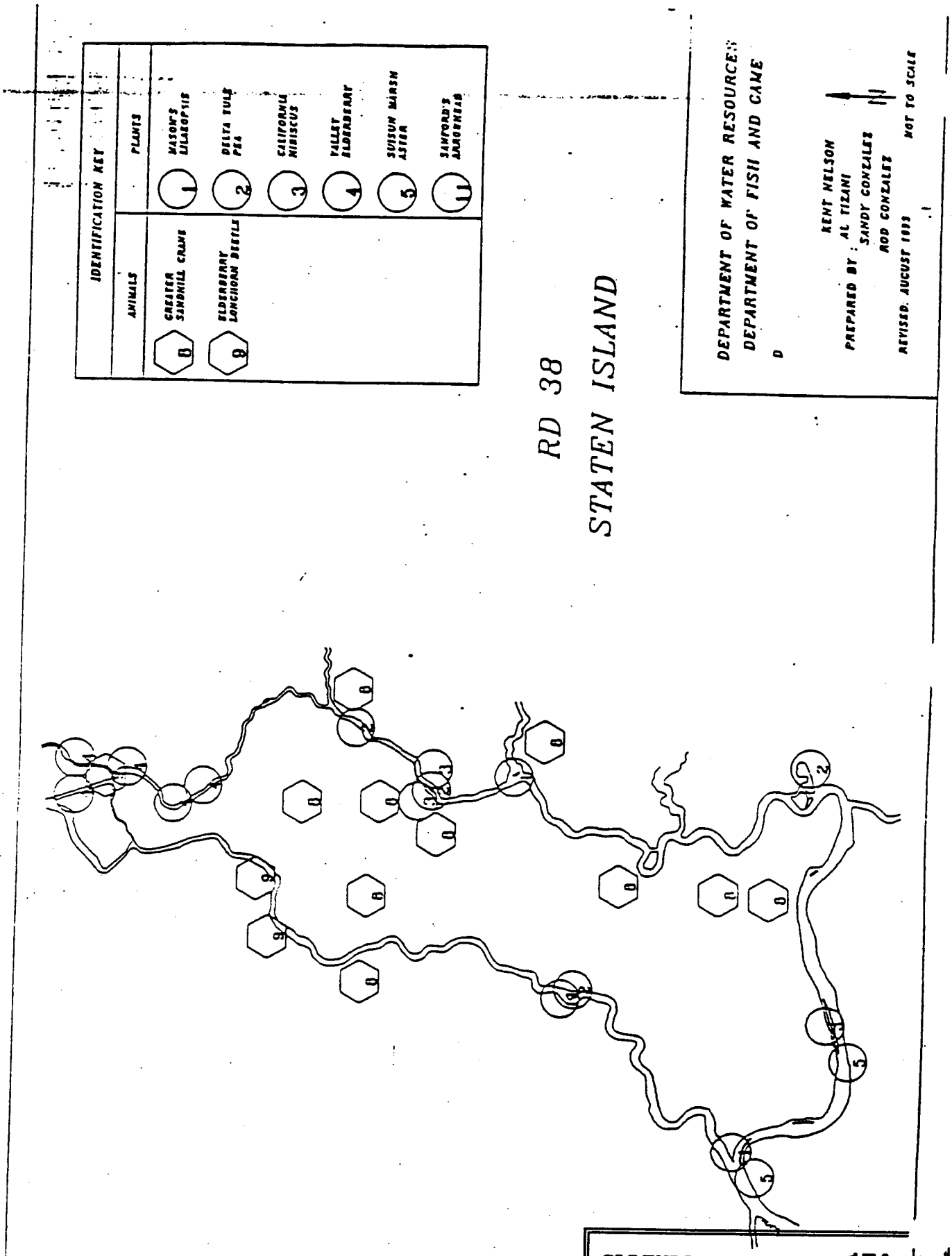
Staten Island, San Joaquin County.

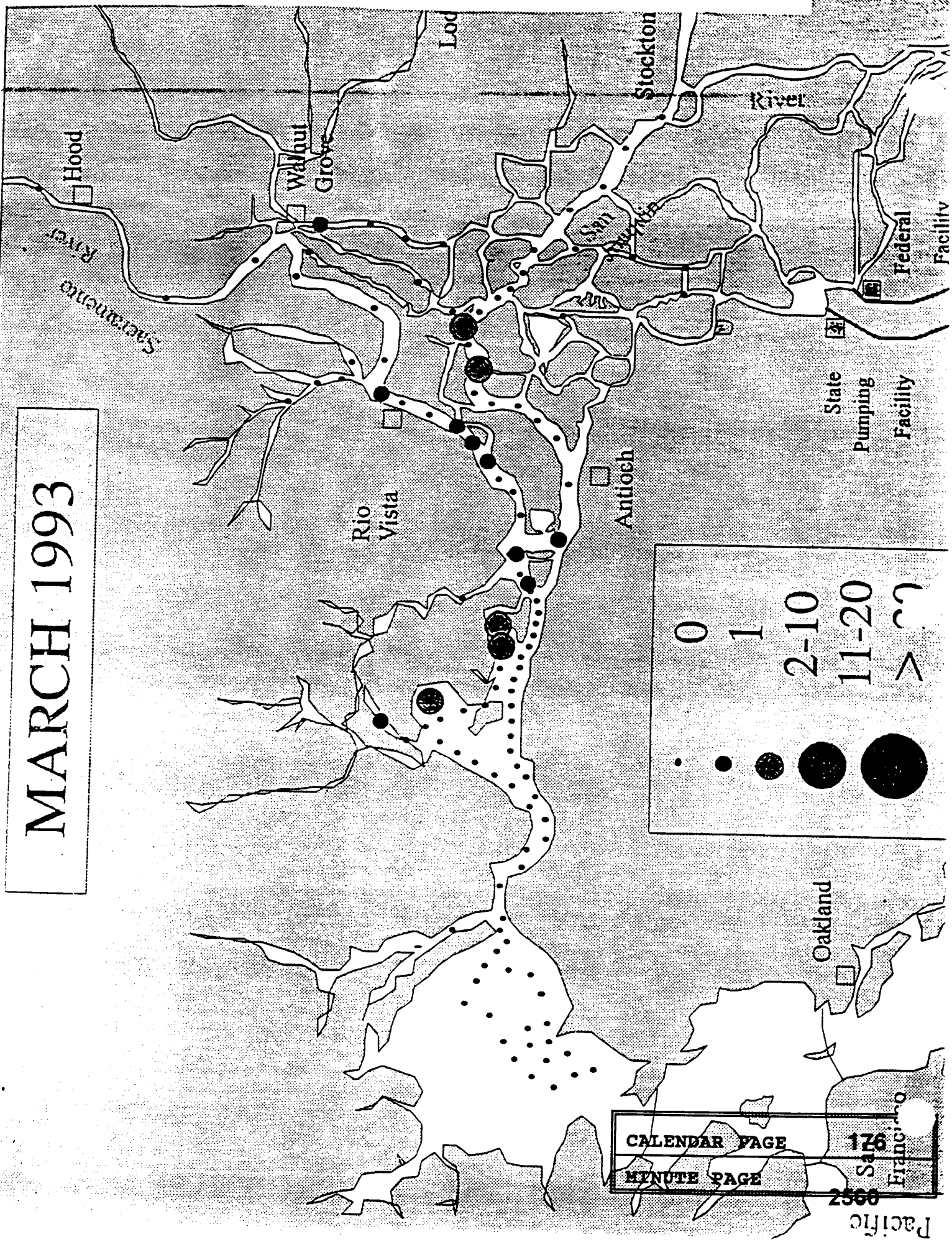


CALENDAR PAGE 174

MINUTE PAGE

Figure 3: Delta Smelt February Distribution Map, from DFG Bay Delta Project.

Figure 4: Delta Smelt March Distribution Map, from DFG Bay Delta Project.



CALENDAR PAGE 176
MINUTE PAGE 2560

Project.

APRIL 1993
Hood
Walnut Grove
Lodi
Stockton
River
Sacramento River
Rio Vista
Antioch
State Pumping Facility
Federal
Oakland
0
1
2-10
11-20
> 20

MATERIALS AND METHODS

Field surveys were conducted by Environmental Specialist III Frank Gray and Scientific Aid Barry Baba. All five channel islands were surveyed in January, February, and March of 1994. The timing of the surveys coincided with the schedule for the completion of the ND. Personnel of the DFG Endangered Plant Program and an independent biological consultant participated in one survey. They inspected the proposed work areas to confirm plant identifications of the Mason's lilaeopsis and mudwort and to evaluate habitat conditions relative to required mitigation measures for rare plants. Assisting in a later survey was Environmental Specialist Kent Nelson of the Department of Water Resources (DWR).

A Fishrite® 20½ foot workboat was used as a work platform for the survey. Duties included the following: setting gillnets, conducting black surveys, obtaining sediment samples, determining channel bottom contours, and observing vegetation types. An inflatable raft was also used for transit between Staten Island and the survey areas.

A Lowrance X-16 graph recorder mounted on the FishRite® boat was used to determine bottom contours of the channel between Island #5 and Staten Island, as well as bottom contours on the south side of that island. This was to determine the feasibility of the project relative to dredging and placement of fill and other structures.

Sampling of the interior of Sycamore Island was very difficult because of the difficulty in entering the dense riparian vegetation.

There was no attempt to quantify habitat according to the Habitat Evaluation Procedures (HEP) process.

A vehicle mounted distance meter was used while driving a vehicle along the levee at Staten Island to determine the approximate lengths of each of the channel islands.

Vegetation Surveys

The goals of the vegetation survey were to serve as a compilation of plant species, a determination of the vegetative structure of the channel islands, and to provide the locations of any CEQA-defined rare or endangered plants that could be directly affected by the project or required mitigation for project components. Aerial photos of the islands taken in October 1992 were used to trace and develop field survey maps. Vegetation types were identified visually by gross differences in vegetation structure and plant species composition. The location and extent of vegetation stands were determined from reference points, such as the water intake structures at the south end of Staten Island, or estimated visually. General estimates were made of the presence of SRA habitat.

Prior to the commencement of rare plant surveys, a literature and database search was conducted to identify rare plant species known or potentially known to occur in the Project areas. Federal, State, and local rare plant lists were reviewed to determine which plant species are known or potentially known to occur within the general vicinity of the Project areas. Based on the information assimilated from various sources and from personal communications with regional experts, five plants are known to have ranges and/or have habitat requirements that coincide with that of the proposed Project vicinity. All are associated with freshwater marsh habitats and are considered rare or endangered to varying degrees because of habitat destruction and water quality degradation. The plants are listed in Table 1.

An extensive search for CEQA-defined rare or endangered plants was conducted in February by raft and on foot. California Native Plant Society (CNPS) listed 1A or 1B, and 2 plants may also qualify as rare or endangered under the CEQA (Section 15380 (d)). Emphasis was given to searching in the intertidal area on either side of Islands #3, #4, #5, and #7 for Mason's lilaeopsis and mudwort, which is scheduled to become a CNPS list 2 plant in the forthcoming CNPS schedule. Those portions of the surveys involving tidally inundated species were completed at low tide.

TABLE 1. CEQA-defined Rare or Endangered Species Whose Distribution May Include the Channel Islands Around Staten Island, San Joaquin County.

COMMON AND SCIENTIFIC NAMES	STATUS CA/FED/CNPS	DISTRIBUTION	HABITAT
Suisun marsh aster (*Aster lentus*)	–/C2/1B	Grows in slightly brackish water from approximately Suisun Marsh, east through the western and central regions of the Sacramento-San Joaquin Delta.	Inhabits tidal streams and marsh areas. Typically occurs along sloughs and riverbanks affected by tidal fluctuations, and commonly grows in association with tules.
California hibiscus (*Hibiscus lasiocarpus*)	–/C3B/1B	Range extends from approximately the lower Butte Creek area north and west of Marysville Buttes, to the lower portions of the rivers and sloughs in the Sacramento-San Joaquin Delta.	Grows in freshwater marsh areas, an on low peat islands. Also occurs in undisturbed backwaters such as ponds and irrigation canals with other marsh vegetation.
Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)	–/C2/1B	Distribution extends from the Napa River in Napa County to the Stockton area, and generally throughout the Sacramento-San Joaquin Delta, north, to perhaps as far north as Walnut Grove.	Found in tidally influenced brackish and freshwater wetlands including marshes, muddy riverbanks, sloughs, and occasionally along older riprapped banks.
Mason's lilaeopsis (*Lilaeopsis masonii*)	R/C2/1B	Range extends from the Napa River in Napa County east throughout the channels and sloughs of the Sacramento-San Joaquin Delta.	Semi-aquatic plant restricted to the water's edge where they are inundated by waves and tidal fluctuations. Generally grows along muddy riverbanks, sloughs, and tule islands.
Mudwort (*Limosella subulata*)	–/–/2	Known only from a few locations in the Sacramento-San Joaquin Delta. Same or similar species also known from the Atlantic coast.	Habitat requirements are similar to *Lilaeopsis masonii*. Grows where populations are inundated by tidal fluctuations.
Sanford's arrowhead (*Sagittaria sanfordii*)	–/C2/3	Currently known from Butte, Fresno, Sacramento, and Del Norte counties; have been extirpated from many former areas.	Emersed or partially submerged aquatic plant usually found in ponds, marshes, and ditches.

The Jepson manual (Hickman, 1993) and a hand lens were used to identify plants.

Soil samples for determination of vegetation growth potential were collected from the FishRite® boat with an Arts Manufacturing sediment sampling kit. Soil samples have not been analyzed to date. A stainless steel split core sampler was connected to a series of stainless steel rods and plunged into the sediment at potential dredging locations, about 30-40 feet south of Islands #3, #4, #5, and #7. The core sampler was driven into the soil about two to three feet in depth, the approximate depth of the dredge sample. Soil samples were stored in plastic containers.

Wildlife Surveys

Birds were identified by use of field guides and binoculars. When possible, they were also identified by calls. Many incidental observations of birds were made while surveying for plants or other elements. Identifications of birds species seen flying over the area in transit to another area were excluded. No breeding censuses for birds were conducted. Observations of other wildlife or evidence of their presence were recorded whenever encountered.

Surveys for the State-listed Threatened and Federal-listed Category 2 Candidate California black rail (Laterallus jamaicensis coturniculus) were conducted on February 15 and March 15, 1994. The presence of this species has been documented at other channel islands in the Delta, with large expanses of wetland vegetation. The black rail is a tiny marsh bird which is rarely seen, and observers must listen for its calls to confirm its presence. Our survey method involved using a standard black rail census tape with alternating "kic-kic-kerr" and "grr" calls separated by pauses of various lengths. A cassette player was used to broadcast calls at various locations along Channel Island #3 and #5 between 9:00 am and 10:00 am. Recordings of the black rail were not played at the other channel islands due to their limited habitat.

Fisheries Surveys

The main goal was to collect a representative sample of fish species within the area and determine the presence of any CEQA-defined rare or endangered fish species. Gillnets were set on January 27, 1994 and left overnight at three of the channel islands (one at Island #3, one at Island #4, and two at Island #5). The nets were set perpendicular to the shoreline.

Table 2 shows the type, size, depth set, and time set for each gillnet. The small mesh end of each net was set at the shallow waterside. Concrete anchors were used to anchor the net at both ends, and styrofoam floats with reflective tape were tied onto the nets for safety. A

graph recorder was used to determine bottom contours and denote any obstructions which could cause problems with the netting operation. The nets were retrieved the following morning, and the fish were identified and measured. No fish sampling was completed at Channel Island #7 or Sycamore Island. A complete description of the gillnet survey is included in Appendix D.

TABLE 2. Gillnet Survey Information, January 27-28, 1994.

Gillnet	Net Type	Net Size	Depth Set	Time Set (hours)	Time Recovered (hours)	Hours in Water
#1	Sinking	120' X 5' (1"-3" mesh)	4' to 9'	1815	0930	15.25
#2	Floating	120' X 8' (1"-3" mesh)	4' to 11'	1830	0945	15.25
#3	Floating	120' X 8' (1"-3" mesh)	4' to 7'	1900	1015	15.25
#4	Sinking	52' X 4' (2"-4" mesh)	unknown	1915	1040	15.60

RESULTS AND DISCUSSION

Each of the channel islands was found to have a highly diverse compliment of plants and wildlife.

The locations of distinctive vegetation stands were mapped in the field and are shown in Appendix A. A complete list of all plant and wildlife species encountered during the survey is shown in Appendix C. A list of field survey maps with CEQA-defined rare or endangered species is in Appendix B. Photographs are provided in Appendix E.

Vegetation

Vegetation associated with the surveys was categorized into five plant associations which are frequently used in the SB 34 program. Uniform stands of vegetation were mapped in the field and are shown in Appendix A. Each of the vegetation types are described below. A complete list of plant species encountered during our surveys is listed in Appendix C. The scientific nomenclature follows Hickman, 1993.

Freshwater marsh - includes vegetation consisting mainly of tules (Scirpus sp.) and cattails (Typha sp.). Collectively, this vegetation type was the most abundant and occurs on all five islands. The extent of this vegetation varied considerably. In general, the most developed stands of tules and cattails were found at Channel Island #3 and #5 and at sections along Sycamore Island. Marsh vegetation also included common reed (Phragmites australis), dallis grass (Paspalum dilatatum), smartweed (Polygonum spp.), rush (Juncus spp.), and verbena (Verbena sp.).

Scrub/shrub - includes trees and woody shrubs and vines less than twenty feet in height. This type of habitat was mainly found at Sycamore Island, where stands of willow (Salix sp.), alder (Alnus rhombifolia), American dogwood (Cornus sericea ssp. sericea), and blackberry (Rubus ursinus) were found. Lesser amounts were

found on Channel Island #5. The scrub/shrub vegetation typically occurred in the center of both islands, where the soil was permanently moist and only intermittently or infrequently inundated.

Riparian forest - includes trees more than twenty feet tall with a shrub understory layer. This habitat type was present only at Sycamore Island where a dense overstory of willow and alder formed dense, jungle like-growth. This vegetation type was difficult to distinguish from scrub/shrub vegetation and, therefore, was mapped in the field as RF/SS.

Shaded riverine aquatic - includes all vegetation overhanging the water, even if only for a small part of the tidal cycle. Most of this habitat type was at Sycamore Island and included mainly willows. Small amounts of SRA were present at Channel Island #5 and included willow, alder, and dogwood.

Riverine aquatic bed - refers to a plant community with vegetation consisting of submerged or floating-leafed plants, typically elodea (Anacharis canadensis), milfoil (Myriophyllum sp.), and hornwort (Cerataophyllum demersum). This community is present on all five channel islands and extends from the water line and into the channel to a depth of about three or four feet. The habitat type is of great value as cover to fish and other aquatic life.

The general vegetation composition of each of the channel islands is as follows (See Appendix A):

Island #3 - This island is covered by large concentrations of tules. The predominant vegetation at the southerly one-half of the island is phragmites, with scattered patches of tules. There were a few partially submerged logs at the northeast portion of the island.

Island #4 - There is very little land left of this island. The island, other than emergent vegetation, is completely inundated at high tide. The higher elevation portions of this island were covered mainly by bulrushes. There is a large partially submerged log at the southern part of the island.

Island #5 - The main vegetation component of this island consists of tules and cattails. At some locations, such as at the south central part of the island, tules extend into the river channel. The general composition of the vegetation changes from mainly bulrushes and cattails at the east end of the island to bulrushes, sedges, and willows at the west end. There are two large patches of willows near the center of the island. Large patches of dogwood exist near the central and western end of the island. Small alders exist at the west and eastern end of the island. There is little submerged tree or shrub vegetation along most of the island; however, there are several logs at the southwest and northwest portion of the island. There was very little apparent fisheries cover elsewhere at Island #5, evident either through direct visual observations or from printouts from the graph recorder. However, extensive concentrations of elodea were present in water 2'-4' deep at the south side of the island, as with all of the islands surveyed. A small patch of Calla lilies was present at the southeast part of the island. There were a few scattered submerged logs about 10'-15' apart on the north and south sides of the island.

Island #7 - There is very little left of this island. There are scattered stands of bulrushes and cattails present.

Sycamore Island - The entire interior of the island is covered by a dense riparian forest. There is a small "bay" at the northeast part of the island, with remnants of submerged riparian vegetation at its entrance. The night heron rookery is immediately adjacent.

Rare Plants

Three CEQA-defined rare or endangered plant species were found: the Mason's lilaeopsis, the California hibiscus, and the mudwort. The Mason's lilaeopsis and mudwort were found at several locations along Channel Island #3, #4, #5, and #7 (Appendix B) on both sides of the island.

The California hibiscus was found at two locations growing in a dense stand of bulrush on the east end of Channel Island #5 (Appendix B). The plant species associated with the Mason's lilaeopsis and mudwort included pygmy weed (Crassula aquatica), flowering quillwort (Lilaea scilloides), dallis grass, and pennywort (Hydrocotyle sp.). No other CEQA-defined rare or endangered plants were found. No such plants were found on Sycamore Island.

Table 3. Species Found at Subject Channel Islands.

Channel Island	Mason's lilaeopsis	Mudwort	Sandford's arrowhead	Suisun Marsh aster	California [illegible]scus
#3	yes	yes	no	no	no
#4	yes	yes	no	no	no
#5	yes	yes	no	no	yes
#7	yes	yes	no	no	no
Sycamore	no	no	no	no	no

Wildlife

A total of 14 bird species were seen in the project area (Appendix C). Fewer surveys were conducted on Sycamore Island because willows and other scrub/shrub vegetation made it impossible to survey the interior of the island without extensive vegetation clearance. The most diverse group of bird species was at Channel Island #5. The cattail and tule marsh was populated with the redwing blackbird (Agelaius phoeniceus), common yellow throat

(Geothlypis trichas), song sparrow (Melospiza melodia), and marsh wren (Cistothorus palustris). The predominant species seen in territorial behavior such as singing were the song sparrow and the marsh wren. The American coot (Fulica americana) was also frequently seen.

A population of adult and juvenile black-crowned night herons (Nycticorax) was present at the northeast side of Sycamore Island. No bird count was conducted, but it was estimated that at least 150 night herons were present during the time of the survey. This section of the island supports large quantities of emergent vegetation and tree branches and is currently used by the night herons as a rookery and roosting site.

Potential black rail habitat occurs only on Channel Island #5, where dense marsh vegetation with shrubs associated with higher ground was present. No California black rails were seen or heard during the surveys. However, this is not conclusive evidence that black rails are not present. There are several factors which may influence black rail responses to taped calls including time of year and time of day. Very little information is available on the wintering distribution of black rails in the Delta.

The five islands, with the presence of abundant tules and cattails, also provided suitable habitat for the tricolored blackbird (Agelaius tricolor). The western pond turtle (Clemmys marmorata) was seen at several locations around the channel islands as indicated in Appendix B. They were seen basking on partially submerged logs. Both the western pond turtle and the tricolored blackbird are Federally listed Category 2 Candidate species.

The only mammal species seen was a muskrat (Ondrata zibethicus). This was seen along the deep water side of Channel Island #5. A beaver lodge was found at the north end of Channel Island #3. There was evidence of beaver activity at Channel Island #3 and #4, in the form of tooth marks on willows. The presence of beavers may be an issue relative to survival of vegetation plantings.

Fisheries

The results of this study provide an overview of the fish species using the area. A complete fish survey report is included as Appendix D. The survey information gives a general indication of fish populations present in the study area.

A total of 10 fish species and 57 fish were caught during the survey. The following species caught are native to the Delta: tule perch, chinook salmon, and steelhead. Only 40 percent of the species and 23 percent of the individuals caught were native to the Delta.

The fish populations caught in the survey include many of the same species caught in the Delta during other surveys. The waters near the south end of Staten Island were sampled by electrofishing in December of 1982 and January of 1983, as part of a Delta wide electrofishing survey conducted from 1980-1984. Species caught during that survey included tule perch, sturgeon, green sunfish, threadfin shad, and steelhead.

Some of the fish species caught in the survey depend upon cover and shallow water shoal areas for spawning and rearing. Redear sunfish and black crappie are found in close association with cattails, bulrushes tree roots and limbs, and overhanging vegetation (Emig, 1966). Reductions in tule perch populations are associated with losses of emergent vegetation and other factors (Moyle, 1976).

The black crappie, like many of the other fish species in the Delta, depends upon shallow water habitat with submerged aquatic vegetation. It nests are usually built in water less than three feet deep (Moyle, 1976).

There appears to be little conclusive evidence regarding the importance of cover to striped bass. However, it is expected that striped bass will benefit from development and maintenance of shallow water shoal areas. The average catch by season at West Island and Santa Clara shoal in the Delta was much greater in water four to ten feet deep than in deeper

water (Sasaki, 1966).

Splittail spawn over flooded streambank vegetation or over beds of aquatic plants (Moyle, 1976). The habitat where the splittail were caught at Islands #4 and #5 had little in the way of submerged cover. The placement of submerged branches as interim cover and the long-term establishment of SRA vegetation will likely benefit this species. However, dredge material may be deposited on submerged vegetation in some shallow water areas.

The proposed project will increase the amount of habitat for these species by placing dead tree roots in the water. Very little of this habitat is present around any of the five channel islands. This submerged vegetation is expected to last for several years until such time as the SRA habitat is established. The two salmon caught in the survey are likely to be late fall-run. Winter-run chinook caught during the time of the survey would probably be smaller than those caught (Fisher, 1994). However, the survey area is likely habitat for winter-run chinook. Juveniles were caught in midwater trawl samples in nearby Georgiana Slough in January and February of 1993.

The mesh sizes of the gillnets used in the assessment are insufficient for capturing delta smelt or winter-run chinook salmon. Other information will be used, such as the information present in Figures #3, #4, and #5.

The variety and number of fish collected from the channel islands suggest that the islands have the potential to provide valuable cover and potential breeding and foraging habitat for over half of the species caught, including the Federal-Proposed Threatened Sacramento Splittail. The data also indicate that the shallow water areas of the channel islands are used by juvenile anadromous fish such as the chinook salmon and striped bass. The presence of these juvenile fish supports the idea that the area may be used as a nursery or holdover area.

REFERENCES

California Department of Fish and Game. 1993. Draft - Sacramento-San Joaquin Delta Master Environmental Assessment. Calif. Dept. of Fish and Game.

California Department of Fish and Game. 1987. Exhibit 24, entered by the California Department of Fish and Game for the State Water Resources Control Board 1987 Water Quality/Water Rights Proceeding on the San Francisco Bay/Sacramento-San Joaquin Delta.

Caywood, M.L. 1974. Contributions to the life history of the splittail Pogonichythys macrolepidotus (Ayres). M. S. thesis California State University, Sacramento.

Emig, J.W. 1966. Red-ear sunfish, 392-398 In A. Calhoun, ed., Inland Fisheries Management, Calif. Dept. Fish, Game.

Evans, J. and G.W. Page. 1985. Quantifying black rail abundance in the San Francisco Bay salt marshes. Point Reyes Bird Observatory.

Fisher, Frank. April. 1994. Personal Communication. California Dept. of Fish and Game.

Gifford, D. Feb. 1994. Personal Communication. California Dept. of Fish and Game.

Hearn, S. Jan. and Feb. 1994. Personal Communication. M & T Staten Ranch, Staten Island.

Herbold, B., A.D. Jassby, and P.B. Moyle. 1992. Status and trend report on aquatic resources in the San Francisco estuary. San Francisco Estuary Project.

Hickman, J.C. 1993. The Jepson Manual - Higher Plants of California. Univ. of Calif. Press, Berkeley.

Kjeldsen, C.K. and J.R. Arnold. 1993. Flora of the Levees of the San Joaquin-Sacramento Delta. Habitat Studies 1990-93.

Mason, H.L. 1957. A Flora of the Marshes of California. Univ. of Calif. Press, Berkeley.

Moyle, P.B. 1976. Inland Fishes of California. Univ. of Calif. Press. Berkeley. 405 pp.

Moyle, P.B., B. Herbold, D.E. Stevens, and L.W. Miller. 1992. Life history and status of the Delta Smelt in the Sacramento-San Joaquin Estuary, California. Trans. Am. Fish. Soc. 121:67-77.

Peterson, R.T. A Field Guide to Western Birds. Houghton-Mifflin Co.

Reyard, G.B. 1974. Some vocalizations of black, yellow, and Virginia rails. Auk 91:747-756.

Sasaki, S. 1966. Distribution of juvenile striped bass, Roccus saxatilus, in the Sacramento-San Joaquin Delta. 59-67. In Jerry L. Turner and D.W. Kelley(ed.) Ecological Studies of the Sacramento-San Joaquin Delta. California Department of Fish and Game, Fish Bull.,(136), 1-168.

Stevens, D.E., S.W. Miller, and B.C. Bolster. 1990. Report to the Fish and Game Commission: A status review of the delta smelt (Hypomesus transpacificus) in California. California Department of Fish and Game Candidate Species Status Report 90-2.

Wang, J.C.S. 1986. Fishes of the Sacramento-San Joaquin estuary and adjacent waters, California: A guide to the early life histories. Interagency Ecological Study Program for the Sacramento-San Joaquin estuary. Tech. Rep. 9.

Wang, J.C.S. 1990. Early life stages and early life history of the Delta smelt, Hypomesus transpacificus, in the Sacramento-San Joaquin estuary, with comparison of early life history stages of longfin smelt, Spririnchus thaleichthys. Interagency Ecological Study Program for the Sacramento-San Joaquin estuary. Tech. Rep. 28.

Whitson, T.D., L.C. Burrill, S.A. Dewey, D.W. Cudney, B.E. Nelson, R.D. Lee, R. Parker. 1992. Weeds of the West. Univ. of Wyoming.

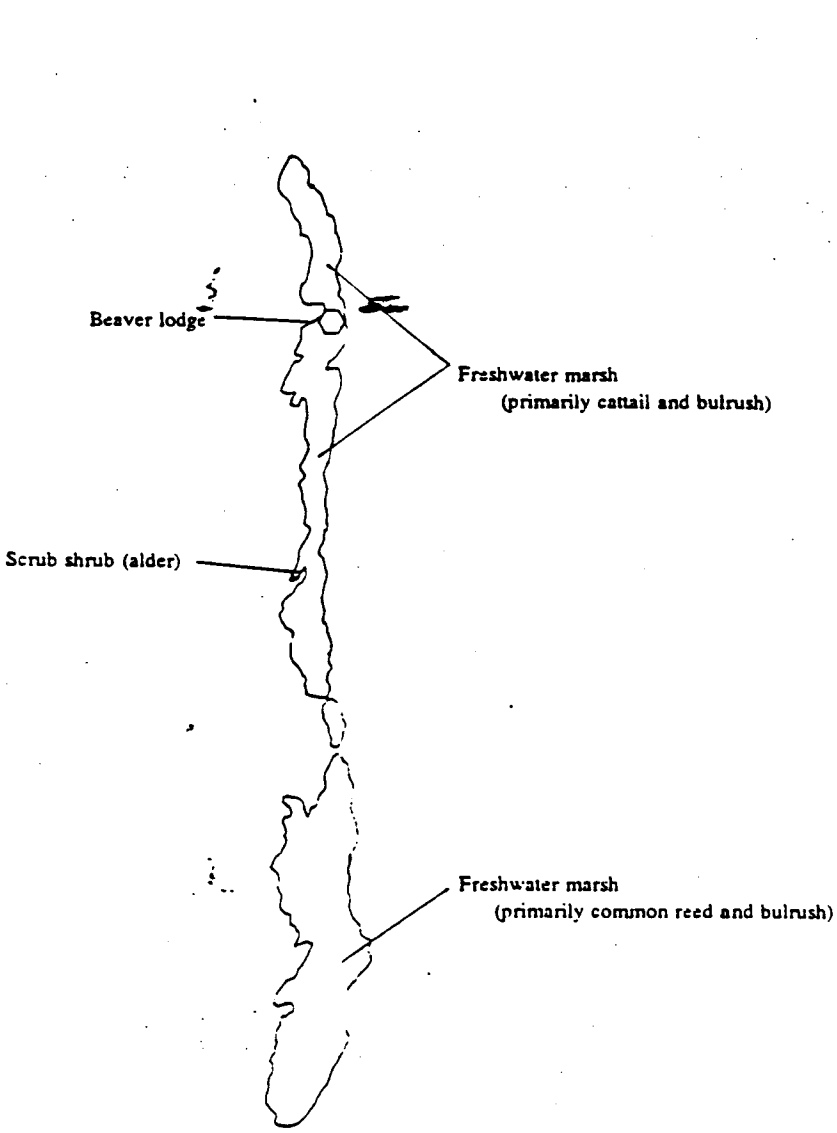
Zeiner, D.C., W.F. Laudenslayer, K.E. Mayer, and M. White. 1990. California's Wildlife. Vol. I, II, II. Calif. Dep. of Fish and Game. Nov., 1990.

cc: Frank Gray, Frank Wernette (DFG, Bay Delta), Chris Kjeldson, Sally Hearne (Staten M & T Ranch), Kent Nelson(DWR), George Redpath

APPENDIX A

FIELD SURVEY MAPS WITH HABITAT LOCATIONS

CHANNEL ISLAND #3



Survey Date: 02- & 03-94

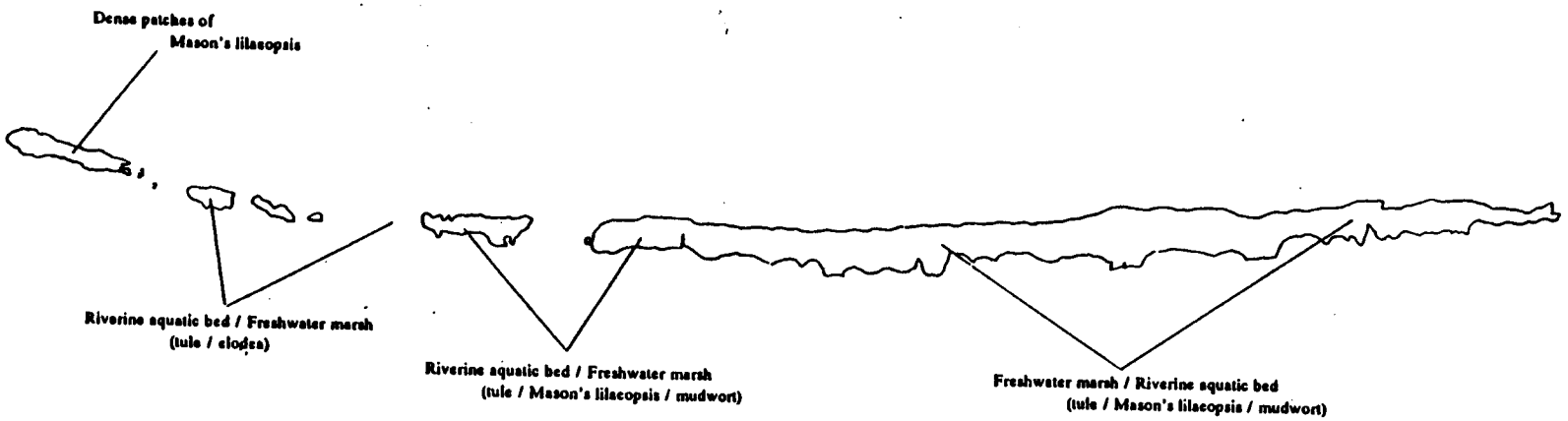
Scale: 1" = 200'

CALENDAR PAGE 193

MINUTE PAGE 2577

CHANNEL ISLAND

CALENDAR PAGE 194
MINUTE PAGE 2578



N

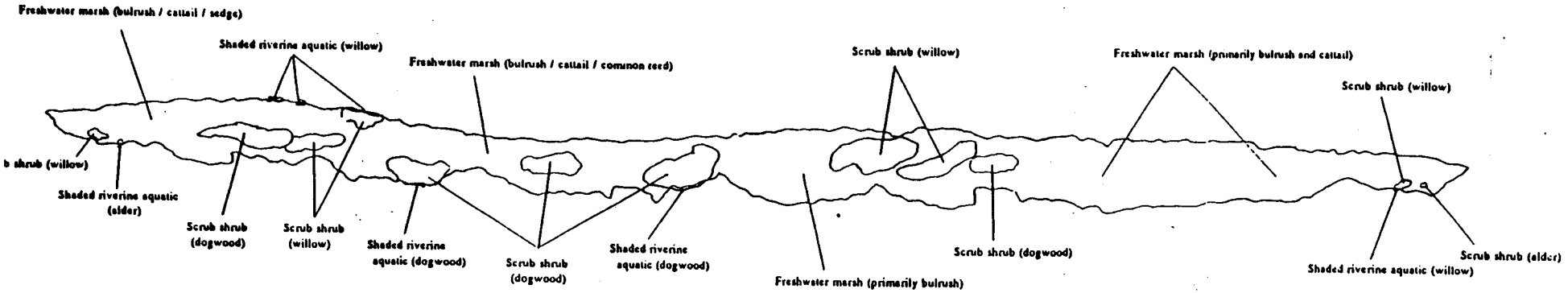
Survey Date: 02- & 03-94

Scale: 1" = 200'

CHANNEL ISLAND 5

CALENDAR PAGE 195

MINUTE PAGE 2579

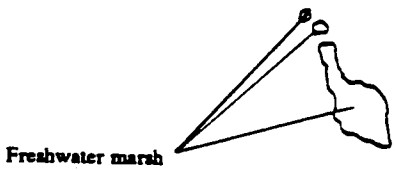


Survey Date: 02- & 03-94

Scale: 1" = 200'

CHANNEL ISLAND #7

N



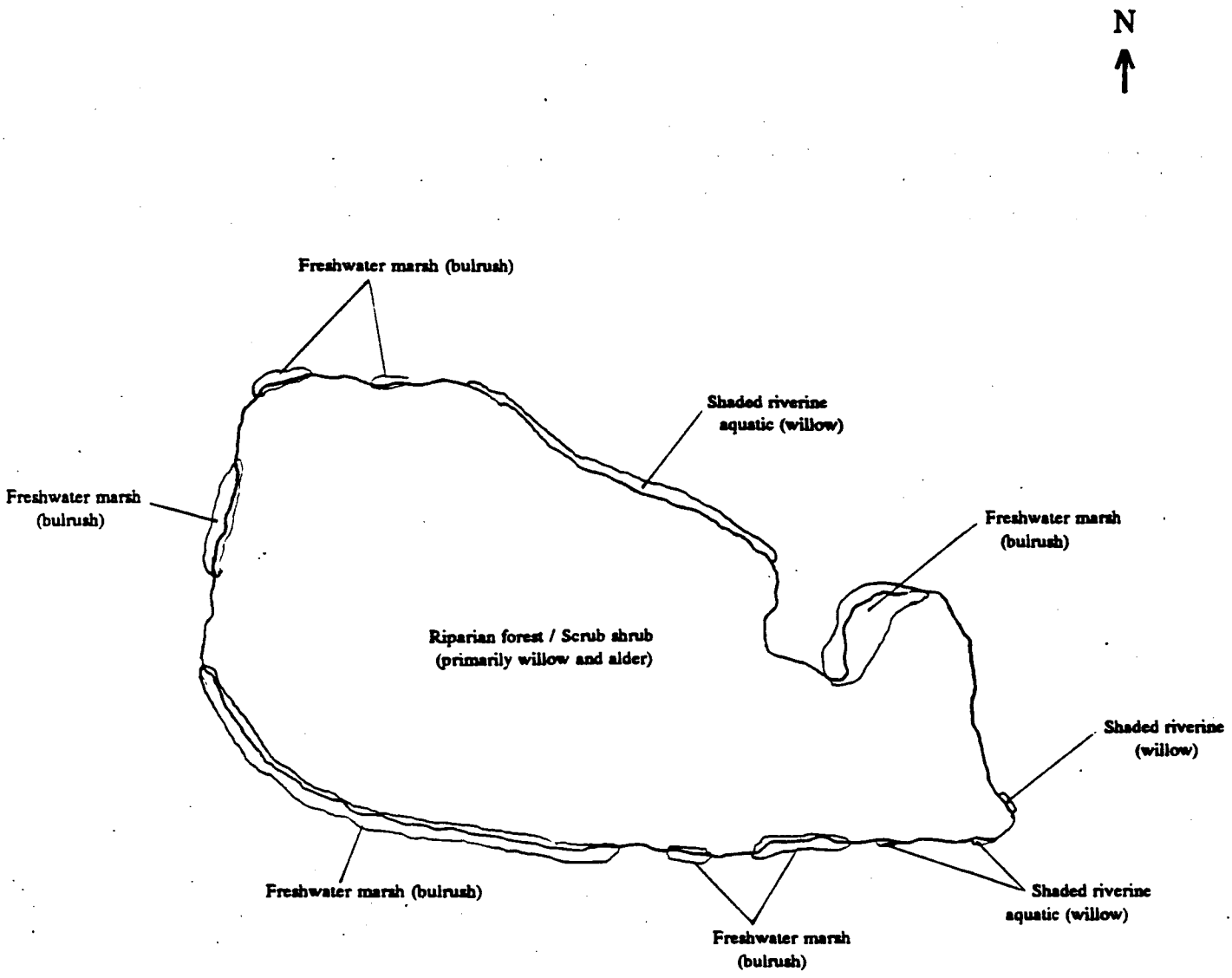
Survey Date: 02- & 03-94

Scale: 1" = 200'

CALENDAR PAGE 196

MINUTE PAGE 2580

SYCAMORE ISLAND



Survey Date: 02-94
Scale: 1" = 200'

CALENDAR PAGE 197

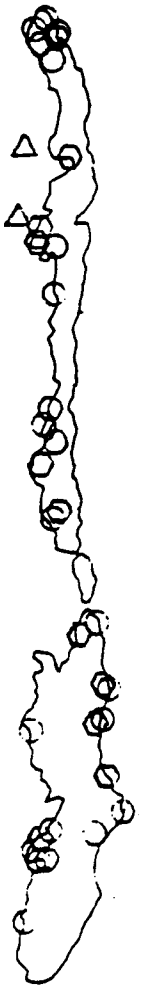
MINUTE PAGE 2581

APPENDIX B

FIELD SURVEY MAPS WITH SENSITIVE SPECIES LOCATIONS

CHANNEL ISLAND #3

N



IDENTIFICATION KEY:

- Mason's lilaeopsis
- Mudwort
- △ Western pond turtle

Survey Date: 02- & 03-94

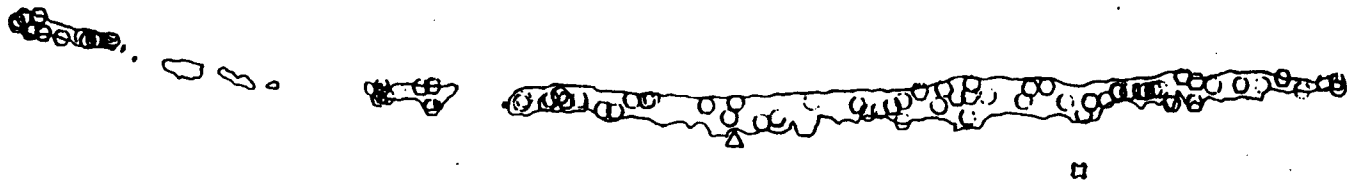
Scale: 1" = 200'

CALENDAR PAGE 199

MINUTE PAGE 2583

CHANNEL ISLAND 4

N



CALENDAR PAGE 200

MINUTE PAGE 6284

IDENTIFICATION KEY:

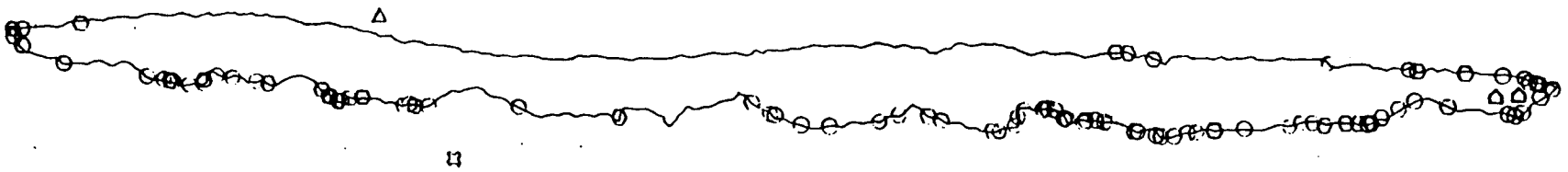
- ○ Mason's lilaeopsis
- ○ Marsh gnat
- △ Western pond turtle
- ⌑ Salt marsh wandering skipper

Survey Date: 02- & 03-94

Scale: 1" = 200'

CHANNEL ISLAND 5

N



CALENDAR PAGE 201

MINUTE PAGE 004585

IDENTIFICATION KEY

- Mason's lilaeopsis
- California black rail
- Mudsnail
- Western pond turtle
- Sacramento splittail

Survey Date: 02- & 03-94

Scale: 1" = 200'

CHANNEL ISLAND #7

N

IDENTIFICATION KEY:

- Mason's lilaeopsis
- Mudwort

Survey Date: 02- & 03-94

Scale: 1" = 200'

CALENDAR PAGE 202

MINUTE PAGE 2586

APPENDIX C

PLANT AND WILDLIFE SPECIES OBSERVED AT THE CHANNEL ISLANDS

LIST OF PLANT AND WILDLIFE SPECIES IDENTIFIED AT CHANNEL ISLAND #3

(Observations: February & March 1994)

SCIENTIFIC NAME	COMMON NAME
PLANTS	
Alnus rhombifolia	White alder
Carex sp.	Sedge
Ceratophyllum demersum	Hornwort
Cornus sericea ssp. *sericea*	American dogwood
Crassula aquatica	Pigmy weed
Eichhornia crassipes	Water hyacinth
Elodea canadensis	Elodea
Juncus spp.	Rush
Hydrocotyle sp.	Pennywort
Iris pseudacorus	Iris
Lilaea scilloides	Flowering-quillwort
Lilaeopsis masonii	Mason's lilaeopsis
Limosella subulata	Mudwort
Myriophyllum sp.	Milfoil
Paspalum dilatatum	Dallis grass
Phragmites australis	Common reed
Polygonum spp.	Smartweeds
Scirpus sp.	Bulrush
Typha sp.	Cattail
BIRDS	
Fulica americana	American coot
Gallinago gallinago	Common snipe
Cistothorus palustris	Marsh wren
Melospiza melodia	Song sparrow
Agelaius phoeniceus	Red-winged blackbird
REPTILES/AMPHIBIANS	
Clemmys marmorata	Western pond turtle

LIST OF PLANT AND WILDLIFE SPECIES IDENTIFIED AT CHANNEL ISLAND #4

(Observations: February & March 1994)

SCIENTIFIC NAME	COMMON NAME
PLANTS	
Carex sp.	Sedge
Ceratophyllum demersum	Hornwort
Crassula aquatica	Pigmy weed
Cyperus sp.	Sedge
Eichhornia crassipes	Water hyacinth
Elodea canadensis	Elodea
Juncus spp.	Rush
Hydrocotyle sp.	Pennywort
Iris pseudacorus	Iris
Lilaea scilloides	Flowering-quillwort
Lilaeopsis masonii	Mason's lilaeopsis
Limosella subulata	Mudwort
Myriophyllum sp.	Milfoil
Paspalum dilatatum	Dallis grass
Phragmites australis	Common reed
Polygonum spp.	Smartweeds
Scirpus sp.	Bulrush
Typha sp.	Cattail
BIRDS	
Anas playtrhynchos	Mallard
Charadrius vociferus	Killdeer
Gallinago gallinago	Common snipe
Sterna forsteri	Forster's tern
Cistothorus palustris	Marsh wren
Melospiza melodia	Song sparrow
REPTILES/AMPHIBIANS	
Clemmys marmorata	Western pond turtle

LIST OF PLANT AND WILDLIFE SPECIES IDENTIFIED AT CHANNEL ISLAND #5

(Observations: February & March 1994)

SCIENTIFIC NAME	COMMON NAME
PLANTS	
Alnus rhombifolia	White alder
Athyrium filix-femina var. *cyclosorum*	Lady fern
Carex sp.	Sedge
Ceratophyllum demersum	Hornwort
Cornus sericea ssp. *sericea*	American dogwood
Crassula aquatica	Pigmy weed
Eichhornia crassipes	Water hyacinth
Elodea canadensis	Elodea
Epilobium sp.	Epilobium
Juncus spp.	Rush
Galium trifidum var. *pacificum*	Bedstraw
Hibiscus lasiocarpus	California hibiscus
Hydrocotyle sp.	Pennywort
Iris pseudacorus	Iris
Lilaea scilloides	Flowering-quillwort
Lilaeopsis masonii	Mason's lilaeopsis
Limosella subulata	Mudwort
Lycopus americanus	Water horehound
Myriophyllum sp.	Milfoil
Paspalum dilatatum	Dallis grass
Phragmites australis	Common reed
Polygonum spp.	Smartweeds
Rubus ursinus	California blackberry
Rumex sp.	Dock
Salix sp.	Willow
Scirpus sp.	Bulrush
Typha sp.	Cattail
Verbena sp.	Verbena
Zantedeschia aethiopica	Calla lily
BIRDS	
Ardea herodias	Great blue heron
Anas platyrhynchos	Mallard
Phasianus colchicus	Ring-necked pheasant

Fulica americana	American coot
Charadrius vociferus	Killdeer
Gallinago gallinago	Common snipe
Tyto alba	Barn owl
Ceryle alcyon	Belted kingfisher
Corvus brachyrhynchos	American crow
Cistothorus palustris	Marsh wren
Dendroica coronata	Yellow-rumped warbler
Geothylypis trichas	Common yellowthroat
Melospiza melodia	Song sparrow
Zonotrichia leucophrys	White-crowned sparrow
Agelaius phoeniceus	Red-winged blackbird

MAMMALS

Ondatra zibethicus	Muskrat

REPTILES/AMPHIBIANS

Clemmys marmorata	Western pond turtle

LIST OF PLANT AND WILDLIFE SPECIES IDENTIFIED AT CHANNEL ISLAND #7

(Observations: February & March 1994)

SCIENTIFIC NAME	COMMON NAME
PLANTS	
Carex sp.	Sedge
Ceratophyllum demersum	Hornwort
Crassula aquatica	Pigmy weed
Eichhornia crassipes	Water hyacinth
Elodea canadensis	Elodea
Epilobium sp.	Epilobium
Juncus sp.	Rush
Hydrocotyle sp.	Pennywort
Iris pseudacorus	Iris
Lilaea scilloides	Flowering-quillwort
Lilaeopsis masonii	Mason's lilaeopsis
Limosella subulata	Mudwort
Myriophyllum sp.	Milfoil
Paspalum dilatatum	Dallis grass
Phragmites australis	Common reed
Polygonum spp.	Smartweed
Scirpus sp.	Bulrush
Typha sp.	Cattail
BIRDS	
Charadrius vociferus	Killdeer
Gallinago gallinago	Common snipe

LIST OF PLANT AND WILDLIFE SPECIES IDENTIFIED AT SYCAMORE ISLAND

(Observation: February 1994)

SCIENTIFIC NAME	COMMON NAME
PLANTS	
Alnus rhombifolia	White alder
Carex sp.	Sedge
Ceratophyllum demersum	Hornwort
Cornus sericea ssp. *sericea*	American dogwood
Crassula aquatica	Pigmy weed
Eichhornia crassipes	Water hyacinth
Elodea canadensis	Elodea
Juncus spp.	Rush
Galium trifidum var. *pacificum*	Bedstraw
Hydrocotyle sp.	Pennywort
Iris pseudacorus	Iris
Lilaeopsis masonii	Mason's lilaeopsis
Limosella subulata	Mudwort
Myriophyllum sp.	Milfoil
Paspalum dilatatum	Dallis grass
Phragmites australis	Common reed
Polygonum spp.	Smartweed
Rumex sp.	Dock
Salix sp.	Willow
Scirpus sp.	Bulrush
Typha sp.	Cattail
Verbena sp.	Verbena
BIRDS	
Ardea herodias	Great blue heron
Nycticorax nycticorax	Black-crowned night heron
Fulica americana	American coot
Corvus brachyrhynchos	American crow
Melospiza melodia	Song sparrow

APPENDIX D

GILLNET SURVEY INFORMATION

Staten Island, San Joaquin County Jan. 27-28 1994 Gillnet Survey

file c:\habasses\statgife.94

April 1, 1994

Memorandum

To: File

From: Frank Gray

Subject: Staten Island, San Joaquin County. Gillnet Survey.

On January 27 and 28, 1994, Frank Gray and Scientific Aid Barry Baba did a gillnet survey at the South Fork of the Mokelumne River near Staten Island. The main goal of the survey was to provide more background information for the proposed mitigation project at five islands surrounding Staten Island. This would be in the form of a fish species inventory to be prepared according to the California Environmental Quality Act (CEQA).

The fish species inventory is useful for items including the following:

1. To help determine Special Status (State or Federally listed Proposed, Endangered, Threatened, Candidate, or Rare)
2. To help determine those measures necessary for the project review, such as justification for the placement of various habitat structures such as tree limbs and the appropriateness of use of rock riprap.
3. To provide part of the information necessary for the development of the CEQA document (EIR or Neg Dec.)

There are no recent fish species data available for Staten Island. The Bay/Delta Division completed a comprehensive series of electrofishing surveys of the Delta during the period from 1980 to 1984.

Materials and Methods

A total of four gillnets were set overnight. The nets were set from the bow of the SB 34 FishRite ® 20.5 foot workboat with 150 hp Mariner outboard. The nets were set perpendicular to the shoreline at locations noted in Figures #1 and #2.

One end of the nets was set in the shallow (<2 foot) depth water along the shoreline. Concrete anchors were used to anchor the net at either end. Each end of the net was marked with a styrofoam

float, which had reflective tape to help nighttime boat operators avoid collision.

Caribiners (such as those used for mountain climbing) were used to connect floatlines, anchors, etc. A Lowrance X-16 graph recorder was used to determine bottom contours and denote the presence of any obstructions which could cause problems with the netting operation.

The small mesh of the net was set next to the shoreline, with the assumption that smaller fish were there.

Results and Discussion

A total of 57 fish were caught in four gillnets (See Table 3). Ten fish species are represented, included the following: Striped bass (SB), white catfish (WCF), steelhead trout (SH), chinook Salmon (KS), carp (CP), golden shiner (GSH), tule perch (TP), redear sunfish (RSF), black crappie (BCR), and Sacramento splittail (SPT).

A total of 30 (53%) of the fish were GSH. A total of two KS were caught in the net during Set #2 and escaped from the net. They were both in the 200 mm length range.

Both of the SH had eroded dorsal fins, indicating hatchery origin.

Incidental observations included those of birds. Birds observed during the trip at the channel islands included a black-shouldered kite and a raptor very similar in appearance to a red-shouldered hawk. Bird species also included the yellow-rumped warbler, the marsh wren, and mallard ducks. All these birds were using the channel islands where the nets were set.

Frank Gray
Environmental Specialist III
Region 2

cc: Maury Fjeldstad (R2), David Kohlhorst (Bay/Delta), Kent Nelson(DWR), Diana Jacobs (State Lands), Sally Hearne (M & T Staten Ranch), Barry Baba, Ed Littrell

Table 1. Gillnet Survey Information, Staten Island, San Joaquin County. January 27-28, 1994.

Set No.	Time Set (Hours)	Time Recovered (Hours)	Hours in Water	Net and Mesh Size
1	1815	0930	15.25	120'x 5' (1"-3" mesh)
2	1830	0945	15.25	120 x 8' (1"-3" mesh)
3	1900	1015	15.25	120'x 8" (1"-3" mesh)
4	1915	1040	15.60	52' x 4' (2"-4" mesh)

Table 2. Additional Gillnet Survey Information, Staten Island, San Joaquin County. January 27-28, 1994.

Set #	Location	Net Type	Bottom Type	Depth Set
1	Island # 5 at East End of island	sinking	mud	4'-9'
2	Island # 5 at South end of island across from pumps	floating	mud	4'-11'
3	Island 4 about 300' from East end of island	floating	mud	4'-7'
4	Island 3 at South tip of island	-	mud	-

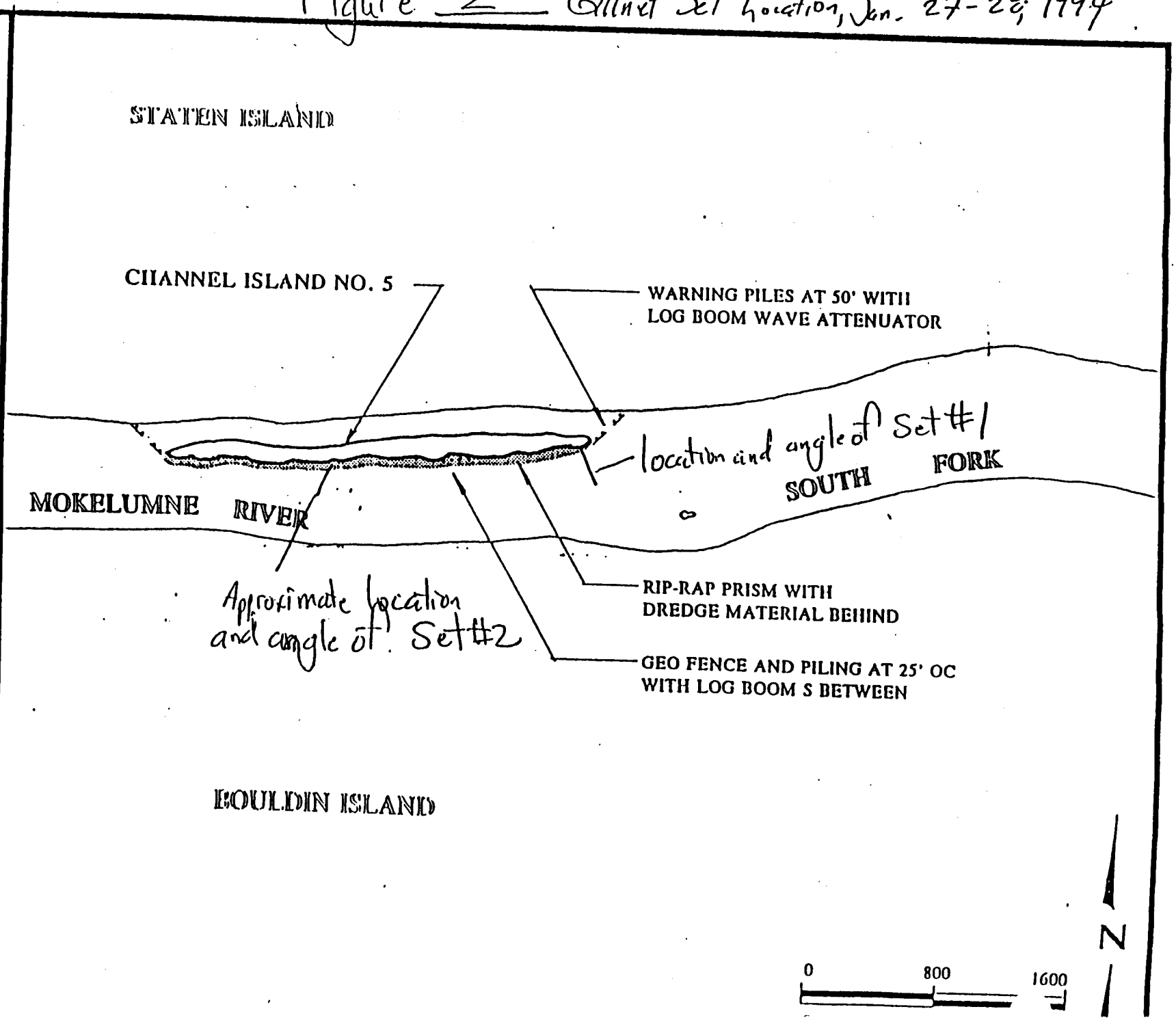
Table 3. Mean Fork Lengths in mm and other pertinent information for Gillnet Survey, Staten Island, San Joaquin County. January 27-28, 1994. Mean fork length is indicated and number caught in parens.

Set #	WCF	SB	RSF	BCR	GSH	CP	SPT	TP	RT	KS
1	249 (1)	336 (2)	178 (1)	141 .5 (2)	163. 23 (13)	781 (1)	-	-	-	-
2	328. 5 (2)	290 (1)	131 (2)	-	163. 53 (15)	-	290 (1)	134 .66 (3)	-	160 (2)
3	-	210 (2)	-	-	159 (2)	-	319 (1)	118 (1)	210 (2)	-
4	-	-	190 (1)	-	-	-	-	155 .66 (3)	-	-

Table 4. Range of Fork Lengths in mm for Gillnet Survey, Staten Island, San Joaquin County. January 27-28, 1994.

Set #	WCF	SB	RSF	BCR	GSH	CP	SPT	RT	TP	KS
1	249	307 to 365	178	138 to 145	93 to 192	781	-	-	-	-
2	325 to 332	318 to 339	162 to 200	-	136 to 193	-	290	-	118 to 166	148 to 173
3	-	279 to 369	-	-	138 to 180	-	319	204 to 216	118	-
4	-	-	190	-	-	-	-		149 to 160	-

Figure 2 Gillnet Set location, Jan. 27-28, 1994

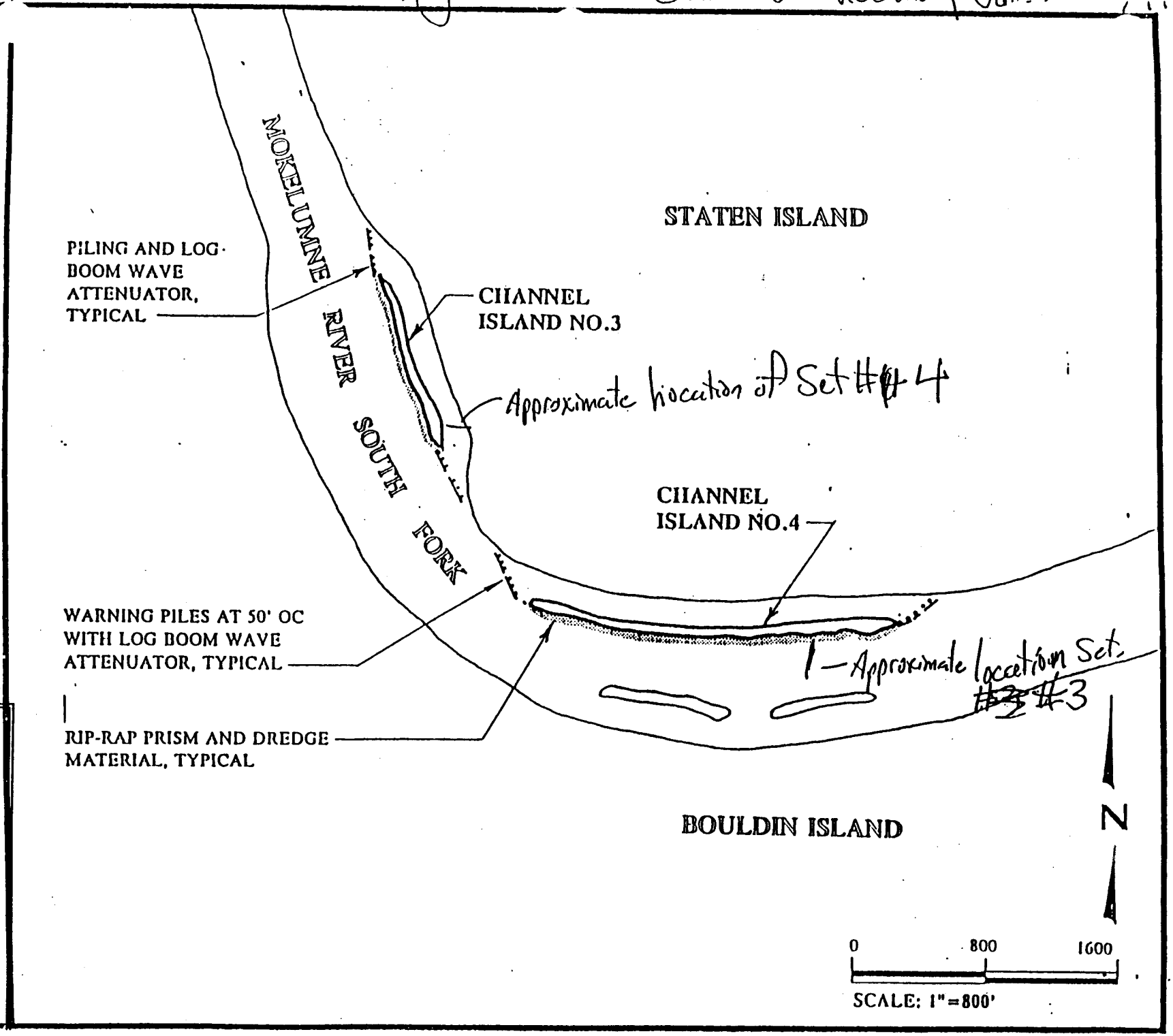


D-5

PURPOSE:
RIVERINE HABITAT ENHANCEMENT

CONTENTS:
SITE PLAN

D-6



CALENDAR PAGE 216
CHANNEL ISLANDS RESTORATION
MT MINUTE PAGE 2600

SHEET 3 of 6

REV.

APPENDIX E

PHOTOGRAPHS

Photo 1
Channel Island #3, 03-08-94. DFG photo by Barry Baba.

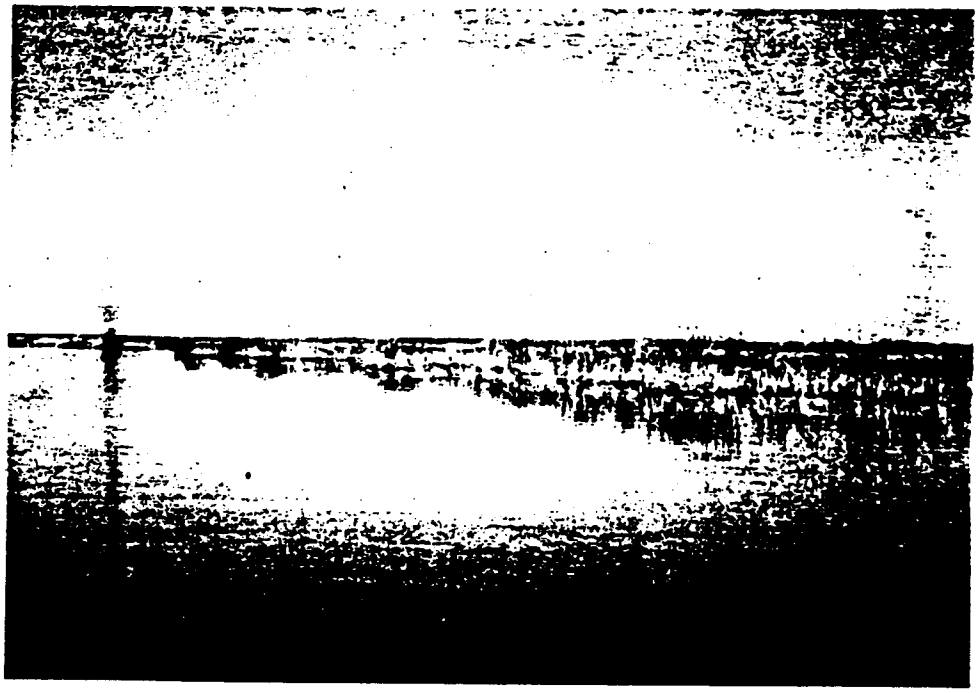


Photo 2
Channel Island #4, 03-15-94. DFG photo by Barry Baba.

Photo 3
Channel Island #5. 03-15-94. DFG photo by Frank Gray.

Photo 4
Channel Island #7. 03-13-94. DFG photo by Frank Gray.

CALENDAR PAGE	219
MINUTE PAGE	2603

Photo 5
Sycamore Island, 02-15-94. DFG photo by Frank Gray.

Photo 6
Mason's lilaeopsis at Channel Island #4, 02-11-94. DFG photo by Barry Baba.

Photo 7
Mason's lilaeopsis from Channel Island #4, 02-11-94. DFG photo by Barry Baba.

Photo 8
Mudwort from Channel Island #4, 02-11-94. DFG photo by Barry Baba

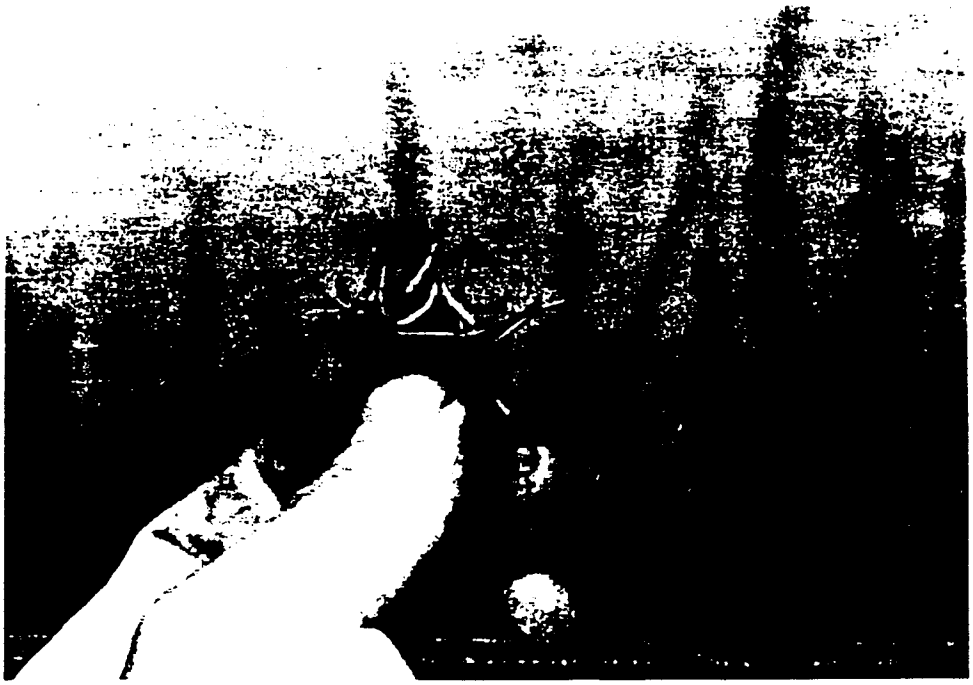


Photo 9
Sacramento splittail caught along Channel Island #5, 01-28-94. DFG photo by Barry Baba.

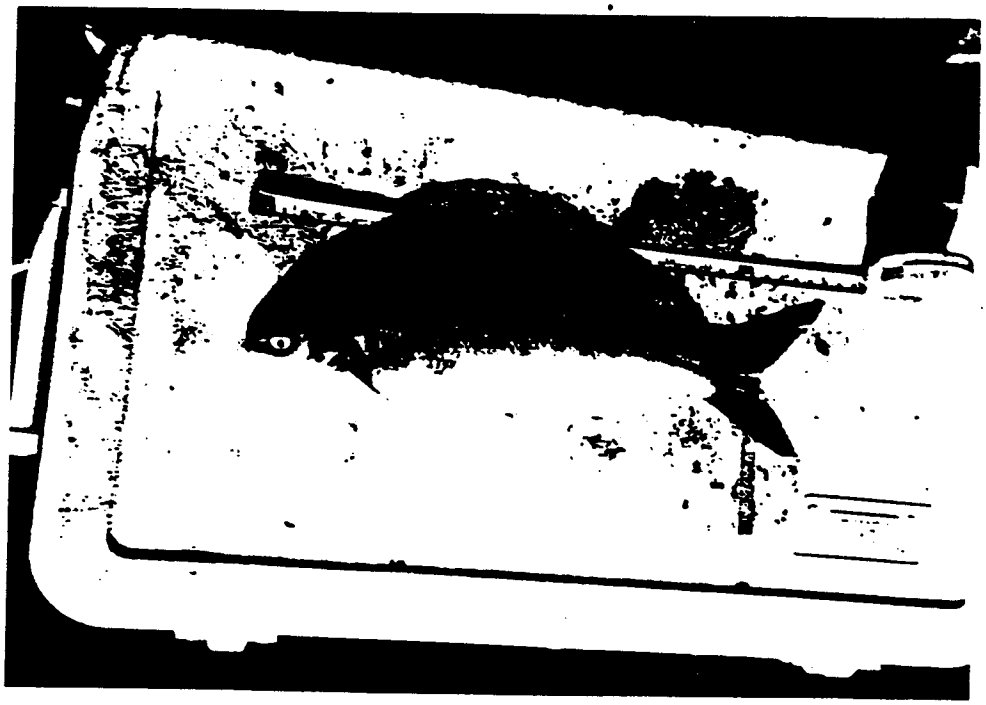


Photo 10
Western pond turtles at Channel Island #5, 03-08-94. DFG photo by Barry Baba.

Photo 11
California hibiscus at Channel Island #5, 03-08-94. DFG photo by Barry Baba.

Photo 12
Beaver lodge at Channel Island #3, 03-08-94. DFG photo by Barry Baba.

DRAFT

MONITORING AND VEGETATION PLANTING PLAN FOR STATEN ISLAND, SAN JOAQUIN COUNTY 1994 MITIGATION PROJECT.

References to "Project Areas" includes those areas of the Channel Islands #3,#4, # 5, and #7 where fill materials have been placed.

The duties in this plan will be performed by representatives of the Department of Fish and Game(DFG) SB 34 staff and/or its assignees. All of the following duties outlined in this plan shall be performed at least bi-annually until January 1, 1999, when funding authorized under the SB 34 program is scheduled to end. Annual monitoring reports shall be prepared until January 1, 1999, and shall be available for review by interested parties.

Vegetation Surveys

Survey transects shall be selected at all locations where earthen berms have been created. Transects shall be set up perpendicular to the channel at intervals sufficient to accurately describe the project. Transects shall extend from the edge of the rock prism to the edge of the earthen berm. Transect locations shall be marked with rebar, wooden stakes, or other materials suitable to the M & T Staten Ranch and the DFG.

There shall be a vertical intersect point along each transect line at intervals not exceeding every two meters. Each plant species intercepted by the vertical line will be recorded, providing a tally of records for each species at each intersect point on the transect. If no vegetation is contacted by the vertical line, then that point of the transect will be considered bare of vegetation. Percent cover and plant species composition will be calculated from these data. Incidental observations of plant species not located along the sampling transect will also be recorded.

Monitoring of the success of plantings of trees and shrubs cuttings or potted plants shall be completed. The following data shall be recorded at the times of vegetation planting.

- Date(s) of Planting
- Specific Planting Locations

- General information about individual size of potted plant/cutting,
- Planting techniques, uses of protective structures for plants, etc.

Individual plants shall be labelled in the field with colored flagging or otherwise identified such that the locations and species planted can be readily identified and discerned from non planted vegetation and monitored.

In addition to transect survey data, ongoing monitoring of vegetation shall include the following information about the growth and survival at each of the vegetation plantings:

- Numbers of surviving trees or shrubs by species.
- Approximate growth rates.
- Photos
- Mortality rates and possible causes
- Success of protective structures for vegetation, such as protective baskets for control of predation by beavers.

Permanent photo stations will be set up of all of project areas to document any changes in plant species composition, rock prism stability, plant growth, or other factors. Color slide photos will be taken at all photo monitoring stations.

Plant surveys will also include surveys to determine the status of the Mason's lilaeopsis and the mudwort, which are both CEQA defined rare or endangered species. Surveys for either species will be conducted of all Mason's or mudwort sites within 15 feet of the project areas and will include determinations of the survival of either species over time in the pre-project locations.

Monitoring of Project Structures

Monitoring will occur to document the condition of the wooden stumps in the riprap and of the log wave attenuator devices shall and will accomplish the following:

- Determine evidence of destabilization of the logs, due to impacts from high flows, wave action, or other factors.
- Determine fisheries habitat value. Fisheries surveys shall be performed to determine the fish species and fish species abundance found in association with the stumps.
- Determine evidence of rotting or other deterioration of the stumps.

Geoweb® is a bank stabilization alternative other than rock riprap which will be tested for its potential as a fish attractor. Geoweb® units shall be monitored to insure that the meet the following criteria:

- Individual units must remain at the exact locations where placed.
- The Geoweb® units must provide fisheries habitat.

Success criteria for the rock prism\earthen fill will include the following:

- Retention of at least 80% of all dredge fill material at all berm locations by July 1, 1996.
- Retention of the rock prism at its present configuration by July 1, 1996.
- Lack of evidence of scour or other signs of erosion at any of the downstream end of all rock riprap locations.

The rock prism will be monitored regularly to determine whether these criteria are met. Observations will be used to determine whether future projects will require modifications in the locations and/placement of riprap or other bank stabilization materials.

Bird and Mammal Observations

Concurrent with plant surveys, surveys of birds and mammals shall be undertaken to determine:

- Species which use the project areas, including the rock prism.

  Species, or groups of species, which use individual or habitat types. An example is documentation of the use of the earthen berm areas by beaver or muskrat.

- Dates, specific locations of observations, and other relevant data.

- Population estimates of various species will be obtained whenever possible.

Miscellaneous Observations

Miscellaneous Observations - The DFG or the M & T Staten Ranch may, at its discretion, elect to conduct an engineering evaluation of the project areas to help assist in a determination of factors which include the following:

- Losses of dredge fill material from the surface of the berm due to high flows or other factors.

- Effects of the project on flood control channel capacity or other factors.

- Erosion, if any, at that portion of Islands #3, #4, #5, and #7.

Rare or Endangered Species Evaluations(Other than those otherwise mentioned in the Plan).

Location of sighting and other pertinent information about all species which are currently CEQA defined rare or endangered species.

EXHIBIT "C"

MONITORING PLAN

Monitoring and Vegetation Planting Plan for Staten Island, San Joaquin County 1994 Mitigation Project.

This monitoring plan is for the shaded riverine aquatic (SRA) habitat mitigation project involving five channel islands near Staten Island. The project is described in Negative Declaration #94052025 and Corps Public Notice No. 199400135. It is scheduled for implementation in July, 1994.

References to "Project Areas" include Channel Islands #3, #4, # 5, and #7 and Sycamore Island and where rock riprap or other fill materials will be placed, or where structures such as Geoweb® or other structures have been placed in the water.

All of the areas subject to this monitoring plan, and the plant and animal species which inhabitat them, are sensitive to disturbance. An example is the night heron rookery at Sycamore Island, where birds are easily scared off. All surveys shall be conducted with a consideration of the well being of those fish and wildlife species at each of the islands. An example is that surveys for birds will be completed with a minimum of disturbance to plant species, and conversely.

Surveys will be completed with the objective of determining the success of the project, and surveys for other purposes will be completed only under separate authorization from the respective landowners. The main goal of the project is the establishment of SRA vegetation as mitigation for losses of this habitat along Delta Levees. Surveys will also include considerations of the project's impacts, if any, on CEQA-defined rare or endangered species. It will be the responsibility of all personnel conducting surveys to be aware of the locations of all CEQA-defined rare or endangered species, plant cuttings, and other features of the Project Areas and as necessary to avoid adverse impacts to these features.

The duties in this plan will be performed by representatives of the Department of Fish and Game (DFG) SB 34 staff and/or its assignees. An independent contractor may be assigned for monitoring/transplant studies of CEQA defined rare or endangered species as required to comply with the objectives of this monitoring plan.

All personnel performing onshore monitoring according to this plan shall notify the owners of Islands #3,#4, #5, and #7 (currently M & T Staten Ranch) at least 24 hours prior to

CALENDAR PAGE	223
MINUTE PAGE	2612

conducting surveys. All personnel conducting onshore monitoring at Sycamore Island shall notify the owners of Sycamore Island (currently Mr. Eric Merlo) at least 24 hours prior to conducting surveys. All personnel conducting monitoring under this plan are responsible for their own safety. Neither the owners of Islands #3, #4, #5, and #7 (the M & T Ranch and the State Lands Commission nor the owners of Sycamore Island assume responsibility for bodily injuries or damages incurred by personnel conducting monitoring under this plan.

All of the following duties outlined in this plan shall be performed at least annually until January 1, 1999, when funding authorized under the SB 34 program is scheduled to end. Annual monitoring reports shall be prepared until January 1, 1999. They shall be sent to the Staten M & T Ranch, the Delta Protection Commission, the California Department of Water Resources, the State Lands Commission, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service, and other interested parties upon their written request. Written comments on the monitoring plans will be due within one month of receipt of the annual report. Failure to provide comments within this time period, or failure to request a monitoring report, will be considered concurrent with the annual report and associated survey procedures.

Vegetation Surveys Unless otherwise mentioned, vegetation surveys shall be confined to Project Areas.

A. Transects

There will be two general survey types of surveys conducted. One will be a stratified sample, which will deal with the status of mudwort and Mason's lilaeopsis populations. The other surveys will consist of transects of the islands at various locations to determine the plants species present on the newly created earthen berms and the relative abundance of those species.

Survey transects shall be selected at all locations where earthen berms have been created. Transects shall be set up perpendicular to the rock prism at intervals sufficient to qualitatively describe vegetation conditions associated with the project. Transects shall extend from the edge of the rock prism to the edge of the earthen berm, and shall include any shallow depression at the boundary between the earthen fill material and the existing island. Transect locations shall be marked with rebar, wooden stakes, or other materials suitable to the M & T Staten Ranch and the DFG. Permanent transects locations shall not be required.

There shall be a vertical intersect point along each transect line at intervals not exceeding every two meters. Each plant species intercepted by the vertical line will be recorded, providing a tally of records for each species at each intersect point on the transect. If no vegetation is contacted by the vertical line, then that point of the transect will be considered bare of vegetation. Percent cover and plant species composition will be calculated from these data. Incidental observations of plant species not located along the sampling transect will also be recorded.

Conducting vegetation transects may not be physically possible because of impenetrable vegetation, or vegetation which is too tall to otherwise permit conducting transects. In such instances, it will be necessary to delete vegetation transects at those areas where such conditions exist. It will be necessary from collect species inventory, photo station, and all other data otherwise described in this plan.

B. Vegetation Mapping

It will be necessary to map, as accurately as conditions permit, the following information:

1. A base map will be prepared which shows the locations of major stands of vegetation. "Major stands" includes areas where greater than 50% of the vegetation cover consists of one or two species. Areas where there is no predominate vegetation species ("major stands") shall also be mapped.

2. General locations of all vegetation plantings shall be indicated.

3. Locations of both existing and transplanted populations of CEQA defined rare or endangered species, such as the Mason's lilaeopsis. This may occur in both existing and populations which have been transplanted.

4. Use of a GIS or other computer based mapping system may be appropriate.

A major goal of the vegetation mapping will be to determine any changes that will occur in vegetation over time.

When mapping plant locations, surveys will include those areas which are at the boundary between the earthen berm and the existing island.

C. Monitoring of Plantings

Staten Island, San Joaquin County 1994 Channel Island Mitigation Project Monitoring Plan

We will monitor the success of plantings of planted trees, shrubs cuttings or potted plants. Data recorded at the time of include the following:

1. Date(s) of Planting
2. Specific Planting Locations - These shall be mapped.
3. General information about the individual size of potted plant/cuttings, their condition, etc. This information will include whether the plant is from a container or is from a cutting.
4. Planting techniques used and protective structures provided.

Individual planted plants shall be labelled in the field with colored flagging or otherwise identified such that the locations and species planted can be readily identified.

In addition to transect survey data, ongoing monitoring of vegetation shall include the following:

1. Information about the growth and survival at each of the vegetation plantings. This will include:
   a. numbers of surviving trees or shrubs by species.
   b. approximate growth rates.
   c. photos of representative specimens
   d. mortality rates and possible causes
   e. success of protective structures for vegetation, such as protective baskets for control of beaver predation.
2. Data will be collected regarding volunteer colonization of the sites.

Success criteria for vegetation establishment is that a minimum of 50% of all trees and shrubs shall survive after three years from the date of the initial plantings. If agreeable by both parties, substitute species may be provided.

D. Rare or Endangered Plants

Plant surveys will also include a determination of the status of the Mason's lilaeopsis and the mudwort, both CEQA defined rare or endangered species. Monitoring for either species for either will be conducted at all Mason's lilaeopsis or mudwort sites within 15 feet of the Project areas and at all transplant locations. It will include determinations of the survival of either species over time.

Pre-project evaluations shall be conducted of all Mason's and mudwort sites. An estimate of abundance shall be obtained of the population at each island where either species is found. using random sampling. This estimate shall consist of percent cover

estimates or actual counts of individual plants, as required to give a reliable estimate of the pre-project abundance of either species. The pre-project evaluations shall be completed prior to the time when project construction begins.

If populations of the Mason's lilaeopsis or mudwort are found to be decreasing, transplanting of existing populations to other locations on the same island shall be initiated. Transplanted populations shall be monitored and transplants made to alternate locations (including to sites other than to the island where found) as required to ensure that no net long-term loss of either plant species occurs during the survey period.

Monitoring of Project Structures

During site visits, the physical conditions of all project structures will be evaluated. These conditions will include the following:

Stumps: Monitoring will occur to document the condition of the wooden stumps in the riprap and of the log wave attenuator devices. The monitoring will accomplish the following:

1. Determine any evidence of destabilization of the logs from impacts from high flows, wave action, or other factors.
2. Determine any evidence of rotting or other deterioration of the stumps.
3. Determine the nature of fisheries at these structures, as described elsewhere in this monitoring report.

Geoweb®: Geoweb® is a bank stabilization alternative which will be tested for its potential as a fish attractor.

Success criteria for the Geoweb® shall include the following:
1. Individual units must remain at the exact locations where placed.
2. The Geoweb® units must provide fisheries habitat.

Geoweb® units shall be monitored to insure that the meet the above criteria.

Earthen Prism\Fill: Success criteria for the rock prism\earthen fill will include the following:
1. Retention of dredge fill material* at all berm locations until July 1, 1996.
2. Retention of the rock prism* at its present configuration until July 1, 1996.
3. Lack of evidence of significant scour or other signs of

erosion at any of the areas adjacent to the rock riprap locations.

* The above items are included as conditions for final payment of all funds to the applicant.

The rock prism will be monitored regularly to determine whether these criteria are met. Observations will be used to help evaluate whether future projects will require modifications in the locations and/placement of riprap or other bank stabilization materials.

Fisheries Surveys

Evaluations will be made of the fish species associated with each structure placed in the project. These structures include rock riprap, tree stumps, the "Owen's Wall" structure, piling areas, and shallow water wetland areas.
Evaluations will consist of:

1. Determination of fisheries habitat values. Fisheries surveys shall be performed to determine the fish species and their abundance found in association with all project structures, including Geoweb® and warning piles. Fisheries monitoring will consist of the following elements:

   a. Electrofishing - Boat electrofishing will be conducted before and after project construction, as tides, conductivity, and other conditions permit. Electrofishing will include the following elements:

      1. Permanent electrofishing stations will be set up along all project structures.
      2. Surveys will be conducted at night.
      3. Surveys will be conducted at least once each spring.
      4. General observations will be made of the species caught, their percent abundance, water temperature, electrofishing time, and other factors.
      5. Fish species and abundance caught in association with specific habitat types, such as riprap or tree stumps, will be noted.

   b. Fyke netting, seining, etc. These methods will be used as required.
   c. Gillnets will be used as appropriate. Gillnetting will be avoided when there is the potential of taking adult or juvenile winter run chinook salmon(September 15 to May 31). If it is not feasible to limit the work to the period when winter run chinook salmon are not present (June 1 to September 15), then the following steps should be taken:

1. Gill nets will continuously tended.
2. Nets will be retrieved when a fish contacts the net. Winter run chinook salmon will be released immediately.
3. Gillnetting activities will be discontinued when adult or juvenile winter-run chinook salmon are caught.
4. The Department will notify both the appropriate National Marine Fisheries Service (Protected Species Division) representative and DFG Inland Fisheries Division for further consultation when winter run chinook salmon are caught.

All fisheries surveys will be conducted in a manner consistent with all applicable State and Federal endangered species laws.

2. Fisheries Performance Criteria - Project structures will be monitored to determine whether populations of fish species non- native to the Delta that are known to prey on winter run chinook salmon (e.g. largemouth bass, striped bass) have increased to numbers to numbers disproportionally compared to other species and considered deleterious to native CEQA defined rare or endangered species. If the DFG determines that the population of one or more of these fish species increases proportionally more compared to prey species (e.g. juvenile chinook salmon), then the Department may modify the project structures to reduce predator fish accumulation, and if necessary, project structures may be removed.

Positive Effect Criteria: Structures will be monitored to determine whether the overall fish species diversity and abundance has increased.

<u>Bird and Mammal Observations</u>
<u>Bird Observations</u>
A minimum of three surveys a year will be conducted beginning in December and ending in June, allowing for the identification of birds using the area for wintering, migration, and breeding. Surveys will be conducted within four hours of dawn to identify birds when they are most active.

Survey techniques will be a modified area search method. Observers will quietly approach the islands by boats or the adjacent levee, recording birds visible from the water. Surveys will then continue along the shore, either by boat or by walking along the island. Attempts will be made to observe birds from sufficient distance to permit species identification and, where possible, observations of behavior. Birds may be identified by their songs.

Birds will be identified and their behaviors will be categorized as follows: foraging, territorial (singing, feeding young, intra-specific fighting, carrying nesting material or fecal sacs, sitting on a nest, etc.) roosting, reacting to observers, or other behaviors. Efforts will be made to identify the habitat in which the birds are first located. The habitat types will include either water mudflats, rock berms, scrub-shrub, riparian vegetation, or emergent marsh. Birds flying over will not be counted, although they may be noted as present.

Bird use data at each island shall also include the following:

1. Bird species
2. Time and Date of observation
3. Specific location at each island where bird observed
4. How bird was observed - e.g. call or visual observation.
5. Population estimates of various species will be obtained whenever possible.
6. Presence of breeding activity or other behavior.
7. Black rail surveys shall be conducted. Playing of rail call recordings at strategic locations near the channel islands shall be sufficient.

Mammal Surveys

These surveys shall be incidental to other surveys and shall be undertaken to determine:

1. Species which use the project areas, including the rock prism.
2. Species, or groups of species, which use individual or habitat types. An example is documentation of the use of the earthen berm areas by beaver or muskrat.
3. Dates, specific locations of observations, and other relevant data.
4. Population estimates of various species will be obtained whenever possible.
5. Presence of Breeding activity.

Miscellaneous Observations

Engineering Evaluations - The DFG or the M & T Staten Ranch, may, at its discretion, elect to conduct an engineering evaluation of the project areas to help assist in determining the following:

1. Losses of dredge fill material from the surface of the berm due to high flows or other factors.
2. Effects of the project on flood control channel capacity or other factors.
3. Erosion, if any, of those portions of Islands #3, #4, #5, #7 and Sycamore Island, which have been protected by riprap.

4. Incidental observations of project structures by personnel of the M & T Staten Ranch, the State Lands Commission, the DFG, and the Delta Protection Commission shall be identified as such and included in the annual monitoring reports as appropriate.
5. Determinations of the net change of the surface area of each island.

Photo Stations

Permanent photo stations will be set up at all of the project areas to document any changes in plant species composition, rock prism stability, plant growth, or other factors. Color slide photos will be taken at all photo monitoring stations on a yearly basis.

Rare or Endangered Species Evaluations (Other than those otherwise mentioned in the Plan).

1. Location of sighting and other pertinent information about all species which are currently CEQA defined rare or endangered species. Observation forms shall be filled out and mailed to the DFG's Natural Heritage Division as appropriate.
2. The monitoring plan shall be modified as necessary by the DFG to include monitoring for species which becomes a CEQA defined rare or endangered species during the terms of the monitoring plan. Appropriate State or Federal agency personnel shall be notified and monitoring protocol developed in conjunction with such personnel. Likewise, requirements of the existing monitoring plan shall be omitted if the subject species is no longer classified as a CEQA defined rare or endangered species. Any changes in monitoring protocol shall based upon these considerations shall, prior to implementation, be communicated by the DFG in writing to the State Lands Commission, the M & T Staten Ranch, and the Delta Protection Commission.

cc: Katie Perry, Pat Brantley (Bay/Delta), Dan Gifford, Julie Horenstein, Kevin Shaffer (NHD)

Mr. Eric Merlo
165 W. Cleveland St.
Stockton, CA 95204

Staten Island, San Joaquin County 1994 Channel Island Mitigation Project Monitoring Plan

Mr. Jerry Hadley
Kjeldson Sinnock & Associates
P.O. Box 844
Stockton, CA 95201-0844

Mr. Dave Lawson
Department of Water Resources
3251 S Street
Sacramento, CA 95816

Mr. Mark Littlefield
U.S. Fish and Wildlife Service
2800 Cottage Way, Room E-1803
Sacramento, CA 95825-1846

Jim Bybee
c/o National Marine Fisheries Service
777 Sonoma Ave, Room 325
Santa Rosa, CA 95404

Ms. Diana Jacobs
State Lands Commission
1807 13th St.
Sacramento, CA 95814

Ms. Sally Hearn
M & T Staten Ranch
P.O. Box 408
Walnut Grove, CA 95690

Exhibit D (DRAFT)

RIPARIAN, FISHERIES AND WILDLIFE HABITAT MITIGATION

MEMORANDUM OF AGREEMENT

by and between

MTC STATEN, INC.

and

CALIFORNIA DEPARTMENT OF FISH AND GAME

and

STATE LANDS COMMISSION

This Memorandum of Agreement (hereinafter referred to as "Agreement") is made by and between the California State Lands Commission (hereinafter referred to as the "Commission"), MTC Staten, Inc. (hereinafter referred to as "M & T") and the California Department of Fish & Game (hereinafter referred to as the "DFG") and is effective upon execution by all parties.

The purpose of this Agreement is to establish and maintain shaded riverine habitat (hereinafter referred to as "SRA habitat") in order to guarantee adequate mitigation for the loss of riparian, fisheries and wildlife habitat on or adjacent to local non-project levees in the Sacramento-San Joaquin Delta. These habitat losses are long-term in nature, and occurred between 1987 and 1991 in conjunction with the rehabilitation and maintenance of the non-project levees that surround the islands or tracts in the Delta. The SRA habitat to be established pursuant to this Agreement will contribute to fulfilling the mitigation required by the Delta Flood Protection Act of 1988 (hereinafter referred to as "SB 34") to ensure no net long-term loss of the riparian, fisheries and wildlife habitats. The remainder of the required mitigation for the habitat losses will be fulfilled under separate agreements between the DFG and other parties.

RECITALS

A. The Commission has jurisdiction and control over sovereign lands held by the State of California, pursuant to Public Resources Code Sections 6000 et seq., for public trust purposes, including, but not limited to preservation, restoration, and enhancement of riparian

Post-it™ brand fax transmittal memo 7671	# of pages 1
To Duncan Simmons	From Frank Gray
Co. State Lands	Co. Fish & Game
Dept.	Phone # 355 0272
Fax # 324 8059	Fax # 355 7102

CALENDAR PAGE 233

MINUTE PAGE 2622

and wildlife habitat.

B. M & T is the successor in interest to lands acquired by the original recipients of State patents for certain Swamp and Overflowed Lands, issued pursuant to the Arkansas Swamp Act 1850, which lands adjoin State owned sovereign lands in the bed of the South Fork of the Mokelumne River. M & T maintains its lands for agricultural use and for riparian and wildlife habitat.

C. The DFG is the State agency charged with protecting and enhancing the fish and wildlife resources of the State and with the coordination of mitigation projects pursuant to the Delta Flood Protection Act of 1988 (SB 34), as amended, for impacts of levee rehabilitation and maintenance activities.

D. The precise location of the boundary between the lands under the jurisdiction of the Commission and those of M & T has not been defined by agreement or court judgment.

E. The parties hereto are concerned with the cumulative loss of wetlands and associated habitat in the Sacramento-San Joaquin Delta, and wish to manage their respective lands cooperatively to reestablish wetlands habitat for wildlife and plant communities, including, but not limited to, threatened and endangered species, and waterfowl subject to the North American Waterfowl Management plan; and to protect the reclaimed swamp and overflowed lands of Staten Island and the channel islands and berms areas located in the adjacent waterways.

NOW THEREFORE, THE COMMISSION, DFG AND M & T AGREE AS FOLLOWS:

1. The Commission, DFG and M & T will fully cooperate to implement and monitor the 1994 Staten Island Channel Island Restoration Project ("Project").

2. The Commission and the DFG agree that to the extent State owned lands are occupied by the Project, M & T may restrict or prohibit hunting, recreational activities, public access or passage on or across the Project lands, in order to protect the habitat and public trust resource values of said lands. The parties agree to the posting of signs by M & T which describes the nature and importance of the project, the collaborative efforts of the parties, and any restrictions or limitations on public access.

3. This agreement shall not be construed to prejudice title of either the Commission or M & T to the Project lands.

4. M & T agrees to indemnify, defend and hold harmless the State Lands Commission of the State of California, its officers, agents, and employees, against any and all liabilities, claims, damages or injuries arising out of or connected in any with the Project unless such act was caused by the negligence of such party.

5. The DFG will conduct monitoring studies of the habitat restoration sites and will confer with Commission and M & T staff if either berm stability or vegetative survival of the project is threatened.

6. The DFG shall be allowed access to all project sites only for project purposes including implementation, monitoring and enforcement.

7. This Agreement does not grant mineral rights and the exploration, development, and production of oil, gas, and other mineral rights held by M & T or other third parties shall be considered compatible with this Agreement provided there shall be no surface exploration or development operations upon the Project Areas.

8. M & T shall not remove native vegetation from the project area for any reason without prior written approval of the DFG. M & T and the Commission shall not be responsible for losses of vegetation at project areas due to circumstances beyond their control, including losses due to fire, vandalism or erosion. Neither the DFG nor the Commission shall initiate introduction or reintroduction into the project area of any CEQA defined rare, threatened or endangered species without the prior, written consent of M & T.

9. Nothing herein shall be construed to limit M & T, its agents, employees or contractors from access to water intake or discharge facilities for repair, maintenance or replacement provided that any damage to project structures or plantings shall be immediately repaired or replaced at their sole cost.

10. No building, fence, or any other structure of any kind shall be erected in the project area except for habitat and erosion protection.

11. Nothing in this Agreement shall prohibit M & T, with the agreement of Commission and DFG, from installing shoreline erosion measures at locations other than the Project areas at any of the islands. Installation of such measures is contingent upon collection of a separate project approval process.

12. M & T may grant Conservation Easements or like interests in their lands provided that such interests are consistent with this Memorandum of Agreement and any amendments hereto.

13. The term of this agreement is forty-nine (49) years from the effective date hereof.

14. The parties may amend this agreement at any time by their further written amendment hereto.

JAMES M. SHANKS
MTC States, Inc.

Date

BOYD GIBBONS, Director
California Department of Fish & Game

Date

ROBERT C. HIGHT, Executive Officer
California State Lands Commission

Date

Approved as to Form
CRAIG MANSON
General Counsel
California Department of Fish and Game

Date