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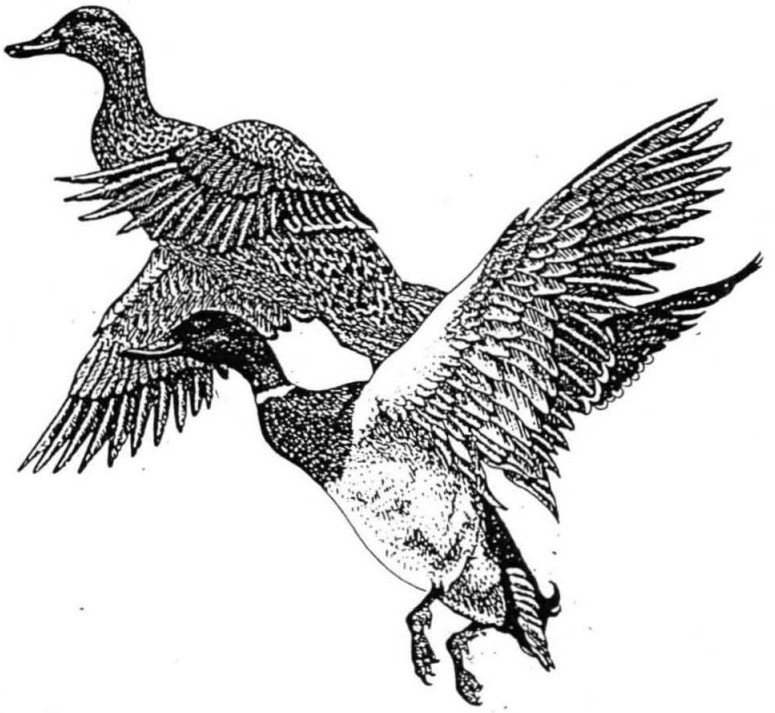
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

ENVIRONMENTAL ASSESSMENT
BEAR RIVER MIGRATORY BIRD REFUGE HUNT PLAN

Brigham City, Utah
June 1995



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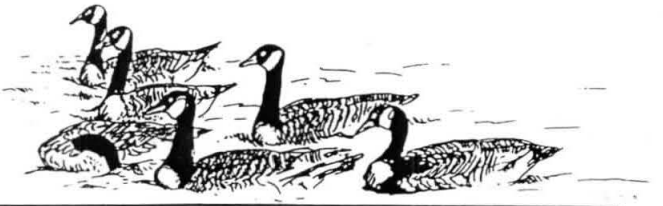

SUMMARY: BEAR RIVER MIGRATORY BIRD REFUGE HUNT PLAN ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) is designed to evaluate possible actions for modifying the Bear River Migratory Bird Refuge (Refuge) public hunt plan.

Refuge enabling legislation was passed by the Congress in 1928. After initial development of impoundments was complete, the Refuge was placed under administration in 1932. The public hunting program was initiated at the same time. It contained 13,200 acres in two blocks of land representing 40% of the impounded area. Local sportsmen and the State Game Commissioner were consulted in selecting the area.

With only minor modifications, the original hunt plan remained in place until flooding of the Great Salt Lake in 1984. Then, high waters overtopped Refuge dikes and destroyed marsh vegetation and all management facilities. Hunt boundaries were modified accordingly during the period of high water levels. As water levels receded in the early 1990's, interim hunt boundaries were established on dikes until the original boundaries could be resurveyed.

In October 1991, an EA was approved for the restoring and expanding the Refuge. It identified 17,000 acres of wetlands and uplands which could be purchased from willing sellers and added to the Refuge. To date, 8,358 acres of lands have been purchased containing 1,980 acres of wetlands. An acreage equivalent to 40% of those wetlands (792 acres) will be added to the wetland acreage open to hunting. With this in mind, the Fish and Wildlife Service is evaluating options for the addition of those acres to the public hunt area and modifying the historic boundaries to meet wildlife and public use objectives.

Issues raised during the review of the hunt plan proposal and from public input are categorized as: Biological, Opportunity for Harvest, Aesthetics, Public Safety, Accessibility, Habitat Variety, Law Enforcement, Boundaries and Quality of Life. After issues were identified, sixteen objectives of the hunt plan were developed.

Numerous alternative actions were discussed, six of which were selected for consideration. Each alternative, except No Action, contains 14,000 acres of flooded wetlands, even though the total area open varies due to non-flooded lands which were included. Also, unit 2 is open in each alternative and the south side of unit 1 is closed for trumpeter swan protection.

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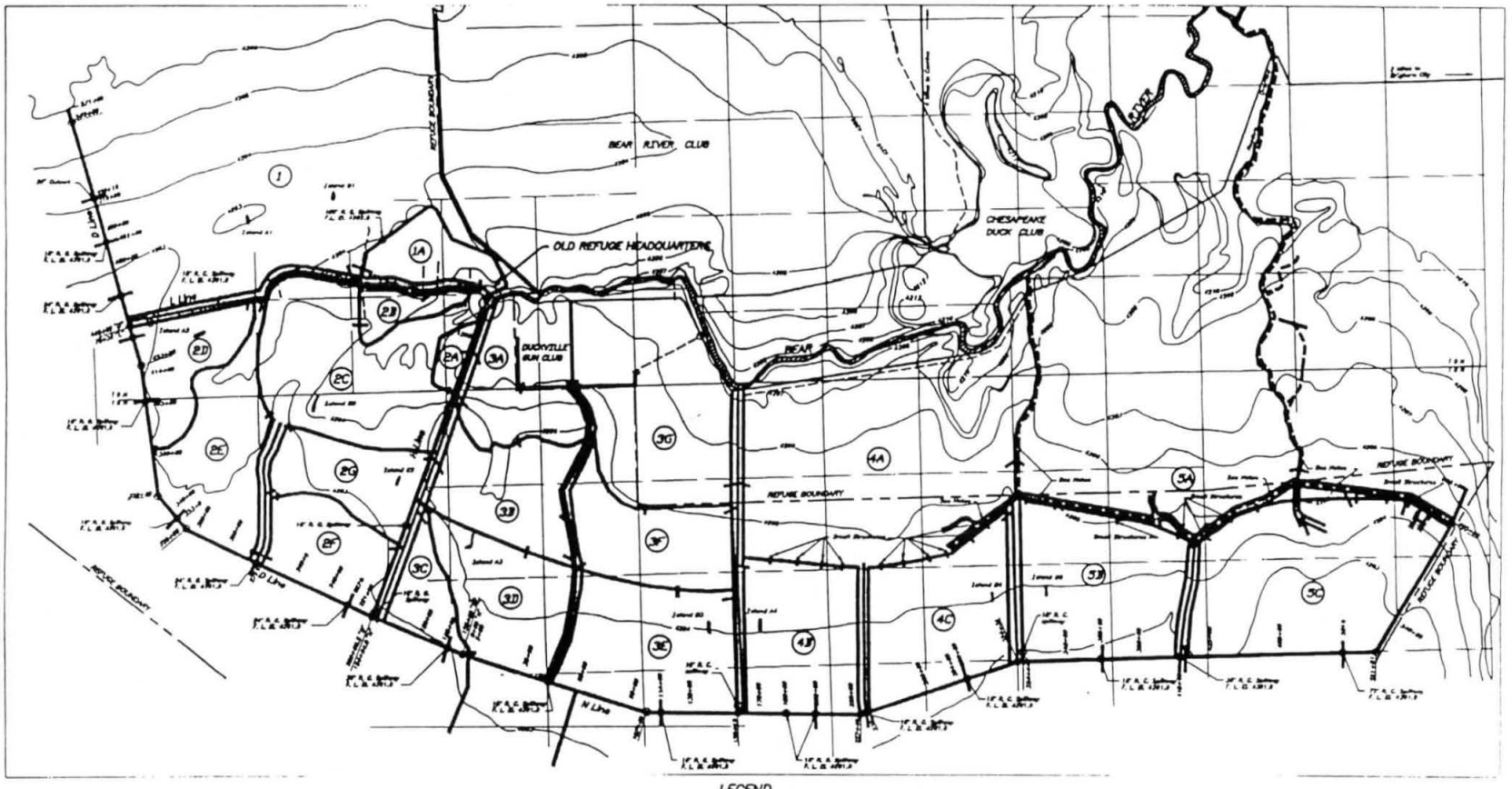
Environmental Issues

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
PHYSICAL						
CLIMATE	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
AIR QUALITY	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
SOILS	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
TOPOGRAPHY	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
HYDROLOGY	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
GEOLOGY	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
BIOLOGICAL						
VEGETATION	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
WILDLIFE						
Threat/Endangered Spp.	Bald eagles and pergrine falcons diplaced from hunt areas. Trumpeter swans exposed to risk of incidental harvest. Travel corridors cross hunting zones.	Bald eagles and pergrine falcons diplaced from hunt areas. Trumpeter swans exposed to risk of incidental harvest. Travel corridors cross hunting zones.	Bald eagles and peragrines displaced from hunt areas. Trumpeters exposed to incidental harvest. Disturbance concentrated in Block A.	Bald eagles and pergrine falcons diplaced from hunt areas. Trumpeter swans exposed to risk of incidental harvest. Travel corridors cross hunting zones.	Bald eagles and peragrines displaced from hunt areas. Trumpeters exposed to incidental harvest. Disturbance concentrated in Block A.	Bald eagles & peregrines displaced from hunt areas. Incidental harvest/ trumpeters. Disturbance concentrated Block A. Safe travel corridor from Unit 1 provided.
Critical Habitat	None designated	None designated	None designated	None designated	None designated	None designated
Feeding	Feeding compromised in open hunt areas. Boat lanes in Unit 9 disruptive. Deep water feeding habitat limited.	Feeding compromised in open hunt areas. Boat lanes in Unit 9 disruptive. Deep water feeding habitat limited.	Feeding compromised in open hunt areas. Feeding areas left undisturbed by concentrating hunting in BLock A. Some disturbance to SC from hunting in Block B.	Feeding compromised in all open hunt areas. Feeding in Units 3,4,and reduced by airboat use in adjacent units.	Feeding compromised in open hunt areas. Boat lanes in Unit 9 disruptive. Deep water feeding habitat limited.	Feeding compromised in open hunt areas. Boat lanes in Unit 9 disruptive. Deep water feeding habitat limited.
Breeding	Limited habitat for protection of hatching year redheads and canvasbacks	Limited habitat for protection of hatching year redheads and canvasbacks	Habitat protected for Hatching year canvasbacks and redheads.	Limited habitat for protection of hatching year redheads and canvasbacks	Habitat protected for Hatching year canvasbacks and redheads.	Habitat protected for Hatching year canvasbacks and redheads.
Resting	Rest area for swans in Unit 1 jeopardized. Unit 9 and 5 disturbed by airboats in adjacent units.	Rest area for swans in Unit 1 jeopardized. Unit 9 and5 disturbed by airboats in adjacent units.	Rest area for swns in Unit 1 jeopardized . Rest areas in units 3, 4, 5 buffered from disturbance in adjacent units.	Rest area for swans in Unit 1 jeopardized. Unit 9 and5 disturbed by airboats in adjacent units.	Unit 1 rest area undisturbed. Rest areas in 3, 4, and 5 buffered by closure of adjacent units.	Unit 1 rest area undisturbed. Rest areas in 3, 4, and 5 buffered by closure of adjacent units.
Spp. Diversity/Abund.	Limited habitat diversity in closed areas. Disturbance in separated areas may limit diversity.	Limited habitat diversity in closed areas. Disturbance in separated areas may limit diversity.	A diversity of habitats undisturbed. Species diversity may be limited by hunting in dry years.	A diversity of habitats undisturbed. Species diversity may be limited by hunting in dry years.	A diversity of habitats undisturbed. Species diversity may be limited by hunting in dry years.	A diversity of habitats undisturbed. Species diversity may be limited by hunting in dry years.
Resident Species	Some resident species would be displaced from open hunt areas.	Some resident species would be displaced from open hunt areas.	Some resident species would be displaced from open hunt areas.	Some resident species would be displaced from open hunt areas.	Some resident species would be displaced from open hunt areas.	Some resident species would be displaced from open hunt areas.
Migratory Species	Human activity in 3 separated areas.	Human activity in 3 separated areas.	Disturbance minimized by concentration in core area.	Distrubance affects large area.	Distrubance to raptor perch sites in Block C.	Distrubance to raptor perch sites in Block C.
Depredation	Depredation of waterfowl may be facilitated if birds concentrate in rest areas.	Depredation of waterfowl may be facilitated if birds concentrate in rest areas.	Depredation of waterfowl may be facilitated if birds concentrate in rest areas.	Depredation of waterfowl may be facilitated if birds concentrate in rest areas.	Depredation of waterfowl may be facilitated if birds concentrate in rest areas.	Depredation of waterfowl may be facilitated if birds concentrate in rest areas.
Exotic Species	No Impact.	No Impact.	No Impact.	No Impact.	No Impact.	No Impact.
Botulism Mortality	Mortality may increase or decrease depending on conditions. Hunting disturbance in 3 areas.	Mortality may increase or decrease depending on conditions. Hunting disturbance in 3 areas.	Mortality may increase or decrease. Hunt areas more concentrated minimizing disturbance.	Mortality may increase or decrease. Linear narrow hunt area maximizes disturbance.	Mortality may increase or decrease. Hunt areas more concentrated minimizing disturbance.	Mortality may increase or decrease. Hunt areas more concentrated minimizing disturbance.
SOCIOECONOMIC						
CULTURAL						
Archelogical Sites	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Educational Opportunity	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Research Opportunity	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Recreational Opportunity						
Wildlife Observation	Hunting limits wildlife observation in Unit 2, however Unit 9 profiles rest area for birds.	Hunting limits wildlife observation in Unit 2, however Unit 9 provides rest area for birds.	Hunting limits wildlife observation in Unit 2 and 9, however Unit 1. 3b, &3c, provides rest area for birds.	Hunting limits wildlife observation in Unit 2, however Unit 1,9, 3a, & 3c provides rest area for birds.	Hunting limits wildlife observation in Unit 2and 9, however Units 1 and 3c provides rest area for birds.	Hunting limits wildlife observation in Unit 2 & 9, however Units 1, 3a & 3b 9 provides rest area for birds.
Photography	Most photographic opportunities for wildlife in Unit 9.	Both Units 1 & 9 provide opportunities to photograph wildlife.	Units 1, 3b & 3c provide photographic opportunity.	Units 1, 3a, b, c & 9 provide photographic opportunity.	Most photographic opportunities provided by Units 1 & 3c.	Photographic opportunities provided in Units 1, 1a, 3a & 3b.
Harvest Opportunity	Ranked among best public hunting. Emergent marsh and open water habitat in two hunting blocks 12,600 acres open	More hunting opportunity in blocks A & C. Block B same as historic. Has emergent marsh and open water and small amount of grasslands. 15,173 acres open.	More opportunity in Block A. Historic Block B eliminated more emergent marsh & a mix of habitats & grasslands & moved north of Unit 5. More habitats open. 16,126 acres open.	Less opportunity in Block A. More opportunity in Block B and C. Mostly emergent marsh, open water, mud flats & grasslands. 17,904 acres open.	More opportunity in Block A. Historic Block B eliminated and moved north of Unit 5. Emergent marsh and mix of other habitats, grasslands emphasized. 17,256 ac. open.	Less opportunity in Block A. Historic Block B eliminated & moved to north of Unit 5. Emergent marsh and mix of other habitats, grasslands emphasized. 18,285 ac open.

Aesthetics	High density of hunters in Block A. Illegal shooting from dikes is frequent. Emergent marsh in Block A. Mud flats in Block B.	High density of hunters in Block A & C. Illegal shooting from dikes is frequent. Prime emergent marshes in Block A. Mud flats in Block B. Grasslands in Block C.	High density of hunters in Block A & C. Illegal Shooting from dike road. Prime emergent marsh and remote mud flats in Block A. Some grasslands Block B.	High density of hunters in Blocks A & C. Illegal shooting from dike road. Emergent marsh in block A. Mud flats, open water in Block B. Some grasslands in Block C.	High density of hunters in Block A & B. Illegal shooting from dike road. Emergent marsh and mud flats in Block A. Large grassland in Block B. Mud flats in Block C.	High density of hunters in Block A & B. Illegal shooting from dike roads. Emergent marsh and mud flat in Block A. Extensive grasslands in Block B. Mud flats in Block C.
Public Safety	Some risk at airboat launches. Illegal dike shooting poses some risk. Medical attention distant.	Some risk at airboat launches. Illegal dike shooting poses some risk. Medical attention distant.	Some risk at airboat launches. Illegal dike shooting poses some risk. Medical attention distant.	Some risk at airboat launches. Illegal dike shooting poses some risk. Medical attention distant. Search and rescue difficult in Block B.	Some risk at airboat launches. Illegal dike shooting poses some risk. Medical attention distant.	Some risk at airboat launches. Illegal dike shooting poses some risk. Medical attention distant.
Accessibility	Block A accessible by foot, boat, and auto. Block B accessible mainly by airboat. 90 % historic use in Block A.	Block A accessible by foot, boat and auto. Block B accessible mainly by airboat. Block C accessible by foot, boat, and airboat.	Block A above D-line accessible by foot, boat and auto. Block A below D-line accessible by airboat, foot and boat. Block B accessible by foot, boat, and airboat.	Block A accessible by foot, boat, and auto. Block B accessible mainly by airboat. Block C accessible mainly by airboat.	Block A above D-line accessible by auto, foot & boat, below D-line accessible by airboat, & by foot and boat. Block B by boat, airboat and foot. Block C by airboat.	Block A above D-line accessible by foot, auto, & boat. Below D-line by airboat, foot & boat. Block B by boat, airboat & foot. Block C by airboat
Habitat Variety	Wetland habitat variety somewhat limited, mostly emergent marsh & open water. No grasslands for upland game.	Wetland habitat variety somewhat limited, mostly emergent marsh & open water. Some grasslands for upland game.	Wetland habitat variety mostly emergent marsh, open water and mud flats. Some grasslands will provide upland game hunting.	Wetland habitat variety mostly emergent marsh, open water and mud flats. Some grasslands will provide upland game hunting.	Wetland habitat variety mostly emergent marsh, open water, & mudflats. Extensive grasslands provide upland game hunting.	Wetland habitat variety is mainly emergent marsh, open water and mudflats. Extensive grasslands provide upland game hunting.
Law Enforcement	Half of boundary in wetlands and difficult to maintain. Hunter recognition of boundary is difficult in some areas and enforcement of regulations difficult in Block B.	Most boundaries on dikes and firm ground, requiring minimum maintenance. Hunter recognition of boundaries is easy. Law enforcement difficult in Block B.	Most boundaries require minimal maintenance. Hunter recognition of boundaries easy. Unit 6 boundary difficult to maintain. Enforcement difficult in Unit 9.	Most boundaries require only minimal maintenance. Boundaries easily recognized. Enforcement difficult in Block B.	Boundaries require minimal maintenance and are easily recognized. Enforcement difficult in Block C. Unit 6 boundary difficult to maintain.	Most Boundaries require minimal maintenance and are easily recognized. Enforcement difficult in Block C. Unit 6 boundary difficult to maintain.
Boundaries	Most boundaries are in wetlands and difficult to maintain.	Most boundaries are on natural features and easily maintained.	Most boundaries on natural features and easily maintained except Unit 6 boundary difficult.	Most boundaries on natural feature and easily maintained.	Most boundaries on natural features and easily maintained. South boundary Unit 6 runs through open water, difficult to maintain.	Most boundaries on natural features and easily maintained. South boundary Unit 6 difficult to maintain.
Fishing	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Boating	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Auto Tour Route	60% of the route open on both sides to hunting. No hunting allowed within 100 yard of route.	40% of the route open on both sides to hunting. No hunting allowed within 100 yard of route.	60% of the route open on both sides to hunting. No hunting allowed within 100 yard of route.	15% of the route open on both sides to hunting. No hunting allowed within 100 yard of route.	60% of the route open on both sides to hunting. No hunting allowed within 100 yard of route.	40% of the route open on both sides to hunting. No hunting allowed within 100 yard of route.
Public Access	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
ECONOMIC						
Cost	High cost boundary maintenance, much running through wetlands. Law enforcement costly in Block B. Hunter registration requires much staff time.	Most of boundary on dikes, less maintenance cost. Law enforcement costly in Block B, inaccessible. Eliminating hunter registration reduces staff cost.	Most boundary low maintenance cost, but Unit 6 , high cost in open water. Law enforcement difficult Unit 9. Eliminating hunter registration reduces staff cost.	Most of boundary on dikes, reducing management costs. Law enforcement costs high Block B. Eliminating hunter registration reduces staff costs.	Dikes require minimum maintenance, except Unit 6. Law enforcement costs high in Block A & C. Eliminating hunter registration reduces costs.	Dikes require minimum maintenance, except Unit 6. Law enforcement costs high in Block A & C. Eliminating hunter registration reduces costs.
Local Economy	Hunters purchase goods & services locally benefiting local economy @ $20.00 per visit during the 1960's & 70's approx. 4,000 hunter visits recorded annually.	More hunters may be attracted by additional acreage open to hunting in Block A & C. Economic benefit will increase if more hunters use the refuge.	More hunters may be attracted by additional acreage open to hunting in Block A & B. Economic benefit will increase if more hunters use the refuge.	Less acres open to hunting in Block A , the most popular area. Less hunters may be attracted, decreasing economic benefit.	More hunters may be attracted by additional acreage open to hunting in Block A & B. Upland game hunters may be attracted to grasslands in Block B.	Less acres open, Block A may attract less hunters, block B will attract more waterfowl & upland game hunters, hunter visits may stabilize or slightly increase.
Tax Revenue	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
LAND USE	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
SOCIAL						
Quality of Life	Improved by recreation and enjoyment of outdoors.	Improved by recreation and enjoyment of outdoors.	Improved by recreation and enjoyment of outdoors.	Improved by recreation and enjoyment of outdoors.	Improved by recreation and enjoyment of outdoors.	Improved by recreation and enjoyment of outdoors.
Community Cohesion	Improved by more recreationl	Improved by more recreationl	Improved by more recreationl	Improved by more recreationl	Improved by more recreationl	Improved by more recreationl
Residences	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Population Change	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Human Health & Safety	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Public Service	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
National Defense	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Aesthetics	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact



LEGEND

Pond Designation — (1)
Existing dike
Existing canal or ditch
Existing Structure — (1)
Existing refuge boundary
New Supply Channels
New Dike
New Drainage Channels and Spillways
New Irrigation Canal

NOTES

Topography based on United States Fish and Wildlife Service drawing Number W-UTAH-1-27.1

BEAR RIVER BIRD REFUGE

KEY MAP

SCALE OF FEET

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
REGION 6 ENGINEERING — DENVER COLORADO

BEAR RIVER MIGRATORY BIRD REFUGE

LOCATION MAP

DRAWING NO. | SHEET OF

REVISED 4 - 3 - 82

BEAR RIVER MIGRATORY BIRD REFUGE HUNT PLAN

INTRODUCTION

General:

The Bear River Migratory Bird Refuge (Refuge), located at the confluence of the Bear River and the Great Salt Lake in northern Utah, is internationally recognized for its unique wetland and wildlife values. The marsh ecosystem supports diverse populations of waterbirds for staging, feeding and reproduction. In 1983, the Refuge was inundated by flood waters from the Great Salt Lake, destroying vegetation and facilities. In 1989 when flood water receded, all that remained of the marshes were barren mudflats.

In planning the Refuge restoration, Hansen (1991) wrote an Environmental Assessment (EA) entitled The Restoration and Enhancement of Bear River MBR, approved in October 1991. It provides an in-depth description of the Refuge along with it's goals and objectives. Also, it contains an overall analysis of the environmental and socio-economic consequences of enhancing and restoring the entire Refuge.

This document is focused only on public hunting and the development of a Hunting Plan designating areas open to hunting and associated regulations.

The Hunt Plan includes waterfowl and pheasants. Since the Refuge is being developed and expanded, we expect further revisions will be necessary. In addition, annual reviews are required to ensure standard criteria are being met for compatibility.

Wetland conditions vary from year to year, affecting hunting quality and quantity. Even so, the hunt plan will remain constant and will not be adjusted on an annual basis to account for temporary climatic variables. Frequent and rapid adjustments are both confusing to the public and require significant efforts to post new boundaries.

To meet habitat needs of birds, wetland conditions will intentionally be modified from time to time. Such changes may impact hunting, but managers will give priority to the needs of wildlife. Affects to hunting will be considered secondarily to wildlife management.

Legislative Guidelines:

The Secretary of the Interior is authorized by the National Wildlife Refuge System Administration Act of 1966 and the Refuge Recreation Act of 1962 to allow hunting on Refuges after a determination that hunting is compatible with the major purposes for which the area was established. In addition to requiring compatibility, the Refuge Recreation Act also requires that funds are available for developing, operating and maintaining the hunting program.

Hunting is viewed as an acceptable, traditional form of wildlife-oriented recreation that may serve as a tool for manipulating wildlife populations (USFWS 1986).

Hunting programs are evaluated on the following criteria: 1) Compatibility with refuge purposes, 2) Biological soundness, 3) Funding availability, 4) Conflicts with other wildlife-oriented public uses, and 5) Recreational opportunity. Evaluations are required annually.

USFWS Refuge Manual guidelines also require coordination with the State, endangered species consultation under section 7 of the Endangered Species Act (ESA) and public involvement and review.

Section 5 of Senate Bill 3194 (Enabling Act), creating the Refuge and appropriating development money, specifies 60% of the Refuge will be an "inviolate sanctuary". Therefore, public hunting can only be allowed on up to 40% of the refuge. (attachment 1)

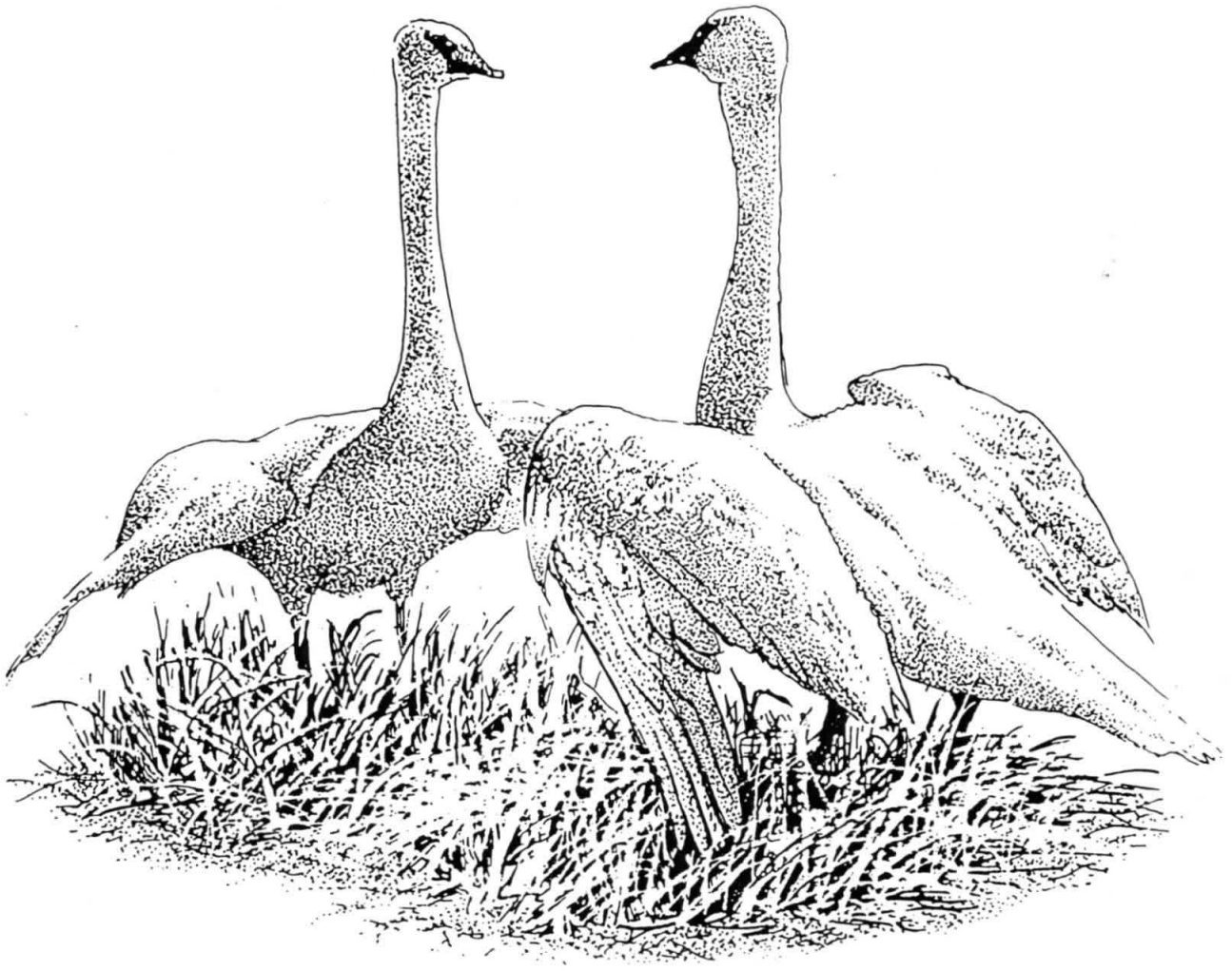
In 1932, pursuant to the Enabling Act, 13 regulations were issued by the Secretary of Agriculture dealing with the administration of the Refuge. Regulation 3 states "Hunting, killing, or taking migratory game birds will be permitted in accordance with State and Federal law upon approximately forty per cent (40%) of the flooded area of the refuge as shall be designated from time to time..." (attachment 2). Other restrictions included: closing 100 yards on either side of dike roads to hunting, requiring hunters to register and report birds killed, and allowing public travel on designated routes only.

Determining boundaries of the original hunting area required approval from both the state "Game Commissioner" and the Governor. Need for changing the hunt areas from time to time was recognized when it is in the interest of the birds as well as the shooting. Hunting areas were supposed to provide "Reasonable shooting privileges" as they existed at the time the areas were established.

The waterfowl season of 1932 was the first time regulations were in effect relative to shooting on the Refuge. In cooperation with the State Game Commissioner and after consultation with a committee representing the sportsmen of Utah, the open area for public shooting was agreed upon. A total of 13,200 acres, or about 40% of the

"flooded" area, that portion of the refuge was officially opened for public hunting by the Secretary of Agriculture (attachment 2).

No major changes were made to the boundaries until necessitated by flooding of the Great Salt Lake in the mid 1980's.



Need to Modify the Hunt Plan:

Hunting is permitted on any refuge within the Refuge System upon determination that hunting is compatible with the major purposes for which such areas were established. In addition to a compatibility determination, funds are available for the development, operation, and maintenance of the hunting program. The USFWS has long recognized the significant positive benefits that can be attributed to a well-managed hunt. Hunting is an acceptable, traditional form of wildlife-oriented recreation that may also serve as a management tool for the effective manipulation of wildlife population levels. A major objective of the USFWS is to provide the public with a quality wild-life oriented experience and the opportunity to utilize a renewable natural resource.

The refuge was placed under administration October 1, 1932 and on October 12th, the Secretary of Agriculture officially designated the "Public Shooting Grounds Within The Bear River Migratory Bird Refuge".

When Refuge impoundments were flooded in 1984 temporary adjustments to the hunt boundary were made. High water destroyed all vegetation as well as public use facilities. Since D-line dike was the only remaining landmark, it was used to designate the hunt area boundary. The area southwest of D-line was open. As water levels further receded, Units 2 and 1A were added to the hunt area.

Concurrent with this temporary change in hunt area boundaries, an environmental assessment was approved which enabled purchase of new lands for the refuge. The approved expansion includes nearly 17,000 acres of lands, containing a mix of wetland and upland. Forty percent of the "flooded" acreage of newly acquired lands are to be added to the 13,200 acre hunt acreage.

To date, a total of 8,358 acres have been purchased. The "flooded" portion of those lands totals 1,980 acres. Forty percent of the 1,980 flooded acres, 792 acres are to be added to the present hunt area acreage.

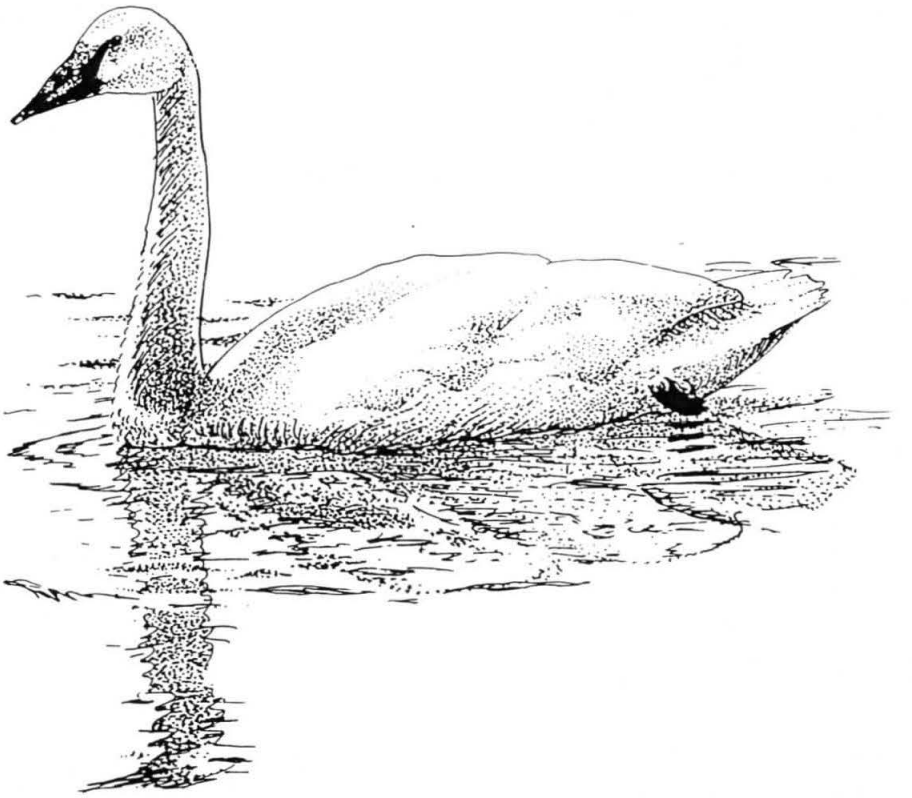
The strict definition of "flooded" is not spelled out in the legislation, however it is referred to in various documents as the area "developed", "impounded", or "diked" and was agreed upon as 33,000 acres in 1932. Apparently, it was considered the impounded area above D-line. The remaining 31,500 acres of the refuge were not included as "flooded" even though they contain marsh, wetlands and mudflats which are naturally flooded on an intermittent basis.

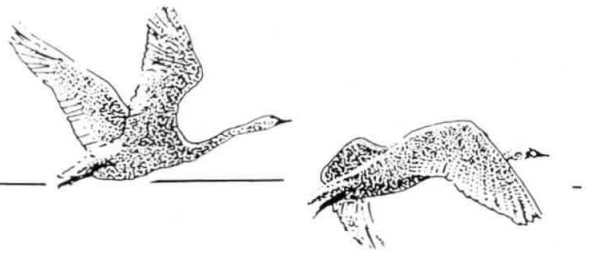
Therefore, the hunt plan needs complete review to ensure an adequate acreage is open to hunting, that open areas provide appropriate quality of hunting, and sanctuary areas provide enough protection for birds.

Objectives of the Hunt Plan:

During public scoping sessions, a variety of people with different interests identified many issues that concerned hunting at the Refuge (appendix). After careful consideration, all of the issues and concerns were summarized to create 9 objectives. The 9 objectives are to:

1) Provide high quality hunting
2) Minimize conflicts with other uses
3) Provide remote hunting areas
4) Provide areas open to airboats
5) Facilitate hunting access
6) Facilitate law enforcement
7) Minimize disturbance to swans
8) Minimize disturbance to rest areas
9) Protect breeding populations





AFFECTED ENVIRONMENT

Hansen's 1991 Environmental Assessment provides a thorough description of the Refuge and should be consulted for detailed information. This hunt plan EA focuses on the environment in terms of hunting and will provide an historic baseline to compare with other alternatives. Drastic changes in wetland vegetation occurred because of flooding from the Great Salt Lake in the mid-1980's. Large expanses of emergent vegetation were killed by the salt water. When the floods receded, the entire Refuge was barren of vegetation. Vast areas of open water and mudflats barren replaced emergent marsh habitats. Some areas have since become revegetated, but a much greater portion of open water and mudflat is present than in pre-flood years. Hunting methods have changed to accommodate the changes in habitat. More hunters utilize open water hunting techniques. Evaluations for this hunt plan were based on the current vegetation patterns and hunting practices on the Refuge. Undoubtedly, vegetation patterns will become more like historic conditions. Future reevaluations of the hunt plan will address the conditions that exist at that time.

Documentation of hunting prior to 1900 is sketchy, but indicates that tremendous wing-shooting existed throughout the delta. Jim Bridger, first European man to report seeing the lake observed "millions" of ducks and geese in 1824. In 1843, Fremont documented "multitudes" of birds (Nelson 1966). Market hunting occurred in the latter quarter of the 1800's. Near the end of the century, numerous hunting clubs organized around the delta and Bear River Bay. Members were attracted from across the country.

While settlement was taking place in the Bear River Basin, subtle changes were occurring to riverflows which affected the delta. Irrigation diversions for farming systematically depleted summer flows in the river. As a result, thousands of acres of delta wetlands were dried up by the early 1900's. As habitat conditions declined, huge outbreaks of avian botulism occurred, killing millions of birds. Declines in waterfowl populations prompted concerned citizens to propose establishing a bird refuge. Their efforts resulted in the Senate establishing the Bear River Migratory Bird Refuge in 1928. Funds were appropriated to build dikes, canals and water control structures. These facilities were aimed at impounding and managing riverflows to reclaim lost wetland habitat in the delta.

No hunting was allowed during initial development of the Refuge. Then, in 1932, the refuge was placed under administration and the first public hunting season was allowed. Through coordination with the State Game Commissioner and sportsmen groups, 13,200 acres were selected for hunting in two blocks. The first block (A)included part of unit 1, all of unit 2 and part of unit 3. The second block (B) was unit 6 (fig 2).

Initially, all aspects of the hunt were highly regulated. Hunters had to park at headquarters and go through a checking station. Each hunter was registered, checked for a plugged shotgun, state hunting license and duck stamp. Access to the refuge was by walking, bicycling or motor boating. Check out was required and all birds in the bag were recorded. No public access was available across refuge lands into unit 6, all access was through privately owned lands and hunt club property.

Over the years, more vehicle access was allowed around unit 2. Parking areas were established in several locations and boat ramps were built to facilitate access into units 1,2 and 3. When airboats were invented, they revolutionized access for hunters. Rapid travel over shallow water and wet mud became possible. Initially unrestricted use was allowed and airboat popularity grew. The remote mudflat areas became readily accessible for the first time. To assist airboat access into state owned lands, lanes were established through units 8 and 9. Small flat cars, on a track called "skids" in units 2 and 3, allowed hunters to move airboats over dikes (Goddard 1962).

Restrictions increased on airboat use through the years, primarily due to noise disturbance. Currently, airboat use is allowed only in unit 6 and in access lanes through unit 9 to Bear River Bay. All airboat use above D-line is restricted.

To improve public access into unit 6 during the 1950's, the D-line dike was graveled from the Perry gate to the first water control structure where a boat ramp was built. Before construction of Willard Bay Reservoir, no other public boat ramp was readily available.

Hunter use was much higher in block A than in block B (fig 2). Ninety percent of all hunter visits occurred in block A prior to the flood according to hunter registration records. Observations of current use of the refuge is similar to that proportion.

The historic hunt areas included a variety of habitats and a wide range of hunting opportunities. The upper delta habitats in unit 1A, 2, and 3 provided shallow emergent marsh suitable for hunters on foot or in boats. Vast open water areas, submergent marshes, in unit 1 and unit 2 were more inaccessible to hunters on foot and provide seclusion for hunters in boats. The remote open mudflats and shallow submergent marshes of Bear River Bay were accessible only by airboat or hunters willing to walk for multiple miles.

Hunt area boundaries were identified with signs mounted on posts. About half of the current boundaries ran through wetlands, while the other half were on dikes. Boundaries in wetlands require a considerable amount of annual maintenance. The boundary below "D" line is the most difficult to maintain, since it runs through the relatively deep water of Willard Spur and is susceptible to both water and ice movement.

Law enforcement consumes considerable amounts of staff time and energy. During the early years, all hunters were checked in and out of headquarters daily. Later, hunters were allowed to self register to save staff time. Currently, field checks of hunters are made on a sporadic basis as personnel and hunter activity dictate. The emergent marsh areas of block A are checked by officers on foot, in boats and historically with the aid of lookout towers located at headquarters and near the Perry gate. Enforcement activities are extremely difficult in block B (unit 6), due to the absence of vegetation and the remote nature of the area. Officers utilizing airboats for travel can be easily detected from long distances.

The Reeder Overflow is considered a navigable waterway and was used by the public until recently to access State owned lands north of Unit 5 . To settle legal claims, the State traded the lands they claimed adjacent to the channel to a private landowner for other lands not accessed by it. While the channel remains open to the public, it does not give access to any State lands.

Hunting methods varied. Some locations were suitable for pass shooting. Other hunters preferred setting decoys and building temporary blinds. For those preferring the seclusion of mudflats in the Bear River Bay-Willard Spur, decoys were placed over shallow water/mudflat habitat. Travel to those areas was via airboat or extended foot travel. The majority of hunters preferred to utilize the emergent marsh areas because they provided good concealment. Most hunters avoided hunting the open water where concealment was difficult. However, hunting methods changed after the Great Salt Lake destroyed the vast areas of emergent marsh vegetation and left only open water and mudflats to hunt. Hunters had to adapt their methods to open water and barren mudflats. Open water hunting is now more common than historically. As a result, disturbance to birds has increased in areas that once were more secluded within the hunting areas.

No major recurring public safety issues occurred, however some incidents happened from time to time. Watercraft sank at launch areas. Vehicles on the tour route were damaged by stray pellets. Airboats were stranded or broken down in remote areas. No major safety problems were of a serious, recurring nature.

Overall, hunting success ranked among the highest of all public hunting areas. An average of 3.2 birds were harvested per hunter/day over a 37 year period (Nelson 1966). Nine hundred hunter visits were recorded in the first open season (1932) and reached 6,605 in 1950. In 1994, hunter visits were 3500.

A broad variety of waterfowl were harvested in the various habitats and migratory periods. In 1932-33, pintails, green winged teal and shoveller made up 70% of the harvest, with pintails the most numerous species in the bag. Harvest records after the mid 1940's indicate pintails slipped to second place behind green-winged teal.

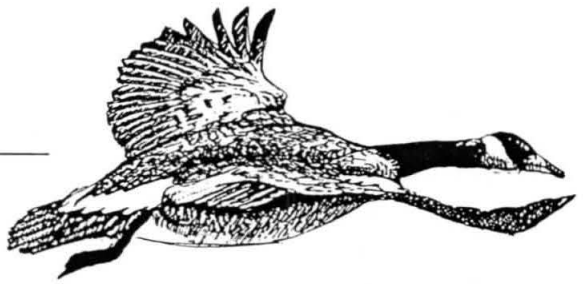
Tundra swan hunting was legalized on the Refuge in 1962, even though some concern was expressed within the Fish and Wildlife Service over accidental shooting of trumpeter swans. The Refuge became a popular area for swan hunting.

Hunter visits comprised about 10% of total visitation during the 1970's and as such contributed substantially to the local economy. Economic studies indicate that hunters contribute $20.00 to the local economy for each visit (Piper 1990). Prior to the flood in the 1960's and 1970's, 4,000 hunter visits were recorded annually.

Recreational opportunities contribute to the "quality of life" aspect for hunters. Substantial effort and cost is expended by hunters in pursuit of their sport. The personal rewards of an enjoyable hunt are highly valued and sought after. Hunters visited the refuge because it provided adequate opportunities for pursuit and harvest of game in pleasing surroundings. Opportunities for hunters included waterfowl hunting in emergent marsh, mudflats and open water. A wide range of hunting methods could be utilized, including pass shooting and hunting over decoys. Those preferring to use motorboats or airboats could pursue their sport. Pheasant hunting added another dimension to the sport when it was legalized in the 1960's. Although pheasant hunting was mainly pursued in large marshes and on dikes rather than on typical upland/grassland habitats, it provided an important source of recreational hunting.

The auto tour route was later developed. The route became popular among non-consumptive visitors, even during the hunting season. No hunting was allowed within 100 yards of the dike road for safety purposes. Also, about 40% of the tour route passes by areas closed to hunting where waterfowl and other birds are undisturbed.

Conflicts occur between hunting and other uses such as bird watching, photography and wildlife viewing. During the height of hunting season, activity on the tour route by hunters adds to traffic and disturbance. Shooting, especially during the early morning and late evening creates noise that affects the serenity and aesthetics for the non-hunting public. Bird use is greatly reduced in areas where hunting is actively being pursued, reducing opportunities for wildlife viewing.



ALTERNATIVES

General:

Alternatives were established after a period of consultation and scoping with various groups, organizations and the general public. Alternatives were identified by considering issues raised, historic uses, biological needs and Refuge objectives. The 6 alternatives were developed so that each emphasizes one or more of the objectives identified through public scoping (table 2).

Each alternative, except Alternative 1 (no action), contains 14,000 acres of "flooded" wetlands. However, the amount of unflooded acreage varies between plans as described below and on the maps. Thus, the total number of acres open to hunting varies in each alternative. Different amounts of each habitat type would be open to hunting in each alternative (table 3). Airboat accessibility would also vary.

Common to all alternatives is: opening unit 2 as the most favored and traditional hunting area, opening additional land on the east side of the Reeder Channel to augment State owned property, and closing the south side of unit 1 for trumpeter swan protection.

Some regulations are required by law or for public safety, and apply to all alternatives. Driving will be restricted to the portions of the D-line dike accessing hunt areas, except in unit 8 where vehicles will be allowed only to the boat launch. Boat launches and parking areas will be provided to facilitate access to all hunting areas. Final decision on placement of launches and parking will be made with consideration to construction activities and once the formal hunt boundaries are established. Hunting will not be permitted within 100 yards of the D-line or auto-tour route dikes. Hunting will be permitted from designated interior dikes bordering some hunting units. No retrieval zones will be allowed within the boundaries of the non-hunt areas. All guns must be unloaded, and cased or broken down when hunters are not in designated hunting areas. Blinds may be constructed from natural materials beginning 2 weeks prior to opening day. All blinds will be available to any hunter on a "first come-first serve" basis regardless of who constructs them. Permanent blinds and sink boxes will not be allowed. Motorized off-road wheeled or tracked vehicles, such as motorcycles or all-terrain vehicles cannot be used on the Refuge. Camping will not be permitted. The Perry gate will be opened 2 weeks prior to opening day, and remain open to provide access to public hunting areas east of Reeder canal.

OBJECTIVE	ALTERNATIVE 1	2	3	4	5	6
Provide high quality hunting		●	●	●	●●	o
Minimize conflicts with other uses		—	—	—	—	—
Provide remote hunting areas		●	●	●●	●	●
Area open to hunting by airboat		—	●	●●	●	●
Facilitate hunting access		●	●	o	●●	●
Facilitate law enforcement		o	●	oo	●	●
Minimize disturbance to swans		●	●	oo	●	●●
Minimize disturbance to rest areas		o	●	oo	●●	●●
Protect breeding populations		—	●	oo	●●	●
	*	**	**	**	**	**

* *Alternative 1 reflects continuation of Historic Hunt Plan*

** *Emphasis of other alternatives as compared to the Historic Hunt Plan*

●●	Much More Emphasis
●	More Emphasis
—	Same Emphasis
o	Less Emphasis
oo	Much Less Emphasis

Table 2: Relative emphasis of Bear River MBR Hunt Plan 1995 alternatives on key objectives

	Altenative					
Flooded Habitats	**1**	**2**	**3**	**4**	**5**	**6**
Wet Meadow (salt grass, salicornia)	0	661	795	100	480	100
Emergent Marsh (bulrush/cattail)	6437	6912	11057	8559	11407	10189
Open Marsh	6342	6419	2140	5341	2140	3703
TOTAL	12779	13992	13992	14000	14027	13992
Non-flooded Habitats						
Mudflat	421	392	1345	3193	1676	2740
Uplands (grasslands)	0	789	789	711	1553	1553
TOTAL	421	1181	2134	3904	3229	4293
TOTAL ACRES OPEN TO HUNTING	13200	15173	16126	17904	17256	18285
total acres open to hunting with airboats	3144	3144	6887	9849	5677	7719

Table 3: Acres of each habitat open to hunting for alternatives in Bear River MBR Hunt Plan, 1995.

Alternative 1 (Historic, no action):

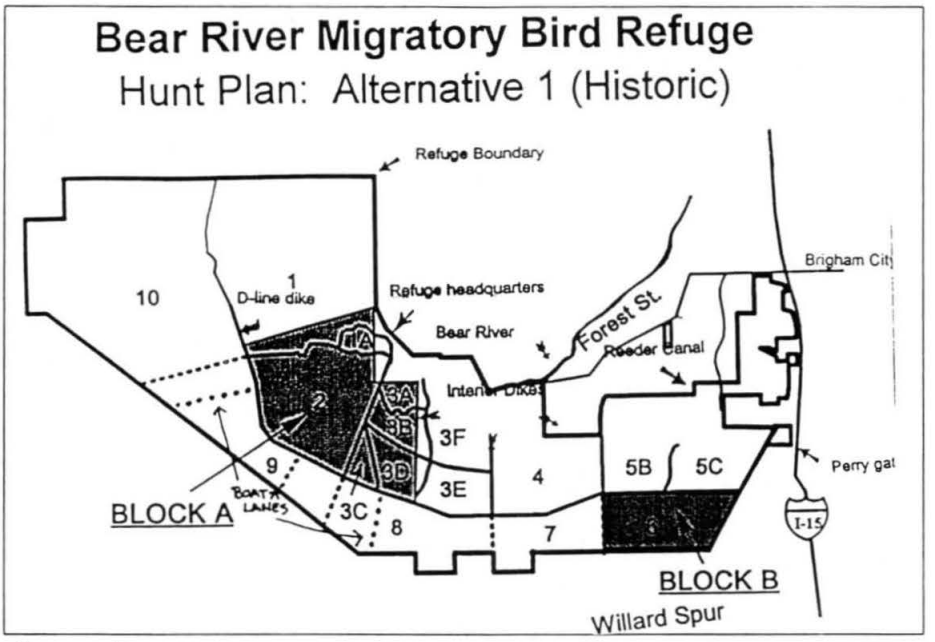


Figure 2

Alternative 1 represents the historic hunt plan that was in place until 1983 when flooding destroyed the Refuge. Since 1983, the Refuge has acquired additional land and implemented a restoration and enhancement plan (Hansen 1991) that includes new dikes and management units. The historic hunt plan is no longer appropriate for the current boundaries and legal mandates. Alternative 1 is presented only for comparison and not as a realistic option.

A total of 12,180 acres would be open to hunting (fig 2). Hunting would occur in 2 separate blocks, A and B. Block A would be open to walk in hunting and to canoes or motorized boats (not airboats). All boats would be allowed to travel across units 8 and 9 through designated travel lanes only. No hunting would be allowed in the travel lanes. Airboats, canoes, and motorboats would be allowed in block B up to 100 yards from the D-line. A non-hunting travel lane across unit 5C would be provided to access State lands. Motor vehicles would be allowed around unit 2 and on the D-line to the boat launches in units 6 and 8.

Alternative 2:

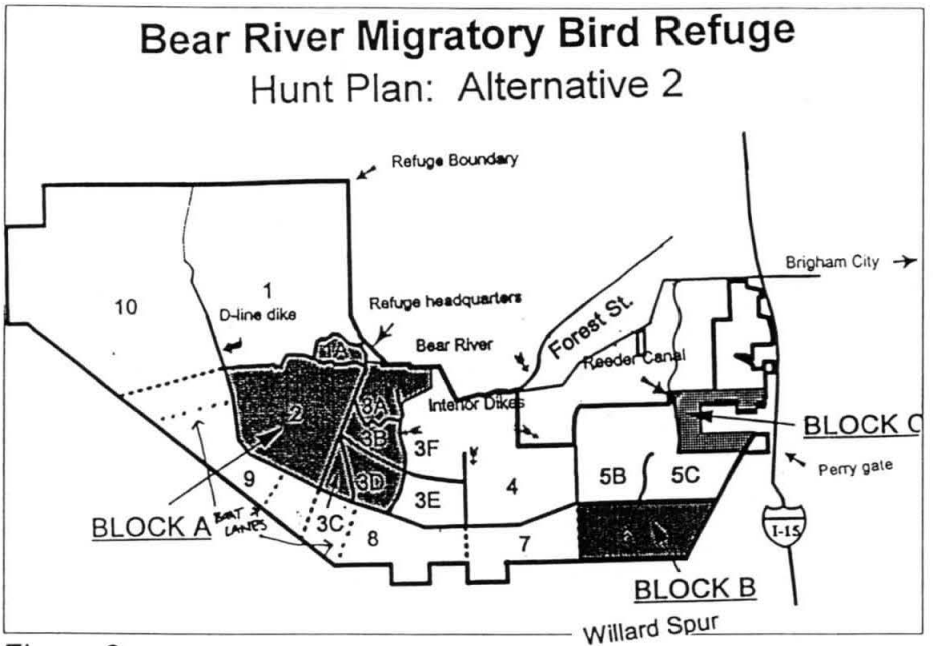


Figure 3

Alternative 2 would include the areas open to hunting in the historic hunt plan (Alternative 1) with the addition of new hunting areas equaling 40% of the flooded lands added to the Refuge through 1995. Alternative 2 would open 15,173 acres to hunting in 3 blocks (fig 3). Foot traffic, canoes and motorized boats (not airboats) would be all allowed in block A. Airboats, canoes, and motorboats would be allowed in block B and all boats would be allowed to cross units 8 and 9 in designated boat lanes. No hunting would be allowed in the boat travel lanes. Airboats would be allowed to access block C from Reeders canal. Other types of boats would be allowed in channels in block C. Motor vehicles would be allowed around unit 2 and up to the boat launches in units 6 and 8.

Alternative 3:

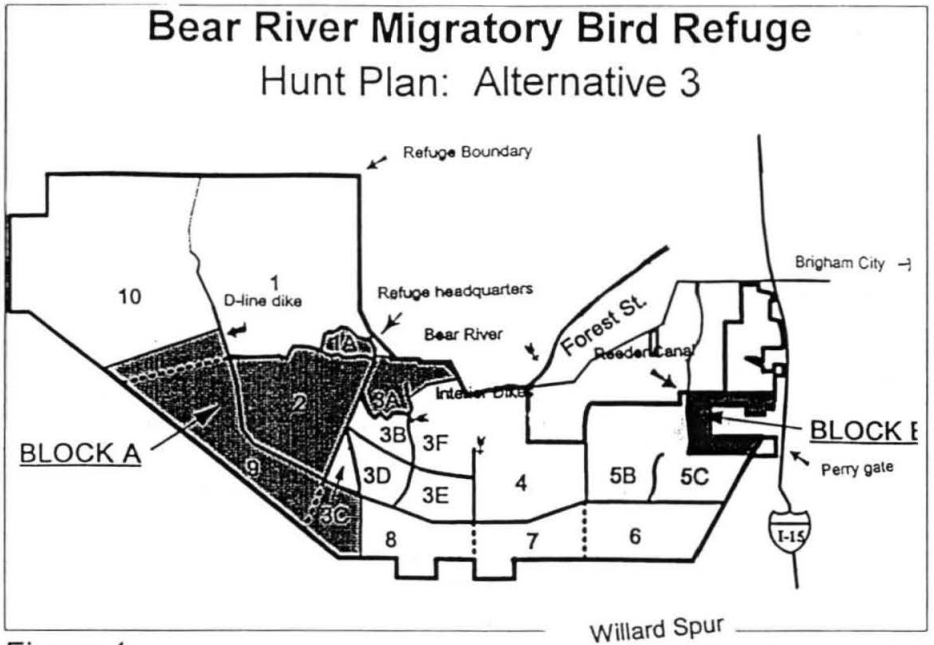


Figure 4

Hunting activities would be concentrated in a core area around unit 2 (fig 4). Additional grassland and wet meadow would be opened east of the Reeder Canal contiguous with the State hunting area (block B). Alternative 3 would open 16,126 acres to hunting. Airboats would be allowed below the D-line and along the Reeder Canal. Foot travel, canoes, and other motor boats would be allowed in all other open areas. Motor vehicles would be allowed around unit 2 and up to the boat launch in unit 8.

Alternative 4:

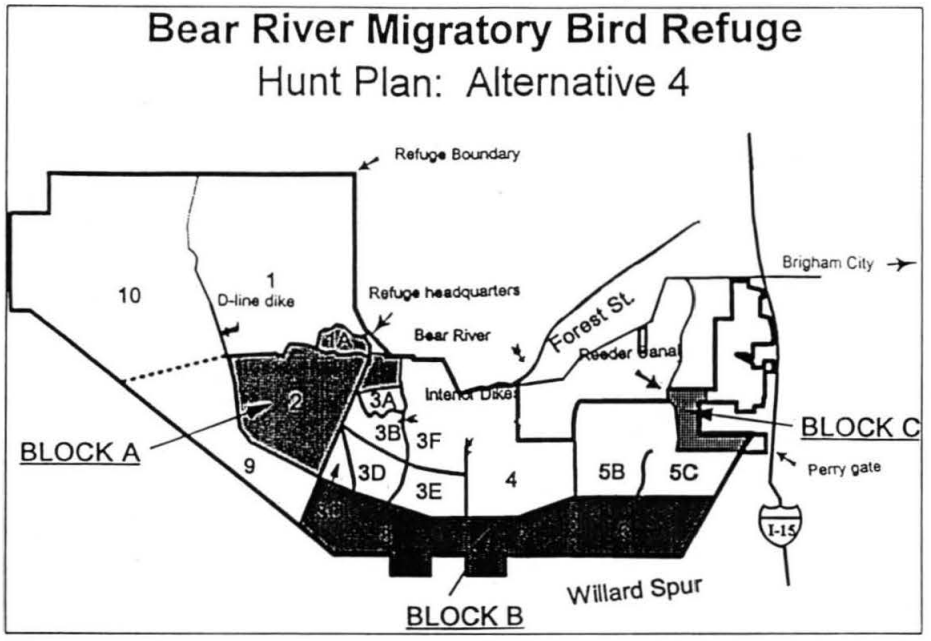


Figure 5

Alternative 4 maximizes the acres below the D-line open to airboat access. A total of 17,904 acres would be open to hunting in 3 separate blocks (fig 5). Foot travel, canoes, and motorboats would be allowed in all open units but airboats only in block B and in Reeder Canal. No airboats or hunting would be allowed within 100 yards of the D-line. Automobiles would be allowed on the dikes around unit 2 and up to boat launches in units 6 and 8.

Alternative 5:

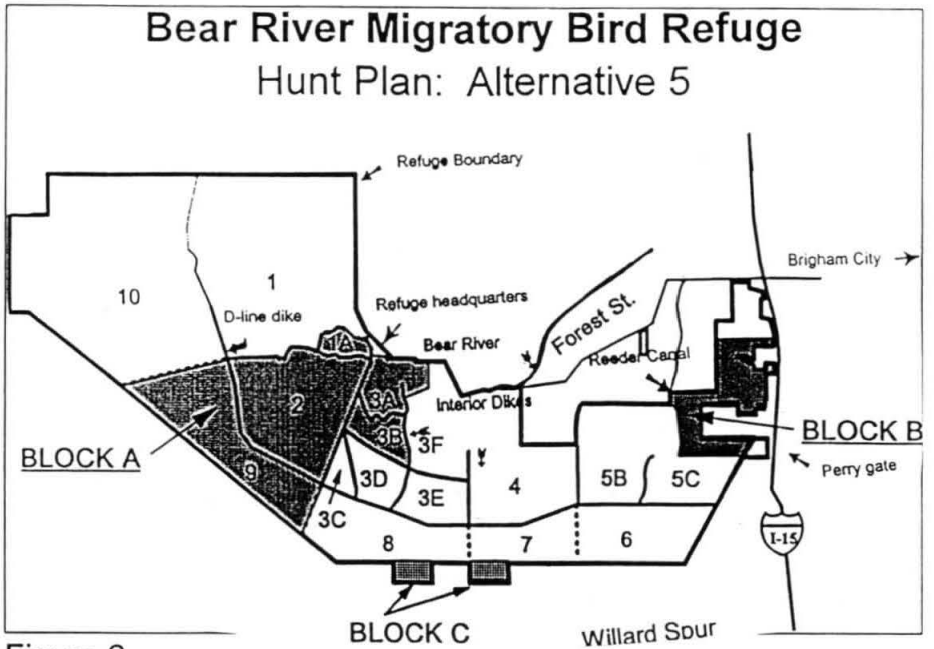


Figure 6

Hunting activities would be concentrated in a core high use area (block A) with additional grassland and wet meadow acres in block B (fig 6). The southern boundary would be linear, opening the "dog ears" projecting south of unit 7 and 8 (block C). Alternative 5 would open 17,256 acres to hunting. Airboats would be allowed in unit 9, Reeder Canal and in block C. Foot travel, canoes, and motorboats would be allowed in all other units. Motor vehicle travel would be allowed around unit 2 and to the southeast corner of block B.

Alternative 6:

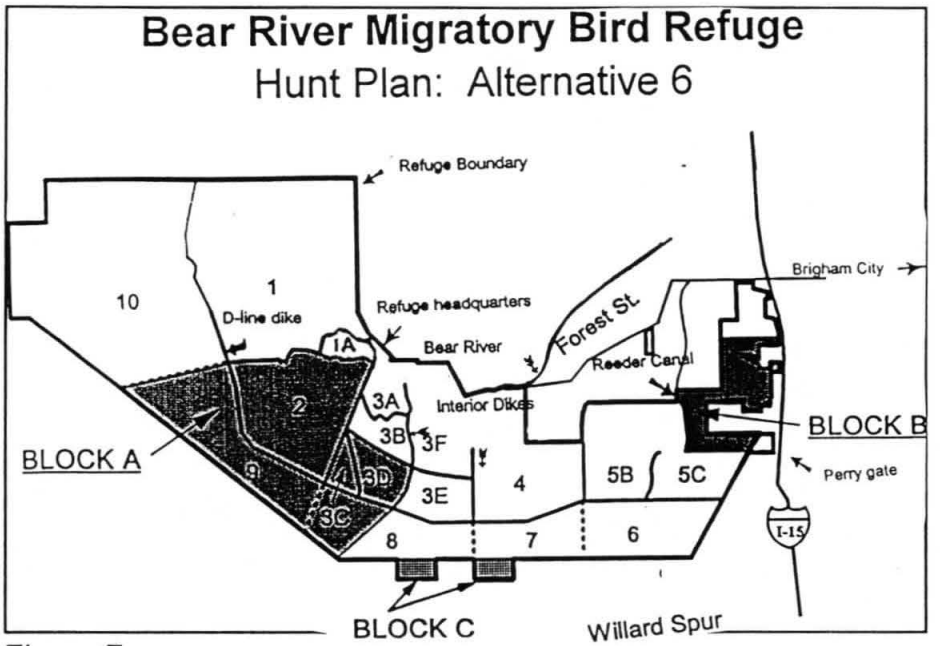


Figure 7

Hunting activity would be concentrated around unit 2 (block A) and east of Reeder Canal (block B) (fig 7). The south Refuge boundary would be straight allowing hunting in the two "dog ear" areas in block C. A total of 18,285 acres would be open to hunting. Airboats would be allowed below the D-line on Reeder Canal and in block C. All areas would be accessible by foot, canoe, or motorboat. Motor vehicles would be allowed around unit 2 and up to the boat launch in unit 8.

ENVIRONMENTAL CONSEQUENCES

A variety of issues were considered in the evaluation of each alternative (table 1). The issues were categorized as physical (pertaining to the physical environment), biological (pertaining to plants and animals), or socio-economic (pertaining to the needs of people and economies). Certain issues were either not relevant to, or would not be impacted by hunting (table 1). These include:

Physical - climate, air quality, soils, topography, geology

Biological - vegetation, exotic species

Socio-economic - archeological sites, education and research opportunities, fishing, boating, land use, development, population growth, open space, natural area preservation, residences, tax revenues, public services, national defense, scenery, noise, odor, aesthetics

Other issues that would have either positive or negative impacts are evaluated in detail for each alternative. Issues are highlighted in bold to correspond with entries in Table 1.

Alternative 1:

Biological Impacts

Foraging bald eagles (**threatened**) and peregrine falcons (**endangered**) are present during the fall hunting season. The presence of human activity would be disruptive to eagles and falcons foraging in hunt areas. Having 2 separated areas open on the east and west sides of the Refuge would create more disturbance than if hunting were concentrated in 1 area. The disturbance and redistribution of waterfowl , a major food source, would deter feeding in open hunting units, but enhance it in closed units where birds are forced to concentrate. The open area, block B would create disturbance along the travel corridor to and from the bald eagle roost site at Willard Bay and to the foraging areas along the east shore.

Trumpeter swans, a **candidate 2 species** for listing under the ESA, may use the Refuge as a migration stop-over during October through December. In mild winters, the Refuge may provide habitat for wintering trumpeters. The Refuge is expected to become more important for migrating trumpeters as the Rocky Mountain trumpeter swan population expands its range. The portion of unit 1 and 1A open to hunting would jeopardize a major swan security area in the north part of unit 1. Trumpeters would be subject to increased disturbance and increased risk of incidental harvest, especially in the travel corridor between unit 1 and 2. The main river delta in unit 2 is an excellent feeding area for swans. Hunting in unit 2 would deter feeding and subject trumpeters to increased risk of hunting mortality. Trumpeters traveling between the security area in unit 1 and feeding areas south and east would be subject to disturbance and potential

mortality. The value of units 5B and 5C for feeding trumpeters would be jeopardized by noise and disturbance from airboats in unit 6.

No **critical habitat** has been designated on the Refuge by the ESA, and thus hunting would not impact critical habitat for endangered species.

Feeding habitat for waterfowl would be compromised in all open hunt areas during daylight hours. Additionally, feeding below unit 2 would be subject to disturbance from airboats using the boat lanes in unit 9. According to the Refuge Water Plan (USFWS 1993), unit 5 would be the only deep water feeding area for diving birds. However, use of unit 5 by feeding waterfowl would be reduced by adjacent airboat use in unit 6.

Hatching year birds may be vulnerable to early season hunting mortality (Nelson 1966). Local **breeding** populations of redheads and especially canvasbacks have been slow to recover from the habitat destruction of the early 1980's. Poor recruitment may be a significant factor limiting population growth. Numbers may rebound if hatching year birds are protected. Alternative 1 protects deep water, hardstem bulrush habitat in unit 5, but opens major production and brood habitat in units 1A, 2 and 3. The closed area in unit 5 may protect hatching year birds, but disturbance from airboats in the adjacent unit 6 may limit bird use.

Since at least 1930, migrating tundra swans have favored the remote northern part of unit 1 for **resting**. The swans are highly sensitive to disturbance and large, visually unobstructed secure space may be a key attribute of the Refuge for tundra swans. The hunting areas in units 1 and 1A would create disturbance in the proximity of the security area in unit 1 and may displace swans. In addition, the travel corridor between the security area in unit 1 and feeding habitat in units 4 and 5 is hampered by the open hunt zone in unit 2. Birds would have to cross an open hunting area to reach feeding areas on the Refuge. Resting habitat below unit 2 and in 5B and 5C would be disturbed by airboats in the boat lanes and in unit 6.

Limited habitat diversity in the closed areas limits **species diversity** . The majority of closed areas are large, open water ponds, while most of the emergent vegetated marsh areas are open to hunting. Habitat diversity would be especially limited in dry years. Opening hunting in 2 separated areas would further limits species diversity by spreading disturbance over a larger area.

Some **resident mammals and birds** would be displaced from the hunt areas, but would find refuge in adjacent closed areas. Reptiles and amphibians would not be impacted.

Depredation of waterfowl by mammalian and avian predators would be facilitated because predators and prey would likely be more concentrated in the closed areas.

Botulism outbreaks are difficult to predict and presumably management of disease outbreaks would supersede all other management plans. Disturbance in open hunt areas during botulism outbreaks may help to displace birds from infected areas. Conversely, disturbance may further weaken already stressed birds making them more susceptible to disease. In dry years, human caused stress may have a pronounced effect on botulism. The freshest and most consistent water supply is in unit 2. Displacement of birds by hunting activity may move birds to poorer quality habitat that is more prone to botulism. Waterfowl also would be more crowded into closed areas increasing the potential for disease transmission.

Socio-economic Impacts

Alternative 1 provides **harvest opportunities** in emergent marsh and open water area, with adjacent rest areas to augment hunting flights. **Habitat variety** open to hunting is somewhat limited. Little grassland or vegetated mudflat would be open. Unit 2, the main river delta has historically provided excellent hunting opportunity, although crowding and illegal shooting from dikes can detract from the **aesthetics** of the hunting experience. Block B would provide remote hunting, primarily accessible by airboat.

Block A would be readily accessible to hunters on foot, in canoes, or in motor boats (not airboats). Alternative 1 would provide hunting areas for persons with limited equipment and effort. Block B would provide some **accessibility** to hunters on foot and access with airboats. Airboats would also be allowed to cross unit 9 to access State lands south of the Refuge.

Maintaining **boundaries** below the D-line in deep water would be difficult and costly. Boundaries in unit 3 would not follow natural features and would be difficult to recognize and enforce. Allowing hunting in 2 separated areas would increase the difficulties and costs associated with **law enforcement**. Regulations would be difficult to enforce in block B because access is limited to airboats.

Access by the non-hunting public would continue to be restricted to the auto tour route in unit 2. Some conflict would be posed because hunting, **wildlife observation** and **photography** would be occurring on the same area. Sixty percent of the **auto tour route** would have hunting on both sides. Disturbance to wildlife and illegal shooting from dikes would detract from the tour. Alternative 1 would not compromise **public safety** except for the general risks posed by boating. Availability of medical attention will inevitably be difficult because of the remoteness of the Refuge.

Maintaining a variety of public uses on the Refuge stimulates the **local economy**. In the 1960's and 70's, 4,000 annual hunter visits provided an economic boost to local businesses. **Costs** to taxpayers would be incurred from law enforcement, education, maintenance of boundaries, roads, and access points, and from search and rescue

efforts. The Refuge is a major feature of the surrounding landscape. **Quality of life** and **community cohesion** would be improved by providing recreation, education, and enjoyment of the outdoors for hunters. Non-hunters and those opposed to hunting would experience some decrease in their ability to enjoy the Refuge.

Conclusion:

Alternative 1 is the historic hunt plan to be used as a "baseline" for comparison with other alternatives. It is not considered a realistic option. No physical impacts would occur. Two separated hunting blocks would increase disturbance to foraging bald eagles and falcons. Trumpeter swan security would be jeopardized by hunter activity in units 1, 1A, and 2; while airboat activity in unit 6 would affect trumpeter use of 5B and 5C. No endangered species critical habitat would be impacted. Waterfowl feeding would decrease in hunt areas during daylight hours. Also, airboat noise in unit 6 would disturb waterfowl feeding in units 5A and 5B. Most emergent marsh habitat would be open to hunting. Airboat noise from unit 6 would reduce feeding use of units 5B and 5C. Tundra swans would be affected by hunting in units 1, 1A and 2. Airboat disturbance would reduce swan use in units 9, 5B and 5C. Most rest areas would be open water habitats and provide limited habitat diversity for wildlife. Botulism would be affected either positively or negatively. Hunting opportunities would be provided primarily in emergent marsh, open water and mudflats. Some areas would be readily accessible on foot, while remote areas would be visited mostly by airboaters. Boundary maintenance and enforcement of regulations would require considerable time and expense in remote areas. Public access for non-hunters would be limited to the auto tour route where some conflicting use would occur between hunters and non-hunting visitors. An average of 4,000 hunter visits would provide economic gain for local communities. Recreational opportunity for hunters would improve their quality of life, while those opposed to hunting would experience some decline in their enjoyment of the Refuge during the hunting season.

Alternative 2:

Biological Impacts

Bald eagles (**threatened**) and peregrine falcons (**endangered**) forage on the Refuge during the waterfowl hunting season. Hunting would displace waterfowl, a major food source, from open areas. Bald eagles and peregrine falcons would avoid areas subject to human disturbance. On the other hand, feeding opportunities would be improved in closed areas where waterfowl would be more concentrated. Eagles move daily between a roost site at Willard Bay and feeding areas on the Refuge. Hunting in blocks B and C would create disturbance along the east side travel corridor. Raptor perch sites near foraging habitat are rare on the Refuge. Hunting activity in block C would disturb the few existing raptor perch sites on the Refuge. Three separated hunting areas would spread disturbance over a large geographic area.

Efforts are underway to expand the range of the Rocky Mountain trumpeter swan, a **candidate 2 species** for listing under the ESA. The Refuge may provide needed security and feeding habitat for migrating trumpeters. The historic swan loafing area would be protected from disturbance by the closure of unit 1. However, hunting in 1A would occur in proximity to a favored swan use area near the Bear River Club spillway. Trumpeters would be excluded from feeding in unit 2 during daylight hours. Hunting in block A would also impede the travel corridor to other feeding areas on the Refuge and subject trumpeters to the risk of incidental harvest. Disturbance in unit 9 from airboat lanes would preclude swan use south of unit 2. Units 4, 5B and 5C would be major feeding areas, but travel to these units would entail crossing open hunt areas . The value of units 5B and 5C as rest areas for trumpeters would be diminished because of hunting activity in block C and airboat traffic in block B.

No **critical habitat** has been designated on the Refuge by the ESA, and thus hunting would not impact critical habitat for endangered species.

Feeding habitat for waterfowl would be compromised in all open hunt areas during daylight hours. Additionally, feeding below unit 2 would be subject to disturbance from airboats using the boat lanes in unit 9. According to the Refuge Water Plan (USFWS 1993), unit 5 would be the only deep water feeding area for diving birds. However, use of unit 5 by feeding waterfowl would be reduced by adjacent airboat use in unit 6.

Hatching year birds may be vulnerable to early season hunting mortality (Nelson 1966). Redheads, and especially canvasbacks, have been slow to recover from the habitat destruction of the early 1980's. Poor recruitment may be a significant factor limiting local **breeding** populations. Numbers may rebound if hatching year birds are protected. Alternative 2 protects deep water, hardstem bulrush habitat in unit 5, but opens major production and brood habitat in units 1A, 2 and 3. The closed area in unit

5 may protect hatching year birds, but disturbance from airboats in the adjacent unit 6 may limit bird use, especially in the deep end of the unit. Unit 5C would also be subject to disturbance on the north by hunting in block C.

Since at least 1930, migrating tundra swans have favored the remote northern part of unit 1 for **resting**. The swans are highly sensitive to disturbance and large, visually unobstructed, secure space may be a key attribute of the Refuge for tundra swans. The hunting areas in unit 1A would create disturbance in the proximity of the security area in unit 1 and may displace swans. In addition, the travel corridor between the security area in unit 1 and feeding habitat in units 4 and 5 is hampered by the open hunt zone in unit 2. Birds would have to cross an open hunting area to reach feeding areas on the Refuge. Resting habitat below unit 2 and in 5B and 5C would be disturbed by airboats in the access lanes and in unit 6. Unit 5C would also have disturbance from hunting to the north in block C.

Limited habitat diversity in the closed areas would limit **species diversity** . The majority of closed areas are large, open water ponds, while most of the emergent marsh areas are open to hunting. Habitat diversity would be especially limited in dry years. Opening hunting in 2 separated areas would further limit species diversity by spreading disturbance over a larger area.

Some **resident mammals and birds** would be displaced from the hunt areas, but would find refuge in adjacent closed areas. Reptiles and amphibians would not be impacted.

Depredation of waterfowl by mammalian and avian predators would be facilitated because predators and prey would likely be more concentrated in the closed areas.

Botulism outbreaks are difficult to predict, and presumably management of disease outbreaks would supersede all other management plans. Disturbance in open hunt areas during botulism outbreaks may help to displace birds from infected areas. Conversely, disturbance may further weaken already stressed birds making them more susceptible to disease. In dry years, human caused stress may have a pronounced effect on botulism. The freshest and most consistent water supply is in unit 2. Displacement of birds by hunting activity may move birds to poorer quality habitat that is more prone to botulism. Waterfowl also would be more crowded into closed areas increasing the potential for disease transmission.

Socio-economic Impacts

Alternative 2 provides **harvest opportunities** mostly in emergent marsh, wet meadow, open water areas and non-flooded mudflat and grasslands. Adjacent rest areas augment flights over hunt areas. All **habitat variety** would include some acreage open

to hunting, including grassland and vegetated mudflat. Unit 2, the main river delta historically provided excellent hunting opportunity, although crowding and illegal shooting from dikes may detract form the **aesthetics** of the hunting experience. Unit 6 would provide remote hunting, primarily accessible by airboats. Block C surrounds State owned land which already receives high numbers of hunters.

Block A would be readily accessible to hunters on foot, in canoes, or in motor boats (not airboats). Alternative 2 would provide hunting areas for persons with limited equipment and effort. Block B would provide some **accessibility** to hunters on foot and access to airboats. Airboats would also be allowed to cross unit 9 to access State lands south of the Refuge. Airboats would have access down the Reeder Canal to the west boundary of block C.

Maintaining **boundaries** below the D-line in wetland areas would be difficult and costly. Boundaries in units 1A, 2, and 3 follow natural features (dikes) and are easily identified and maintained. The south and southeast boundaries of unit 6 would be difficult and costly to maintain. Block C would be bounded by natural features on the south and west. Three separated hunting areas would increase the difficulties and costs associated with **law enforcement**. Regulations would be difficult to enforce in block B due to access by airboats only.

Access by the non-hunting public would be restricted to the auto tour route in unit 2. Some conflict would occur between hunting, **wildlife observation** and **photography**. Forty percent of the **auto tour route** would have hunting on both sides. Disturbance to wildlife and illegal shooting from dikes would detract from the tour route. Alternative 2 would not compromise **public safety** except for the general risks posed by boating. Medical services would not be readily available due to the remote nature of the area.

The variety of public uses on Refuge lands stimulates **local economics**. Hunter visits averaged around 4,000 annually from 1960-1980. Additional land opened to hunting under this alternative would attract more hunter use.

Costs to taxpayers would be incurred for law enforcement, education, maintenance of boundaries, roads, and access points, and from search and rescue efforts. The Refuge is a major feature of the surrounding landscape. **Quality of life** and **community cohesion** would be improved by providing recreation, education, and enjoyment of the outdoors for hunters. Non-hunters and those opposed to hunting would experience some decrease in their ability to enjoy the Refuge during the hunting season.

Conclusion:

No impacts would occur to the physical environment if alternative 2 was implemented. Bald eagles, peregrine falcons and trumpeter swans would be displaced from open

hunt areas, and subject to disturbance along travel corridors between feeding and rest areas. Hunting would subject trumpeters to potential incidental harvest in some areas. Closed units would provide adequate feeding for most birds, although deep water would be limited for diving birds. Unit 9 would not function as a rest or feed area when airboats were traveling in the boat lanes. Undisturbed habitat for hatching year canvasbacks would be limited. The security area for tundra swans would be jeopardized by hunting in unit 1 and 1A. Limited habitat diversity in the closed areas would limit species diversity especially in dry years. Botulism would be positively or negatively impacted. Hunting opportunities would be mostly in emergent marsh and open water. Unit 6 is remote and would be used mostly by airboaters, while Block C and Block A would be readily accessible on foot and have heavy use. Boundary maintenance and enforcement of regulations would require considerable time and expense in remote areas. Public access for non-hunters would be limited to the auto tour route where some conflicting use would occur between hunters and non-hunting visitors. Additional hunter visits would be expected, which would provide economic gain for local communities. Recreational opportunity for hunters would improve their quality of life, while those opposed to hunting may experience some decline in their enjoyment of the Refuge.

Alternative 3:

Biological Impacts

Foraging bald eagles (**threatened**) and peregrine falcons (**endangered**) are present during the fall hunting season. The presence of human activity would be disruptive to eagles and falcons foraging in the hunt area. Most hunting would occur in one main concentrated area (block A), minimizing disturbance. Activity in block B would disturb trees used as perch sites by migrating raptors, but the travel corridor between the Refuge and eagle roost sites at Willard Bay would be unimpeded. The disturbance and redistribution of waterfowl, a major food source, would deter feeding in open hunting units, but enhance it in closed units where birds would be more concentrated.

Trumpeter swans are a **candidate 2 species** for listing under the ESA. The Refuge will become more important for migrating trumpeter swans as their range expands. Unit 1 provides an important security area for swans. Alternative 3 would close unit 1 to hunting, protecting the security area. However, some disturbance would occur from hunting in unit 10, particularly near the water control structure in D-line where swans tend to congregate as ice forms on the rest of the unit. The main river delta in unit 2 is an excellent feeding area for swans. Hunting in unit 2 would deter feeding and subject trumpeters to potential incidental harvest. A large block of feeding and resting habitat in units 4 and 5 would be protected from disturbance. Closed areas in units 3, 6, 7, and 8 would provide a buffer from airboat traffic. Trumpeters moving from unit 1 to feeding areas in units 4 and 5 would have to cross open hunting areas and would be vulnerable to hunting mortality, especially in units 1A and 3A.

No **critical habitat** has been designated on the Refuge by the ESA. Hunting would not impact critical habitat for endangered species.

Feeding habitat for waterfowl would be compromised in all open hunt areas during daylight hours. Alternative 3 would concentrate much of the human activity in a large block (A) and thus minimize disturbance in other feeding areas. Hunting in block B would create some disturbance to feeding birds on the north of 5C. Units 3C and 5C would provide deep water feeding habitat for diving birds, although bird use in 3C may be limited by airboat noise in adjacent units.

Hatching year birds, especially canvasbacks and redheads, may be vulnerable to early season hunting mortality (Nelson 1966). Poor recruitment may be a significant factor limiting local **breeding** populations and local breeding populations may rebound if hatching year birds are protected. Alternative 3 protects deep water, hardstem bulrush habitat in unit 5, and brood habitat in units 1, 3B, 3C and 3D.

Since at least 1930, migrating tundra swans have favored the remote northern part of unit 1 for **resting**. Large, secure, undisturbed, open spaces may be an important, but limited commodity for migrating swans. Hunting in units 1A and 10 would create disturbance in the proximity of the unit 1 security area and may displace swans, especially after ice-up. Swans would have to cross open hunting areas to reach feeding habitat in units 4 and 5. Closing units 6 and 7 would buffer units 4 and 5 from disturbance.

A diversity of habitats would be protected from disturbance and most hunting would occur in block A. **Species diversity** would not be impacted by Alternative 3 except in dry years when unit 2 is the only unit with consistent water supply. Hunting would limit wildlife use of unit 2 in dry years.

Some **resident mammals and birds** would be displaced from the hunt areas, but would find refuge in adjacent closed areas. Reptiles and amphibians would not be impacted.

Depredation of waterfowl by mammalian and avian predators would be facilitated because predators and prey are likely to be more concentrated in the closed areas.

Botulism outbreaks are difficult to predict and presumably management of disease outbreaks would supersede all other management plans. Disturbance in open hunt areas during botulism outbreaks may help to displace birds from infected areas. Conversely, disturbance may further weaken already stressed birds making them more susceptible to disease. In dry years, human caused stress may have a pronounced effect on botulism. The freshest and most consistent water supply is in unit 2. Displacement of birds by hunting activity may move birds to poorer quality habitat that is more prone to botulism. Waterfowl also would be more crowded into closed areas increasing the potential for disease transmission.

Socio-economic Impacts

Alternative 3 provides **harvest opportunities** in emergent marsh, wet meadow, open water areas and non-flooded mudflats and grasslands. Adjacent rest areas would augment flights over hunting areas. A **variety of habitats** would be open to hunting. Unit 2, the major river delta historically provided excellent hunting opportunity, although crowding and illegal shooting from dikes may detract form the **aesthetics** of the hunting experience. Unit 6 would be closed under this alternative and would adversely impact historic hunting patterns of the Willard Bay and Pintail Duck Clubs. Unit 9 and portions of units 8 and 10 would be open and would provide excellent hunting for relatively large numbers of hunters. Block C, surrounding State land, would be readily **accessible**. It would receive high numbers of hunter visits.

Block A would be readily accessible to hunters on foot, in canoes, and motor boats. Airboats would be allowed in unit 9 and open portions of units 8 and 10. Alternative 3 would provide hunting areas for persons with limited equipment and effort. Block B would be accessible to hunters on foot, and in motorboats. Airboat access would be allowed along the west side of the area on the Reeder Canal only.

Maintaining **boundaries** below the D-line in wetlands would be difficult and costly, especially the south and southeast boundaries of unit 6. Boundaries in units 1A, 2, and 3 follow natural features (dikes) and are easily identified and maintained. Block B is bounded by natural features on the south and west. Two, rather than three separated hunting areas, would reduce costs and difficulties associated with **law enforcement**.

Access by the non-hunting public would be restricted to the auto tour route in unit 2. Some conflict would occur between hunting, **wildlife observation** and **photography**. Sixty-five percent of the auto tour route would have hunting on both sides. Disturbance to wildlife and illegal shooting from dikes would detract from the tour route. Alternative 3 would not compromise **public safety** except for the general risks posed by boating. Medical services would not be readily available due to the remote nature of the area.

The variety of public uses on Refuge lands stimulates **local economics**. Hunter visits averaged 4,000 annually from 1960-1980. Additional lands opened to hunting under this alternative would attract more hunters. Costs to taxpayers would be incurred for law enforcement, education, maintenance of boundaries, roads, and access points, and from search and rescue efforts. The Refuge is a major feature of the surrounding landscape. **Quality of life** and **community cohesion** would be improved by providing recreation, education, and enjoyment of the outdoors for hunters. Some organized hunt clubs (Willard Bay, Pintail, etc.) would be adversely impacted by the closing of unit 6. Non-hunters and those opposed to hunting would experience some decrease in their ability to enjoy the Refuge during the hunting season.

Conclusion:

No impacts would occur to the physical environment if Alternative 3 was implemented. Bald eagles, peregrine falcons and trumpeter swans would be displaced from open hunt areas and subject to disturbance along travel corridors. The travel corridor for eagles to the Willard Bay roost site would be maintained. Hunting would subject trumpeter swans to potential incidental harvest in some areas. The rest area for swans in unit 1 would be disturbed by activity in unit 10. Feeding and resting areas in units 4 and 5 would be buffered from disturbance by closure of adjacent units. Available habitat for hatching year canvasbacks and redheads would be protected. A diversity of habitats would be protected from disturbance. Botulism would be positively or negatively impacted depending on conditions. Most hunting opportunity would be in emergent marsh, open water and mudflats. Some grasslands would be included in the

hunt area. Readily accessible areas would include units 2, 3, 1A and block B. Units 8, 9, and 10 are more remote. Boundary maintenance would be costly on unit 6, while most other boundaries would be easily maintained. Non-hunters would have access to the auto tour route, but hunting would reduce bird observations. Hunter visits would be expected to increase due to increased acreage of accessible hunting acres. Some privately owned hunt clubs would be adversely impacted by the closure of unit 6. Quality of life for hunters would improve, while non-consumptive visitors may loose some enjoyment during the hunting season.

Alternative 4:

Biological Impacts

Foraging bald eagles (**threatened**) and peregrine falcons (**endangered**) are present during the hunting season. The presence of human activity would be disruptive to eagles and falcons foraging in hunt areas. Spreading the hunt area out along the length of the D-line would maximize disturbance. The travel corridor for eagles from the Refuge to Willard Bay roost sites would be blocked because eagles would have to cross an open hunt zone. The disturbance and redistribution of waterfowl, a major food source, would deter feeding in open hunt areas, but enhance it in closed areas where birds would concentrate. However, the rest areas in units 3, 4, and 5 would not be buffered from airboat disturbance and human activity in adjacent units. The closed areas would not provide adequate protection from disturbance for bald eagles and peregrine falcons.

Trumpeter swans, a **candidate 2 species** for listing under the ESA may use the Refuge as a migration stop over during October through December. The Refuge will become more important for trumpeters as the Rocky Mountain population expands its range. Swans typically loaf in unit 1 and feed in units 2, 4 and 5. Alternative 4 would protect unit 1 from disturbance, but trumpeters feeding in or crossing over block A would be subject to risk of incidental harvest. Trumpeters traveling from resting to feeding areas would have to cross hunt zones. The value of units 4 and 5 for feeding would be jeopardized by noise and disturbance from airboats in adjacent units. Unit 5C would have some disturbance on the north from hunting in block C.

No **critical habitat** has been designated on the Refuge by the ESA, and thus hunting would not impact critical habitat for endangered species.

Feeding habitat for waterfowl would be compromised in all open hunt areas during daylight hours. According to the Refuge Water Plan (USFWS 1993), units 3C and 5 would be the only deep water feeding area for diving birds. Use of units 3, 4 and 5 by feeding waterfowl would be reduced by adjacent airboat use below the D-line.

Hatching year birds may be vulnerable to early season hunting mortality (Nelson 1966). Redheads, and especially canvasbacks, have been slow to recover from the habitat destruction of the early 1980's. Poor recruitment may be significant factor limiting local **breeding** populations. Numbers may rebound if hatching year birds are protected. Alternative 4 would protect deep water, hardstem bulrush habitat in unit 5, but open major production and brood habitat in units 1A and 2. The protected area in unit 5 may protect hatching year birds, but disturbance from airboats in the adjacent unit 6 would limit bird use.

Since at least 1930, migrating tundra swans have favored the remote northern part of unit 1 for **resting**. The swans are highly sensitive to disturbance, and large, visually unobstructed, secure space may be a key attribute of the Refuge for tundra swans. The hunting area in unit 1A would create disturbance in the proximity of the security area in unit 1 and may displace swans, especially after ice-up. In addition, the travel corridor between the security area in unit 1 and feeding habitat in units 4 and 5 is hampered by the open hunt zone in unit 2. Birds would have to cross an open hunting area to reach feeding areas on the Refuge. Resting habitat in units 3, 4, and 5 would be disturbed by airboat use and human activity in adjacent units.

The closed areas are representative of the diversity of habitat present on the Refuge. **Species diversity** would not be impacted, although spreading the hunting over a large area would temporarily displace some species.

Some **resident mammals and birds** would be displaced from the hunt areas, but would find refuge in adjacent closed areas. Reptiles and amphibians would not be impacted.

Depredation of waterfowl by mammalian and avian predators would be facilitated because predators and prey would likely be more concentrated in the closed areas.

Botulism outbreaks are difficult to predict and presumably management of disease outbreaks would supersede all other management plans. Disturbance in open hunt areas during botulism outbreaks may help to displace birds from infected areas. Conversely, disturbance may further weaken already stressed birds making them more susceptible to disease. In dry years, human caused stress may have a pronounced effect on botulism. The freshest and most consistent water supply is in unit 2. Displacement of birds by hunting activity may move birds to poorer quality habitat that is more prone to botulism. Waterfowl also would be more crowded into closed areas increasing the potential for disease transmission.

Socio-economic Impacts

Alternative 4 would provide **harvest opportunities** in a **variety of habitats** including emergent marsh, open water and mudflats. Limited amounts of wet meadow and grasslands also would be also open. The long, narrow shape of block B provides about 10 miles of boundary with rest areas that would augment hunting flights. Unit 2, the major river delta has historically provided excellent hunting opportunity, although crowding and illegal shooting from dikes can detract form the **aesthetics** of the hunting experience. Block B would provide 9,849 acres of remote lands below D-line **accessible** primarily to airboats. Vegetated mudflats in unit 7 would provide excellent hunting. Block C would be readily accessible and surrounds State owned land. It would receive high numbers of hunter visits.

Block A would be readily accessible to hunters on foot, in canoes, and motor boats. Airboats would be allowed in units 6, 7, and 8. Alternative 4 would provide some hunting areas for persons with limited equipment and effort. Blocks A and C would be accessible to hunters on foot, and in motorboats. Airboat access would be allowed along the west side of the block C on the Reeder Canal only.

Boundary maintenance below the D-line would be of minimum cost. Boundaries in units 1A, 2, and 3 follow natural features (dikes) and would be easily identified and maintained. Block B is bounded by D-line dike on the north. Block C is bounded by canals on the west and south. Three separated hunting areas increase costs and difficulties associated with **law enforcement** and the remote nature of block B would be extremely difficult for enforcement of regulations.

Access by the non-hunting public would be restricted to the auto tour route in unit 2. Some conflict would occur between hunting and **wildlife observation** and **photography**. Fifteen percent of the **auto tour route** would have hunting on both sides, affording good opportunity for wildlife observation by non-hunters. However, disturbance to wildlife and illegal shooting from dikes would detract from the tour route. Alternative 4 would not compromise **public safety** except for the general risks posed by boating. Medical services would not be readily available due to the remote nature of the area, especially in Block B.

The variety of public uses on Refuge lands stimulates **local economics**. Hunter visits averaged 4,000 annually from 1960-1980. The large, remote acreage in Block B would provide excellent hunting, but would not be accessible to large numbers of hunters since airboat travel would be required to access much of the area. Therefore, total hunter visits would decline under this alternative. **Costs** to taxpayers would be incurred for law enforcement, education, maintenance of boundaries, roads, and access points, and from search and rescue efforts. The Refuge is a major feature of the surrounding landscape. **Quality of life** and **community cohesion** would be improved by providing recreation, education, and enjoyment of the outdoors for hunters. Non-hunters and those opposed to hunting would experience some decrease in their ability to enjoy the Refuge during the hunting season.

Conclusion:

No impact would occur to the physical environment if Alternative 4 was implemented. Bald eagles, peregrine falcons and trumpeter swans would be displaced from open hunting areas. Birds traveling from feeding areas on the Refuge to units 4 and 5 for resting would have to cross over open hunting areas. Trumpeter swans would be exposed to risk of incidental harvest in some areas. Disturbance would be maximized by the long narrow hunt area below the D-line. The value of the rest areas in units 3, 4, and 5 would be jeopardized by airboat disturbance in adjacent units. Habitat for

hatching year canvasbacks and redheads would be limited. Species diversity would not be impacted. Botulism mortality may increase or decrease depending on conditions. Hunting opportunity would be mostly in emergent marsh, open water and mudflats. Some grasslands would also be open. Total hunter visits would be less due to the limited access into block B. Block A and C would receive the majority of hunter visits. Boundary maintenance would require minimal effort and cost. Law enforcement would be costly and difficult. Non-hunters would be allowed to use the tour route. Decreased hunter visits overall would contribute less to the local economy. Alternative 4 would improve recreational opportunities for hunters, but be negative for refuge visitors who oppose hunting.

Alternative 5:

Biological Impacts

Bald eagles (**threatened**) and peregrine falcons (**endangered**) that use the Refuge for foraging during the fall migration. The presence of human activity would be disruptive to eagles and falcons foraging in hunt areas. Concentrating hunting in block A would minimize disturbance to foraging areas. The disturbance and redistribution of waterfowl would enhance foraging opportunities in closed units where birds concentrate. Activity in block B would disturb trees used as perch sites by migrating raptors, but the travel corridor between the Refuge and Willard Bay roost sites would be unimpeded.

Trumpeter swans, a **candidate 2 species** for listing under the ESA may use the Refuge as a migration stop-over during October through December. In mild winters, the Refuge may provide habitat for wintering trumpeters. The Refuge is expected to become more important for migrating trumpeters as the Rocky Mountain trumpeter swan population expands its range. Trumpeters would be subject to increased disturbance and increased risk of incidental harvest, especially in the travel corridor between unit 1 and 2. The main river delta in unit 2 is an excellent feeding area for swans. Hunting in unit 2 would deter feeding and subject trumpeters to increased risk of hunting mortality during daylight hours. Trumpeters traveling between the security area in unit 1 and feeding areas south and east would be subject to disturbance and potential mortality as they crossed the hunt zone in block A. Units 4 and 5 would provide ample feeding habitat for trumpeters and would be buffered from disturbance by closure of unit 6 and 7.

No **critical habitat** has been designated on the Refuge by the ESA, and thus hunting would not impact critical habitat for endangered species.

Feeding habitat for waterfowl would be compromised in all open hunt areas during daylight hours. However. concentrating hunting in 1 main block would minimize overall disturbance. According to the Refuge Water Plan (USFWS 1993), units 5 and 3C would be the only deep water feeding area for diving birds. The north portion of unit 5C, often used by grazing geese and ducks, would be subject to disturbance by hunting in block B.

Hatching year birds may be vulnerable to early season hunting mortality (Nelson 1966). Redheads and especially canvasbacks have been slow to recover from the habitat destruction of the early 1980's. Poor recruitment may be a significant factor limiting local **breeding** populations. Numbers may rebound if hatching year birds are protected. Alternative 5 protects deep water, hardstem bulrush habitat in units 3C and

5, but opens major production and brood habitat in units 1A, 2 and 3.

Since at least 1930, migrating tundra swans have favored the remote northern part of unit 1 for **resting**. The swans are highly sensitive to disturbance and large, visually unobstructed, secure space may be a key attribute of the Refuge for tundra swans. In general, disturbance would be minimized by concentrating hunting in large blocks. Unit 1 would be adequately protected, but hunting in 1A would create some disturbance in the proximity of the security area, especially after ice-up when swans heavily use the Bear River Club spillway. In addition, the travel corridor between the security area in unit 1 and feeding habitat in units 4 and 5 is hampered by the open hunt zone in units 2 and 3. Birds would have to cross an open hunting area to reach feeding areas on the Refuge.

A diversity of habitats would be protected from disturbance, and **species diversity** would not be impacted by Alternative 5. However, in dry years unit 2 would be the only area with consistent water supply. Species diversity may be limited by hunting in unit 2 in dry years.

Some **resident mammals and birds** would be displaced from the hunt areas, but would find refuge in adjacent closed areas. Reptiles and amphibians would not be impacted.

Depredation of waterfowl by mammalian and avian predators would be facilitated because predators and prey would likely be more concentrated in the closed areas.

Botulism outbreaks are difficult to predict, and presumably management of disease outbreaks would supersede all other management plans. Disturbance in open hunt area during botulism outbreaks may help to displace birds from infected areas. Conversely, disturbance may further weaken already stressed birds making them more susceptible to disease. In dry years, human caused stress may have a pronounced effect on botulism. The freshest and most consistent water supply is in unit 2. Displacement of birds by hunting activity may move birds to poorer quality habitat that is more prone to botulism. Waterfowl also would be more crowded into closed areas increasing the potential for disease transmission.

Socio-economic Impacts

Alternative 5 would provide **harvest opportunities** in a **variety of habitats**, especially emergent marsh. A large grassland area (1,553 acres) would provide additional pheasant hunting opportunities. Unit 2, the major river delta has historically provided excellent hunting opportunity, although crowding and illegal shooting from dikes can detract form the **aesthetics** of the hunting experience. Unit 9 would provide excellent hunting, especially in the northern section where unit 1 spills water. Block B would be

readily accessible and surrounds State owned land. It would receive high numbers of hunter visits due to the close proximity to Brigham City and easy access by foot, motor boat and airboat. Block C is isolated and accessible only by airboat.

Block A would be readily accessible to hunters on foot, in canoes, and motor boats. Airboats would be allowed in units 9 and the "dog ear" portions of units 7 and 8. Alternative 5 would provide some hunting areas for persons with limited equipment and effort. Blocks A and B would be accessible to hunters on foot, and in motorboats. Unit 9 in block A and block C would be accessible with Airboats. Airboat access would also be allowed along the west side of the Block B on the Reeder Canal only.

Boundary maintenance below the D-line would be of considerable cost for the south and east boundary of unit 6.. Boundaries in units 1A, 2, and 3 follow natural features (dikes) and are easily identified and maintained. Block B would be bounded by canals on the west and south boundaries. Block C would have no natural features on the boundaries, creating some difficulty in maintenance. Three separated hunting areas would increase costs and difficulties associated with **law enforcement**.

Access by the non-hunting public would be restricted to the auto tour route in unit 2. Some conflict would occur between hunting and **wildlife observation** and **photography**. Sixty percent of the **auto tour route** would have hunting on both sides, reducing opportunity for wildlife observation by non-hunters. In addition, disturbance to wildlife and illegal shooting from dikes would detract from the tour route. Alternative 5 would not compromise **public safety** except for the general risks posed by boating. Privately owned hunt clubs which utilize unit 6 would be adversely impacted. Medical services would not be readily available due to the remote nature of the area.

The variety of public uses on Refuge lands stimulates **local economics**. Hunter visits averaged 4,000 annually between 1960-1980. Hunter visits would increase due to the availability of new hunting area in block B and the increased accessibility in unit 9 (block A). Blocks A and B would encompass the historically popular hunting areas and would be easily accessible. **Costs** to taxpayers would be incurred for law enforcement, education, maintenance of boundaries, roads, and access points, and from search and rescue efforts.

Three separate blocks of hunting would increase law enforcement costs and effort. The Refuge is a major feature of the surrounding landscape. **Quality of life** and **community cohesion** would be improved by providing recreation, education, and enjoyment of the outdoors for hunters. Non-hunters and those opposed to hunting would experience some decrease in their ability to enjoy the Refuge during the hunting season.

Conclusion:

The physical environment would not be impacted by Alternative 5. The presence of human activity in hunt areas would displace bald eagles, peregrine falcons and trumpeter swans. The travel corridor for eagles to Willard Bay would be unimpeded. Trumpeter swans would be exposed to risk of incidental harvest as they crossed from the rest area in unit 1 to feeding areas in units 4 and 5. The rest area in unit 1 would be protected from disturbance and units 4 and 5 would be buffered from disturbance in adjacent units. Closed units would provide a variety of feeding habitats and overall disturbance by hunting would be concentrated primarily in block A and to a lesser extent in block B. Habitat for hatching year canvasbacks and redheads would be protected. Species diversity would not be impacted. Botulism mortality may increase or decrease depending on condition. Hunting opportunities would mostly be in emergent marsh, but include all other habitat types as well as 1,553 acres of grasslands. Maximum numbers of hunters would be expected to utilize blocks A and B. Boundary maintenance costs would be high on the south and east side of unit 6. Law enforcement efforts would be substantial. Non-hunters would use the auto tour route, however less than half the route is bounded by rest areas for birds. Privately owned hunt clubs near Willard Bay would be adversely impacted by the closure of unit 6. Benefit to local economics would occur from the increase in hunter numbers. Increased recreational opportunities would benefit hunters, but would impact non-hunters during the hunting season.

Alternative 6:

Biological Impacts

Bald eagles (**threatened**) and peregrine falcons (**endangered**) that use the Refuge for foraging during the fall migration. The presence of human activity would be disruptive to eagles and falcons foraging in hunt areas. Concentrating hunting in block A would minimize disturbance to foraging areas. The disturbance and redistribution of waterfowl would enhance foraging opportunities in closed units where birds concentrate. Activity in block B would disturb trees used as perch sites by migrating raptors, but the travel corridor between the Refuge and Willard Bay roost sites would be unimpeded. Alternative 6 would provide a narrow, hunt free travel zone between unit 1 and units 3, 4, and 5.

Trumpeter swans, a **candidate 2 species** for listing under the ESA may use the Refuge as a migration stop-over during October through December. In mild winters, the Refuge may provide habitat for wintering trumpeters. The Refuge is expected to become more important for migrating trumpeters as the Rocky Mountain trumpeter swan population expands its range. Alternative 6 closes unit 1 and 1A and the north half of unit 3 to facilitate movement of swans from unit 1 to southern feeding areas. The main river delta in unit 2 is an excellent feeding area for swans. Hunting in unit 2 would deter feeding and subject trumpeters to increased risk of hunting mortality during daylight hours. Trumpeters traveling between the security area in unit 1 and feeding areas south and east would be subject to disturbance and potential mortality as they crossed the hunt zone in block A. Units 4 and 5 would provide ample feeding habitat for trumpeters and would be buffered from disturbance by closure of units 6 and 7.

No **critical habitat** has been designated on the Refuge by the ESA, and thus hunting would not impact critical habitat for endangered species.

Feeding habitat for waterfowl would be compromised in all open hunt areas during daylight hours. However. concentrating hunting in 1 main block would minimize overall disturbance. According to the Refuge Water Plan (USFWS 1993), unit 5 would be the only deep water feeding area for diving birds. The north portion of unit 5C, often used by grazing geese and ducks, would be subject to disturbance by hunting in block B.

Hatching year birds may be vulnerable to early season hunting mortality (Nelson 1966). Redheads and especially canvasbacks have been slow to recover from the habitat destruction of the early 1980's. Poor recruitment may be a significant factor limiting local **breeding** populations. Numbers may rebound if hatching year birds are protected. Alternative 6 protects deep water, hardstem bulrush habitat in units 1A, 3A,

3B, and 5, but opens major production and brood habitat in unit 2. Unit 5 would be buffered from disturbance by closure of unit 6.

Since at least 1930, migrating tundra swans have favored the remote northern part of unit 1 for **resting**. The swans are highly sensitive to disturbance and large, visually unobstructed, secure space may be a key attribute of the Refuge for tundra swans. In general, disturbance would be minimized by concentrating hunting in large blocks. Unit 1 would be adequately protected. Although hunting in unit 2 would hamper movement of swans to units 4 and 5, a safe travel corridor would be maintained across the top of units 2 and 3. Resting habitat along the north edge of unit 5C would be disturbed by hunting in block B.

A diversity of habitats would be protected from disturbance, and **species diversity** would not be impacted by Alternative 6. However, in dry years unit 2 would be the only area with consistent water supply. Species diversity may be limited by hunting in unit 2 in dry years.

Some **resident mammals and birds** would be displaced from the hunt areas, but would find refuge in adjacent closed areas. Reptiles and amphibians would not be impacted.

Depredation of waterfowl by mammalian and avian predators would be facilitated because predators and prey would likely be more concentrated in the closed areas.

Botulism outbreaks are difficult to predict and presumably management of disease outbreaks would supersede all other management plans. Disturbance in open hunt area during botulism outbreaks may help to displace birds from infected areas. Conversely, disturbance may further weaken already stressed birds making them more susceptible to disease. In dry years, human caused stress may have a pronounced effect on botulism. The freshest and most consistent water supply is in unit 2. Displacement of birds by hunting activity may move birds to poorer quality habitat that is more prone to botulism. Waterfowl also would be more crowded into closed areas increasing the potential for disease transmission.

Socio-economic Impacts

Alternative 6 would provide **harvest opportunities** in a **variety of habitats**, especially emergent marsh. A 1,553 acre grassland area would provide pheasant hunting opportunities in addition to waterfowl. Unit 2, the major river delta has historically provided excellent hunting opportunity, although crowding and illegal shooting from dikes can detract form the **aesthetics** of the hunting experience. Block B would be readily accessible and surrounds State owned land. It would receive high numbers of hunter visits due to the close proximity to Brigham City and easy access by foot, motor boat and airboat. Block C is isolated and would be accessible only by airboat. Unit 1A would be closed under this alternative and has historically provided excellent hunting for large numbers of hunters.

Block A would be readily **accessible** to hunters on foot, in canoes, and motor boats. Airboats would be allowed in units 9, the west part of 8, and the "dog ear" portions of units 7 and 8. Alternative 6 would provide some hunting areas for persons with limited equipment and effort. Blocks A and B would be accessible to hunters on foot, and in motorboats. Unit 9 in block A and block C would be accessible with airboats. Airboat access would also be allowed along the west side of the block B down the Reeder Canal only.

Boundary maintenance below the D-line would be of considerable cost for the south and east boundary of unit 6. Boundaries in units 2, and 3 follow natural features (dikes) and would be easily identified and maintained. Block B would be bounded by canals on the west and south. Block C would have no natural features on the boundaries and have difficult boundaries to maintain. Three separated hunting areas would increase costs and difficulties associated with **law enforcement**.

Access by the non-hunting public would be restricted to the auto tour route in unit 2. Some conflict would occur between hunting and **wildlife observation** and **photography**. Forty percent of the **auto tour route** would have hunting on both sides, providing considerable opportunity for wildlife observation by non-hunters. However, disturbance to wildlife and illegal shooting from dikes would detract from the tour route. Privately owned hunt clubs (Willard Bay and Pintail, etc.) would be adversely impacted by the closure of unit 6 as a nearby hunting location. Alternative 6 would not compromise **public safety** except for the general risks posed by boating. Medical services would not be readily available due to the remote nature of the area.

The variety of public uses on Refuge lands stimulates **local economics**. Hunter visits averaged 4,000 annually from 1960-1980. An increase in hunter visits would occur due to the availability of new hunting areas in block B and the increased accessibility in unit 9 (block A). Blocks A and B would encompass historically popular hunting areas and

would be easily accessible. **Costs** to taxpayers would be incurred for law enforcement, education, maintenance of boundaries, roads, and access points, and from search and rescue efforts. Three separate blocks of hunting would increase law enforcement costs and effort. The Refuge is a major feature of the surrounding landscape. **Quality of life** and **community cohesion** would be improved by providing recreation, education, and enjoyment of the outdoors for hunters. Non-hunters and those opposed to hunting would experience some decrease in their ability to enjoy the Refuge.

Conclusion:

The physical environment would not be impacted by Alternative 6. Hunting activity would displace bald eagles, peregrine falcons and trumpeter swans from open areas. Travel corridors would be protected from disturbance. The swan rest area in unit 1 would not be impacted. Activity would be concentrated in large blocks, providing undisturbed feeding and resting habitat. Units 4 and 5 would have a buffer from airboat traffic in adjacent units. Habitat for hatching year canvasbacks and redheads would be protected. Species diversity would not be impacted. Botulism mortality would increase or decrease depending on conditions. Alternative 6 wold offer hunting mostly in emergent marsh, open water and mudflat. Grasslands would also be well represented. Unit 1A would be closed, precluding use of a popular area. However, the remainder of block A and block B would receive heavy use by hunters. Boundary maintenance in unit 6 would be high. Law enforcement efforts would be substantial due to three hunting areas. Hunter use would increase due to the opening of block B and the accessibility of block A, boosting local economics. However, privately owned hunt clubs utilizing unit 6 would be adversely impacted. Increased recreational opportunity for hunters would occur, but non-hunters may be adversely impacted during hunting season.

CONSULTATION AND COORDINATION

Input on the hunt plan was solicited from a variety of sources, beginning in April 1994. Meetings were held with a number of interested groups, organizations and individuals. Personal contacts, telephone interviews and correspondence were used to gather this information.

Following is a list representing interested parties contacted prior to the preparation of this EA. These contacts were made through scoping sessions, telephone interviews and correspondence:

Utah State University
Utah Department of Natural Resources - Division of Wildlife Resources
Public Shooting Grounds WMA, Ogden Bay WMA, Harold Crane WMA
Box Elder Wildlife Federation
Bear River Club Company
Canada Goose Club, Inc.
Ducks Unlimited
Audubon Society - Salt Lake Chapter
Premium Club
Willard Bay Gun Club
Utah Air Boat Association
Salt Grass Club
Previous Refuge managers - Lloyd Gunther, Ned Peabody
Pintail Club
Browning Co.
Trumpeter Swan Society
Pheasants Unlimited
Bear River Friends of the Refuge
Local landowners, businessmen and private citizens
Bear River Water Use Council
Box Elder Farm Bureau

Section 7 consultation pursuant to the ESA has been submitted to the U.S. Fish and Wildlife Service, Division of Ecological Services, Salt Lake City.

REFERENCES

Goddard, Stephen V. 1962. Factors affecting the waterfowl hunter utilization and the waterfowl kill at Bear River Migratory Bird Refuge. Master's thesis, Utah State University. Logan, Utah. 107 pp.

Hansen, Keith S. 1991. Environmental assessment for the restoration and expansion of the Bear River Migratory Bird Refuge. USFWS. Denver, Co. 61 pp.

Nelson, Noland F. 1966. Waterfowl hunting in Utah. Utah Dpt. of Game and Fish. Publication No. 66-10. 100 pp.

Piper, Steve. 1990. Bear River Migratory Bird Refuge, environmental assessment economic study. U.S. Bur. Rec. Denver, Co. 18 pp.

USFWS. 1986. "Public use management" in Refuge Manual. USDI. Washington D.C. 8RM5.

USFWS. 1993. Bear River Migratory Bird Refuge long range management plan. BRMBR. Brigham City, Utah. 57 pp.

USFWS. 1995. A comprehensive management plan, Bear River Migratory Bird Refuge. BRMBR. Brigham City, Utah. 40 pp.

ATTACHMENTS

The following attachments are available for review at the:

Bear River MBR
866 S. Main
Brigham City, UT 84302
(801) 723-5887

Senate Bill 3194. An act to establish the Bear River Migratory Bird Refuge. 1932.

Regulations for the administration of the Bear River Migratory Bird Refuge. 1932.

Order designating public shooting grounds within the Bear River Migratory Bird Refuge. 1933.

APPENDIX

Issues were raised during review of the hunt plan by the public and were categorized as follows:

Biological:

Will hunting affect habitat quality for birds? Will hunted and/or non-hunted species of birds be adversely affected? Are adequate rest areas being maintained, both size and location for adequate food and rest? Do plans protect enough emergent marsh habitat for bird resting? Is disturbance and hunting in the upper delta area affecting canvasback and redhead production? How will migrations of trumpeter swans be protected and encouraged? Can unit 2 be closed to swan hunting to help protect trumpeter swans? Can the refuge close swan hunting on December 1 each year? Will increased airboat travel across Willard Spur adversely affect birds resting in the event unit 6 is closed?

Socio-Economic:

Harvest Opportunity

Will hunting quality be as good as in the past? How much new acreage is being opened? Is upland game hunting going to be available? Are blinds for day-to-day use going to be available to the public? Can special hunt days be established for youth or physically challenged? Will hunting be permitted from interior dikes not open to vehicles? Can the vegetated areas below "D" line in unit 7 be kept open to hunting since vegetation is sparse elsewhere?

Aesthetics

How will habitat conditions be in the hunting area? Can refuge construction activities be planned to avoid disturbing hunters and birds? Will conflict of uses occur with non-consumptive visitors? How will noise from airboats affect hunting and bird use? Can crowding be controlled?

Public Safety

Will the safety of non-hunters be jeopardized on the tour route? In densely hunted areas, will hunter safety be compromised? Will deep, narrow channels have safe crossings? Is it possible to stop hunting in unit 2 and improve public safety on the tour route? Will hunters below "D" line be able to cross the borrow ditch on foot to access the dike in event of an emergency?

Accessibility

Are enough boat ramps being planned for all open areas including the main river channel, interior units and canals (including Whistler and Reeder canals)? Is

automobile access and parking going to be ample? Will access lanes be provided for all-terrain-vehicle use? Where will airboats be allowed? Can permanent blinds be maintained in Unit 6 by the Willard Bay Gun Club and others? Is camping going to be allowed on the refuge?

Habitat Variety

Will hunt areas have a variety of habitats for a variety of hunting? Can hunt areas be rotated annually for better shooting? If a hunt area is dry, can another unit be substituted for that year?

Law Enforcement

Is it necessary to register hunters? Will regulations be modified again, and if so how soon?

Boundaries

Will boundaries be posted sufficiently to recognize closed and open areas? (Note-questions asked about keeping certain favorite areas open were too numerous to list, however; all areas were considered in developing the 6 alternatives)

Quality of Life

Is unit 6 going to remain open, so that use by hunt clubs who have historically used them can continue? Will the hunting traditions on the refuge continue into the future? Will hunting regulations maintain the quality of recreation for non-hunters?

BEAR RIVER MIGRATORY BIRD REFUGE HUNT PLAN

I. INTRODUCTION

The Bear River Migratory Bird Refuge (Refuge), located at the confluence of the Bear River and the Great Salt Lake in northern Utah, is internationally recognized for its unique wetland and wildlife values. The marsh ecosystem supports diverse populations of waterbirds for staging, feeding and reproduction. In 1983, the Refuge was inundated by flood waters from the Great Salt Lake, destroying vegetation and facilities. In 1989 when flood water receded, all that remained of the marshes were barren mudflats.

In planning the Refuge restoration, Hansen (1991) wrote an Environmental Assessment (EA) entitled The Restoration and Enhancement of Bear River MBR, approved in October 1991. It provides an in-depth description of the Refuge along with it's goals and objectives. Also, it contains an overall analysis of the environmental and socio-economic consequences of enhancing and restoring the entire Refuge.

This document is focused only on public hunting and the development of a Hunting Plan designating areas open to hunting and associated regulations.

The Hunt Plan includes waterfowl and pheasants. Since the Refuge is being developed and expanded, we expect further revisions will be necessary. In addition, annual reviews are required to ensure standard criteria are being met for compatibility.

Wetland conditions vary from year to year, affecting hunting quality and quantity. Even so, the hunt plan will remain constant and will not be adjusted on an annual basis to account for temporary climatic variables. Frequent and rapid adjustments are both confusing to the public and require significant efforts to post new boundaries.

To meet habitat needs of birds, wetland conditions will intentionally be modified from time to time. Such changes may impact hunting, but managers will give priority to the needs of wildlife. Affects to hunting will be considered secondarily to wildlife management.

II. Conformance with Statuary Authorities

The Secretary of the Interior is authorized by the National Wildlife Refuge System Administration Act of 1966 and the Refuge Recreation Act of 1962 to allow hunting on Refuges after a determination that hunting is compatible with the major purposes for which the area was established. In addition to requiring compatibility, the Refuge Recreation Act also requires that funds are available for developing, operating and maintaining the hunting program.

Hunting is viewed as an acceptable, traditional form of wildlife-oriented recreation that may serve as a tool for manipulating wildlife populations (USFWS 1986).

Hunting programs are evaluated on the following criteria: 1) Compatibility with refuge purposes, 2) Biological soundness, 3) Funding availability, 4) Conflicts with other wildlife-oriented public uses, and 5) Recreational opportunity. Evaluations are required annually.

USFWS Refuge Manual guidelines also require coordination with the State, endangered species consultation under section 7 of the Endangered Species Act (ESA) and public involvement and review.

Section 5 of Senate Bill 3194 (Enabling Act), creating the Refuge and appropriating development money, specifies 60% of the Refuge will be an "inviolate sanctuary". Therefore, public hunting can only be allowed on up to 40% of the refuge.

In 1932, pursuant to the Enabling Act, 13 regulations were issued by the Secretary of Agriculture dealing with the administration of the Refuge. Regulation 3 states "Hunting, killing, or taking migratory game birds will be permitted in accordance with State and Federal law upon approximately forty per cent (40%) of the flooded area of the refuge as shall be designated from time to time...". Other restrictions included: closing 100 yards on either side of dike roads to hunting, requiring hunters to register and report birds killed, and allowing public travel on designated routes only.

Determining boundaries of the original hunting area required approval from both the state "Game Commissioner" and the Governor. Need for changing the hunt areas from time to time was recognized when it is in the interest of the birds as well as the shooting. Hunting areas were supposed to provide "Reasonable shooting privileges" as they existed at the time the areas were established.

The waterfowl season of 1932 was the first time regulations were in effect relative to shooting on the Refuge. In cooperation with the State Game Commissioner and after consultation with a committee representing the sportsmen of Utah, the open area for public shooting was agreed upon. A total of 12,600 acres, or about 40% of the "flooded" area, that portion of the refuge was officially opened for public hunting by the Secretary of Agriculture.

No major changes were made to the boundaries until necessitated by flooding of the Great Salt Lake in the mid 1980's.

III. Statement of Objectives

Hunting is permitted on any refuge within the Refuge System upon determination that hunting is compatible with the major purposes for which such areas were established. In addition to a compatibility determination, funds are available for the development, operation, and maintenance of the hunting program. The USFWS has long recognized the significant positive benefits that can be attributed to a well-managed hunt. Hunting is an acceptable, traditional form of wildlife-oriented recreation that may also serve as a management tool for the effective manipulation of wildlife population levels. A major objective of the USFWS is to provide the public with a quality wild-life oriented experience and the opportunity to utilize a renewable natural resource.

The refuge was placed under administration October 1, 1932 and on October 12th, the Secretary of Agriculture officially designated the "Public Shooting Grounds Within The Bear River Migratory Bird Refuge".

When Refuge impoundments were flooded in 1984 temporary adjustments to the hunt boundary were made. High water destroyed all vegetation as well as public use facilities. Since D-line dike was the only remaining landmark, it was used to designate the hunt area boundary. The area southwest of D-line was open. As water levels further receded, Units 2 and 1A were added to the hunt area.

Concurrent with this temporary change in hunt area boundaries, an environmental assessment was approved which enabled purchase of new lands for the refuge. The approved expansion includes nearly 17,000 acres of lands, containing a mix of wetland and upland. Forty percent of the "flooded" acreage of newly acquired lands are to be added to the 13,200 acre hunt acreage.

To date, a total of 8,358 acres have been purchased. The "flooded" portion of those lands totals 1,980 acres. Forty percent of the 1,980 flooded acres, 792 acres are to be added to the present hunt area acreage.

The strict definition of "flooded" is not spelled out in the legislation, however it is referred to in various documents as the area "developed", "impounded", or "diked" and was agreed upon as 33,000 acres in 1932. Apparently, it was considered the impounded area above D-line. The remaining 31,500 acres of the refuge were not included as "flooded" even though they contain marsh, wetlands and mudflats which are naturally flooded on an intermittent basis.

Therefore, the hunt plan needs complete review to ensure an adequate acreage is open to hunting, that open areas provide appropriate quality of hunting, and sanctuary areas provide enough protection for birds.

Objectives of the Hunt Plan:

During public scoping sessions, a variety of people with different interests identified many issues that concerned hunting at the Refuge (appendix). After careful consideration, all of the issues and concerns were summarized to create 9 objectives. The 9 objectives are to:

1) Provide high quality hunting
2) Minimize conflicts with other uses
3) Provide remote hunting areas
4) Provide areas open to airboats
5) Facilitate hunting access
6) Facilitate law enforcement
7) Minimize disturbance to swans
8) Minimize disturbance to rest areas
9) Protect breeding populations

IV. Environmental Assessment

A variety of issues were considered in the evaluation of the hunt plan. The issues were categorized as physical (pertaining to the physical environment), biological (pertaining to plants and animals), or socio-economic (pertaining to the needs of people and economies). Certain issues were either not relevant to, or would not be impacted by hunting. These include:

Physical - climate, air quality, soils, topography, geology
Biological - vegetation, exotic species
Socio-economic - archeological sites, education and research opportunities, fishing, boating, land use, development, population growth, open space, natural area preservation, residences, tax revenues, public services, national defense, scenery, noise, odor, aesthetics

Other issues that would have either positive or negative impacts are evaluated.

Biological Impacts

Bald eagles **(threatened)** and peregrine falcons **(endangered)** use the Refuge for foraging during the fall migration. The presence of human activity may be disruptive to eagles and falcons foraging in hunt areas. However, concentrating hunting in block A will minimize disturbance to foraging areas. The disturbance and redistribution of waterfowl will enhance foraging opportunities in closed units where birds concentrate. Activity in block B will disturb trees used as perch sites by migrating raptors, but the travel corridor between the Refuge and Willard Bay roost sites will be unimpeded.

Trumpeter swans, a **candidate 2 species** for listing under the ESA may use the Refuge as a migration stop-over during October through December. In mild winters, the Refuge may provide habitat for wintering trumpeters. The Refuge is expected to

become more important for migrating trumpeters as the Rocky Mountain trumpeter swan population expands its range. Trumpeters will be subject to increased disturbance and increased risk of incidental harvest, especially in the travel corridor between unit 1 and 2. The main river delta in unit 2 is an excellent feeding area for swans. Hunting in unit 2 will deter feeding and subject trumpeters to increased risk of hunting mortality during daylight hours. Trumpeters traveling between the security area in unit 1 and feeding areas south and east may be subject to disturbance and potential mortality as they crossed the hunt zone in block A. Units 4 and 5 will provide ample feeding habitat for trumpeters and will be buffered from disturbance by closure of unit 6 and 7.

No critical habitat has been designated on the Refuge by the ESA, and thus hunting will not impact critical habitat for endangered species.

Feeding habitat for waterfowl may be compromised in all open hunt areas during daylight hours. However. concentrating hunting in 1 main block will minimize overall disturbance. According to the Refuge Water Plan (USFWS 1993), units 5 and 3C will be the only deep water feeding area for diving birds. The north portion of unit 5C, often used by grazing geese and ducks, may be subject to disturbance by hunting in block B.

Hatching year birds may be vulnerable to early season hunting mortality (Nelson 1966). Redheads and especially canvasbacks have been slow to recover from the habitat destruction of the early 1980's. Poor recruitment may be a significant factor limiting local **breeding** populations. Numbers may rebound if hatching year birds are protected. Alternative 5 protects deep water, hardstem bulrush habitat in units 3C and 5, but opens major production and brood habitat in units 1A, 2 and 3.

Since at least 1930, migrating tundra swans have favored the remote northern part of unit 1 for **resting**. The swans are highly sensitive to disturbance and large, visually unobstructed, secure space may be a key attribute of the Refuge for tundra swans. In general, disturbance would be minimized by concentrating hunting in large blocks. Unit 1 will be adequately protected, but hunting in 1A will create some disturbance in the proximity of the security area, especially after ice-up when swans heavily use the Bear River Club spillway. Vegetation has recovered well in 1A and will provide ample cover for both hunters and birds. In addition, the travel corridor between the security area in unit 1 and feeding habitat in units 4 and 5 is hampered by the open hunt zone in units 2 and 3. Birds will have to cross an open hunting area to reach feeding areas on the Refuge. However, closing land above Units 4 and 5 will enhance a major movement corridor between the private clubs and the Refuge.

A diversity of habitats will be protected from disturbance, and **species diversity** will not be impacted by Alternative 5. However, in dry years unit 2 may be the only area with consistent water supply. Species diversity may be limited by hunting in unit 2 in dry years.

Some **resident mammals and birds** may be displaced from the hunt areas, but will find refuge in adjacent closed areas. Reptiles and amphibians will not be impacted.

Depredation of waterfowl by mammalian and avian predators may be facilitated because predators and prey will likely be more concentrated in the closed areas.

Botulism outbreaks are difficult to predict, and management of disease outbreaks will supersede all other management plans. Disturbance in open hunt area during botulism outbreaks may help to displace birds from infected areas. Conversely, disturbance may further weaken already stressed birds making them more susceptible to disease. In dry years, human caused stress may have a pronounced effect on botulism. The freshest and most consistent water supply is in unit 2. Displacement of birds by hunting activity may move birds to poorer quality habitat that is more prone to botulism. Waterfowl also will be more crowded into closed areas increasing the potential for disease transmission.

Socio-economic Impacts

Alternative 5 will provide **harvest opportunities** in a **variety of habitats**, especially emergent marsh. A large grassland area (1,553 acres) will provide additional pheasant hunting opportunities. Unit 2, the major river delta has historically provided excellent hunting opportunity, although crowding and illegal shooting from dikes can detract form the **aesthetics** of the hunting experience. Unit 9 will provide excellent hunting, especially in the northern section where unit 1 spills water. Block B will be readily accessible and surrounds State owned land. It will receive high numbers of hunter visits due to the close proximity to Brigham City and easy access by foot, motor boat and airboat. Block C is isolated and accessible only by airboat.

Block A will be readily accessible to hunters on foot, in canoes, and motor boats. Airboats will be allowed in units 9 and the "dog ear" portions of units 7 and 8. Alternative 5 will provide some hunting areas for persons with limited equipment and effort. Blocks A and B will be accessible to hunters on foot, and in motorboats. Unit 9 in block A and block C will be accessible with airboats.

Boundary maintenance below the D-line will be of considerable cost for the south and east boundary of unit 6.. Boundaries in units 1A, 2, and 3 follow natural features (dikes) and are easily identified and maintained. Block B will be bounded by canals on the west and south boundaries. Block C will have no natural features on the boundaries, creating some difficulty in maintenance. Three separated hunting areas may increase costs and difficulties associated with **law enforcement**.

Access by the non-hunting public will be restricted to the auto tour route in unit 2. Limited conflict may occur between hunting and **wildlife observation** and **photography**. Sixty percent of the **auto tour route** will have hunting on both sides, reducing opportunity for wildlife observation by non-hunters. In addition, disturbance to

wildlife and illegal shooting from dikes may detract from the tour route. Alternative 5 will not compromise **public safety** except for the general risks posed by boating. Privately owned hunt clubs which utilize unit 6 will be adversely impacted. Medical services will not be readily available due to the remote nature of the area.

The variety of public uses on Refuge lands stimulates **local economics**. Hunter visits averaged 4,000 annually between 1960-1980. Hunter visits will increase due to the availability of new hunting area in block B and the increased accessibility in unit 9 (block A). Blocks A and B will encompass the historically popular hunting areas and will be easily accessible. **Costs** to taxpayers will be incurred for law enforcement, education, maintenance of boundaries, roads, and access points, and from search and rescue efforts.

Three separate blocks of hunting will increase law enforcement costs and effort. The Refuge is a major feature of the surrounding landscape. **Quality of life** and **community cohesion** may be improved by providing recreation, education, and enjoyment of the outdoors for hunters. Non-hunters and those opposed to hunting may experience some decrease in their ability to enjoy the Refuge during the hunting season.

Conclusion:

The physical environment will not be impacted by the Hunt Plan. The presence of human activity in hunt areas will displace bald eagles, peregrine falcons and trumpeter swans. The travel corridor for eagles to Willard Bay will be unimpeded. Trumpeter swans will be exposed to risk of incidental harvest as they crossed from the rest area in unit 1 to feeding areas in units 4 and 5. The rest area in unit 1 will be protected from disturbance and units 4 and 5 will be buffered from disturbance in adjacent units. Closed units will provide a variety of feeding habitats and overall disturbance by hunting will be concentrated primarily in block A and to a lesser extent in block B. Habitat for hatching year canvasbacks and redheads will be protected. Species diversity will not be impacted. Botulism mortality may increase or decrease depending on conditions. Hunting opportunities will mostly be in emergent marsh, but include all other habitat types as well as 1,553 acres of grasslands. Maximum numbers of hunters will be expected to utilize blocks A and B. Boundary maintenance costs will be high on the south and east side of unit 6. Law enforcement efforts will be substantial. Non-hunters will use the auto tour route, however less than half the route is bounded by rest areas for birds. Privately owned hunt clubs near Willard Bay will be adversely impacted by the closure of unit 6. Benefit to local economics will occur from the increase in hunter numbers. Increased recreational opportunities will benefit hunters, but will impact non-hunters during the hunting season.

V. Description of the Hunting Program

Hunting activities will be concentrated in a core high use area (block A) with additional grassland and wet meadow acres in block B (fig 6). The southern boundary will be linear, opening the "dog ears" projecting south of unit 7 and 8 (block C). Alternative 5 will open 17,256 acres to hunting. Airboats will be allowed in unit 9, Reeder Canal and in block C. Foot travel, canoes, and motorboats will be allowed in all other units. Motor vehicle travel will be allowed around unit 2 and to the southeast corner of block B. The attached map depicts the areas open to hunting. Opening and closing dates of the hunting season as well as bag limits will basically conform with state regulations. Waterfowl and pheasants are species open to hunting. No special permits other than State and Federal licenses, stamps and permits are required to participate in the refuge hunt.

Assessment of tundra swan harvest and it's affect to trumpeter swan recovery programs is of special interest. Should information show that adjustments need to be made in the refuge hunt plan, proposed changes will be coordinated with state, federal and private organizations. Relocation of trumpeter swans is a consideration in the near future. If and when that occurs, a management plan will be developed by all the affected agencies prior to initiating the program.

Control and enforcement of the hunt program will be accomplished primarily with Refuge Officers on staff. Currently three employees have enforcement authority. From time to time, assistance is received from Utah Division of Wildlife Officers and Special Agents. No permanent check stations are staffed, hunters are checked as necessary while entering, leaving or hunting in the field.

Funding required to administer and manage the hunt totals 15,900 in FY 95 dollars, as reported in the 1994 compatibility determination for waterfowl hunting.

VI. Measures Taken to Avoid Conflicts With Other Management Objectives

See attached section 7 consultation regarding impacts to endangered species.

Conflicts with public use occur only to a minor degree with the Auto Tour Route around Unit 2. Ample wildlife viewing is assured by establishment of rest areas adjacent to the route. Also, public safety is enhanced by the closure of all hunting from anywhere within 100 yards of the route. No loaded firearms are allowed in motor vehicles and no shooting is allowed from roads.

No administrative conflicts are expected to occur.

VII. Conduct of the Hunt

Hunting areas include:

Block A - Units 1A, 2, 3A & adjacent land as posted, and 3B

Block B - Unit 5A north and east of Reeder Canal and portions of tracts purchased from L.C. White, Knuduson, Nichols, Simper and Hall **as posted.**

Block C - Those portions of Units 7 & 8 that protrude south of the east-west Refuge boundary line **as posted.**

Vehicle travel is permitted, by both hunters and non-hunters, around Unit 2 on the L, H, and D line dikes if all firearms are unloaded and cased or broken down.

Shooting, hunting or loaded firearms are not permitted within 100 yards of the primary roads (L, H, and D line dikes). All firearms must be cased or broken down when hunters are not in designated hunt areas, including parking areas and roads (D, L, and H line dikes)

Hunting is limited to migratory birds including ducks, geese, swans, coots and tundra swans (with a special state permit); as well as ring-necked pheasant.

Season dates, hours, bag & possession limits confirm to current State and Federal regulations.

Steel shot is required for all hunting.

Small boats, both motorized and non-motorized, are permitted. Hunters may launch boats in the refuge hunting area two weeks prior to opening of hunting season to scout the area and set up temporary blinds.

Airboats may be used in Unit 9 of Block A and Block C.

Temporary blinds may be constructed using natural vegetation only. Permanent blinds or sunken boxes may not be built on Refuge lands.

All temporary blinds are available for public use on a first come, first served basis regardless of who initially build it.

Off road vehicles, either tracked or wheeled, may not be used anywhere on the Refuge.

Open fires are not allowed.

Camping is not permitted.

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UNITED STATES FISH AND WILDLIFE SERVICE
REGION 6

ENVIRONMENTAL ACTION MEMORANDUM

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and have determined that the action of *moving hunting area boundaries at the Bear River Migratory Bird Refuge* is found not to have significant environmental effects as determined by the attached Environmental Assessment and Finding of No Significant Impact and is therefore authorized to be implemented.

DEPUTY * Regional Director — Date: 8/30/95

(3) Assistant Regional Director, Refuges and Wildlife — Date: 8/29/95

(2) Refuge Supervisor — Date: 8/26/95

(1) Chief, Land Acquisition & Refuge Planning — Date: 8/24/95

***As delegated by 4 AM 4.1 Director Order No. 5**

FINDING OF NO SIGNIFICANT IMPACT

AND

NOTICE OF DECISION

BEAR RIVER MIGRATORY BIRD REFUGE HUNT PLAN

JUNE 1995
BRIGHAM CITY, UTAH

Based upon the analysis in the attached Environmental Assessment, I find that Alternative 5 will not have a significant impact on the human environment. I therefore conclude that no Environmental Impact Statement is necessary.

My rationale for this finding is:

1) Adverse impacts to threatened and endangered species will be minimized by concentrating hunting and rest areas into large blocks,

2) Hunting is compatible with the purposes for which the Bear River Migratory Bird Refuge (Refuge) was established, funds are available for developing, operating and maintaining the hunting program, and hunting is recognized as an acceptable, traditional form of wildlife oriented recreation,

3) Disturbance to biological and physical resources is minimized.

4) There will not be any adverse impacts to minorities or low-income populations and communities.

NOTICE OF DECISION

After careful consideration, I have selected alternative 5 of the Refuge Hunt Plan EA for implementation in the fall of 1995.

Alternative 5 meets the 9 objectives presented on page 8 of the EA:

1) Provide high quality hunting
Alternative 5 allows hunting in the main river delta in units 2 and 1A. This area provides some of the most vigorous and consistently wet habitat on the Refuge. Additional acres opened to hunting include the historic "Duckville" hunt club as well as wet meadow habitat and a block of grasslands along the east side of the Refuge. A variety of habitat types are open, accommodating a broad spectrum of hunting methods.

2) Minimize conflicts with other uses
Alternative 5 provides areas closed to hunting adjacent to the auto tour route. Refuge visitors will have the opportunity to view abundant wildlife.

3) Provide remote hunting areas
Alternative 5 provides remote hunting in Unit 9 and also in Block C. Some of this acreage is accessible only by air boat. Remote areas are also available to hunters on foot in Block B.

4) Provide areas open to air boats
Alternative 5 opens 5,677 acres for air boat use. Block C will probably be used exclusively by air boaters because access by other means is limited.

5) Facilitate hunting access
Alternative 5 provides excellent access for the majority of hunters with limited equipment or physical abilities. The large hunting area adjacent to Interstate 15 will facilitate access for hunters with limited equipment and time.

6) Facilitate law enforcement
Hunting is concentrated in two main blocks, requiring less time and resources to enforce laws and regulations. Hunt area boundaries are mostly on recognizable land features which minimize maintenance expenses.

7) Minimize disturbance to swans
Alternative 5 provides large secure rest areas north of D- line dike that are buffered from disturbance in adjacent areas. During the fall, swans often concentrate on large expanses of undisturbed remote wetlands. Hunting activity will occur mostly in a main contiguous area (Block A), leaving large, undisturbed areas for swan use. Ample feeding opportunities are available for swans in Units 3D, 4 and 5C. The historic swan use area in Unit 1 is closed to all entry, as is the adjacent Unit 10. New lands purchased in 1995 north of Units 3F, 4 and 5B will be closed to hunting in order to provide an undisturbed corridor between the prime swan habitat of Units 4 & 5 and the privately owned wetlands to the north.

8) Minimize disturbance to rest areas
Disturbance in, or adjacent to, rest areas is minimized by concentrating hunting in Block A. Rest areas contain adequate food resources and security.

9) Protect breeding populations
Alternative 5 protects habitats for hatching year redheads and canvasbacks.

RESPONSE TO ISSUES

Over the course of the 30 day comment period some issues were raised that either were not addressed in the EA, or require further clarification. These issues are discussed below:

Compliance with NEPA, ESA, and other Federal statutes:

Under NEPA (National Environmental Policy Act), EA's (environmental assessments) are used to determine to ~~determine~~ if a Federal action has significant impacts on the human environment thus requiring the preparation of an EIS (environmental Impact Statement).. However, EA's may also be completed " to aid in planning or decision making, serve as a vehicle to gain public input, or facilitate interagency coordination". This EA was not prepared to comply with NEPA, but was undertaken to gather ample input from all concerned parties. The purpose of the EA is to aid the Service in making a well-informed, biologically sound decision about the placement of hunting area boundaries. Notice of the completion , availability , and comment period for the draft EA was published in area newspapers, and copies were mailed to those parties expressing interest. Copies were also available at the Refuge office and at the State and Regional DWR (Utah Division of Wildlife) offices.

A wide range of alternatives were considered, but some were rejected because they did not meet Service policy, legal mandates, or biological requirements. Other alternatives were rejected because they were beyond the scope and purpose of the document. The purpose of the EA is to establish the location of hunting area boundaries, not to evaluate the merits of hunting or to set species specific regulations. A "no hunting" alternative was considered, but rejected because it was beyond the scope and purpose of the document. Hunting is, and has been, a valued form of outdoor recreation at the Refuge since its establishment in 1928. The Regulations for the Administration of the Bear River Migratory Bird Refuge (1932) states that " hunting, killing, or taking of migratory game birds will be permitted in accordance with State and Federal law upon approximately 40% of the flooded area of the Refuge ...." Objectives for the Refuge hunting program were proposed, put out for public review, and approved in the Restoration and Expansion of the Bear River Migratory Bird Refuge, Environmental Assessment (Hansen 1991). Hunting was declared compatible with the purposes for which the Refuge was established (as per 1995 Compatibility Determination, on file USFWS (US Fish and Wildlife Service)).

Many suggestions were received about opening specific "favorite" hunting spots on the Refuge. Consideration was given to all requests. However, when the objectives of the EA were considered, some areas were eliminated because they were not biologically or logistically feasible. The alternatives presented in the EA represent an array of hunting preferences while maintaining the biological integrity of the Refuge.

One group commented that an agreement was in place that allowed them use of unit 6. No agreements exist which guarantee the use of the Refuge by any exclusive groups. Hunt boundaries are set by a broad range of considerations, of which wildlife management objectives

are given priority. Although the needs and preferences of all user groups were considered, the welfare of the majority of users was given priority.

Section 5 of Senate Bill 3194 (Refuge enabling legislation) specifies that 60% of the Refuge will be an "inviolate sanctuary". Public hunting can be allowed on up to 40 % of the Refuge. The total acreage of the Refuge is 72,858 ac. Alternative 5 will open 17,256 ac or 24% of the total acreage.

Season setting procedures:

Evaluating the impacts of harvest on waterfowl species is accomplished on a flyway scale by the Migratory Bird Management Office (MBMO) of the USFWS. Population data on migration patterns, production, survival, sex and age ratios, and harvest are collected on a continent-wide basis. Ultimately, the USFWS, in coordination with the Pacific Flyway Council (PFC) and the Canadian Wildlife Service (CWS) determines the season length, bag limits and species specific regulations for each flyway. Each State then establishes regulations within the framework of the USFWS regulations. Data on all species is available for the Refuge, but it would be inappropriate to consider setting hunting regulations for specific species based on a single site within the much larger flyway. Exceptional conditions, such as the flooding of the GSL (Great Salt Lake), may warrant temporary adjustments to hunting regulations. However, under typical conditions, the Refuge will continue to use the expertise and recommendations of the Flyway Council system in establishing species specific hunting regulations.

Threatened and endangered species:

No published data is available to document the effects of hunting to bald eagles or peregrine falcons at the Refuge. However, all potential impacts to threatened and endangered species, no matter how insignificant, must be given consideration. The GSL winters over 500 bald eagles, making it on of the 10 largest wintering areas for this species. Hunting has the potential to impact the foraging behavior and travel patterns of bald eagles and peregrine falcons. However, the large expanse of remote, undisturbed habitat will accommodate bald eagle and peregrine falcon populations. Eagles and falcons may benefit from crippled or unretrieved birds, and from the larger concentrations of waterfowl in rest areas. Impacts to threatened and endangered species was reviewed by the Ecological Services Division of the USFWS through the Intra-Service Section 7 Evaluation procedure required by the Endangered Species Act.

Wildlife Health:

Occasionally conditions occur that drastically alter habitat and jeopardize the health of wildlife. Flooding by the GSL and severe drought may necessitate changes to hunt area boundaries to accommodate the needs of wildlife. Managers will give priority to the needs of wildlife. Affects to hunting will be considered secondarily to wildlife needs. The Refuge manager has the authority

to change boundaries or close areas on an emergency basis if conditions become detrimental to the health or well-being of wildlife populations.

Conditions on the Refuge changed drastically after the flood. Hunters adjusted to these changes in vegetation, water flows, and silt deposition. Evaluation of the current plan is based on existing conditions. Vegetation patterns and hunting practices will change as the Refuge continues to recover from the flood. The Refuge manager has the flexibility to adapt the hunt plan to changing conditions. Re-evaluation of the plan will be completed at approximately 5 year intervals, unless new information warrants more immediate changes.

Several comments suggested that the EA gave too much consideration to air boats. Others suggested that not enough attention was given. In either case, the noise and movement of an air boat will generate some degree of disturbance to water birds. A nationwide survey of refuge managers determined that air boat use was considered the most prevalent disruptive use on refuges. While the degree of disturbance may be debatable, the needs of feeding, resting, and breeding birds are the primary purpose for which the Refuge was established. The Service must ensure that rest areas "function" as rest areas and are buffered from disturbance in adjacent areas. Low water conditions in late summer often restricts sago pondweed survival to the deeper, southern portions of all units. Air boats moving below the D-line force birds onto the more remote northern portions of the units where little food resources are available.

Hatching year birds, particularly those of late nesting species, are vulnerable to early season shooting. Adjusting the opening day of the season would provide more protection for hatching year birds than protecting natal marshes. However, local breeding populations may recover to pre-flood levels more quickly if the habitat used by local hatching year birds is protected from hunting.

Botulism is usually over by the opening of hunting season. However, in some years die-offs have occurred in early October. Disturbance that disrupts feeding of migrating birds can lead to decreased accumulation of fat reserves. Disturbance to birds further weakened by disease may increase mortality.

Pheasant hunting:

Historically, the Refuge was open to pheasant hunting. Since the flood little of the original Refuge provides suitable habitat for pheasants. The new land along the east side of the Refuge may provide excellent habitat. Unfortunately, pheasant populations around the GSL are exceptionally low, and in recent years the State has restricted the season. The Refuge will continue to adhere to State season regulations. Pheasant production and survival will be encouraged through habitat improvement. No stocking of hand reared birds is planned.

Trumpeter swan protection:

Although the Service is not legally bound to cooperate with the Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans (Pacific Flyway Study Comm. 1992), policy has been to follow the recommendations of the study committee. The Refuge has, and will continue to, participate in the management activities of the study committee. At this time, the management plan does not make any recommendations specific to the Refuge. If future changes to the Management Plan warrant management changes on the Refuge they will be carried out if possible. Although USFWS policy does not require any special management actions for category 2 candidate species, Region 6 of the USFWS has spent considerable time and money on monitoring and range expansion efforts. The Refuge staff is prepared to participate in any new planning efforts that includes the Refuge as part of the Rocky Mountain Population range expansion plan.

Confirmed trumpeter swan sightings have been rare, although surveying logistics are exceptionally difficult at the Refuge (Roy 1994). In the fall of 1994, Refuge personnel spent over 100 hours in the field observing swans, with 1 confirmed trumpeter sighting. Conversely, researchers from Idaho observed 20 trumpeters on several visits to the Refuge (Shea 1995). Bill length measurements of harvested swans were taken by biologists in 1962-65, by hunters in 1971-93, and by biologists in 1994. No trumpeter swans were detected in the harvest. In 1994, with increased emphasis on harvest monitoring, statistics show that the bill length survey had a 99% probability of detecting at least 1 trumpeter in a harvest of 600 birds when trumpeters comprised 1% or more of the harvest (Aldridge 1995).

Nonetheless, movement patterns and feeding behavior of all swans (both tundra and trumpeter) were given consideration in the EA. Swans have been staging in unit 1 since the Refuge began collecting data in 1936 (Roy 1994). Although several comments asserted that historically swans were not disturbed by hunting, Alternative 5 closes unit 1 as a conservative measure to protect an important staging area. Furthermore, swans seem to prefer large expanses of undisturbed habitat in the fall. Alternative 5 provides the largest blocks of closed habitat possible by concentrating hunting around unit 2. Finally, the 8,000 acres added to the Refuge in 1995 were all open to hunting when privately owned. Alternative 5 closes 4,813 acres of the new property, providing a wide travel corridor between major swan use areas.

Historical records indicate 13,200 acres were open to hunting since 1932. Alternative 5 will open 17,256 acres. While this appears to be a significant increase, the ratio of wetland acres open to hunting to the total Refuge acres remains the same (about 19%) for both Alternatives 1 and 5. Alternative 5 will open 24% of the total Refuge acreage, far short of the 40% allowed by law. Since the Refuge has grown in size, some more acres are open to hunting yet a greater acreage has been set apart as sanctuary. Also, the placement of the hunt areas in relation to bird use patterns is of more importance than total acreage. Alternative 5 maximizes the size and security of rest areas and provides a wide travel lane to wetlands north of the Refuge. The 2,424 new acres open in block B are not in a swan use area.

Several comments were received from hunters suggesting that the swan season be modified rather than establishing hunting area boundaries to accommodate swans. It is beyond the scope of the EA to set species specific seasons, a function provided by the annual regulations setting process. Once again, the Refuge will defer to the expertise of the MBMO and the rule setting procedure that is currently in place.

An alternative that would close all or part of the Refuge to tundra swan hunting was considered and rejected because the tundra swan hunt is a legally sanctioned hunt under State and Federal law. A formal procedure for establishing seasons and bag limits for individual species is implemented by the PFC and the MBMO of the USFWS. The Refuge will continue to cooperate with State and Federal regulations regardless of where the hunting area boundaries are established. Most recent information indicates that the Refuge hunt does not increase mortality to trumpeter swans (Aldridge 1995). Monitoring efforts on the Refuge were increased in 1994. If future data indicates that the tundra swan hunt jeopardizes trumpeter swan range expansion, the Service will make necessary adjustments in cooperation with other affected parties.

Alternative 6 proposed closing unit 1A and the top of unit 3 to hunting. While this alternative may be the more conservative approach to protecting swans, it closes some of the historically most popular hunting areas. Alternative 5 was selected because it was a better overall solution to providing for the needs of both the swans and the hunters. The vegetation in unit 1A has recovered fully from the flood and provides excellent cover for both hunters and birds.

Private land issues:

Landowners adjacent to the Refuge were concerned over trespass and disturbance to wildlife from air boat traffic on the Reeder canal. Regulation of access and boat use on the Reeder canal is not within the authority of the USFWS. The US Army Corp of Engineers holds regulatory authority over all navigable waterways. However, air boat use within Refuge lands north of the D-line is restricted. The Refuge will erect a 4-strand barbed wire fence on the boundary between public hunt areas and private lands. Hunters trespassing onto private land are subject to citation under State regulations.

Public use:

Fishing in the main river channel and the auto tour route are the only other public uses permitted on the Refuge. Abundant wildlife viewing will be available along the tour route. Forty percent of the route will be adjacent to rest areas. No hunting is allowed from , or within 100 yards, of the tour route dike. This policy has been in effect since 1932 and no public safety problems have been recorded. In addition, no loaded guns are allowed in vehicles traveling within the Refuge.

Both consumptive and non-consumptive users contribute to the local economy. The Refuge provides important recreation and education opportunities for both groups of users. In the past, conflicts between user groups have not been a problem. The Refuge will continue to encourage

use by hunting and non-hunting visitors.

Hunting quality:

Several respondents felt that more control of hunters and hunting methods would improve the quality of hunting and reduce violations. Suggestions were made to limit hunter numbers, require check in and out, restrict parking, eliminate over-water blinds, ban hunting on interior dikes, and conduct more law enforcement. More controls may be needed as hunter numbers increase. Future restrictions will be implemented as the need is assessed.

Incorporating rest areas within the hunting areas may improve hunting quality. A suggestion was made to place a half mile no hunting buffer along D-line to improve hunting in units 2 and 3. Buffer strips may be a good idea, however, they require additional boundary posting and create a patchwork of open and closed areas that are difficult to recognize and enforce. If conditions warrant, buffer strips may be considered in future revisions to the hunt plan.

Environmental Justice Policy:

Executive Order 12898 (Feb. 1994) requires agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Alternative 5 will not disproportionately impact any ethnic or economic class of people. Costs for hunting on the Refuge are not exorbitant, and consideration was given to providing access for people with limited hunting equipment.

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
Robert G. Valentine
Division Director

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801-538-4700
801-538-4709 (Fax)

July 12, 1995

Al Trout
Bear River Migratory Bird Refuge
866 S. Main
Brigham City, UT 84302

Dear Al:

The Utah Division of Wildlife Resources supports your selection of Alternative 5 as the preferred alternative in the Environmental Assessment for migratory bird hunting on the refuge. We feel this alternative provides a diversity of hunting experiences, is biologically sound and maintains an emphasis on hunting consistent with previous hunt plan strategies.

Although trumpeter swan range expansion is an issue, we feel swan hunting strategies should not drive your overall hunt plan. The most recent harvest data do not demonstrate a trumpeter harvest problem. Should future data indicate a problem, further modifications could be made through the state hunting proclamation to provide trumpeters additional protection.

We appreciate the opportunity to comment on the hunt plan.

Sincerely,

Robert G. Valentine
Director

RV\TA\vw

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
LINCOLN PLAZA
145 EAST 1300 SOUTH, SUITE 404
SALT LAKE CITY, UTAH 84115

In Reply Refer To
(ES)

August 9, 1995

Memorandum

To: Refuge Manager, Bear River Migratory Bird Refuge, U.S. Fish and Wildlife Service, Brigham City, Utah

From: Assistant Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, Salt Lake City, Utah

Subject: Bear River Migratory Bird Refuge Hunt Plan

We have received your Intra-Service Section 7 evaluation regarding the subject plan. This office concurs with your determination of may affect but not likely to adversely affect the bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*).

If we can be of further assistance, please advise us.

Attachment

INTRA-SERVICE SECTION 7 EVALUATION

Location: Bear River Migratory Bird Refuge, Brigham City, Utah

Listed Species: Bald eagle (Haliaeetus leucocephalus)
Peregrine falcon (Falcon peregrinus)

Objectives of the Action:

1) Provide high quality hunting
2) Minimize conflicts with other uses
3) Provide remote hunting areas
4) Provide areas open to airboats
5) Facilitate hunting access
6) Facilitate law enforcement
7) Minimize disturbance to swans
8) Minimize disturbance to rest areas
9) Protect breeding populations

Explanation of Impact on Listed Species or Critical Habitat:

Implementation of the proposed action would not impact populations of the two endangered species using the Refuge. Bald eagle and peregrine falcon use would be limited in open hunt areas. However, the proposed action concentrates hunting as much as possible into large blocks, leaving large areas of the Refuge undisturbed. Crippled and un-retrieved birds may provide forage for eagles and falcons. Foraging opportunities may also be improved in rest areas where waterfowl are more concentrated. Finally, a travel corridor across Unit 6 to Willard Bay roost sites will be closed to hunting.

Recommendations to Avoid Adverse Impacts or Enhance Species Conservation:

Continuation of the current hunt area boundaries, or implementation of alternatives 2 or 4 would have greater impact by spreading disturbance over several areas.

Conclusion:

Implementation of Alternative 5 as described in the attached EA, would not adversely impact populations of bald eagles or peregrine falcons, would improve foraging opportunities, and thus contribute to the perpetuation of endangered and threatened species.

Attachment:

Environmental Assessment, Hunt Plan Bear River Migratory Bird Refuge, Brigham City, UT, 1995

Project Leader: Alan K. Tuart Date: 7/25/95

May Affect: X Will Not Affect :_____

for Assistant Regional Director: [signature] Date: 8/9/95

May Affect: X Will Not Affect:_____