. No. That's our differential that we set that at.
Q. Why do you set it at 2.3?
A. For you don't short cycle the motor. For if you had the shutoff at 2.0 and had the float at 2.1, that pump would fluctuate and turn on and off in minutes. So you let the water get up a little bit and then the pump kicks on. So it has time to run to pump that water out.
Q. Why not have the pump turn on and off every few minutes?
A. You'll wreck it.
Q. What do you mean?
A. You're talking on and off on and on and on multiple times. You have a motor starter. It's not -- you try not -- you try to prevent that from happening on motors.
Q. So one of the goals is to preserve the motor, I guess; is that right? Trying to make sure the motor --
A. Yes.
Q. What will happen to it? When you say "wreck it," what does that mean?
A. You take a lot of wear and tear out of the motor. You got contacts. You got 260 volts flashing with contactors. You got carbon buildup on the

A. Yes.
Q. Do you sometimes see water flowing between the two?
A. Can't recall. The tulies are there. It's hard to see it. You don't see a big flow. Just filters really slow through all the tulies that are there.
Q. Do you see water in the channel?
A. Yes.
Q. Have you ever looked at the channel and seen there's no water in the channel?
A. No.
Q. So in your experience, there's always at least some water?
A. Yeah, residual water in that --
Q. That's what I wanted to ask, whether you knew about the level at which the connection between the Horse Stable Pond and Laguna Salada no longer exists?
A. No.
Q. You don't know anything about that?
A. No.
Q. We talked just for a second about how strong the pumps are. You talked about a smaller pump and a larger pump. What is the difference between the two?
A. Do you want me to give you a calculation on gallons? We got an estimated small pump, we're going to

pump out about a thousand GPM, and large pump --
Q. What is GPM?
A. Gallons per minute. And large pump, say about 6,000 GPM.
Q. When the small pump is on, can you see water flowing into the pump?
A. If you had something to sight it off of like a piece of tulie floating, very, very slow as it's moving in towards the pump, very slow.
Q. How about for the large pump?
A. Maybe just speed it up a little faster, not much.
Q. Does that change as the sediment builds up near the pump?
A. Unclear on what you mean by the sediment.
Q. The debris that you talked about.
A. Yeah, it would slow it down a little bit, yes.
Q. Why do you clear debris for the pump?
A. Just for it doesn't work it's way in.
Q. To keep it out of the --
A. Yeah. You got to keep it till it will actually, here's a screen. It will actually starts here, it will start working its way down here.
Q. The debris?
A. Yes. Keep that clear.

can keep it say estimated say we're going to keep it at 1.5, that will stop that golf course from flooding.

Q. The lower the number the more it's going to pump?

A. Yes.

Q. I got that right?

A. Yeah.

Q. So I guess one thing I'm still trying to understand, if we can, is how the growth of the tulies over time is impacting that number?

A. To not let the water come into the pump station.

Q. It's keeping the water out of the pump station?

A. Keeping it way up above. All those tulies is keeping like a dam and keeping all that water all up in the golf course instead of letting it flow down. You were saying through that channel creek is all grown where it's stopping the water from draining to our pump station.

Q. It's your understanding that at some point the pump is no longer draining the golf course; is that right?

A. Very slow.

Q. Very slow. Okay. And that's gotten worse over time as well; is that right?

Q. Right. I think we talked before about what the level is changed over time, say 2.3 --
A. Yes.
Q. -- at that point, the golf course would start to flood?
A. Yes.
Q. So if I'm understanding, with regard to the second part again before the frogs laying eggs, the goal that you've been told is to pump low so that the frogs won't lay eggs at a high level because if they did, you would have to maintain the water at that level; is that right?
A. Yes.
Q. Okay. But in the last winter, for example, the water level did go up; right?
A. Yes. I can recall, yeah, to the log book and the water level that year being high.
Q. Do you recall seeing the golf course flooded last winter?
A. Yes.
Q. And why did it flood if you had the pump set at this low level?
A. Because all the tulies.
MR. CLEMENTS: Objection. It's an incomplete hypothetical. It's vague. You can answer.

THE WITNESS: Because the tulies are growing and stopping our water from coming to the pumps. Then it floods all out. It's holding the water all out at the golf course instead of letting it come to our pumps for we can pump it out.

MR. CRYSTAL: Q. As far as you understand, let's say, were you there at a time -- the problem with the tulies it's gotten worse over time --

A. Yes.

Q. -- that you've been there?

Again, as best you understand from your experience, if the tulies were removed, then the pumps would be able to get the water out more efficiently; is that right?

A. Yes.

Q. And do you think that you would be able to keep the course from flooding if the tulies weren't there?

A. Yes.

Q. Even in a winter like last winter where there was a lot of rain?

MR. CLEMENTS: Objection. Calls for speculation.

MR. CRYSTAL: Q. Based on your experience.

A. Yes. It would do good with the pumps running. It would pump that water out.

level.
Q. Right. So if they wanted you to maintain a certain level, they can tell you to adjust the floats?
A. Yes.
Q. If the water was below that level, that would turn off the pumps?
A. Yes.
Q. If they weren't sure of the level, they might tell you to shut off the pumps?
MR. CLEMENTS: Calls for speculation.
MR. CRYSTAL: Q. That's right.
A. Yes.
(Plaintiff's Exhibit No. 12 was marked for identification.)
MR. CRYSTAL: Q. So giving you what's been marked No. 12, this is another page from the log book; is that right?
A. Yes.
Q. Again, your entries?
A. Yes.
Q. These are your notes?
A. Yes.
Q. So if you look at the entry for March 31st, I just want to talk about the numbers at the end of that entry where it says, "Small pump and large pump." Could

you read that for us?
A. "Small pump, 918.5, large pump 407.9."
Q. Again, what are those numbers?
A. Those are hour meters.
Q. That is telling you how many hours those pumps have operated?
A. Yes.
Q. Is that right?
So if you go to the -- actually, do it this way. Give you another exhibit.
(Plaintiff's Exhibit No. 13 was marked for identification.)
MR. CRYSTAL: Q. Giving you what's been marked No. 13, is this another page from the log?
A. M-hm, yes.
Q. These are your notes?
A. Yes.
Q. Is that right?
I just want to look at the bottom. You see the entry for December 7th, 2010?
A. Yes.
Q. At the very bottom of that, see where it says, "Small and large." Can you read those?
A. "Small 58.0, large 1.5."
Q. So what I wanted to do was compare. If I am

understanding right, December 7th, 2010, the reading on the gauge for small pump was 58, and the reading on the gauge for large pump was 1.5?

A. Yes.

Q. Those are the numbers of hours they had been running; is that correct?

A. Yes.

Q. If you switch back to page 90 that we were looking at, you read these other numbers, "Small pump, 918.5, large pump 407.9," those reflect the numbers of hours they had run as of March 31st, 2009?

A. Yes.

Q. If you take the number on March 31st and subtract the number on December 7th, for example, on the large pump take the 407.9 hours and subtract the 1.5 hours, am I right that would tell you how many hours the large pump ran between December 7th, 2010 and March 31st, 2011?

A. Yes.

Q. That's approximately 400 hours; right?

A. Yes.

Q. Am I right during the winter of 2010/11, from early December to late March, the large pump ran for about 400 hours?

A. Yes.

Q. How about the small pump?
A. You're looking at 900 about 30.
Q. It was 918 hours on March 31st?
A. Yeah.
Q. And ran for 58 hours already?
A. Right.
Q. It's between 850 and 900; is that right?
A. Right.
Q. That's the number of hours the small pump ran last winter?
A. Right.
Q. Okay. Just one more of these, and we should take a break.
(Plaintiff's Exhibit No. 14 was marked for identification.)
MR. CRYSTAL: Q. So another page of the log book, you see that the signature in the middle it says --
A. Mark Seigenthaler.
Q. Who's he again?
A. Mark Seigenthaler, he's my foreman.
Q. Does he ever -- does he monitor the pumps at the pump house?
A. Not really monitor them. Might go and do a review, overlook them.

Sharp Park

RECORD

Mori
Point

6/15/10 level at 2.1 cleaned intake ope check large pump 37090.
tulies are growing closer to pump house need to be removed J Ascary

7/26/2010 level at 1.8 check building and pumps tulie are growing close to pump house will have problems this year with flooding on north side J Aceny

8/16/2010 level at 1.6 came to meet with contractor. big motor installation.
small pump 28703.1 J Aceny
large pump 037104.2 on

10/19/2010 installed small pump. no more need for oilers central shops installed zert fitting on bearings
J Aceny
L Reyes

11/7/2010 raising case to turn small pump on for first time being relevant turned to auto hour meter .5 level at 20
J Arce
I Reyes

11/12/2010 meet with contractors to remove silt from intake lots of sand J Arce

11/20/2010 level 21 small pump off adjusted floats for water level to kg at 1.8.
#1 pump hour meter 2.0
#2 pump off line J Arce

11/21/2010 level at 22 pump came on hour meter 9.8.
J Arce
izzy

11/22/2010 level at 21 removed old airlis installed heat tape on small meter.
hour meter 12.2
J Arce

11/24/2010 level at 2.2 droped floats to turn on small pump to pump down to 1.8 hour meter 19.8

J Asay

11/25/2010 level at 2.1 reset to set floats for small pump stays on longer hour meter 21.8 J Asay

11/27/2010 level at 2.1 supose to rain all day. lowerd floats to kick on small pumps hour meter 21.8

John Asay

11/28/2010 level at 2.1 supose to rain. droped floats to kick on pumps. hour meter 34.4.

J Asay

12/3/2010. installed pump & meter ran pump to test amps

#1.106 #2 #107 #3 98

J Asay
N Helmering

12/5/2010 level at 2.1 ran big
pump for 20 min Hour meter
1.3 level 1.7 reinstalled floor
cleaned out garbage and
swept floor. left big pump
offline when pumping level drops
past low water level. need
to take 6" weir out might
help out small pump on line
hour meter 47.4.

J Ascoy

12/6/2010 small pump on around
level at 1.8 hour meter 56.7
water is just above weir.
pump shut off. 56.9

J Ascoy

12/7/2010
level at 2.1. came to
meet contractor to show him
loose angle iron, removed weights
from check valve small pump
came on. weir is set at 1.8
needs to be lowered contractor
will try and be out here
friday to fasten angel iron
so we could lower weir
small 58.0 large 1.5 John Ascoy

12/8/2010 pump on level at 1.9
raining all day small pump
doing good hour meter 63.9
large pump turned of.
J Arzy

12/9/2010 level at 1.9 pump running
pond water dirty
hour meter 79.1
J Arzy

12/13/2010 level at 2.1 greased small
pump hour meter 104.4
John Arzy

12/19/2010 Water level above
marker came in pump house
no power lost one leg
have lights no pumps
called PG&F meet with
him told him problem installed
new connectors on pole two
good problem down line
found broken wires he is
going to call out another crew
I took out 3 wires
J Arzy

12/20/2010 power restored
large pump running 3.8
level 3.1 small pump 132.2
330 level at 1.9 large pump
running 13.6.
J Arzy

12/21/2010 level at 2.6 big pump on. meet with Dan Mauer. droped level to 1.5 to pump down pond before rain and frogs laying eggs.
big pump 21.8 small pump 140.6
greased small pump.
raked intake screen clean
300 big pump shut off 1.6 25.3
lowered floats to shut off
@ 1.5 J Ascaiz

12/22/2010 level at 1.6 both pumps off. large pump 34.3
small pump 146.8
200 level at 1.5 big pump just turned off
small pump 149.8
large pump 38.3
small pump starts @ 1.9 J Ascaiz
large pump starts @ 2.1

12/23/2010 small pump running
level at 2.0 tulies are
letting water by slow
large pump 42.2
small pump 158.4
J Ascaiz

12/26/2010 5:00 AM small pump running
level at 2.0
small pump 215.0
large pump 50.9
11:30 level at 2.1 small
pump running greased
small pump pulled, pulled
out tafies from intake.
small pump 220.8
large pump 50.9.
J Ascay

12/27/2010 small pump running
level at 1.9. small pump
shut off small pump 239.6
large pump 50.9 J Ascay

12/28/2010 level at 2.0.
small pump start at 2.2½
large pump start 2.3½
try to maintain 2.0 - 2.2.
level in pond.
small pump 263.3 J Ascay
large pump 50.9

12/29/2010 5:30 AM level at 2.3½ rained
heavy last night large
pump on 61.0
small pump 264.6.
2:00 pm level at 2.2 large
pump running very windy
small pump 266.7
large pump 66.5

12/30/2010 6:00AM level at 2.1 big
pump running.
large pump 72.8
small pump 274.7
330 small pump running 280.7
level at 2.25
large pump 74.7
J Ascay

12/1 OP's New Year

1/1/2011 5:00AM level at 2.1½
small pump running
rained a little last night
small pump 317.4
large pump 75.3
J Ascay

1/2/2011 5:00AM level at 2.2
large pump running
rained heavey last night
large pump 75.6
small pump 339.5
J Asca

1/3/2011 level at 2.2 small pump
running no rain last
night just yesterday
small pump 361.3
large pump 77.9
J Ascay

3:00PM level at 2.1
small pump running
small pump 369.3
large pump 78.1 J Ascay

11/5/2011 level at 2.2 no pumps
running raked out intake
small pump 403.7
large pump 78.1
J Ascay

11/6/2011 level at 2.25 no pumps
running checked intake
small pump 407.6
large pump 78.1
330 J Ascay
was told to shut
off pumps. I shut
off probes on breaker
panel to further notice.
level at 2.1 J Ascay
small pump 411.9
large pump 78.1 J Ascay

11/10/2011 level at 2.5 turned
pumps back on
small pump 411.9
large pump 78.1
large pump come on J Ascay

11/11/2011 level at 2.1 pump off
small pump 422.5
large pump 78.9
300pm received call to raise
water level to 2.3
raised floats.
small pump 427.5
large pump 78.9
J Ascay

1/12/2011 level at 2.4 no pumps running.
small pump 427.5
large pump 78.9.
J Ascan

1/14/2011 level at 2.5 no pumps running. pump should come on soon.
small pump 427.5
large pump 78.9 J Ascan

1/17/2011 level at 2.5+ no pumps running nice morning
small pump 436.4
large pump 78.8
John Ascan

1/18/2011 level at 2.5 no pumps running small pump 439.0
large pump 78.8
J Ascan

1/23/2011 level at 2.5 no pumps running weather nice no rain in forecast
small pump 452.8
large pump 78.8
J Ascan

1-30/2011 level at 2.5 raining slightly
small pump 477.7
large pump 78.8
J Ascay

2-14-2011 level at 2.3½ started raining pump is running
small pump 499.3
large pump 78.8
Joh Ascay

2-15-2011 level at 2.5 no pumps running small pump 507.6
large pump 78.8
J Ascay

2-18-2011 level at 2.4 no pumps running rained yesterday
small pump 535.8
large pump 108.1
J Ascay

2-20-2011 level above marker rained heavy all day yester golf course floded large pump running small pump 539.4
150.3

2-21-2011 level at 3.0 top of marker no rain yesterday lots of run of water from hills
small pump 539.4
large pump 174.9
large pump running J Ascay

2-22-2011 level at 2.5½ large pump
running No rain yesterday
small pump 540.6
large pump 197.6
J Acey

2-23-2011 level at 2.5 small
pump running
small pump 550.1
large pump 209.2
added oil to oiler J Acey

2-24-2011 level at 2.6 small pump
running raked out infront
of in take large pump
started small pump 571.3
large pump 211.1
J Acey

2-25 2011 level at 2.6 large pump
running cleaned yesterday
small pump 590.3
large pump 214.6
J Acey

2-27-2011 level at 2.4½ small pump
running nice day no rain
small pump 642.0
large pump 218.1
John Acey

3-2-2011 level at 2.3¼ small pump running then shut off pump turns on at 2.6 turns off at 2.3¼.
small pump 680.2
large pump 218.1
J Ascary

3-6-2011
level at 2.4 small pump running. raining small pump 715.4
large pump 218.1
J Ascary

3-7-2011 level at 2.4 small pump running no rain small pump 728.6
large pump 218.1

3-9-2011 levele at 2.4½ small pump running pulled floats up to turn off pump. reset floats to turn off at 2.5 as told
small pump 745.2
large pump 218.1
J Ascary

3-13-2011 level at 2.5 small pump just shut off
small pump 751.5
large pump 218.1
J Ascary

3-17-2011 level at 2.5 1/4
raised yesterday.
small pump 801.2
large pump 218.1
J Ascay

3-19-2011 level at 2.8 small
pump running raked intake
of tulies. large pump
came on. greased small
pump. small pump 828.8
large pump 226.0
J Ascay

3-20-2011 4:50 level at 2.9 large
large pump running
lots of rain last night
checked dripper in
large pump small pump 831.7
large pump 242.4
J Ascay

3-21-2011 level at 2.6 1/2 raked
out tulies from intake
large pump running
checked oiler ok.
small pump 832.3
large pump 266.2
J Ascay

3-22-2011 level at 2.7 small pump running.
small pump 839.0
large pump 280.0
J Ascarz

3-23-2011 level at 2.6 large pump running rain heavy last night
small pump 854.8
large pump 287.1
J Ascarz

3-24-2011 level at 2.7 1/4 small pump running raked out intake of tulies
large pump came on
small pump 860.0
large pump 292.2
J Ascarz

3-25-2011 level at top of marker 3.3 rain heavy yesterday raked out tulies from intake.
small pump 867.5
large pump 319.2
J Ascarz

3-28-2011 level at 2.5 ½ no pumps running ~~on~~ raked out intake small pump 868.1
large pump 390.1
J Avery

3-30-2011 level at 2.7 ½ large pump running raked out tulies from intake
small pump 895.9
large pump 407.1
J Avery

3-31-2011 level at 26 small pump running raked out tulies added oil to res in large pump
small pump 918.5
large pump 407.9

4-4-2011 level at 2.5 ½
no pumps running
raked out intake
small pump 982.8
large pump 407.8

J Avery

4-25-2011 level at 2.6.
raked out tulies from
intake screen greased
small pum checked
oil in large pump res
small pump 1083.2
large pump 407.8
J Asay

5-18-2011 level at 2.6 raked
out intake of tulies
ops checked small and
large pumps ok
small pump 1117.7
large pump 407.9
J Asay

5-26-2011 level at 2.6 cleaned intake
screen small pump 1126.7
large pump 407.9
J Asay

6-10-2011 level at 2.6. cleared out
tulies from intake ops checked
small and large pump.
large pump 411.2
small pump 1196.0
J Asay

6-24-2011 received Email from
lisa wayne to drop level to
2.2 lowered probe to
2.2 set mark large pump
raw on small pump 1149.4
large pump 411.2
J Acary

7-8-2011 ope checked pump
station all ok
Graffite on side wall
will put in work order
to painter
small pump 12408
large pump 411.6
level at 2.3.
J Acary

8-30-2011 ope checked pumps
ran for two min
both pumps ok level at
2.0 small pump 01240.8
large pump 00411.6
J Acary

10-3-2011 level at 1.7.

Small pump 1240.9
lg. pump 411.6
Drilled holes for grease fitting access.
& ops checked fittings.

Tony
John

10-20-2011 - 16:00

Water level @ 1,875

Small Pump Hours 1255.7

Large Pump Hours 411.6
Removed Log book for phone copeing
M. Siegen

10-21-15:00 Returned Log book to Mori Pump Station
Water level @ 1,860 Pump hours same

M. Siegen

11-6-2011 level at 1.9 rained last night small pump 01257.8
large pump 00411.6
J Ascaz

11-17-2011 ope checked pump house. level @ 1.4
small pump 1260.0
large pump 0411.6

J Ascay

12-8-11 level at 1.9.
small pump @ 1296.8
large pump @ 4129

J Ascay

12-18-2011 returned log book
level at 1.9. floats set to turn off pumps at 2.0
small pump 01296.8
large pump 412.9

J Ascay

1-3-2012 received call from steve Flannery to lower floats to lower water level down to 1.5. dropped floats down large pump came on then set it to 1.5.
water level at 1.9
small pump 1296.8
large pump 413.0
oiler set in large pump to drop every 6 sec. greased small pump

J Ascay

1-4-2012 level at 1.8
small pump 1298.9
large pump 413.2
there are so many tulies
they are holding the water
back from coming into
the pump house. turned
on large pump to hand.
then turned off pump and
put to auto
J Asay

1-5-2012 level at 1.7
small pump 1301.8
large pump 414.4
ran large pump in hand
for 30 min to bring down water
level to 1.5. scrubbed marker
so it is readable. greased
small pump
J Asay

1-8-2012 level at 1.7
small pump 1307.4
large pump 414.4
J Asay

1-9-2012 level at 1.7
small pump ~~13~~ 1308.4
large pump 414.4
raked intake
J Asay

1-11-2012 level at 1.7
readjusted floats to pump
water down to 1.2
the stulers are holding water
back need to clear pathway
small pump 1309.4 J Asevy
large pump 414.8 Izzy Kenyer

1-13-2012 level at 1.3
small pump 13 ~~20.8~~ 21.0
large pump 414.8.
J Asevy

1-17-2012 level at 1.3
small pump 1327.8
large pump 414.8
greased small pump
raked intake
J Asevy

1-21-2012 level at 1.3
raked out intake.
small pump 1343.0
large pump 418.9
rained last night
J Asevy

CCSF097029

1-23-2012 level at 1.4
small pump 1370.0
large pump 420.0
greased pump raked
out intake.
J Ascary

1-28-2012 level at 1.4
small pump on
small pump 1407.5
large pump 420.6
J Ascary

1-30-2012 level at 1.4
small pump 1415.7
large pump 420.0
turned small pump
and large pump off
per steve flannery request
J Ascary

2-11-2012 level at 1.8
was told to turn pumps
on and set float level
to turn off at 1.9.
per [illegible] Wayne request
small pump 1415.7
large pump 420.0
J Ascary

2-15-2012 level at 1.9
cleaned intake checked
oil in large pump
greased small pump
small pump 1415.7
large pump 420.0
J Ascary

2-29-2012 level at 2.0
intake clean
small pump 1415.7
large pump 420.0
ops checked pumps J Ascary

3-18-2012 level at 2.0
cleaned intake
small pump 1416.5
large pump 420.0
J Ascary

EXHIBIT C

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LAGUNA SALADA
RESOURCE ENHANCEMENT PLAN

Prepared for:

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and
The State of California Coastal Conservancy

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and

Associated Consultants:

Todd Steiner

John Hafernik

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#621

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Wharton et al. (1987) noted other occasional prey to include earthworms, leeches and pond snails, and a previously killed rodent. Although Wharton et al. (1987) did not quantify age-specific food habits of the SFGS, they mention newborn snakes taking fish, but suggest that fish may be taken only when no other appropriate size food items were available. McGinnis (1986b) reported that a newly born snake from Mori Point taken into captivity would only eat small worms and young of the year California slender salamanders (*Batrachoseps attentuatus*).

iii. Competition

Competition between SFGSs and conspecifics has been considered to be an important factor in the recovery of the SFGS (McGinnis 1984, 1986; USFWS 1990). However, no data exist to support this contention. Competition between snake species has rarely been demonstrated (Reichenbach and Dalrymple 1980), and has not been shown to occur between SFGSs and other closely related species and subspecies.

McGinnis (1986a) emphasized the importance of competition in the recovery of SFGS because he reports that he has never found SFGSs when "(A) a pond frog species was not present, and (B) when the two other coastal garter snake species were present." However, Jennings (pers. comm.) reports finding RLF, both coast and Santa Cruz garter snakes at all locations where he has observed SFGSs (Pescadero, Waddell, Ano Nuevo). Sean Barry (pers. comm.) has reported similar results for a number of sites he investigated. Of the ten sites where Fox collected SFGSs, all three species of garter snakes were collected at five sites, two species were collected at three sites and only SFGSs were collected at two sites. The semi-aquatic habitat and food habits of the SFGS suggest that it is intermediate ecologically between the more aquatic Santa Cruz garter snake and the more terrestrial coast garter snake and may be more likely to be found when the two conspecific species are present.

iv. Mortality

SFGSs are known to be killed on the roads (Sean Barry, pers. comm.) and in mowing operations (Dalrymple and Reichenbach 1984). Mortality from vehicles and mowing operations are considered important mortality factors which can be reduced by proper management as demonstrated for endangered garter snakes in Ohio and endangered rattlesnakes in Missouri (Siegel 1986).

No known predator specializes on garter snakes in the study area. Carpenter (1952) and Fitch (1965) report a number of garter snake predators which are found in and around Sharp Park including several hawks, herons, racers (*Coluber constrictor*), raccoons (*Procyon lotor*), skunks (*Mephitis mephitis*) and opposums (*Didelphis marsupialis*). Foxes (presumably the introduced red fox, *Vulpes fulva*, a specimen which was positively identified from a dead animal seen in nearby Calera Creek, although grey foxes, *Urocyon cinereoargenteus*, are native to the area) were seen in Sharp Park and are also common in the area. Carpenter

(1952) also reported large crayfish and frogs as garter snake predators. Large crayfish, presumably an exotic species from Louisiana (Mark Jennings, pers. comm.) are common at Sharp Park.

c. Distribution

The SFGS is restricted in geographic distribution to San Mateo and northern Santa Cruz counties and only a few viable disjunct populations are still known to exist (USFWS 1985). Beginning in 1946, Sharp Park has been surveyed for SFGSs several times. The results of these surveys indicate that in the mid-40's SFGSs were abundant, but that by the late 70's the population was greatly diminished. Barry (1978) suggested that their depleted numbers were primarily the result of commercial collection for the pet trade, based on interviews he conducted with reptile dealers. However, in 1979 Barry (1979) located thirty seven SFGSs in the wetland area adjacent to Horse Stable Pond and 46 SFGSs were observed on Mori Point, primarily in the "bowl" area. Barry hypothesized that... "the bowl is apparently of considerable importance to perhaps the entire Laguna Salada [SFGS] population..." and stated that the small number of recaptures of individuals in the bowl area suggests that the snakes were primarily using the area as a migratory corridor.

McGinnis made five different surveys of Sharp Park and Mori Point between 1984 and 1989. In several hundred survey-hours and thousands of trap-hours, only two SFGSs were observed; one giving birth and another lone adult, both on the far western end of Mori Point.

d. Occurrence at Sharp Park and Adjacent Areas

i. Methods

Surveys conducted during this study consisted of walking systematic transects around Laguna Salada, Horse Stable Pond, connecting canals and adjacent marshes and the creek. In addition, all unmowed areas were surveyed at least twice. All species of reptiles and amphibians encountered were recorded. Following winter rains, the study area was surveyed for the presence of temporary ponds. Surveys were conducted between May 1990 and May 1991. In addition, a reconnaissance survey was performed in January 1992. Sixty-eight hours were spent in Sharp Park (includes Laguna Salada, greater golf course area west of Highway One including Sanchez Creek, Horse Stable Pond and stable area) and thirteen hours were spent on Mori Point. No traps were used during this study.

Habitat was assessed qualitatively for availability of food, cover and over-wintering sites. In order to provide historical perspective in habitat changes over the last two decades a one-day survey was conducted with Sean Barry (University of California, Davis), who had previously studied the status of SFGSs at Sharp Park in the 1970s. In addition, a half-day was spent in Sharp Park east of Highway 1 following the creek up through the rifle and archery range, and site visits were made to Pescadero Marsh, San Francisco Airport and

Ano Nuevo to view additional habitats presently in use by SFGSs. Common and scientific names for reptiles and amphibians used in this report are those of Collins, et. al. (1978).

ii. Results

1) Present Status

No SFGSs were located in Sharp Park, but three juvenile SFGSs were found at Mori Point: two together on surveys in 1990-1991 and one in January 1992 (Figure 34). Two hundred ninety seven observations of garter snakes were made in Sharp Park. All positively confirmed sightings were of the coast garter snake (*Thamnophis elegans terrestris*). Approximately 40 garter snakes moved out of view before a positive identification could be made.

Although no SFGSs were located at Sharp Park proper during this study, Laguna Salada, Horse Stable Pond, the connecting canals and associated wetlands are most probably important feeding areas for existing SFGSs which still occur in the vicinity. The lack of observations suggests that populations remain significantly reduced compared to the historical records of Fox in the 1940s and Barry in the 1970s (1978, 1979). A number of factors have been identified as possible reasons for the decline (McGinnis 1986a, USFWS 1988) and are discussed below.

2) Prey Abundance

Small choruses of Pacific tree frogs were heard both day and night following winter and spring rains but no tadpoles or egg masses were located. No more than five tree frogs were found on any given survey around Horse Stable Pond and the connecting canal. Tree frogs were heard calling near a drainage ditch that runs off the golf course into Laguna Salada on its east side, but none in or around Laguna Salada itself.

The only earthworm and salamander populations were located under the isolated debris in patches of Monterey cypress. Whether earthworms are numerous in the soil under the golf course grass was not determined. Slugs were common in marshes and were found in the stomachs of numerous coast garter snakes. Small fish were common along the edges of Laguna Salada, Horse Stable Pond, Fairway Drive Creek and the connecting canal.

Additional feeding areas are present south across Mori Point to Calera Creek; these areas contained prime feeding habitat (McGinnis 1990) that was severely degraded recently, but is in the process of being restored (Michael Vasey, Pacifica City Council and San Francisco State University, pers. comm.). Mori Point may also provide alternative feeding sites at temporary ponds that form after heavy rains during winter and spring. McGinnis (1986b) previously reported a lack of salamanders on Mori Point except at one location at the far western end of Mori Point, but the present study recorded an abundant supply of slender salamanders, earthworms and slugs during the wet conditions of winter and spring.

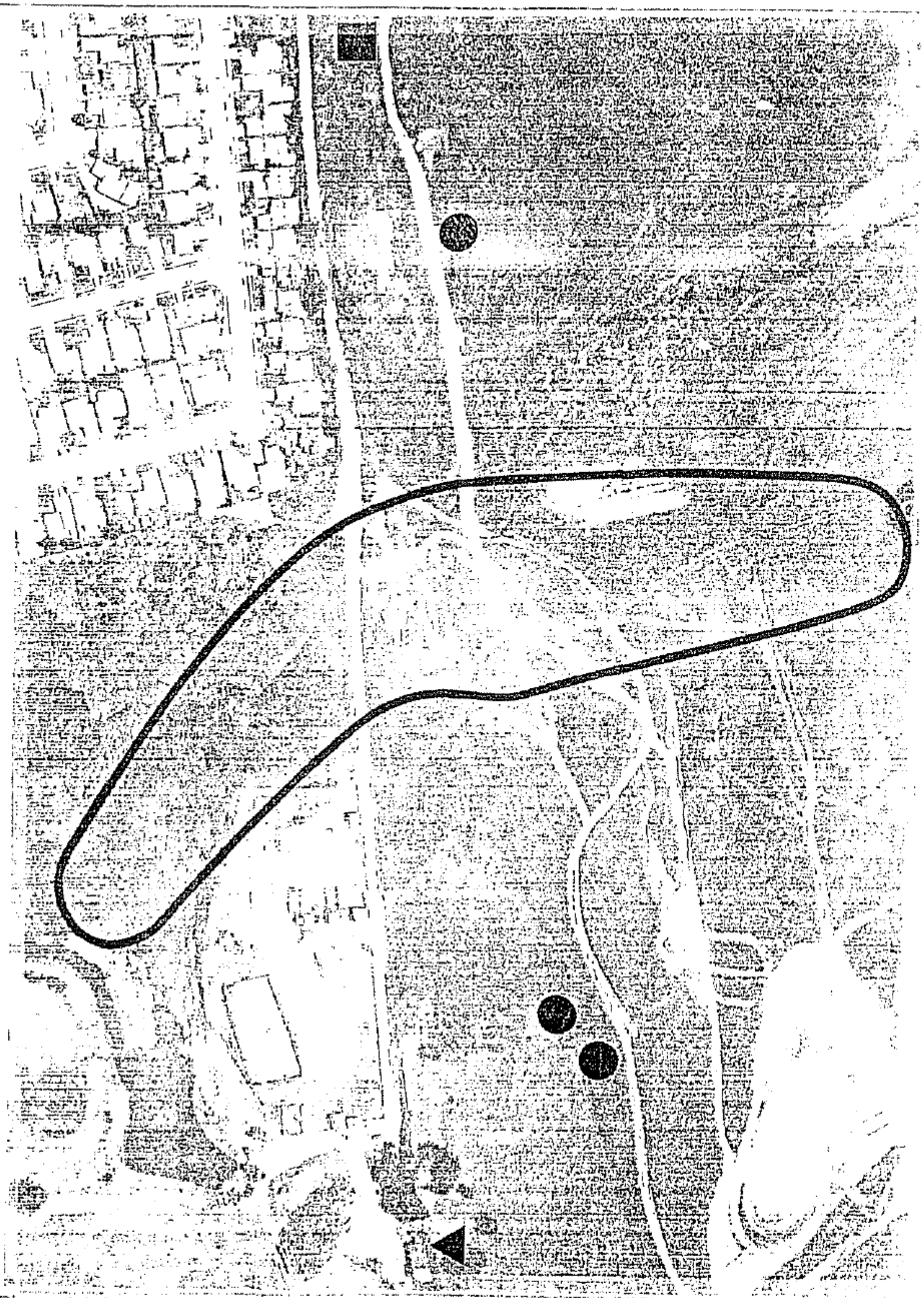

Figure **34** Location of SFGS sightings from present study (square), McGinnis, 1986b (triangle), and Barry, 1978b (circles indicate single sightings, solid line denotes area of multiple sightings).

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The large-scale salt water intrusion into the lagoon and pond during the mid-1980's undoubtedly caused amphibian populations, SFGS primary prey, to decline sharply. Once viable, reproducing frog populations are reestablished, the area will provide much greater foraging habitat for SFGS.

3) Habitat Assessment

Overall size of marsh habitat at Sharp Park has not changed dramatically since Barry's study in 1978 (Sean Barry, University of California, Davis, pers. comm.), although several years of drought conditions probably have reduced hydroperiods significantly during the last five years. McGinnis's (1986a) description of Laguna Salada proper also mirrors present conditions

Laguna Salada proper provided partial cover for snakes along most of its margin, except for open sandy areas along the western side. The abundance of aquatic organisms appeared to decrease as one moved from south to north, and this included frogs, fish, and aquatic insects. In general, prey levels of frogs were low, although small fish were common.

The connecting canals provide good cover for SFGSs and frog and fish prey availability. They also provide cover for movements between Laguna Salada and Horse Stable Pond. McGinnis rated the canal areas connecting Laguna Salada and Horse Stable Pond as prime SFGS habitat, and this area also provided significant numbers of sightings of coast garter snakes during this study. Good cover and abundant prey items suggest that this area remains important feeding habitat for SFGSs. Presumably, the canal also provides migratory paths for snakes from Laguna Salada south to Horse Stable Pond and Mori Point.

Sanchez Creek provides adequate cover for SFGSs along its western terminus where it meets Horse Stable Pond. In other areas the creek either passes underground or is overshadowed by dense cypress and has little or no vegetation. In these areas, Sanchez Creek provides poor frog and fish habitat and little SFGS cover.

Horse Stable Pond provides good cover for SFGSs along its southern edge. The northern and western edge of the pond had adequate cover at the beginning of the study, but winter freezes followed by heavy storms reduced cover significantly. By summer of 1991, new vegetation provided adequate cover. Horse Stable Pond had the highest concentration of frog and fish prey items and provides excellent feeding habitat for SFGSs.

No natural upland habitat, which is now believed to be important to SFGSs (McGinnis and Keel 1987, USFWS 1988), exists on the golf course west of Highway One. The artificially created berm which separates the Pacific Ocean and the golf course currently has little vegetation on it and does not now appear to support any small mammal burrows which are thought to serve as overwintering retreats (McGinnis 1988).

Mori Point is separated from Horse Stable Pond by an abandoned stable area which contains a ring of tires, old barns and a number of old bathtubs. At the time of this study, the area is overgrown with grasses reaching a height of three feet and provides a dispersal corridor for SFGSs onto Mori Point and excellent foraging habitat. This upland area is the only upland habitat within Sharp Park and is an important habitat for SFGSs and the other special status species.

The privately owned uplands on Mori Point are critical to SFGS. These uplands provide overwintering sites, a corridor between Sharp Park and Calera Creek, and alternative feeding areas. In fact, since Barry (1978) located two SFGSs at Sharp Park, subsequent surveys have only located snakes on Mori Point uplands and at Calera Creek on the southern side of Mori Point. USFWS (1985) stressed the need to understand movements and activity patterns to properly manage the SFGSs. Site specific movements and activity patterns for Sharp Park remain unknown, except those reported by Barry (1979) that suggest that SFGS movement between the southern marsh area at the east end of Horse Stable Pond onto Mori Point.

The population status of the SFGS at Sharp Park remains critically low following heavy collection pressures in the 1970s, marine intrusion and drought conditions in the 1980s and the continued degradation of adjacent upland and feeding habitats at Mori Point and Calera Creek. The success of enhancement plans for the recovery of the SFGS at Sharp Park is intricately tied to protection and recovery of these adjacent habitats.

Although no SFGSs were found in Sharp Park during the present survey, the area probably serves as an important feeding habitat for the small population of SFGSs of the region, including those located on Mori Point. Furthermore, Horse Stable Pond, Laguna Salada and the connecting canal currently support RLF, the most often mentioned prey item for the SFGS.

3. Red-legged Frog

a. Introduction

The red-legged frog (*Rana aurora draytonii*) is a Federal candidate species for listing under the Federal Endangered Species Act (Federal Register, January 6, 1989, Volume 54(4):554-579) and will probably be recommended for federal listing within one year (Mark Jennings, California Academy of Sciences, pers. comm.). It is also considered a species of special concern by California Department of Fish & Game.

b. Natural History

RLF feeding habitats have been the subject of quantitative analysis (Hayes and Jennings 1989). These investigators found RLFs were found in aquatic habitats that included "some area with water at least 0.7 m [2 feet] deep, [and that] had a largely intact emergent or shoreline vegetation." Shrubby willows (*Salix* sp.) were recorded at 67% of the sites. Adult frogs seemed especially sensitive to the need for dense vegetation and deep water as only juvenile frogs were found at sites where vegetation and water depth were limited.

c. Occurrence on Site

i. Methods

Between may 1990 and May 1991, four surveys (7 hours) were spent at Sharp Park after dark surveying for frogs that are primarily active at night (Mark Jennings, California Academy of Sciences, pers. comm). Special attention was given to RLFs, a federal candidate species, which may be an important prey species of SFGSs. One survey for RLFs was conducted in November with Drs. Mark Jennings and Marc Hayes, who have both been involved in extensive studies of this species, and are presently determining its status in California under contract to California Department of Fish & Game.

ii. Results

On warm days throughout the study period, juvenile RLFs were common around Horse Stable Pond and along the connecting canal. Up to 100 juvenile frogs were counted around Horse Stable Pond during one survey in May, undoubtedly a small fraction of actual number of frogs present. In comparison, less than 20 frogs were counted around the west, north and southern end of Laguna Salada proper, an area vastly larger than the small Horse Stable Pond. RLFs were rarely seen along Sanchez Creek, although some individuals were located under debris and in some temporary ponds near its terminus with Horse Stable Pond.

Adult RLFs are nocturnal and few were seen during nocturnal or diurnal surveys, although one large individual was located along the connecting canal. No choruses of RLFs were heard and no egg masses or tadpoles were seen during the surveys in 1990 and 1991. However, in March 1992, following a month of significant rainfall, numberous RLF egg masses were found at Horse Stable Ponds. The pumping of water out of Horse Stable Pond and the resultant exposure of shoreline was causing massive frog egg mass mortality.

The small number of adult RLFs present in Laguna Salada and Horse Stable Pond suggest that either the present frog population is relatively new and/or few breeding sites are available. Both are probably true. McGinnis reported no frogs in 1986 and five years of drought have reduced the reproductive success of this species at many sites (Mark Jennings, pers. comm.). Much of the present sites at Sharp Park do not offer adequate vegetative structure for breeding (Hayes and Jennings 1989; Mark Jennings, pers. comm.); for example, Sanchez Creek is currently too shallow and does not provide adequate vegetational structure to support RLF. Despite significant rainfall in 1991, no tadpoles or eggs of this species were located.

The low number of RLFs in Laguna Salada may also be due to inadequate vegetational structure and shallow water conditions (< 2 feet) along the edges of the lagoon. The possibility also exists that predatory fish are present in Laguna Salada. Sweeney (Sharp Park superintendent, pers. comm.) noted reports of bass in Laguna Salada, although he had no first-hand observations. Hayes and Jennings (1989) mentioned the elimination of RLFs at many locations following introduction of predatory fish.

Red-legged frogs are "explosive breeders", reproducing in a veryt short period of time following heavy rains as occurred in February 1992. The frogs by their eggs near the water surface attached to emergent vegetation. This reproductive behavior is disastrous with the present system of pumping down water levels following large rains. Egg masses are then exposed and dessicate. Those that hatch may be mpum,ped out to sea as indicated by the large numbers of fish pumped out in 1991. Hence, either water should be held in the system consistent with flood constraints or pumped out the north end of the lagoon.

4. <u>San Francisco Forktail Damselfly</u>

a. Introduction

The San Francisco forktail damselfly *(Ischnura gemina)* has the most restricted distribution of any western damselfly or dragonfly. The FTDF is associated with coastal and San Francisco Bay wetlands. Prior to human impacts on these areas, it probably was associated primarily with sluggish freshwater streams and marshes. Such wetland areas are now seriously threatened by urbanization, channeling of creeks, and other human activities. Because of threats to its survival and its association with threatened biological communities, this species is a Category 1 federal candidate for listing as an endangered or threatened species. It is also listed by the International Union for the Conservation of Nature (IUCN) as an endangered species. Recently, it has been used in a photo-essay as a symbol of threatened California invertebrates (Middleton 1988) and was included in an exhibition of photographs (**Sliding Towards Extinction: The Disappearing Wildlife of California**) co-sponsored by the California Academy of Sciences and the Nature Conservancy.

Current concern centers around the negative effects that rapid changes in Bay Area wetlands are having on this species. Most of its habitats have been greatly altered or eliminated. These alterations probably greatly restrict the area that can support this species, and threaten the existence of many colonies. In the past 12 years many colonies have been extirpated by development and habitat alterations (Hafernik, pers. obs.). Hybridization with closely related species in areas highly disturbed by humans also pose a significant threat to

IV. SUMMARY OF OPPORTUNITIES AND CONSTRAINTS

The existing conditions described in the previous section represent both opportunities and constraints for enhancement.

From a hydrologic perspective, the historical transition from a saline or brackish wetland to fresh water has allowed the development of endangered species habitat. Past ocean wave incursions represented catastrophic reversals back to saline conditions. The recent completion of the seawall should greatly reduce future catastrophic changes. However, these may still occur, and the opportunity exists to develop a response plan should ocean incursion recur.

Existing water sources are generally capable of sustaining a viable wetland. Late-summer dry periods have resulted in low water levels. In conjunction with some shallowing due to sand input from wave overwash, emergent vegetation is encroaching into previous open-water areas. Better water management and dredging of some areas could restore open water areas.

The present water discharge system (pumps and gravity culvert) is old and has deteriorated. A modern larger-capacity system would reduce flooding and improve water management. However, periodic high water levels from freshwater flooding primarily affects the golf-course operation. If sufficient upland refuge is available, vegetation and wildlife species will survive. Thus, major expenditures on flood control facilities are probably not warranted solely on the basis of wetland enhancement.

Biologically, four special status species are known to occur on or near the Sharp Park study area: San Francisco garter snake (SFGS), red-legged frog (RLF), San Francisco forktail damselfly (FTDF), and salt marsh yellowthroat (SMYT). The four special status species generally have compatible habitat requirements and therefore none of the proposed manipulations would result in decreased habitat values for any one species. The SMYT, FTDF and RLF are currently present albeit in relatively low numbers. The SFGS was historically found at Laguna Salada and is currently found on the adjacent Mori Point property. Because all four species are currently found on or near the study area, there is every expectation that the enhancement plan should (a) improve habitat conditions for these species, (b) increase use of Sharp Park and the surrounding area, and (c) increase their local population sizes to decrease the danger of extinction.

Sharp Park is publically held and not threatened by further development that would otherwise threaten the special status species. Nevertheless, the use of Sharp Park as a golf course and for public access to the coast has potential impacts for wildlife. However, public access impacts may be avoided with barriers in critical habitat and through public education. The USFWS Recovery Plan (1985) for the SFGS mentions the need to control heavy foot travel around waterways. Foot traffic continues to be heavy around the edge of the marsh areas, primarily by individuals collecting golf balls.

Any future expansion of traffic on the road between Sharp Park and Mori Point needs to be mitigated to prevent road killed SFGSs. Apparently, a ban of off-road vehicle use has not been effective (Michael Rothenberg, President, Pacificans for Mori Point, pers. comm.). Mori Point presently receives a large amount of recreational use. Hikers, bikers, off-road vehicles (including 4-wheel drive trucks, 3-wheel ATCs and motor bikes), parasailers, bird-watchers, and people walking their dogs were all observed in the area. The most detrimental activities to wildlife presumably comes from off-road vehicles which have scarred the landscape, eliminated vegetation and caused erosion. The area is also used as a dump with piles of mattresses, old cars, and trash.

Critical habitat is either privately owned or is immediately adjacent to private land in the Mori Point area. Hence, many of the enhancement suggestions at Horse Stable Pond, the marsh to the east, and the upland area to the south will be greatly affected by the extent and type of development. This is particularly true for the SFGS as it was only found on Mori Point and Mori Point is considered an important dispersal corridor for the snake.

Natural disasters, such as the storm surge that caused high salinities in the freshwater habitats at Sharp Park, should be anticipated to occur infrequently even with the recent additions to the sea wall. Such disasters may eliminate critical habitat for the special status species and alternative habitats should be provided. Water salinity was quite low during this study indicating Laguna Salada and Horse Stable Pond have returned to freshwater. McGinnis (1984) indicated salt-water intrusion had occurred two years previous to his 1984 survey based on interviews with golf course personnel, and he measured salinities in 1986 (McGinnis 1986b) which he believed too high to support RLF.

Finally, low water quality due to run-off from the golf course and other nearby housing developments may pose a threat to aquatic animals. Chemical treatments of the golf course, mentioned as a possible threat by USFWS (1985), may impact FTDFs and RLFs and other amphibians.

V. ENHANCEMENT PLAN OBJECTIVES

In determining the need for an enhancement plan for Laguna Salada, the City of San Francisco and the State Coastal Conservancy identified four broad goals:

- Preserve and enhance the site for endangered species, particularly the San Francisco garter snake.

- Protect and improve wildlife habitat.

- Provide for long-term, beneficial management and maintenance of the wetland.

- Coordinate with the City of San Francisco on any adjacent construction projects, particularly the sea wall.

During the collection of data on existing conditions and based on input from the interagency advisory group, these general policies have been refined as a series of specific goals. Although all of the goals are important, those relating to endangered species are critical. For several species, the site represents one of the most crucial areas of remaining habitat. The enhancement plan elements in Chapter VI are designed to respond to each of the following goals.

A. CRITICAL SPECIES GOALS

1. Determine the occurrence of target endangered species using the site at present.

2. Identify specific areas and habitat types being used by endangered species on the site.

3. Protect and manage existing habitats for endangered species.

4. Expand endangered species habitat by modification of adjacent areas to conditions favorable to the species.

5. Provide new information as feasible on the occurrence, behavior and overall natural history of the target endangered species.

6. Provide information on the role of adjacent off-site areas in the regional protection and enhancement of endangered species habitat.

B. MULTIPLE SPECIES HABITAT

1. Enhance existing degraded wetlands to improve overall wildlife habitat on the site.

2. Identify potential wetland expansion areas.

3. Improve riparian habitat along Sanchez Creek.

4. Improve upland habitat.

C. HYDROLOGY

1. Develop a water management plan to protect and enhance endangered species and maximize resource values without compromising adjacent flood control needs.

2. Identify current flood hazards (with completion of the sea wall). Recommend flood control strategies that are compatible with resource needs.

3. Discuss the feasibility of using tertiary-treated waste water (when and if it becomes available) to supplement natural freshwater inflow.

D. PUBLIC ACCESS

1. Manage public access to promote views of the site and use which is compatible with the natural resource values of the site and with the golf course operation.

2. Identify appropriate buffer zones to reduce human and domestic/feral animal intrusion into sensitive wildlife zones.

3. Discuss the impact of poaching on the SFGS.

4. Discuss possible educational opportunities.

E. COMPATIBLE LAND USES

1. Provide recommendations to the Golf Course Management regarding reconstruction of the former hole between Laguna Salada and the levee.

2. Provide information on the role of adjacent off-site areas to the ecology of critical species.

3. Discuss the role of off-site development on flood hazards.

4. Evaluate the role of the sea wall to the overall Laguna Salada Enhancement Plan.

VI. ENHANCEMENT PLAN ELEMENTS

A. PLAN OVERVIEW

The recommended plan focuses on the management and enhancement of the special status wildlife species found on or adjacent to Sharp Park. However, the recommendations will improve conditions for a variety of additional species. The plan recognizes that existing conditions are suitable for all four of the special status species and a dramatic major reconfiguration of habitat is not recommended. Instead, an overall water management program and specific, localized enhancement measures are recommended. The critically low number of individuals of some species suggests a cautious approach to developing or modifying adjacent off-site areas.

The format of the enhancement plan is as follows. In the first section, we make recommendations for the overall water management of the entire wetland system. Following this, the habitat needs of the four special status species, and specific enhancement features at each of the major components of the Laguna Salada system that meet their needs are listed.

B. WATER MANAGEMENT PLAN

It is clear that management of water levels and quality in Laguna Salada is crucial to both the overall habitat quality and to the enhancement of critical species on the site. In addition, it is a key element in the management of the golf course, particularly during floods. Water management may be separated into four broad categories:

- Water level management
- Management during floods
- Water quality management
- Supplemental water supply

These are discussed in the following sections.

1. Water Level Management

During the course of the year, the water level in the system fluctuates in response to water inputs (winter rainstorms, groundwater inflows, irrigation on the golf course, and periodic flows down Sanchez Creek) and outflow (pumped outflow, flow out the gravity culvert, evaporation, and seepage). Many of these factors are uncontrolled, and the water surface elevations rise and fall in response to the natural variations. During the study period, water levels varied between about 3 ft. and 5 ft. NGVD, reflecting non-flood conditions. The optimum range for water surface elevations from a natural resource perspective is between 4 and 5 ft. NGVD. Above these, flooding of the golf course begins, while below 3.5 ft. NGVD, shallow water depths permit emergent vegetation (tules and *Scirpus*) to invade. Considering the flood hazards, it would be preferable to maintain water levels between 4.0 and 4.5 ft. Somewhat lower winter water levels (about 3.5 ft. NGVD) would be acceptable if the summer levels could be kept above 4.0 ft. Our primary concern has been that summertime elevations below 4.0 ft. are allowing encroachment and loss of open water by emergent vegetation. The main elements which allow some control over water levels are:

- The capacity of the pumps
- On-and-off level settings for pump controls
- Flow out the gravity culvert

a. Pump Sizes

The pumps are clearly undersized to prevent flooding of the golf course. In addition, they are old and in relatively poor condition, and should eventually be replaced. Our modeling results suggest that pumps with a capacity of 30 to 100 cfs will be required to reduce major flood hazards. However, their performance is more related to flood protection than resource enhancement. In addition, the cost of a new or substantially upgraded pump station would be high ($0.5 to $1.0 million) and is probably not warranted solely for flood reduction purposes. It should be noted that all rainfall runoff in the watershed eventually ends up in Laguna Salada and must be pumped out. Thus, any new development or roads in the watershed will increase flood hazards and pumping requirements. As such, a drainage fee should be leveed on development which can eventually be used to improve the pump system.

b. Pump Level Controls

Our surveys indicate that the pump level controls are currently switched on at 4.3 ft. and off at 3.2 ft. NGVD. The latter elevation is too low, if subsequent winter inflow does not raise the water level back to about 4.0 ft. We would prefer to have the pumps shut off at either 4.0 ft. or 3.75 ft. Typically, the level sensors are set with about a 1-ft. difference between on and off settings to prevent frequent "cycling" (on-and-off switching, which wears the pumps out more quickly). It is not clear if this would be a problem for these relatively small pumps. Some experimentation would be in order. If cycling is a problem, the on-and-off settings could be adjusted to 4.5 ft. and 3.5 ft. respectively. Cycling will be less of a problem when the connector channel is deepened, as both Laguna Salada and the Horse Stable Pond will function as a single pond in these elevation ranges.

Considering both the flood control needs of the golf course and the water depth needs of the wetlands, the preferred solution would be to operate the pumps differently during the rainy season and the dry season. During the winter (October through March or April) the pumps could be operated as they currently are (on at 4.3, off at 3.2). However, as discussed under the section on red-legged frogs, rpid pumping after high-rain periods may drop water levels precipitously, thereby exposing RLF egg masses to dessication and washing larvae out of the pond into the ocean. During summer, the water levels would be maintained at 4.0 to 4.5 feet, and the pump level controls either reset to a higher level, or turned off. This may require addition of some water following the rainy season (when levels could be as low as 3 feet) and throughout the dry season to maintain water level. TTWW would be a likely candidate to supplement the natural surface of groundwater inflow.

c. Gravity Flow Culvert

The 2-ft. diameter outflow culvert from the Horse Stable Pond to the Pacific Ocean is also in poor condition. The inlet side in the Horse Stable Pond (pipe invert elevation = 3.3 ft. NGVD) has about a foot of sand in it. The outlet end on the beach is buried under about five feet of sand. To be useful during a flood, the discharge end is located by water seepage and excavated with a backhoe.

Similar to the pump station, the primary role of the culvert is for flood control; at present, it does not have a major role in the natural resource functioning of the ponds. However, despite being partially blocked, it may be allowing summertime seepage and contributing to the undesirable low water levels.

Major upgrading of the gravity outflow system for flood-control purposes would be expensive. Our hydraulic modeling shows that the existing 2-ft. diameter pipe should be replaced by one or two 4-ft. diameter pipes to effectively remove large amounts of water in a major rainstorm. To prevent blockage by wave-transported sand on the discharge side, the pipes would have to extend beyond the beach into subtidal water. This would probably require that they be attached to the current pier structure that supports the pump discharge pipe. The discharge ends of the pipes would be equipped with flap gates to prevent seawater backflow into the pipes. The cost to install 300 ft. of twin 48-inch pipes with headwalls and flap gates in this difficult working environment would probably be between $250,000 and $350,000. Their long-term functioning in the harsh marine environment is uncertain. For these reasons, this is not likely to be feasible at this time.

For natural resource enhancement, control of water surface elevation and seepage prevention out of the gravity culvert are desirable. To accomplish this and improve the existing inlet conditions, the inlet area should be dredged and the culvert cleaned. (This may be accomplished by excavating the discharge end of the culvert and flushing the culvert with a high-pressure water jet.) The inlet end of the pipe should be fitted with a flashboard weir. To control water levels, the flashboard should be set at 4 ft. The flashboard weir will reduce blockage of the east end of the culvert from sediments in the pond. (Sand blockage from the beach will continue to affect the pipe.) A staff gage should be installed on the pump house to allow direct reading of the water elevations.

2. Management During Floods

As discussed in the Existing Conditions section, Laguna Salada and the golf course are subject to flooding from two sources: freshwater flooding during periods of extreme rainstorms and seawater flooding during periods of wave overwash. From a natural-resources perspective, the main adverse effect of rainfall flooding results from inundation of habitat. This can be partially mitigated by providing higher ground refuge, with adequate vegetation cover to prevent mortality from predators. This is discussed further in subsequent sections. Aside from this, the water level should be returned to the recommended 4-ft. operating elevation as soon as possible. Periodic flooding of wetland habitats is a natural phenomenon and (except for economic damages to developed areas) not adverse to the ecological system. As discussed in the previous section, measures to control flood levels (larger pumps and discharge culvert) would be expensive.

Seawater flooding has had much more serious consequences for wildlife, particularly the RLF and SFGS. Prevention of high salinity levels is justified for the preservation of these species. The newly-constructed seawall will dramatically reduce seawater flooding. The two main factors in its success will be frequency of overtopping and long-term stability. Constructed with a top elevation of 25 ft. NGVD, the levee will only be overtopped infrequently. Water volumes during overtopping will likely be low, assuming the levee remains intact.

If overtopping does occur, the City should monitor salinity levels in the lagoon. Pond salinity has dropped from 7 to 10 ppt during the 1983 and 1986 overwash periods to present levels below 1 ppt. If levels exceed 3 to 5 ppt, the lagoons should be pumped down and refilled with fresh water. If freshwater inflow is likely to be available from subsequent rainstorms, irrigation of the golf course, or tertiary-treated wastewater, the ponds should be pumped down to an elevation of about +1.0 ft. and refilled with fresh water. This would remove about 75 percent of the total water in the ponds; if the initial salinity were 5 ppt, it would be reduced to about 1.25 ppt. It would require pumping of about 22 acre-feet of water, which would take about 30 hours of pumping (assuming the pumps are operating at 9 cfs). The pond would likely require a month or longer to refill from groundwater seepage and natural runoff. A more rapid refilling (and concurrent reduction in salinity) would be preferred if a fresh water source is available.

The long-term stability of the seawall is obviously crucial to the prevention of salinity intrusion and sand transport to the ponds. At present, a portion of the compacted earth levee is protected with rip-rap. The City is monitoring erosion to determine the need for additional protection (Sean Sweeney, pers. comm.). We are assuming that the seawall will be maintained in perpetuity by the City. If this were not done, more frequent overwash would occur. The above pumping regime would be likely required on an annual basis; conditions for endangered species would deteriorate.

3. Water Quality Management

Salinity management is the most critical water quality management issue affecting endangered species use of the site. The construction of the seawall wall and the pumping regime/freshwater replacement approach suggested above should provide adequate fresh water for the RLF and SFGS.

Other issues include the quality of inflow water to the ponds. Direct runoff from the golf course will transport fertilizers or any herbicides/pesticides used in turf management. Runoff from adjacent developed areas may transport traces of heavy metals and other urban pollutants. These are not quantifiable without a specific monitoring program. The one-time spot samples collected did not indicate unusually high pollutant levels. The absence of wildlife mortality also indicates that toxic pollutant levels have not occurred. Long-time pollutant effects are unknown.

The proposed changes in hydrology will reduce mosquito problems by providing deeper water and improved circulation through the system.

4. Supplemental Water Supply

The City of Pacifica has indicated that its treatment plant may be capable of providing significant amounts of tertiary-treated wastewater (TTWW) in the future. If this were done, this water may be available for use in wetland enhancement as well as golf-course irrigation. The treatment plant is located about 2,000 ft. north of the golf course. For relatively small amounts of water delivery, a relatively small (3- or 4-inch line) pressure line could be constructed directly from the plant to the golf course. As the tertiary-treatment capacity expands. The effluent would likely be pumped to a holding reservoir in the watershed and then distributed via a major gravity line (about 30 inches in diameter) to users.

There appears to be a number of alternative scenarios:

a. No use of the TTWW on either the golf course or the wetlands.

b. Use of the TTWW for golf-course irrigation. Eventual seepage and groundwater flow to the ponds.

c. Direct discharge of TTWW to the ponds in emergency situations (either to fill the ponds following pumping drawdown to remove saltwater, or as a supplement to maintain water levels during a drought).

d. As a continuous inflow source to the lagoons to provide regular circulation during summer months or throughout the year.

e. As a water source to create new wetlands in adjacent areas.

The main question (on a nationwide basis) regarding the use of TTWW is that of water quality. If the treatment process provides water with acceptable pollutant levels, the water represents an attractive source. As such, the wetland use would probably be competing with other water users. In any event, final determination of the potential use must be based on water quality issues.

For Laguna Salada, it appears that existing water sources are capable of creating and maintaining a high-quality wetland capable of supporting all four endangered species. Water levels or circulation do not appear to limit these species. As such, Alternative d (continuous inflow of TTWW) is not recommended at this time. Alternatives b, c, and e do appear to have merit. Use of TTWW on the golf course (Alternative b) is particularly attractive. If the ponds experience a significant wave overwash event, the resulting high salinity in the ponds will eliminate RLF and greatly reduce habitat value for the SFGS. Pumping out the salt water and replacing it with low-salinity TTWW represents the only realistic approach to minimizing salinity damage.

Perhaps the most attractive use of TTWW would be the possible creation of new wetlands in existing upland areas (Alternative e). Here, the extensive use of TTWW would not affect existing wetlands or endangered species. Unfortunately, there is almost no land on the site and very little available land on adjacent areas where wetland creation is feasible. Virtually all of the site is developed as a golf course or is already an integral part of the wetlands. Some areas just south and east of Horse Stable Pond could be converted to wetlands, but this can likely be done by excavation alone, using existing water surfaces. Surrounding open-space areas to the south are hilly. While wetlands could be created by grading a series of ponds and wetland plateaus, this would be of questionable value; in addition, the SFGS already uses this area.

In summary, it appears that TTWW can represent a valuable supplement to existing water sources under certain conditions. However, there does not appear to be a major need or opportunity to use it in significant quantities on a regular basis at this time. In response to the Draft Enhancement Plan, the City of Pacifica provided additional information on the possible use of TTWW. This letter (included as Appendix D) stresses the volume of the water for circulation, and describes additional water quality and risk factors. It also points out the use of TTWW may provide a funding wource for the Enhancment Plan.

The use of TTWW would require construction of a connecting line either directly from the treatment plant (approximately 1,500 feet south of Laguna Salada). The size of pipe would likely be determined by the volume required for irrigation of the golf course. A 3-in. to 4-in. diameter pressure pipe installed along Palmetto Avenue would be the most direct route to the golf course. If this route were unfeasible, the water line could be placed along the seawall.

C. SPECIAL STATUS SPECIES HABITAT REQUIREMENTS

The proposed enhancement plan recommends habitat modification, public education and awareness programs, and wildlife protection to improve habitat conditions for the four special status species at Sharp Point: San Francisco garter snake (SFGS), red-legged frog (RLF), San Francisco forktail damselfly (FTDF), and salt marsh yellowthroat (SMYT). The plan will also improve habitat conditions for other wildlife, such as song birds and amphibians.

Table 3 lists the critical habitat requirements of the four special status species and Table 4 identifies briefly how the enhancement plan fulfills these requirements. The major enhancement plan elements are shown in Figure 40 and in the 100-scale plan enclosed in the map pocket. Details of the enhancement plan elements and location of the site are provided in the following sections.

D. ENHANCEMENT OPTIONS

1. Laguna Salada

Laguna Salada itself does not currently support any of the special status species. However, the habitat modifications listed below would significantly improve habitat values and the four special status species would be expected to use the lagoon and its perimeter in the future. These modifications are:

- Deepen the edge of Laguna Salada to provide breeding habitat for RLFs. Optimum depth for breeding RLFs is approximately 2 feet. Two foot depths should be alternated with depths of >3 feet to prevent closure of open water by cattails. This habitat structure would provide suitable habitat for the RLF, SFGS and FTDF (Areas "B", Figure 41). Along the shore this may be accomplished by alternating fingers of deep and shallow areas (Figure 42).

- Channels >3 feet deep should also be cut across the base of peninsulas extending into the lagoon to create small islands (Figure XX). Such islands would provide refugia for SFGS by preventing human and domestic and

Table 3:

Habitat requirements of the San Francisco garter snake, red-legged frog, San Francisco forktail damselfly, and salt marsh yellowthroat.

Species	Habitat Requirements
SFGS	Abundant prey including tree- and red-legged frogs, basking sites, protected dispersal corridors, upland overwintering sites, protection from predators and road and mower mortality.
RLF	Two-foot deep water for breeding, reliable year-round water sources, diverse vegetational structure adjacent to water including emergent vegetation and willows, elimination of predatory fish (if present).
FTDF	Sunlight areas with low vegetation in water habitats for breeding, tall grass-forb vegetation for roosting and foraging, protected shallow sunlight wetlands.
SMYT	Dense willows with a thick undergrowth of herbaceous plants, nest sites over or near open water, moist conditions in marshes that promote high insect abundance.

Table 4.

Habitat enhancement recommendations to meet the requirements of the special status species at Sharp Park.

San Francisco garter snake

1) Create shallow pools (< two feet) for treefrog breeding and deeper pools (two feet) for red-legged frog breeding sites.

2) Alternate fingers of various depths along the shoreline of the pond and lagoon to provide frog breeding sites.

3) Create canals across small peninsulas in the lagoon to make small islands for snake refugia and canals for frog breeding sites.

4) Create mounds adjacent to water for basking sites.

5) Leave a strip of unmowed grassland as a buffer surrounding water courses and ponds as foraging and dispersal habitat.

6) Open Sanchez Creek across southern fairway. Prune cypresses to allow light penetration to the creek area that is heavily shaded. Plant low growing emergent vegetation to increase foraging habitat.

7) If possible, secure adjacent Mori Point uplands and "bowl" area to protect dispersal corridors and overwintering sites.

Red-legged frog

1) Create pools, canals and deepen shoreline on pond and lagoon to two foot depths for breeding habitat.

2) Use tertiary-treated water to ensure year-round water supply.

3) Build mounds adjacent to the pond and lagoon and plant willows to provide vegetational structure.

4) Open Sanchez Creek, as in (6) above, to provide breeding habitat.

San Francisco forktail damselfly

1) Control cattails and other emergent vegetation in connecting canal, Horse Stable Pond, and the lagoon by increasing water depth in sections to >3 feet and by dredging to provide open, sunlight areas for breeding.

2) Leave an unmowed buffer of grasses and forbs around connecting canal, Horse Stable Pond and the Lagoon for roosting and feeding sites.

3) Create shallow, sunlight wetland pools for additional breeding sites.

4) Open Sanchez Creek, as in (6) above, to provide breeding habitat.

Salt marsh yellowthroat

1) Plant willows on mounds at edge of pond and lagoon for additional breeding habitat.

2) Use tertiary treated water to ensure year-round water supply and moist meadow conditions.

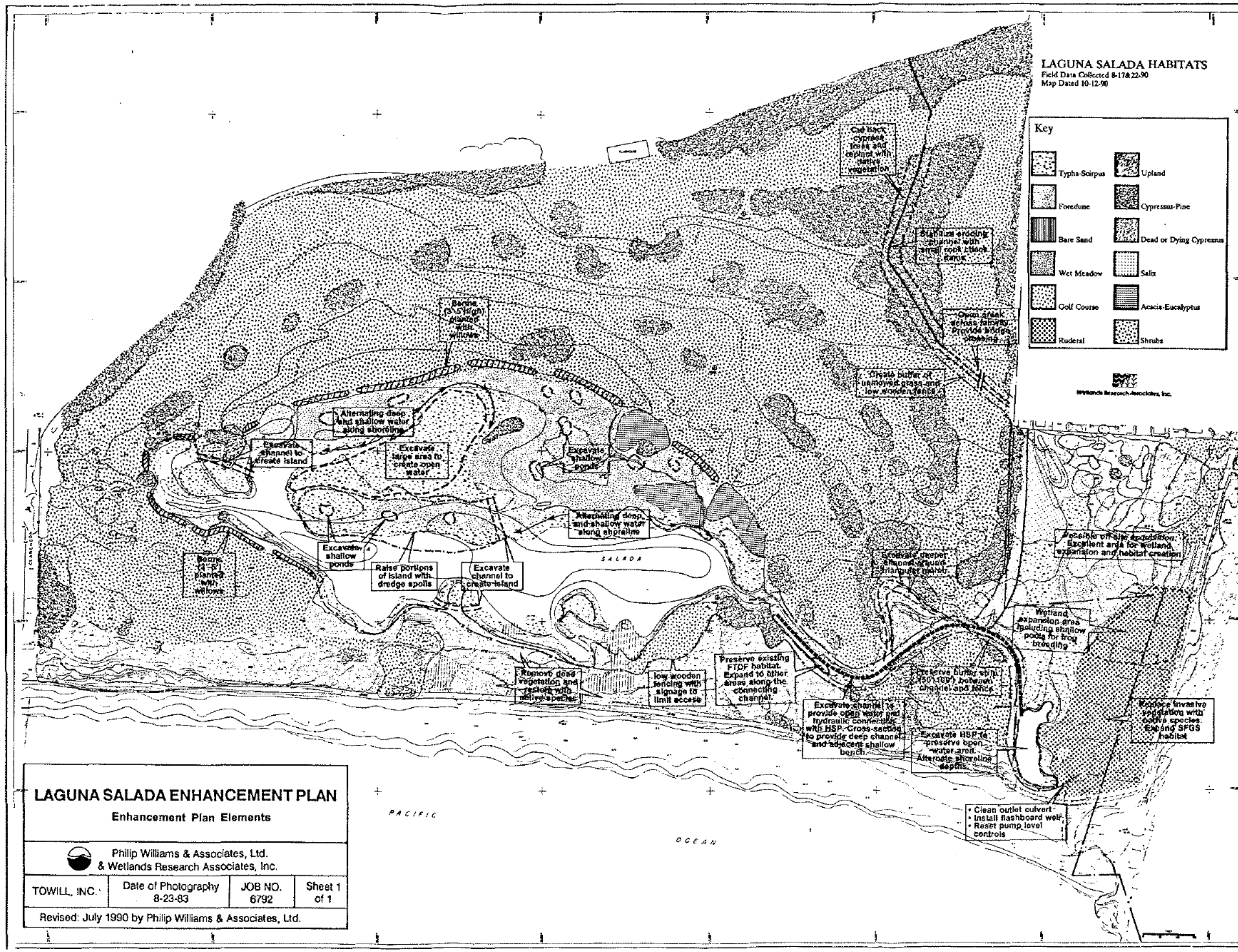
All Species

1) At a minimum, the critical habitat should be fenced and signs posted: "Sensitive Wildlife Habitat. Please Do Not Enter." A more formal wildlife reserve designation could be developed in consultation with CDFG and USFWS.

2) Post signs to limit foot traffic into and through critical habitats. Although this would not eliminate access, such as golfers retrieving balls from the rough within the fence, overall human intrusion would decline.

3) Build low wooden fencing to shield critical habitat from human intrusion.

4) Institute and educational program and provide interpretive material to golfers and other public users to increase awareness of the site's unique wildlife.



LAGUNA SALADA HABITATS
Field Data Collected 8-17&22-90
Map Dated 10-12-90
Key
Typha-Scirpus
Upland
Foredune
Cypressus-Pine
Bare Sand
Dead or Dying Cypressus
Wet Meadow
Salix
Golf Course
Acacia-Eucalyptus
Ruderal
Shrubs
Wetlands Research Associates, Inc.
Excavate channel to create island
Excavate large area to create open water
Excavate shallow ponds
Raise portions of island with dredge spoils
Excavate channel to create island
SALADA
PACIFIC
OCEAN
• Clean outlet culvert
• Install flashboard weir
• Reset pump level controls
LAGUNA SALADA ENHANCEMENT PLAN
Enhancement Plan Elements
Philip Williams & Associates, Ltd.
& Wetlands Research Associates, Inc.
TOWILL, INC.
Date of Photography 8-23-83
JOB NO. 6792
Sheet 1 of 1
Revised: July 1990 by Philip Williams & Associates, Ltd.

Figure 40

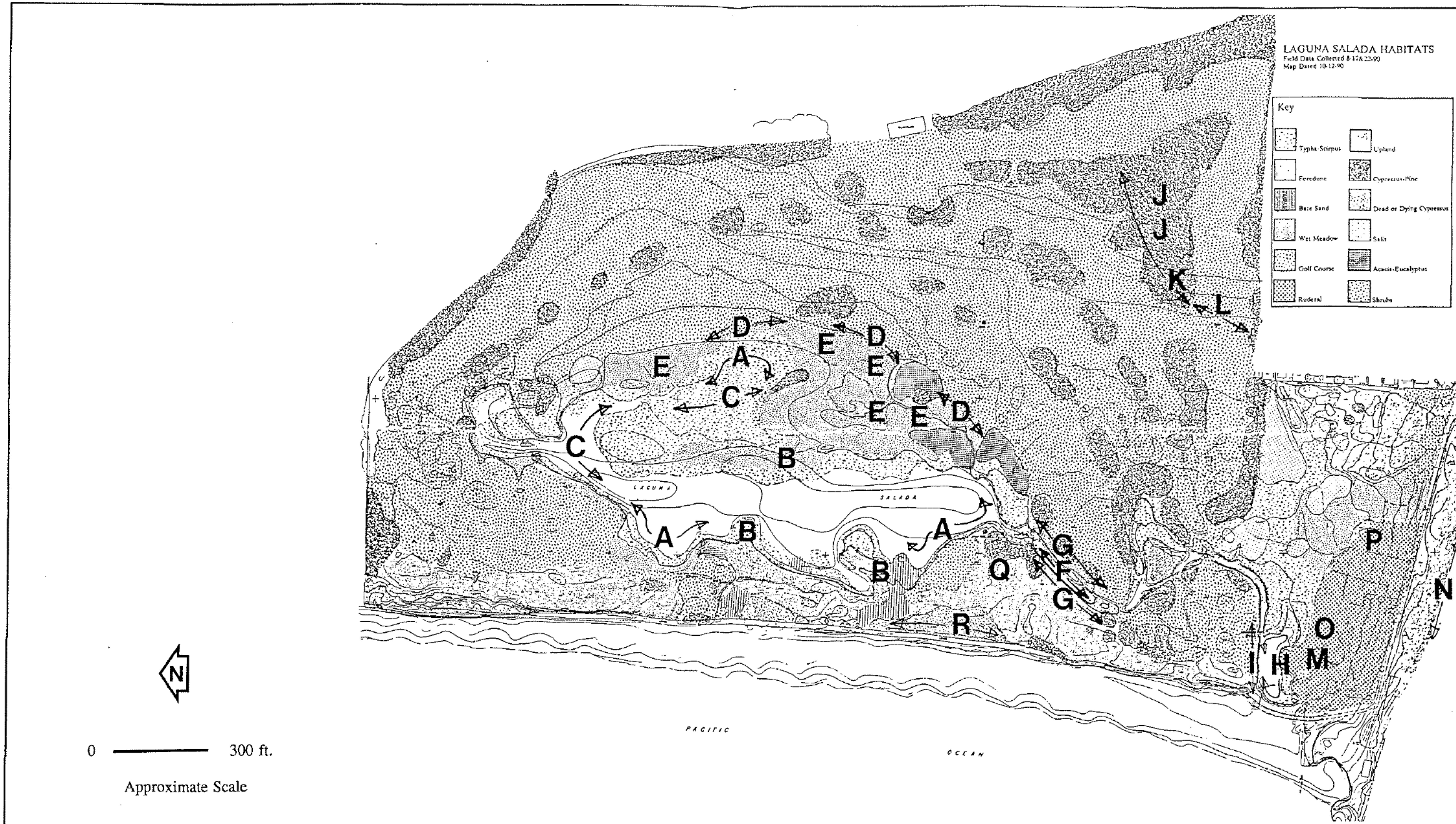


Figure 41 Location of enhancement plan objectives. Letters correspond to descriptions in text.

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feral animal intrusion. The channels would also provide breeding habitat for RLF and FTDF (Areas "B", Figure 41). In addition, the central "peninsula" (see Figure 40) when cut-off should be expanded. As suggested by McGinnis (1986a), the island should have some elevated mounds approximately 6 inches high which are built around piles of concrete on slabs to provide retreat areas for SFGS.

- Large areas of the lagoon are choked with dense stands of tules or cattails that create poor habitat conditions for the RLF, SFGS and FTDF. Portions should be cleared and dredged to depths greater than 3 feet to provide open water areas for these species and for waterfowl (Areas "C", Figure 41).

- A series of low berms or mounds should be created on the eastern margin of Laguna Salada and planted with willows (Figure 42). This would provide a barrier to shield portions of the marsh vegetation from foot-traffic, create basking areas for SFGS and RLF, provide vegetative structure for RLF, and create suitable nesting habitat for SMYT (Areas "D", Figure 41). Low areas between the berms would prevent water ponding problems behind the berms.

- Create several small pools in the wet meadow east of Laguna Salada to provide breeding sites for RLF and Pacific tree frogs (Figure 42) (Areas "E", Figure 43).

- Remove exotic vegetation including pampas grass, broom (*Cytisus* spp.), fennel and iceplant from some sites surrounding Laguna Salada and replant dead eucalyptus and acacia with willows.

- The area could be designated with signs providing a statement such as "Critical Wildlife Habitat. Please Do Not Enter". A more formal designation and protection could be developed in consultation with the CDFG & USFWS.

2. <u>Connecting Canal</u>

- Redesign the canal profile to include a shelf of relatively shallow water (two feet) and a deeper channel (> 3 feet). This will ensure open water and abundant emergent vegetation (Area "F", Figure 41).

- Create a 10 foot wide unmowed buffer along the canal to provide roosting and feeding habitat for FTDF and feeding habitat for SFGS. This will also provide a secure dispersal corridor between Horse Stable Pond and Laguna Salada for SFGS (Area "G", Figure 41).

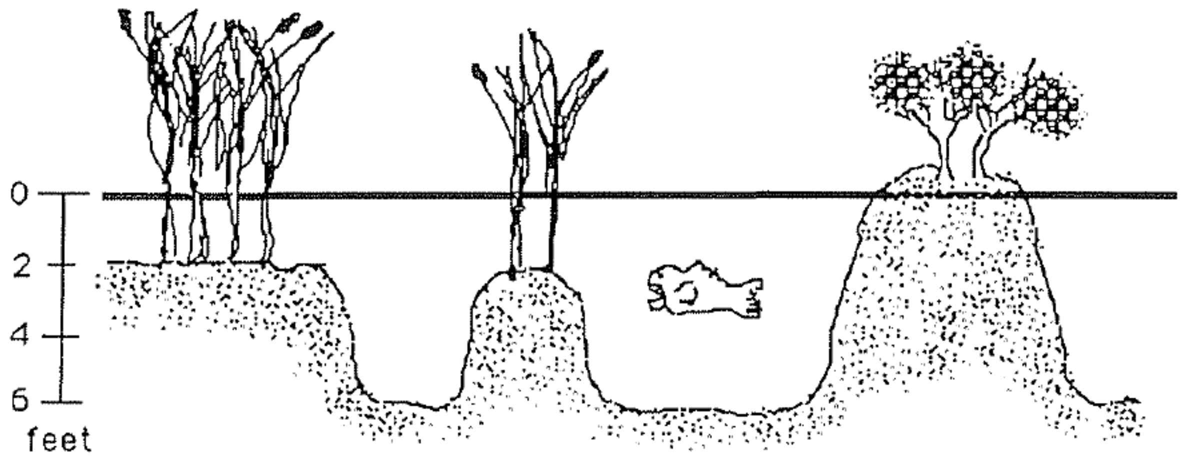

Figure **42** Profile of lagoon and pond edge showing areas excavated to provide a mosaic of open, deep water and shallow habitats.

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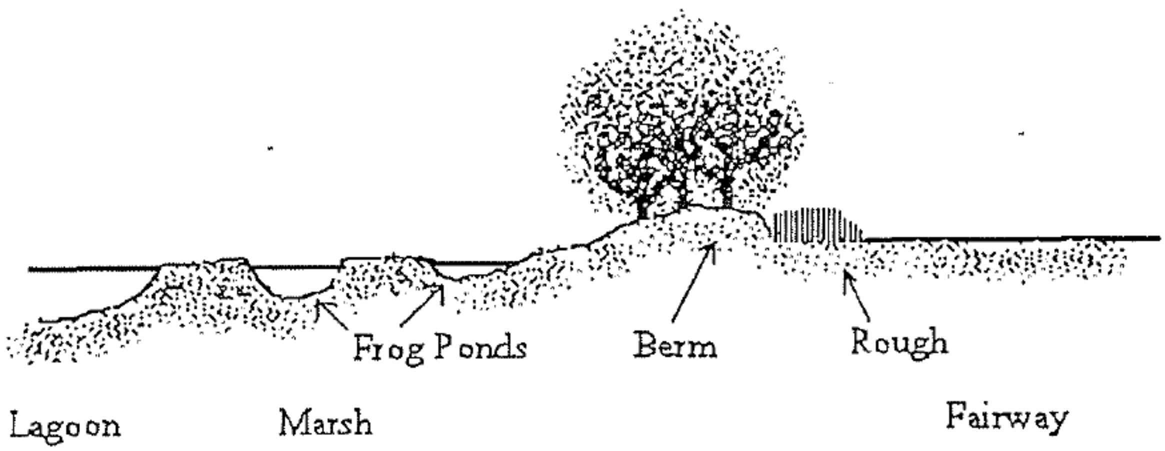

Figure **43** Area east of lagoon showing excavated frog ponds, berm planted with willows, and 10 foot unmowed buffer adjacent to fairway.

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- Limit foot traffic in the unmowed buffer with low wooden fencing and by posting appropriate signs.

3. <u>Horse Stable Pond</u>

- Deepen the edge of Horse Stable Pond as described above for the lagoon to provide breeding habitat for RLF and a bank for basking snakes and frogs. Optimum depth for breeding RLF is approximately 2 feet. Adjacent areas should be deepened to >3 feet to prevent closure of open water by cattails. Along the shore this may be accomplished by alternating deep and shallow areas. This habitat structure would provide suitable habitat for RLF, SFGS and FTDF (Area "H", Figure 41).

- Create buffer vegetation on the west and north side of the pond. Tall (3 foot) upland vegetation adjacent to water provides roosting and foraging habitat for FTDF and foraging areas for SFGS. Limit public access into the buffer with signs and fencing (Areas "I", Figure 41).

4. <u>Sanchez Creek Wetlands East of Horse Stable Pond</u>

- Create a hydrological system that retains water from winter storm runoff and thus increases the depth and length of the hydroperiod in marshes east of Laguna Salada and south of Horse Stable Pond. Increased water depth in spring would decrease cattail growth and provide small pools in the lower areas in the marsh for breeding FTDF and Pacific tree frogs. Extending the period of surface water in the marsh would also benefit SMYT and make the habitat more desirable for breeding. However, the impacts of increased water depth on willows should be determined before any significant change in hydroperiod is instituted .

- Tertiary treated wastewater could be used, given suitable water quality, to maintain year-round water flow through Sanchez Creek and wetlands adjacent to Horse Stable Pond.

5. <u>Sanchez Creek, Upstream</u>

- Sanchez Creek should be modified to incorporate several small ponds and increase vegetational structure to provide breeding habitat for RLF and Pacific tree frogs (Areas "J", Figure 41).

- The Monterey cypress should be trimmed back to increase light penetration to the understory. This should promote understory growth and provide cover for SFGS, RLF and FTDF (Area "K", Figure 41).

- Open Sanchez Creek on the southern most fairway and plant portions with emergent vegetation. An unmowed buffer should be left between the fairway and the creek. This would provide habitat for all four special status species (see Figure 44) (Area "L", Figure 41).

6. Uplands South of Horse Stable Pond

- The old tires, sheds, bathtubs and other debris should be removed (Area "M", Figure 41). This should be done under supervision of a trained biologist to avoid harming snakes that may occur in the area.

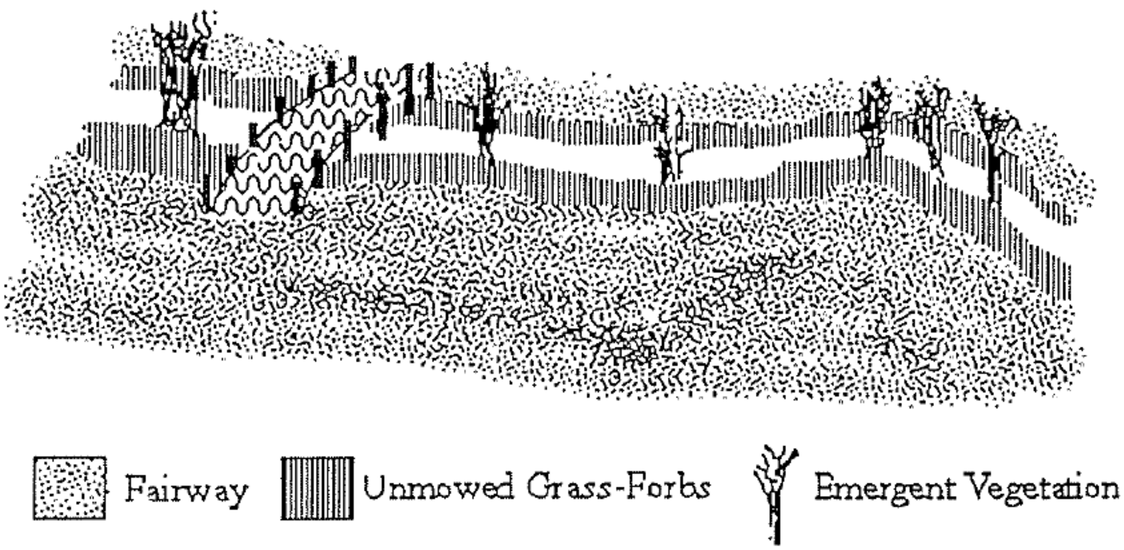
- If possible, the privately owned adjacent upland should be protected from development and maintained as SFGS habitat. This area is critical to SFGS because it allows the snakes to move freely between Sharp Park and upland overwintering sites (Area "N", Figure 41).

- The tall (3 foot) vegetation in this upland area provides foraging and perhaps nesting habitat for SMYT, roosting and foraging habitat for FTDF, and foraging and dispersal habitat for SFGS. However, the vegetation includes largely nonnative, invasive species which could be replaced with native grasses and forbs in a phased revegetation program (Area "O", Figure 41). Before such a program is implemented, surveys in the designated sites would need to be done to insure that no snakes are harmed in the process.

- There is a shallow depression downhill from the bowl on Mori Point and to the east of Horse Stable Pond. SFGS were abundant in this area in the '70's. A portion of the upland habitat south of the pond and adjacent to this depression could be excavated to provide shallow pools in the spring. This would create both frog and FTDF breeding sites and encourage use by SFGS. Such excavation should be done on a phased, small-scale, experimental basis to ensure the success of the modification (Area "P". Figure 41). Resurveys would be required to insure that no snakes would be harmed; any snakes present would be moved to an adjacent area on site.

7. Golf Course and Levee

- When rebuilding the lost fairway and green on the southwest corner of the Laguna, the green should be elevated, sloped slightly toward the tee, and set back from Laguna Salada to reduce intrusion into the shoreline vegetation on the lagoon perimeter. The green would be elevated to provide views of the lagoon and also provide a buffer area between the green and the lagoon edge vegetation. The area surrounding the fairway



Sanchez Creek Opened Across Fairway

Figure **44** Sanchez Creek opened across southern fairway.

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and green should be planted with native dune vegetation (Area "Q", Figure 41).

- The levee currently supports little vegetation. It should be planted with perennial grasses on the upper slope. The lower sandy slopes should be planted with native coastal dune vegetation (Area "R", Figure 41).

8. <u>Educational-Public Awareness</u>

- Institute an endangered species environmental education curricula for Pacifica students.

- Post signs identifying critical areas as sensitive species habitat.

- Require golf course personnel to consult with wildlife agencies or trained biologists before altering sensitive species habitat with bulldozers or other heavy equipment.

- Institute an educational program and provide interpretive material to golfers and other recreational users of the park and adjacent Mori Point to increase awareness of the area's importance for a number of endangered species. Encourage people to actively protect their unique park.

E. PROPOSED DREDGING PLAN

To accomplish the enlargement plan elements described in the proceeding sections, a dredging and spoiling disposal/grading program will be required. The major components are shown in Figure 45 which shows proposed bathymetric (deep water only) contours and spoil placement locations. The total dredged quantities are listed in Table 5. A maximum of about 33,000 cubic yards (cy) of sediment would be excavated. More detailed estimates would be provided during the final design. In Laguna Salada the east arm of the main pond will be dredged to a bottom elevation of -1.0 feet. This will provide 4 to 5 feet of water depth during normal dry season conditions, which will prevent encroachment by emergent vegetation. Along the shoreline, alternating bands of deep and shallow water will be provided. Three peninsulas of land which extend into the pond will cut off as islands by excavating open water channels at their base. In addition, a number of shallow ponds will be excavated along the east side of the Laguna and on the main island. The majority of the excavated dredge spoils will be placed in a band 100-200 feet wide along the tee, fairway and green of the former golf hole (which is proposed for rebuilding). The spoils will require drying and conditioning, prior to final grading. The placement of dredge spoils will raise this area 5 to 7 feet. In addition to providing on-site disposed of spoils (greatly reducing construction cost), the raised golf hole will provide an overview of the wetlands of ponds

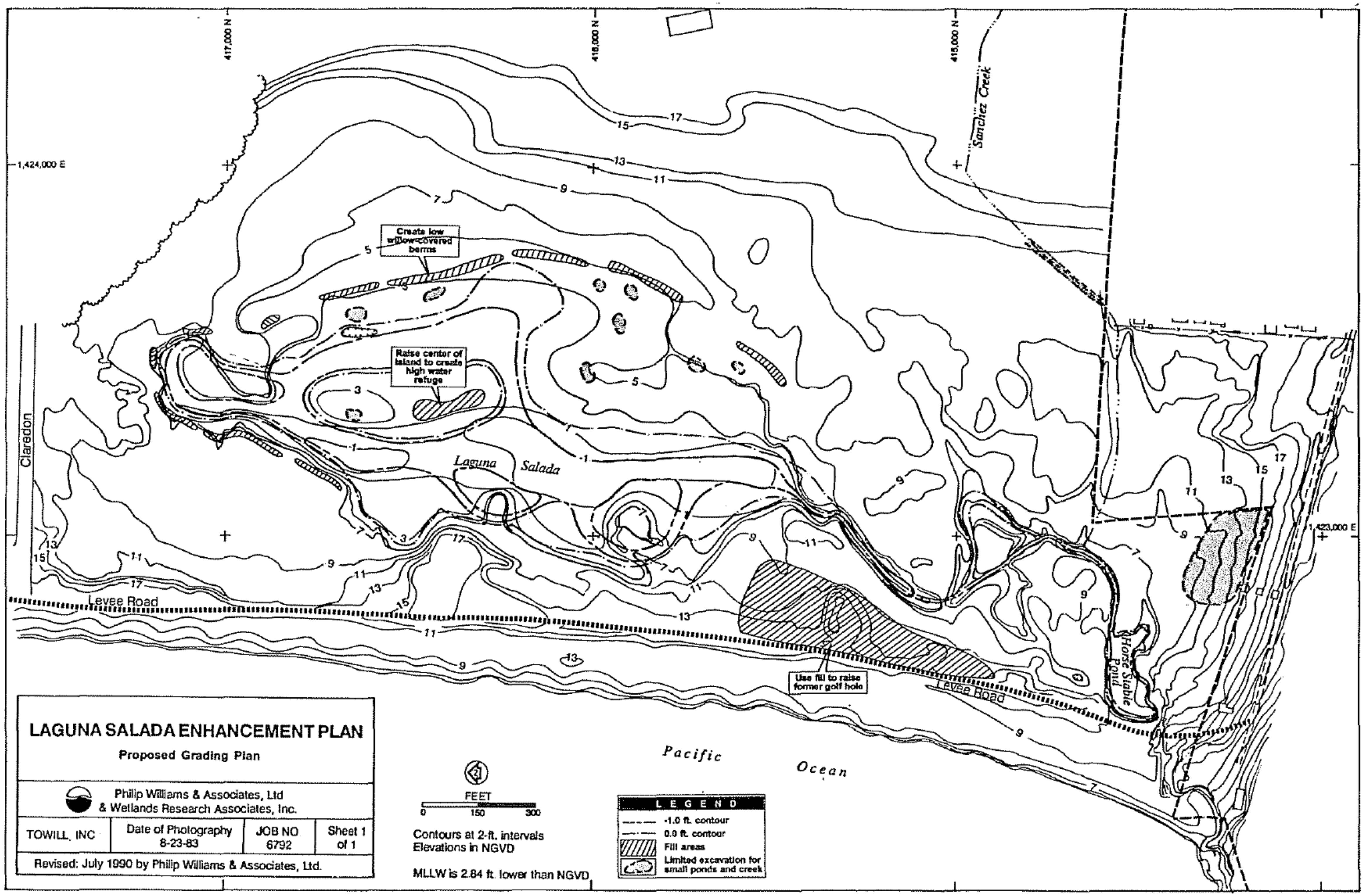
LAGUNA SALADA ENHANCEMENT PLAN
Proposed Grading Plan
Philip Williams & Associates, Ltd
& Wetlands Research Associates, Inc.
TOWILL, INC
Date of Photography 8-23-83
JOB NO 6792
Sheet 1 of 1
Revised: July 1990 by Philip Williams & Associates, Ltd.
FEET
0
150
300
Contours at 2-ft. intervals
Elevations in NGVD
MLLW is 2.84 ft. lower than NGVD
LEGEND
-1.0 ft. contour
0.0 ft. contour
Fill areas
Limited excavation for small ponds and creek
Create low willow-covered berms
Raise center of island to create high water refuge
Use fill to raise former golf hole
Laguna Salada
Pacific Ocean
Sanchez Creek
Horse Stable Pond
Levee Road
Clarendon
417,000 N
416,000 N
415,000 N
1,424,000 E
1,423,000 E

Figure 45

Table 5:

EXCAVATION VOLUME AND SPOIL PLACEMENT ESTIMATES

EXCAVATION SITES		VOLUME (cubic yards)
1.	Laguna Salada	26,400
2.	Horse Stable Pond	2000
3.	Connecting Channel	3300
4.	Sanchez Creek	550
5.	Additional Small Ponds	1000
	TOTAL EXCAVATED VOLUME	33,250

DISPOSAL ZONES		
1.	Berms: Assume 1500 LF, average height of 3 feet:	2,100 cy
2.	Former Golf Hole: Assume 600 ft. long, 200 ft. wide, 7.0 ft. high:	31,000 cy
	TOTAL SPOIL PLACEMENT	33,250 cy

without requiring closer access. This will allow maintenance of a buffer zone ground the wetlands.

In addition, some spoils will be used to create a series of low berms 2-4 feet high around the wetlands. These will further identify the border between the golf course of the wetlands, restricting access and reducing intrusion.

Along the connecting channel, the channel bottom will be deepened to -1.0 feet NGVD. This will provide a continuous hydraulic connection along all the wetlands between LS and the HSP. In addition to the deep channel, the connecting channel cross-section will also include a shallow bench or terrace along the west bank to create additional habitat for the FTDF. Closer to the HSP, a small triangular shaped area of wetland will be enhanced with a perimeter, open water channel. All construction work in this area will have to be closely monitored to insure no damage to the existing FTDF habitat.

The Horse Stable Pond will also be deepened to provide open water, free of emergent vegetation. The shoreline will provide alternating deep of shallow water habitat. Dredging will extend up to the pump house of gravity outflow culvert to allow more efficient water management. Some additional ponds will be created in the uplands along the south project property lines. Additional, habitat for the SFGS, as suggested by McGinnis (1986), could be constructed with dredge spoils along the south-west property line.

We have also proposed opening Sanchez Creek across the golf hole which parallels Fairway Drive. This would provide additional freshwater marsh and open creek habitat which we believe could be integrated with the golf hole.

The type of dredging and staging areas will be determined during the final project design/implementation phase. Three methods of dredging are feasible:

1. Land-based dredging and disposal, using hydraulic excavators, and dump trucks. A variant of this is the "Sauerman Technique", which uses a land-based crane operating a bucket on a cable. This system is capable of excavation in a large open water zone using land-based equipment.

2. A floating, clamshell dredge, with spoils placed in a small barge and then transferred to a dump truck.

3. Suction dredging, with the liquified spoils pumped to the disposal area.

Land-based dredging (Method 1) would be the least expensive and simplest. It will be used for all accessible areas, including the connecting channel, small ponds, Sanchez Creek and much of Horse Stable Pond. It may also be feasible in parts of Laguna Salada

A variant of this technique, referred to as the Sauerman Technique, allows land-based equipment to conduct dredging beyond the reach of excavator arm. A long, circular cable is looped around a pulley attached to an immovable object (bulldozer, tree, etc.) on the opposite side of the pond and controlled by the crane. A bucket is attached to this cable. This system is less precise than normal hydraulic excavator-based dredging and more expensive. However, it does provide the opportunity to use land-based equipment in open water areas, which is cheaper and may be less destructive than floating equipment.

For areas inaccessible by land, methods 2 or 3 will be used. Method 2 (floating clamshell) is preferred since the dredge spoils are dryer and easier to handle and shape following excavation. However, transport from the excavation area in Laguna Salada to the shore may be difficult. Suction dredging (method 3) would simplify transport by using a temporary pipeline to pump the spoils to the disposal area. However, to allow pumping, the spoils are mixed with water to create a slurry, and a dewatering pond must be constructed. This method generally requires a location for discharge of the decanted overflow water from the dewatering pond.

Final selection of the dredging and disposal method will be made in conjunction with the dredging contractor. For preliminary cost estimates, land-based dredging (least expensive) has been assumed for all sites except for Laguna Salada. Costs for dredging the main pond assumes that one of the two more expensive methods will be used.

Management of the dredging program will be required to minimize disturbance to the shoreline habitat and golf course. Specific pond access locations and haul routes will be staked by the monitoring team. Sensitive wildlife areas will also be identified and fenced-off.

Timing of the construction will be determined by the project biologists to minimize wildlife impacts. While some disturbance to the site vegetation is inevitable, most of the wetland vegetation is robust and will recover fairly quickly. However, avoidance of construction impacts to the critical species is essential.

F. RECOMMENDATIONS ON REGIONAL PLANNING ISSUES

1. Mori Point Development

Privately held lands on Mori Point are both directly and indirectly important to SFGS, RLF, FTDF, and the SMYT. All of these species are found in areas adjacent to or on Mori Point lands and the SFGS is currently found only on Mori Point. In addition, Mori Point may serve as a critical SFGS dispersal corridor between Sharp Park and suitable habitat on Mori Point and Calera Creek. The marsh immediately east of Horse Stable Pond and the uplands to the south and southeast are an integral part of the Horse Stable Pond watershed. The proximity of these privately held lands to the Sharp Park project area makes their development of great concern to the success of the proposed enhancement plan and future of the special status species.

2. Golf Course Planning

The proposed enhancement plan identifies several issues that bear directly on golf course planning. These issues are outlined here and discussed in more detail in Section V:

- When rebuilding the lost fairway and green for the hole southwest of the Laguna, the green and fairway should be elevated, sloped slightly toward the tee, and set back from the lagoon to reduce intrusion into the shoreline vegetation on the lagoon perimeter. The dead trees along the lake perimeter in this area should be replanted with native shrubs and shrub-like trees such as willow. The fairway and greens can be elevated, using dredge spoils to provide a view of the Laguna without requiring proximity.

- A series of small berms should be created on the east side of the lagoon and the connecting channel between the pond and the fairways and planted with willow. This would reduce intrusions into shoreline vegetation along the lagoon perimeter and provide basking sites for SFGS, diverse vegetational structures for RLF, and nesting habitat for SMYT.

- Grassland-forb vegetation adjacent to the lagoon, Horse Stable Pond, and the connecting channel should not be mowed. This would provide increased cover for SFGS and roosting and foraging areas for FTDF. The width of the unmowed buffer will vary depending on fairway configuration but at a minimum should be 10 feet on either side of the waterways.

- Sanchez Creek currently flows through the golf course. It is above ground when passing through the stands of Monterey Cypress but flows underground beneath the fairways. The Monterey Cypress trees that overhang the creek should be heavily trimmed to allow light to pass to pass through and the creekbed planted with emergent vegetation. The creek should also be opened across the final fairway before it opens into the marsh and planted in places with low growing emergent wetland vegetation and in manner consistent with golf course use. This would provide habitat for SFGS prey items and FTDF. This will not increase mosquito populations at Sharp Park. Fencing and signage would deter golfers from retrieving golf balls from the creek and surrounding vegetation although this activity would not completely end.

EXHIBIT D

2011-12 California Red-legged Frog
Sharp Park Egg Mass Survey
Summary 1/27/12-3/8/12

Date Egg Mass First Observed	Egg Mass Number	Fate:
1/30/12	1	
1/27/12	2	
1/30/12	3	
1/27/12	4	
1/30/12	5	
1/27/12	6	
1/30/12	7	Notes say stranded
1/27/12	8	
1/30/12	9	
1/27/12	10	
1/30/12	11	
1/27/12	12	
1/30/12	13	
1/27/12	14	
1/30/12	15	
1/27/12	16	
1/30/12	17	
1/27/12	18	
1/30/12	19	
1/27/12	20	
1/30/12	21	
1/27/12	22	Discovered stranded on 2/8/12
1/30/12	23	Includes stranded egg masses Vredenburg lab observed
1/30/12	25	Includes stranded egg masses Vredenburg lab observed
1/31/12	26	
1/30/12	27	Includes stranded egg masses Vredenburg lab observed
1/31/12	28	
1/30/12	29	Includes stranded egg masses Vredenburg lab observed
1/31/12	30	fragmented
1/30/12	31	Includes stranded egg masses Vredenburg lab observed
1/31/12	32	
1/30/12	33	Includes stranded egg masses Vredenburg lab observed
1/31/12	34	fragmented
1/30/12	35	Includes stranded egg masses Vredenburg lab observed
1/31/12	36	
1/30/12	37	Includes stranded egg masses Vredenburg lab observed
1/31/12	38	

Date Egg Mass First Observed	Egg Mass Number	Fate:
1/30/12	39	Includes stranded egg masses Vredenburg lab observed
1/31/12	40	
1/30/12	41	Includes stranded egg masses Vredenburg lab observed
1/31/12	42	In saturated mud at waters edge with shallow margin
1/30/12	43	Includes stranded egg masses Vredenburg lab observed
1/31/12	44	In saturated mud at waters edge with shallow margin
2/14/12	45	
1/31/12	46	In saturated mud at waters edge with shallow margin
2/14/12	47	
1/31/12	48	In saturated mud at waters edge with shallow margin
2/14/12	49	
1/31/12	50	In saturated mud at waters edge with shallow margin
2/14/12	51	
1/31/12	52	In saturated mud at waters edge with shallow margin
2/14/12	53	
1/31/12	54	In saturated mud at waters edge with shallow margin
2/14/12	55	
1/31/12	56	In saturated mud at waters edge with shallow margin
2/14/12	57	
1/31/12	58	In saturated mud at waters edge with shallow margin
2/14/12	59	
1/31/12	60	In saturated mud at waters edge with shallow margin
1/31/12	62	In saturated mud at waters edge with shallow margin
2/14/12	63	
1/31/12	64	fragmented, scattered
2/14/12	65	eggs on bottom, broken
1/31/12	66	In saturated mud at waters edge with shallow margin
2/14/12	67	broken, on bottom
1/31/12	68	In saturated mud at waters edge with shallow margin
2/14/12	69	separated into parts
1/31/12	70	
2/14/12	71	
1/31/12	72	
2/14/12	73	
1/31/12	74	
2/14/12	75	
1/31/12	76	
2/14/12	77	
1/31/12	78	
2/14/12	79	

Date Egg Mass First Observed	**Egg Mass Number**	**Fate**:
1/31/12	80	In saturated mud at waters edge with shallow margin
2/14/12	81	Damaged, covered in algae on 3/7/12
1/31/12	82	In saturated mud at waters edge with shallow margin
2/14/12	83	
1/31/12	84	In saturated mud at waters edge with shallow margin
2/14/12	85	
1/31/12	86	13 egg masses, fragmented, at least six in mud
2/14/12	87	
2/14/12	89	
2/8/12	90	
2/14/12	91	
2/8/12	92	
2/14/12	93	
2/8/12	94	
2/14/12	95	broken apart
2/8/12	96	
2/14/12	97	embryos decaying, but not yet at hatching stage
2/8/12	98	stranded
2/14/12	99	
2/8/12	100	
2/14/12	101	
2/8/12	102	
2/27/12	103	
2/27/12	105	
2/8/12	106	
2/8/12	108	
2/8/12	110	
2/8/12	112	
2/8/12	114	
2/8/12	116	
2/8/12	118	fragmented, no dogs on golf side
2/8/12	120	fragmented, no dogs on golf side
2/8/12	122	fragmented, no dogs on golf side
2/22/12	150	
2/22/12	152	
2/22/12	154	
2/22/12	156	
2/22/12 & 3/1/2012	158	Two egg masses recorded as this number.
2/22/12 & 3/1/2012	160	Two egg masses recorded as this number.
2/22/12 & 3/1/2012	162	Two egg masses recorded as this number.

Date Egg Mass First Observed	Egg Mass Number	Fate:
2/22/12 & 3/1/2012	164	Two egg masses recorded as this number.
3/1/12	166	
3/1/12	168	
3/1/12	170	
3/1/12	172	
3/8/12	174	egg mass fragments noted at this location on this date.
3/8/12	176	
3/8/12	178	
3/7/12	201	
3/7/12	203	
3/7/12	205	
3/7/12	207	
3/7/12	209	
3/7/12	211	
3/7/12	213	
Total Egg Masses Observed:	**148**	
Total Egg Masses Stranded, Desiccated, Fragmented, or Otherwise Taken:	**47**	
% of Total Taken:	**31.8%**	

Notes:

- Summary chart prepared by the Wild Equity Institute.
- Summary is based on attached RPD data sheets. RPD has provided data only through March 7, 2012. RPD consultants may have evidence of additional egg masses and/or stranded egg masses.
- According to RPD, skipped egg mass numbers were not used during surveys. Typically numbers were skipped if observed could not recall the last number used from previous survey. To avoid double-counting, observer would skip-ahead a large number on the next data sheet.
- Egg masses with no fate information have an unknown fate. They are presumed "not taken" by RPD for the purposes of this summary.

Jon Campo/RPD/SFGOV

01/21/2011 09:00 AM

To David_Kelly@fws.gov

cc Lisa Wayne/RPD/SFGOV@SFGOV

Subject Re: CRLF eggmasses Reference Number 81420-2011-TA-093Notes Link

Hi Dave,

I have some good news in regards to the CRLF's at Sharp Park golf course. The egg masses we have moved appear to be healthy as they approach gosner stage 15-21. Also, we seem to be having a banner year for breeding. I have been documenting the CRLF eggmasses at Sharp Park for over 8 years and this year I have recorded more than 3 times the eggmasses than any other year.

Unfortunately, the challange is that they are also breeding at a very high rate in unsustainable habitat. Yesterday I found another 24 eggmasses in the shallow swale on the east edge of Laguna Salada. Again, without intervention they will become stranded and descicate. I am assuming the USFWS is also supportive of moving these eggmasses. If have the your authorization, I can move the eggmasses tomorrow to a more sustainable habitat. Please feel free to call me to discuss this further.

Jon Campo
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SF Recreation & Park Department
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Ph# 415.831.6332
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-----David_Kelly@fws.gov wrote: -----

To: Jon.Campo@sfgov.org
From: David_Kelly@fws.gov
Date: 01/18/2011 06:35AM
Cc: Lisa.Wayne@sfgov.org, Chris_Nagano@fws.gov, Josh_Hull@fws.gov
Subject: Re: CRLF eggmasses Reference Number 81420-2011-TA-093

Jon Campo, thank you for the update.

David Lee Kelly
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