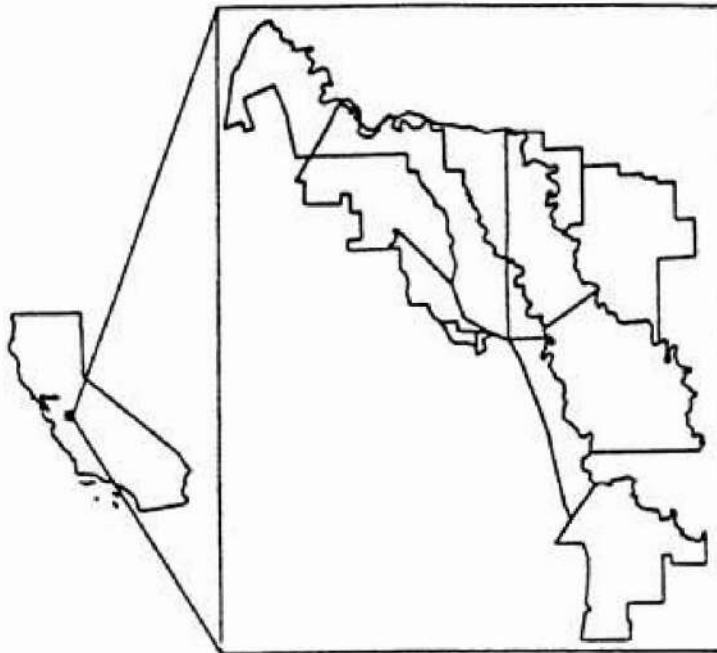


**SAN JOAQUIN BASIN ACTION PLAN/
KESTERSON MITIGATION PLAN**

MERCED COUNTY, CALIFORNIA



**UNITED STATES DEPARTMENT OF
INTERIOR
BUREAU OF RECLAMATION
FISH AND WILDLIFE SERVICE**

**STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME**

DECEMBER 1989

SAN JOAQUIN ACTION PLAN/KESTERSON MITIGATION PLAN

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STATE OF CALIFORNIA
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UNITED STATES DEPARTMENT OF
INTERIOR
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FISH AND WILDLIFE SERVICE

APPROVALS

THE STATE OF CALIFORNIA

THE UNITED STATES OF AMERICA

By Pete Bontadelli
Director
Department of Fish & Game

By Lawrence J. Hancock
Regional Director,
Mid-Pacific Region
Bureau of Reclamation

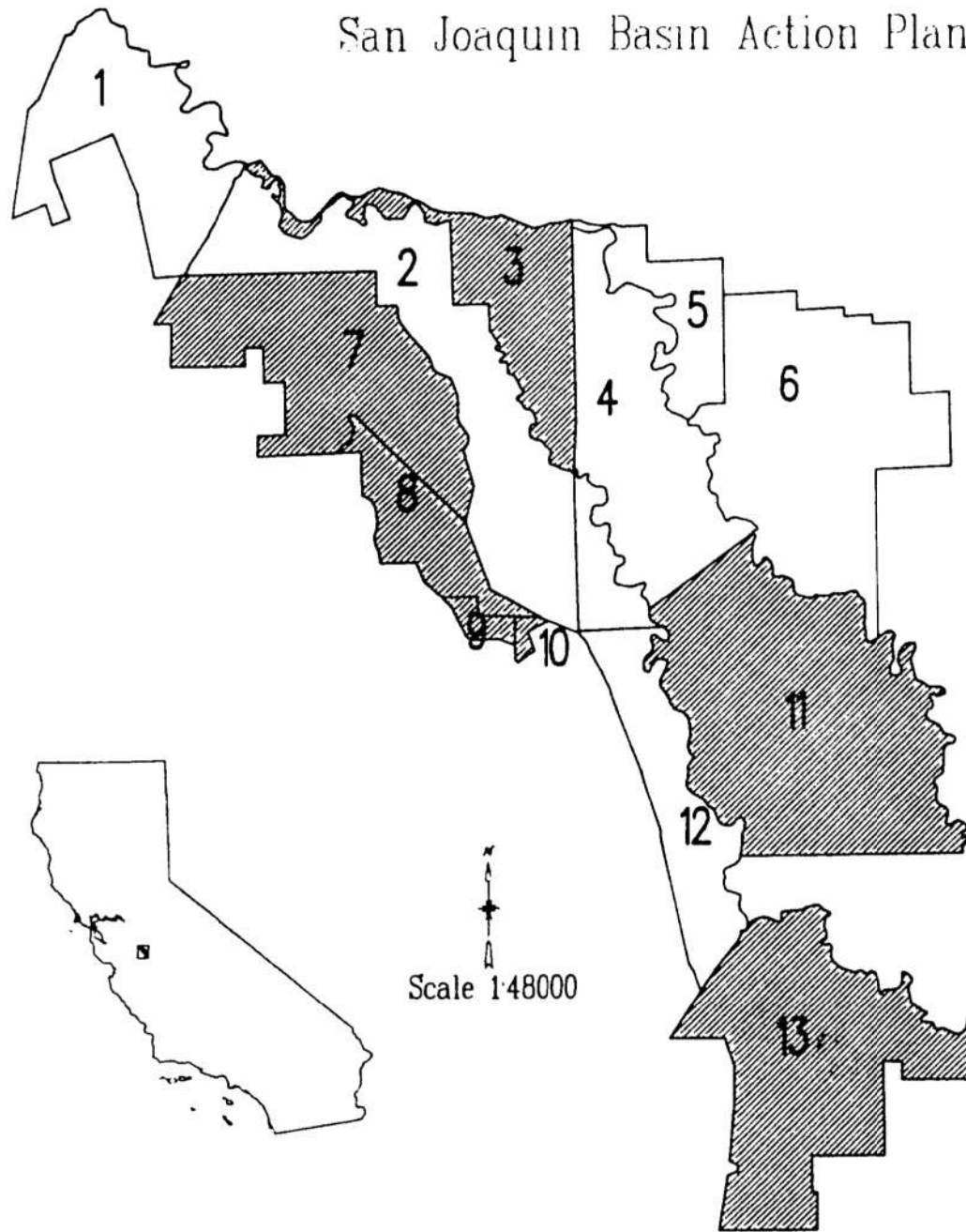
Date Jan. 11, 1989

Date JAN 9 - 1990

By Maria L. Olench
Regional Director
Fish & Wildlife Service

Date JAN 10 1990

San Joaquin Basin Action Plan – Kesterson Mitigation Plan



- 1 Freitas-McPike
- 2 Freitas
- 3 Grasslands State Park
- 4 West Gallo
- 5 Kelly
- 6 East Gallo
- 7 Kesterson National Wildlife Refuge
- 8 Kesterson Reservoir
- 9 Schwab
- 10 Claus
- 11 San Luis National Wildlife Refuge
- 12 San Luis Ranch
- 13 Los Banos Wildlife Area

▨ Existing Federal-State Land
□ Proposed for Acquisition

SAN JOAQUIN BASIN ACTION PLAN/KESTERSON MITIGATION PLAN

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Executive Summary

SAN JOAQUIN BASIN ACTION PLAN/KESTERSON MITIGATION PLAN

Executive Summary

The U.S. Bureau of Reclamation, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game jointly propose a habitat acquisition and wetland enhancement program that will meet both the requirements of long-term mitigation for Kesterson Reservoir and a significant portion of established objectives for the San Joaquin Basin under the North American Waterfowl Management Plan's Central Valley Joint Venture.

Specifically, this program identifies approximately 23,500 acres of private lands within the Northern San Joaquin River Basin for fee acquisition and management by appropriate Federal and State agencies. Seven parcels of privately-owned land, ranging from 90 to 7,600 acres, have been identified within the immediate vicinity of the Kesterson and San Luis National Wildlife Refuges.

The management objectives for the proposed project lands are to:

- 1) Ensure permanent habitat preservation of lands that are of vital importance to Pacific Flyway ducks and geese, threatened and endangered species, other migratory birds, and resident species.
- 2) Create wetlands for waterfowl and other wetland dependent species on agricultural lands suitable for conversion.
- 3) Protect and enhance riparian habitat and fishery resources on the San Joaquin River and its tributaries.
- 4) Increase public use opportunities for both consumptive and non-consumptive users when compatible with other objectives.
- 5) Provide adequate sanctuary to encourage wider distribution of waterfowl and provide protection from disturbance for endangered and threatened species, sandhill cranes, and geese.
- 6) Identify and protect cultural resource sites.

Baseline information, including existing and potential wetland habitat; water rights; annual water needs; wildlife and public use potential; plus estimated development and operational costs has been accumulated for each property.

Properties within the project area receive water from a variety of sources, including deep wells, water right diversions, and Federal (Central Valley Project) contracts. It has been determined that over 74,000 acre-feet of water is currently associated with the properties (approximately 61,830 acre-feet has been identified as needed for optimum annual management operations). None of the water is of a firm basis, with the majority of the water right diversions based upon "if and when available" supplies and the contract water being allotted on an annual interim basis only. A large percentage of the water in the major slough channels (west of the San Joaquin River) is currently contaminated with unacceptable levels of selenium.

The implementation of the Zahm-Sansoni-Nelson Plan will allow a rapid clean-up of Salt Slough. This action will allow the diversion and beneficial use of thousands of acre-feet of heretofore unusable water for wetland management purposes. With the future conversion of several blocks of CVP water (currently being made available on an interim basis) to a firm, long-term supply; the implementation of an affordable conjunctive use program; plus the continuation of current supplies of CVP or State contract water to upstream agricultural districts, it is expected that most of this project's water supply needs can be met without any new Delta diversions.

Should all seven properties be acquired and appropriate habitat development and water distribution systems completed, the project will result in the protection and enhancement of 6,239 acres of wetlands (seasonal, permanent and riparian) plus increase wetlands (via conversion of existing agricultural lands) by 4,464 acres. This action will totally compensate the lost wetland acreage and ultimately the lost wildlife values associated with the closure and cleanup of Kesterson Reservoir. In addition, the protection of 6,239 acres of existing wetlands and the increase of 4,464 wetland acres via agricultural land conversions will satisfy 12% and 22%, respectively, of similar objectives as stated in the Central Valley Habitat Joint Venture's San Joaquin Basin Action Plan.

Existing and projected habitat acreages identified
under the San Joaquin Basin Action Basin Plan/Kesterson
Mitigation Plan

<u>Habitat</u>	<u>Existing</u>	<u>Projected</u>	<u>Difference</u>
Agricultural Acres			
Pasture	5840	1392	- 4448
Grain	<u>1228</u>	<u>712</u>	<u>- 516</u>
Total	7068	2104	-4964
Wetland Acres			
Seasonal	1886	5835	+3949
Permanent	<u>640</u>	<u>1122</u>	<u>+ 482</u>
Total	2526	6957	+4431
Riparian Acres			
	3713	3746	+ 33
Miles	88.5	90.9	+ 2.4
Upland	9997	10497	+ 500
Other	<u>279</u>	<u>279</u>	<u>-0-</u>
Total	23,583	23,583	

San Joaquin Basin Action Plan/Kesterson Mitigation Plan

Existing and Projected Habitat Modifications

Habitat	San Luis Ranch			East Gallo			West Gallo			Freitas-McPike			Freitas Ranch			Claus			Schwab			Total		
	Existing	Projected	Change	Existing	Projected	Change	Existing	Projected	Change	Existing	Projected	Change	Existing	Projected	Change	Existing	Projected	Change	Existing	Projected	Change	Existing	Projected	Change
Wetland																								
Seasonal Acres	115	955	+840	609	2,341	+1,732	364	1,321	+957	303	1,002	+699	294	216	-78	45	-0	-45	156	-0	-156	1,886	5,835	+3,949
Permanent Acres	74	151	+ 77	189	342	+ 153	-0	156	+156	100	118	+ 18	277	355	+78	-0	-0	-0	-0	-0	-0	640	1,122	+ 482
Agricultural																								
Pasture Acres	1,576	381	-1,195	3,117	783	-2,334	-0	-0	-0	1,147	228	-919	-0	-0	-0	-0	-0	-0	-0	-0	-0	5,840	1,392	-4,448
Sa. Brain Acres	-0	221	+221	-0	289	+ 289	1,228	-0	-1,228	-0	202	-202	-0	-0	-0	-0	-0	-0	-0	-0	-0	1,228	712	- 516
Riparian																								
Acres	200	200	-0	1,331	1,331	-0	695	728	+33	558	558	-0	929	929	-0	-0	-0	-0	-0	-0	-0	3,713	3,746	+ 33
Miles	4.6	4.6	-0	19.7	19.7	-0	14.0	16.4	+2.4	14.2	14.2	-0	36.0	36.0	-0	-0	-0	-0	-0	-0	-0	88.5	90.9	+ 2.4
Upland Acres	187	244	+ 57	2,164	2,324	+160	1,800	1,882	+ 82	1,769	1,769	-0	4,000	4,000	-0	45	90	+45	32	188	+156	9,997	10,497	+ 500
Other Acres	89	89	-0	190	190	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	279	279	-0
Total	2,241	2,241		7,600	7,600		4,087	4,087		3,877	3,877		5,500	5,500		90	90		188	188		23,583	23,583	

SAN LUIS RANCH

I. Introduction

This 2,241 acre unit, owned by the Wolfsen Corporation, consists mainly of irrigated pasture and is currently managed as a cattle ranch. The unit is surrounded by the San Luis and Kesterson National Wildlife Refuges, the Los Banos Wildlife Management Area and the Grassland Water District. The pasture provides important late-winter, early-spring habitat for geese, including the endangered Aleutian Canada geese plus cackling Canada, snow and white-fronted geese. The endangered San Joaquin kit fox is also found on the area. The entire property is for sale by a willing seller. No offers have been made.

A. Wetlands

- 1. Existing wetland, to be enhanced189 ac.
 - a. Seasonal115 ac.
 - b. Permanent 74 ac.
- 2. Existing riparian to be enhanced200 ac.
 -4.6 mi.
- 3. Wetlands to be created917 ac.
 - a. Seasonal840 ac.
 - b. Permanent 77 ac.
 - c. Riparian-0- ac.
- 4. Total wetlands1,106 ac.

B. Pasture/grain crops600 ac.

C. Annual water needs for optimum habitat management..
.....10,020 AF

D. Water rights and current status

This unit has an annual appropriative right to divert 8,891 AF from Salt Slough. The 1,100 AF annual deficit could be overcome by utilizing additional Salt Slough waters or CVP supplies. Salt Slough is currently contaminated with selenium and implementation of the Zahm-Sansoni-Nelson Plan must be accomplished before Salt Slough can be used for wetland management purposes. Action should be taken to ensure minimum daily flows in Salt Slough thus firming up the "if and when available" status currently attached to the unit's appropriative rights.

E. Wildlife potential

Improved habitat management programs will enhance this area's utilization by upland feeding geese and sandhill cranes, nesting and wintering populations of numerous duck species, plus a diversity of non-game species.

F. Public use opportunities

A well-planned program could allow compatible activities. Such activities could include waterfowl and upland gamebird hunting; fishing; wildlife observation; hiking; canoeing; etc.

G. Total estimated development costs..\$1,248 - 1,364,000

- 1. Water delivery facilities.....337,000
- 2. Wetland creation and enhancement ..\$203 - \$319,000
- 3. Other Habitat\$105,000
- 4. Other facilities\$220,000
- 5. Equipment.....\$382,000

H. Estimated annual operational and maintenance costs\$278 - \$332,000



San Luis Ranch (4/85) Irrigated pasture to be converted to seasonal marsh and small grains. Salt Slough in middle, San Luis NWR at left and upper left. Note absence of riparian habitat on San Luis Ranch side of Salt Slough. Potential for riparian restoration.



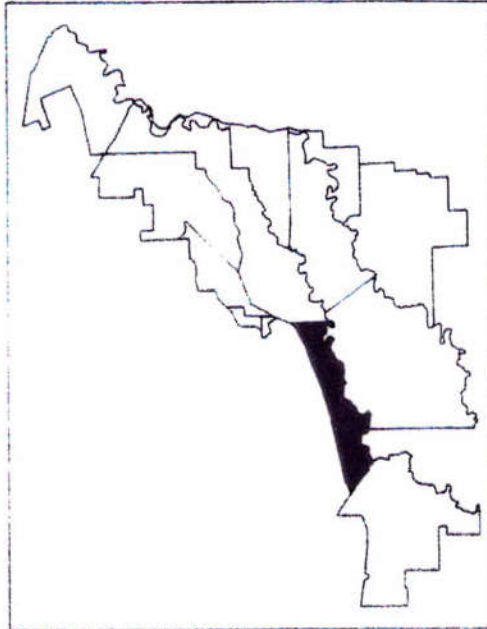
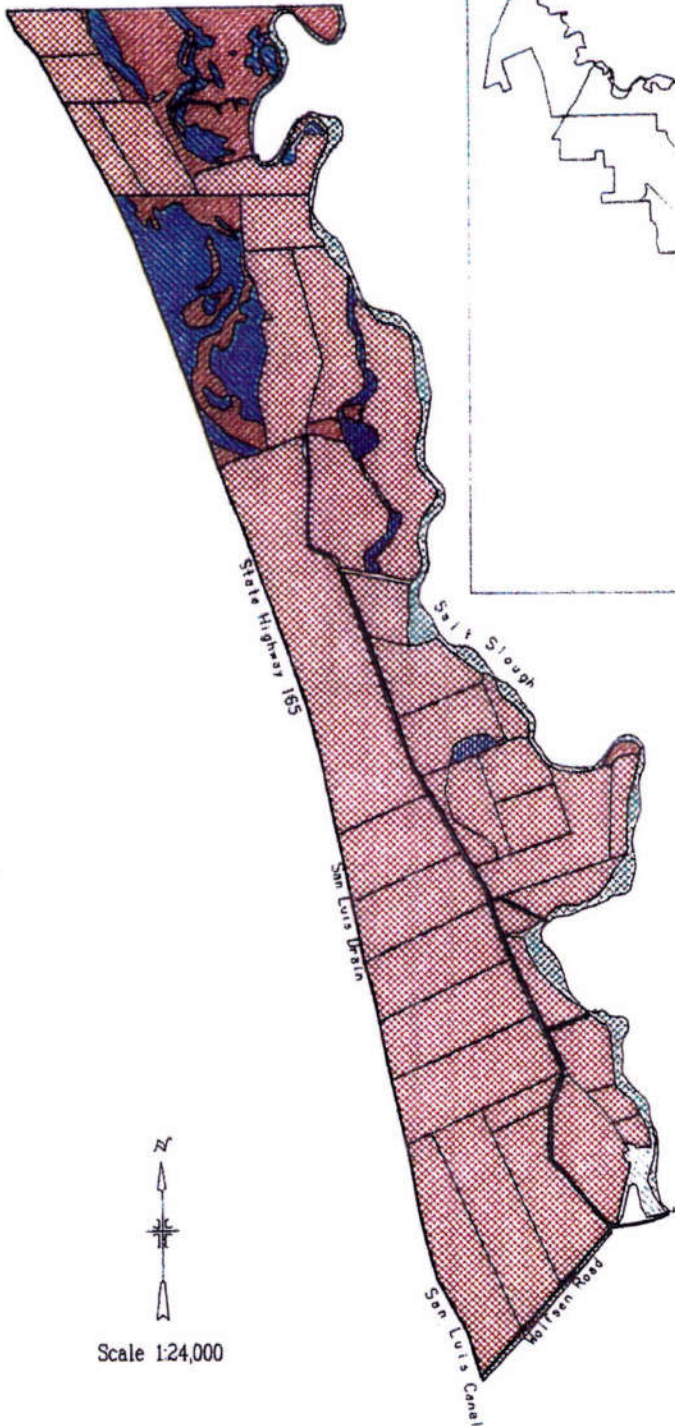
San Luis Ranch (4/85) Natural wetlands and irrigated pasture. Candidate for enhancement plus conversion to managed wetlands. Salt Slough at left, Grasslands Water District at upper right.



San Luis Ranch (3/89) Ross' and Cackling Canada geese graze on irrigated pasture. Will be managed to retain goose forage.

SAN LUIS RANCH

Existing Habitat
and
Water System



- Upland
- Seasonal-Wetland
- Pasture
- Permanent-Wetland
- Wolfson House/
Corrals
- Riparian

- Pipeline
- Existing Ditch
- Existing Drain Ditch

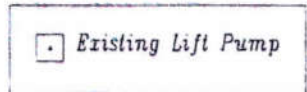
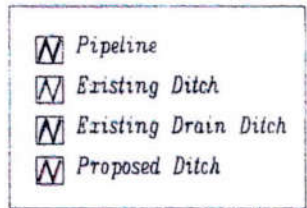
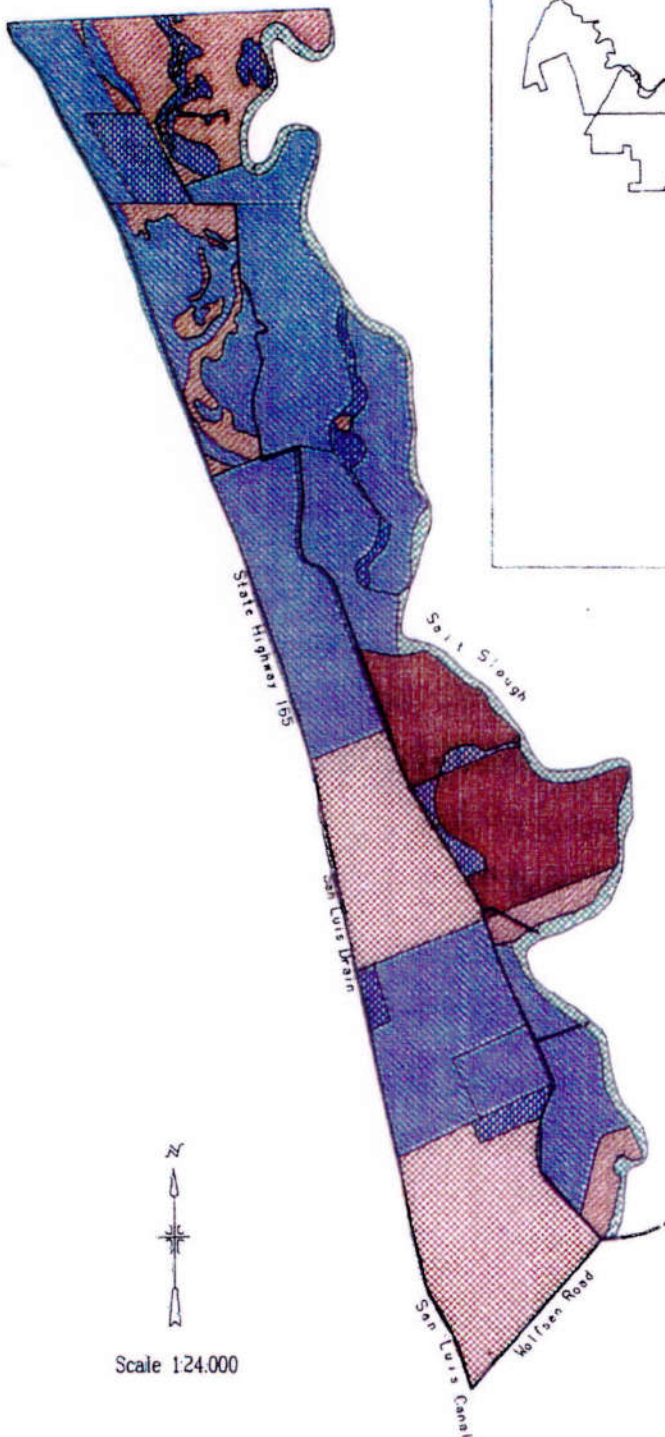
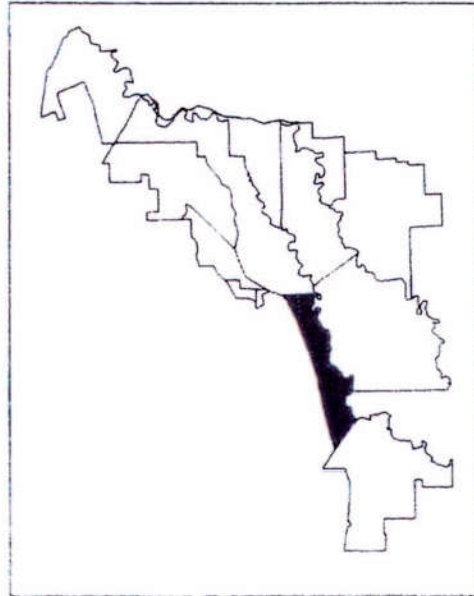
- Existing Lift Pump

Scale 1:24,000

Developed by the
Bureau of Reclamation
Geographic Information System

SAN LUIS RANCH

Proposed Habitat and Water System



Scale 1:24,000

Developed by the
Bureau of Reclamation
Geographic Information System

FREITAS-McPIKE

I. Introduction

This 3,877 acre unit, owned by the Wolfsen Corporation, consists mainly of irrigated pasture and native grasslands; and is currently managed as a cattle ranch. This unit serves as the northern boundary of the overall project. The pasture provides important winter habitat for geese and Sandhill cranes, including the endangered Aleutian Canada goose. The area has been identified for acquisition in the Department of Fish and Game's Region 4 wetland protection plan. The entire property is for sale by a willing seller. No offers have been made.

A. Wetland

- 1. Existing wetlands to be enhanced..... 403 ac.
 - a. Seasonal 303 ac.
 - b. Permanent 100 ac.
- 2. Existing riparian to be enhanced 558 ac.
 - 14.2 mi.
- 3. Wetlands to be created 717 ac.
 - a. Seasonal 699 ac.
 - b. Permanent 18 ac.
- 4. Total Wetlands 1,120 ac.

B. Pasture/grain crops 430 ac.

C. Annual water needs for optimum habitat management
..... 10,450 AF

D. Water rights and current status

Although the property is adjacent to the San Joaquin River, no water rights have ever been filed for. With the implementation of the Zahm-Sansoni-Nelson plan, water for wetlands will not be usable from Mud Slough. Present water demands are met through the use of 5 deep wells. Alternate water supplies via the CVP could be utilized via the Newman Wasteway which is adjacent to the project's north boundary.

E. Wildlife potential

Improved habitat management programs will enhance the area's attractiveness to upland feeding geese and Sandhill cranes; nesting and wintering populations of numerous duck species; and a wide diversity of non-game species.

F. Public use opportunities

A well planned program could allow compatible activities. Such activities could include waterfowl and upland gamebird hunting, fishing, wildlife observation and nature study; hiking; canoeing; etc.

G. Total estimated development costs \$1,047 - \$1,137,000

1. Water delivery facilities	\$310,000
2. Wetland creation and enhancement ..	\$179 - \$269,000
3. Other habitat	\$ 28,000
4. Other facilities	\$148,000
5. Equipment	\$382,000

H. Estimated annual operational and maintenance costs

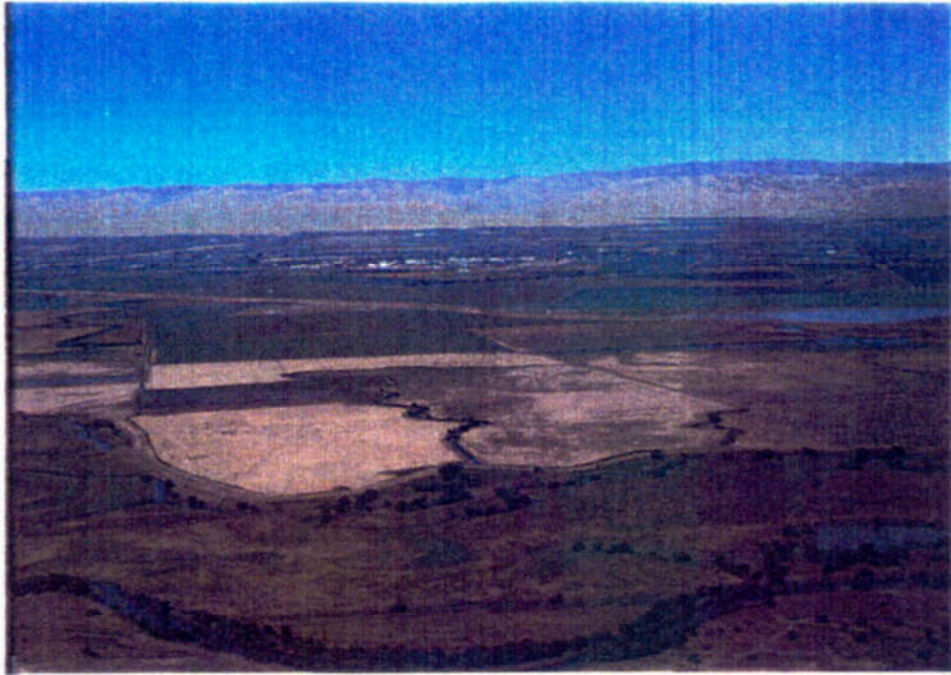
	\$364 - \$569,000
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Freitas-McPike (8/89) Riparian habit on San Joaquin River.



Freitas-McPike (8/89) San Joaquin River floodplain. Newman
Wasteway bisects middle of photo.



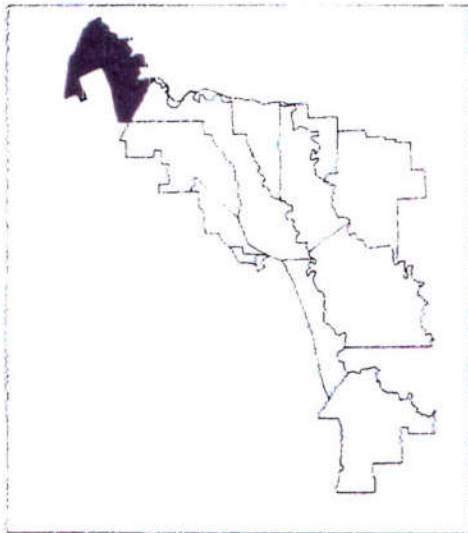
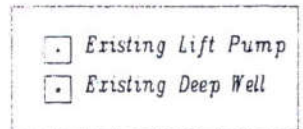
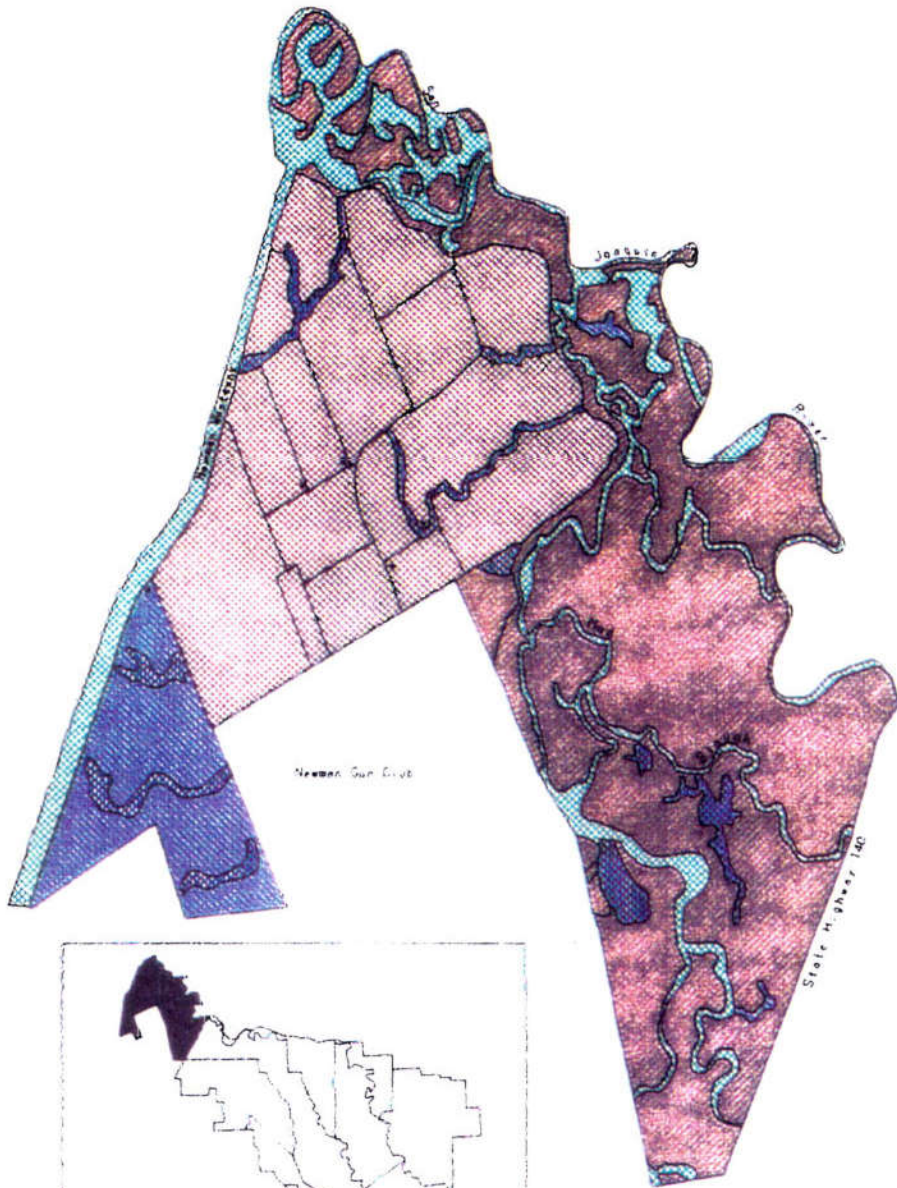
Freitas-McPike (8/89) Agricultural lands - subject to wetland conversion. San Joaquin River in foreground will be enhanced via elimination of grazing and tree/shrub planting.



Freitas-McPike (8/89) Wetlands associated within Los Banos Creek/Mud Slough floodplain.

FREITAS-McPIKE

Existing Habitat
and
Water System

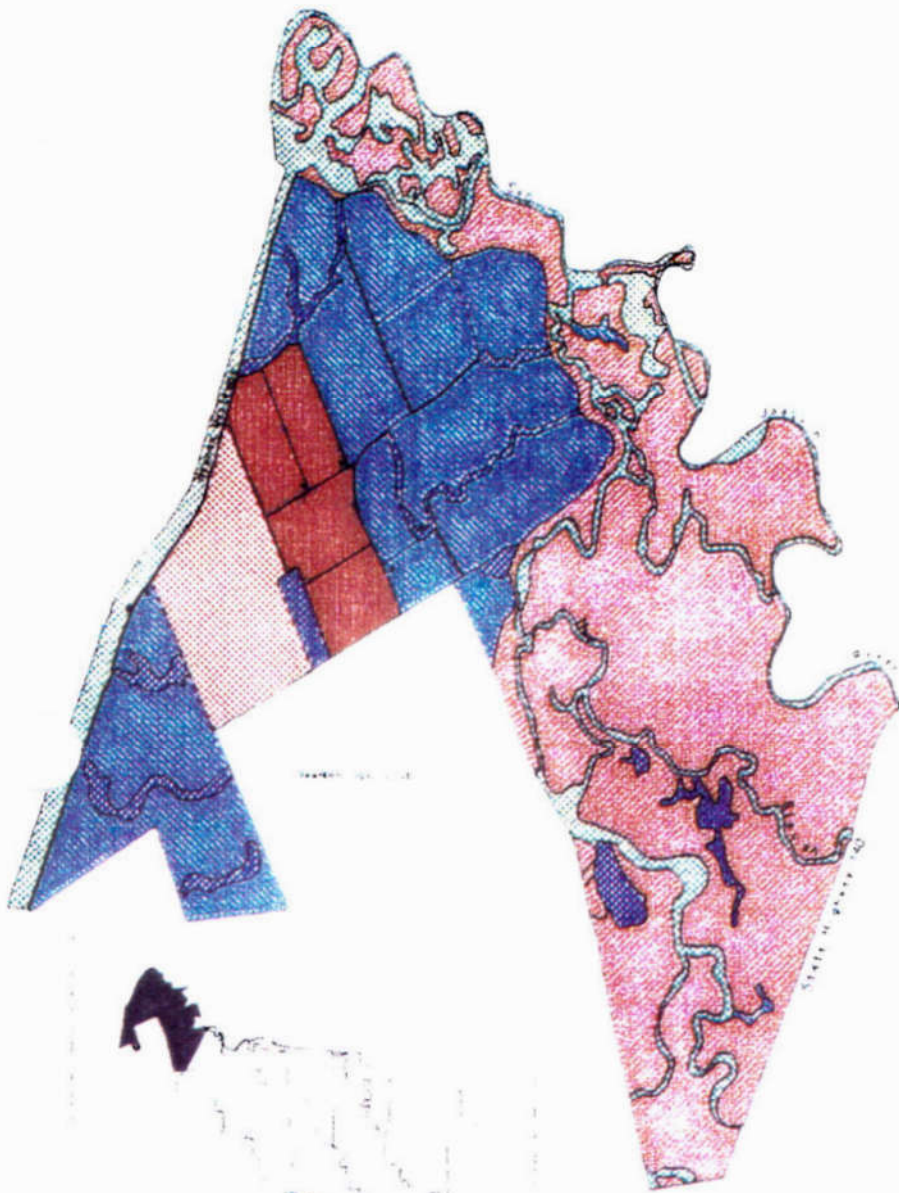


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Developed by the
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Geographic Information System

FREITAS-McPIKE

Proposed Habitat
and
Water System



- Upland
- Seasonal-Wetland
- Pasture
- Permanent-Wetland
- Small Grain
- Riparian

Proposed Ditch

- Existing Lift Pump
- Proposed Lift Pump
- Existing Deep Well

Scale 1:24,000

Developed by the
Bureau of Reclamation
Geographic Information System

FREITAS RANCH

I. Introduction

This 5,500 acre unit, owned by the Frank Freitas family consists primarily of native grassland, seasonal wetlands, sloughs and oxbows, and is operated as a cattle ranch. The unit is immediately adjacent to Kesterson Reservoir and is surrounded by Kesterson NWR and the Grasslands State Park. The unit contains significant stands of valley oak woodland and riparian habitat which provides nesting habitat for the state threatened Swainson's hawk. The endangered San Joaquin kit fox is also found on the area. The entire property is in the process of being acquired by the U.S. Department of Justice as part of a settlement for damages caused by Kesterson Reservoir.

A. Wetlands

1. Existing wetland to be enhanced	571 ac.
a. Seasonal	294 ac.
b. Permanent	277 ac.
2. Existing riparian to be enhanced	929 ac.
	36 mi.
3. Wetlands to be created	-0-
a. Seasonal	-78 ac.
b. Permanent	+78 ac.
c. Riparian	-0-
4. Total wetlands	571 ac.

B. Pasture/grain crops -0-

C. Annual water needs for optimum habitat management
..... 5,290 AF

D. Water rights and current status

This unit has no appropriative water rights to divert water from Salt Slough or the San Joaquin River. The 5,290 AF water supply can be fulfilled using a portion of San Luis NWR's existing appropriative right from Salt Slough or CVP water delivered via the San Luis Canal. Salt Slough is currently

contaminated with selenium and implementation of the Zahm-Sansoni-Nelson Plan must be accomplished before Salt Slough can be used for wetland management purposes. Action should be taken to ensure minimum daily flows in Salt Slough thus firming up the "if and when available" status currently attached to the Salt Slough water right.

E. Wildlife potential

Improved habitat management programs will enhance this area's utilization by tundra swans, upland feeding geese, and Sandhill cranes; nesting and wintering populations of numerous duck species, plus a diversity of non-game species.

F. Public use opportunities

A well planned program could allow compatible recreational use activities. Such activities could include waterfowl and upland gamebird hunting; fishing; wildlife observation; hiking; canoeing; etc.

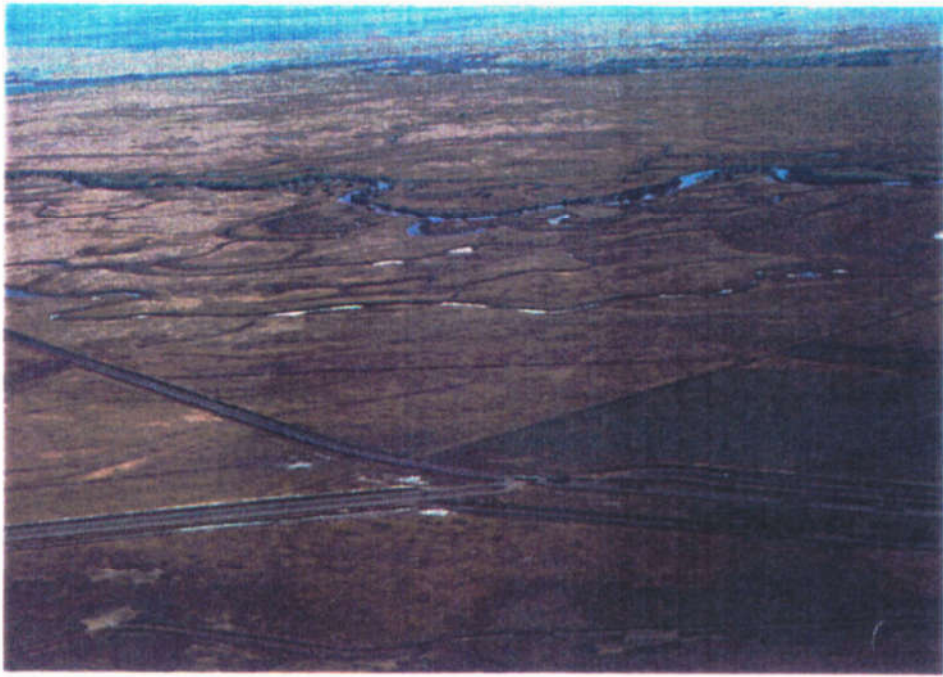
G.	<u>Total estimated development cost</u>	\$1,194,000
	1. Water delivery facilities	\$510,000
	2. Wetland creation and enhancement	\$57,000
	3. Other habitat	\$72,000
	4. Other facilities	\$173,000
	5. Equipment	\$382,000
H.	<u>Estimated annual operational and maintenance costs</u>	\$440,000 - \$550,000



Freitas Ranch (8/89) San Joaquin River/Salt Slough riparian floodplain.



Freitas Ranch (8/89) Salt Slough at right. Native grasslands, wetland basins and riparian slough channels - all subject to enhancement.



Freitas Ranch (8/89) Native grasslands and natural slough channels. Salt Slough in upper half, Highway 165 and San Luis Drain in foreground.





Freitas Ranch (8/89) Drained wetland basin. Subject to future enhancement.

FREITAS RANCH

*Existing Habitat
and
Water System*

-  *Unclassified*
-  *Upland*
-  *Seasonal-Wetland*
-  *Riparian*

-  *San Luis Canal*

-  *Deep Well*



Scale 1:42000

Developed by the
Bureau of Reclamation
Geographic Information System

WEST GALLO

I. Introduction

This 4,087 acre unit, owned by Joseph Gallo, consists mainly of native grasslands and leveled agricultural lands, and is currently managed for cattle and small grain production. The San Joaquin River forms the east boundary of the ranch with San Luis NWR located adjacent to the south boundary. The riparian habitat associated with the ranch provides important non-game habitat as well as brood water for resident waterfowl. The federally endangered San Joaquin kit fox and the state threatened Swainson's hawk are also found on the area. The area has been identified for acquisition in the East Grassland Environmental Assessment and approved by the Fish and Wildlife Service. Appraisals have been completed. The owner has previously rejected an offer which did not meet his price expectations.

A. Wetlands

1. Existing wetland to be enhanced	303 ac.
a. Seasonal	303 ac.
b. Permanent	-0- ac.
2. Existing riparian to be enhanced	695 ac.
.....	14 mi.
3. Wetlands to be created	1,174 ac.
a. Seasonal	1,018 ac.
b. Permanent	156 ac.
c. Riparian	33 ac.
4. Total wetlands	1,477 ac.

B. Pasture/grain crops -0- ac.

C. Annual water needs for optimum habitat management
..... 10,810 AF

D. Water rights and current status

This unit has no appropriative right to divert water from the San Joaquin River or Salt Slough. Current water needs are being met using seven deep wells, all

of which have questionable water quality. Water supply options for this property include CVP deliveries thru San Luis NWR's "C" Canal or pumping from Salt Slough. Salt Slough is currently contaminated with selenium and implementation of the Zahm-Sansoni-Nelson Plan must be accomplished before Salt Slough can be used for wetland management purposes. Water supply sources for this property include 6,225 AF available in the San Luis NWR contract with San Luis Canal Company and 4,585 AF from San Luis NWR's appropriative right on Salt Slough.

E. Wildlife potential

Improved habitat management programs will enhance this area's utilization by nesting and wintering waterfowl populations plus a diversity of non-game species. Upland feeding geese and Sandhill cranes will also benefit from improved habitat management.

F. Public use opportunities

A well planned public use program could allow compatible activities. This properties proximity to the Grasslands State Park and State Highway 165 provides an opportunity to develop an interagency visitor use facility. Public use activities could include waterfowl and upland gamebird hunting; fishing; wildlife observation; hiking; canoeing; natural history interpretation; etc.

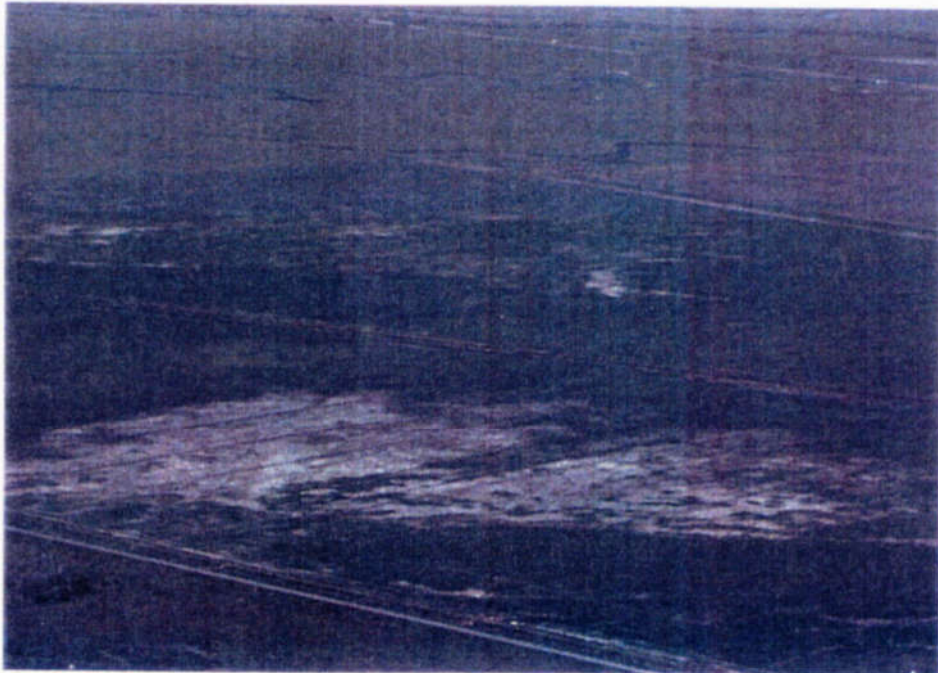
G. Total estimated development costs \$1,486 - \$1,625,000

- 1. Water delivery facilities \$670,000
- 2. Wetland creation and enchancement
..... \$249,000 - \$388,000
- 3. Other habitat \$32,000
- 4. Other facilities \$153,000
- 5. Equipment \$382,000

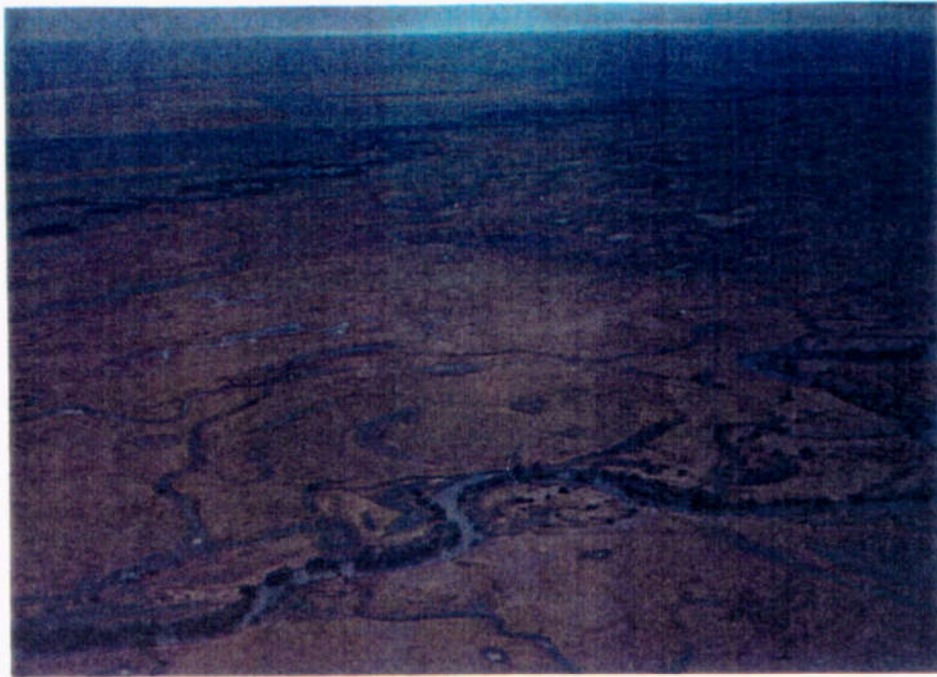
H. Estimated annual operational and maintenance costs \$483 - \$656,000



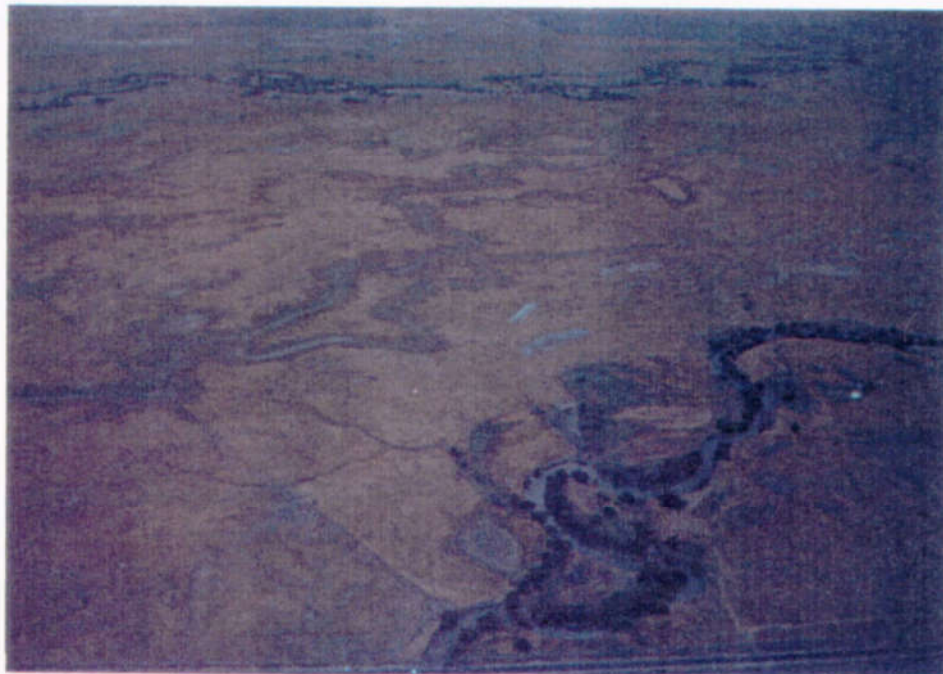
West Gallo (4/85) Native grasslands and dry vernal pools. North boundary of San Luis NWR in foreground.



West Gallo (4/85) Poor quality croplands (note historic wetland basins) which will be converted back to managed seasonal marsh. Highway 165 and Grasslands State Park at bottom left.

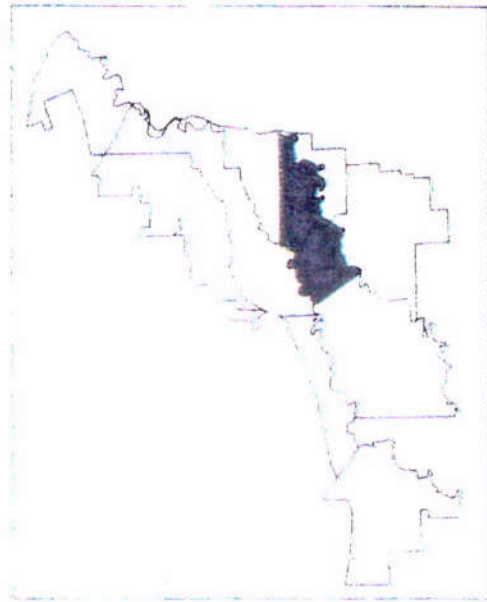
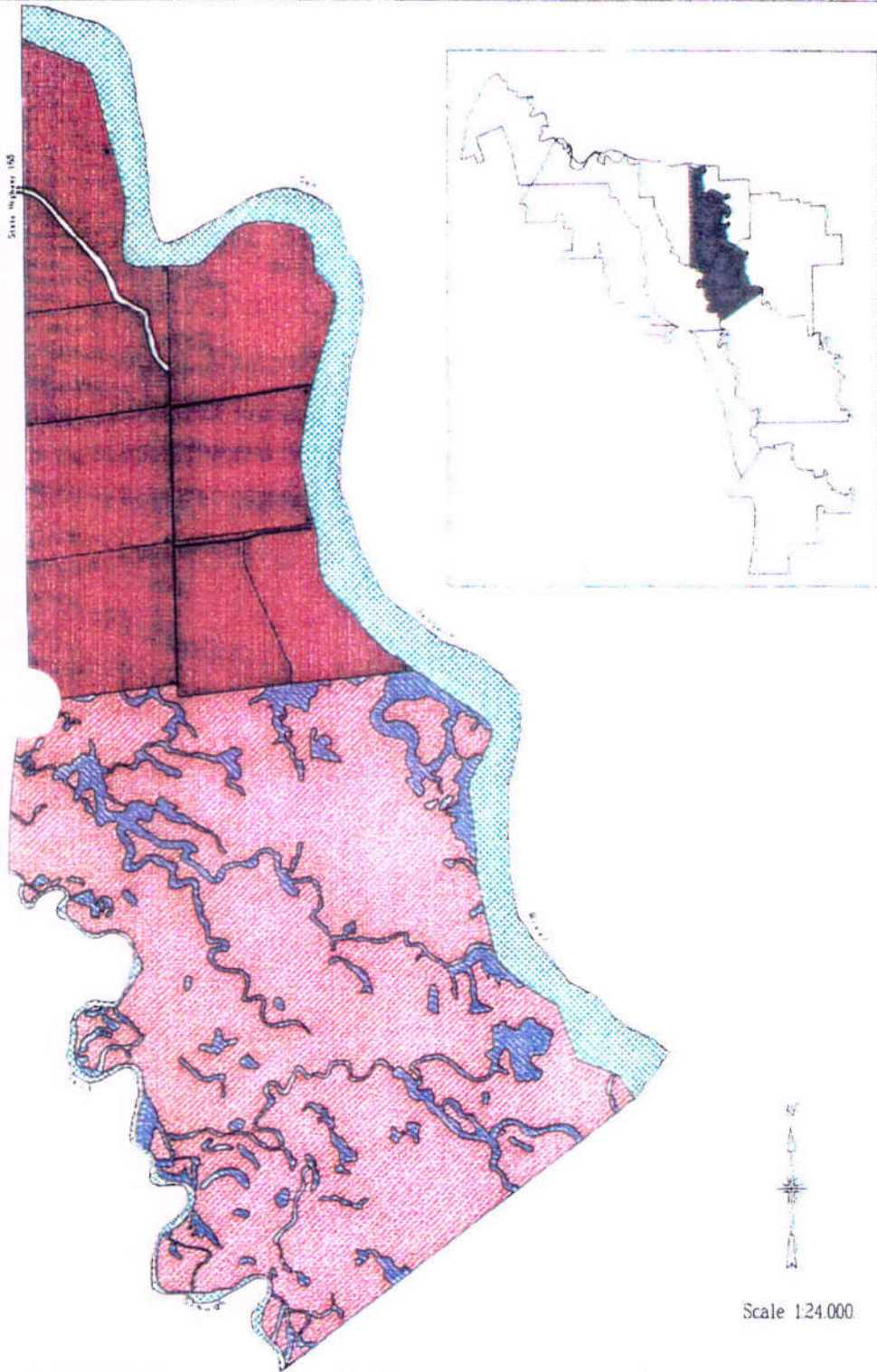


West Gallo (8/84) Native grasslands, Salt Slough in foreground, San Joaquin River in background. San Luis NWR, at upper right, will be future source of delivered CVP water.



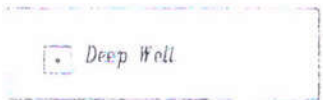
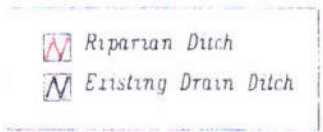
West Gallo (8/84) Native grasslands plus dry channels which will be enhanced with delivered water and managed via low-head dikes and control structures. Salt Slough and Highway 165 at bottom right.

Sheet Number 148



WEST GALLO

*Existing Habitat
and
Water System*

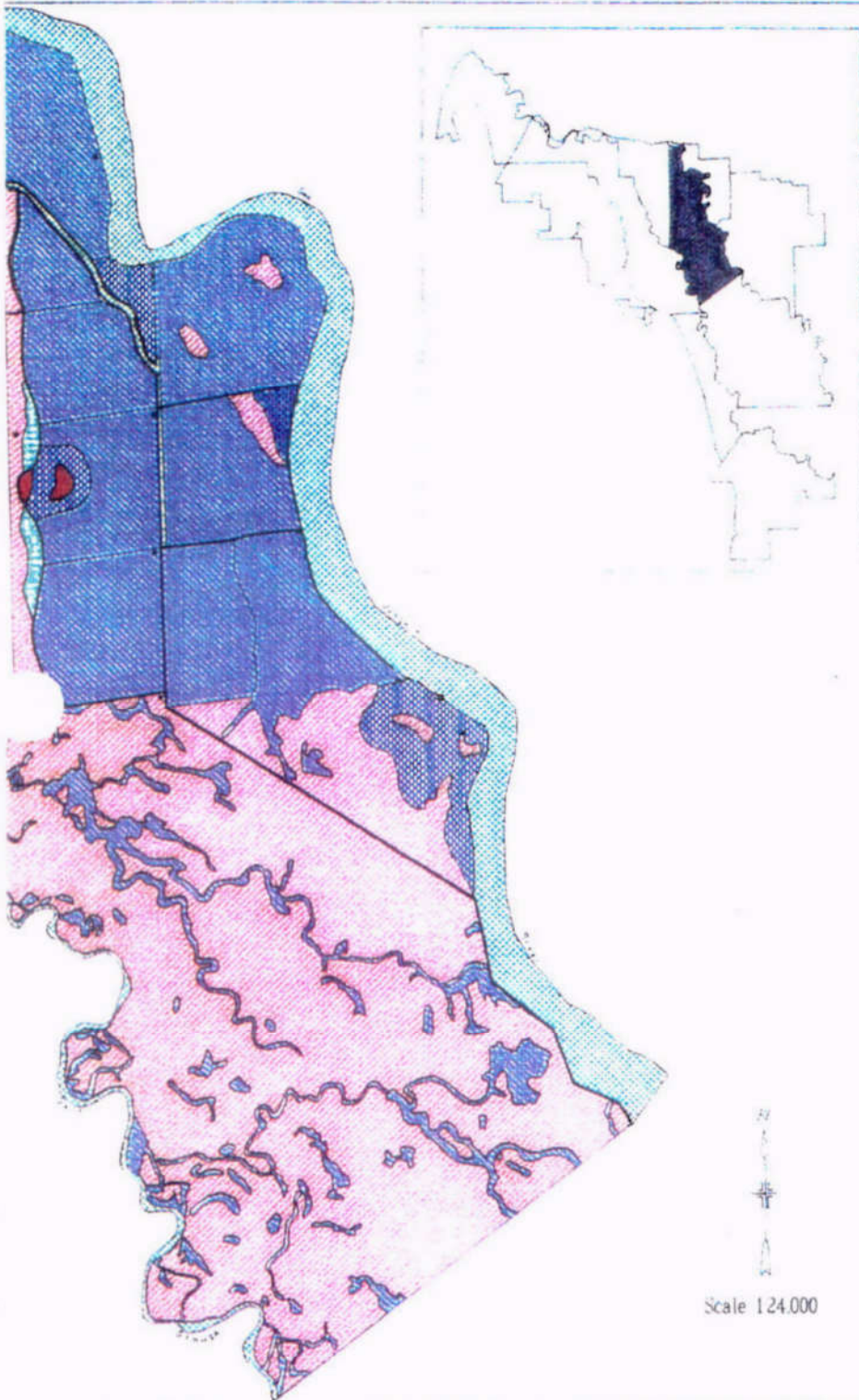


Scale 1:24,000

Developed by the
Bureau of Reclamation
Geographic Information System

WEST GALLO

Proposed Habitat and Water System



- Upland
- Upland-Island
- Seasonal-Wetland
- Permanent-Wetland
- Riparian
- Riparian-Trees

- Riparian Ditch
- New Ditch
- Existing Drain Ditch
- "C" Canal Extension

- Deep Well
- Proposed Lift Pump

Scale 1:24,000

Developed by the
Bureau of Reclamation
Geographic Information System

EAST GALLO/KELLY

I. Introduction

This 7,600 acre unit, owned by Joseph Gallo, and the Stevinson corporation respectively, is located east of the San Joaquin River adjacent to San Luis NWR. The property consists mainly of native grassland, irrigated pasture and small grain production lands, and is currently managed as a cattle ranch. The area provides important winter and spring habitat for grazing geese (Ross'; cackling Canada, and white-fronted), and Sandhill cranes. Extensive stands of valley oak provide nesting habitat to herons and egrets, and the state threatened Swainson's hawk. The state endangered Delta button celery occurs along the San Joaquin River floodplain. The entire property has been offered for sale by a willing seller. The owner was made an offer in 1985 which was refused.

A. Wetland

1.	Existing wetland to be enhanced	798 ac.
	a. Seasonal	609 ac.
	b. Permanent	189 ac.
2.	Existing riparian to be enhanced	1,331 ac.
	19.7 mi.
3.	Wetlands to be created	1,885 ac.
	a. Seasonal	1,732 ac.
	b. Permanent	153 ac.
	c. Riparian	-0- ac.
4.	Total wetland acres	2,683 ac.

B. Pasture/grain crops 783 ac.

C. Annual water needs for optimum habitat management
.....25,260 AF

D. Water rights and current status

This unit has an annual appropriative water right of 27,267 AF, associated with Bear Creek and the Livingston Drain between March 1st and October 27th on an "if and when available" basis. A deficit of 6,730 AF exists during the November through February

period. The additional water supplies needed could be developed from existing wells by using CVP project power, or by delivering CVP surface supplies via the Central California Irrigation District into the San Joaquin River.

E. Wildlife potential

Improved habitat management programs will enhance this area's utilization by upland feeding geese and sandhill cranes; nesting and wintering populations of numerous duck species; plus a diversity of non-game species.

F. Public use opportunities

A well planned program could allow compatible recreational activities such as waterfowl and upland gamebird hunting; fishing; wildlife observation; hiking; canoeing; etc.

G. Total estimated development costs \$1,534 - \$1,793,000

1. Water Delivery	\$190,000
2. Wetland creation and enhancement	\$409 - \$668,000
3. Other Habitat	\$98,000
4. Other facilities	\$455,000
5. Equipment	\$382,000

H. Estimated annual operational and maintenance costs..with CVP water \$1,058 - \$1,185,000
... with well water \$1,265 - \$1,518,000



East Gallo/Kelly (8/89) Bear Creek backwater in center surrounded by agriculture land and native grasslands. Subject to grassland and riparian enhancement and/or conversion to managed wetlands. West Gallo and San Joaquin River in background.







East Gallo/Kelly (8/89) Low lift pump station and inlet channel from San Joaquin River. San Luis NWR at top.

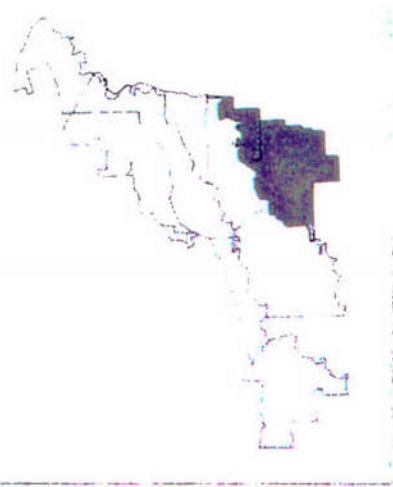
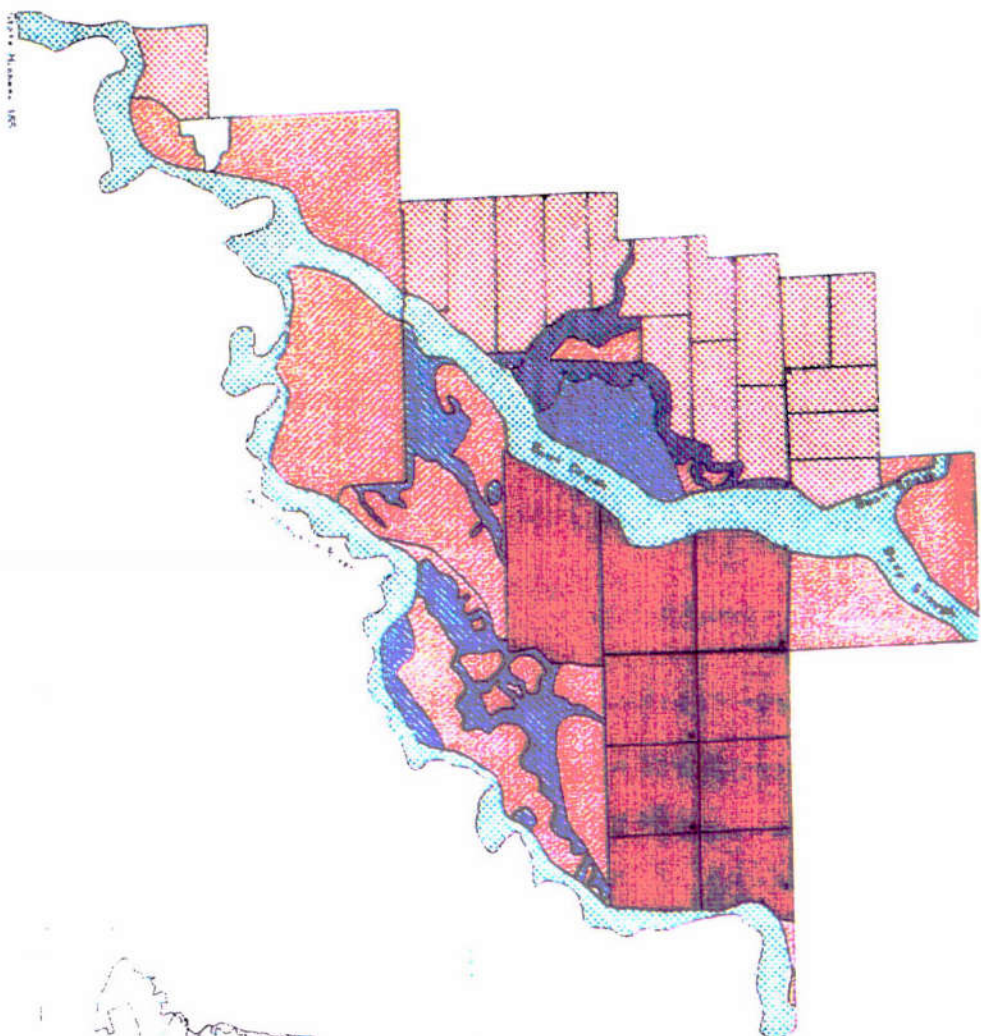
EAST GALLO/KELLY

Existing Habitat and Water System

-  Upland
-  Seasonal Wetland
-  Pasture
-  Permanent Wetland
-  Dairy Houses
-  Riparian
-  Small Grain

-  Existing Ditch
-  Existing Pipeline

-  Existing Deep Well
-  Existing Lift Pump

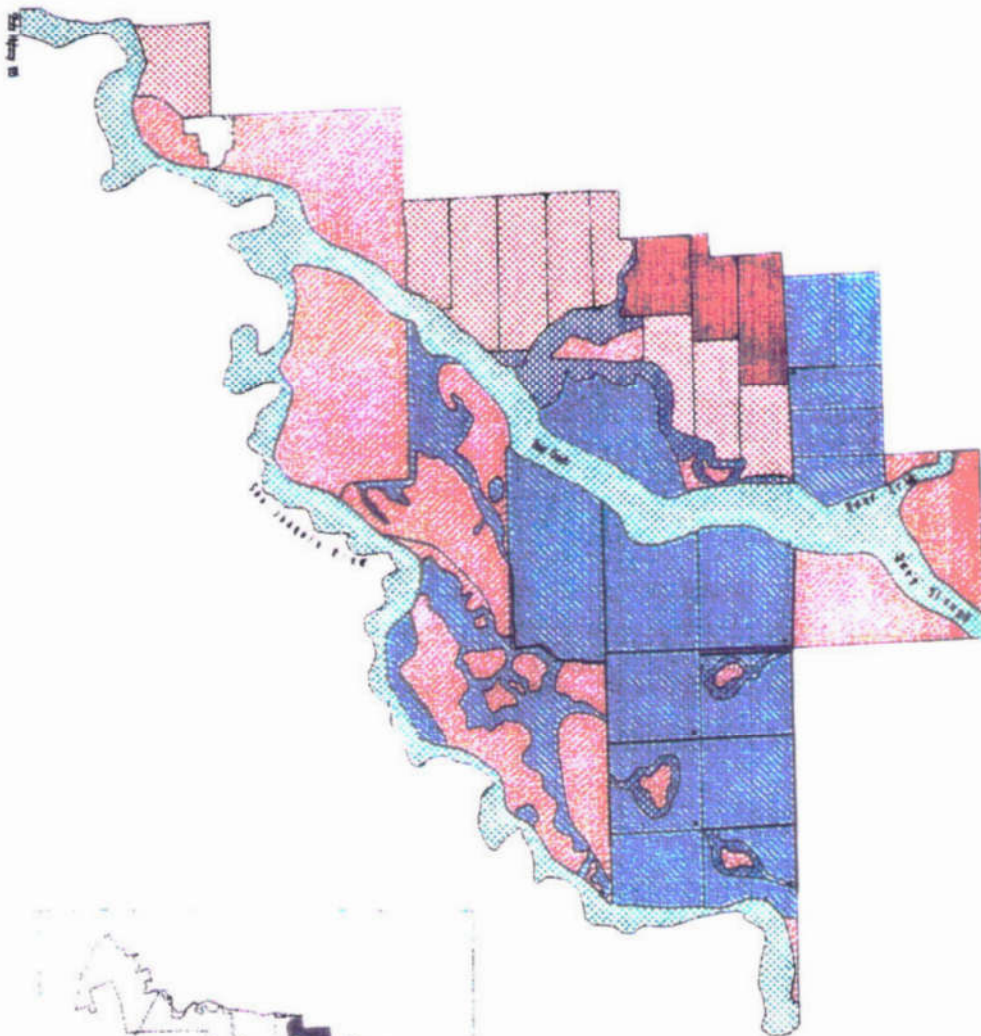


Scale 1:36000

Developed by the
Bureau of Reclamation
Geographic Information System

EAST GALLO/KELLY

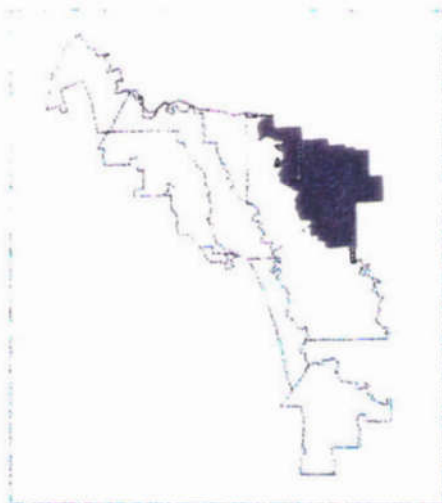
Proposed Habitat and Water System



- Upland
- Seasonal-Wetland
- Pasture
- Permanent-Wetland
- Dairy-Houses
- Riparian
- Small Grain

- Proposed Ditch
- Existing Ditch
- Existing Pipeline
- Proposed Drain Ditch

- Existing Deep Well
- Existing Lift Pump
- Proposed Lift Pump



Scale 1:36000

Developed by the
Bureau of Reclamation
Geographic Information System

Introduction

INTRODUCTION

The U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, and California Department of Fish and Game jointly propose a habitat acquisition and wetland enhancement program that will meet both the requirements of long-term mitigation for Kesterson Reservoir and the successful implementation of the Central Valley Habitat Joint Venture (CVHJV) of the North American Waterfowl Management Plan. The proposed plan will begin to accomplish several objectives of the Central Valley Habitat Joint Venture. The CVHJV objectives are:

1. To protect 80,000 additional acres of existing wetlands through fee or perpetual easement acquisition.
2. Increase wetland area by 120,000 acres by conversion of agricultural lands to wetlands.
3. Enhance wetland habitats on 290,000 acres of public and private lands.

In addition, the proposed plan will meet the mitigation requirements as specified in the California Regional Water Quality Control Board (Regional Board) Order No. 87-149 for the closure and cleanup of Kesterson Reservoir. The order states that "the long-term mitigation program shall provide for no net loss of wetlands acreage and no net loss of wildlife values." The specific objectives of the CVHJV for the San Joaquin Basin are:

1. To protect 53,000 acres of existing wetlands through fee or perpetual easement acquisition.
2. Increase wetland area by 20,000 acres by conversion of agricultural lands to wetlands.
3. Enhance the 121,000 acres of existing wetlands in public and private ownership.

The proposed plan provides the unique opportunity for preserving and protecting an expansive and very valuable riparian area, wetland floodplain, and native grassland habitat and will result in the restoration of thousands of acres of agricultural lands back to wetlands.

A. HISTORICAL OVERVIEW

Historically, the Northern San Joaquin Valley was a large floodplain of the San Joaquin River and its tributaries. Flood waters created vast areas of wetlands which consisted of shallow seasonal marshes; permanent ponds; lakes and sloughs; and riparian habitat. This area, known as the "Grasslands," once provided important habitat for large and diverse populations of wildlife and fish. Over the past 80 years, flood control projects and conversion of wetlands to agricultural crops have drastically changed the flooding regime of the area. Natural flooding of the San Joaquin basin floodplain and associated wetlands has become a rare event. Remaining wetlands in the basin are no longer maintained by flood waters. Today, the remaining wetlands are maintained with Federal project contract water, agricultural return flows of adequate quality, and deep wells.

The remaining wetlands, uplands, and riparian habitat are vitally important to the existing wildlife populations that depend on the Northern San Joaquin Valley.

B. PHYSICAL ENVIRONMENT

The proposed project area contains 23,583 acres and consists of floodplain, upland, wetlands and riparian habitat along the San Joaquin River and its tributaries Salt and Mud Slough (that drain the West Grasslands) and Bear Creek (which drains through the East Grasslands). The area is approximately 41 miles long and 27 miles wide. Within this area are 2,526 acres of wetlands, 9,997 acres of upland, and 3,713 acres (or 88.5 miles) of riparian habitat. The project area also includes 7,068 acres of leveled agricultural lands suitable for conversion to wetlands, small grain cropping or irrigated pasture.

Soils in the area can generally be characterized as poorly drained and alkaline, derived primarily from alluvial deposits of the San Joaquin River and its tributaries. The water table is fairly close to the surface throughout the area.

The climate in the Northern San Joaquin Valley is characterized as having hot, dry summers and cool, damp winters. Average annual precipitation for the area is 9 inches, with the majority of rain falling in the December-March period. Summer temperatures are often over 100°F in July and August. Winter temperatures in the 30-40°F range,

coupled with high humidity and an inversion layer, create dense fog which can persist through the winter for up to two weeks at a time.

C. CULTURAL AND SOCIAL ENVIRONMENT

The entire proposed project area was once occupied by a group of primitive native American Indians called Yokuts. There are many known archeological sites throughout the adjacent Federal and State lands. During the 1800's, the Spanish controlled much of the area and a State Historic Monument is located within the proposed acquisition area.

The proposed acquisition area lies primarily within Merced County, with a small area (164 acres) in Stanislaus County. The largest towns in the area are Merced, Los Banos, and Gustine, with the smaller, adjacent communities of Newman and Stevenson. Agriculture is the primary industry in the area with wheat, cotton, barley, sugar beets, alfalfa, and corn being the major crops grown. The area is also supported by a large beef cattle and dairy industry. Also important to the local economy is the waterfowl hunting associated with the Grasslands Water District and State Wildlife Areas and Federal National Wildlife Refuges.

D. BIOLOGICAL RESOURCES

1. Plant Communities

The proposed acquisition/enhancement area is composed of several major vegetation communities. These include native grasslands, seasonal and permanent wetlands, riparian, and agricultural crops.

The native grassland communities are primarily a mixture of annual and perennial grasslands interspersed with marshes, sloughs, streams, and vernal pools. Much of this grassland occurs in the San Joaquin River, and Salt and Mud Slough floodplains. The area contains some of the last unprotected perennial native grassland habitat, including alkali sacaton (Sporobolus aeroides) and beardless wild rye (Elymus triticoides). The remainder of the area is dominated by introduced annual grasses. Also important is the native flood

plain shrub/scrub community of iodine bush (Allenrolfea occidentalis) and saltgrass. Most of the native grasslands in the area are currently subjected to severe overgrazing by cattle.

The majority of wetlands in the proposed acquisition area are unmanaged seasonal and permanent marshes, plus sloughs and oxbows of the San Joaquin River, Bear Creek, and Salt and Mud Sloughs. Because many of the wetlands are interspersed throughout the uplands, most marsh vegetation is heavily grazed and very little emergent vegetation persists. Vernal pools also provide wetland habitat and unique floral communities in wet years. Two rare plants that occur in or adjacent to wetlands are Hispid bird's beak (Cordylanthus mollis spp. hispidus) and bearded allocarya (Plagiobothrys hystriculus). Both are candidates species for the Federal endangered species lists.

A large portion of the proposed project area is riparian habitat along the San Joaquin River, Mud and Salt Sloughs, and Bear Creek. The riparian community in most of the area is overgrazed and/or substantially altered by maintenance activities of the local flood control district. Existing channels of the San Joaquin River and Bear Creek are contained by large flood control levees which minimize inundation of the adjacent floodplain and increase the flooding depth and duration of the riparian habitat within the levees. Riparian habitat in the project area is dominated by black willow (Salix nigra) and interspersed with groves of Valley oak (Quercus lobata) and cottonwoods (Populus Fremonti). Understory shrub species, including buttonbush (Cephalanthus occidentalis) and elderberry (Sambucus cerulea), have been severely altered by overgrazing. Delta button celery (Eryngium racemosum- state endangered) is also present along the San Joaquin River.

The remaining acreage consists of leveled agricultural fields which grow primarily small grain row crops (wheat, barley, and corn) and irrigated pasture.

2. Wildlife

The wildlife populations using the Grasslands area in and around the proposed acquisition area are diverse and abundant. Over 200 species of birds have been observed in the Grasslands. Included in this list

are the Federal endangered: Aleutian Canada goose, Southern bald eagle, and peregrine falcon; California threatened: Swainson's hawk and greater sandhill crane; and Federal candidate species: white-faced ibis, tricolored blackbird, and fulvous whistling duck. Other California Species of Concern that use the area are the western snowy plover, white pelican, double-crested cormorant, sharp-shinned and Cooper's hawks, golden eagle, prairie falcon, willow flycatcher, and yellow warbler.

The Grasslands provides important winter habitat for millions of migratory waterfowl, cranes and shorebirds from September to April. Four goose species, tundra swans, and 20 duck species winter in the area, and eleven species of ducks breed in the Grasslands. In addition, more than seventy species of birds nest in the Grasslands.

Over 10,000 lesser sandhill cranes use the area during the winter period along with many long-billed curlews, black-necked stilts, avocets, great and snowy egrets, great blue herons, and black-crowned night herons.

Raptors are abundant, especially during the winter period, and include red-tailed and rough-legged hawks; northern harriers; black-shouldered kites; short-eared, great-horned, and barn owls; and American kestrels.

Fisheries resources known to exist within the project area include both warmwater and anadromous fish species. The warmwater fishery (mainly catfish, black bass, black bullheads and carp) exists primarily in the San Joaquin River, Salt Slough and Mud Slough. Reduced flows in the Merced River, coupled with increased agricultural drainwater flows from the Grasslands, has resulted in increased movement of migratory king salmon into the Grasslands reach of the San Joaquin River.

3. Water

Historically, Northern San Joaquin Valley wetlands were flooded nearly every year during the winter and spring by natural overflow from the San Joaquin River. As flood waters and natural stream flows were diverted for flood protection and irrigation projects, water became less available and these lands were inundated less frequently.

Existing water supplies to the project area vary from deep wells, Federal (CVP) contracts, or water rights diversions. All of the diversions or contracted supplies are based upon or provided on an "if and when available" basis.

Major tributaries of the project area include the San Joaquin River, Salt and Mud Sloughs and Bear Creek. Except during periods of abnormal rainfall and associated flooding, the flows consist of agricultural runoff. Studies have documented adequate and fairly consistent in-stream flows in Salt Slough and the east side tributaries of the San Joaquin River. Unless there are major reductions in historic water right allotments to upstream and/or adjacent agricultural lands or drastic changes in cropping patterns occur, in-stream flows associated with this project will usually be adequate for the proposed habitat management programs.

Quality of these water supplies vary. San Joaquin River supplies (upstream of Salt Slough and Bear Creek) are generally considered usable for wetland management purposes. Quality of Mud and Salt Slough water is currently poor as a high percentage of agricultural subsurface tile drainwaters is being diverted through these tributaries. The drainwater, which originates from westside agricultural land, is transported through the Grasslands Water District (GWD) and discharged into Mud or Salt Slough. Contaminants of concern in the drainwater include selenium and boron and generally, this water supply has not been usable for wetland management.

Future management of this water supply is uncertain. Contaminant levels in the drainwater remain above the water quality objectives set by the Regional Board and are therefore, unacceptable for use on wetlands. Operationally, planning is currently underway by the Grassland Drainage Task Force to isolate this contaminated water from many of the GWD canals and Mud and Salt Sloughs. The plan being developed (Zahm- Sansoni-Nelson) is designed to convey drainwater in the federally-owned San Luis Drain to Mud Slough at Kesterson NWR. Implementation of this plan, or any other procedure which permanently diverts unusable drainwater from canal systems and natural slough channels which service this project's wetland habitat, is imperative if this venture is to succeed.

Supplemental water supplies to implement the San Joaquin Basin Action Plan may need to be developed. Potential supplies (in addition to existing) include, but are not limited to, Federal CVP water and/or deep wells. Surface water supplies from the State or Federal Water Projects are or can be delivered via Grasslands Water District, Central California Irrigation District or the San Luis Canal Company. Water for lands east of the San Joaquin River could be transported through the Merced Irrigation District or via the Central California Irrigation District-San Joaquin River-Mariposa Eastside By-pass linkage.

The table on the following page provides monthly estimates of optimum water needs for each property within the project. Total net water need for the entire project is estimated to be 61,830 acre-feet. This supply has not been identified in the Bureau of Reclamation's Refuge Water Supply Investigation, thus any block of new water would have to be developed as an additional supply and would necessitate additional Delta diversions.

E. PROPOSED ACQUISITION AREAS

The entire project area is 23,583 acres and is broken down into seven separate parcels. The seven parcels and their current ownership and size are listed below:

1. Claus (Federal)	90	Acres
2. Schwab (Federal)	188	Acres
3. San Luis Ranch (Wolfsen)	2,241	Acres
4. Freitas-McPike (Wolfsen)	2,963	Acres
5. Freitas Ranch (Freitas)	5,500	Acres
6. West Gallo (Gallo)	4,087	Acres
7. East Gallo/Kelly (Gallo & Kelly)	<u>7,600</u>	Acres
	Total	23,583 Acres

These lands, because of their immediate proximity to San Luis and Kesterson NWR's, Los Banos WMA and Grasslands State Park are an important link to managing a large portion of the Grasslands as an ecological unit. The

Monthly water needs associated with properties identified in the
San Joaquin Basin Action Plan/Kesterson Mitigation Plan

<u>Month</u>	<u>Property/Monthly Need (AF)</u>					<u>Total (AF)</u>
	<u>San Luis Ranch</u>	<u>Freitas</u>	<u>W. Gallo</u>	<u>Freitas-McPike</u>	<u>E. Gallo/Kelly</u>	
January	560	290	740	560	1,340	3,490
February	560	290	740	560	1,340	3,490
March	520	180	80	370	950	2,100
April	80	400	1,400	1,060	2,510	5,450
May	230	580	1,480	1,190	2,780	6,260
June	1,530	680	1,530	1,400	3,480	8,620
July	1,240	460	200	230	550	2,680
August	280	460	200	230	550	1,720
September	2,540	890	1,480	2,630	3,270	10,810
October	630	480	1,480	620	4,440	7,650
November	1,000	290	740	870	2,120	5,020
December	<u>850</u>	<u>290</u>	<u>740</u>	<u>730</u>	<u>1,930</u>	<u>4,540</u>
	10,020*	5,290*	10,810*	10,450*	25,260*	61,830*

*Figure represents actual amount of water delivered to property boundary or inlet(s). Losses during transportation from supply source to property boundary would result in increased total need.

project would protect and enhance 3,700 acres (88.5 miles) of rapidly vanishing riparian habitat on the San Joaquin River, Salt and Mud Sloughs, and Bear Creek. Approximately 2,300 acres of wetlands now exist on these properties along with 10,000 acres of grassland, and 4,700 acres of marginal agricultural land that can be converted to wetlands.

The following is a summary of the existing conditions for each parcel and includes acreage; significant wildlife and habitat values; water; cultural resources; and current land use.

CLAUS (FEDERAL)

This 90 acre parcel was purchased by the Federal government in 1988 as the result of a lawsuit. The land contains 45 acres of seasonal wetlands and 45 acres of native grassland. This parcel was used in the past as a duck club and its primary use was by waterfowl. The endangered San Joaquin kit fox has been observed using the native grassland habitat. The potential water source for this land is the Grassland Water District's Fremont Canal which can deliver good quality water. The property can be drained into the Fremont Canal via the adjacent Schwab property. Cultural resource values are unknown. The area would be kept dry at this time because of its proximity to the Kesterson Reservoir, and the possible effects that flooding the ponds may have on ground-water levels under the Kesterson Reservoir.

SCHWAB (FEDERAL)

This 188 acre parcel was also purchased by the Federal government in 1988 as the result of a lawsuit. The land contains 156 acres of seasonal wetlands and 32 acres of native grassland. This area is used by waterfowl, and the San Joaquin kit fox, while Hispid bird's beak is found scattered amongst the uplands. The direct water source is the Fremont Canal or through the Claus property. Water can be drained back into the Fremont Canal to Mud Slough. A deep well is located on the south end of the property but its condition and water quality are unknown. Cultural resource values are unknown. Land use of the parcel has been waterfowl hunting, farming, and cattle grazing. The land would be kept dry at this time because of its close proximity to the Kesterson Reservoir, and the possible adverse effects that flooding the area could have on the ground-water levels beneath the Kesterson Reservoir.

FREITAS RANCH - (FREITAS)

This 5,500 acre tract lies east of, and immediately adjacent to the Kesterson Reservoir and Kesterson NWR, and is bordered by the Grasslands State Park on the east and north. There are approximately 4,000 acres of upland, most of which are in the floodplain of the San Joaquin River and Salt Slough, 294 acres of seasonal wetland, 277 acres of permanent marsh/slough channels, and 929 acres (36 miles) of braided riparian habitat. This parcel contains a significant piece of remaining native upland with braided Valley oak woodland/riparian habitat with many sloughs and oxbows. It is used by the endangered San Joaquin kit fox, bald eagle, and peregrine falcon. The giant garter snake and tiger salamander also inhabit the vernal pools and wetlands. The riparian area is used by nesting Swainson's hawks, and colonial nesting birds build rookeries in the large Valley oaks and willows. California's endangered Delta button-celery is found in the floodplain within the riparian area and Sandhill cranes, tundra swans, and waterfowl use the marshes and sloughs. The water sources for this property are the San Joaquin River, Salt Slough, and two deep wells. Water quality is currently poor in Salt Slough and the San Joaquin River because of contaminants in the agricultural subsurface drainage water.

The water quality in the wells is unknown but is expected to be high in TDS and boron, thus similar to other wells in the vicinity. There are no water rights for Salt Slough or the San Joaquin River. The distribution system is not well developed and consists primarily of natural slough channels and small ditches. Cultural resource values are expected to be high because of the extensive use by native Americans along both Salt Slough and the San Joaquin River. Current land use is intensive cattle grazing which has degraded the riparian and upland habitats. There is limited waterfowl hunting and fishing by the landowner.

SAN LUIS RANCH - (WOLFSEN)

This 2,241 acre parcel is located on the west side of Salt Slough adjacent to San Luis NWR and Los Banos WMA. It contains 1,576 acres of improved irrigated pasture for cattle grazing; 200 acres (4.6 miles) of riparian habitat on Salt Slough; 115 acres of seasonal and 74 acres of permanent wetland; and 187 acres of native upland. This area's 4.6 miles of riparian habitat is consistently used by Swainson's hawks and other raptors, plus herons and egrets. The improved pasture is used as a feeding area

during the winter and spring by thousands of Sandhill cranes, snow, Ross', white-fronted and cackling Canada geese. The endangered San Joaquin kit fox and Aleutian Canada geese have also been observed using the property. The riparian area is degraded from over-grazing and has little or no understory vegetation. The water source for this parcel is Salt Slough, currently of poor quality because it contains selenium-contaminated subsurface drainage water unacceptable for wildlife management purposes. There are three lift pump stations in Salt Slough which have "if and when available" water rights for 38 cfs and 8,891 acre-feet. A well developed water distribution system exists through most of the property and includes approximately 3.2 miles of water delivery canals, 3.9 miles of drainage canals, and 0.6 miles of pipeline. Cultural resource values include a State Historical Landmark. Native American archeological sites may occur along Salt Slough and perhaps within the native grasslands. The current land use is intensive cattle grazing and limited private hunting and fishing activities.

FREITAS-McPIKE - (WOLFSEN)

This 3,877 acre tract is located on the San Joaquin River and borders Kesterson NWR and the Freitas Ranch on the northwest. This parcel contains 1,769 acres of native grassland floodplain, 588 acres (14.2 miles) of riparian habitat on the San Joaquin River and Mud Slough, 303 acres of seasonal and 100 acres of permanent wetland, and 1,147 acres of improved irrigated pasture. The area is most significant for its Valley oak woodland/riparian habitat important to Swainson's hawks, herons, egrets, and waterfowl. China Island, in the north corner of this property, is a low-lying 309 acre island crisscrossed with tree-lined sloughs and oxbows at the confluence of the San Joaquin and Merced Rivers. The endangered San Joaquin kit fox and Delta button-celery are both found on the area. Sandhill cranes and geese feed and roost extensively in the irrigated pasture.

Waterfowl use the wetlands on the small duck club portion as well as vernal pools within the native grassland. The water source for the irrigated pastures are five deep wells and one lift pump station. The water quality of the wells is unknown but is expected to be of satisfactory quality for wetland management. There are no water rights to Mud Slough or the San Joaquin River. The Newman Wasteway forms the northwest boundary of the area and terminates at China Island. The water distribution system for the irrigated pasture is well developed with several miles of small

ditches. The native uplands and riparian area are likely to have native American archeological sites. Current land use is cattle grazing and limited waterfowl hunting.

WEST GALLO - (GALLO)

This 4,087 acre tract is located adjacent to, and north of San Luis NWR. The San Joaquin River forms the east boundary and Salt Slough and Highway 165 form the west boundary. This property contains 1,800 acres of native grassland, 364 acres of seasonal marsh, 695 acres (14 miles) of riparian habitat in the San Joaquin River and Salt Slough, and 1,228 acres of agricultural lands. Significant wildlife and habitat values include use by San Joaquin kit fox, Swainson's hawk, colonial nesting bird rookeries on the San Joaquin River, and tiger salamanders. Valley oak woodland/willow riparian habitat, vernal pools, and Delta button-celery also exist on the property.

Though the West Gallo property is bounded on two sides by Salt Slough and the San Joaquin River, there are no water rights for the property. The water source for this property is ten wells, of which seven are currently operational. The water quality in the seven wells is questionable, with the water high in salts and boron. The deep wells water distribution system to the agricultural fields is well established. There is not a developed distribution system in the native grassland portion. Cultural resource values are expected to be high along Salt Slough, the San Joaquin River, and native grasslands because of historic use by Native Americans. Current land use is cattle grazing, farming and limited waterfowl hunting and fishing by the landowner.

EAST GALLO/KELLY - (GALLO-KELLY)

This 7,600 acre tract is located east of the San Joaquin River and is adjacent to San Luis NWR. It contains 3,117 acres of improved irrigated pasture and small grain crops, 609 acres of seasonal and 189 acres of permanent wetlands, 1,331 acres (19.7 miles) of riparian habitat along the San Joaquin River and Bear Creek, and 2,164 acres of native grassland habitat. The area contains important Valley oak woodland/riparian habitat for colonial nesting herons and egrets, Swainson's hawks, and other riparian species. The State threatened giant garter snake is also found on the property. Delta button-celery is found along the San Joaquin River floodplain and vernal pools exist in the native grassland habitat. The seasonal and permanent

wetlands on Bear Creek are an important historical roost site for Ross', Cackling Canada, and white-fronted geese. The native uplands and irrigated pastures are used extensively by feeding geese and Sandhill cranes. Waterfowl use of the seasonal wetlands that are flooded for duck hunting during the fall and winter is extensive.

The water sources for this property are a combination of surface agricultural return flows, irrigation operational spill, and winter runoff flows in Bear Creek, the Livingston Drain, and the San Joaquin River. In addition, there are six deep wells on the property around the agricultural lands.

There are eight lift pump stations on the Livingston Drain and three on Bear Creek. The water right entitlement on the Livingston Drain is 27 cfs with a maximum of 9,027 acre-feet from April 1 to November 1 on an "if and when available" basis. The water right entitlement on Bear Creek is 38 cfs with no maximum acre-feet on an "if and when available" basis from March 1 to October 31. Water availability during the March-October period has historically been good. A lift pump on the San Joaquin River currently diverts water but no water right exists.

The water distribution system is well developed in the agricultural lands and managed seasonal wetlands using the wells and lift pump systems. The native grasslands and associated wetlands do not have a developed water distribution system. The native grasslands and San Joaquin River/Bear Creek riparian areas are likely to have native American archeological sites, however no sites have yet been identified. Current land use is farming for small grains, and cattle grazing on the irrigated pastures and native grasslands. Waterfowl hunting is conducted by the landowner and by lessees on the two managed seasonal wetland areas.

Fishing on the San Joaquin River and Bear Creek for warmwater fishes and during infrequent salmon runs, is limited to the landowner.

F. MANAGEMENT OBJECTIVES

The management objectives for the proposed project lands are to:

- 1) Ensure permanent habitat preservation of lands that are of vital importance to Pacific Flyway ducks and geese, threatened and endangered species, other migratory birds, and resident species.
- 2) Create wetlands on suitable agricultural lands for waterfowl and other wetland dependent species.
- 3) Protect and enhance riparian habitat and fishery resources on the San Joaquin River and its tributaries.
- 4) Increase public use opportunities for both consumptive and non-consumptive users when compatible with other objectives.
- 5) Provide adequate sanctuary to encourage wider distribution of waterfowl and provide protection from disturbance for endangered and threatened species and Sandhill cranes and geese.
- 6) Identify and protect cultural resource sites.

G. DEVELOPMENT AND ENHANCEMENT PLANS

Plans were developed for the five new acquisition areas, as well as for the enhancement of five areas already under State or Federal ownership. The five new acquisition areas are:

1. San Luis Ranch (Wolfson)
2. Freitas-McPike Ranch (Wolfson)
3. Freitas Ranch (Freitas)
4. West Gallo (Gallo)
5. East Gallo/Kelly (Gallo/Kelly)

The areas already under State or Federal ownership are:

1. Claus (Federal)
2. Schwab (Federal)
3. Kesterson NWR (Federal)
4. Los Banos WMA (State)
5. San Luis NWR (Federal)

The following individual unit development and enhancement plans include: potential wetland creation and enhancement data; water and water conveyance needs; estimated facility construction costs; and estimated annual operations and maintenance costs.

Development and Enhancement
(New Areas)

SAN LUIS RANCH - (WOLFSEN)

On this 2,241 acre tract, the 187 acres of uplands would remain the same, though with well-regulated cattle grazing to enhance the existing wetlands that are adjacent to the native uplands. Perennial grasses will eventually re-establish and provide upland nesting cover for birds. The 200 acres (4.6 miles) of riparian habitat on Salt Slough will be enhanced by the exclusion of grazing and the future planting of an understory of native shrubs such as elderberry, native Atriplex sp., wild rose and blackberry thickets, along with Valley oaks willows, cottonwoods, and buttonbush. Approximately 917 acres of irrigated pasture would be converted to 840 acres of seasonal moist-soil wetlands, and 77 acres of permanent marsh, in addition to the 115 acres of seasonal and 74 acres of permanent marsh that currently exist. Approximately 380 acres of irrigated pasture would continue to be managed as pasture, and would be rest-rotation grazed in the summer; used for feeding by geese and cranes in the fall and winter; and for waterfowl nesting in the spring.

Approximately 220 acres of irrigated pasture would be farmed for small grains (wheat, corn, vetch) on a rotation basis for food for geese and cranes. One 40 acre seasonal wetland (primarily swamp timothy) would be created for goose and crane roosting and by grazing or mowing the perimeter to eliminate emergent vegetation.

The existing water source for this property is Salt Slough which has been contaminated with subsurface agricultural drainwater. Implementation of the Zahm-Sansoni-Nelson Plan would allow Salt Slough to be used as a fresh water source. An additional water source would be Federal CVP surface water delivered via the San Luis Canal or San Luis Drain if it were used to convey fresh water supplies. Either the San Luis Canal or San Luis Drain could be connected to the existing internal water conveyance system at the southwest corner of the property. Approximately 12,020 acre-feet of water will be needed to manage the property under the preceding management scenario. A delivery system with a minimum capacity of 40 cfs would be required. The existing water distribution canal would need to be extended 1.4 miles to the north end of the property to service the seasonal and permanent wetlands which will be established. Drainage for the individual units will be either into the existing drain ditch that runs from south to north (adjacent to the San Luis Drain on the west side of the property) or to the east into Salt Slough. The water drained through the wetlands is expected to be of good quality. The drain ditch on the west side of the property

eventually empties into Salt Slough on the Freitas property.

The estimated monthly water needs for this property under the preceding management scenario are:

<u>Month</u>	<u>Acre/Feet</u>
January	560
February	560
March	520
April	80
May	230
June	1,530
July	1,240
August	280
September	2,540
October	630
November	1,000
December	<u>850</u>
Subtotal	10,020
20% loss	<u>2,000</u>
Total	12,020

Any change in the amount or type of wetlands that would be created will change the amount of water needed. The San Luis Ranch has a Salt Slough water right of 8,891 acre-feet, which is on an "if and when available" basis, and is dependent on Salt Slough having acceptable quality water of no more than 2ppb Se.

The capacity of the San Luis Canal will have to be enlarged to adequately meet existing demands plus the additional demands of the San Luis Ranch, Freitas Ranch, Kesterson NWR, and the Claus and Schwab properties. The San Luis Canal could convey an additional 40-50 cfs if improvements were made south of Highway 152.

A public use program will likely be developed on the San Luis Ranch that would allow limited waterfowl and upland game bird hunting, fishing in Salt Slough during certain times of the year, interpretive facilities such as foot or canoe trails, and a sanctuary area that will allow undisturbed use of portions of the property by geese and Sandhill cranes.

All existing cultural resources would be identified and protected from disturbance by the managing agency.

Estimated Development Costs

I. Water Delivery Facilities

- A. Outlet from San Luis Canal or San Luis Drain for CVP surface water delivery - \$30,000
- B. Increase capacity of San Luis Canal - \$125,000
- C. Rehabilitation of 7.2 miles of existing internal water delivery canal to convey 40-50 cfs flow, and rehabilitation of drainage ditch - \$40,000
- D. Water control structures and installation for individual marsh and pasture units - \$100,000
- E. Construction of 1.4 miles of 25 cfs capacity ditch to serve north end of property - \$17,000
- F. Rehabilitation of 3 low-lift pump stations-\$25,000

Subtotal: \$337,000

II. Marsh Creation and Enhancement

- A. Conversion of 920 acres of irrigated pasture to wetland. (Includes levee enlargements and rehabilitation, discing, seeding, and island and channel construction) \$184,000 - \$300,000
- B. Enhancement of 190 acres of existing wetland - \$19,000

Subtotal: \$203,000 - \$319,000

III. Rehabilitation of Irrigated Pasture

- A. Discre-level, re-seed 380 acres of pastures for preferred goose browse plant mixture - \$95,000

Subtotal: \$95,000

IV. Riparian Restoration

- A. Shrubland tree planting on 4.6 miles of Salt Slough
\$10,000

Subtotal: \$10,000

V. Public Use

- A. Visitor contact kiosk - \$10,000
B. Parking areas - \$30,000
C. Construction of foot trails - \$20,000
D. Purchase and installation of hunting blinds
(Approximately 30) - \$22,500

Subtotal: \$82,500

VI. Fencing and Posting

- A. 9 miles of external and internal pasture
fencing and boundary posting - \$63,000

Subtotal: \$63,000

VII. Rehabilitation of Internal Access Roads

- A. Rehabilitate 10 miles of roads by widening,
re-sloping, and gravelling necessary access roads -
\$75,000

Subtotal: \$75,000

VIII. Equipment Needed

- A. 4WD tractor, plow disc, cultipacker - \$110,000
B. Backhoe - \$50,000
C. Small tractor and mower - \$60,000
D. Bulldozer (D6 size) - \$140,000
E. 4WD Pickup - \$18,000
F. ATV - \$4,000

Subtotal: \$382,000

Total Development Costs: \$1,247,500 - \$1,363,500

Annual Operations and Maintenance Costs

- I. Operations and maintenance costs are estimated to be approximately \$100/acre. 2,240 acres x \$100/acre = \$224,000

- II. Water delivery or pumping costs
 - A. Low-lift pump operations (\$5-10/acre-foot) - \$44,000 - \$88,000

 - B. Federal contract surface water delivery via the San Luis Canal (\$5-10/acre-foot) 10,750 acre-feet \$54,000 - \$108,000

- Total Annual Operations and Maintenance Costs = \$278,000 - \$332,000

UNIT NAME SAN LUIS RANCH

TOTAL ACREAGE 2,241 ac.
EXISTING WETLAND ACREAGE 189 ac.
(Subject to possible enhancement)
SEASONAL 115 ac.
PERMANENT 74 ac.
EXISTING RIPARIAN 200 ac.
4.6 mi.
CREATED WETLAND ACREAGE 917 ac.
SEASONAL 840 ac.
PERMANENT 77 ac.
CREATED RIPARIAN -0- ac.
TOTAL WETLAND ACREAGE 1,106 ac.

EXISTING WATER RIGHTS FIRM
YES X NO YES NO X

TOTAL WATER SUPPLIES NEEDED FOR
OPTIMUM WETLAND MANAGEMENT 10,020 a.f.

POTENTIAL FOR CVP WATER DELIVERY
YES X NO

DELIVERY SYSTEM IN PLACE
YES X NO

CONJUNCTIVE USE
EXISTING POTENTIAL X

PUBLIC USE
EXISTING POTENTIAL X

PRIVATE DEVELOPMENT POTENTIAL
HIGH MEDIUM X LOW

FREITAS-McPIKE - (WOLFSEN)

This 3,877 acre tract includes 1,769 acres of annual native grassland, primarily within the San Joaquin River flood plain, and China Island. This habitat will remain unchanged although intensive grazing will be modified to protect vernal pools and key nesting cover areas for upland nesting species. Grazing will be continued on select native grassland areas to maintain winter forage habitat for grazing geese and cranes. The 558 acres of riparian habitat along 7 miles of the San Joaquin River and 7 miles of Mud Slough will also be enhanced by controlling grazing, and by the re-establishment of understory shrubs such as buttonbush, elderberry, wild rose and blackberries. A key feature of this property is China Island which is located at the north end of the project, and is formed by the confluence of the Merced and San Joaquin Rivers. Habitat on the island is dominated by annual grasslands interspersed with Valley oaks and willows in the isolated oxbows and sloughs which cut across the island. The island provides exceptional nesting habitat for Swainson's hawks, herons and egrets, and wood ducks.

The proposed management of the site will include conversion of 717 acres of the 1,147 acres of agricultural lands to wetlands. Approximately 699 acres of seasonal and 18 acres of permanent wetlands will be created. A total of 1,002 acres of seasonal wetlands and 118 acres of permanent wetlands will be maintained. The remaining 430 acres of agricultural lands will be managed for small grain production (202 acres) and improved irrigated pasture (228 acres). The permanent wetlands will be maintained to provide summer water and brood habitat for waterfowl and other waterbirds. Seasonal wetland management will produce a diversity of moist-soil vegetation which will be flooded to provide winter habitat for waterfowl and other wetland-related species. The irrigated pasture and small grain production will enhance adjacent wetlands and provide a high energy food supply for geese and cranes. White-faced ibis will also benefit from the irrigated pasture management adjacent emergent vegetation in the permanent wetlands. The existing water supply for this property includes five deep wells and two low lift pumps situated throughout the agricultural fields. The existing wetland receives some water from an existing well north of the Newman Wasteway via a 36" flume. Other potential water sources are Federal CVP surface water delivered through the Newman Wasteway which lies adjacent to the north boundary of the project. Two low lift pumps (30 cfs each) could supply sufficient water for management of the area. Approximately 3.2 miles of existing or new water delivery

canals would be required to service the existing wetlands, new wetlands, irrigated pasture and crop lands. Drainage water from the wetlands will be taken into the permanent marshes and natural sloughs of the San Joaquin River, thus benefitting the riparian area and improving habitat conditions for the resident fishery.

The monthly water needs for this property under the preceding wetland management scenario are:

<u>Month</u>	<u>Acre-Feet</u>
January	560
February	560
March	370
April	1,060
May	1,190
June	1,400
July	230
August	230
September	2,630
October	620
November	870
December	<u>750</u>
Subtotal	10,450
20% loss	<u>2,280</u>
Total	13,670

Any change in the amount or type of habitat managed for or created will change the amount of water needed.

A public use program will be likely developed to accomodate both consumptive and non-consumptive use. Access to the area is somewhat limited, therefore, intensive visitor contact programs may not be possible.

A waterfowl and upland game bird hunting program would likely be developed, as well as foot or canoe trails on the San Joaquin River during certain times of the year. Warm-water and fall salmon fishing would be encouraged along the San Joaquin River.

All existing cultural resources would be identified and protected from disturbance by the managing agency.

Estimated Development Costs

I. Water Delivery Facilities

- A. Establishment of surface supply of CVP water will require the construction of a diversion facility in the Newman wasteway - \$40,000
 - B. Install 2 low lift pump stations rated at 30 cfs - \$60,000
 - C. Rehabilitate and increase capacity of the existing internal water delivery system (approximately 5.2 miles) - \$110,000
 - D. Water control structures and installation. 50 @ \$2,000 - \$100,000
- Subtotal - \$310,000

II. Marsh Creation and Enhancement

- A. Conversion of 717 acres of agricultural lands to 699 acres of seasonal wetlands and 18 acres of permanent wetlands (Includes levee enlargement and rehabilitaion, discing, seeding, and island and channel construction) - \$143,000 - \$233,000
 - B. Enhancement of 356 acres of existing wetlands - \$35,600
- Subtotal - \$179,000 - \$268,600

III. Riparian Restoration

- A. Restore San Joaquin River and Mud Slough riparian habitat by planting trees and shrubs. 14 miles - \$28,000
- Subtotal - \$28,000

IV. Public Use

- A. Visitor contact kiosk - \$10,000
 - B. Construction of foot trails - \$10,000
 - C. Construction and gravel for three parking areas - \$30,000
- Subtotal - \$50,000

V. Fencing and Posting

- A. Fourteen miles of fencing and boundary posting - \$98,000
- Subtotal - \$98,000

VI. Equipment Needed

- A. 4WD tractor, plow disc, cultipacker - \$10,000
 - B. Backhoe - \$50,000
 - C. Small tractor and mower - \$60,000
 - D. Bulldozer (D6) - \$140,000
 - E. 4WD Pickup - \$18,000
 - F. ATV - \$4,000
- Subtotal - \$382,000
- Total Development Costs = \$1,047,000 - \$1,136,000

Annual Operations and Maintenance Costs

- I. Operations and maintenance costs are estimated to be approximately \$100/acre for 2,963 acres - \$296,000

II. Water Delivery or Pumping Costs

- A. Low-lift pump operations from the Newman Wasteway (\$5-\$10/acre-foot, 13,670 acre-feet) - \$68,000 - \$137,000

B. Pumping from deep wells (\$15-20/acre-feet,
13,670 acre-feet) \$205,000 - \$273,400

(Options A and B are not additive)

Subtotal - \$68,000 - \$273,400

Total Annual Operations and Maintenance Costs =
\$364,000 - \$569,000

UNIT NAME FREITAS - McPIKE

TOTAL ACREAGE 3,877 ac.
EXISTING WETLAND ACREAGE 403 ac.
(Subject to possible enhancement)
SEASONAL 303 ac.
PERMANENT 100 ac.
EXISTING RIPARIAN 558 ac.
14.2 mi.
CREATED WETLAND ACREAGE 717 ac.
SEASONAL 699 ac.
PERMANENT 18 ac.
CREATED RIPARIAN -0- ac.
TOTAL WETLAND ACREAGE 1,120 ac.

EXISTING WATER RIGHTS FIRM
YES NO X YES NO X

TOTAL WATER SUPPLIES NEEDED FOR
OPTIMUM WETLAND MANAGEMENT 10,450 a.f.

POTENTIAL FOR CVP WATER DELIVERY

YES X NO

DELIVERY SYSTEM IN PLACE

YES NO X

CONJUNCTIVE USE

EXISTING X POTENTIAL

PUBLIC USE

EXISTING POTENTIAL X

PRIVATE DEVELOPMENT POTENTIAL

HIGH X MEDIUM LOW

FREITAS RANCH - (FREITAS)

This 5,500 acre tract is entirely native grasslands, seasonal wetlands, and riparian habitat associated with Salt Slough and the San Joaquin River. There are no agricultural lands on this property that could be converted to wetlands. This property is valuable because of its large expanses of native upland and 36 miles of riparian sloughs, oxbows, and riverine channels. Of the existing 294 acres of seasonal wetlands, one 78 acre deep water pond will be converted to permanent marsh. This marsh annually receives good use by tundra swans, ducks and cranes. The remaining 276 acres of seasonal wetlands would be enhanced by securing a dependable water supply and managing for moist-soil plants. The existing 277 acres of permanent marsh will be enhanced by increasing emergent vegetation on the edges and insuring a dependable water supply and delivery system. The north end of the property, including the Salt Slough-San Joaquin River delta and the San Joaquin River floodplain, provides infrequent but high-quality waterfowl habitat when periodically inundated. The native perennial grassland habitat will be rested and allowed to regain vigor. Controlled grazing or burning will be employed to maintain optimum wildlife cover. The 36 miles and, 1232 acres of riparian habitat have been severely degraded by overgrazing. An understory of young trees and shrubs such as willows, Valley oaks, cottonwoods, buttonbush, wild rose, elderberry and blackberry should be planted and protected from grazing.

Grazing should not be eliminated from this property, but used as a management tool to maintain a specific short-grass aspect for such species as sandhill cranes, long-billed curlew, American wigeon and geese.

Because the only existing water supply outside of the Salt Slough and San Joaquin River channels are two deep wells of questionable quality, securing additional water for wetland management is essential. Potential water sources are the San Luis Canal and Salt Slough. The San Joaquin River is another potential water source but because of the location, it could only service a small portion of the property. Salt Slough is currently contaminated with subsurface agricultural drainwater. To use Salt Slough, the Zahm-Sansoni-Nelson plan would have to be implemented and appropriative water rights water applied via a newly-constructed delivery canal and low-lift pumps. The San Luis Canal is a good potential water source for Federal CVP surface water delivery. This canal runs adjacent to the property's westside for 2.6 miles and could be extended another 2.0 miles to service additional habitat. The

capacity of the San Luis Canal must be increased to adequately meet existing demands plus the additional demands of the Freitas Ranch, Kesterson NWR, and the San Luis Ranch. A low-lift pump station and 0.75 miles of ditch may be needed to deliver water to some of the wetlands off the San Luis Canal. Water drained off the wetlands will go into Salt Slough and will improve the flow and quality of Salt Slough for warmwater fish.

The estimated monthly water needs for this property under the preceding management scenario are:

<u>Month</u>	<u>Acre-Feet</u>
January	290
February	290
March	180
April	400
May	580
June	680
July	460
August	460
September	900
October	470
November	290
December	<u>290</u>
Subtotal	5,290
20% loss	<u>1,090</u>
Total	6,350

Any change in the amount or type of wetlands that would be created will change the amount of water needed.

A public use program will likely be developed on the Freitas Ranch that would allow limited waterfowl and upland gamebird hunting; fishing in Salt Slough and the San Joaquin River during certain times of the year; and non-consumptive recreational activities such as foot or canoe trails, wildlife photography and nature study.

All existing cultural resources would be identified and protected from disturbance by the managing agency.

Estimated Development Costs

I. Water Delivery Facilities

- A. New low-lift pump station on San Luis Canal - \$60,000
 - B. Construction of lift canal (30 cfs) at San Luis Canal - \$60,000
 - C. Extension of San Luis Canal - 2.6 miles. - \$100,000
 - D. Two new low-lift pump stations on Salt Slough - \$120,000
 - E. Construction of internal water delivery canals - 1.0 mile. - \$120,000
 - F. Water control structures and installation - 25 @ \$2,000 each - \$50,000
- Subtotal - \$510,000

II. Marsh Enhancement

- A. Enhancement of 571 acres of wetlands - \$57,000
- Subtotal - \$57,000

III. Riparian Restoration

- A. Restore San Joaquin River and Salt Slough riparian habitat by planting trees and shrubs - 36.0 miles - \$72,000
- Subtotal - \$72,000

IV. Public Use

- A. Visitor contact kiosk - \$10,000
 - B. Construction of foot trails - \$10,000
 - C. Construction and gravel for two parking areas - \$20,000
- Subtotal - \$40,000

V. Fencing and Posting

- A. Nineteen miles of fencing and boundary posting -
\$133,000

Subtotal - \$133,000

VI. Equipment Needed

- A. 4WD tractor, plow disc, cultipacker - \$110,000
B. Backhoe - \$50,000
C. Small tractor and mower - \$60,000
D. Bulldozer (D6 size) - \$140,000
E. 4WD Pickup - \$18,000
F. ATV - \$4,000

Total Development Costs = \$1,095,000

Annual Operations and Maintenance Costs

- I. Operations and maintenance cost are estimated to be
approximately \$100/acre for 5,500 acres - \$550,000

II. Water Delivery or Pumping-Costs

- A. Low-lift pump operations from Salt Slough or
San Luis Canal (\$5-10/acre-foot, 6,350 acre-
feet) - \$31,800 - \$63,500
B. Pumping from deep wells (\$15-20/ acre-feet,
6,350 acre-feet) - \$95,300 - \$127,000

(Options A and B are not additive)

Subtotal - \$31,800 - \$127,000

Total Annual Operations and Maintenance Costs =
\$439,800 - \$550,000

UNIT NAME FREITAS RANCH

TOTAL ACREAGE 5,500 ac.

EXISTING WETLAND ACREAGE 571 ac.
(Subject to possible enhancement)

SEASONAL 294 ac.

PERMANENT 277 ac.

EXISTING RIPARIAN 929 ac.

36.0 mi.

CREATED WETLAND ACREAGE -0- ac.

SEASONAL -78 ac.

PERMANENT +78 ac.

CREATED RIPARIAN -0- ac.

TOTAL WETLAND ACREAGE 571 ac.

EXISTING WATER RIGHTS

FIRM

YES NO X

YES NO X

TOTAL WATER SUPPLIES NEEDED FOR
OPTIMUM WETLAND MANAGEMENT 5,280 a.f.

POTENTIAL FOR CVP WATER DELIVERY

YES X NO

DELIVERY SYSTEM IN PLACE

YES NO X

CONJUNCTIVE USE

EXISTING POTENTIAL X

PUBLIC USE

EXISTING POTENTIAL X

PRIVATE DEVELOPMENT POTENTIAL

HIGH MEDIUM LOW X

WEST GALLO - (GALLO)

On this 4,087 acre tract, 1,045 acres of seasonal wetlands, 67 acres of permanent wetland, 21 acres (2.4 miles) of riparian habitat, and 95 acres of uplands and islands would be created in the 1,228 acres of leveled agricultural fields. In addition, an existing 12 acre drain channel would be enhanced as riparian habitat, and an 89 acre seasonal wetland would be transformed into a permanent marsh. The remaining 260 acres of existing wetlands would be enhanced by linking the existing sloughs and small wetlands to a dependable water source. These wetlands are not flooded regularly or managed to their full potential, and cattle grazing eliminates all emergent vegetation. These wetlands (seasonal and permanent) would be intensively managed for food production and habitat diversity. A managed grazing program, which controls the stocking rate and time of use, would enhance the uplands and adjacent wetlands. The uplands are composed primarily of introduced annual grasses, but with proper management, the less abundant native perennial bunchgrass, alkali sacaton, will regain its vigor and increase. The 3.4 miles of riparian habitat on Salt Slough will be enhanced by protecting the slough from grazing and allowing the understory to become re-established. Wild Rose, blackberry, elderberry, and buttonbush would be planted on the slough to increase diversity and provide food for riparian species. The San Joaquin River has 660 acres (10.6 miles) of Valley oak/willow riparian habitat and floodplain within the flood control levee. The riparian habitat is severely overgrazed and essentially no understory exists. The habitat will be enhanced by planting of native shrubs such as wild rose, blackberry, elderberry, Atriplex sp., and buttonbush.

Planting of Valley oaks would also increase the riparian diversity and provide food for riparian species. A total of 1,321 acres of seasonal wetlands, 156 acres of permanent wetlands, 728 acres of riparian habitat, and 1,882 acres of upland habitat would be present on the property, with a net gain of 1,097 acres of wetlands and 33 acres of riparian habitat. The only current water source for this property is from seven deep wells situated around the agricultural fields. Three additional wells are present but are not operational at this time. Federal CVP surface water can be delivered via San Luis NWR's system. Modifications to the existing "C" Canal would allow the delivery of water to the sloughs in the southern portion of the Gallo property. To deliver water to the agricultural lands (which will be converted to wetlands), a 1.9 mile canal extension (which will carry 50 cfs), would be required.

Another potential water source is Salt Slough, which is presently contaminated with agricultural subsurface drainage water and cannot be used for wetland management. Salt Slough could convey freshwater supplies if the Zahm-Sansoni-Nelson plan is implemented. The water would have to be lifted out of Salt Slough into "A" Canal on San Luis NWR and then transported to the existing wetlands or into a new "C" Canal extension. A new lift pump station and 1650' of new ditch would be required to lift Salt Slough water into "A" Canal.

Approximately 2.7 miles of new water delivery ditch with a 40 Cfs capacity would be required to service the newly created wetlands on the agricultural lands. Approximately 1 mile of drainage ditches need to be rehabilitated to provide independent drainage capability to each wetland for optimum marsh management. The existing wetlands will drain into Salt Slough and drainage for the created wetlands in the agricultural lands will drain through Grasslands State Park and into the San Joaquin River. Drainage into Salt Slough and the San Joaquin River will likely benefit the riparian area, increase flows, and improve the fishery in both systems.

The monthly water needs for this property under the preceding wetland management scenario are:

<u>Month</u>	<u>Acre-Feet needed</u>
January	740
February	740
March	80
April	1,400
May	1,480
June	1,530
July	200
August	200
September	1480
October	1,480
November	740
December	<u>740</u>
Subtotal	10,810
20% loss	<u>2,160</u>
Total	12,970

Any change in the amount or type of wetlands that would be created will change the amount of water needed.

A public use program will likely be developed on the West Gallo property that would allow limited waterfowl and

upland game bird hunting, periodic fishing in the San Joaquin River and Salt Slough (only if Salt Slough contains uncontaminated water), interpretive facilities with an auto tour route, foot and canoe trails, and a sanctuary area. Because of its location adjacent to the Grasslands State Park, the north end of the West Gallo property would provide an excellent location for a multi-agency interpretive facility. A diversity of habitat types will be available at this location, i.e. seasonal and permanent wetlands, San Joaquin River Valley oak woodland/riparian habitat, native grassland, and vernal pools, as well as the site having excellent access via Highway 165.

All existing cultural resources would be identified and protected from disturbance by the managing agency.

Estimated Development Costs

I. Water Delivery Facilities

- A. Extension of "C" Canal from San Luis NWR to agricultural lands - 1.9 miles - \$150,000
 - B. New lift pump station on Salt Slough - \$60,000
 - C. Construction of new canal from lift pump station to "A" Canal - 0.3 mile - \$30,000
 - D. Extension of "A" Canal to "C" Canal on San Luis NWR - \$90,000
 - E. Construction of water delivery canals on the agricultural lands - 2.7 miles @ 30 cfs - \$114,000
 - F. Rehabilitation of existing drainage ditch - 1 mile - \$5,000
 - G. Water control structures and installation for individual marsh units - 50 @ 2,000 each - \$100,000
 - H. New lift pump station on San Joaquin River - \$60,000
 - I. Rehabilitation of three deep wells - \$60,000
- Subtotal - \$669,400

II. Marsh Creation and Enhancement

A. Conversion of 1,112 acres of agricultural lands to 1,045 acres of seasonal wetlands and 67 acres of permanent wetlands (Includes levee enlargement and rehabilitation, discing, seeding, and islands and channel construction) - \$222,400 - \$361,400

B. Enhancement of 260 acres of existing wetlands - \$26,000

Subtotal - \$248,400 - \$387,400

III. Riparian Restoration and Creation

A. Restore San Joaquin River riparian by planting shrubs and trees - 10.6 miles - \$20,000

B. Restore Salt Slough riparian by planting shrubs and trees - 3.4 miles - \$7,000

C. Create 21 acres of riparian habitat in agricultural lands - \$4,200

Subtotal - \$31,200

IV. Public Use

A. Visitor contact kiosk - \$10,000

B. Gravel for roads for public use - 3 miles - \$22,500

C. Construction and gravel for three parking areas - \$30,000

D. Construction of foot trails - \$10,000

E. Purchase and installation of hunting blinds (approximately 15) - \$11,500

Subtotal - \$84,000

V. Fencing and Posting

A. Six miles of fencing and boundary posting - \$42,000

Subtotal - \$42,000

VI. Rehabilitation of Internal Access Roads

- A. Rehabilitate 3.5 miles of roads by widening, re-sloping, and gravelling necessary access roads -
Subtotal - \$26,500

VII. Equipment Needed

- A. 4WD tractor, plow disc, cultipacker - \$110,000
B. Backhoe - \$50,000
C. Small tractor and mower - \$60,000
D. Bulldozer (D6 size) - \$140,000
E. 4WD pickup - \$18,000
F. ATV - \$4,000
Subtotal - \$382,000

Total Development Costs = \$1,483,500-\$1,622,500

Annual Operations and Maintenance Costs

- I. Operations and Maintenance costs are estimated to be approximately \$100/acre for 4,087 acres - \$408,000

II. Water Delivery or Pumping-Costs

- A. Lowlift pump operations from Salt Slough or San Joaquin River (\$5-10/acre foot, 14,920 acre-feet) - \$74,600-\$149,200
B. Federal contract surface water delivery through San Luis NWR (\$10.50/acre-foot, 14,920 acre-feet) - \$156,600
C. Pumping from deep wells (\$15-20/acre-foot, 12,400 acre-feet) - \$186,000 - \$248,000

(Options A, B, and C, are not additive)

Subtotal - \$74,600-\$248,000

Total Annual Operations and Maintenance Costs = \$482,600-\$656,000

UNIT NAME WEST GALLO

TOTAL ACREAGE 4,087 ac.

EXISTING WETLAND ACREAGE 303 ac.
(Subject to possible enhancement)

SEASONAL 303 ac.

PERMANENT -0- ac.

EXISTING RIPARIAN 695 ac.

14.0 mi.

CREATED WETLAND ACREAGE 1,174 ac.

SEASONAL 1,018 ac.

PERMANENT 156 ac.

CREATED RIPARIAN 33 ac.

TOTAL WETLAND ACREAGE 1,477 ac.

EXISTING WATER RIGHTS FIRM
YES NO X YES NO X

TOTAL WATER SUPPLIES NEEDED FOR
OPTIMUM WETLAND MANAGEMENT 10,810 a.f.

POTENTIAL FOR CVP WATER DELIVERY

YES X NO

DELIVERY SYSTEM IN PLACE

YES NO X

CONJUNCTIVE USE

EXISTING POTENTIAL X

PUBLIC USE

EXISTING POTENTIAL X

PRIVATE DEVELOPMENT POTENTIAL

HIGH MEDIUM LOW X

EAST GALLO/KELLY - (GALLO/KELLY)

Habitat development will focus on enhancement of existing seasonal wetlands, riparian, and native grassland habitat. New wetlands will be created on a portion of the existing 3,117 acres of agricultural lands within the project area. Approximately 2,164 acres of native uplands will be enhanced by controlling the time and duration of cattle grazing. The objectives of upland management will be to optimize foraging habitat for grazing geese and cranes as well as to enhance upland nesting cover adjacent to permanent and seasonal wetlands. Re-establishment of perennial grasses will provide nesting cover for waterfowl and other species. Approximately 1,331 acres (20 miles) of riparian habitat on Bear Creek and the San Joaquin River will be enhanced by managing grazing to allow understory shrubs and vegetation to recover.

Native shrubs such as wild rose, blackberry, elderberry and buttonbush will be planted in thickets. Valley oaks will be established in suitable areas (in oxbows and sloughs) by planting as well as natural propagation. Approximately 609 acres of seasonal wetland and 189 acres of permanent wetland will be enhanced by providing a dependable water supply and water delivery system for optimum moist-soil management. Of the existing 3,117 acres of agricultural land, 783 acres will continue to be managed as irrigated pasture, and 289 acres will be dedicated to small grain production. The management objective will be to provide high energy foods to wintering geese, sandhill cranes and waterfowl. Approximately 2,045 acres of agricultural lands will be converted to 1,754 acres of seasonal marsh, 131 acres of permanent marsh, and 160 acres of upland. These habitat types will be integrated to provide diverse habitat for migratory birds, upland nesting cover for resident waterfowl and wildlife, and quality brood habitat.

Surface water sources for this area include 9,020 A.F. of usable agricultural drain water from the Livingston Drain between March 1 and October 1 and from Bear Creek between March 1 and October 1 with no maximum. These water rights are on an "if and when available" basis. The only other existing water source is from deep wells. There are seven known wells on the property which provide irrigation water to the agricultural lands. Drainage from the irrigated pasture and other agricultural ground will provide or supplement the water for the natural wetland areas. Quality of the existing surface water supplies is unknown, although salts are probably high. Selenium is not present in levels harmful to waterfowl/water birds. Undeveloped native uplands on this site are without a water supply. Additional water supplies needed to implement management

plans could come from the Federal CVP via the San Joaquin River (from the Sack Dam to the Eastside Bypass channel) or through the development of additional wells. Approximately 25,260 A.F. of firm water will be needed to manage the land under the proposed habitat objectives.

The monthly water needs for this property under the preceding wetland management scenario are:

<u>Month</u>	<u>Total</u>
January	1,340
February	1,340
March	950
April	2,510
May	2,780
June	3,480
July	550
August	550
September	3,270
October	4,440
November	2,120
December	<u>1,930</u>
Subtotal	25,260
20% loss	<u>5,050</u>
	30,310

Although some modifications will be required, water conveyance facilities are in place to allow for the conversion of agricultural lands to wetlands.

Improvements to the water distribution system serving the existing 609 acres of seasonal wetland will also be required. Water supplies to the existing seasonal wetlands also need to be developed. The two options for developing water on this property are: surface supplies could be conveyed to the property through the Bear Creek channel; or the San Joaquin River via the Mendota pool through the Eastside Bypass channel. Water would then be lowlifted into the distribution system and moved by gravity to each management unit. An existing lowlift pump station could be utilized to accomplish this. CCID could convey Federal CVP surface water to the Eastside Bypass and then to the San Joaquin River via the Mariposa Bypass or to Bear Creek. An alternate scenario would be to develop additional deep wells with high pumping capacity. With this scenario, federal project power would be required to minimize water costs to the property.

A public use program will likely be developed to accommodate both consumptive and non-consumptive users. A key element of the program will be to provide protection to the existing goose and crane roost. Management of this important habitat will afford significant opportunities for viewing of large concentrations of several goose species plus sandhill cranes. Hunting programs will be established primarily for waterfowl and upland game birds. Riparian habitat restoration will allow for the re-establishment of upland game and diverse populations of non-game species.

Significant potential exists to utilize the warm water fishery and potential salmon movement through the project area. Cultural resource sites will be identified and protected from disturbance by the managing agency.

I. Estimated Development Costs

- A. Establishment of surface supply of CVP water would require using the existing San Joaquin River or Bear Creek Channels - No cost
- B. Install four low lift pumps with 40 cfs capacity @ \$30,000 each = \$120,000
- C. Rehabilitate and increase capacity of existing internal delivery system and establish 5.5 miles of new delivery channels with diversions to convey 40-50 cfs - \$70,000

Subtotal - \$190,000

II. Marsh Creation and Enhancement

- A. Conversion of 2,054 acres of irrigated pasture/cropland to wetland (Includes discing, seeding, and levee, island, and channel construction).

Subtotal - \$409,000 - \$668,000
- B. Enhancement of 820 acres of existing wetlands - \$82,000

Subtotal - \$82,000

III. Rehabilitation of Irrigated Pasture

- A. Re-seed approximately 783 acres of existing pasture to mix of preferred goose browse species - \$54,000
- Subtotal - \$54,000

IV. Riparian Restoration

- A. Includes shrub and tree planting along 13.5 miles of the San Joaquin River and 6.2 miles along Bear Creek - \$44,000
- Subtotal - \$44,000

V. Public Use

- A. Visitor Contact Point (check station/kiosk) - \$20,000
- B. Parking areas and road improvement
 - 1) 6 parking acres - \$ 90,000
 - 2) 20 miles of road - \$150,000
- C. Construction of foot trails - \$ 20,000
- Subtotal - \$280,000

VII. Fencing and Posting

- A. Posting of 25 Miles of boundary - \$175,000

VIII. Equipment Needs

- A. 4WD tractor, stubble disc, & cultipacker - \$110,000
- B. Backhoe - \$50,000
- C. Small tractor and mower - \$60,000
- D. Bulldozer (D6) - \$140,000
- E. 4WD pickup - \$18,000
- F. ATV - \$4,000
- Subtotal - \$382,000

Total Development Cost = \$1,534,000-\$1,793,000

Annual Operations and Maintenance Cost

I. Costs are estimated to be approximately \$100/acre 7600
x \$100 = \$760,000

Subtotal - \$760,00

II. Water Costs

A. Low lift pump operations (\$5-10/acre-foot) -
\$126,000 - \$253,000

B. CVP water costs (O&M rate - \$6.80/acre foot) -
\$172,000

C. Pumping cost for deep wells (\$20-30/acre-foot) -
\$505,000 - \$758,000

Subtotal - \$298,000 - \$758,000

Total annual operation and maintenance cost of East
Gallo/Kelly is:

With CVP water - \$1,058,032 - \$1,185,000

With well water - \$1,265,000 - \$1,518,000

UNIT NAME EAST GALLO/KELLY

TOTAL ACREAGE 7,600 ac.

EXISTING WETLAND ACREAGE 798 ac.
(Subject to possible enhancement)

SEASONAL 609 ac.

PERMANENT 189 ac.

EXISTING RIPARIAN 1,331 ac.

19.7 mi.

CREATED WETLAND ACREAGE 1,885 ac.

SEASONAL 1,732 ac.

PERMANENT 153 ac.

CREATED RIPARIAN -0- ac.

TOTAL WETLAND ACREAGE 2,683 ac.

EXISTING WATER RIGHTS FIRM
YES X NO YES NO X

TOTAL WATER SUPPLIES NEEDED FOR
OPTIMUM WETLAND MANAGEMENT 25,260 a.f.

POTENTIAL FOR CVP WATER DELIVERY

YES X NO

DELIVERY SYSTEM IN PLACE

YES NO X

CONJUNCTIVE USE

EXISTING X POTENTIAL

PUBLIC USE

EXISTING POTENTIAL X

PRIVATE DEVELOPMENT POTENTIAL

HIGH X MEDIUM LOW

Development and Enhancement
(Existing)

KESTERSON NWR - (FWS)

Enhancement of 650 acres of wetlands on Kesterson NWR (West of Mud Slough) could be accomplished by providing an independent water delivery system that will make water available to all wetlands on a daily basis. The current water delivery system is dependent upon inefficient and inconsistent flowage through private duck clubs.

Implementation of the following projects will allow the Fish and Wildlife Service to produce high quality wintering, migrating, and breeding waterfowl habitat, as well as habitat for other species including the tricolored blackbird.

Estimated Development Costs

1. Santa Fe Canal extension to Gallo Pond: One mile of 50 cfs. canal.....	\$100,000
2. Gallo Pond to Sprig Lake Canal. 0.75 mile canal system.....	\$ 70,000
3. Sprig Lake to South Teal Canal. 0.40 mile canal system.....	\$ 30,000
4. Rehabilitation of San Luis Canal to increase capacity.....	\$ 40,000
Total.....	\$240,000

LOS BANOS WA COMPLEX - (CDF&G)

Approximately 1,800 acres of wetlands cannot be consistently managed because of selenium contamination in Salt and Mud Sloughs and the San Luis Canal. When the Blake-Porter Bypass is in operation, the San Luis Canal can be utilized to deliver freshwater; however, Salt and Mud Sloughs continue to transport contaminated water. To enhance wetlands on Los Banos WA, a dependable year-round water delivery system must be available and only the implementation of the Zahm-Sansoni-Nelson Plan will accomplish that objective. The construction cost of the Zahm-Sansoni-Nelson Plan is estimated to be \$675,000.

A firm supply of 14,500 AF is needed to replace temporary water that has been ear-marked for the eventual transfer to an addition to the San Luis NWR.

SAN LUIS NWR - (FWS)

There are approximately 470 acres of wetlands that could be enhanced by implementing the Zahm-Sansoni-Nelson Plan (previously discussed); constructing a new lift pump station and canal at Salt Slough; and by completing a new extension of "A" Canal.

A new lift pump station and 0.3 mile canal on Salt Slough could more efficiently utilize San Luis NWR's existing appropriative right on Salt Slough to manage 77 acres on the refuge's northern portion. The completion of "A" canal would connect the "A" and "C" Canal's and thus enhance existing wetlands through improved water management. These projects could also be used on the West Gallo property following the anticipated acquisition.

In addition, the siting of a new well in the Tule Elk Pasture Unit would insure water for approximately 100 acres of wetlands during critically dry years.

The estimated development costs for the above projects are listed below.

Estimated Development Costs

1. New lift pump station on Salt Slough.....	\$ 60,000
2. Construction of 0.3 mile canal from Salt Slough Lift pump to "A" Canal.....	\$ 30,000
3. Completion of "A" Canal extension to "C" Canal....	\$ 90,000
4. New deep well at Elk Pasture Unit.....	\$ 95,000
Total.....	\$275,000

CLAUS - (DOI)

This 90 acre unit has 45 acres of seasonal wetlands that could be enhanced by the development of a water supply inlet from the Grassland Water District's Fremont Canal and appropriate drainage channels. Discing and flushing of the soil, along with proper water management, will enhance the seasonal wetlands. Implementation of the Zahm-Sansoni-Nelson Plan would make the San Luis Canal-Fremont Canal a year-round, fresh water delivery system and allow for optimum marsh management. An annual water supply of 360 AF is required for wetland enhancement.

Estimated Development Costs

1. Develop inlet and outlet water control structures and channels.....\$ 7,000
2. Disc and seed 45 acres of seasonal marsh....\$ 4,500
- Total.....\$11,500

Annual Operations and Maintenance Costs 100/acre.... \$ 9,000

This property will be kept dry at this time because of its proximity to the Kesterson Reservoir, and the possible effects that flooding the ponds may have on ground-water levels under the Kesterson Reservoir. Therefore, until the ground-water issue is resolved, this potential wetland enhancement cannot take place.

SCHWAB - (DOI)

The 188 acre Schwab property has 156 acres of seasonal wetlands that could be enhanced. The wetlands could be flooded through the 90 acre Claus property via the Fremont Canal or directly off the Fremont Canal through the Manteca Duck Club. Drainage is via an existing ditch into the Fremont Canal. A deep well is located on the south end of the property but its condition, volume, and water quality are unknown. Discing and flushing of the soil, along with proper water management will enhance the seasonal wetlands.

Implementation of the Zahm-Sansoni-Nelson Plan would make the San Luis Canal a year-round freshwater delivery system and allow for optimum marsh management. An annual firm water supply of 1,250 AF is also required for wetland enhancement.

Estimated Development Costs

1. Develop inlet and outlet water control structures and channels.....\$ 7,000
2. Rehabilitate levees and disc and seed 156 acres of seasonal marsh.....\$ 16,000
3. Rehabilitate deep well.....\$ 20,000
- Total.....\$43,999

Annual Operations and Maintenance Costs \$100/acre....\$19,000

This property will be kept dry at this time because of its proximity to the Kesterson Reservoir, and the possible effects that flooding the ponds may have on ground-water levels under the Kesterson Reservoir. Therefore, until the ground-water issue under Kesterson Reservoir is resolved, the potential wetland enhancement cannot take place.

Implementation

San Joaquin Basin Action Plan/Kesterson Mitigation Plan
Proposed Implementation
Phases I,II & III

PREFACE

Following a review of the information presented in the previous sections, the inter-agency team working on the development of the San Joaquin Basin Action Plan/Kesterson Mitigation Plan was asked to develop some realistic and cost-effective, phased, implementation scenarios with the goal that Phase I include at least sufficient wetland development to offset the loss of habitat at Kesterson Reservoir. A number of potential properties, alone or in combination, could be included in Phase I to meet this requirement, and presented below is one proposed Implementation Plan that provides for efficient development and management. It should be noted that other combinations could be scheduled in Phase I and the land acquisition process will necessarily influence which properties are included in Phase I. It should also be noted that cost estimates presented below may not necessarily exactly match those presented in the previous section since in this effort some attempt was made to identify efficiencies (e.g. sharing or reuse of equipment, etc.), and O&M costs are estimated on a per managed wetland acre as opposed to a per acre basis as presented previously.

BASIC ASSUMPTIONS

During the development of the implementation plan, the following series of assumptions were made.

WATER

1. Central Valley Project water will be made available in amounts necessary to accomplish pre-set objectives.
2. Total water delivery figures are based on net needs.
3. Water delivery systems will be adequate to transport optimum water needs.
4. Construction will be done under formal contract, via rigid engineering standards, and maintainable via force account labor following project completion.
5. The main-line delivery system will allow for independent unit management.

6. Drainage systems shall be designed for maximum water re-use opportunities.

CONJUNCTIVE USE

Deep wells will be considered as:

1. A supplement to surface deliveries during a critical drought period.
2. For the production of small grains or irrigated pasture.
3. For the management/maintenance of permanent wetlands.
4. For year-round instream flows in riparian corridors.
5. For use in an overall groundwater management program.

Other aspects of a conjunctive use program are:

1. The rehabilitation of existing wells will take preference over the construction of new wells.
2. Groundwater quality must be acceptable for the production of beneficial fish and wildlife outputs.
3. Energy costs must be affordable (Project power is expected).
4. All new wells will have underground power supplies plus existing, internal (versus perimeter) overhead lines will be dismantled and replaced with underground supplies.

OTHER DEVELOPMENT

1. All new development projects will be accomplished under formal contract. Future maintenance will be accomplished on a force account basis.
2. Equipment needs are in excess of existing, agency-owned fleets (which are expected to be used in conducting annual O&M activities on the newly-acquired properties).
3. Public use facilities (visitor centers, foot trails, hunting blinds, etc.) will be necessary additions, however, specific siting locations and funding proposals will be done by the managing agency at a later date.

ANNUAL OPERATIONS AND MAINTENANCE COSTS

1. Costs are based upon \$200 per managed acre.
2. Existing staff levels (CDFG and FWS) will increase by 1 1/2 man-years per project property at initial acquisition and development. Final staffing levels will be set by the managing agency.
3. O&M tasks on state-owned lands will be accomplished with the proposed Habitat Development Crew. Pending the establishment of an appropriate MOU, specific O&M tasks on federal lands could be accomplished by the Habitat Development Crew.

ANNUAL WATER COSTS

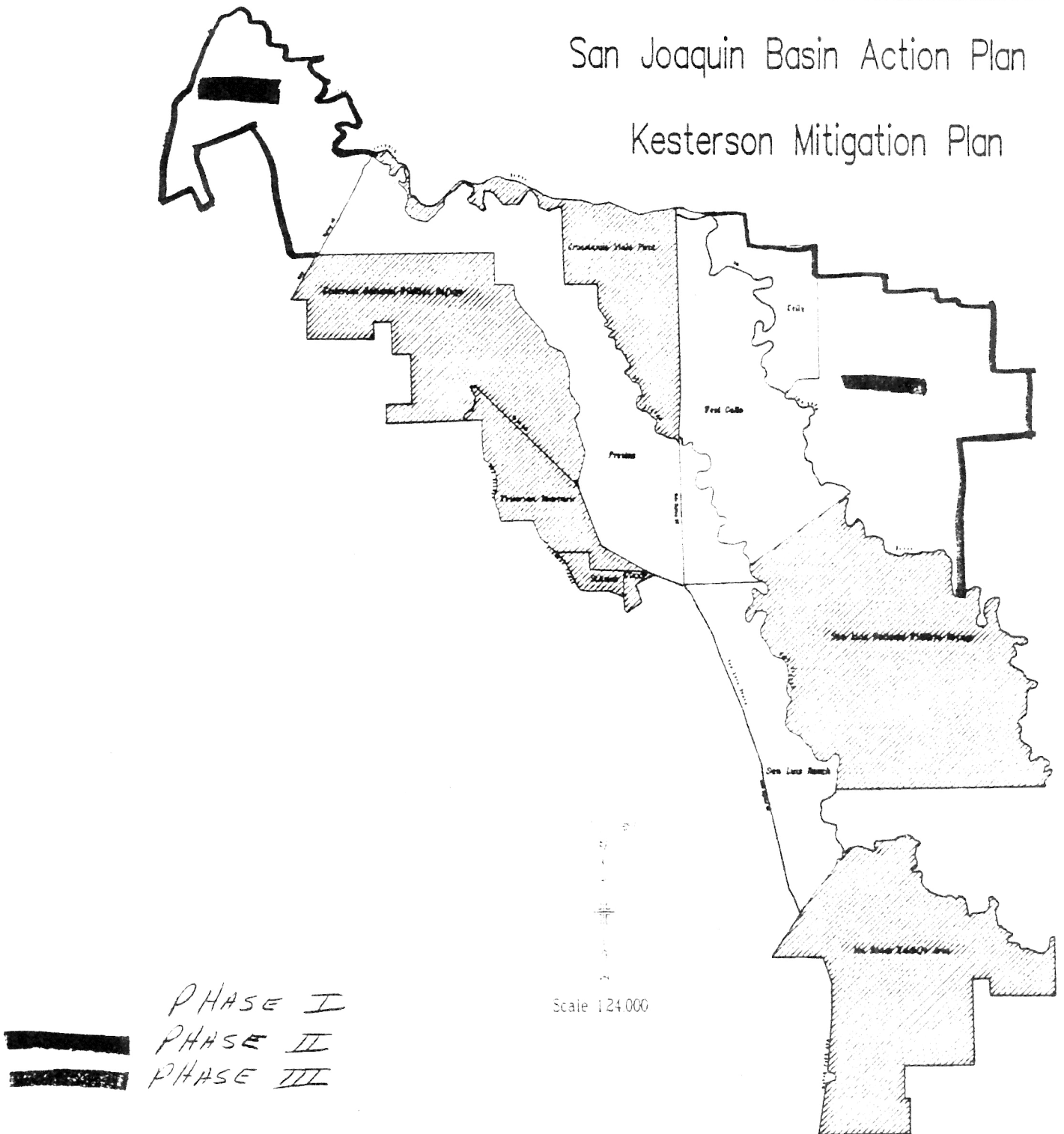
1. Surface water costs are based upon Delta diversions and subsequent downstream transport to regulating facilities (Mendota Pool, Volta Wasteway, etc). Conveyance charges and losses which may be charged by the local water districts are not included in the cost figures.

OTHER

1. Kesterson Reservoir will be removed from the National Wildlife Refuge System and the remainder of the Kesterson National Wildlife Refuge (approximately 4,700 acres) will be transferred in fee title ownership to the USFWS.

San Joaquin Basin Action Plan

Kesterson Mitigation Plan



San Joaquin Basin Action Plan/Kesterson Mitigation Plan
 Implementation Schedule - Phases I - II
 Acquisition Status and Estimated Development/Operations Costs (in thousands)

PHASE I

<u>Property</u>	<u>Acquisition Status</u>			<u>CVP Water Delivery System</u>	<u>Conjunctive Use</u>	<u>Other Development</u>	<u>Total Development</u>	<u>Annual O+M</u>	<u>Annual Water</u>	<u>Total Annual</u>
	<u>Owned</u>	<u>Not Owned</u>	<u>Agency</u>							
CLAUS	X		USA	7	-	-	7	-	-	-
SCHWAB	X		USA	35	20	-	55	-	-	-
FREITAS RANCH	X		USA	390	40	312	742	114	74.1	188.1
SAN LUIS RANCH		X	CDFG	187	440	655	1,282	341.2	140.3	481.5
WEST GALLO		X	FWS	369	200	770.5	1,339.5	295.4	151.3	446.7
KESTERSON NWR	X		BOR	240	-	-	240	130	-	130
LOS BANOS WA	X		CDFG	160	-	-	160	200	14	214
SAN LUIS NWR	X		FWS	180	190	-	370	94	-	94
GRASSLAND WD	X		GWD	185	-	-	185	-	-	-
				\$1,753	\$890	\$1,737.5	\$4,380.5	\$1,174.6	\$379.7	\$1,554.3

PHASE II

<u>Property</u>	<u>Acquisition Status</u>			<u>CVP Water Delivery System</u>	<u>Conjunctive Use</u>	<u>Other Development</u>	<u>Total Development</u>	<u>Annual O+M</u>	<u>Annual Water</u>	<u>Total Annual</u>
	<u>Owned</u>	<u>Not Owned</u>	<u>Agency</u>							
FREITAS-McPIKE		X	CDFG	350	250	403	1,003	310	146.3	456.3

PHASE III

<u>Property</u>	<u>Acquisition Status</u>			<u>CVP Water Delivery System</u>	<u>Conjunctive Use</u>	<u>Other Development</u>	<u>Total Development</u>	<u>Annual O+M</u>	<u>Annual Water</u>	<u>Total Annual</u>
	<u>Owned</u>	<u>Not Owned</u>	<u>Agency</u>							
EAST GALLO/KELLY		X	CDFG	790	790	1,232	2,812	751	354	1,105

Total Estimated Development/Operations Costs (in thousands)

Phases I - III

<u>CVP Water Delivery System</u>	<u>Conjunctive Use</u>	<u>Other Development</u>	<u>Total Development</u>	<u>Annual O+M</u>	<u>Annual Water</u>	<u>Total Annual</u>
2,893	\$1,930	\$3,372.5	\$8,195.5	\$2,235.6	\$880	\$3,115.6

San Joaquin Basin Action Plan/Kesterson Mitigation Plan
Data Used to Develop Phase I Cost Figures

Phase I

A. WATER DELIVERY SYSTEM

1.	<u>Claus</u> (45 managed wetland acres)	<u>\$ 7,000</u>
a.	Develop inlet/outlet water control structures and channels. (actual use of new facilities will be delayed until BOR completes KR monitoring).	
2.	<u>Schwab</u> (156 managed wetland acres)	<u>\$ 35,000</u>
a.	Develop inlet/outlet water control structures and channels.	\$ 7,000
b.	Levee rehabilitation.	\$ 8,000
c.	Rehabilitate existing deep well (actual use of new facilities will be delayed until BOR completes KR monitoring).	\$ 20,000
3.	<u>Freitas Ranch</u> (571 managed wetland acres)	<u>\$390,000</u>
a.	Extend San Luis Canal (2.6 miles)	\$100,000
b.	Develop low-lift pump station on San Luis Canal.	\$ 60,000
c.	Construct 30 cfs lift canal off San Luis Canal.	\$ 60,000
d.	Construct internal water delivery canals (1 mile).	\$120,000
e.	Install 25 water control structures.	\$ 50,000

4.	<u>San Luis Ranch</u> (1,106 managed wetland acres)	<u>\$187,000</u>
	a. Construct and install San Luis Canal outlet.	\$ 30,000
	b. Extend main delivery canal to north end of property (1.4 miles, 25 cfs capacity).	\$ 17,000
	c. Rehabilitate 7.2 miles of existing internal delivery canal (upgrade to 40-50 cfs)	\$ 40,000
	d. Purchase and install appropriate water control structures for individual marsh and pasture units.	\$100,000
5.	<u>West Gallo</u> (1,477 managed wetland acres)	<u>\$369,000</u>
	a. Extend "C" Canal (1.9 miles)	\$150,000
	b. Construct internal water delivery canals	\$114,000
	c. Water control structure installation.	\$100,000
	d. Rehabilitate existing drainage ditch. (1 mile)	\$ 5,000
6.	<u>Kesterson NWR</u> (enhance 650 acres of existing wetlands)	<u>\$240,000</u>
	a. Develop internal delivery system to marsh units west of Mud Slough (2.5 miles @ 50 cfs)	\$200,000
	b. Rehabilitate San Luis Canal.	\$ 40,000
7.	<u>Los Banos WA</u>	<u>\$160,000</u>
	a. Construct in-line check structure and inlet from San Luis Canal.	\$ 30,000
	b. Rehabilitate internal water delivery canals. (2.5 miles)	\$110,000
	c. Construct internal water control structures.	\$ 20,000

8.	<u>San Luis NWR</u> (enhance 470 acres of existing wetlands)	<u>\$180,000</u>
	a. Construct lift pump station.	\$ 60,000
	b. Construct appropriate "A" Canal connection to existing "C" Canal.	\$120,000
9.	<u>Grasslands Water District</u>	<u>\$185,000</u>
	a. Enlarge existing San Luis Canal @ Highway 152.	\$120,000
	b. Rehabilitate San Luis Canal from Highway 152 to Wolfsen Road (6.5 miles)	\$ 65,000
	c. Both a and b must be completed before GWD can transport water supplies necessary to manage aforementioned properties.	

TOTAL WATER DELIVERY SYSTEM IMPROVEMENTS - \$1,753,000

B. CONJUNCTIVE USE PROGRAM

1. Claus - N/A
2. Schwab \$ 20,000
 - a. Rehabilitate existing well, panel box plus all hook-ups.
 - b. Facility will not be useable until final Kesterson Reservoir cleanup is completed.
3. Freitas Ranch \$ 40,000
(maintain 355 acres permanent wetland)
 - a. Rehabilitate 2 existing well, panel boxes plus all hookups.
4. San Luis Ranch \$440,000
(manage 600 acres of pasture/small grain plus 151 acres of permanent marsh)
 - a. Develop 4 new wells, complete with panel box, discharge system and electrical hookups. \$380,000
 - b. Install underground power lines. \$ 60,000
5. West Gallo (maintain 156 acres of permanent wetland plus provide riparian enhancement flows) \$200,000
 - a. Rehabilitate 7 existing wells, panel boxes, plus all hookups. \$140,000
 - b. Convert interior overhead power lines to underground supply. \$ 60,000
6. Kesterson NWA - N/A
7. Los Banos WA - N/A

8. San Luis NWR \$190,000
 (maintain 200 acres permanent wetlands in Tule Elk
 Pasture and Deadman's Slough)

a. Develop 2 new well's, complete with panel box,
 discharge system and electrical hookup.

TOTAL CONJUNCTIVE USE SYSTEM DEVELOPMENT = \$890,000

C. OTHER DEVELOPMENT COSTS

1. Claus - N/A until Kesterson cleanup completed.

2. Schwab - N/A until Kesterson cleanup completed.

3. Freitas Ranch \$312,000

a. Wetland enhancement (571 acres) \$ 57,000

b. Fencing and posting (Hwy 165 and 140 frontage) \$ 63,000

c. Equipment \$192,000

1. 4WD Pickup (18,000)

2. ATV (4,000)

3. Small tractor and mower (60,000)

4. 4WD tractor, disc plow, cultipacker
 (110,000)

4. San Luis Ranch \$655,000

a. Wetland creation and enhancement (1,100 acres) \$230,000

b. Rehabilitate irrigated pasture (380 acres) \$ 95,000

c. Fencing and posting (9 miles) \$ 63,000

d. Access road rehabilitation (10 miles) \$ 75,000

e. Equipment \$192,000

1. 4WD tractor, disc plow, cultipacker (110,000)
2. Small tractor and mower (60,000)
3. 4WD Pickup (18,000)
4. ATV (4,000)
5. West Gallo \$770,500
 - a. Wetland creation and enhancement (1,477 acres) \$310,000
 - b. Fencing and posting (6 miles) \$ 42,000
 - c. Access road rehabilitation (3.5 miles) \$ 26,500
 - d. Equipment \$392,000
 1. 4WD tractor, disc plow, cultipacker (110,000)
 2. Small tractor and mower (60,000)
 3. Excavator (200,000)
 4. 4WD Pickup (18,000)
 5. ATV (4,000)
6. Kesterson - N/A
7. Los Banos WA - N/A
8. San Luis NWR - N/A

TOTAL OTHER DEVELOPMENT COSTS = \$1,737,500

D. ANNUAL OPERATIONS AND MAINTENANCE COSTS (\$200/managed acre)

1. Claus - N/A
2. Schwab - N/A
3. Freitas Ranch
 - a. 571 acres \$114,000
4. San Luis Ranch
 - a. 1,486 acres \$297,200

5.	<u>West Gallo</u>	
	a. 1,477 acres	\$295,400
6.	<u>Kesterson NWR</u>	
	a. 650 acres	\$130,000
7.	<u>Los Banos WA</u>	
	a. 1,000 acres	\$200,000
8.	<u>San Luis NWR</u>	
	a. 470 acres	\$ 94,000

TOTAL ANNUAL O&M COSTS - \$1,130,000

E. ANNUAL WATER COSTS (assume average of \$14/AF)

1.	<u>Claus</u> - N/A	
2.	<u>Schwab</u> - N/A	
3.	<u>Freitas Ranch</u>	
	a. 5,290 AF	\$ 74,060
4.	<u>San Luis Ranch</u>	
	a. 10,020 AF	\$140,280
5.	<u>West Gallo</u>	
	a. 10,810 AF	\$151,340
6.	<u>Kesterson NWR</u> - N/A	
7.	<u>Los Banos WA</u>	
	a. 1,000 AF	\$ 14,000
8.	<u>San Luis NWR</u> - N/A	

TOTAL ANNUAL WATER COSTS - \$379,680

San Joaquin Basin Action Plan/Kesterson Mitigation Plan
Data Used to Develop Phases II & III Cost Figures

Phase II
FREITAS-McPIKE

A.	<u>WATER DELIVERY SYSTEM</u>	<u>\$ 310,000</u>
1.	Water control structure in Newman Wasteway.	\$ 40,000
2.	Develop 2 low-lift pump stations.	\$ 60,000
3.	Rehabilitate 5.2 miles of existing delivery system.	\$ 110,000
4.	Install 50 water control structures.	\$ 100,000
	TOTAL WATER DELIVERY SYSTEM IMPROVEMENTS =	\$310,000
B.	<u>CONJUNCTIVE USE PROGRAM</u>	<u>\$ 250,000</u>
1.	Rehabilitate 5 existing wells, panel boxes plus all hookups.	\$ 100,000
2.	Convert overhead power lines to underground supply.	\$ 150,000
	TOTAL CONJUNCTIVE USE SYSTEM DEVELOPMENTS =	\$250,000
C.	<u>OTHER DEVELOPMENT COSTS</u>	<u>\$ 403,000</u>
1.	Wetland creation and enhancement (1,120 acres)	\$ 223,000
2.	Fencing and posting (14 miles)	\$ 98,000
3.	Equipment	\$ 82,000
	a. 4WD Pickup (18,000)	
	b. Small tractor and mower (60,000)	
	c. ATV (4,000)	
	TOTAL OTHER DEVELOPMENT COSTS =	\$403,000

D. ANNUAL OPERATIONS AND MAINTENANCE COSTS (\$200/managed acre)

1. 1,120 acres \$ 224,000

TOTAL ANNUAL O&M COSTS = \$224,000

E. ANNUAL WATER COSTS (assume average of \$14/AF)

1. 10,450 AF \$ 146,300

TOTAL ANNUAL WATER COSTS = \$146,300

PHASE III
EAST GALLO-KELLY

A. WATER DELIVERY SYSTEM \$ 190,000

1. Develop 4 low-lift pump stations. \$ 120,000

2. Rehabilitate existing internal delivery system
and establish 5.5 miles of new delivery channels. \$ 70,000

TOTAL WATER DELIVERY SYSTEM IMPROVEMENTS = \$190,000

B. CONJUNCTIVE USE PROGRAM \$ 600,000

1. Rehabilitate 7 existing wells, panel boxes plus
all hookups. \$ 140,000

2. Develop 4 new wells, complete with panel boxes,
discharge systems and all hookups. \$ 380,000

3. Installation of underground power supply. \$ 80,000

TOTAL CONJUNCTIVE USE SYSTEM DEVELOPMENTS = \$600,000

C.	<u>OTHER DEVELOPMENT COSTS</u>	<u>\$1,170,000</u>
1.	Wetland creation and enhancement (2,874 acres)	\$ 621,000
2.	Rehabilitate existing pasture (783 acres).	\$ 54,000
3.	Fencing and posting (25 miles)	\$ 175,000
4.	Equipment	\$ 320,000
	a. 4WD tractor, disc plow, cultipacker (\$110,000)	
	b. Backhoe (\$50,000)	-
	c. Bulldozer D6 (\$140,000)	
	d. 4WD Pickup (\$18,000)	
	e. ATV (\$4,000)	

TOTAL OTHER DEVELOPMENT COSTS = \$1,170,000

D.	<u>ANNUAL OPERATIONS AND MAINTENANCE COSTS (\$200/managed acre)</u>	
1.	3,657 acres	\$ 731,400

TOTAL ANNUAL O&M COSTS = \$731,400

E.	<u>ANNUAL WATER COSTS (assume average of \$14/acre foot)</u>	
1.	25,260 AF	\$ 353,640

TOTAL ANNUAL WATER COSTS = \$353,640

Appendices

San Joaquin Basin Action Plan/Kesterson Mitigation Plan
 Estimated Optimum Monthly Water Needs by Habitat Types

Seasonal Marsh

2.5 AF/acre	September	2.5 (floodup)
.5 AF/acre	October-February	2.5 (maintenance)
1 AF/acre	April-June	<u>3.0</u> (irrigation)
		8.0

Permanent Marsh

1 AF/acre	May	1.0 (maintenance)
1.3 AF/acre	June-August	4.0 (maintenance)
1 AF/acre	September-October	2.0 (maintenance)
.5 AF/acre	November-April	<u>3.0</u> (maintenance)
		10.0

Permanent Irrigated Pasture

.75 AF/acre	March	.75 (irrigation)
.75 AF/acre	June	.75 (irrigation)
.75 AF/acre	November	.75 (irrigation)
.75 AF/acre	December	<u>.75</u> (irrigation)
		3.0

Cropland (Corn)

1.0 AF/acre	May	1.0 (irrigation)
1.0 AF/acre	June	1.0 (irrigation)
1.0 AF/acre	July	1.0 (irrigation)
1.0 AF/acre	August	<u>1.0</u> (irrigation)
		4.0

Cropland (winter wheat, vetch)

1.0 AF/acre	March	1.0 (irrigation)
1.0 AF/acre	November	<u>1.0</u> (pre-irrigation)
		2.0

WATER RIGHTS PERMIT NUMBERS

SAN LUIS RANCH

Salt Slough

1. License #012074 - 38.0 cfs
Application # 014582
Statement of Riparian Right #009611
This license covers two diversion points
for 38.0 cfs
2. License #005016
Application #013508
3.0 cfs

WEST GALLO

None

FREITAS

None

EAST GALLO-KELLY

1. Bear Creek

License #11092
Permit #16329
This license covers three diversion points
for 38.0 cfs from March 1 - October 27 - no
maximum acre-feet
2. Livingston Drain

1. License #11092
Permit #15628
This license covers eight diversion points for
27.0 cfs from March 1 - October 31 - 9,020 acre
feet maximum

FREITAS-McPIKE RANCH

None

SAN LUIS NWR

Salt Slough

1. License #010741
Application #11687
40.9 cfs diversion
2. License # 010120
Application #011688
20.2 cfs diversion

SAN LUIS RANCH
 Estimated Water Needs
 1,706 acres of Managed Habitat

<u>Month</u>	<u>Irrigated Pasture</u> (380)	<u>Small Grain</u> (220)	<u>Seasonal Wetland</u> (955)	<u>Permanent Wetland</u> (151)	<u>Total</u> (1706)
January			480	80	560
February			480	80	560
March	290	150		80	520
April				80	80
May		80		150	230
June	290	80	960	200	1530
July		80	960	200	1240
August		80		200	280
September			2390	150	2540
October			480	150	630
November	290	150	480	80	1000
December	<u>290</u>	<u>—</u>	<u>480</u>	<u>80</u>	<u>850</u>
Subtotal	1,160	620	6,710	1,530	10,020
20% loss					<u>2,000</u>
Total					12,020

Source of water - Salt Slough

Intermittant supply - 8.900

Required for
 Seasonal wetland - 6710 A/F

Required for
 Permanent wetland - 1530 A/F

Wells - 1120-1780 A/F

Required for
 Small grain,
 permanent pasture - 1780 A/F

FREITAS-McPIKE
 Estimated Water Needs
 1,550 acres of Managed Habitat

<u>Water Needs</u>	<u>Irrig. Pasture</u> (228)	<u>Small Grain</u> (202)	<u>Seasonal Wetland</u> (1002)	<u>Perm. Wetland</u> (118)	<u>Total</u> (1,550)
January			500	60	560
February			500	60	560
March	170	140		60	370
April			1000	60	1060
May		70	1000	120	1190
June	170	70	1000	160	1400
July		70		160	230
August		70		160	230
September			2510	120	2630
October			500	120	620
November	170	140	500	60	870
December	<u>170</u>	<u> </u>	<u>500</u>	<u>60</u>	<u>730</u>
Total	680	560	8,010	1,200	10,450

Available water supply - 5 deep wells

Potential Supply:

New CVP water via Newman Wasteway.

FREITAS RANCH
 Estimated Water Needs
 571 acres of Managed Habitat

<u>Month</u>	<u>Seasonal Marsh (216)</u>	<u>Permanent Marsh (355)</u>	<u>Total (571)</u>
January	110	180	290
February	110	180	290
March	.	180	180
April	220	180	400
May	220	355	580
June	220	460	680
July		460	460
August		460	460
September	540	355	470
October	110	355	470
November	110	180	290
December	<u>110</u>	<u>180</u>	<u>290</u>
Subtotal	1,750	3,525	5,290
20% loss			<u>1,060</u>
TOTAL			6,350

Available Supply:

2 - Deep Wells

Potential Supply:

6,350 A.F. from S.L.N.W.R. Salt Slough Supply

WEST GALLO
 Estimated Water Needs
 1,477 acres of Managed Habitat

<u>Month</u>	<u>Irrigated Pasture</u> (0)	<u>Small Grain</u> (0)	<u>Seasonal Wetland</u> (1321)	<u>Permanent Wetland</u> (156)	<u>Total</u> (1477)
January	-0-	-0-	660	80	740
February	-0-	-0-	660	80	740
March	-0-	-0-		80	80
April	-0-	-0-	1320	80	1400
May	-0-	-0-	1320	160	1480
June	-0-	-0-	1330	200	1530
July	-0-	-0-		200	200
August	-0-	-0-		200	200
September	-0-	-0-	1320	160	1480
October	-0-	-0-	1320	160	1480
November	-0-	-0-	660	80	740
December	-0-	-0-	<u>660</u>	<u>80</u>	<u>740</u>
Subtotal	-0-	-0-	9,250	1,560	10,810
20% loss					<u>2,160</u>
Total					12,970

Available water supply - 7 wells

Potential Supply -

6,225 AF. Federal CVP
 4,585 AF. Salt Slough

EAST GALLO/KELLY
 Estimated Water Needs
 3,775 Acres of Managed Habitat

<u>Month</u>	<u>Cropland Small Grain</u>	<u>Irrigated Pasture</u>	<u>Seasonal Wetland</u>	<u>Permanent Wetland</u>	<u>Total</u>
January			1171	1171	1340
February			1171	1171	1340
March	188	588		171	950
April			2341	171	2510
May	95		2341	342	2780
June	95	580	2341	455	3480
July	95			455	550
August	95			455	550
September			2927	342	3270
October			4098	342	4440
November	188	588	1171	171	2120
December	—	<u>588</u>	<u>1171</u>	<u>171</u>	<u>1930</u>
Subtotal	756	2,352	18,732	3,075	25,260
20% loss					<u>5,050</u>
Total					30,310

Available Supply:

Livingstion drain - 9,020 A.F. March 1 - October 27
 Bear Creek - no maximum March 1 - October 27

7 - deep wells

Potential Supply:

New CVP supply via CCID/SJR

Current or Potential Water Supplies
 (via water rights or existing contracts)
 associated with the San Joaquin Basin
 Action Plan/ Kesterson Mitigation Plan

<u>Water (acre-feet)</u>	<u>DESCRIPTION</u>
19,900	San Luis NWR's appropriative right via Salt Slough. If and when available basis. Historically generated from upstream agricultural land's operational spills and surface/sub-surface drain out-flow. Acceptable quality until 1985. Currently contaminated with unacceptable levels of selenium.
8,891	San Luis Ranch's appropriative right via Salt Slough. See above for historic and current situation.
6,225	Scheduled to be delivered, via terms of long-term contract signed between San Luis NWR (FWS) and San Luis Canal Company, to wetlands on the West Gallo property. Water currently made available to San Luis NWR via interim, annual contract from USBR. Directly associated with 47,000 AF block of water as per 1954 CVP legislation.
27,267	East Gallo/Kelly appropriative rights associated with Bear Creek and the Livingston Drain. If and when available basis, March 1 to October 31.
12,000	Nuisance Abatement/Alternative Habitat water currently being supplied to the Grassland Water District via temporary, interim contract.
Unknown	Operational spill/surface drainwater via the Newman Wasteway.
74,283 + acre feet	

Water needs deficit associated
with properties identified under the
San Joaquin Basin Action Plan/Kesterson Mitigation Plan

<u>Property</u>	<u>Location</u>	<u>Deficit (Acre Feet)</u>
Freitas Ranch	West of San Joaquin River	5,290 AF
West Gallo	West of San Joaquin River	4,585 AF (1)
San Luis Ranch	West of San Joaquin River	1,100 AF (2)
Freitas-McPike	West of San Joaquin River	10,450 AF
East Gallo/Kelly	East of San Joaquin River	6,730 AF (3)

- (1) Difference between total annual need (10,810 AF) and that schedule to be delivered via long term, existing contract between the San Luis NWR and San Luis Canal Company (6,225 AF).
- (2) Difference between total annual need (10,020 AF) and amount available via existing appropriative rights (8,900 AF).
- (3) Amount identified as needed during November 1 through February 27, a period for which no water rights exist.

Existing water (contract and/or water rights) that could be
used to fulfill water needs of properties identified under the
San Joaquin Basin Action Plan/Kesterson Mitigation Plan

<u>Water (Acre-Feet)</u>	<u>Description Current Use</u>	<u>Potential Recipient(s)</u>	<u>Comments</u>
6,225 AF	Remainder of 40,000 AF CVP supplies currently deliverable under San Luis NWR/SNLCC contract	West Gallo	Block of water already earmarked under long-term contract
12,000 AF	Nuisance Abatement/Alternative Habitat water currently being supplied to Grassland Water District under temporary contract	Freitas Ranch (5,290 AF)	Would fulfill entire deficit
		San Luis Ranch (10,020 AF)	Would fulfill entire deficit
		Freitas-McPike (10,450 AF)	Would fulfill entire deficit
		West Gallo (6,225 AF)	Could be in lieu of afore- mentioned contract
19,000 AF	San Luis NWR's appropriative water right from Salt Slough currently not used due to high selenium. Zahm-Sansoni-Nelson Plan needed plus guaranteed in-stream flows of acceptable quality must be assured	Freitas Ranch (5,290 AF)	Would fulfill entire deficit
		San Luis Ranch (1,100 AF)	Would fulfill entire deficit above property's appropriative right
		West Gallo (4,585 AF)	Would fulfill remaining deficit via new lift pump and access ditch on San Luis NWR
		San Luis NWR (8,925 AF)	Will be retained for supple- ment to CVP contract during unforeseen emergency

8,891 AF	San Luis Ranch's appropriative water right from Salt Slough (see information above for current Salt Slough situation)	San Luis Ranch (8,891 AF)	Would fulfill all but 1,100 AF of entire need
		Freitas Ranch (5,290 AF)	Would fulfill entire deficit

27,267 AF	East Gallo/Kelly appropriative rights via Bear Creek/Livingston Drain, March 1 to October 31.	East Gallo/Kelly (14,090 AF)	Would fulfill all needs between March 1 and October 31.
		West Gallo	Could supplement summer water supply to approximately 3 miles of riparian habitat
		Freitas Ranch	Could supplement summer water supply to approximately 6 miles of riparian habitat

Unknown	Operational spill/surface drainwater in Newman Wasteway	Freitas/McPike (10,450 AF)	Could be used to provide an unknown portion of property's annual needs
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