
CHAPTER IV H

Volta Wildlife Management Area Alternative Plans



*U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
MID-PACIFIC REGION*

CHAPTER IV H

VOLTA WILDLIFE MANAGEMENT AREA

Volta Wildlife Management Area (WMA) is owned by Reclamation and has been operated by DFG since 1952 under a lease agreement. Volta WMA consists of approximately 3,000 acres of primarily large alkali ponds with waterfowl areas containing swamp timothy, bulrush, sprangletop, watergrass, and smartweed. Volta WMA is located approximately six miles northwest of the City of Los Banos. The refuge lies within the Grassland Resource Conservation District (GRCD), located along the southwest boundary, as described in Chapter IV G of this report.

These wetlands, described in more detail in Chapter IV G, are the remnants of a much larger seasonal wetlands complex that historically extended throughout the Central Valley. This wetlands area is described in more detail in Chapter IV G.

A. WATER RESOURCES

The water management plan for Volta WMA requires flooding to start July 15. This early flooding plays an important role in providing feeding and resting areas for early arriving waterfowl. This is the first, and usually only area, flooded in the GRCD this early in the year (CDFG, 1986b).

Estimated annual water requirements and existing water supply for the Volta WMA are 16,000 acre-feet and 10,000 acre-feet, respectively. The primary problem at the Volta WMA is receiving an additional dependable supply of water.

1. Surface Waters

Volta WMA has a firm water supply of 10,000 acre-feet from the San Luis Spillway and the O'Neill Forebay via the Volta Wasteway, as shown on Figure IV H-1. The contract for the water is with Reclamation. In 1986, approximately 16,000 acre-feet was supplied through this means.

Operation spills from the Delta-Mendota Canal and surface runoff from Volta Lake also contribute to the Volta WMA water supply. The Volta Lake flow is from artesian wells. Table IV H-1 lists water delivered to Volta WMA since 1974. Water delivered is of good quality for irrigation and waterfowl management. Volta WMA serves as a control area for on-going selenium studies.

TABLE IV H-1
WATER DELIVERIES
VOLTA WMA
(acre-feet)

Year	San Luis/Volta Wasteway Pump	Gravity	Kesterson Mitigation Water	Total
1977	9,000	1,000	N/A	10,000
1978	9,000	1,000	N/A	10,000
1979	9,000	1,000	N/A	10,000
1980	9,000	1,000	N/A	10,000
1981	9,000	1,000	N/A	10,000
1982	9,000	1,000	N/A	10,000
1983	9,000	1,000	N/A	10,000
1984	9,000	1,000	N/A	10,000
1985	9,000	1,000	960	10,960
1986	9,000	1,000	6,543	16,543

Source: Donald Blake, DFG, Los Banos WMA Complex, 1987

2. Water Conveyance Facilities

Water from the Delta-Mendota Canal is transported to the Volta WMA through the Volta Wasteway which enters the refuge at the southwest corner. The San Luis/Volta Wasteway has sufficient capacity to meet future water supply needs of Volta WMA.

The Volta Wasteway passes through the center of the refuge. The water is lifted by low lift pumps located just off Ingomar Grade Road into two ditches, one running east, the other northwest. This water can flow by gravity through an internal ditch system. Additional water flows to the center of the refuge via outtake pipes which are located near a check dam in the Wasteway. These pipes are 18-inch diameter pipes and cause hydraulic constrictions. The water delivery system is shown on Figure IV H-1.

The Grassland Water District routes water destined for the northern District area through Volta WMA utilizing the San Luis Wasteway/Mosquito Ditch. This causes management problems for Volta WMA due to fluctuating water levels.

3. Groundwater

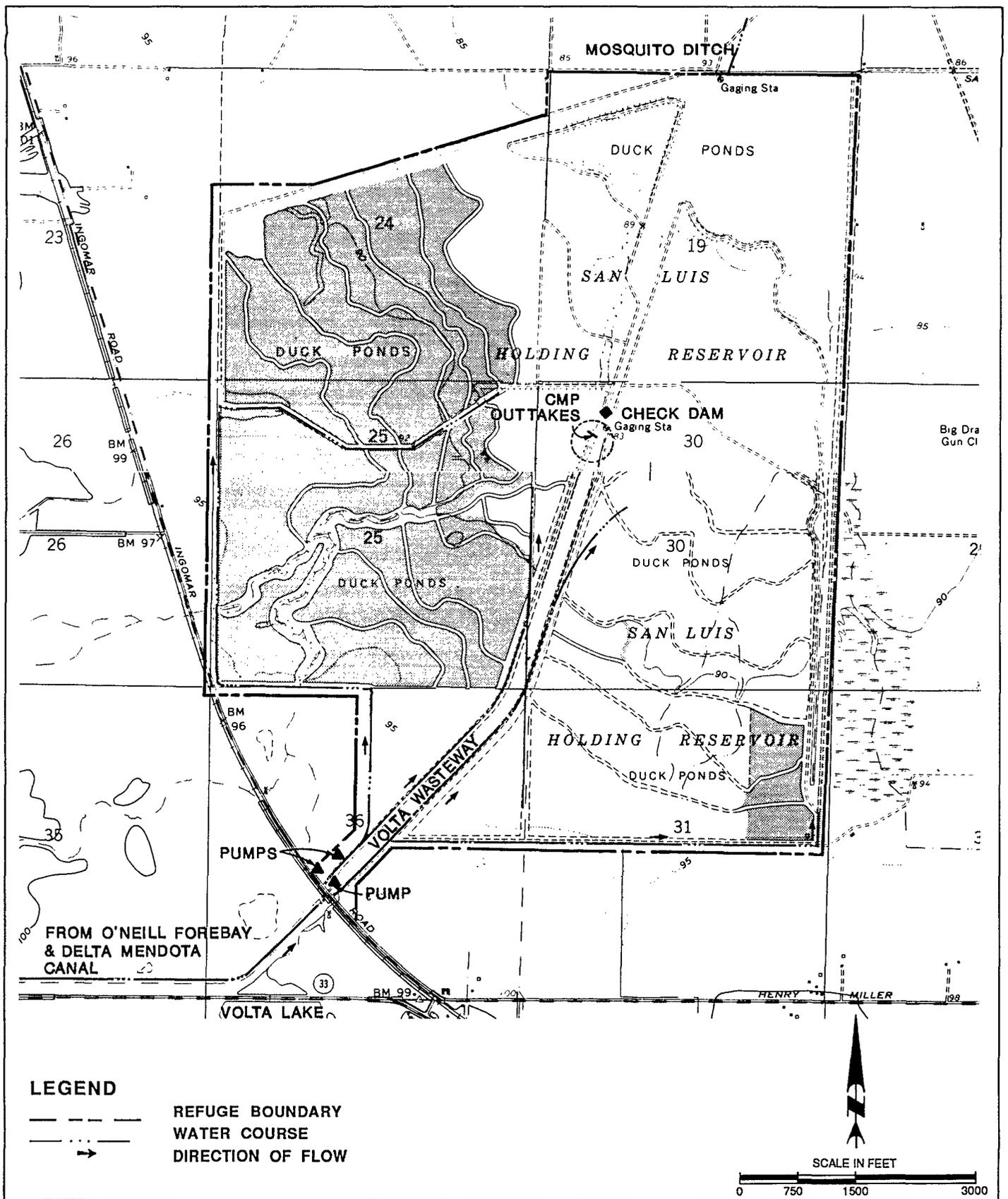
Groundwater levels are usually within 25 feet of the land surface, and experience small seasonal fluctuations. Water quality is poor above the Corcoran clay (approximately 200 feet in depth) and generally good below the Corcoran Clay, as discussed in Chapter IV G of this report. Although groundwater has not been used as a water supply at Volta WMA, Reclamation estimates that a safe pumping capacity of 4,200 acre-feet per year is available for use.

B. FORMULATION AND EVALUATION OF ALTERNATIVE PLANS

In the past, wildlife areas have relied upon surplus surface water, agricultural return water, and groundwater for meeting water needs. To provide for full development of the refuge, the annual water requirement is estimated by DFG to be 16,000 acre-feet per year. However, for the purposes of assessing the impacts of water delivery alternatives, four levels of water supply have been identified and are presented in Table IV H-2. Each of the water supply levels provide a different rate and volume of water summarized as follows:

Level 1 - Existing firm water supply

Level 2 - Current average annual water deliveries



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TABLE IV H-2
DEPENDABLE WATER SUPPLY NEEDS
ALTERNATIVE SUPPLY LEVELS FOR THE VOLTA WMA

Month	Supply Level 1		Supply Level 2		Supply Level 3		Supply Level 4	
	ac-ft	cfs	ac-ft	cfs	ac-ft	cfs	ac-ft	cfs
January	200	3.3	200	3.3	200	3.3	500	8.1
February	200	3.6	200	3.6	200	3.6	500	9.0
March	200	3.3	200	3.3	200	3.3	500	8.1
April	200	3.4	200	3.4	200	3.4	500	8.4
May	1,000	16.3	1,000	16.3	2,000	32.5	2,000	32.5
June	1,200	20.2	1,200	20.2	2,000	33.6	2,000	33.6
July	600	9.8	600	9.8	800	13.0	1,800	29.3
August	1,400	22.8	1,400	22.8	1,400	22.8	2,400	39.0
September	1,800	30.3	1,800	30.3	1,800	30.3	1,800	30.3
October	2,000	32.5	2,000	32.5	2,000	32.5	2,000	32.5
November	600	10.1	600	10.1	1,100	18.5	1,000	16.8
December	600	9.8	600	9.8	1,100	17.9	1,000	16.3
Total	10,000	165.0	10,000	165.0	13,000	214.5	16,000	264.0
Maximum	2,000	32.5	2,000	32.5	2,000	33.6	2,400	39.0

Notes:

- Alternative 1 Existing firm water supply
- Alternative 2 Current average annual water deliveries
- Alternative 3 Full use of existing development
- Alternative 4 Optimum management

Source: USFWS, 1986g

Level 3 - Water supply needed for full use of existing development

Level 4 - Water delivery needed for optimum management

Multi-objective project evaluation procedures, in accordance with concepts outlined by the Water Resources Council, is one of the tools used in evaluating and comparing alternatives. The Water Contracting EIS's will evaluate the national, regional, and site-specific environmental impacts of providing water to the refuges and other users under the different Water Supply Levels. Based on the results of the Water Contracting EIS's, Water Supply Levels will be identified for each refuge. Following completion of the Water Contracting EIS's, the plans to meet the identified water level will be compared under the National Economic Development Account, Environmental Quality Account, and Social Account.

The beneficial and adverse effects of each alternative to provide additional water to the refuge also were compared with respect to many criteria. A summary comparison of the alternatives to provide additional water to the refuge for the Water Supply Levels 1,2,3, and 4 is presented in Table IV H-3.

The following alternatives have been developed to convey the identified levels of water supply described above to the Volta WMA.

1. Delivery Alternative for Level 1 (No Action Alternative)

Since this level represents the existing firm water supply minimum construction and/or the use of existing facilities is required to provide a dependable conveyance system for the refuge.

Alternative A - Construct Turnout at Main Canal. Under this alternative, a turnout would be constructed on Central California Water District's (CCID's) Main Canal to the Volta Wasteway, approximately two miles upstream of the Volta WMA, to allow CVP water to continue to be routed through the Wasteway as shown on Figure IV H-2. A turnout into the Volta wasteway from the Main Canal would allow for increased usage of operational spill. Using Delta-Mendota Canal water in the Main Canal when the Mendota Pool is drawn down requires the utilization of the Wolfson Bypass, as described in Chapter IV G of this report.

Alternative B - Implement a Conjunctive Use Plan. Groundwater could be used during an emergency in conjunction with surface water. A conjunctive use plan has been defined in Chapter II. The groundwater would be mixed with surface water to reduce the boron concentrations. Wells could be constructed around the existing internal conveyance facilities to allow for gravity flows throughout the refuge.

IV H-3

TABLE IV H-3
SUMMARY COMPARISON OF WATER DELIVERY ALTERNATIVES
VOLTA WMA

	<u>Supply Levels 1 & 2</u>		<u>Supply Level 3 & 4</u>
	<u>Alternative A</u>	<u>Alternative B</u>	<u>Alternative C</u>
Availability of Water Supply	Yes	Yes	Yes
Ability to Convey Water	Yes	Yes	Yes
Need New Water	Yes	Yes	Yes
Need New Conveyance Agreements	Yes	No	Yes
Type of Water Supply	Fresh Water	Fresh Water & Groundwater	Fresh Water
Operational Flexibility	Yes	Yes	Yes
Wildlife Habitat	Improve	Improve	Improve
Public Use	Increase	Increase	Increase
Total Annual Costs (\$) ^(a)	1,090	52,670	1,520

Notes: Alternative A: CVP Water from Main Canal to Volta Wasteway.
Alternative B: Conjunctive Use Plan.
Alternative C: Same as Alternative A plus upgraded outtakes.

(a) Total Annual Costs includes annualized construction cost, annual operation and maintenance cost, annual power and wheelage cost.

2. Delivery Alternative for Level 2

Water Supply Level 2 can be accommodated with the delivery alternatives for Level 1.

3. Delivery Alternative for Level 3

Under this level, construction and/or the use of existing conveyance facilities may be required to fully serve the already developed area with an increase in water supplied.

Alternative C - Construct Turnout at Main Canal and Upgrade Out-Takes. Under this alternative, a turnout would be constructed on CCID's Main Canal to the Volta Wasteway, approximately two miles upstream of the Volta WMA, to allow CVP water to continue to be routed through the Wasteway. This alternative is the same as Alternative A but in addition, the 18" corrugated metal pipe (CMP) outtake near the check dam in the Wasteway is to be upgraded to a 24" outtake to accommodate the additional flows under Water Supply Levels 3 and 4. The location of the outtakes is shown on Figure IV H-2.

4. Delivery Alternative for Level 4

Water Supply Level 4 can be accommodated with Water Supply Level 3 alternatives.

5. Summary of Alternatives

Alternative A and B are considered for implementation of Levels 1 and 2. Alternative A would require the construction of a turnout at the Main Canal. This alternative allows for operational flexibility when used in conjunction with the Wolfson Bypass as described in Chapter IV G of this report. Alternative B, implementation of a conjunctive use program, would require pumping costs and the blending of the groundwater due to a poor quality of water.

C. COSTS AND ECONOMIC ANALYSIS

Costs for the alternative plans for providing adequate water supplies under the Water Supply Levels 1,2,3, and 4 are presented in Table IV H-4 and the Cost Estimating Appendix. The construction costs include factors to cover engineering, contingencies, and overhead. During the advanced planning phase, these costs will be refined further.

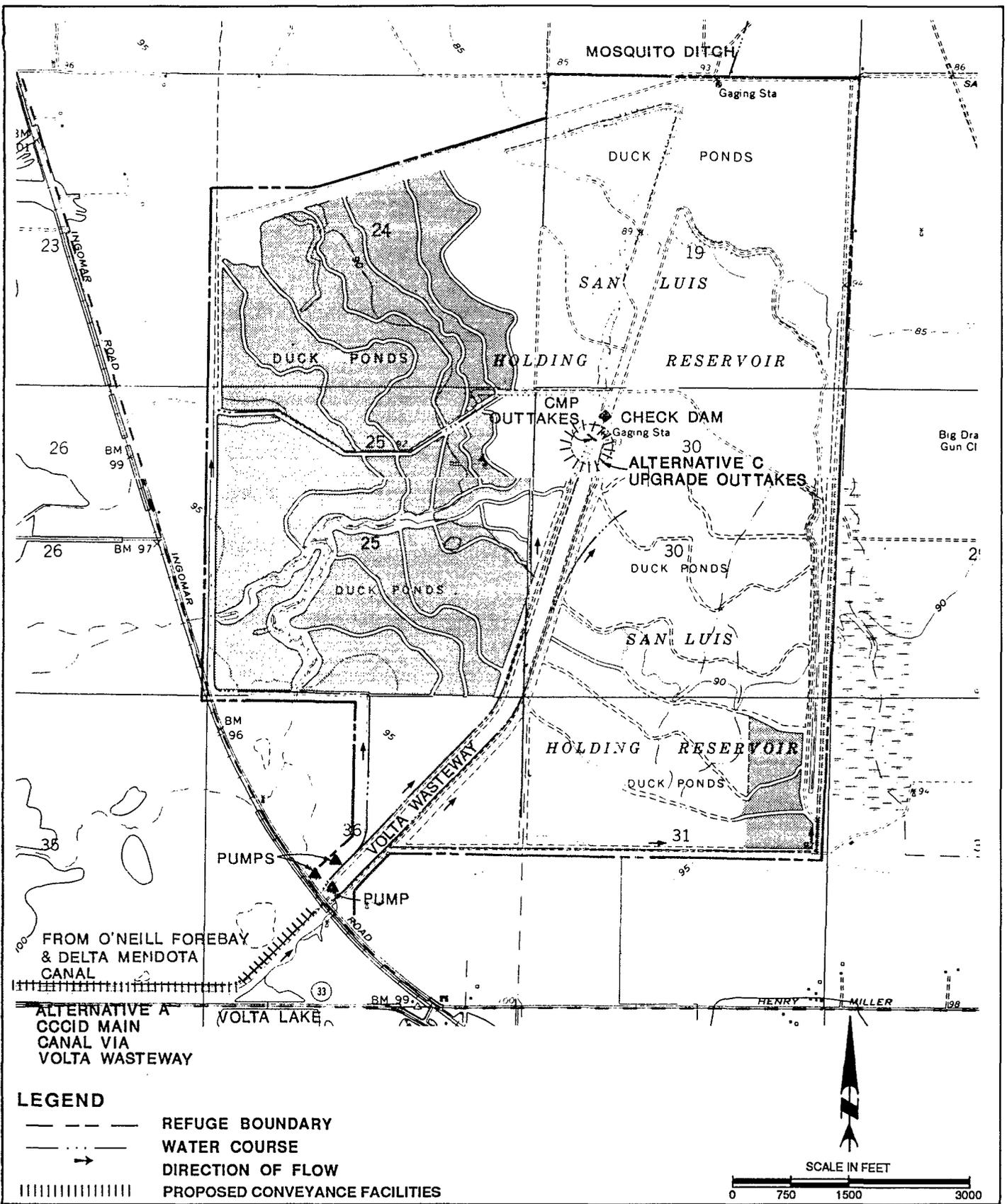


FIGURE IV H-2
VOLTA WILDLIFE MANAGEMENT AREA
PROPOSED WATER SUPPLY FACILITIES
ALTERNATIVES A & C



TABLE IV H-4
SUMMARY OF ESTIMATED COSTS OF ALTERNATIVES
VOLTA WMA

Items	Water Delivery Levels		
	1 & 2		3 & 4
	Alternatives		
	A	B	C
Total Construction Costs	\$ 10,000	\$123,000	\$ 13,000
Power Costs (\$/acre-foot)	0.00	8.70	0.00
Water Wheeling Costs (\$/acre-foot)	0.00	0.00	0.00
Annualized Construction Costs (8.875%, 30 years)	890	11,830	1,250
Annual Operations & Maintenance Costs	200	4,300	270
Annual Power Costs	0	36,540	0
Annual Water Wheelage Costs	0	0	0
Total Annual Costs	\$ 1,090	\$ 52,670	\$ 1,520

Alternative A - Construct Turnout at Main Canal

Alternative B - Conjunctive Use

Alternative C - Construct Turnout at Main Canal and upgrade out takes

Construction of the improvements under the preferred plans to provide Level 1,2,3, and 4 water deliveries would result in additional money being spent in Merced County during construction. The construction could be completed within one summer season by construction workers who reside in Merced or Fresno County.

Currently, the annual public use to Volta WMA is about 3,500 consumptive, and 2,000 non-consumptive use-days per year. If water is provided throughout the year, the attendance levels would increase, but not significantly.

D. WILDLIFE RESOURCES

The annual waterfowl use in the Volta WMA is approximately 4,000,000 use-days for ducks. Records are not available for geese and waterbirds. The only listed threatened and endangered species are the San Joaquin kit fox, Vulpes macrotis mutica. Numerous candidate species may occur in this area and are also presented in Table IV H-5.

The plan under water delivery Level 4 would provide an additional 6,000 acre-feet of water over the course of the year to improve habitat in the refuge. The improved habitat would increase the number of wildlife use days and recreational benefits, as presented in Table IV H-6.

Implementation of any of the alternative plans for Levels 2, 3 or 4 would not adversely effect the listed and candidate threatened and endangered species of birds. Detailed field investigations would be completed during the advanced planning phase of the project. Implementation of the plan would result in overall beneficial environmental effects. The No Action Alternative would result in the management of the refuge under the current water supply conditions. The results of the preliminary environmental analysis for the plans are presented in the Environmental Appendix. Additional environmental analyses would be completed as part of the Water Contracting EIS's.

E. SOCIAL ANALYSIS

The social consequences of constructing and operating the plans would be positive due to the potential increase in wildlife use and subsequently public use. The local social environment is discussed in the Social Appendix.

TABLE IV H-5

LISTED, PROPOSED, & CANDIDATE, THREATENED & ENDANGERED SPECIES

VOLTA WMA

Listed Species

Mammals

San Joaquin kit fox, Vulpes macrotis mutica (E)

Proposed Species

None

Candidate Species

Birds

White-faced ibis, Plegadis chihi (2)

Tricolored blackbird, Agelaius tricolor (2)

Reptiles

Giant garter snake, Thamnophis couchi gigas (2)

California tiger salamander, Ambystoma tigrinum californiense (2)

Invertebrates

Molestan blister beetle, Lytta molesta (2)

Plants

Hispid bird's-beak, Cordylanthus mollis subsp. hispidus (2)

Delta coyote-thistle, Eryngium racemosum (1)

Bearded allocarya, Plagiobothrys hystriculus (2)

Valley spearscale, Atriplex patula subsp. spicata (2)

Source: USFWS, June 4, 1987

(E)—Endangered (T)—Threatened (CH)—Critical Habitat

(1)—Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.

(2)—Category 2: Taxa for which existing information indicated may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

TABLE IV H-6
WILDLIFE RECREATIONAL BENEFIT AND RESOURCE IMPACTS
VOLTA WMA

Item	Water Delivery Levels		
	Level 1	Level 3	Level 4
Habitat Acres			
Permanent Water	200	225	250
Brood Water	150	200	250
Watergrass	50	600	850
Aquatics	600	550	500
Un-Irrigated Native			
Marsh	1,650	1,175	1,000
Uplands	350	250	150
Bird Use Days			
Coots	1,000,000		
Ducks	3,500,000	5,000,000	6,500,000
Geese	300,000	300,000	300,000
Wading Birds	200,000	250,000	300,000
Shore Birds	20,000,000	20,000,000	20,000,000
Public Use Days			
Consumptive	3,500	5,250	7,000
Non-Consumptive	2,000	2,800	3,600
Annual Recreational Benefits			
	\$ 119,130	\$ 174,360	\$ 229,600

F. POWER ANALYSIS

If CVP project use power were determined to be available, Volta NWR may not be able to receive the CVP power, as Pacific Gas & Electric Company (PG&E) has entered into an agreement with Reclamation to convey CVP power to CVP customers within a specified area, also known as a "wheeling area". Volta NWR is located outside of this area. However, a similar agreement has been negotiated with PG&E to convey power to the Truckee-Donner Public Utility District which also is located outside of the wheeling area and the PG&E service area. That agreement provided for PG&E to supply CVP power through the PG&E-Sierra Pacific Power Company entirety. Therefore, if the CVP could be reauthorized to provide project-use power to Volta NWR, an agreement would be needed to allow PG&E to convey the power through an entirety with Pacific Power and Light Company.

The authority to deliver CVP power to the refuge is currently being examined and will be detailed in the Refuge Water Supply Planning Report. A more detailed discussion of project-use power and wheeling agreements is provided in the Power Analysis section of Chapter IV B.

G. PERMITS

Construction activities would require several permits. Merced County would issue approvals to ensure that the existing drainage facilities would not be adversely effected. If additional water is transferred through the California Aqueduct, approvals from the DWR would be required. If the CCID facilities are utilized, their approval would be required. If water rights are to be obtained or modified, the State Water Resources Control Board would be responsible for granting the permits. Stream Alteration Permits would be required from the DFG, and an Army Corps of Engineers permit would be required for construction activities in wetlands or riparian corridors.