

**CAMAS PRAIRIE CENTENNIAL MARSH**  
**Wildlife Management Area**

**Management Plan**  
**July 1999**

**Idaho Department of Fish and Game**  
**Magic Valley Region**  
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## EXECUTIVE SUMMARY

Camas Prairie Centennial Marsh Wildlife Management Area (Centennial Marsh) is located in south-central Idaho 14 miles west of Fairfield (Figure 1). Centennial Marsh covers approximately 3,100 acres, providing aquatic and upland habitats for breeding, nesting and feeding waterfowl and shorebirds. In 1987, through the combined efforts of Idaho Department of Fish and Game (Department), Ducks Unlimited (DU) and The Nature Conservancy (TNC), the initial acquisition was made. Three more acquisitions were made over the next 2 years.

Centennial Marsh is a seasonally flooded wetland. It is inundated by water from mid-April to mid-July and 70% of Centennial Marsh is covered by 1 ft. or less of water. The large expanse of shallow water and the dense emergent vegetation, predominantly sedge (*Carex* spp.) and juncus (*Juncus* spp.), attract large numbers of waterfowl and other water-based birds. Many of these birds stay on the area to nest and raise broods. The seasonality of the water creates a shortage of brood-rearing habitat. To alleviate this problem, 18 - 2 ½ acre brood ponds and a well water delivery system, were constructed. The wells supply water to the ponds in late-July and August. In normal water years, the marsh refloods in late-September to early-October from water moving down the Camas Creek drainage. By early to mid-November the marsh starts to freeze-up and stays snow covered until April.

The majority of the public use occurs during the Camas Lily (*Camassia quamash*) bloom in late-May. Bird watchers utilize the area throughout the spring and summer. Due to the early freeze-up waterfowl hunting is limited.

The primary purpose of Centennial Marsh is to provide quality wetland and upland habitat to meet the needs of migratory and resident wildlife resources. This will be accomplished through protection and restoration of the Centennial Marsh wetlands. Centennial Marsh will also provide quality recreational opportunities consistent with the primary purpose.

This plan will provide direction for the Department to manage Centennial Marsh for wildlife production and conservation. This plan provides a brief history of the area, a description of the flora and fauna, current habitat conditions and management issues. No significant management issues were generated by the public or Department personnel during the public input process, therefore no alternatives were developed.

MAP OF AREA (Figure 1)

**Figure 1. Map of Camas Prairie Centennial Marsh Wildlife Management Area, Camas County, Idaho.**

## **MISSION STATEMENT**

*The Camas Prairie Centennial Marsh Wildlife Management Area will be managed to provide high quality, diverse wetland and upland habitat. The area will also provide public access for multiple outdoor recreational activities that do not adversely impact the integrity of the habitat or the wildlife resources.*

## **CHAPTER ONE - PLANNING ISSUES AND MANAGEMENT REQUIREMENTS**

### **INTRODUCTION**

Centennial Marsh is located in south-central Idaho, 14 miles west of Fairfield in Camas county (Figure 1). It covers just over 3,100 acres, providing aquatic and upland habitats for breeding, nesting and feeding waterfowl and shorebirds. In 1987, through the combined efforts of Idaho Department of Fish and Game (Department), Ducks Unlimited (DU) and The Nature Conservancy (TNC) the first acquisition was made. Three more acquisitions followed in 1988 and 1989. Centennial Marsh is a seasonally flooded wetland. Typically from mid-April to mid-July 70% of the management area is covered by 1 ft., or less, of water. The large expanse of shallow water is covered predominantly by sedges and juncus. The remainder of the management area is dominated by silver sagebrush (*Artemisia cana*) or in agricultural ground.

### **PURPOSE OF THE PLAN**

The purpose of this plan is to document public resources and management issues. Guide management activities and direction on Centennial Marsh. This plan establishes management direction and will be supplemented by specific programmatic plans.

### **DESIRED FUTURE CONDITION**

The Desired Future Condition (DFC) of Centennial Marsh is briefly described as including the following key elements:

1. An extensive area characterized by native wetland vegetation maintained in good to excellent stand conditions. Vegetation will be maintained in a variety of successional stages and in a complex mosaic of cover types, by allowing and encouraging establishment and succession of native and desirable non-native plant species to fulfill wildlife management objectives.
2. Waterways will be characterized by clean water, providing habitat for wildlife populations.
3. Soil erosion will be reduced through minimal soil disturbance, control or elimination of noxious weeds, and restoration of biologically diverse plant communities.
4. Wildlife populations will be managed to ensure that native species are restored to desirable population levels, which will provide hunting and viewing opportunity.
5. Provide human recreation for present and future generation for wildlife-associated recreation that minimizes wildlife disturbance.

6. Cultural and historic values will be protected from natural and human-related degradation.
7. Camas Prairie Centennial Marsh will be valued by the citizens of Idaho.

## **PLANNING PROCESS**

The Centennial Marsh plan has been developed under the following process:

- 1. Inventory of baseline resource conditions**

General vegetative and wildlife inventories were conducted on Centennial Marsh from 1988 to 1998 by current manager. A botanical inventory was conducted as part of the Anderson Ranch Mitigation Habitat Evaluation Procedure (HEP) analysis in 1994 (Ragotzkie and Beucler 1994). Physical features such as roads, fence lines, and buildings were also inventoried. Cultural resource surveys have been conducted in areas where groundbreaking activities have taken place (Gallagher 1990).

- 2. Issue scoping**

Management issues were identified through a series public meetings hosted by the Department. Issues were further identified by the current manager and comments received from Department personnel.

- 3. Long-term monitoring of result**

Monitoring will be preformed by the manager to measure progress toward the DFC.

- 4. Adaptive management based on results of monitoring**

If desired results are not being achieved, the Department will adjust management as needed to achieve desired results.

## **ORGANIZATION OF PLAN**

This Management Plan includes 4 chapters and supporting appendices.

**Chapter 1:** Introduction to the Plan.

**Chapter 2:** An overview of the historical management of the area and a detailed description of existing resources.

**Chapter 3:** Identifies issues and concerns generated by the public and from Department review.

**Chapter 4:** Presents management objectives and strategies to accomplish each prioritized goal.

## MANAGEMENT REQUIREMENTS AND AUTHORITIES

### Direction from the Commission and Director

The Idaho Fish and Game Commission (Commission) has established and approved general policies for the management of Idaho's wildlife resources (IDFG 1991).

Management-*"Fish and wildlife habitat and populations will be preserved, protected, perpetuated and managed for their intrinsic and ecological values, as well as their direct benefit to man." "Protection and restoration of wildlife habitat will continue to be a top priority in the management program."*

Cooperation-*"The Department will advocate land management practices that protect, restore and enhance fish and wildlife habitat, especially habitats such as wetlands and riparian areas that benefit a wide variety of fish and wildlife species."*

The Department has a responsibility to manage lands it controls for the benefit of Idaho wildlife, and where opportunities exist, to provide for wildlife-associated recreation opportunities.

This plan will incorporate the habitat conditions in both the short and long-term context (at both fine and broad landscape scales) and opportunities to manage and restore habitats through practices designed to reduce short and long-term risks to species and their habitats on Centennial Marsh.

### Requirements Relative to Funding

The annual operating funds for Centennial Marsh currently come from United States Fish and Wildlife Service (USFS) Federal Aid Pitman-Robertson funds. Federal funds must be used for restoration, conservation, and enhancement of wild birds and wild mammals, and the provision for public use of and benefits from these resources (U.S. Fish and Wildlife Service 1992).

Department general license funds must be used to help meet the mission and policies of the Commission as stated in *Idaho Code* 36-103(b). This code states: *All wildlife, including all wild animals, wild birds, and fish, within the state of Idaho, is hereby declared to be the property of the state of Idaho. It shall be preserved, protected, perpetuated, and managed.*

### Federal and State Law Requirements

The Department has the responsibility under the Endangered Species Act (ESA) to ensure that any management actions protect threatened and endangered species. The Department also management responsibility under the Clean Water Act (CWA) to ensure that water quality standards and guidelines are in place on Centennial Marsh lands and waters.

Under the National Historic Preservation Act, The Department must ensure that historic sites are protected on the Centennial Marsh.

The Idaho Noxious Weed Law (*Idaho Code 22-2405*) requires all landowners to eradicate noxious weeds on their lands, except in special management zones. The counties are required to enforce the State of Idaho law.

The Department is required by *Idaho Code 63-602* to pay a fee-in-lieu-of-tax (FILT) payment on lands owned by the Department and meeting certain code requirements. These fees are submitted annually to affected counties based on the number of qualifying acres. The fee paid for 1997 in Camas County was \$5,403.75.

### **Regulations**

The Department has a published set of regulations governing public use of all Department lands and access areas (Commission Rule # 13.01.03). Regulations cover motor vehicle access, fires, fireworks, dog use, firearm use, and other land use activities and recreational opportunities. These regulations are available from the Magic Valley Regional Office in Jerome (208-324-4359) or state headquarters in Boise (208-334-2920).

## **LIFE SPAN OF PLAN**

The Camas Prairie Centennial Marsh Plan will provide broad long-term management direction. This plan may be revised and updated, in whole or in part, as necessary to meet resource management objectives consistent with area goals and requirements.

## **PURPOSE OF WILDLIFE MANAGEMENT AREAS**

### **Background**

The Department manages over 360,000 acres of land statewide; of this total about 193,000 acres are owned (about 0.36% of Idaho's total acreage). Most of the remainder are managed under a variety of easements, agreements, and leases with private land owners and other land management agencies. A statewide network of 29 Wildlife Management Areas (WMAs) varying in size from several hundred acres to Craig Mountain's 110,000 acres and they provide critical habitat for nearly every species of wildlife found in Idaho and supply thousands of recreational use days annually.

### **Management Goals**

The Department acquires and develops WMAs with the following 4 general goals in mind:

1. Preserve and improve habitat for the production and maintenance of wildlife populations.
2. Provide public hunting opportunities.
3. Provide nonconsumptive wildlife uses.
4. Provide scientific, educational and recreational uses not related to wildlife.

The operation and management direction statements for all WMA plans are established on a priority basis and conform to these general goal statements.

### **RELATIONSHIP TO SPECIES MANAGEMENT PLANS**

This plan and all other WMA plans provide a mechanism to integrate the habitat management program with the species management plans approved by the commission. Appropriate management of wildlife habitats under Department control will complement species management plans and should aid in the achievement of desired population goals. It should be recognized, however, that the Department usually does not own or manage all habitats needed by any wildlife species through their annual life cycle. An ecosystem management approach is required to assure all needs are met for wildlife species able to move freely off Department-owned and managed lands.

The goals for habitat and population levels for wildlife big game, upland game, waterfowl, and non-game species on the Centennial Marsh are consistent with the species management plans approved by the Fish and Game Commission.

## **CHAPTER TWO - EXISTING MANAGEMENT CONDITION**

### **AREA BACKGROUND**

#### **Cultural History**

Before Anglo-European settlement, the Camas Prairie (CP) was a principal camas root gathering area and summer hunting grounds for the Native Americans of the middle Snake River region (Statham 1982). Bannock, Shoshone, and Northern Paiute family bands were the most common tribes that congregated on the prairie in spring and early summer to hunt and dig camas bulbs.

In 1820, Donald Mackenzie (USDA 1981), a Northwest Company fur trader, was the first white man to enter the CP. He passed through while returning from a trapping expedition in the Lost River area. Trappers subsequently used this route between Fort Hall and Fort Boise.

In 1852, a wagon route was established through the CP and used by pioneers heading for Oregon (Statham 1982). This route became known as the Emigrant Road and was used primarily as a migration route to gold mining claims in the South Fork of the Boise River area, Montana, and later the Wood River Valley. This route was used by sheep and cattle operators to reach rail shipping areas in Omaha, Nebraska and later Wyoming territories.

By the 1860's, the miners and livestock operators demanded removal of all Native people from southwestern Idaho. The governor of Idaho Territory, D.W. Ballares, arranged to put the Boise and Bruneau Shoshone on the new reservation at Fort Hall in 1866. The treaty allowed them access to the CP. In 1868, an army detachment from Fort Boise was dispatched to the CP to protect the Indians from some troublesome settlers who were out to steal their horses. For the next decade, the Shoshone-Bannock Indians from Fort Hall came regularly to the CP.

During the late 1870's, hog producers of south central Idaho discovered common camas to be an ideal source of feed (Statham 1982). Hogs were trailed up in the early spring to feed on the camas bulbs and grasses through the summer and returned south for the winter. Competition for the camas resulted in an uprising of the Indians known as the Bannock Wars. The result of the uprising was the exclusion of Native Americans from the CP.

#### **Agricultural History**

With the Indians largely gone, white settlement started on the CP in 1880. The settlement started as part of a promotion plan by the association of Rice and Foster, of the Hailey Land Office. In 1881, the first land claims were filed under provisions of the Desert Land Act of 1877. These first immigrants to the CP were not informed about the short growing season, cold winters, killing frosts, and other drawbacks. Most settlers left because of the weather hardships.

The second influx of settlers started about 1902 when Twin Lakes Reservoir Company was formed and a dam constructed on McKinney Creek. Most of the settlers of this irrigation project were members of the Church of Latter Day Saints from Utah. As a result the reservoir was called, Mormon Reservoir. About this same time, farmers from the Palouse area of eastern

Washington settled the dryland areas of the CP. These people were successful at dryland farming and, by 1897, most of the good land had been claimed. In 1909, the town site of Prairie, renamed Hill City in 1912, was established. Early settlers discovered that small grains and legumes could be grown without irrigation. Initially, winter wheat (*Triticum* spp.) was the main cash crop grown under a crop-fallow system. Native grass was cut for hay from the wet meadows of the CP.

The Oregon Shortline Railroad, later taken over by the Union Pacific, ran from Richfield to Hill City was completed in 1911. The line was operated until 1983, when it was abandoned and removed.

In the early years, the livestock industry was probably evenly split between sheep and cattle. At one point, Hill City was known as the largest single sheep shipping point for the nation. Due to declining demand, sheep production is significantly reduced in the area today. A few sheep bands still graze the Sawtooth National Forest during the summer, with residual crop grazing during the fall on the CP. Today, the dominant livestock operation is cow-calf, with very few cattle being wintered because of snow conditions and costly feeding requirements.

The agricultural landscape began to change by 1950. The change came because of declining agricultural yields, snow mold problems with winter wheat, government crop reduction programs, and higher demand for alfalfa (*Medicago sativa*) hay. Today, alfalfa is the leading agricultural commodity within the Camas Creek watershed. Crops which can be grown in the area include winter and spring wheat, barley (*Hordeum vulgare*), oats (*Avena sativa*), various grasses and alfalfa.

From the 1880's through about 1935, all farming was done with horses. From 1935 through 1938, farmers converted to track-type tractors. By 1965, most farmers had converted to wheel tractors to perform tillage and planting. Mechanization reduced tillage time, making more time available to farmers. Farm size tended to get larger while the human population was getting smaller. The marsh itself was never intensively farmed due to the period of time it was inundated with water. The sedges and grasses were cut for hay and the entire area was heavily grazed by cattle, sheep and horses (Camas SCD 1994).

## **PHYSICAL FEATURES**

### **Geographical Location**

Centennial Marsh is located 14 miles west of Fairfield, Idaho on State Highway 20. This is in south-central Idaho approximately 100 miles east of Boise, Idaho. The area is a high elevation valley (average elevation of 5,000 ft.) lying between the Smoky Mountains to the north and the Bennett Hills to the south. It is a gently-sloped basin drained by Camas Creek and its tributaries.

## **Climate**

The Rocky Mountains partly shield the CP from strong Arctic winds, thereby protecting this region from the severe blizzards that sweep east of these mountains (USDA 1981). During the summer, Pacific ocean winds are partly blocked; days are hot, but nights are cool. The average winter temperature recorded at Hill City, Idaho is 20°F and the average daily minimum is 9°F (USDA 1981). The record low temperature of -58°F occurred on December 22, 1991. During the summer, the average temperature is 63°F and the average daily maximum is 82°F (USDA 1981). The record high temperature of 101°F occurred on July 23, 1959 (USDA 1981).

Average annual precipitation as recorded in Hill City is 15.7 in. with 31% of the precipitation falling during the growing season (April through September). Average cumulative snowfall is 93 in. The greatest recorded snow depth at any one time was 68 in. (USDA 1981)

## **Soils**

Soils on the Camas Prairie are segregated into 5 categories established by the United States Resource Conservation Service (NRCS) (USDA 1981). All 5 soil types are characterized by clay loam, silty clay loam and/or sand loam to a depth of 38 to 47 in. Below this depth, sand loam, gravelly sand and/or coarse sand is prevalent. The majority of the Centennial Marsh is classified as Type 27-houk silty clay loam, which includes silty clay loam from the surface to 13 in. depth, clay or clay loam from 13 to 46 in. and sandy clay loam to gravelly sand below 46 in. (Appendix 1).

Excavated test pits have shown the soils in the Centennial Marsh can be generally classified as either relatively impermeable or highly permeable. The impermeable areas are either clay or silt and clay mix from the surface to a depth that varies from approximately 44 to 57 in. Below this depth, sand loam, gravelly sand and/or coarse sand are prevalent. The permeable areas are dominated by sand at or near the surface to a depth of 4 to 5 ft. (USDA 1981). The water table measured in August 1989 was 66 in. or more below the surface. In August of 1996, the water table was at approximately 40 in.

## **Geology**

Camas Creek occupies a broad, east-west mountain valley referred to as Camas Prairie. The valley is bounded on the south by the Bennett Hills which rise to an elevation of 6,806 ft. and on the north by the Solider Mountains which reach 10,095 ft. in elevation. The elevation of the valley floor ranges from 5,000 to 5,100 ft. The mountains to the north are composed of granitic igneous rocks of the Cretaceous Age, Idaho Batholith and Eocene Age, Challis Volcanic (Camas SCD 1994). The Bennett Hills to the south are formed in late Cenozoic Age basalt and rhyolite volcanic which cover and surround weathered Idaho Batholith granitics (Camas SCD 1994). Valley fill deposits are unconsolidated Quaternary Age alluvial and lacustrine sediments of clay to boulder size. The sediments are generally coarser on the north side of the valley. A 90 ft. thick clay layer exists in the valley fill at about 120-ft. depth over much of the valley. This layer acts as an aquitard to ground water movements through the unconsolidated fill (Camas SCD 1994).

## **Hydrology**

From 1945 until the early 1960's, private land owners removed willows (*Salix* spp.) and straightened channels along Camas creek and its tributaries. This work was an attempt to reduce flooding, drain wetlands, increase farmable acres, and remove sediment. These channel alterations have accelerated runoff and erosion and lowered the water table and artesian flows.

As snow melt and runoff water enter the gently sloping floodplain, it spreads out creating temporary wetlands (Cowardin et al. 1979). The temporary wetlands slow the flows of Camas creek which result in a lower peak discharge. The western end of the valley is inundated with water for as much as 4 months each spring. The flows of Camas creek generally stop about mid-July and the marsh waters gradually recede. Near the end of September or early-October Camas creek flows again reflooding the marsh, but to a lesser degree than in the spring. In 1995, the fall reflooding occurred for the first time in 8 years. The marsh partially reflooded in 1996, but not in 1997. The high flows occur from March through May with the peak usually occurring in April. Nearly 50% of the watershed lies at an elevation between 5,000 to 5,200 ft. An example of one winter flood occurred February 13, 1963. A flow of 9,200 cfs was recorded where Camas creek empties into Magic Reservoir. The 100 year peak flow rate at the point where Camas creek leaves Centennial Marsh is 7,050 cfs. (Camas SCD 1994). Due to flatness of the terrain, the velocity is only 2 fps.

## **NATURAL RESOURCES**

### **Wildlife**

Many species of wildlife inhabit Centennial Marsh. Waterfowl and shorebirds are found throughout the area on creeks, ponds, and wetlands. The largest numbers occur during spring migrations on the wetlands south of Hill City. Canada geese (*Branta canadensis*), mallards (*Anas platyrhynchos*), northern pintail (*Anas acuta*), green-winged (*Anas crecca*) and cinnamon teal (*Anas cyanoptera*), lesser scaup (*Aythya affinis*), northern shoveler (*Anas clypeata*) and ruddy ducks (*Oxyura jamaicensis*) are the primary waterfowl species observed and nesting on the area. Shorebirds commonly observed include the sandhill crane (*Grus canadensis*), long-billed curlew (*Numenius americanus*), American avocet (*Recurvirostra americana*), black-necked stilt (*Himantopus mexicanus*), and Wilson's phalarope (*Steganopus tricolor*). Passerines include the red-winged (*Agelaius phoeniceus*) and yellow-headed blackbird (*Xanthocephalus xanthocephalus*) and western meadowlark (*Sturnella neglecta*). Typical raptors include the American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), Swainson's (*Buteo swainsoni*) and red-tailed hawk (*Buteo jamaicensis*).

Mule deer (*Odocoileus hemionus*) are the most common big game animal with lesser numbers of elk (*Cervus elaphus*) and pronghorn antelope (*Antilocapra americana*). Mule deer and pronghorn use Centennial Marsh in the spring, summer, and fall. More specifically, pronghorns occupy the private agricultural ground, whereas mule deer inhabit the foothills surrounding the valley. Several moose (*Alces alces*) were introduced in 1986 and 1990 and they have been observed several times on or near Centennial Marsh.

Many carnivores have also been observed on Centennial Marsh. The species include the coyote (*Canis latrans*), red fox (*Vulpes vulpes*), badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*) and numerous rodents including beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), Columbian ground squirrel (*Spermophilus columbianus*) and meadow vole (*Microtus pennsylvanicus*).

Upland gamebird species use the different cover types surrounding Centennial Marsh. Mourning doves (*Zenaida macroura*) are closely associated with private farmlands, while sage grouse (*Centrocercus urophasianus*), gray partridge (*Perdix perdix*), white-tailed jackrabbit (*Lepus townsendii*) and Nuttall's cottontail (*Sylvilagus nuttallii*) are more commonly observed on the rangelands. Blue grouse (*Dendragapus obscurus*) broods use the lower foothills in the spring and gradually move to the high ridges by fall.

## **Vegetation**

The Centennial Marsh consists of the following vegetation types:

### Palustrine Persistent Emergent Seasonally Flooded Wetland (Cowardin et al. 1979)

This is the largest habitat type on Centennial Marsh occurring on approximately 1,800 ac (Figure 1). The wetland vegetation type is a complex mix of emergent vegetation that is dominated by common spikerush (*Eleocharis palstris*), Nebraska sedge (*Carex nebrascensis*), Baltic rush (*Juncus balticus*), common camas (*Camassia quamash*) and nodding groundsel (*Senecio bigelovii*). The majority of this area is typically covered with 12 in. of water from snow melt in mid-April, until mid-July. Once the water recedes the plants will stay green until early-September when they go dormant.

### Scrub-Shrub Broad-leaved Evergreen Seasonally Flooded Wetland (Cowardin et al. 1979)

This cover type completely surrounds the seasonally flooded wetland and occurs on approximately 600 acres. This vegetation type defines the line between upland and wetland, growing right to the waters edge. The predominate overstory cover is silver sagebrush (*Artemisia cana*) with intermittent occurrence of bush cinquefoil (*Potentilla fruticosa*). The understory consists of Great Basin wildrye (*Leymus cinereus*), Idaho fescue (*Festuca idahoensis*), Kentucky bluegrass (*Poa pratensis*) and bulbous bluegrass (*Poa bulbosa*).

### Sagebrush-grass cover type

In the southeast and northeast corners of Centennial Marsh, there are approximately 160 acres of dry upland site occupied by mountain big sagebrush (*Artemisia tridentata vaseyana*), Great Basin wildrye, Idaho fescue and bulbous bluegrass.

### Scrub-Shrub Broad-leaved Deciduous Seasonally Flooded Wetland (Cowardin et al. 1979)

The channels and the adjacent area are dominated by a coyote (*Salix exigua*), Geyer (*S. geyeriana*) and Booth's willow (*S. boothii*) overstory. The understory is reed canarygrass (*Phalaris arundinacea*), Garrison creeping meadow foxtail (*Alopecurus arundinaceus*) and other grasses. This area consist of about 25 acres.

### Dense Nesting Cover

Approximately 160 acres of wetland that were formerly farmed in barley (*Hordeum vulgare*) have been planted to dense nesting cover. The primary species planted include, Great Basin wildrye, altai wildrye (*Leymus angustus*), tall wheatgrass (*Elytrigia elongata*), reed canary grass and Garrison creeping meadow foxtail. Annual spring floods encourage some reestablishment of native sedge, juncus and silver sage onto newly seeded sites. An additional 426 acres of dryland barley and alfalfa (*Medicago savita*) will be planted in the fall of 1999 and 2000, to a similar grass mix with the addition of alfalfa, lupine (*Lupinus spp.*), blue flax (*Linum lewisii*), woods rose (*Rosa woodsii*), golden currant (*Ribes aureum*), silver sagebrush and mountain big sagebrush.

## **THREATENED AND ENDANGERED SPECIES**

Several threatened and endangered flora and fauna (Moseley and Groves 1992) have been observed on or adjacent to Centennial Marsh.

The following is an explanation of the status symbols used below:

Federal:	LE	Listed Endangered	State:	E	Endangered
	LT	Listed Threatened		SSC	Species of Special Concern
	FSC	Species of Concern		S3	Sensitive species
	C	Candidate species		M	Monitor species
	W	Watch species		P	Protected Nongame Species
				2	State Priority 2

### **Birds**

black tern (*Chlidonias niger*) SSC

Three to 4 pairs nest on Centennial Marsh annually.

great egret (*Ardea alba*) SSC

Two to 3 individuals are observed annually.

white-faced ibis (*Plegadis chihi*) FSC

Numbers have increased: one individual was observed in 1993 and approximately 80 were observed in 1998.

bald eagle (*Haliaeetus leucocephalus*) LT, E

Bald eagles are observed occasionally on or near Centennial Marsh.

peregrine falcon (*Falco peregrinus anatum*) LE, E

Individuals have been seen numerous times hunting on Centennial Marsh.

yellow-billed cuckoo (*Coccyzus americanus*) W, SSC

Only one observation has been made on Centennial Marsh in 1996.

western burrowing owl (*Speotyto cunicularia hypugaea*) FSC

Have been observed just off the south-west corner of Centennial Marsh.

long-billed curlew (*Numenius americanus*) FSC, P

Curlews are frequently observed on and around Centennial Marsh.

Nests have been found in the surrounding alfalfa fields.

trumpeter swan (*Cygnus buccinator*) FSC, SSC

One pair occupied Centennial Marsh the summer of 1993 and the following year nested and raised 3 cygnets on a small Department pond east of Centennial Marsh.

loggerhead shrike (*Lanius ludovicianus*) FSC, SSC

Shrikes have rarely been observed on or near Centennial Marsh.

### **Amphibians**

western toad (*Bufo boreas*) W/FSC, SSC

Western toads are common throughout Centennial Marsh.

spotted frog (*Rana pretiosa*) C, SSC

The spotted frog has been found in the area and is thought to occur on the Centennial Marsh.

### **Plants**

cinquefoil tansy (*Sphaeromeria potentilloides*) 2

Last seen in 1981 by Barbara Ertter on the south-west corner of Centennial Marsh.

fringed water plantain (*Machaerocarpus californicus*) M

Located in the south-east corner of Centennial Marsh (S. Popovich, BLM botanist, pers. comm. 1996)

bugleg goldenweed (*Haplopappus insecticruris*) FSC, S3

Has been observed in the area but not on Centennial Marsh.

## **PUBLIC USE**

The predominant human use of Centennial Marsh occurs in late-May to observe the Camas Lily bloom. Approximately 300 people visit on the last two weekends of May. Bird watchers visit during the spring, summer and fall. Annual tours of Centennial Marsh are conducted for 150 to 200 elementary and middle school students. Nature photographers utilize Centennial Marsh throughout the spring and summer. During the waterfowl season there is limited hunting depending upon when freeze up occurs.

## **PHYSICAL IMPROVEMENTS**

Existing structures on the property include, the manager's residence, built in 1921, open shop and equipment storage buildings. The home is older and in fair to good condition. Repairs are needed to the electrical and septic systems. The residence is poorly situated for the headquarters site, as the area is periodically flooded. The north-south entrance road drifts with snow in the winter, making access difficult.

At the time of purchase, all the associated properties were extensively fenced and cross-fenced. Fourteen miles of interior cross fences and unnecessary perimeter fences were removed. Five and one-half miles of perimeter fence are maintained in cooperation with the adjoining landowners.

From 1988-1990, 18 2 1/2 acre brood ponds were constructed. In 1990, a pump was installed in an existing well and 2 additional wells were drilled in 1991 and 1993. In 1992, 21,400 ft. of underground pipe and 11,000 ft. of open ditch were installed to supply the brood ponds.

## **WATER RIGHTS**

### Surface Water Rights

After the spring flood waters subside, the only standing water through mid-summer occurs in a 9 acre pond in the south-west corner of Centennial Marsh. The water remains for only a few months. No surface water rights existed with Centennial Marsh when the property was acquired.

An application for surface water rights was submitted to the Idaho Department of Water Resources (IDWR) on May 12, 1989. The water right was received on May 17, 1990, which resulted in 220 acre ft. of surface water that is used in the 18 brood ponds.

### Ground Water Rights

Two wells have been drilled and a third was improved. Water rights for the wells provide 4 cfs. of ground water. This water is used to maintain the brood ponds into the summer.

## **ACQUISITION FUND SOURCES**

In 1987, the first of 3 purchases created the Centennial Marsh. Department funds were used to purchase 1,803 acres that encompassed the Petrick and Thomason properties. Subsequently, from 1988 through 1990, 1,250 acres were purchased from Travelers Insurance and Les Ruby.

## **CHAPTER THREE - ISSUES, CONCERNS, AND OPPORTUNITIES**

### **ISSUE IDENTIFICATION**

Issue identification information was gathered during a series of local meetings with concerned public, Department internal concerns and personal contacts.

#### **Public Issues**

The Department conducted a series of public meetings and issued a number of news releases to inform Idaho citizens of resource management opportunities and to provide a forum for people to express their opinions regarding the future management of Centennial Marsh.

Two Wildlife Management Area public meetings were held in Burley and Gooding on April 3 and 4, 1996, respectively. Two Anderson Ranch Mitigation public meetings were also conducted, in Fairfield and Mountain Home on May 5, 1994 and November 21, 1996 respectively. These two meetings provided a forum for issue identification. A second series of public meetings was held from February 8, 1999 through February 12, 1999 in Fairfield, Burley, Hailey, Gooding and Twin Falls. The results of these public meetings was that there are no significant issues or management concerns were generated for Centennial Marsh.

One comment sheet was submitted as a result of these public meetings. The following is a summarization of the written comment:

"A real treasure. More duck sightings than in previous years."

Four requests were made for copies of the Centennial Marsh management plan and were sent for comment. No comments were received.

### **ISSUE DISCUSSION**

Only one issue has been raised, but it was determined by the planning team not to be significant in the management of Centennial Marsh. The principal purpose of Centennial Marsh is waterfowl production. Most waterfowl begin to nest before new growth is suitable for nesting, the presence of residual cover from the previous year permits birds to begin nesting earlier and allows a longer time for renesting. Any activity which reduces residual cover from the previous year may adversely affect waterfowl production. Elimination of grazing and mowing activities will result in increased waterfowl production (Leopold 1933, Kirsch 1969)

The wetlands of Centennial Marsh are saturated until mid to late-July, therefore livestock grazing is not possible and allow sufficient regrowth for nesting the following year. The residual growth of the grass species that have been planted, persist for 2-3 years, annual removal of this growth would be detrimental to waterfowl nesting. The presence of residual cover may also benefit invertebrate insect populations that occupy seasonal wetlands. As litter is flooded, nutrients and detrital material (as coarse particulate organic matter) are released for a host of aquatic invertebrates. As material is broken down into finer particles, organisms that gather detritus or filter feed will take advantage of the newly available foods (Kirsch 1969). These invertebrates provide an important food source for all ages of waterfowl and shore birds.

## CHAPTER FOUR - MANAGEMENT DIRECTION

### MANAGEMENT GOALS

1. Provide quality wetland habitat for spring, summer and fall migratory and resident wetland wildlife.
2. Provide quality upland habitat for big and, upland game, nesting waterfowl and other non-wetland wildlife.
3. Provide quality recreational opportunities consistent with the primary purpose.

### MANAGEMENT OBJECTIVES AND STRATEGIES

- I. Goal: Provide quality wetland habitat to meet the needs of migratory and resident wetland wildlife.
  - A. Objective: Preserve and maintain existing wetland  
Strategies:
    1. Maintain vegetation in a diverse successional stage emphasizing production and migration habitats for dabbling ducks and Canada geese. Utilizing fire and or herbicides to set back climax species, sedge and reed canary grass.
    2. Exclude livestock to maximize nesting cover and minimize wetland damage.
    3. Encourage beaver activity, through the restoration of healthy willow communities. Promote and assist in restoring riparian system on adjacent private and public lands.
  - B. Objective: Maintain existing and develop new brood rearing habitat  
Strategies:
    1. Where soils allow, create and maintain at least 1-2 acre brood pond for each 160 acres of wetland or upland nesting habitat. Pond design will be optimal for brood rearing habitat (March 1971). Four to 6 additional ponds will be built when funding is available.
    2. Maintain 18 brood ponds with wells and water delivery system.
    3. Maintain dense nesting cover on 82 islands created from excavated pond and open ditch material.
    4. Plant moist soil waterfowl food plants (millet, smartweed, etc.) in and around brood and pair ponds annually.
    5. Maintain 4 acres of Canada goose pasture.

- C. Objective: Develop additional waterfowl breeding habitat.  
Strategies:
1. Construct waterfowl pair ponds (1,500 to 2,000 sq. ft) on the wetland fringes and uplands within 1/4 mile of brood water (March 1971). Eight to 10 pair ponds will be built when funding is available.
- D. Objective: Develop and maintain dense nesting cover  
Strategies:
1. Enhance nesting cover on upland sites. Replace unsatisfactory existing cover on 20 acres with appropriate grasses, shrubs and forbs by 2001.
  2. Convert approximately 426 acres of seasonally flooded and upland cropland to permanent nesting cover by 2000.
  3. Provide grain on 15 to 20 acres of the dense nesting cover annually.
- E. Objective: Maintain and enhance artificial nesting structures.  
Strategies:
1. Maintain 100 Canada goose nesting platforms. Additional structures will be added when occupancy reaches 85%.
  2. Maintain 16 American kestrel nesting boxes.
  3. Continue experimenting with waterfowl nesting structures to overcome the ice damage problems.
  4. Maintain one bat nursery box and monitor use.
- F. Objective: Monitor waterfowl production  
Strategies:
1. Monitor duck production with brood counts. When a method can be developed that will account for the wide age spread in juveniles and the broods being spread out over the entire Centennial Marsh in normal water years.
  2. Annually monitor goose platform use.
- G. Objective: Control noxious weeds on Centennial Marsh.  
Strategies:
1. Continue to identify and control noxious weeds on Centennial Marsh. The noxious weeds are Canada thistle (*Cirsium arvense*) and field bindweed (*Convolvulus arvensis*). These 2 species occur primarily in the agricultural ground and are controlled with herbicides. Weed control will be coordinated with the Camas County weed supervisor.
  2. Prohibit the use of insecticides on the area and restrict the use of other pesticides.

- II. Goal: Provide quality upland habitat for big game, upland game and other non-wetland wildlife.
- A. Objective: Manage developed and native uplands in a manner that will provide a diverse habitat base.
- Strategies:
1. The DNC (426 acres) will contain a diverse mix of grasses, forbs and shrubs that will provide secure nesting and foraging cover for many wildlife species (Completion date: 2000).
  2. Interseed a 40 acre alfalfa field with shrubs (Completion date: 2001).
- III. Goal: Provide quality recreational opportunities consistent with the primary purpose.
- A. Objective: Provide hunting opportunity
- Strategies:
1. Maintain existing road and parking area for hunters.
  2. Provide 1 outhouse facility for hunters (Completion date: 1999).
  3. Continue unrestricted walk-on hunting.
  4. Delineate motorized and non-motorized areas (Completion date: 1999).
  5. Annually leave 15 - 20 acres of grain and stubble in the fields for waterfowl.
  6. Monitor hunter use and opinions annually.
- B. Objective: Provide non-consumptive recreational and educational opportunity.
- Strategies:
1. Maintain existing roads and parking area for bird watchers and photographers.
  2. Provide outhouse facilities for bird watchers and photographers (Completion date: 1999).
  3. Continue unrestricted walk-on for bird watchers and photographers.
  4. Delineate motorized and non-motorized areas (Completion date: 1999).
  5. Provide brochures and bird lists of Centennial Marsh.
  6. Monitor non-consumptive use and opinions annually.

## LITERATURE CITED

- Osborne, D. 1974. Camas County Comprehensive Plan. Camas County Commission Chairman. 88pp.
- Camas County Soil Conservation District. 1994. Camas Creek Agricultural Pollution Abatement Plan. 79pp.
- Cowardin, L. M., V. Carter, F. C. Golte, and E. T. LaRoe. 1979. Classification of Deepwater Habitats of the United States. U. S. Department of Interior, Biological Services Program, FWS\OBS-79/31. 101pp.
- Gallagher, J. 1990. Heritage Preservation Resources. Boise, ID. 6pp.
- Idaho Department of Fish and Game. 1991. Idaho Fish and Game Policy Plan 1990-2005: A Vision for the Future. Idaho Department of Fish and Game. Boise, ID. 33pp.
- Kirsch, M. 1969. Waterfowl Production in Relation to Grazing. J. Wildl. Manage. 33:821-828.
- Leopold, A. L. 1933. Game Management. Charles Scribner's Sons. New York and London. 481pp.
- March, J. R. 1971. Recommendations For Pond Development In Wisconsin. Bureau of Research. Department of Natural Resources. Madison, Wisconsin. 4pp.
- Moseley, R. and C. Groves. 1992. Rare, Threatened and Endangered Plants and Animals of Idaho. April 1998 update. Conservation Data Center. Idaho Dept. of Fish and Game. Boise, Idaho. 38pp.
- Ragotskie, K.E. and M. Beucler. 1994. Anderson ranch wildlife mitigation project. Idaho Department of Fish and Game. Boise, Idaho. 52pp.
- Pennak, R. W. 1978. Freshwater Invertebrates of the United States. John Wiley & Sons, New York. 803pp.
- Statham, D.S. 1982. Camas and the Northern Shoshoni: A Biogeographic and Socioeconomic Analysis. Archaeological Report No.10. Boise State University. Boise, ID. 103pp.
- U.S. Department of Agriculture. Camas Soil Survey. 1981. Soil Conservation Service. 139pp.
- U.S Fish and Wildlife Service. 1992. Federal Aid Handbook.

## APPENDIX I

### SOIL SURVEY INFORMATION

The majority of the impermeable soil areas in the marsh are classified as Type 27 - Houk Silty Clay Loam (USDA 1981). There are 4 other soil types on Centennial Marsh.

Soil Type 5--Brailsford loam. This is a very deep, somewhat poorly drained soil that formed in mixed alluvium. Areas are in basins, which are about 30 to 50 ft. across, on stream terraces and alluvial fans. The elevation ranges from 5,000 to 6,000 ft. The average annual precipitation is 14 in., the average annual temperatures is 40°F. and the frost-free period is about 80 days.

Typically, the surface layer is gray loam and about 7 in. thick. The subsurface layer is gray loam about 4 in. thick. The subsoil in the upper 4 in. is pale brown sandy clay loam; and in the lower 23 in. is light brownish-gray sandy clay loam. The substratum in the upper 6 in. is light brownish-gray fine gravelly sandy clay loam; below that, to a depth of 60 in. or more, is a light gray sand. Included in mapping are small areas of brinegar loam, Simonton loam and Strom loam. Permeability is slow. The available water capacity is very high. Surface runoff is ponded, and there is no hazard of erosion. The water table is at a depth of 30 to 40 in., especially in the spring. About 70% of the acres is cultivated cropland. The rest is rangeland. This soil is cultivated in the same way as the surrounding soils but yields are very low. The high water table in spring and early summer, frequently flooding and a short growing season limit the potential of this soil for use as cropland.

While ponded, this soil provides habitat for shorebirds and ducks. The high water table and frequent flooding are the main limitations to the use of this soil as sites for houses.

Soil Type 6 --Brailsford Variet Loam: This is a very deep, somewhat poorly drained, strongly saline-alkali soil that formed in mixed alluvium. It is in basins, which are about 10 to 50 ft. across, on low stream terraces. The elevation ranges from 5,000 to 5,500 ft. The average annual precipitation is 14 in., the average annual temperatures is 41°F. and the frost-free period is about 80 days.

Typically, the surface layer is light brownish-gray loam about 3 in. thick. The subsoil is pale brown and very pale brown clay loam 18 in. thick. The substratum in the upper part is white, moderately calcareous clay loam 17 in. thick. In the lower part it is stratified to a depth of 60 in.; the upper layer is very pale brown fine gravelly clay loam and the fine gravelly loam 11 in. thick; the middle layer is a manganese oxide pan 1 inch thick; and the lower layer is gray, mottled sandy clay loam 10 in. thick. Included in mapping are small areas of Houk silty clay loam and Strom loam. Permeability is slow. The root zone extends to a depth of 40 to 60 in. or more. The average water capacity is very high. Surface runoff is ponded, and the hazard of erosion is none to slight. The water table is at a depth of 3 to 5 ft. in spring. About 80% of the acreage of this soil is dry-farmed cropland, but yields are very low. The remainder is rangeland. The high water table in spring and early summer, frequently flooding, and a short growing season limit the potential of this soil for use as cropland. While ponded, this soil is suited to habitat for shorebirds and ducks. The high water table and frequent flooding are the main limitations to the use of this soil as sites for houses.

Soil Type 27--Haulk silty clay loam. This is a very deep, somewhat poorly drained soil that formed in mixed alluvium. It is on low terraces and bottom lands. The slopes are 0 to 1%. The elevation ranges from 5,000 to 5,500 ft. The average annual precipitation is 14 in., the average annual temperatures is 41°F. and the frost-free period is about 85 days.

Typically, the surface layer is gray silty clay loam about 8 in. thick, the subsurface layer is gray silty clay loam about 5 in. thick. The subsoil in the upper 18 in. is dark gray clay; and in the lower 15 in. it is gray, calcareous clay loam. The substratum in the upper part is light gray, calcareous sandy clay loam 11 in. thick. The low part, to a depth of 60 in. or more, it is gray, noncalcareous sandy loam. Mottles are at a depth of 30 to 46 in. Included in mapping are small areas of Brailsford loam, brinegar loam, marshdale loam and Strom loam. Permeability is slow. The root zone extends to a depth of 60 in. or more. The available water capacity is very high. Surface runoff is very slow, and the hazard of erosion is none to slight. The water table is at a depth of 30 in. in spring and at a depth of 60 in. late in summer and in fall. About 75% of the acreage of this map unit is cultivated to alfalfa, spring wheat and barley. The rest is used for nonirrigated pasture and range. In most years, there is sufficient moisture for annual cropping, and, in rotation, alfalfa is grown for 10 to 12 years and small grains are grown for 2 to 4 years. Some of the small grain is grown in a crop-fallow system to control weeds. Stubble mulching, chiseling, weed control and minimum tillage help to control erosion and produce a favorable growth of crops. Chiseling breaks up the plowpan and thereby promotes better root penetration and improves aeration.

The native vegetation is mainly Nebraska sedge, rush, tufted hairgrass and red top. If properly managed, these plants will remain in the composition. This soil provides habitat for curlew, avocet, phalarope, sandhill crane, killdeer, ducks, marsh hawk and mule deer. Canadian geese feed in the grainfields in fall. The high water table and stream overflow during snow melt are the main limitations to the use of this soil as sites for buildings and as septic tank filter fields.

Soil Type 36--Marshdale loam, 0 to 4% slopes. This is a very deep and poorly drained soil that formed in mixed alluvium. It is on bottom lands. The elevation ranges from 4,800 to 5,500 ft. The average annual temperature is 45°F. and the frost-free period is about 80 days.

Typically, the surface layer is dry gray loam about 33 in. thick. The underlying material in the upper part is light gray clay loam 15 in. thick; in the middle part, it is light gray loamy coarse sand 13 in. thick; and in the lower part, it is reddish yellow coarse sand to a depth of 60 in. or more. Included in mapping are small areas of Houk silty clay loam, Strom loam, Strom sandy clay loam and a soil that is similar to the Marshdale soil but has a sandy loam surface layer. Permeability is moderately slow in the subsoil and rapid in the substratum. The root zone extends to a depth of 60 in. or more. The available water capacity is moderate. Surface runoff is slow, the hazard of erosion is none to slight. The water table is a depth of 1 to 5 ft. in spring and summer. About 75% of the acreage is used for small grains, pasture and alfalfa hay. The rest is used for range. In most years there is sufficient moisture for annual cropping. Some of the grain is grown in a crop-fallow system to control weeds. Flooding by snow melt can ruin winter grain' therefore, spring wheat is the best suited grain crop for this soil. Stubble mulching, chiseling,

weed control and minimum tillage help to control erosion and produce a favorable growth of crops. Chiseling breaks up the plowpan and thereby promotes better root penetration and improves aeration. The native vegetation is mainly Nebraska sedge, rush, tufted hairgrass and slender wheat grass. If properly managed, these plants will remain in the composition. Seeding is a suitable practice. The seedbed usually needs to be plowed and cropped for a year prior to seeding.

The soil provides habitat for curlew, avocet, phalarope, sandhill crane, killdeer, ducks and marsh hawks. The high water table and stream overflow during snow melt are the main limitations to the use of this soil as sites for buildings. The high water table, low strength, and shrinking and swelling break up roads in spring.

Soil Type 55--Strom sandy clay loam, 0 to 4% slopes. This is a very deep, somewhat poorly drained soil that formed in mixed alluvium. It is on alluvial fans, bottom lands and stream terraces. The elevation ranges from 5,000 to 5,500 ft. The average annual precipitation is 14 in., the average annual temperature is 41°F. and the frost-free period is about 80 days.

Typically, the surface layer is a dry gray and clay loam about 11 in. thick. The subsurface layer is gray sandy loam about 3 in. thick. The subsoil is about 27 in. thick. In the upper 11 in. it is dry gray clay loam, in the middle 8 in. it is gray clay loam and in the lower 8 in. it is light brownish gray loam. The substratum is light gray sandy loam to a depth of about 62 in. or more.

Included in mapping are small areas of Houk silty clay loam, Marshdale loam and Brailsford loam. Permeability is moderately slow. The root zone extends to a depth of 60 in. or more. The available water capacity is very high. Surface runoff is very slow to slow, and the hazard of erosion is none to slight. About 80% of the acreage is cropland. The rest is nonirrigated pasture. In most years there is sufficient moisture for annual cropping, and, in rotation, alfalfa is grown for 10 to 12 years and small grains are grown for 2 to 4 years. Some of the grain is grown in a crop-fallow rotation because of the need to control weeds. Reed canary grass, timothy and meadow foxtail are suitable for seeding pasture and waterways. Stubble mulching, weed control minimum tillage and chiseling help to control erosion and produce a favorable growth of crops. Chiseling breaks up the plowpan and thereby improves aeration and promotes better penetration by roots and water. The native vegetation is mainly Nebraska sedge and tufted hairgrass. With good management, these plants will remain in the composition in desirable portions. Seeding is a suitable practice. The soil provides habitat for shorebirds, sandhill crane, ducks, and geese. The high water table, stream overflow by snow melt, frost action, and low strength are the main limitations to the use of this.

## **APPENDIX II**

### **WELL REPORT**

In 1990, a 40 horsepower (h.p.) pump was installed in an existing well (monument gulch well) in the southwest corner Centennial Marsh (Figure 1). This pump was initially run on single-phase power with a phase converter. This proved unsatisfactory due to marginal power at the pump and insufficient power for future pumps on the same line. It was decided to extend three-phase power to supply this pump and increase the single-phase power available for future pumps.

The (Petrick well) was drilled in 1991 at the old Petrick homesite. This turned out to be an excellent well, capable of producing in excess of 1 cfs. with a 10 h.p. pump. This well is the primary well on Centennial Marsh due to its high volume and low operating costs. It is capable in most years of maintaining 15 brood ponds through July and August.

A second well (center well) was drilled in 1993, although only 1,500 ft. away from the Petrick well, it produces less water with four times the horsepower. It is only used when absolutely necessary. A third well was never drilled. The water right was transferred to the Petrick well. The pump on this well will be upgraded to more horsepower when it is determined that the additional water is necessary.

**APPENDIX III  
GROUNDWATER WELL DATA**

Well No. and Date Drilled	Owner	Location	Total Depth	Depth to Basalt/Granite	Screens or Perforation Used	Comments
1. 08/70	Rice	SW Sec 6	211'	>211'	None	6" casing
2. 10/67	Rice	NE Sec 6	190'	>190'	None	6" casing was artesian
3. 09/77	Rice	NW Sec 5	492'	492'	220' of casing perforations	8" casing was artesian
4. 10/79	Rice	NW Sec 7	600'	>600'	217' of screens	16" casing/screens
5. 11/80	Rice	NW Sec 8	327'	309'	None	Abandoned
6. 11/80	Rice	NW Sec 8	450'	>450'	160' of screens	16" casing/screens
7. 10/56	Faulkner	W ½ Sec 16	266'	262'	None	Abandoned
8. 11/74	Reed	SW Sec 14	400'	198'	None	6" casing was artesian
9. 09/73	Calacca	NE Sec 5	304'	>304'	20' of casing perforations	8" casing was artesian
10. 07/77	Ruby	NE Sec 12	207.5'	119'	None	12" & 10" casing
11. 10/69	IDFG	SE Sec 2	222'	198.5'	None	6" casing was artesian
12. 09/71	IDFG	NE Sec 11	75'	>75'	None	8" & 6" casing
13. 10/77	IDFG	NE Sec 3	129'	129'	?	8" & 6" casing
14. ?	IDFG	SW Sec 9	?	?		16" at surface
15.	IDFG	SW Sec 9	?			6" at surface

**APPENDIX IV**  
**MAJOR DEVELOPMENTS ON CENTENNIAL MARSH**

- 1988 Deepened a 2 acre portion of an existing 9 acre pond.  
Installed 75 Canada goose nesting platforms
- 1989 Constructed 1 - 2 acre pond in an upland site, prepared and seeded the spoils.  
Installed 25 Canada goose nesting platforms
- 1990 Installed pump and three phase power to monument gulch well.  
Constructed 16 - 2 ½ acre brood ponds within the wetlands. The spoils were made into 70 nesting islands, totaling 60 acres. These were seeded to dense nesting cover.
- 1991 Drilled Petrick well, installed pump and power.  
Removed 14 miles of interior and unnecessary exterior fences.  
Constructed 20 - 2,000 sq. ft. pair ponds.  
Planted 15 acres of dense nesting cover.
- 1992 Installed 18,000 ft. of 10", 3,400 ft. of 6" pipeline and 11,000 ft. of open ditch. These connect the wells to 16 brood ponds. The spoils from the open ditch made 12 nesting islands.  
Installed 12 mallard nesting cylinders.  
Replanted 15 acres of dense nesting cover lost during drought.
- 1993 Drilled center well, installed pump and power.  
Prepared and planted 90 acres of dense nesting cover.  
Prepared and planted 5 acres of irrigated goose pasture.
- 1994 Installed 3 water structures in the open ditch system to better regulate the water levels.
- 1996 Prepared and replanted 8 nesting islands to dense nesting cover.
- 1997 Prepared and planted 65 acres of dense nesting cover.  
Rebuilt 3,000 ft. of access road on the WMA.
- 1998 Prepared and replanted 4 acres of dense nesting and 4 acres of goose pasture.  
Repaired 10" mainline damaged by ice

**APPENDIX V**  
**WILDLIFE SPECIES LISTS**

**SEASON OF OCCURRENCE**

(s) spring March-May  
(S) Summer June-August  
(F) Fall September-November  
(W) Winter December-February

**RELATIVE ABUNDANCE**

(a) abundant a species which is numerous  
(c) common certain to be seen or heard in suitable habitat

\* Nesting has occurred on Centennial Marsh

(u) uncommon present, but not certain to be seen

(o) occasional seen only a few times during the season

(r) rare seen at intervals of 2 to 5 years

	<u>s</u>	<u>S</u>	<u>F</u>	<u>W</u>		<u>s</u>	<u>S</u>	<u>F</u>	<u>W</u>
<b>AVIAN SPECIES</b>									
<u>LOONS-GREBES</u>						<u>SWANS-GEESE-DUCKS</u>			
Common Loon	r	-	-	-	Tundra Swan	o	r	r	-
Western Grebe	u	u	-	-	Trumpeter Swan*	u	o	o	-
Eared Grebe*	c	c	c	-	Snow Goose	o	-	-	-
Pied-billed Grebe*	c	c	c	-	Canada Goose*	a	a	a	-
					Mallard*	a	a	a	-
					Gadwall*	o	o	o	-
<u>PELICANS-CORMORANTS</u>									
Double-crested Cormorant	r	r	r	-	Green-winged Teal*	a	a	a	-
					American Widgeon*	a	a	a	-
<u>HERONS-IBISES-CRANES</u>									
American Bittern*	u	u	u	-	Eurasian Widgeon	r	r	r	-
Black-crowned Night-Heron	u	u	u	-	Northern Pintail*	a	a	a	-
Snowy Egret	r	r	r	-	Northern Shoveler*	a	a	a	-
Great Egret	r	r	r	-	Blue-winged Teal*	c	u	u	-
Great Blue Heron	o	o	o	-	Cinnamon Teal*	a	a	a	-
White-faced Ibis	u	u	r	-	Ruddy Duck*	a	a	a	-
Sandhill Crane*	a	a	a	-	Canvasback*	c	c	c	-
Whooping Crane	r	r	r	-	Redhead*	c	c	c	-
					Ring-necked Duck*	u	u	u	-
					Lesser Scaup*	a	a	a	-
<u>RAILS-COOTS</u>									
Virginia Rail *	r	r	r	-	Barrow's Goldeneye*	r	r	r	-
Sora*	c	c	c	-	Common Goldeneye*	u	u	u	-
American Coot*	a	a	a	-	Bufflehead*	a	a	a	-
					Common Merganser	-	r	-	-
					Wood Duck	r	-	-	-

	<u>s</u>	<u>S</u>	<u>F</u>	<u>W</u>		<u>s</u>	<u>S</u>	<u>F</u>	<u>W</u>
<u>AVOCETS-PLOVERS</u>					<u>VULTURES-EAGLES-HAWKS-FALCONS</u>				
American Avocet*	a	a	a	-	Turkey Vulture	c	c	c	-
Black-necked Stilt*	a	a	a	-	Golden Eagle	c	c	c	u
Killdeer*	a	a	a	-	Bald Eagle	o	o	o	o
					Northern Harrier*	a	a	a	-
<u>SANDPIPERS</u>					Sharp-shinned Hawk	u	u	u	-
Marbled Godwit	r	-	-	-	Cooper's Hawk	u	u	u	-
Long-billed Curlew*	a	a	a	-	Northern Goshawk	r	r	r	-
Willet*	a	a	a	-	Red-tailed Hawk*	a	a	a	o
Greater Yellowlegs	r	r	r	-	Swainson's Hawk*	a	a	a	-
Lesser Yellowlegs	o	o	o	-	Rough-legged Hawk	a	a	a	o
Wilson's Phalarope*	a	a	a	-	Ferruginous Hawk	u	u	u	-
Red-necked Phalarope	r	-	-	-	American Kestrel*	a	a	a	-
Long-billed Dowitcher	-	o	-	-	Merlin	o	o	o	-
Common Snipe*	c	c	c	-	Prairie Falcon	u	u	u	-
Western Sandpiper	-	o	-	-	Peregrine Falcon	r	r	r	-
<u>GULLS-TERNES</u>					<u>GROUSE</u>				
Bonaparte's Gull	o	-	-	-	Ruffed Grouse	u	u	u	u
Ring-billed Gull	a	a	a	-	Spruce Grouse	r	r	r	-
California Gull	a	a	a	-	Blue Grouse	u	u	u	u
Western Gull	r	r	r	-	Sharp-tailed Grouse	r	r	r	r
Forster's Tern	r	-	-	-	Sage Grouse*	c	c	c	-
Black Tern*	o	o	o	-	California Quail	r	r	r	r
					Gray Partridge*	o	o	o	o
<u>DOVES-CUCKOOS</u>					Ring-necked Pheasant	r	r	r	r
Rock Dove *	a	a	a	a					
Mourning Dove*	a	a	a	-	<u>OWLS</u>				
					Barn Owl	r	r	r	-
<u>WOODPECKERS</u>					Short-eared Owl*	c	c	c	-
Northern Flicker*	c	c	c	-	Long-eared Owl	o	o	o	-
Lewis' Woodpecker*	u	u	u	-	Great Horned Owl*	c	c	c	o
Red-naped Sapsucker	u	u	u	-	Burrowing Owl*	u	u	u	-
<u>NIGHTJARS-SWIFTS</u>					<u>HUMMINGBIRDS-KINGFISHERS</u>				
Common Poor-will	o	o	o	-	Black-chinned				
Common Nighthawk*	u	u	u	-	Hummingbird	r	r	r	-
					Calliope Hummingbird	r	r	r	-
					Rufous Hummingbird*	u	c	u	-
					Belted Kingfisher	u	u	u	-

TRYANT FLYCATCHERS

Eastern Kingbird	o	o	o	-
Western Kingbird*	c	c	c	-
Western Wood-Pewee	r	u	r	-
Say's Phoebe	o	-	-	-
Willow Flycatcher	o	u	-	-

JAYS-CROWS

Black-billed Magpie*	a	a	a	a
American Crow*	a	a	a	r
Common Raven*	a	a	a	a

GROSBEAKS-BUNTINGS-SPARROWS

Lazuli Bunting	u	u	-	-
Green-tailed Towhee	o	o	o	-
Rufous-sided Towhee*	c	c	c	-
Vesper Sparrow*	c	c	c	-
Savannah Sparrow*	a	a	a	-
Song Sparrow*	a	a	a	-
Lark Sparrow	o	o	o	-
Chipping Sparrow*	a	a	a	-
Brewer's Sparrow*	c	c	c	-
White-crowned Sparrow	u	u	u	-
Snow Bunting	-	-	-	o

PIPITS-DIPPERS-WAXWINGS

American Pipit	o	o	o	-
American Dipper	r	r	r	-

STARLINGS-VIREOS-WARBLERS

European Starling*	a	a	a	-
Yellow-rumped Warbler	c	c	-	-
Townsend's Warbler	r	-	-	-
Yellow Warbler	c	c	-	-
Common Yellowthroat	o	o	-	-

LARKS-SWALLOWS

Horned Lark*	a	a	a	c
Tree Swallow	u	u	u	-
Violet-green Swallow*	a	a	a	-
Northern Rough-winged Swallow	u	u	u	-
Cliff Swallow*	a	a	a	-
Barn Swallow*	a	a	a	-

CHICKADEES-BUSHTITS

Black-capped Chickadee*	o	u	u	o
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CREEPERS-NUTHATCHES- WRENS

House Wren*	o	o	o	-
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THRUSHES-SHRIKES-MIMIC THRUSHES

Western Bluebird*	o	o	o	-
Mountain Bluebird*	a	a	a	-
American Robin*	a	a	a	-
Loggerhead Shrike	o	o	-	-
Northern Shrike	-	-	o	o
Sage Thrasher*	c	c	c	-

BLACKBIRDS-ORIOLES

Western Meadowlark*	a	a	a	-
Yellow-headed Blackbird*	a	a	c	-
Red-winged Blackbird*	a	a	c	-
Brewer's Blackbird*	a	a	c	-
Brown-headed Cowbird*	a	a	a	-
Northern Oriole	u	u	u	-
Western Tanager	c	c	u	-

WEAVERS-FINCHES

House Sparrow*	a	a	a	-
American Goldfinch	c	u	c	-

**ACCIDENTALS**

Purple Martin

Tricolored Blackbird

Blue Jay

## **MAMMALS**

Mule Deer (*Odocoileus hemionus*)  
Elk (*Cervus elaphus*)  
Pronghorn Antelope (*Antilocapra americana*)  
Moose (*Alces alces*)  
Mountain Lion (*Felis concolor*)  
Black Bear (*Ursus americanus*)  
Coyote (*Canis latrans*)  
Red Fox (*Vulpes vulpes*)  
Porcupine (*Erethizon dorsatum*)  
Badger (*Taxidea taxus*)  
Striped Skunk (*Mephitis mephitis*)  
River otter (*Lutra canadensis*)  
Mink (*Mustela vison*)  
Short-tailed Weasel (*Mustela erminea*)  
Snowshoe Hare (*Lepus americanus*)  
White-tailed Jack Rabbit (*Lepus townsendii*)  
Nuttall's Cottontail (*Sylvilagus nuttallii*)  
Raccoon (*Procyon lotor*)  
Beaver (*Castor canadensis*)  
Muskrat (*Ondatra zibethicus*)  
Columbian Ground Squirrel (*Spermophilus columbianus*)  
Golden-mantled Ground Squirrel (*Spermophilus lateralis*)  
Northern Pocket Gopher (*Thomomys talpoides*)  
Great Basin Pocket Mouse (*Perognathus parvus*)  
Deer Mouse (*Peromyscus maniculatus*)  
Western Harvest Mouse (*Reithrodontomys megalotis*)  
Bushy-tailed Woodrat (*Neotoma cinerea*)  
Meadow Vole (*Microtus pennsylvanicus*)  
Montane Vole (*Microtus montanus*)  
Sagebrush Vole (*Lagurus curtatus*)  
Masked Shrew (*Sorex cinereus*)  
Dusky Shrew (*Sorex monticolus*)  
Big Brown Bat (*Eptesicus fuscus*)  
Yuma Bat (*Myotis yumanensis*)  
Little Brown Myotis (*Myotis lucifugus*)

## **AMPHIBIANS**

Long-toed Salamander (*Ambystoma macrodactylum*)  
Pacific Chorus Frog (*Pseudacris regilla*)  
Spotted Frog (*Rana pretiosa*)  
Western Toad (*Bufo boreas*)

## **REPTILES**

Short-horned Lizard (*Phrynosoma douglasii*)

Western Fence Lizard (*Sceloporus occidentalis*)

Sagebrush Lizard (*Phrynosoma platyrhinos*)

Gopher Snake (*Pituophis catenifer*)

Western Terrestrial Garter Snake (*Thamnophis elegans*)

Racer (*Coluber constrictor*)

**APPENDIX VI**

**FEDERAL AID PROJECT STATEMENT AND PROGRESS REPORT**

CAMAS PRAIRIE CENTENNIAL MARSH

CAREY LAKE WILDLIFE MANAGEMENT AREA

Management Priorities:

1. Waterfowl Production
2. Nongame Production And Appreciation
3. Waterfowl Hunting

Management Priorities:

1. Waterfowl Production
2. Waterfowl Hunting
3. Waterfowl And Nongame  
Appreciation

# Activity specific to project    \* Activity specific to project

◆ Additional work performed and reported under Magic Valley Habitat Maintenance.

ACTIVITY	ACTIVITY CODE	UNITS OF WORK		COST		COMMENTS
		Planned	Actual	Planned	Actual	
<b>WATERFOWL PRODUCTION</b>						
<b>Management Program</b>						
Develop and manage wetland and upland habitats, emphasizing production and migration habitats for ducks and geese		3,800 acres		◆		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
Maintain wood duck nest boxes		1 week 24 boxes		1,252		
Maintain 100 goose nesting platforms annually, install 30 new platforms	1211	3 weeks 100 platforms		3,756		Species benefited: CAGO

ACTIVITY	ACTIVITY CODE	UNITS OF WORK		COST		COMMENTS
		Planned	Actual	Planned	Actual	
Develop and maintain dense nesting cover	1322	1 week		1,252		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
Maintain water delivery system utilizing wells, piping and ditching	1211	1 week		1,252		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
*Maintain dense nesting cover on dike	1322	1 weeks		1,252		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
*Develop, install, maintain, and evaluate nesting boxes and duck nesting structures	1211	1 week 12 structures		1,252		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
Maintain water levels for brood rearing habitat	1211	3 weeks		3,756		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
#Restore riparian systems by encouraging beaver activity	1211	1 week		1,252		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
Administer sharecroppers to perform farming activities consistent with waterfowl production goals	1211	1 week		1,252		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds, Antelope

ACTIVITY	ACTIVITY CODE	UNITS OF WORK		COST		COMMENTS
		Planned	Actual	Planned	Actual	
#Develop and maintain four acres goose pasture	1322	2 weeks		2,504		Species benefited: CAGO
Monitor waterfowl production with brood counts	1460	1 week		1,252		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
<b>NONGAME PRODUCTION AND APPRECIATION</b>						
<b>Management Program</b>						
Develop and manage wetlands for migrating and nesting shorebirds	1322			◆		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
Provide stabilized water levels varying in depth from 1-24 inches throughout the nesting period	1322					Done in conjunction with waterfowl water manipulation. Species benefited:
Encourage emergent vegetation on brood pond areas	1322	1 week		1,252		Same. Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
#Conduct tours, give talks and provide community with information	1630	1 week		1,252		Species benefited: All
Maintain species observation list	1630	1 week		1,252		Species benefited: All

ACTIVITY	ACTIVITY CODE	UNITS OF WORK		COST		COMMENTS
		Planned	Actual	Planned	Actual	
<b>WATERFOWL HUNTING</b>						
<b>Management Program - to provide habitat to attract waterfowl during hunting season</b>						
#Utilize brood ponds and water system to provide some fall water on dry years	1211	1 week		1,252		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
*Utilize 2,000 acre feet water right to provide year-round water levels	1211	1 week		1,252		Species benefited: MALL, GADW, AMWI, AGWT, BWTE, CITE, NSHO, NOPI, REDH, CANV, LESC, CAGO, Shorebirds
Monitor hunter use	1430	1 week		1,252		Species benefited:
<b>TECHNICAL ASSISTANCE</b>						
Review of public projects	1710	7 weeks		8,764		Species benefited: All
Assistance to landowners	1720	3 weeks		3,756		Species benefited: All
<b>ADMINISTRATION</b>						
<b>Management Program</b>						
Maintain Department lands and facilities	1211	2 weeks		2,504		Species benefited: All
Control noxious weeds on project areas	1211	2 weeks		2,504		Species benefited:
Maintain project buildings	1211	1 week		1,252		Species benefited:
Maintain and repair equipment	1211	2 weeks		2,504		Species benefited:
Develop planning documents, review and evaluate	1630	2 weeks		2,504		Species benefited:
Maintain files, prepare administrative reports	1630	3 weeks		3,756		Species benefited:

ACTIVITY	ACTIVITY CODE	UNITS OF WORK		COST		COMMENTS
		Planned	Actual	Planned	Actual	
Technical assistance for other agencies	1630	3 weeks		3,756		Species benefited:
Other duties (as assigned)	1630	5 weeks		6,260		Species benefited:

**ABBREVIATION CODES TO BE USED IN THIS REPORT:**

Mallard	MALL	Blue-winged Teal	BWTE	Northern Pintail	NOPI
Gadwall	GADW	Cinnamon Teal	CITE	Northern Pintail	NOPI
American Wigeon	AMWI	Northern Shoveler	NSHO	Redhead	REDH
Canvasback	CANV	Lesser Scaup	LESC	Canada Goose	CAGO

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