
CHAPTER IV

Refuge Plans



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

CHAPTER IV

REFUGE PLANS

This chapter presents discussions of the land and water resources for each of the 15 managed wetland areas investigated. In addition, alternative plans to provide water supplies are provided. These plans were developed after extensive investigations of each area were completed, and using the plan evaluation criteria provided in the previous chapter.

Selected plans will be presented in the up-coming Refuge Water Supply Planning Report and will be based on the findings of investigations presented in this report, as well as those of the Water Contracting EIS's.

Due to the complexity and amount of information developed under this study, fifteen separate subchapters were prepared for Chapter IV to facilitate their review. The areas are presented in respect to their general geographical location.

- o Chapter IV A - Modoc National Wildlife Refuge
- o Chapter IV B - Sacramento National Wildlife Refuge
- o Chapter IV C - Delevan National Wildlife Refuge
- o Chapter IV D - Colusa National Wildlife Refuge
- o Chapter IV E - Sutter National Wildlife Refuge
- o Chapter IV F - Gray Lodge Wildlife Management Area
- o Chapter IV G - Grassland Resource Conservation District
- o Chapter IV H - Volta Wildlife Management Area
- o Chapter IV I - Los Banos Wildlife Management Area
- o Chapter IV J - Kesterson National Wildlife Refuge
- o Chapter IV K - San Luis National Wildlife Refuge
- o Chapter IV L - Merced National Wildlife Refuge
- o Chapter IV M - Mendota Wildlife Management Area
- o Chapter IV N - Pixley National Wildlife Refuge
- o Chapter IV O - Kern National Wildlife Refuge

CHAPTER IV A

Modoc National Wildlife Refuge Alternative Plans



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

CHAPTER IV A

MODOC NATIONAL WILDLIFE REFUGE

Modoc National Wildlife Refuge (NWR) was authorized by the Migratory Bird Conservation Commission in 1959 and is currently managed by the Service. The original 5,966-acre tract was acquired in 1961 and subsequently expanded to 6,203-acres. The refuge is located in Modoc County south of Alturas in the Pit River Valley which is part of the Sacramento River Valley hydrologic basin. U.S. Highway 395 and a Southern Pacific Railroad line bisect the property from north to south, as shown in Figure IV A-1. The North and South Forks of the Pit River merge near the northwest corner of the refuge.

A. WATER RESOURCES

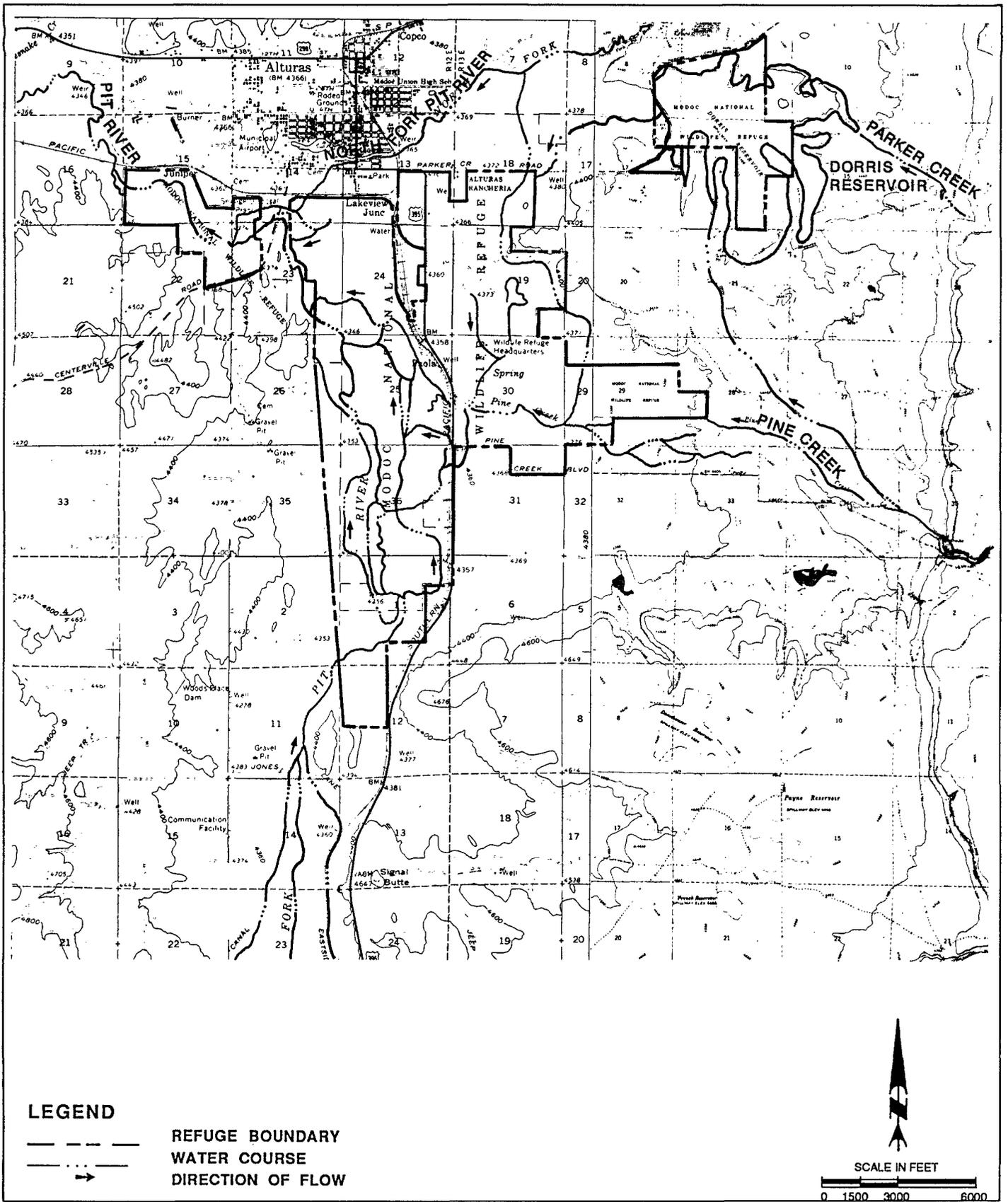
Historically, the refuge has been an important area for waterfowl migrating between the Malheur National Wildlife Refuge in the Harney Basin of Oregon and the Central Valley of California.

Water applied on the refuge is used to irrigate grain crops, flood ponds and meadows, maintain pond levels, and circulate pond water. Typically, grain is planted on about 500-acres to provide feed for waterfowl. Cattle graze on part of the refuge following the harvest. Most ponds remain flooded year-round to accommodate a large flock of Canada geese and other resident waterfowl. Nesting islands are constructed and maintained within the ponds. Occasionally, the water levels are withdrawn to allow repairs of dikes and water-control structures and rehabilitation of the nesting islands.

In general, the refuge receives adequate water supply in most years to maintain existing wetlands. An additional 1,900 acre-feet per year is needed to fully develop wetlands within the refuge boundaries.

1. Surface Waters

There are three surface water sources which supply most of the water for the refuge, the South Fork Pit River, Dorris Reservoir, and Pine Creek. Dorris Reservoir impounds water from two sources: Pine Creek and North Fork Pit River via Parker Creek. The total water requirement for full refuge development is 20,550 acre-feet.



Modoc NWR has the right to divert 18,550 acre-feet of water from the South Fork Pit River, North Fork Pit River and Pine Creek. The historical annual water supply is summarized in Table IV A-1. Water quality is good for irrigation and wildlife and because the refuge is located in the upper watershed, the surface waters do not contain extensive amounts of silt.

The refuge receives approximately 90-percent of the water needed for full development of the lands within the refuge boundaries. However, adequate water supply is not available during August when the ponds need to be flooded, especially in the western portion of the refuge along the South Fork of the Pit River. Water is generally available from Dorris Reservoir for use in the central and eastern portions of the refuge. However, the western sections cannot be served by gravity flow from Dorris Reservoir. Therefore, one supplemental need for Modoc NWR is to obtain additional water in the late summer and fall months in the western portion of the refuge.

Another need for additional water is to provide 2,000 acre-feet of water to manage approximately 520 acres of uplands and valley land in the northwestern portion of the refuge, known as the Godfrey Tract. Approximately 250 acres of this area could be managed as a wetland if an additional 2,000 acre-feet of water is provided.

South Fork Pit River - The South Fork Pit River flows are regulated by West Valley Creek Refuge. The water is diverted to the refuge at South Fork Dam and Sharkey Dam to irrigate the southern portion of the refuge. Most of the water eventually returns to the river. That portion of the refuge adjacent to the South Fork Pit River was part of the Dorris Ranch prior to acquisition by the Federal government. The Dorris Ranch was not part of the South Fork Pit River Decree No. 3273, therefore the water rights are undefined. This water has been used on riparian land when water is available in that portion of the river. All natural flows in the South Fork Pit River are allocated upstream of Modoc NWR except during the spring high flow period.

Dorris Reservoir - This reservoir, which is partially located within the refuge boundaries, also provides a significant portion of the refuge water supply. The reservoir stores water from runoff and snowmelt from Parker Creek, Pine Creek, and Stockdill Slough watersheds. Modoc NWR has a total storage and diversion right of 1,100 acre-feet of surplus water from Dorris Reservoir. This water right includes 6,100 acre-feet from Parker Creek under the North Fork Pit River Decree and Application 1321, 800 acre-feet from Stockdill Slough under the North Fork Pit River Decree

TABLE IV A-1
WATER DELIVERIES
MODOC NWR
(acre-feet)

Year	South Fork Pit River	Pine Creek	Dorris Reservoir	Total
1977	10,150	1,350	5,082	16,582
1978	5,480	1,180	5,902	12,562
1979	14,600	1,743	6,151	22,494
1980	8,500	2,780	6,606	17,886
1981	8,460	1,950	8,000	18,410
1982	32,500 (a)	3,130	7,621	40,251
1983	38,000 (a)	12,300 (a)	6,638	56,938
1984	31,000 (a)	8,500 (a)	8,460	47,960
1985	6,900	3,655	7,990	18,545
1986	67,800 (a)	8,500 (a)	8,523	84,823

(a) Estimated water amount. This water was received as flood water.

Source: USBR, 1986a

and Application 1042, 3,100 acre-feet from Pine Creek under the Pine Creek Agreement and Applications 760 and 1042, and 1,100 acre-feet from Pine Creek under Appropriative License 4822 and Application 12263. The water is generally available during any season if the rights of other users have been met.

North Fork Pit River - Under the North Fork Pit River Decree (Decree 4074), Modoc NWR has the right to divert 12.66 cfs of fourth class priority water at Diversion Point 142 from April 1 to September 30. An additional 37.98 cfs could be diverted whenever the flow in the North Fork exceeds 52.08 cfs. The second diversion has been withdrawn since Hughes Dam was destroyed in 1939. This change in place of diversion provides for water to be diverted from Parker Creek, a tributary of North Fork Pit River, at Diversion Point 119 into Dorris Reservoir.

Pine Creek - Modoc NWR also diverts water directly from Pine Creek to irrigate 340 acres of refuge land, known as the Pine Creek Field, which is located at elevations above the diversion from Dorris Reservoir. Under the Pine Creek Agreement, the refuge has the right to divert 10 cfs of first priority water and 20 cfs of second priority water from Pine Creek to irrigate 2,700-acres of land between April 1 and September 30. This agreement also stated that the Dorris Ranch be allowed to divert 3.78 cfs or one-half of the Pine Creek flow, whichever is less, until the amount available from the North Fork Pit River decrease below 37.98 cfs. At that time, the amount of water diverted from Pine Creek can be increased up to one-half of the flow in Pine Creek. The agreement also gives the refuge the right to divert 0.34 cfs of the first priority water and 0.45 cfs of second priority water from Pine Creek at Diversion Point 1 to irrigate 72 acres in the southern half of the southwestern quarter.

Pit River - Modoc NWR does not have any water rights on the Pit River. All claims and water rights along the Pit River for the northwestern portion of the refuge, also known as the Godfrey Tract, were sold in 1919. During wet years, surplus water is available for appropriation for storage on the refuge.

2. Water Conveyance Facilities

Water is diverted at various locations from the South Fork of the Pit River to be used primarily on the west side of the refuge. Land which is located along Pine Creek at elevations above Dorris Reservoir is irrigated with water diverted directly from Pine Creek. Most of the water from Pine Creek is transported through a ditch to Dorris Reservoir from November through April. The eastern and central portions of the refuge receive water directly from Dorris Reservoir or from the Dorris Reservoir Canal located downstream of the reservoir. Surface waters are delivered by gravity.

Portions of the Modoc NWR and surrounding areas are subject to flooding and have been damaged during previous floods. Flooding during the 1986 Winter caused major damage to a radial gate structure on Parker Creek which is used to divert water to Dorris Reservoir. Due to the damaged gate structure, water could not be diverted to Dorris Reservoir from Parker Creek during 1987. This gate is being repaired.

3. Groundwater

Modoc NWR is located in the Alturas Groundwater Basin, which consists of volcanic and sedimentary formations. The principal water bearing deposits are included within the moderately consolidated Alturas Formation. The formation consists of moderately consolidated beds of tuff, ashy sandstone, and diatomite. The Alturas Formation is separated into an upper and lower member by a Plio-Pleistocene basalt and the Warm Springs tuff member. Buried lava flows may yield more groundwater than other formations. Volcanic uplands surrounding the Modoc NWR serve as recharge areas for the moderate to highly permeable aquifers of the Alturas Formation. Groundwater movement is from the mountains towards the valley floor. Groundwater movement along the valley is north towards Alturas. Groundwater often exists near the land surface. Groundwater levels in the vicinity of the refuge were about 50-feet below the ground surface with slightly lower levels north of the refuge towards Alturas. Most wells were drilled to depths of 250- to 350-feet (DWR, 1986). The refuge itself currently has one well.

Previous investigations have estimated that wells should intercept artesian water at depths of less than 100-feet and produce 300- to 1,000-gallons of water per minute. Portions of the refuge along the most westerly and most easterly boundaries may be underlain by thinner permeable formations and may have lesser amounts of water. The groundwater quality has alkaline tendencies, but appears to be adequate for irrigation and waterfowl use (Service, 1978; DWR, 1986).

B. FORMULATION AND EVALUATION OF ALTERNATIVE PLANS

For the purpose of assessing the impacts of water delivery alternatives, four levels of water supply have been identified and are presented in Table IV A-2. Each of the water supply levels provide a different rate and volume of water, and are summarized as follows:

Level 1 - Existing firm water supply

Level 2 - Current average annual water deliveries

IV A-4

DEPENDABLE WATER SUPPLY NEEDS
ALTERNATIVE SUPPLY LEVELS FOR THE MODOC NWR

TABLE IV A-2

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	1,030	16.8	1,030	16.8	1,080	17.6	1,140	18.5
February	1,130	20.3	1,130	20.3	1,190	21.4	1,250	22.5
March	840	13.7	840	13.7	880	14.3	930	15.1
April	1,990	33.4	1,990	33.4	2,090	35.1	2,210	37.1
May	2,430	39.5	2,430	39.5	2,550	41.5	2,690	43.7
June	2,600	43.7	2,600	43.7	2,730	45.9	2,880	48.4
July	2,110	34.3	2,110	34.3	2,220	36.1	2,340	38.1
August	2,320	37.7	2,320	37.7	2,450	39.8	2,570	41.8
September	1,990	33.4	1,990	33.4	2,090	35.1	2,210	37.1
October	920	15.0	920	15.0	970	15.8	1,020	16.6
November	590	9.9	590	9.9	620	10.4	650	10.9
December	600	9.8	600	9.8	630	10.2	660	10.7
Total	18,550	307.5	18,550	307.5	19,500	323.3	20,550	340.7
Maximum	2,600	43.7	2,600	43.7	2,730	45.9	2,880	48.4

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: Doug Weinrich, Ecological Services, USFWS, 1987

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 in the western portion of the refuge also were compared with respect to criteria outlined in Chapter III. A summary comparison of the alternatives to provide additional water to the refuge for water delivery Levels 1, 2, 3, and 4 is presented in Table IV A-3.

The following delivery alternatives have been considered to convey the four levels of water supply described above.

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

Since this level represents the existing firm water supply, existing facilities could be used to provide a dependable conveyance system for the refuge. The conveyance systems in the eastern and central portions of the refuge are adequate to deliver the existing water supply following repairs which will be completed in 1987. Water would not be available for the Godfrey Tract; during drought years water may not be available in the central portion of the refuge. Power requirements would remain the same.

2. Delivery Alternative for Level 2

Under normal conditions, the surface waters are adequate to supply 18,500 acre-feet of firm water each year. However, during years which are drier than normal, groundwater may be needed to meet the Level 2 water supply needs. To meet these needs, a conjunctive use alternative was developed. A conjunctive use program has been defined in Chapter II.

TABLE IV A-3
SUMMARY COMPARISON OF WATER DELIVERY ALTERNATIVES
MODOC NWR

	<u>Supply Levels 2 & 3</u>		<u>Supply Level 4</u>	
	<u>Alternative A</u>	<u>Alternative B</u>	<u>Alternative C</u>	
Availability of Water Supply	Yes	Yes	Maybe	
Ability to Convey Water	Yes	Maybe	Yes	
Need New Water	No	No	Yes	
Need New Conveyance Agreements	No	No	No	
Type of Water Supply	Groundwater	Groundwater	Groundwater	
Operational Flexibility	Yes	Maybe	Maybe	
Wildlife Habitat	Improve	Increase Ponds	Increase Ponds	
Public Use	No Change	Increase	Increase	
Total Annual Costs (\$) ^(a)	3,760	24,620	126,360	

Notes: Alternative A: Conjunctive use
Alternative B: Rehabilitate Dam Structure on Pit River
Alternative C: Construct wells in Western Portion of Refuge

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

Alternative A - Conjunctive Use. The existing well could be rehabilitated and used at the end of the summer and fall seasons to provide additional water to portions of the refuge when adequate water does not flow in the South Fork of the Pit River. This well would be operated under a conjunctive use program. During years when surplus water is available on the South Fork of the Pit River, the well would not be needed.

3. Delivery Alternative for Level 3

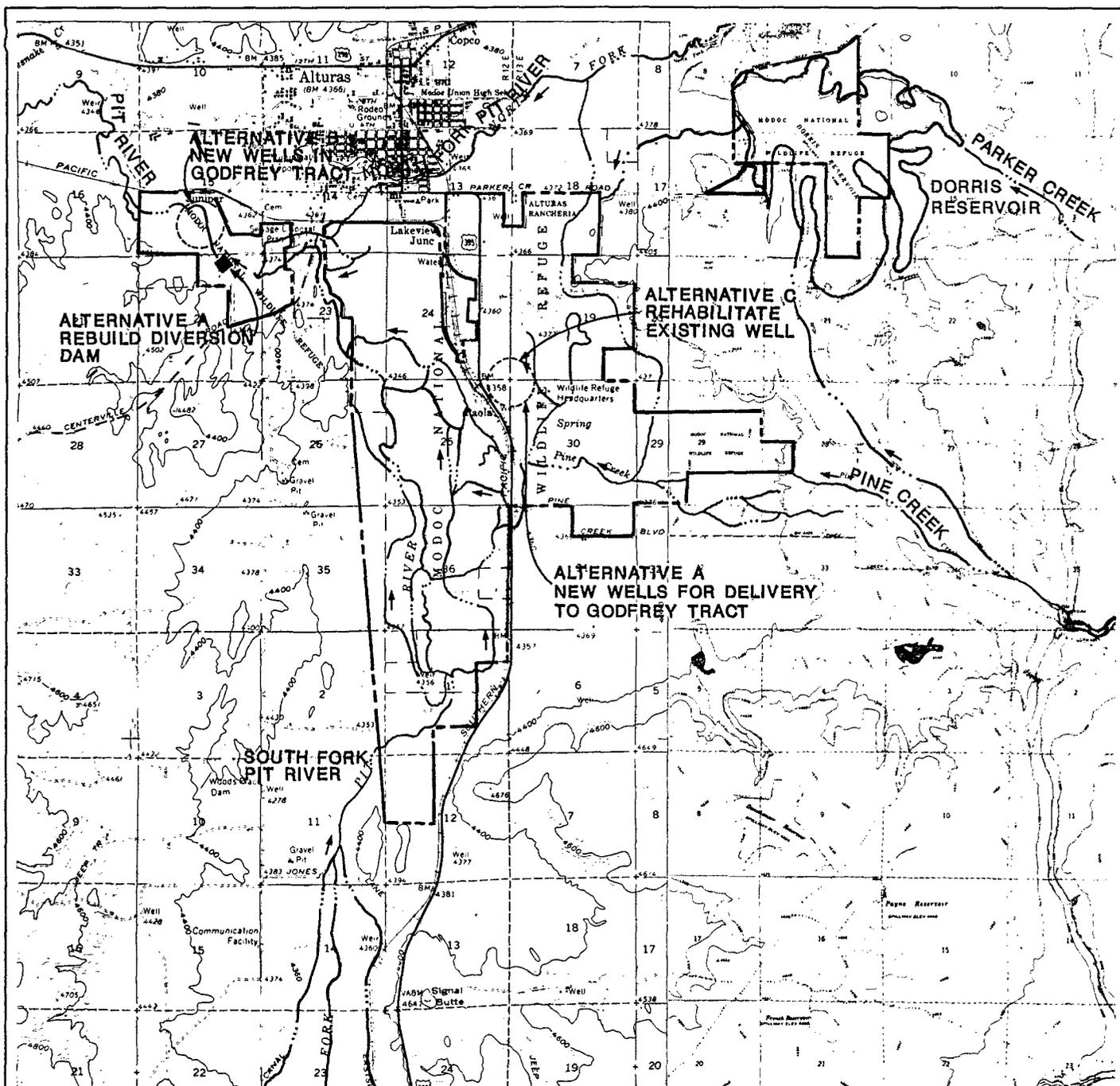
Under this level, existing conveyance facilities could be used to fully serve the currently developed portions of the refuge with an increase in water supplied through acquisition of new water rights or annual use of the existing well, as discussed under Alternative A for Water Level 2. Additional water could extend the duration of flooding earlier in the fall and later in the spring. Increased circulation and flow through would improve disease prevention and control.

4. Delivery Alternatives for Level 4

Under this water delivery level, existing facilities could be used to fully serve the developed portions of the refuge. New facilities could be constructed to serve the western portion, or Godfrey Tract, of the refuge which is currently not developed. Two alternatives have been developed to provide water to the western portion of the refuge under Level 4, as shown in Figure IV A-2.

Alternative B - Rehabilitate Dam Structure on Pit River. This alternative which would allow diversion of water, involves rehabilitation of an existing dam on the Pit River and construction of four wells in the central portion of the refuge. If water could be made available from the Pit River immediately downstream of the confluence of the North and South Forks, surface water could be provided to the western portion of the refuge. During most years, unappropriated water is generally unavailable during July and August on the Pit River under the State Water Resources Control Board Decision 990.

To provide water to the Godfrey Tract, wells could be constructed in the central portion of the refuge and the water discharged to ditches which could transfer the flow to the South Fork Pit River for continued flow into the Pit River. The water could be diverted at the rehabilitation dam. To provide the maximum of 280 acre-feet of water in June, four wells would be needed, assuming each would produce about 600 gpm. During years when surplus water is available on the Pit River, the wells may not be



LEGEND

- REFUGE BOUNDARY
- WATER COURSE
- DIRECTION OF FLOW



FIGURE IV A-2

MODOC NATIONAL WILDLIFE REFUGE

**PROPOSED WATER SUPPLY FACILITIES
ALTERNATIVES A, B, & C**



needed. The new wells could be located in the general vicinity of the existing well to reduce costs of placing the electrical distribution facilities underground. The Service requires that all electrical distribution and transmission facilities be placed underground on refuges to reduce the impact to wildlife.

A potential consideration under this alternative could be the use of groundwater in the central portion of the refuge and use of surface water on the Godfrey Tract. This plan would require construction of the wells and the dam on the Pit River, as well as transfer the place of diversion of the South Fork Pit River water to the Pit River. However, the transfer of the place of diversion probably could not be implemented because the existing water rights are for the use of the water on specific lands in the central portion of the refuge.

Alternative C - Construct Wells in Western Portion of Refuge. Water wells could be constructed in the western portion of the refuge to provide an additional 2,000 acre-feet per year with a maximum of 280 acre-feet in June. However, the water bearing formations are not extensive in this area. Therefore, the wells may not produce adequate water supplies. If the wells do not produce more than 50 gpm, more than 43 wells would be required.

5. Summary of Alternatives

There are no alternatives necessary for Level 1. Alternative A is the only alternative for Levels 2 and 3. This conjunctive use alternative would provide adequate water for the central portion of the refuge when water is not available from the South Fork Pit River.

Alternatives B and C could supply water to the Godfrey Tract. Alternative B would require approvals from the State Water Resources Control Board and State Department of Water Resources to convey water through the South Fork Pit River and Pit River to the western portion of the refuge. Under Alternative C, wells could be located in areas which may not have sufficient water bearing formations. Therefore, adequate water may not be provided under Alternative C.

C. COSTS AND ECONOMIC ANALYSIS

Costs for the alternative plans to provide adequate water supplies under water delivery Levels 1, 2, 3, and 4 are presented in Table IV A-4. The construction costs include factors to cover engineering, contingencies, and overhead costs, as discussed in the appendices of this report. During the advanced planning phase, these costs will be refined further.

TABLE IV A-4
SUMMARY OF ESTIMATED COSTS OF ALTERNATIVES
MODOC NWR

Items	Water Delivery		
	Level 2 & 3 Alternative	Level 4 Alternatives	
	A	B	C
Total Constructions Costs	\$ 16,500	\$206,000	\$963,200
Power Costs (\$/acre-foot)	3.10	1.10	3.10
Water Wheeling Costs (\$/acre-foot)	0	0	0
Annualized Construction Costs (8.875%, 30 years)	1,590	19,820	92,660
Annual Operations & Maintenance Costs	650	2,600	27,500
Annual Power Costs	1,520	2,200	6,200
Annual Water Wheelage Costs	0	0	0
Total Annual Costs	\$ 3,760	\$ 24,620	\$126,360

Alternative A - Conjunctive Use

Alternative B - Rehabilitate Dam Structure on Pit River

Alternative C - Construct Wells in Western Portion of Refuge

Improvements described under the alternative E & F plans to provide Levels 2, 3, or 4 would result in additional money being spent in the economy of Modoc County during construction. The construction could be completed within one summer season by construction workers who reside in Modoc County.

Currently, the annual public use at Modoc NWR is about 14,300 visits per year based on attendance from 1981 through 1985. If Alternative A is implemented to provide Levels 2 or 3, the public use would not increase significantly. If Alternatives B or C are implemented to provide Level 4, public use would increase about 100 visitor days per year due to an increase in pheasant hunting.

D. WILDLIFE RESOURCES

The annual waterfowl use on Modoc NWR is approximately 3,356,000 use-days based upon the annual average use from 1981 through 1985. Approximately 60 and 30-percent of the waterfowl use are by ducks and geese, respectively, including many species which nest on the refuge. Wildlife and fishery resources associated with the refuge are presented in Table IV A-5. The only listed threatened and endangered species associated with the refuge is the bald eagle, Haliaeetus leucocephalus. Candidate species associated with the Modoc NWR include the white-faced ibis, Plegadis chichi; tricolored blackbird, Agelaius tricolor; and prostrate buckwheat, Erigeron procerus, as listed in Table IV A-6.

The single alternative considered for Levels 2 and 3 would improve the viability of the vegetation during drought years in the central portion of the refuge. The alternative plans under Level 4 would improve habitat in the western portion of the refuge. The water could be used to flood an additional 70-acres of seasonal wetlands, provide 120-acres of seasonal marsh, and improve management of 50- to 80-acres for planting of emergents. The improved habitat would increase the number of nesting pairs of waterfowl and upland birds, as indicated in Table IV A-6. The number of wildlife and recreational use days also would increase for this portion of the refuge, as indicated in Table IV A-7.

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 and would improve habitat that could be used by the White-faced ibis. However, the candidate plant, Prostrate buckwheat, may be impacted under implementation of alternatives for Level 4 by the flooding of upland areas in the western portion of the refuge. Detailed field investigations would be necessary prior to the design 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

TABLE IV A-5
WILDLIFE RESOURCES
MODOC NWR

Ducks

Common Merganser Mallard ^(a) Gadwall ^(a) American Wigeon ^(a) Green-winged Teal Blue-winged Teal ^(a)	Northern Shoveler ^(a) Pintail ^(a) Wood Duck Redhead ^(a) Canvasback ^(a) Lesser Scaup	Ring-necked Duck Common Golden Eye Barrow's Golden Eye Bufflehead Ruddy Duck ^(a) Cinnamon Teal ^(a)
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Geese and Swans

Snow Goose Ross' Goose White-fronted goose	Canada Goose ^(a) Cackling Goose Tundra Swan
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Coots

American Coot

Shore and Wading Birds

Double-crested Cormorant White Pelican American Bittern ^(a) Least Bittern Great Blue Heron Great (Common) Egret Snowy Egret Black-Crowned Night Heron ^(a) Greater Sandhill Crane ^(a)	Virginia Rail ^(a) Sora Wilson's Phalarope ^(a) American Avocet ^(a) Lesser Sandhill Crane Greater Sandhill Crane ^(a) Western Grebe ^(a) Eared Grebe Black-Necked Stilt ^(a)	Common Snipe ^(a) Long-billed Dowitcher Least Sandpiper Greater Yellowlegs Solitary Sandpiper Willet ^(a) Spotted Sandpiper Black-bellied Plover Horned Grebe Pied-billed Grebe ^(a)
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TABLE IV A-5

WILDLIFE RESOURCES

MODOC NWR
(Continued)

Upland Game

Ring-necked Pheasant^(a)

California Quail^(a)

Raptorial Birds

Turkey Vulture
Northern Harrier^(a)
Cooper's Hawk
Red-tailed (Harlan) Hawk^(a)
Bald Eagle

Swainson's Hawk
Rough-legged Hawk
American Kestrel (Sparrow Hawk)
Barn Owl^(a)

Long-eared Owl^(a)
Short-eared Owl
Flammulated Owl
Great Horned Owl^(a)
Golden Eagle

Fish

Bass
Suckers
Chubs

Catfish
Brook Trout

Furbearers

Muskrats
Skunk
Badger

Mink
Coyote
Weasel

Notes:

(a) Birds nesting on refuge

Source: USFWS computerized annual printout for NWR Birds, Department of Interior, USFWS (RF11650-2 9-79) (July 1973 to June 1974, NWR'S Public Use Report (1)) and refuge records.

TABLE IV A-6

LISTED, PROPOSED, & CANDIDATE, THREATENED & ENDANGERED SPECIES

MODOC NWR

Listed Species

Birds

Bald eagle, Haliaeetus Leucocephalus (E)

Proposed Species

None

Candidate Species

Birds

White-faced ibis, Plegadis chihi (2)

Tricolored blackbird, Agelaius tricolor (2)

Plants

Prostrate buckwheat, Erigonum prociduum (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 A-7
WILDLIFE RECREATIONAL BENEFITS AND RESOURCE IMPACTS
MODOC NWR

Item	Water Delivery Levels ^(a)		
	Level 1	Level 2	Level 3 (b)
Habitat Acres			
Wetlands	1,278	1,278	1,478
Uplands	3,403	3,403	3,203
Croplands & Others	1,500	1,500	1,500
Bird Use Days			
Ducks	1,980,000	1,980,000	2,080,000
Geese	953,000	953,000	978,000
Wading and Shorebirds	423,000	423,000	449,500
Quail and Pheasants	(c)	(c)	60,000
Public Use Days			
Consumptive	6,430	6,430	6,476
Non-Consumptive	7,870	7,870	7,924
Annual Recreational Benefits	\$ 309,740	\$309,740	\$ 311,900

(a) Data not available for Level 4.

(b) Additional water would be supplied to the currently undeveloped Godfrey tract only.

(c) Quail and pheasant use days are included with other bird use days.

water supply and conditions. The Godfrey Tract would not be developed in accordance with the management plan. The results of the preliminary environmental analysis for the alternative plans are presented in the Environmental Appendix.

E. SOCIAL ANALYSIS

The social consequences of the alternatives to implement Level 4 would be positive due to the potential increase in hunting days. The social impacts associated with Levels 2 or 3 are related only to potential employment during construction. The social environment is discussed in the Social Appendix.

F. POWER ANALYSIS

Pacific Power and Light Company serves the Modoc NWR. If CVP project-use power were determined to be available, Modoc 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". Modoc 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 intertie. Therefore, if the CVP could be reauthorized to provide project-use power to Modoc NWR, an agreement would be needed to allow PG&E to convey the power through an intertie with Pacific Power and Light Company. 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 of the wells under Alternative A for implementation of Levels 2 or 3, or the construction of the wells and dam rehabilitation measures under Alternative B for implementation of Level 4 would require several permits. Modoc County would issue permits for well construction and approvals for construction along the banks of the Pit River and South Fork Pit River to ensure that existing drainage facilities would not be adversely effected. Approvals from DWR and State Water Resources Control Board would be required for water transfer through the South Fork Pit River to the Pit River and diversion from the Pit River. A Stream Alteration Permit from DFG and Corps of Engineers permits would be required for construction of the dam rehabilitation measures. A permit also may be needed from the State Lands Commission for construction within the banks of the Pit River.