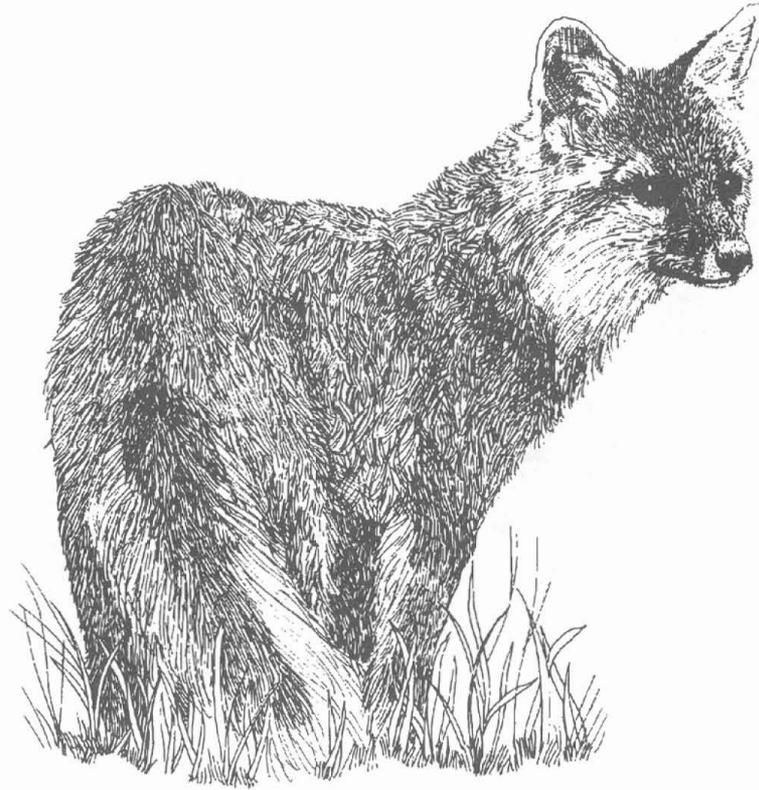

Appendices



Appendix A—National Wildlife Refuge System Mission and Goals

The mission of the National Wildlife Refuge System is to preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plant resources of the United States for the benefit of present and future generations.

Four broad goals are:

- To preserve, restore, and enhance in their natural ecosystems (when practicable), all species of animals and plants that are endangered or threatened with being endangered;
- To perpetuate the migratory bird resource;
- To preserve a natural diversity and abundance of fauna and flora on refuge lands; and
- To provide an understanding and appreciation of fish and wildlife ecology and man's role in his environment, and to provide refuge visitors with high quality, safe, wholesome, and enjoyable recreational experiences oriented toward wildlife to the extent that these activities are compatible with the purposes for which the refuge was established.



Appendix B—Legislation

Migratory Bird Treaty Act (1918)

Designates the protection of migratory birds as a Federal responsibility in concert with other nations.

Migratory Bird Conservation Act (1929)

Establishes procedures for acquisition by purchase, rental, or gift of areas approved by the Migratory Bird Conservation Commission.

Refuge Recreation Act (1962)

Allows the use of refuges for recreation when such uses are compatible with the refuges' primary purposes.

National Wildlife Refuge System Administration Act (1966)

Defines the National Wildlife Refuge System and authorizes the Secretary of the Interior to permit any use of an area provided such use is compatible with the major purposes for which such area was established.

National Historic Preservation Act (1966)

Expands the Federal mandates to preserve cultural resources found on the refuges.

National Environmental Policy Act (1969)

Requires the disclosure of the environmental impacts of any major Federal action significantly affecting the quality of the human environment.

Endangered Species Act (1973)

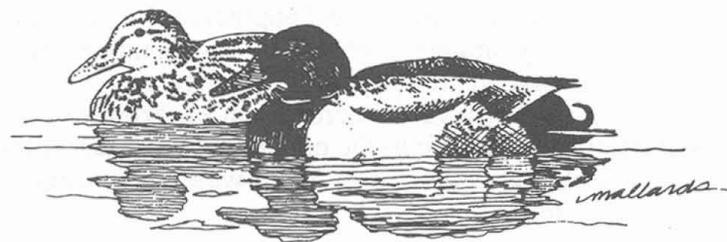
Requires all Federal agencies to carry out programs for the conservation of endangered species and threatened species.

Game Range Act (1976)

Requires all National Wildlife Refuges under the Secretary of the Interior to be administered by the Fish and Wildlife Service.

Emergency Wetlands Resources Act (1986)

The purpose of the act is "To promote the conservation of migratory waterfowl and to offset or prevent the serious loss of wetlands by the acquisition of wetlands and other essential habitat, and for other purposes."



Appendix C—Project Cost Estimates

Phase I—Environmental Education Study Area

Refuge sign	\$ 3,000
Entry gate/kiosk	\$ 12,500
Habitat restoration	\$ 43,200
Parking lot	\$ 82,500
Fence remainder of Refuge	\$ 23,000
Subtotal	<u>\$ 164,200</u>

Phase II & III

40'X40' restrooms/pavilion/amphitheater	\$ 200,000
2 (200 sq. ft.) platforms @ \$8.00/sq. ft.	\$ 3,200
200 ft. of boardwalks @ \$8.00/linear ft.	\$ 1,600
2 miles of trails @ \$4.00/linear ft.	\$ 42,250
Subtotal	<u>\$ 247,050</u>

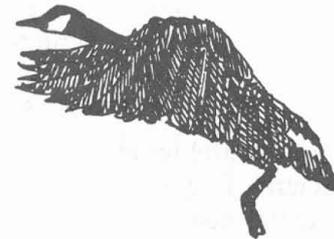
Phase II & III

4 bridges @ \$30,000	\$ 120,000
2 interpretive overlooks (including signs)	\$ 31,620
Subtotal	<u>\$ 151,620</u>

Total **\$562,870**

15% for planning and design	\$ 84,450
10% for contingencies	\$ 56,287

Grand Total **\$703,607**



Appendix D—Re-establishment of Native Plants

The Refuge has a 3/4 share of water in the Farmers High Line Canal that may be used to supplement natural rainfall to reestablish native plants. Ten miners inches of water is one full share. One cubic foot per/second equals 38.4 inches of water.

The following forbs/wildflowers will be reintroduced to the area:

- prairie coneflower
- purple prairie clover
- Lewis blue flax
- Rocky Mtn. beeplant
- dotted gayfeather
- Missouri evening primrose
- giant evening primrose
- scarlet globemallow

Chemical control with herbicides and cultural control using tillage and mulch are the two main choices for weed control. Due to the ecological and social sensitivity of the site, the cultural control methods are preferred.

Fall plowing, followed by a second plowing operation in the spring, two disking operations, and at least one harrowing will do the best job of eliminating brome as a weed problem. All land preparation will be on the contour in 50-100-foot strips.

A grass drill should be used to plant the grass seed. The Colorado Division of Wildlife has a grass drill that might be used for this purpose.

The grass seed can be planted after November 1, as a dormant seeding, or in the spring before April 30, planting no deeper than 1/2 inch into ground that is not frozen or wet.

A mulch of long-stemmed, weed- and seed-free grass hay should be used to protect the site after grass seed is planted by applying 1.5 to 2 tons of hay per acre (approximately one standard rectangular bale per 1000 sq. ft. area). Fifty percent of the mulch, by weight, should be stems at least 10 inches long. After spreading the mulch, a crimping machine should be used to anchor the grass stems about 4 inches deep. This should be done perpendicular to the prevailing wind direction or, on sloping ground, on the contour.

After planting, the only maintenance required will be occasional mowing at a 6-8-inch height for weed control.

If a volunteer or partner can be found, it may be possible to prepare the seedbed, buy and drill the seed, and buy and apply the mulch for about \$300 per acre. (The mulch accounts for about 2/3 of this cost.) It's worth trying to locate a "farmer", because a contractor's charges will more likely run into the \$1200-\$1500 per acre range.

Good soil preparation and weed control are key to revegetation success. Some supplemental irrigation may speed germination and establishment, but it is not necessary, as long as people are patient. The irrigation water which is available for at least part of this site may be applied after seedlings have established.

Around the pond margins and in the moist bottomland, yellow Indiangrass, prairie cordgrass, slender wheatgrass, and Missouri goldenrod may be used.

Once native vegetation is established, the primary management tools will be rest from cultivation and use, and reestablishment of healthy living organisms. Grazing will not be used as a control method. Fire will not be used because of the urban setting of this Refuge. Although not considered a tool, haying may be employed from time to time.

Appendix E—Wildlife Observed at Two Ponds

Birds

Great blue heron	<i>Ardea herodias</i>	Northern flicker	<i>Colaptes auratus</i>
Black-crowned night heron	<i>Nycticorax nycticorax</i>	Dark-eyed junco	<i>Junco hyemalis</i>
Canada goose	<i>Branta canadensis</i>	Western kingbird	<i>Tyrannus verticalis</i>
Mallard (nest)	<i>Anas platyrhynchos</i>	Cliff swallow	<i>Hirundo pyrrhonota</i>
American wigeon	<i>Anas americana</i>	Barn swallow	<i>Riparia riparia</i>
American white pelican	<i>Pelicanus erythrorhynchos</i>	Black-billed magpie (nest)	<i>Pica pica</i>
Double-crested cormorant	<i>Phalacrocorax pelagicus</i>	American crow	<i>Corvus brachyrhynchos</i>
Blue jay	<i>Cyanocitta cristata</i>	Black-capped chickadee	<i>Parus atricapillus</i>
Gadwall	<i>Anas strepera</i>	American pipit	<i>Anthus rubescens</i>
House sparrow	<i>Passer domesticus</i>	House wren	<i>Troglodytes aedon</i>
Prairie falcon	<i>Falco mexicanus</i>	American robin	<i>Turdus migratorius</i>
European starling (nest)	<i>Sturnus vulgaris</i>	Red-tailed hawk	<i>Buteo jamaicensis</i>
California gull	<i>Larus californicus</i>	Northern shrike	<i>Lanius excubitor</i>
Franklin's gull	<i>Larus pipixcan</i>	Yellow-rumped warbler	<i>Dendroica coronata</i>
Red-winged blackbird (nest)	<i>Agelaius phoeniceus</i>	Common nighthawk	<i>Chordeiles minor</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	Common yellow-throat	<i>Geothlypis trichas</i>
Common grackle	<i>Quiscalus quiscula</i>	Rock dove	<i>Columba livia</i>
Northern oriole (nest)	<i>Icterus galbula</i>	Lark sparrow	<i>Chondestes grammacus</i>
House finch	<i>Carpodacus mexicanus</i>	Chipping sparrow	<i>Spizella passerina</i>
American goldfinch	<i>Carduelis tristis</i>	American tree sparrow	<i>Spizella arborea</i>
Downey woodpecker	<i>Picoides pubescens</i>	American bittern	<i>Botaurus lentiginosus</i>
Swainson's hawk (nest)	<i>Buteo swainsoni</i>	Wood duck	<i>Aix sponsa</i>
Rough-legged hawk	<i>Buteo lagopus</i>	Lark bunting	<i>Calamospiza melanocorys</i>
American kestrel	<i>Falco sparverius</i>	Olive-sided flycatcher	<i>Contopus borealis</i>
Killdeer (nest)	<i>Charadrius vociferus</i>	Yellow warbler	<i>Dendroica petechia</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	Song sparrow	<i>Melospiza melodia</i>
Violet-green swallow	<i>Tachycineta thalassina</i>	White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Ring-billed gull	<i>Larus delawarensis</i>	Western meadowlark	<i>Sturnella magna</i>
Mourning dove (nest)	<i>Zenaida macroura</i>	Northern harrier	<i>Circus cyaneus</i>
Orange-crowned warbler	<i>Vermivora celata</i>	Brown-headed cowbird	<i>Molothrus ater</i>
Wilson's warbler	<i>Wilsonia pusilla</i>	Eastern kingbird	<i>Tyrannus tyrannus</i>
Grey catbird	<i>Dumetella carolinensis</i>	Osprey	<i>Pandion haliaetus</i>
Belted kingfisher (year round)	<i>Ceryle alcyon</i>	Say's phoebe	<i>Sayornis saya</i>
		American redstart	<i>Setophaga ruticilla</i>
		Lesser scaup	<i>Aythya affinis</i>
		Loggerhead shrike	<i>Lanius ludovicianus</i>

Townsend's solitaire
 Clay-colored sparrow
 Chimney swift
 Western tanager
 Swainson's thrush
 Spotted towhee
 Solitary vireo
 MacGillivray's warbler
 Northern waterthrush
 Cedar waxwing
 Sharp-shinned hawk
 Pied-billed grebe
 Ring-necked duck
 Blue-gray gnatcatcher
 Broad-tailed hummingbird
 Ruby-crowned kinglet
 Red-breasted nuthatch
 Redhead
 Sora
 Red-eyed vireo
 Rufus-sided towhee
 Bald eagle
 Lincoln's sparrow

Mammals

Red fox
 Muskrat
 Beaver (lodge on Croke Canal)
 Raccoon
 Vole
 Coyote
 Mule deer

Myadestes townsendi
Spizella pallida
Chaetura pelegica
Piranga ludoviciana
Catharus ustulatus
Pipilo erythrophthalmus
Vireo solitarius
Oporornis tolmiei
Seiurus noveboracensis
Bombycillia cedrorum
Accipiter striatus
Podilymbus podiceps
Aythya collaris
Polioptila caerulea
Selasphorus platycercus
Regulus calendula
Sitta canadensis
Aythya americana
Porzana carolina
Vireo olivaceus
Pipilo erythrophthalmus
Haliaeetus leucocephalus
Melospiza lincolnii

Vulpes fulva
Ondatra zibethica
Castor canadensis
Procyon lotor
Microtus ssp.
Canis latrans
Odocoileus hemionus

Reptiles and Amphibians

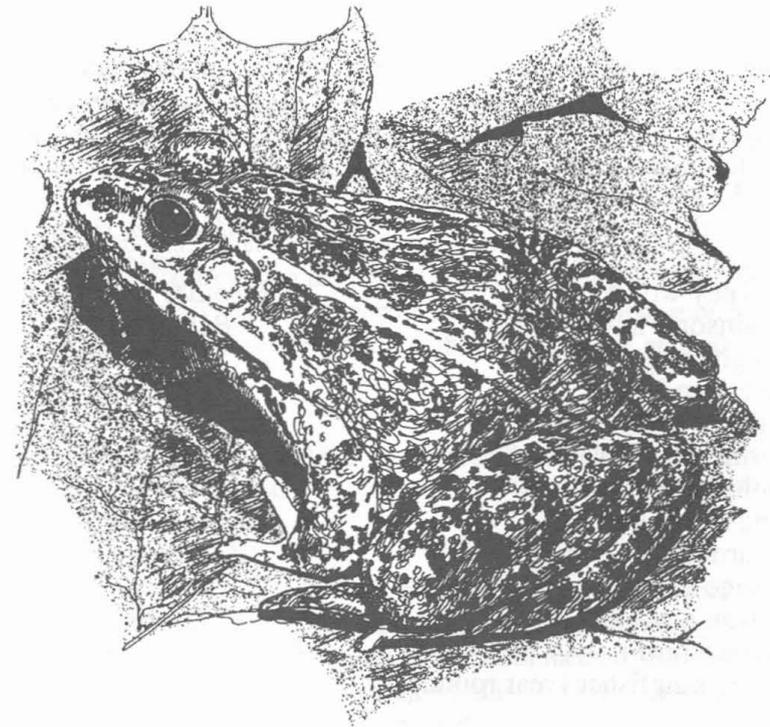
Painted turtle
 Snapping turtle
 Bullfrog
 Leopard frog

Chrysemys picta
Chelydra serpentina
Rana catesbeiana
Rana pipens

Fish

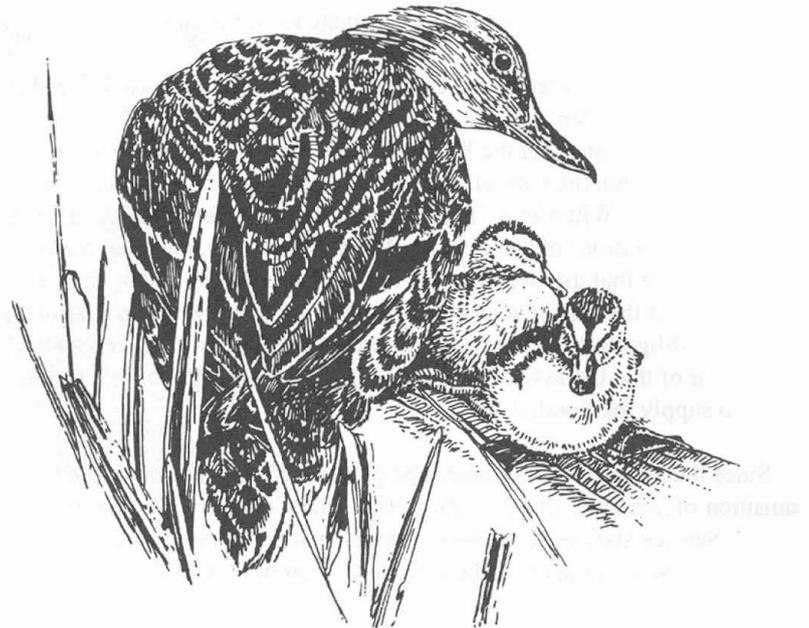
Bluegill
 Largemouth bass
 Grass carp

Lepomis macrochirus
Micropterus salmoides
Ctenopharyngodon idellus



Appendix F—Two Ponds Tree Inventory

<u>Species</u>	<u>Number</u>	<u>Percent</u>	<u>Diam. Breast Ht.</u>
Siberian elm	47	5.5	4.5
American elm	3	1.0	7.3
Common cottonwood	17	5.6	17.3
Juniper	12	3.9	3.7
Honey locust	3	1.0	-5.3
Russian olive	41	13.0	3.1
Silver maple	1	0.3	20.0
Blue spruce	5	1.6	11.6
Siberian crabapple	4	1.3	9.0
Domestic apple	?	9.7	6.8
American linden	1	0.3	2.0
Pine Pond/Aust	10	3.3	11.4
Pine other	3	1.0	4.0
Black walnut	6	1.9	7.0
Tree-of-heaven	1	0.3	2.0
Catalpa	5	1.6	8.0
Weeping willow	26	8.4	12.2
Douglas fir	1	0.3	4.0
Mountain ash	2	0.6	8.0
Hawthorn	1	0.3	2.0
Silver poplar	6	1.9	6.0
Aspen	5	1.6	2.8
Fruit other	27	8.7	2.7
Sumac	4	1.3	2.5
Other	45	14.9	6.7
Total	360	100.00	6.1



Appendix G—Water Rights Assessment

There are three ponds located on the Refuge in Parcel 1, (Figure 2). Each pond has a dam and is supplied by seepage from irrigation canals diverting from Clear Creek. Two of the ponds are spring-fed. Three irrigation ditches also are located on the area. The Farmers High Line Canal, operated by the Farmers High Line Canal and Reservoir Company (FHL), has first priority on Clear Creek (1860) and supplies one-half its flow to Standley Lake for municipal water supplies for the cities of Westminster and Thornton. It continues onto Farmers' Reservoir for irrigation use, and at 123rd and Washington Streets, it falls under different management and becomes Signal Ditch supplying Signal Reservoir, also for irrigation purposes.

Croke Canal, owned and operated by the Farmers' Reservoir and Irrigation Company, supplies Standley Lake. According to Mr. Ed Ziegler, Superintendent of FHL, there are no headgates with the exception of one at or near Alkire Street west of subject area. (The ditch apparently intercepted a spring, so the ditch company had to replace that source.) Croke Canal also captures seepage from Farmers High Line Canal.

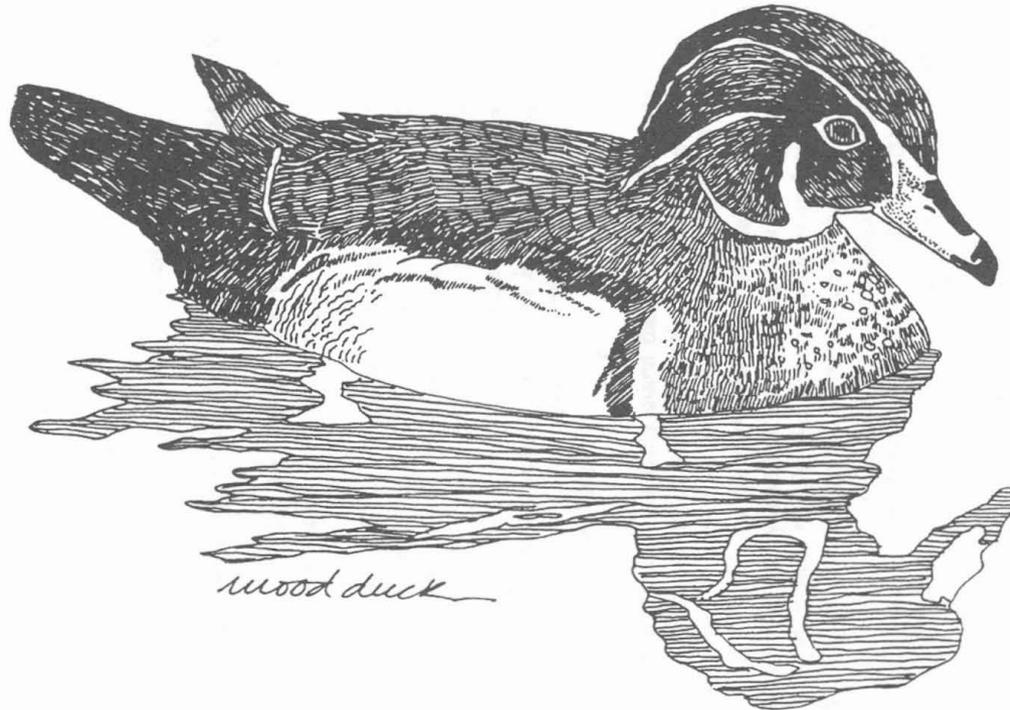
Church Ditch, operated by the Church Ditch Company, holds decreed absolute priorities to 113.03 cfs (cubic feet per second) of water from Clear Creek. The headgate is also located in Golden, and the canal runs for 26 miles through Jefferson County, including portions of the City of Arvada, until it ends near the intersection of 100th Avenue and Simms Street at the Ketner flume. The Church Ditch Company and all of its assets and priorities are owned by the Cities of Northglenn and Broomfield. The correspondence from the Farmers' Reservoir and Irrigation Company, the Church Ditch Company and the Farmers High Line Canal and Reservoir Company, responding to Service (Harvey Wittmier's) inquiries, specifically refer to the need for mutual agreements between the Service and the companies covering liability and conflicts with maintenance operations of these canals. Most importantly, they maintain that Refuge ponds are probably entirely supplied by seepage from the ditches, and the companies cannot guarantee that this seepage will not be prevented by future conservation measures, i.e., lining the ditches. Only the FHL has stated a willingness to work with the Service to offset the loss of such water by agreeing to allow the bypass of natural drainage that enters the FHL. However, FHL also states in their letter, "The FHL Canal is under no obligation to continue to intercept the natural drainage water, and in order to protect the water quality in Standley Lake, may undertake responsibility for construction of this bypass. During acquisition negotiations for this property, the Service representative should attempt to get a commitment for use of this storm water run-off to supply the ponds."

Since the seepage waters cannot be guaranteed, in addition to the stormwater run-off, the only other means of protecting the Two Ponds Refuge water supply is the acquisition of available shares in the FHL Canal Company. Ms. Evelyn Lighter owns 1/2 share of FHL. Home Federal S&L also has a headgate and 1/4 share of FHL, although Service staff were advised that this headgate has not been used for some time and would require a measuring flume estimated at \$500. These particular shares are not attached to the lands and can be sold separately with the current value estimated to be between \$108,000 and \$112,000 per share.

These FHL shares provide water for 7-1/2 months, April 1 through November 15 each year, with the possibility of additional water during free water conditions. FHL delivers 100 % when 206 cfs is taken from Clear Creek. Any decrease in that amount results in the prorating of the amount delivered per share. Mr. Ziegler advises that it is rare to receive less than 200 cfs, and the amount will never go below 48 cfs with users receiving no less than 20%. Service staff had further discussions with Mr. Kelly DiNatelli of the City of Westminster (the largest FHL shareholder) who stated that in an average year, FHL supplies 22 acre-feet per share and only 10 acre-feet per share

in a dry year. However, there is a pending lawsuit (Schedule Water Suit) between the City of Arvada and FHL, and if Arvada wins, a dry year supply will be reduced to about 3 acre-feet per share. That reduced amount would not be sufficient to maintain the ponds. Both the Division Water Commissioner and Mr. DiNatelli have stated that the FHL's water rights are for a multitude of uses.

The mean annual precipitation of 15.97 inches and the mean annual evaporation of 40 inches results in a loss of 24.03 inches per year. Over the 1.238 surface acres impounded at the Refuge this results in a net loss of 2.478 acre-feet annually.



Appendix H—Intra-Service Section 7 Consultation on Water Use

On October 3, 1996, the Service initiated and completed an informal Section 7 Consultation under the Endangered Species Act on the proposed operation of the Refuge (attached). The result of this consultation identified an annual depletion of 2 acre-feet of water to both the central and lower reaches of the Platte River. The Service has agreed to the reasonable and prudent alternative of utilizing the National Fish and Wildlife Foundation account to offset the project-related impact to Platte River fish and wildlife resources. Therefore, \$70.00 will be debited annually from the Foundation account for use in restoring Platte River habitat for threatened and endangered species.



BS/CO: BS:BSA:Sect 7:
Small Depletion BO

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Colorado Field Office
730 Simms Street, Suite 290
Golden, Colorado 80401

RECEIVED

OCT 17 1996

U.S. FISH & WILDLIFE SERVICE
ROCKY MOUNTAIN ARSENAL NWR

Memorandum

OCT 03 1996

TO: Project Leader, Rocky Mountain Arsenal National Wildlife Refuge

FROM: Colorado Field Supervisor, Ecological Services, Golden, CO *Rey W. Curtis*

SUBJECT: Biological Opinion for Minor Water Depletions to the Platte River System at Two Ponds National Wildlife Refuge

In accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et seq.) and the Interagency Cooperation Regulations (50 CFR 402), the U.S. Fish and Wildlife Service (Service) has reviewed your September 17, 1996, correspondence regarding the impacts from the operation of the Two Ponds National Wildlife Refuge on Federally listed species and designated critical habitat occurring along the Platte River. It has been determined the proposed action, located in Jefferson County, Colorado, pertains to an existing project which results in an annual depletion of 2 acre-feet (af) to both the central and lower reaches of the Platte River.

Since 1978, the Service has consistently taken the position in its section 7 consultations that Federal agency actions resulting in water depletions to the Platte River system are likely to jeopardize the continued existence of one or more Federally listed threatened or endangered species and adversely modify or destroy designated critical habitat. Consequently, the Service has adopted a jeopardy standard for all such actions requiring formal section 7 consultation. In light of this, the Service concurs with your determination that the proposed project is likely to jeopardize the continued existence of the following Federally listed species: whooping crane (*Grus americana*), least tern (*Sterna antillarum*), piping plover (*Charadrius melodus*), and pallid sturgeon (*Scaphirhynchus albus*). This project may also result in adverse modification or destruction of designated critical habitat of the whooping crane.

During the course of informal consultations with a number of Federal agencies, the Service learned that there are over 1,000 proposed projects which will deplete water from the Platte River system and require formal section 7 consultation. It was also determined that the vast majority of these projects would likely result in individual depletions of 25 af or less per year. To effectively deal with such an anticipated large workload, it was necessary for the Service to develop a stream-lined approach which meets the requirements of section 7 for offsetting the adverse effects of each Federal agency action resulting in a minor water depletion.

An intra-Service section 7 consultation was conducted in coordination with those Federal agencies whose actions may result in minor water depletions of 25 af or less per year to the Platte River system. This led to the issuance of a biological opinion by the Service on June 13, 1996, which provides reasonable and prudent alternatives to avoid the likelihood of jeopardy to Federally listed species and adverse modification or destruction of designated critical habitat occurring along the Platte River. To satisfy the requirements of the Act, Federal action agencies and project proponents (i.e., both Federal and non-Federal) are provided reasonable and prudent alternatives described in the aforementioned biological opinion furnished to your agency.

As a result of informal section 7 consultation with your agency on the proposed Federal action described above in the first paragraph, it is the Service's understanding that you intend to take advantage of the reasonable and prudent alternative authorizing the availability of funds in a National Fish and Wildlife Foundation account for use in off-setting the project-related impacts to Platte River fish and wildlife resources. Therefore, it has been calculated that \$70.00 will be debited from the Foundation account for use in restoring Platte River habitat as described in the referenced biological opinion.

The Service hereby agrees that the process described above will serve to offset the project related impacts and avoid the likelihood of jeopardy to Federally listed species and adverse modification or destruction of designated critical habitat. Any need for reinitiation of formal consultation on this proposed action will be as outlined in the CONCLUSION section of the referenced biological opinion.

Questions or need for additional information regarding this matter may be referred to Clay Ronish within our office by calling (303) 231-5280.

CC: FWS/NE Field Office (Attn: Wally Jobman)
FWS/COKANUT (Attn: Mike Stempel)
Project File
Reading File



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Rocky Mountain Arsenal National Wildlife Refuge
Building 111
Commerce City, Colorado 80022-1748
Telephone (303) 289-0232
Fax (303) 289-0579

September 17, 1996

MEMORANDUM

TO: Field Supervisor, Colorado Field Office, Ecological Services

FROM: Project Leader, Rocky Mountain Arsenal National Wildlife Refuge

SUBJECT: Intra-Service Section 7 Consultation for Minor Water Depletion to the Platte River System at Two Ponds National Wildlife Refuge

This memorandum responds to stipulated procedures for required Intra-Service Section 7 consultation related to minor water depletion (less than 25 acre-feet per year) to the Platte River system resulting from management of aquatic habitats at Two Ponds National Wildlife Refuge in Arvada, Colorado. This response complies with guidance contained in the Regional Director's memorandum of June 13, 1996, concerning Intra-Service consultation for minor water depletions to the Platte River system.

Management of aquatic habitats at Two Ponds National Wildlife Refuge results in a water depletion to the Platte River system totaling 2.0 acre-feet per year. At this time, the Refuge has no means to replace this water so funding for aquatic and terrestrial habitat restoration is the reasonable and prudent alternative required to avoid jeopardizing listed species in the Platte River system from this water depletion. The attached table includes calculations used to determine the required dollar amount from the Refuge to be provided for habitat restoration in the Platte River system. Beginning in FY 1997, the Refuge will provide an annual transfer of funds in this amount to the proper account for habitat restoration.

With this memorandum, I am requesting your concurrence with the above approach for completing Section 7 requirements related to existing water depletions at Two Ponds National Wildlife Refuge. Please contact me at 303-289-0232, extension 117 at any time if you have questions or recommendations regarding this issue.

Formula for Calculating the Aquatic and Terrestrial Habitat Restoration and Maintenance Costs for Management of TWO PONDS NATIONAL WILDLIFE REFUGE Resulting in an Annual Water Depletion of 2.0 acre-feet (af) to the Platte River System Upstream from Chapman, Nebraska.

Two Ponds NWR Depletion						
<u>in AF per year</u>		<u>2 AF</u>	=	<u>0.0000007</u>		
Total Estimated		2,650,000 AF		Two Ponds NWR		
Annual Depletion in				Share		
Basin						
417,000 AF	X	0.0000007	X	\$37/AF	=	\$10.80
Annual		Two Ponds Share		Water		Two Ponds Cost
Streamflow				Acquisition		for Water
Shortfall				Cost		Acquisition
29,000	X	0.0000007	X	\$2,500/acre	=	\$50.75
Acres of		Two Ponds Share		Habitat		Two Ponds Cost for
Habitat				Restoration, and		Habitat Restoration and
Needed				Maintenance Cost		Maintenance
\$10.80		+	\$50.75		=	\$61.55
Two Ponds Cost			Two Ponds Cost for Habitat			Total Two Ponds Cost
for Water			Restoration and Maintenance			for Aquatic and Terrestrial
Acquisition						Habitat Restoration and
						Maintenance

Appendix I—Step-down Objectives

Natives

The Service will survey the Refuge in the spring of 1996 and mark the areas to be plowed and reseeded. A fall plowing in 1996 followed by a second plowing operation in the spring of 1997, two disking operations, and at least one harrowing will be applied to eliminate the existing brome grass.

All preparation will be on the contour in 50-100-foot strips. The grass seed should be planted after November 1, as a dormant seeding, or in the spring after April 30.

Trees

By the fall of 1997, the Service will survey woodland acreage to determine the current amount of Refuge woodland coverage. Depending upon results of this survey, Service staff will develop and implement a plan to achieve the goal of 10% tree cover on the Refuge.

Wildlife

A number of point count stations were established in 1994 to monitor bird use of the Refuge. Bird species and numbers are monitored year-round to add to the species list and determine seasonal abundance. A special effort will be made each spring to monitor breeding bird populations. Additional stations were added in 1996 to include recently acquired land.

Three small mammal trapping grids were established in 1994. Small mammals will be live trapped and marked annually to determine species

presence or absence and habitat use. An additional grid will be established in 1997 to include recently acquired land.

The Service will conduct surveys during 1997 to determine sensitive wildlife areas and periods of use to minimize disturbances to wildlife. From these surveys, strategies will be implemented to minimize impacts to wildlife due to potential habitat restoration and environmental education/public use projects.

Drift fences with pit-fall and funnel traps will be placed in various habitats during 1997 to trap reptiles and amphibians. Wetlands will be monitored for salamander larvae and tadpoles. Reptile hiding places, such as brush piles, rocks, and logs will be overturned and checked incidentally.

Aquatic

During 1997, grass carp will be stocked initially at a rate of 15 per surface acre to control aquatic vegetation. The Service will stock fathead minnows at a rate of 500 per surface acre during the spring of 1997. Stocking fatheads will provide a food source for wading and shorebirds and provide opportunities for environmental education classes.

To control mosquito numbers, the Service will stock 500 mosquito fish in Marshall Pond, 500 mosquito fish in Unnamed Pond and 200 mosquito fish in the Lighter Pond per season beginning in spring 1997. During 1998, mosquito fish will be stocked in the spring (mid-April) after the first mosquito larvae are detected in the ponds.

Environmental Education Curriculum Development

Begin planning EE curriculum with local teachers	March 1996
Test curriculum with local school	April-May, 1996
Draft EE curriculum outlines	June-July 1996
Recruit and train volunteer leaders and teachers	July-Aug. 1997
Begin EE classes at Refuge	Sept.-Oct. 1997

THE FOLLOWING FACILITIES WILL BE DEVELOPED TO SUPPORT ENVIRONMENTAL EDUCATION AND PUBLIC USE PROGRAM GOALS AND OBJECTIVES.

1997 Schedule

Design gate house interpretive panels	January
Hold public meeting on Refuge plan	March
Construct gatehouse/entry gate/kiosk	April
Design pavilion	April-June
Mow trails in Environmental Education and Prairie Management Areas	May

Identify possible funding sources for construction of Refuge facilities	June
Draft specs for parking lot	July
Complete fence around Environmental Education Area	Sept.
Construct parking lot (contingent on funding)	Nov.-Dec.
Stripe parking lot (contingent on funding)	Nov.-Dec.

Phase III 1998

Prepare specs for pavilion, platforms, and boardwalks	Jan.-Feb.
Apply for assistance from previous funding sources	Mar.-Apr.
Reseed disked areas	Apr.-May
Construct restrooms/pavilion/amphitheater	

Phase IV 1999

Convert mowed trails and interpretive overlooks to hard surface.

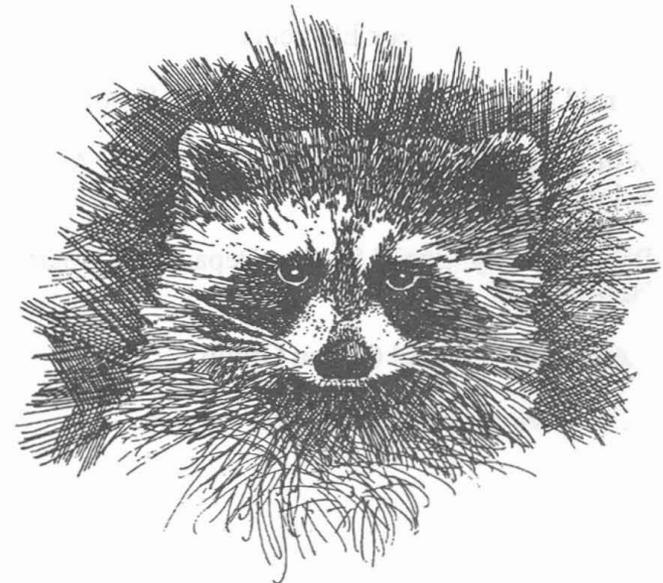
Construct interpretive overlooks.

Design bridges over the Croke, Farmers High Line, and Church Ditch Canals.

Phase V 2000

Construct bridges over Croke, Farmers High Line, and Church Ditch Canals.

Complete interpretive signage at overlooks.



Appendix J—Letters of Support

Congressman David Skaggs, Colorado 2nd District

City Council of the City of Arvada

Neighbors of the Two Ponds National Wildlife Refuge

North Jeffco Park and Recreation District

Colorado Wildlife Federation

Lutheran Medical Center

Dudley Weiland, Peck Elementary School

Harold Pratt, Jefferson County Public Schools

William Jones, Science Department Chair, Arvada West High School

Richard Feely, Social Studies Department Chair, Arvada West High School

Sierra Club - Rachel Carson Group

U. S. Environmental Protection Agency

