BIG COTTONWOOD
Wildlife Management Area

Management Plan
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Idaho Department of Fish and Game
Magic Valley Region
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EXECUTIVE SUMMARY

The Big Cottonwood Wildlife Management Area (BCWMA) was purchased by the Idaho Department of Fish and Game (Department) in 1993 for fish and wildlife conservation and federal land access. Prior to BCWMA's purchase, the property was privately owned and operated as a cattle ranch and farm for nearly 110 years. The property was sought by the Department because the area provided important habitats for reintroduced California bighorn sheep, transplanted Rio Grande wild turkeys, and one of the few remaining populations of native Yellowstone cutthroat trout. In addition, the acquisition secured public access to thousands of acres of adjacent Federal lands.

To date, management emphasis on BCWMA has focused on restoring and rehabilitating habitats for a variety of wildlife species. Original management priorities included improving upland habitats for bighorn sheep and riparian/wetland habitats in Big Cottonwood Creek for cutthroat trout.

BCWMA is popular destination for recreationists from Cassia, Minidoka, and Twin Falls Counties. The primary uses of the management area include mountain bike riding, hiking/sightseeing, fishing and hunting, and horseback riding. The portion of Big Cottonwood trail on BCWMA has been closed to motorized vehicles which has prompted some concern by motorized trail-bike users, although nonmotorized users of the trail have expressed support for the closure.

This BCWMA Management Plan identifies legal mandates and requirements and land management responsibilities (Chapter 1), provides a brief history of these lands and identifies the inventory of natural resources (Chapter 2), identifies potential alternatives for management as identified through public and interagency involvement (Chapter 3), evaluates the immediate and long-term impacts of each of the management alternatives (Chapter 4), and identifies the Department's preferred alternatives and goals for management (Chapter 5). This plan is expected to provide long term direction for management of BCWMA. If monitoring indicates that progress toward identified management goals is not being achieved, the Department will adjust management as needed to meet those goals.

MISSION STATEMENT

The mission of the Big Cottonwood Wildlife Management Area is to preserve, protect, and enhance a diversity of upland and riparian habitats for a variety of wildlife species and to provide public uses compatible with these wildlife resources.

CHAPTER ONE – PLANNING ISSUES AND MANAGEMENT REQUIREMENTS

INTRODUCTION

The 814 acre Big Cottonwood Wildlife Management Area (BCWMA) is located approximately 22 miles southwest of Burley in south central Idaho (Figure 1). BCWMA is located on the northeast corner of the South Hills and borders private, State, and Federal properties.

BCWMA is situated at the mouth of Big Cottonwood Canyon. The majority of BCWMA is characterized by the Big Cottonwood Creek floodplain, with the remaining portions occupying the toe to upper slopes of Big Cottonwood Canyon. The canyon area is characterized by steep talus slopes, some in excess of 60%, broken by numerous bedrock outcroppings. Prominent cover types found on BCWMA include 407 acres of sagebrush/grass, 45 acres of riparian/wetland, and 360 acres of agriculture.

PURPOSE OF THE PLAN

The purpose of this plan is to document public resources and management issues and to guide future management activities on the BCWMA. This plan establishes management direction and will be supplemented by specific programmatic plans.

DESIRED FUTURE CONDITION

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

1. The sagebrush/grass cover types will be managed for a mosaic of mid to late seral stages as described by Hironaka et al. (1983) for the Wyoming big sagebrush/ bluebunch wheatgrass (Artemisia tridentata wyomingensis/Pseudoroegneria spicatum) habitat type.

2. The irrigated agricultural cover types will be characterized by a desirable mix of native and nonnative grasses and forbs providing habitat for a wide variety of wildlife species. The nonirrigated agricultural cover types will be restored using established range restoration practices to achieve a sagebrush/grass cover type consisting of desirable native plant species beneficial to wildlife.

3. Riparian-wetland habitats on BCWMA will be managed for the early to mid seral stages as described by Hansen et al. (1995) for the narrowleaf cottonwood/red-osier dogwood (Populus angustifolia/Cornus stolonifera) community type.

4. Soil erosion will be minimized through minimization of soil disturbance, control or elimination of noxious weeds, and restoration of biologically diverse plant communities.

Figure 1. Map of Big Cottonwood Wildlife Management Area, Cassia County, Idaho.

5. Wildlife habitats will be managed to ensure native wildlife species are restored to desirable population levels and game species are maintained at levels, which will provide hunting, fishing and trapping recreational opportunity.

6. Opportunities for wildlife-associated recreation, that minimizes wildlife disturbance, will be provided for present and future generations.

7. Identified cultural sites will be protected. Some significant historic sites will be stabilized and protected from natural and human-related degradation.

8. BCWMA will be a good neighbor to adjoining landowners and an example of interagency cooperation.

PLANNING PROCESS

The BCWMA plan has been developed under the following six-step process.

1. Inventory of baseline resource conditions

Intensive riparian trend transects, breeding bird surveys, Yellowstone cutthroat trout (Oncorhynchus clarki bouvieri) population monitoring, and California bighorn sheep (Ovis canadensis californiana), Rio Grande turkey (Meleagris gallopavo), and California quail (Callipepla callipepla) production monitoring have been conducted on BCWMA from 1994 to 1998. Physical features such as roads, fence lines, and buildings have also been inventoried. Baseline resource data continues to be collected on an annual basis.

2. Issue scoping

Management issues were identified through public scoping meetings held at Burley and Gooding in April, 1996 and in Burley, Gooding, Fairfield, Hailey, and Twin Falls in February, 1999. Issues were further identified in a 1997 tour of the management area by local Legislators, Cassia County Commissioners, the Cassia County Public Lands Council, neighboring private landowners, United States Forest Service (USFS) and Bureau of Land Management (BLM) representatives, a Fish and Game Commissioner and regional personnel, and concerned citizens and through interagency draft plan review, meetings, and tours.

3. Development of alternatives

Alternatives developed are based on (1) baseline inventory information, (2) issues identified during scoping, and (3) management constraints due to existing agreements and legal requirements.

4. Selection and implementation of Preferred Alternative

The final Preferred Alternative will be selected following public review of the preliminary alternatives developed in this draft management plan. The Preferred Alternative may represent a blend of actions from each of the alternatives presented, based on public input and preference.

5. Long-term monitoring of results

A monitoring plan is provided that will allow the Department to measure progress toward short- and long-term management goals.

6. Adaptive management based on results of monitoring

If monitoring indicates that progress toward identified management goals is not being achieved, the Department will adjust management as needed to meet those goals.

ORGANIZATION OF THE PLAN

This Management Plan includes 5 chapters and supporting appendices.

Chapter One: Includes an introduction to the Plan and detail on any special management constraints existing on the area.

Chapter Two: Provides an overview of the historical management of the area and a detailed description of existing resources.

Chapter Three: Identifies issues and alternatives for management of the area.

Chapter Four: Provides an evaluation of the biological, physical, social, and economic effects of each alternative relative to constraints, mandates, and opportunities.

Chapter Five: Discusses the preferred management alternative and provides rationale for choices, provides specific goals and objectives, and includes a monitoring plan to ensure goals and objectives are met by management.

MANAGEMENT REQUIREMENTS/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 in the ***Idaho Fish and Game Policy Plan 1990-2005: A Vision for the Future*** (1991)**.** Below is a summary of those sections of the policy plan pertinent to the management of Department lands.

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 attempt to look at habitat conditions in 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 BCWMA lands.

Requirements Relative to Funding

Land Acquisition and Habitat Development funds ($560,000) were used to acquire BCWMA. General license funds are used for annual operations (approximately $7,900 annually) and to provide Fee-In-Lieu-of-Tax (FILT) payments (approximately $1,900 annually) and fire protection payments (approximately $100 annually) for BCWMA. 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 section 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*."

Funds from the Bonneville Power Administration for Minidoka Dam Wildlife Mitigation have been used to enhance wildlife habitats on BCWMA. These funds can only be applied towards habitats for target wildlife species identified in the Wildlife Protection, Mitigation, and Enhancement Plan for Minidoka Dam (Meuleman et al. 1991).

Federal and State Law Requirements

Several federal and state laws affect management of BCWMA. The Department has responsibility under provisions of the Endangered Species Act to ensure that management actions protect threatened and endangered species, and responsibility under the Clean Water Act to ensure that water quality standards and guidelines are in place on BCWMA lands and waters.

Under the National Historic Preservation Act, the Department must ensure that historic properties are protected on BCWMA.

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

Consistent with *Idaho Code* 36-114 and through a cooperative agreement with the Idaho Department of Lands (IDL), the Department is required to pay a fee for fire protection on all

forest and rangeland acreage it owns. Fees are submitted annually based on the number of qualified acres owned by the Department.

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.

Regulations

The Department has published a set of regulations governing public use of all Department lands and access areas. 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).

The Department will comply with other state and federal regulations as they apply.

LIFE SPAN OF PLAN

This plan will provide long-term management direction for the BCWMA. This plan will 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

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

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

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

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 species on BCWMA are consistent with the management direction for Game Management Unit 54 in Department species management plans.

CHAPTER TWO – EXISTING MANAGEMENT CONDITION

HISTORY

Native Americans (Shoshone) inhabited the Oakley Valley area as hunting and gathering grounds. They primarily gathered pinyon pine (Pinus edulis) nuts in the fall in the City of Rocks area (Boothe 1963). The first Euro-American explorers and trappers entered the area in late 1811 (Boothe 1963). In the mid-1800's, thousands of emigrants passed through on the way to California. Cattle were first brought into the area in 1871 and 1872. In 1870, William Oakley established the pony express and stage station 2 miles west of the present town of Oakley. The earliest settlers of the Cottonwood area were James and John Iverson, and Peter Anderson in approximately 1870.

Records of land ownership of the present day management area following settlement are somewhat unclear. In 1934, Charles W. Bariger acquired 80 acres of land adjacent to Big Cottonwood Creek (the southwestern portion of BCWMA) from the General Land Office under the 1862 Homestead Act (General Land Office 1934). In 1943, Weyley and Mattie Cooper (daughter of John Iverson) purchased 134 acres, including the above 80 acres, from Charles and Bessie Larson for $700 (Cassia County 1943a). Two months later, Bariger quitclaimed the same 134 acres to the Cooper's (Cassia County 1943b). In 1957, the Cooper's claimed an additional 80 acres of BLM land along the western border of BCWMA (BLM 1957). In 1965, Harold and Kerma Cranney purchased 814 acres (present day BCWMA) from the Cooper's (Cassia County 1965). In 1993, The Conservation Fund (a Maryland nonprofit corporation) purchased the 814 acres from the Cranney's and later sold the property to the Department.

PHYSICAL DESCRIPTION

Climate

The average annual daily temperature for the area, as recorded at the Oakley Weather Station, is 48.3^{o} F. The highest recorded temperature was 108^{o} F in July 1973 while the lowest recorded temperature was -26^{o} F in December 1990. The average annual precipitation for the area is 11.5 in. Nearly 80% of annual precipitation is received from November through June (9.1 in.). The growing season length at BCWMA is variable. The average frost-free period for the area is 110-130 days.

Soils

Soils found in the Big Cottonwood Creek flood plain are characterized as a deep, moderately well drained loam (Beetville) with depths approaching 50 in. These soils are moderately permeable and slightly vulnerable to wind and water erosion. Soils found between the flood plain and the toe of Big Cottonwood Canyon are characterized as a somewhat excessively drained, alkaline, gravelly loam (Aysees) with depths approaching 60 in. These soils have moderately rapid permeability and are considered slightly to moderately vulnerable to wind and water erosion. Soils associated with Big Cottonwood Canyon generally fall within the Hymas-Rock outcrop complex. This complex is characterized as approximately 65% Hymas cobbly

loam at slopes from 25-60% and approximately 15% Pocatello silt loam at slopes of 12 to 30% and Winu stony silt loam at 30-60% slopes. Rock outcrops, on small ridgecrests, constitute the remaining 20% of this complex. These soils are generally shallow and well drained, moderately permeable, highly vulnerable to water erosion, and slightly vulnerable to wind erosion. Soil information was obtained from the Natural Resources Conservation Service (1981).

Topography

The BCWMA is situated at the mouth of Big Cottonwood Canyon. The majority of the management area lies within the Big Cottonwood Creek flood plain at elevations from 4,600 ft. on the northern border to 4,800 ft. on the southern border. The remaining portions occupy the toe to upper slopes of Big Cottonwood Canyon at elevations of 4,800-5,400 ft. Steep talus slopes, some in excess of 60%, broken by numerous bedrock outcroppings, characterize this canyon area.

Geographical Location

The BCWMA is located in west central Cassia County in south central Idaho (Figure 1). It is situated on the northeast corner of the South Hills, 6.5 miles northwest of Oakley, Idaho and 22 miles southwest of Burley, Idaho (Figure 1).

NATURAL RESOURCES

Vegetation

Cover types on BCWMA fall in 3 general categories: agricultural, sagebrush/grass, and riparian. The agricultural cover type includes irrigated and nonirrigated lands totaling approximately 360 acres. The irrigated portions are characterized by alfalfa (Medicago sativa), common sainfoin (Onobrychis viciaefolia), creeping woodsorrel (Oxalis corniculata), quackgrass (Agropyron repens), orchard grass (Dactylis glomerata), bulbous bluegrass (Poa bulbosa), and smooth brome (Bromus inermis) with portions invaded by cheatgrass brome (Bromus tectorum) and wild oats (Avena fatua). The nonirrigated agricultural lands are in an early-seral condition (from intensive livestock use and drought) and include mixes of rabbitbrush (Crysothamnus spp.), cheatgrass brome, kochia (Kochia scoparia), tumble mustard (Sisymbrium altissimum) greasewood (Sarcobatus vermiculatus__in), and halogeton (Halogeton glomeratus). The potential natural community of the nonirrigated lands is a sagebrush/grass cover type.

The sagebrush/grass cover type totals approximately 407 acres and is generally in late-seral condition. The majority of this cover type occupies the toe to mid slope region of Big Cottonwood canyon and is characterized by a Wyoming big sagebrush or Wyoming big sagebrush/Utah juniper (Juniperus osteosperma) overstory and a bluebunch wheatgrass, Thurber needlegrass (Stipa thurberiana), needle and thread grass (Stipa comata), bottlebrush squirreltail (Elymus elymoides), Sandberg bluegrass (Poa sandbergii), Indian paintbrush (Castilleja spp.), Scarlet globemallow (Sphaeralcea coccinea), tapertip onion (Allium acuminatum), loco weed (Astragalus spp.), and cheatgrass brome understory. The presence of Utah juniper in portions of this cover type is likely the result of an absence of fire.

A portion of the sagebrush/grass cover type, adjacent to Big Cottonwood Creek, historically received intensive winter grazing pressure from domestic livestock and has been seeded. These areas are dominated by a Wyoming big sagebrush overstory and a crested wheatgrass (Agropyron cristatum), alfalfa, yellow (Meliotus officianalis) and white sweetclover (M. alba), and cheatgrass brome understory.

The riparian cover type, associated exclusively with 2.5 miles of Big Cottonwood Creek, encompasses approximately 45 acres and is comprised of numerous forested and scrubshrub wetlands. Predominant species along the riparian cover type include narrowleaf cottonwood, red-osier dogwood, yellow willow (Salix lutea), Pacific willow (Salix lasiandra), sandbar willow (Salix exigua), Booth willow (Salix boothii), Geyer willow (Salix geyeriana), river birch (Betula occidentalis), woods rose (Rosa woodsii), oakleaf sumac (Rhus trilobata), golden current (Ribes aereum), sedge (Carex spp.), and Kentucky bluegrass (Poa pratensis). Western clematis (Clematis ligusticifolia) exists throughout the upland and wetland portions of the WMA.

Various degrees of riparian health exist along the creek. Riparian health above the irrigation diversion is moderate to good, although riparian health steadily deteriorates downstream through the management area. Poor riparian health is a result of intermittent water flows due to irrigation diversion from October-April coupled with historic intensive livestock grazing.

Taxonomic names were obtained from Hansen et al. (1995), Hironaka et al. (1983), Padgett et al. (1989), and Stubbendieck et al. (1989).

Wildlife

Avian point count surveys conducted in 1995, 1996, and 1997 (IDFG, unpublished data) and incidental wildlife observations indicate the presence of at least 120 vertebrate species inhabiting BCWMA (Appendix 1). This includes 85 avian, 29 mammalian, 5 reptilian, and 1 amphibian species.

The BCWMA provides habitat for two big game species. California bighorn sheep were reintroduced in Big Cottonwood Canyon (including BCWMA) beginning in 1986 in an effort to reestablish a population in the Magic Valley Region. From 1986-93, 50 bighorn sheep from southwestern Idaho were released in the Big Cottonwood drainage (IDFG 1996). Presently, bighorns frequent the irrigated agricultural lands on BCWMA in late fall and early winter and occupy the canyon portions of the management area during all seasons. The current status of bighorn sheep in Big Cottonwood Canyon is precarious. Recruitment rates and subsequent bighorn numbers in Big Cottonwood Canyon have steadily declined throughout the 1990's (IDFG 1998). Recent population estimates indicate fewer than 50 bighorn sheep remain (IDFG 1998).

Mule deer (Odocoileus hemionus) are year-round residents of BCWMA and found primarily in association with juniper/sagebrush cover types in Big Cottonwood Canyon and the riparian cover types along Big Cottonwood Creek. Mule deer hunting opportunity is managed under a controlled permit system.

The BCWMA also supports mountain lion (Felis concolor) in addition to numerous furbearers like bobcat (Lynx rufus), beaver (Castor canadensis), muskrat (Ondatra zibethica), and mink (Mustela vison).

The BCWMA supports huntable populations of ring-necked pheasants (Phasianus colchicus) and gray partridge (Perdix perdix). Smaller populations of sage grouse (Centrocercus urophasianus), California quail, and chukar (Alectoris chukar) also inhabit the management area. Among these game birds, only the sage grouse, and possibly the California quail, are native.

Big Cottonwood Creek (including BCWMA) is the top priority release site for wild turkeys in the Magic Valley Region (IDFG 1990). From 1988-98, 83 wild Rio Grande turkeys have been released on BCWMA. Recent efforts to monitor turkey production and recruitment on BCWMA indicate the population is probably decreasing despite efforts to provide supplemental winter food sources (corn food plots and fruit/mast orchard) and enhance nesting and brood rearing habitat. The future of the wild turkeys at BCWMA will likely be dependent on future releases to augment the population.

Many nongame species inhabit BCWMA. These include the burrowing owl (Athene cunicularia), ferruginous hawk (Buteo regalis), Western small-footed myotis (Myotis ciliolabrum) and Townsend's big-eared bat (Corynorhinus townsendii) which are considered rare or sensitive by state and/or federal wildlife or land management agencies.

Fisheries

Aquatic habitats on BCWMA are exclusively associated with the 2.5 mile reach of Big Cottonwood Creek that bisects the management area. Big Cottonwood Creek supports good numbers of Yellowstone cutthroat trout in addition to a population of mottled sculpin (Cottus bairdi) (IDFG 1993).

In 1990, the Idaho Legislature declared the cutthroat trout as the state fish. The Snake River fine-spotted cutthroat trout (Oncorhynchus clarki ssp.) (SRFCT) and the Yellowstone cutthroat trout may be the same fish. The SRFCT and Yellowstone cutthroat trout are listed as a Species of Special Concern with the Department while the SRFCT is listed as a Sensitive Species with the BLM and USFS (Conservation Data Center 1994).

In 1998, 3 conservation groups and an ecologist petitioned the United States Fish and Wildlife Service (USFWS) to list the Yellowstone cutthroat trout as a threatened species where it currently exists throughout its known historical range (including Montana, Wyoming, and Idaho) in the United States (F. Partridge, pers. comm.). The USFWS is currently reviewing the petition and will render a decision on whether listing is warranted at a later date.

Prior to 1987, catchable rainbow trout were released by the Department in the headwaters of Big Cottonwood Creek. Because most hatchery rainbow trout were of fall spawning stock, there is little likelihood of significant hybridization (F. Partridge, pers. comm.).

Historic intensive domestic livestock grazing, intermittent water flow, and drought have significantly depleted riparian health in the creek below the irrigation diversion on BCWMA.

However, the removal of domestic livestock coupled with 3 years of above average annual precipitation has helped expedite riparian recovery. As riparian vegetation becomes established, stream banks stabilize, and sedimentation and water temperature decrease, fish populations may recolonize this portion of the creek.

The Department maintains a general fishing season and 2 fish bag limit for cutthroat trout on Big Cottonwood Creek. This fishery is popular with local MiniCassia residents. Annually, 10-15% of public use on BCWMA is for fishing.

Threatened and Endangered Species

One species occurring on BCWMA is listed as threatened (Conservation Data Center 1994). The bald eagle (Haliaeetus leucocephalus), a winter inhabitant of the management area, annually uses the large cottonwoods on Big Cottonwood Creek for roosting habitat. The USFWS has primary management authority for the bald eagle.

Six terrestrial wildlife species (burrowing owl, ferruginous hawk, California bighorn sheep, Western small-footed myotis, Townsend's big-eared bat, and sage grouse) and one fish species (Yellowstone cutthroat trout) inhabiting BCWMA are considered rare or sensitive by state and/or federal wildlife or land management agencies (Conservation Data Center 1994). In addition, the pygmy rabbit (Sylvilagus idahoensis), western toad (Bufo boreas), and Ute lady's tresses (Spiranthes diluvialis), all considered rare or sensitive, have distributions falling within the boundaries of BCWMA (Conservation Data Center 1994).

PUBLIC USE

Historically, public use of BCWMA has centered around motorized vehicle access to Big Cottonwood trail. Motorized vehicle access to the trail (and the present day management area) has varied by landowner. Throughout the 1970's the trail was accessible to full-sized motorized vehicles and access was unregulated. In 1979, because of concerns over soil erosion and sedimentation in Big Cottonwood Creek, the USFS conducted an environmental assessment (EA) to develop strategies to prevent further degradation. The EA attributed much of the erosion and sedimentation to old roads (ruts) and vehicular use in Big Cottonwood Canyon. In 1982 the USFS, in cooperation with landowner Harold Cranney, removed a bridge that spanned the primary irrigation diversion from Big Cottonwood Creek. The removal of the bridge, in lieu of costly road reconstruction and rehabilitation, effectively limited motorized access to off-highway vehicles (OHVs).

In the early 1980's, Mr. Cranney began annually closing the trail to all motorized vehicles from March through May in response to increasing levels of vandalism and livestock harassment. The 1990 USFS Draft Travel Plan for the Sawtooth National Forest identifies Big Cottonwood trail on USFS administered lands as open to motorized wheeled vehicles only on designated roads and trails, closed to oversnow vehicles and other motorized vehicles from 12/1 to 4/30, and four-wheeled vehicles prohibited (USFS 1990).

The 1.5 miles of trail on BCWMA has been closed to motorized vehicles since the Department assumed management of the property in 1993. In 1997-98, the majority of visitors accessing Big Cottonwood Canyon via the trail were nonconsumptive users (86% vs. 14% consumptive users in 1997-98). Mountain bikers, hikers/walkers, fisherman, and horseback riders were the most numerous users of the trail as determined from sign-in sheets at the trailhead (Table 1). This pattern of user visitation has remained fairly consistent. In 1995-96, mountain bikers, hikers/walkers, fisherman, and horseback riders were also the most numerous users of the trail (Table 1).

Table 1. Recreational use by activity, number of people, and hours expended on Big Cottonwood trail in 1997-98 as gathered from sign-in sheets at the Big Cottonwood trailhead. Recreational use for 1995-96 by activity and number of people is in parenthesis.

ACTIVITY	# OF PEOPLE	HOURS EXPENDED
Fishing	40 (30)	105.0
Hiking/Walking	77 (84)	196.0
Horseback Riding	38 (27)	163.5
Mtn. Biking	92 (124)	236.5
Birding/Viewing	12 (0)	19.5
Llama Packing	5 (0)	40.0
Miscellaneous	14 (2)	60.0
TOTALS	278 (267)	820.5

PHYSICAL IMPROVEMENTS

One administrative site currently exists on BCWMA which includes one house with attached garage (BCWMA headquarters), one detached garage, two metal storage sheds, and a livestock corral. One house and two cabins, remnants from earlier homesteads, occur on the management area but have decayed beyond repair.

One house and numerous other buildings and sheds scattered throughout BCWMA were removed following Department acquisition of the property. Several options for relocating and/or restoring the house were reviewed and denied by the Idaho State Historical Society, City of Oakley, Cassia County Commissioners, and the Cassia County Historical Society prior to its removal.

The Department has the responsibility of integrating management planning for historic and cultural resources with management planning for wildlife. The Department will continue to attempt to avoid sensitive sites in implementing habitat, recreation, or administrative activities.

Approximately 2 miles of primary and secondary roads are currently open to public use on BCWMA. Several miles of tertiary road are restricted to motorized vehicles for administrative purposes only. Approximately, 1.5 miles of Big Cottonwood trail on BCWMA is closed to motorized vehicles.

Several miles of barbed wire and 1 mile of post/rail fence occur on BCWMA. Several miles of net-wire fence have been removed to aid in wildlife movement through the management area.

The irrigation system at BCWMA consists of a network of irrigation canals, ditches, checks, and laterals. The main irrigation diversion for Big Cottonwood Creek originates on BCWMA. One ditch, starting at the main diversion, traveling north along the eastern border of the management area, supplies irrigation water for BCWMA and a neighboring landowner.

MANAGEMENT AGREEMENTS

A USFS grazing allotment (Cottonwood Allotment) was associated with, and is adjacent to, the deeded properties constituting BCWMA. The allotment is approximately 19,000 acres. The Department does not, and cannot, hold the grazing lease. The USFS allotment extends approximately 7 miles southwest of BCWMA. The eastern border follows the Cottonwood Canyon rim and the western border extends 1.5 to 3 miles west of the Big Cottonwood Creek. The USFS is planning to conduct an environmental analysis on Big Cottonwood canyon to explore alternatives for future management of the Cottonwood Allotment.

A share of a BLM allotment (Pickett-Wake) was also associated with the deeded property. The allotment share consisted of 37 animal unit months (AUMs) of cattle use. The BLM has retired the 37 AUMs.

A section (640 acres) of IDL property was also associated with the deeded property. The Department holds the grazing lease for this IDL section.

One crop of grass/alfalfa hay is annually harvested from the irrigated farmland on BCWMA in late June/early July under a sharecrop agreement. The Department receives 1/3 of the annual production that is exchanged with the Lessee to accomplish other wildlife goals on BCWMA. Currently, sharecrop agreements are bid on a three year basis.

The Department cooperatively manages a parcel of BLM land adjacent to BCWMA. Under an agreement with the Snake River Resource Area Manager, approximately 4 acres of irrigated agricultural land is managed to provide nesting and security cover for upland birds.

WATER RIGHTS

Water rights in the area were claimed by the first settlers. They laid claim to the rights under the American doctrine of "Appropriation." Later, many water rights were purchased by and/or negotiated by The Church of Jesus Christ of Later Day Saints for individual church members. The earliest water rights on Big Cottonwood Creek were to: J.H. and J.F. Caldwell (160 in.) on 10 June 1871 and to John Iverson (20 in.) and William Poulton (12 in.) on 31 March 1872. From that time, to present day, agricultural development and settlement in the Oakley area has been extensive and expansive.

The Department maintains an 8.8 cubic feet per second (cfs) water right on BCWMA. The water rights purchased with BCWMA are dictated by water rights law, but delivered by the local water master. The method of delivery to Big Cottonwood WMA and our neighbors was reaffirmed in 1995 (Pickett 1995).

All water rights are filled when Big Cottonwood Creek flow reaches 3,482 in. Any water above 3,482 in. is allotted to the Oakley Canal Company. The 3,482 in. does not include the 40 in. decree from Big Cedar Canyon, a tributary to Big Cottonwood Creek. Water is delivered by date of claim, oldest right filed first. See Appendix 2 for the current water master's (Verl Okelberry) records of inches of water that flowed from Big Cottonwood Creek from 1979 through 1993.

CHAPTER THREE – ISSUES, CONCERNS, OPPORTUNITIES, AND ALTERNATIVES

ISSUE IDENTIFICATION

Public Issues

The Department conducted public scoping meetings in April, 1996 at Burley and Gooding and in February, 1999 at Burley, Gooding, Fairfield, Hailey, and Twin Falls to provide a forum for people to express their opinions regarding the future management of BCWMA. In addition, a 1997 tour of the management area by local Legislators, Cassia County Commissioners, the Cassia County Public Lands Council, neighboring private landowners, USFS and BLM representatives, an Idaho Fish and Game Commissioner and regional personnel, and concerned citizens provided further opportunity to identify issues and gather input on future management direction of BCWMA. The following is a discussion of the issues identified as a result of the public scoping meetings and tour.

Access Management - Four comments received at the public scoping meetings in 1997 and 1999 centered on the motorized vehicle closure of Big Cottonwood trail. Three of the four comments were opposed to the motorized vehicle restriction while one supported the closure. In addition, questions regarding the legality of the closure and a perceived conflict with maintaining public access yet restricting motorized users were raised during the 1997 tour.

Vegetation Management/Livestock Grazing - A few comments received during the 1997 tour focused on livestock grazing at BCWMA. Under prior management, livestock grazing occurred throughout the property from late fall through early spring. Under Department management, no livestock grazing has occurred on BCWMA since 1993. Some respondents felt livestock grazing and wildlife habitat needs/goals were compatible if managed properly.

Youth Turkey Hunt - One respondent at the 1997 scoping meetings was concerned that the Department was opening a turkey season too soon following the initial release of birds on BCWMA. To date, one youth turkey hunt with three permits has been held on BCWMA. Future hunting on BCWMA will be annually evaluated based on turkey population levels and the public's desire for more turkey hunting opportunity.

Preservation of Historic/Cultural Resources - The Department has received several informal comments from the public regarding the round corral and gravesite on BCWMA. Currently, both sites have been preserved and will be maintained and protected in the future.

Predator Management - During the 1999 scoping meetings, two respondents urged mountain lion control.

Upland Bird Habitat - Two comments focusing on upland bird management at BCWMA were received during the 1999 scoping period. One respondent recommended

planting small grain (oats, barley, or wheat) food plots to benefit California quail, gray partridge, and ring-necked pheasants while another respondent recommended increasing upland bird habitat (particularly quail habitat). Current upland bird habitat management at BCWMA has focused on food plots and nesting cover plantings. Future activities will include additional food plots, nesting cover plantings, and tree and shrub plantings.

Department Issues

The following is a list of issues identified by Department regional personnel regarding future management of BCWMA. Input was gathered via internal review of the draft management plan and tours of the management area.

Vegetation Management - Comments regarding vegetation on BCWMA concentrated on management of the irrigated farmland. Currently, one crop of grass/alfalfa hay is annually harvested from the irrigated farmland in early July under a sharecrop agreement with a neighboring landowner. Would upland gamebird production on the management area increase under a different management scenario?

Access Management - One of the major issues raised after internal review dealt with motorized access from the trailhead through BCWMA. Motorized vehicles can have direct and indirect negative effects on wildlife and wildlife habitat through displacement, disturbance, and degradation. Annual road maintenance, improvement, and enforcement costs associated with motorized access could be costly. In addition, there is an ever increasing demand for nonmotorized recreational opportunities from big game hunters, horseback riders, mountain bikers, and hikers. Can motorized access be permitted through BCWMA without negatively affecting other management objectives? Could restrictions on certain types of motorized vehicles and/or seasonal motorized vehicle closures be implemented and still meet other management objectives? How would motorized vehicle access affect other recreationists? What funding is available to cover costs associated with maintenance, improvements, and enforcement if motorized access is permitted?

California Bighorn Sheep - Protecting bighorn sheep habitat was a high priority in the Department's decision to acquire BCWMA. Following acquisition, bighorn sheep habitat enhancement became the top management goal at BCWMA. However, the long-term status of bighorn sheep in Big Cottonwood Canyon is questionable. Recruitment rates in Big Cottonwood Canyon and the East Fork of Dry Creek (approximately 7 miles west) have steadily declined throughout the 1990's (IDFG 1998). Recent population estimates indicate fewer than 50 bighorn sheep remain in the two areas (IDFG 1998). Causes for low production and recruitment rates and the subsequent population decline may include predation, poaching, and/or disease. Current emphasis on reestablishing California bighorn sheep in the Magic Valley Region is now focused on the Jim Sage Mountain Range in Unit 55. In addition, a decision was made to halt further augmentations to the Big Cottonwood and Dry Creek populations because of concerns over the proximity of domestic sheep allotments on adjacent USFS lands. These developments have implications on the management direction at BCWMA. Should bighorn sheep habitat continue to be the top management priority at BCWMA even though the status of the

population is questionable? Would a shift in management priorities be a more productive use of limited resources? For example, the haying of the irrigated agricultural lands was designed to provide palatable forage for bighorn sheep during the fall and winter. Discontinuing this practice would potentially benefit ground-nesting birds by providing more residual cover for nesting habitat.

Wild Turkey Management - Big Cottonwood Creek (now BCWMA) has been identified as the top priority release site for the establishment of a wild turkey population in the Magic Valley Region (IDFG 1990). The Statewide Upland Game Species Management Plan (1990) states: "A release site shall be considered fully stocked when 20 to 25 hens and 8 males (at least three adult toms) have been released. All birds will be released within the same winter trapping period." Recent efforts to monitor turkey production and recruitment on BCWMA indicate the population is decreasing despite efforts to provide supplemental winter food sources (corn food plots and fruit/mast orchard) and enhance nesting and brood rearing habitat. The future of wild turkeys at BCWMA will likely be dependent on future releases to augment the population. Prior to the winter of 1998-99, none of the releases at BCWMA met the fully stocked criteria. These small releases, conducted from 1994 through the spring of 1998 (Appendix 3), probably had little effect on the population due to trapping related mortality and predation following release (J. O'Neill, pers. comm.). BCWMA should receive two consecutive years of releases meeting the fully stocked criteria. The releases should be monitored closely (via radio telemetry) to determine whether BCWMA can be expected to support a viable population of wild turkeys.

Trailhead Development - The Big Cottonwood trailhead is located on lands administered by the BLM. Initial discussions between the Department and BLM regarding development of the trailhead focused on maintaining the site in a "primitive" condition. Developments to date have included 4 picnic tables, several fire rings, a portable toilet, an interpretive sign, hitch-posts, and graveled parking areas and vehicle turnouts.

MANAGEMENT ALTERNATIVES

The public scoping process and interagency review revealed a wide variety of issues relative to the future management direction at BCWMA. Several of the issues will be excluded from further analysis because: 1) management actions have already been and will continue to be implemented to address the issue (preservation of historic/cultural resources), 2) the issue is beyond the scope of this document (bighorn sheep, wild turkey, and predator population management and turkey hunting), or 3) management responsibility/authority falls outside the jurisdiction of the Department (trailhead development). This analysis will concentrate solely on the evaluation of alternatives for access management and vegetation management on BCWMA. Each issue will be addressed separately. Alternatives for vegetation management will concentrate on the irrigated agricultural lands because the issues pertained exclusively to this cover type.

ACCESS MANAGEMENT

Alternative 1: Emphasize nonmotorized public access.

Under this alternative, management would focus solely on nonmotorized public access including horseback riding, mountain biking, and hiking. All forms of motorized access from the trailhead through BCWMA would be prohibited and nonmotorized access would be limited to the existing trail only. This is the current status of access management for the trail at BCWMA.

Alternative 2: Emphasize public access.

Under this alternative, off-highway vehicles (OHVs) and nonmotorized public access from the trailhead through BCWMA would be permitted. All forms of motorized and nonmotorized access would be limited to the existing trail only.

Alternative 3: Emphasize seasonal use of OHVs and nonmotorized public access.

Under this alternative, seasonal use (summer/fall) of OHVs and all forms of nonmotorized access would be permitted from the trailhead through BCWMA. All forms of motorized and nonmotorized access would be limited to the existing trail only. Public access was managed in a similar manner prior to Department ownership of the property.

VEGETATION MANAGEMENT

Alternative 1: Manage the irrigated agricultural lands using seasonal cattle grazing as a tool to meet annual wildlife habitat objectives.

Under this alternative, the irrigated agricultural lands would be grazed on an annual basis by cattle. Domestic sheep grazing was not considered due to the potential for disease transmission between domestic and wild sheep. A rest-rotation or deferred rotation grazing system from July through August with multiple pastures and alternating periods of rest would be implemented. Minimum stubble height criteria in addition to the rested pastures would ensure residual cover for upland bird nesting habitat and forage for big game.

Alternative 2: Manage the irrigated agricultural lands using established hay production practices as a tool to meet annual wildlife habitat objectives.

Under this alternative, the irrigated agricultural lands would produce one cutting of hay on an annual basis. This is the current status of management for the irrigated agricultural lands at BCWMA. Hay harvest would occur in late June to minimize impacts on upland bird nesting and allow adequate plant regrowth for residual upland bird nesting and security habitat and forage for big game.

Alternative 3: Manage the irrigated agricultural lands using a variety of land management practices to meet annual wildlife habitat objectives.

Under this alternative, the irrigated agricultural lands would be managed using a variety of land management practices to maximize upland bird and big game production. All land management activities would focus on optimizing upland bird nesting, brood rearing, and security habitat and increasing big game forage production. Management practices would include periodic controlled burning and/or mowing to maintain stand integrity and plant vigor.

CHAPTER FOUR – EFFECTS OF ALTERNATIVES

ACCESS MANAGEMENT

Alternative 1

Alternative 1 was developed to specifically focus on nonmotorized public access from the trailhead through BCWMA. All forms of nonmotorized access would be limited to the existing trail. Nonmotorized uses would include horseback riding, mountain biking, and hiking. All forms of motorized access would be prohibited. This is the current status of access management for the trail at BCWMA.

Physical Effects

Alternative 1 would have the fewest physical impacts of any of the access management alternatives examined. Soil erosion, stream sedimentation, water quality, and riparian-wetland vegetation would not deviate substantially from the current condition. Management of Big Cottonwood Creek towards the Desired Future Condition (DFC) would be achieved.

Biological Effects

Alternative 1 would have the fewest biological impacts of any of the alternatives examined. Cutthroat trout spawning and fry rearing habitat would be protected under this alternative because impacts on soil erosion, stream sedimentation, water quality, and riparian-wetland vegetation would not diverge from the current condition.

Nonmotorized activities (foot traffic) can have negative impacts on wildlife. Freddy et al. (1986) found that winter mule deer flight distances in response to persons afoot were greater than those elicited by snow machines. Wright and Speake (1975) found foot trail traffic adversely affected an areas use by wild turkeys. However, controlled access and proper management can minimize these impacts. MacAuthur et al. (1982) suggested disturbance of mountain sheep (Ovis canadensis canadensis) may be minimized by restricting human activities to roads and established trail systems. Similarly, Freddy et al. (1986) suggested restricting human activity to designated trails may make the activities predictable and more acceptable to wintering mule deer. In addition, Wright and Speake (1975) found that wild turkeys avoided heavily used off-road vehicle areas to a greater extent than foot traffic areas.

Social Effects

Alternative 1 would help satisfy the ever increasing demand for nonmotorized recreational opportunities from big game hunters, horseback riders, mountain bikers, and hikers. In addition, this alternative would eliminate potential conflicts between motorized and nonmotorized users. However, this alternative may result in complaints from motorized recreationists desiring access through this portion of the canyon.

Economic Effects

Alternative 1 could be implemented at the least cost to the Department, both initially and over the long-term. Costs for trail improvement and maintenance would be approximately $75.00/mile or $113.00 per year (M. Yingst, pers. comm.). Enforcement costs would be within current budgetary parameters. New trail development, trail relocation, trail improvements, or bridge construction are not anticipated under this alternative.

It is unlikely implementing this alternative would have any significant impact on recreation and tourism dollars spent in local communities.

Alternative 2

Alternative 2 focuses on OHV and nonmotorized public access from the trailhead through BCWMA. All forms of public access would be limited to existing trails only.

Physical Effects

Alternative 2 would have the most physical impacts of any of the access management alternatives examined. Soil erosion and stream sedimentation from roads (ruts) and vehicular use would likely increase under this alternative. Decreased water quality and loss of desirable riparian-wetland vegetation would result and potentially threaten the DFC for Big Cottonwood Creek. This alternative would require a number of physical improvements on the trail to accommodate four-wheeled motorized vehicles including trail widening, trail relocation, and possibly bridge construction. In addition, water bars and sediment traps would likely be required to reduce soil erosion and sedimentation if this alternative is implemented.

Biological Effects

Alternative 2 would have the most significant impacts of any of the access management alternatives examined. Motorized vehicles can have negative impacts on wildlife including upland bird and big game displacement from preferred habitats (Dorrance et al. 1975, Wright and Speake 1975, Barrett 1976, King 1987, Still and Baumann 1990) and disturbance during critical times of the year (Barrett 1976, Rost and Bailey 1979, Freddy et al. 1986, Still and Baumann 1990). In addition, decreased water quality from sedimentation and loss of riparian-wetland vegetation would negatively impact cutthroat trout spawning and fry rearing habitat.

Social Effects

Alternative 2 would not satisfy the increased demand for nonmotorized recreational opportunities and likely result in a loss of nonmotorized recreationists. In addition, this alternative would likely increase conflicts between motorized and nonmotorized users. However, implementation of this alternative would satisfy motorized recreationists desiring access to this portion of the canyon.

Economic Effects

Alternative 2 will be the most costly for the Department to implement. Current estimates on new trail construction/trail relocation are approximately $5,000/mile (M. Yingst, pers. comm.). This capital expense coupled with trail improvements, annual trail maintenance, and possible bridge construction are not feasible under current budgetary constraints and would require alternative funding sources.

It is unlikely implementing this alternative would have any significant impact on recreation and tourism dollars spent in local communities.

Alternative 3

Alternative 3 was developed to accommodate motorized and nonmotorized users. Under this alternative, summer/fall use of OHVs and all forms of nonmotorized access would be permitted from the trailhead through BCWMA. Access would be limited to existing trails only. Public access was managed in a similar manner prior to the Department's ownership of the property.

Physical Effects

Alternative 3 would have significant physical impacts. Soil erosion and stream sedimentation, although less than Alternative 2, would increase under this alternative. Decreased water quality and loss of desirable riparian-wetland vegetation would result and potentially threaten the DFC for Big Cottonwood Creek. This alternative would require physical improvements on the trail to accommodate four-wheeled motorized vehicles including trail widening, trail relocation, and possibly bridge construction. In addition, water bars and sediment traps would likely be required to reduce soil erosion and sedimentation if this alternative is implemented.

Biological Effects

The seasonal OHV closure would help reduce the biological impacts of Alternative 3. The seasonal closure would target critical time periods (spring and winter) to reduce potential impacts on wildlife. However, negative impacts on cutthroat trout spawning and fry rearing habitat would occur if soil erosion and stream sedimentation levels deviate from current conditions. In addition, wildlife displacement (see Alternative 2) from preferred habitats (e.g. brood rearing) would still occur when OHVs are permitted.

Social Effects

Alternative 3 would likely have no impact on satisfying the demand for nonmotorized recreational opportunities. If implemented, this alternative would likely result in a loss of nonmotorized recreationists. In addition, conflicts between motorized and nonmotorized users would likely increase under this alternative. However, implementation of this alternative would satisfy motorized recreationists desiring access to this portion of the canyon.

Economic Effects

Alternative 3 would be costly for the Department to implement. Trail improvement, relocation, and possible bridge construction would still be required under this alternative. Current estimates on new trail construction/trail relocation are approximately $5,000/mile (M. Yingst, pers. comm.). This capital expense coupled with trail improvements, annual trail maintenance, and possible bridge construction is not feasible under current budgetary constraints and would require alternative funding sources.

It is unlikely implementing this alternative would have any significant impact on recreation and tourism dollars spent in local communities.

VEGETATION MANAGEMENT

Alternative 1

Alternative 1 was designed to use domestic livestock grazing as a tool to manage the irrigated agricultural lands to meet annual wildlife habitat objectives. A rest-rotation or deferred rotation grazing system from July through August with multiple pastures, alternating periods of rest, and a 10 in. stubble height criteria would be implemented. Pasture irrigation for livestock forage production would be considered a beneficial use of water, thereby maintaining the Department's water right on BCWMA. Domestic livestock grazing would be implemented as per guidelines established in Department Fish and Wildlife Policy 17.00.

Physical Effects

Alternative 1 would require a significant amount of physical development on BCWMA including pasture and food plot fences and a riparian exclosure. This alternative, because of livestock trampling, would result in annual reconstruction of irrigation ditches and laterals. A 10 in. stubble height criteria would help protect water quality and soil stability however, soil compaction as a result of grazing could impact plant vigor and stand productivity in the long-term.

Biological Effects

Studies on the effects of grazing systems on upland nesting waterfowl (Martz 1967, Kirsch 1969) and wild turkey (Merrill 1975, Bryant et al. 1981) production consistently demonstrate higher nest densities and nest success in ungrazed or lightly grazed areas. The lower nest densities and nest success in grazed areas are generally attributed to the lack of residual cover and disturbance. Additional impacts can include egg trampling (Merrill 1975, Bryant et al. 1981), increased risk of nest depredation (Blakey 1944, Ransom et al. 1987), nest-site selection (Merrill 1975, Ransom et al. 1987), altered food availability (Blakey 1944, Walker 1949), and altered movement patterns (Beasom and Wilson 1992). The proposed grazing strategy would ensure some residual cover and recovery time for vegetation regrowth for ground nesting birds and big game foraging. However, this may be insufficient to ensure adequate nesting cover for upland nesting species. Beasom and Wilson (1992) recommend at least 18-24 in. vegetation height for optimal Rio Grande turkey nesting habitat. Similarly, Ringelman (1992) recommends a minimum vegetation

Table 2. Comparison of the access management alternatives for Big Cottonwood Wildlife Management Area.

Management Emphasis Area	**Alternative 1:** Nonmotorized Public Access	**Alternative 2:** All Forms of Public Access	**Alternative 3:** Restricted Motorized Public Access
Water Quality	Require minor trail improvement/relocation to protect water quality	Require major trail improvement/rehabilitation to protect water quality	Require major trail improvement/rehabilitation to protect water quality
Air Quality	No major impacts on air quality	Increased risk of wildfire	Increased risk of wildfire
Soils	Require minor trail improvement/rehabilitation to prevent soil erosion	Require major trail improvement/rehabilitation to prevent soil erosion	Require major trail improvement/rehabilitation to prevent soil erosion
Vegetation	Minimizes impacts on native upland vegetation and riparian habilitation	Negative impacts on native upland vegetation and riparian rehabilitation	Negative impacts on native upland vegetation and riparian rehabilitation
Noxious Weeds	Minor soil disturbance; potential weed introduction from domestic stock	Soil disturbance would create environment for noxious weed invasion	Soil disturbance would create environment for noxious weed invasion
Wildlife	Minimizes displacement from preferred habitats and disturbance during critical periods	High displacement and disturbance probabilities	Mitigates disturbance factors; potential for displacement from preferred habitats
Fisheries	Reduces impacts to spawning habitat by minimizing impacts on soils and water quality	Negative impacts on spawning habitat without major trail improvement and rehabilitation	Negative impacts on spawning habitat without major trail improvement and rehabilitation
Rare Species	Minimizes disturbance and displacement and reduced impacts on spawning habitat	Negative impacts on spawning habitat and high displacement and disturbance probabilities	Negative impacts on spawning habitat and high displacement and moderate disturbance probabilities
Hunting, Fishing, and Trapping	Promote nonmotorized hunting, fishing, and trapping opportunities	Maximizes hunting, fishing, and trapping opportunities	Expands hunting, fishing, and trapping opportunities
Other Recreational Activities	Helps satisfy public desire for nonmotorized recreational opportunities	Does not satisfy public desire; may result in user conflicts	Does not satisfy public desire; may result in user conflicts
Road/Trail Access	Nonmotorized public access on designated trail only; no other anticipated change in access	All forms public access permitted on designated trail only; no other anticipated change in access	Seasonal restrictions on OHV's; nonmotorized access permitted; designated trail only; no other anticipated change in access

height of 18 in. for upland nesting waterfowl. Obtaining the minimum vegetation heights for adequate upland bird nesting habitat could be achieved by adjusting the stubble height criteria to increase residual cover and altering the season of use to ensure adequate vegetation regrowth.

The riparian exclosure and minimum stubble height criteria would help protect water quality and soil stability and subsequently cutthroat trout spawning and fry rearing habitat.

Domestic livestock could be a source of noxious weed introduction to the management area.

Social Effects

Alternative 1 would likely have some minor impacts on public recreation at BCWMA. Recreationists may avoid areas being grazing. The presence of domestic livestock on BCWMA may conflict with the "recreational publics" perception of how Department lands should be managed. However, the presence of domestic livestock on BCWMA would more closely reflect historic management of the area.

Economic Effects

Alternative 1 would require the largest capital investment of any of the alternatives. The following are initial cost estimates for new fence construction and annual fence maintenance to manage domestic livestock on BCWMA. Additional costs for water development, annual ditch and lateral repair, and noxious weed control are not included. Figures on fence construction and maintenance were developed by the BLM (K. Pavlet, pers. comm.).

5.0 mi. of four-strand barbed wire fence @ $5,000/mi.	$25,000
0.5 mi. of single-strand electric fence for food plots @ $1,200/mi.	$600
Annual temporary personnel to monitor pastures, move livestock, and maintain fences	$1,120
Materials and supplies for annual maintenance on 5.0 mi. of barbed-wire fence @ $50/mi.	$250
Annual reditching of 3 mi. of irrigation laterals and ditches @ $100/mi.	$300
Total	$27,270

Current budgetary limitations would require alternative funding sources be secured to implement this management option.

Alternative 1 would generate revenue for annual habitat management activities on BCWMA. The following AUM estimates were generated for livestock grazing on BCWMA (K. Pavlet, pers. comm.):

150 acres irrigated agricultural lands @ 1 AUM/acres = 150 AUMs
150 AUMs x $15.00/AUM = $2,250.00/yr

Implementing this alternative would likely have little economic impact on local communities.

Alternative 2

Alternative 2 was designed to manage the irrigated agricultural lands using established hay production practices as a tool to meet annual wildlife habitat objectives. This is the current status of management for the irrigated agricultural lands on BCWMA. Under this alternative, the pastures would be irrigated to produce one cutting of hay in late June/early July. Pasture irrigation for hay production would be considered a beneficial use of water, thereby maintaining the Department's water right on BCWMA. Hay harvest would be conducted through a sharecrop agreement as outlined in Department Fish and Wildlife Policy 17.00.

Physical Effects

Alternative 2 would produce minor physical effects on BCWMA. Under this alternative, a minimum 50-ft. riparian buffer and 6-in. stubble height would be maintained after harvest to protect water quality and soil stability. This alternative would require minor annual irrigation ditch and lateral repair. No additional fence building, only maintenance of existing fences would be required under this alternative. The most prominent physical effect of this alternative would likely be the abrupt change in the appearance of the pastures immediately after hay removal and before vegetation regrowth.

Biological Effects

Under this alternative, impacts to ground nesting birds would be minor because hay harvest would occur (late June/early July) after the peak in upland bird hatching (late May/early June). This alternative may result in some wildlife disturbance and have negative impacts on later renesting attempts by ground nesting birds. The timing of hay harvest would ensure some residual cover and a period of recovery for vegetation regrowth for ground nesting birds and big game foraging. However, this may be insufficient to ensure adequate nesting cover for upland nesting species (see Vegetation Management Alternative 1). Beasom and Wilson (1992) recommend at least 18-24 in. vegetation height for optimal Rio Grande turkey nesting habitat. Similarly, Ringelman (1992) recommends a minimum vegetation height of 18 in. for upland nesting waterfowl. Obtaining the minimum vegetation heights for adequate upland bird nesting habitat could be achieved by adjusting the stubble height criteria to increase residual cover and altering the timing of hay harvest to ensure adequate time for vegetation regrowth.

The riparian buffer and minimum stubble height criteria would help protect water quality and soil stability and subsequently cutthroat trout spawning and fry rearing habitat.

No change in noxious weed control is expected under this alternative.

Social Effects

Alternative 2 would likely have some minor impacts on public recreation at BCWMA. Recreationists will likely avoid areas that have been harvested. The use of BCWMA for hay production may conflict with the "recreational publics" perception of how Department lands should be managed. However, hay production on BCWMA would more closely reflect historic management of the area.

Economic Effects

Because Alternative 2 is the current status of management on BCWMA, monetary investments to implement this alternative would be low. This alternative would require manageable annual expenses for irrigation ditch and lateral repair and noxious weed control.
Alternative 2 would generate revenue for habitat management activities on BCWMA. Under current sharecrop guidelines (IDFG F&W 17.00), the Department receives 1/3 of the annual production of hay on BCWMA. The Department's share is exchanged with the Lessee to accomplish other wildlife goals on BCWMA. The following are hay production figures, the Department's share, and monetary value of the Department's share from the 1996-98 growing seasons on BCWMA.

Year	Total Production (tons)	IDFG's Share (tons)	Monetary Value of IDFG's Share
1996	225	75	$3,750
1997	246	82	$4,100
1998	267	88	$3,960
Averages	246	82	$3,937

Implementing this alternative would likely have little economic impact on local communities.

Alternative 3

Alternative 3 was designed to maximize upland bird and big game production on the irrigated agricultural lands using a variety of land management practices. Land management activities would focus on optimizing upland bird nesting, brood rearing, and security habitat and increasing big game forage production. Management practices would include periodic burning and/or mowing selected pastures on a rotational basis to maintain stand integrity and plant vigor. Pasture irrigation for wildlife production is not considered a beneficial use of water and would potentially jeopardize the Department's water right on BCWMA.

Physical Effects

Alternative 3 would have the fewest physical impacts of any of the vegetation management alternatives examined. This alternative would require minor annual irrigation ditch and lateral repair. No additional fence building, only maintenance of existing fences, would be required.

Because vegetation would not be annually removed under this alternative, no abrupt change in the appearance of the pastures would occur.

Biological Effects

Because of the abundance of residual cover, this alternative would meet minimum vegetation height requirements for upland bird nesting habitat and subsequently could produce the most favorable conditions for upland bird production. Water quality, soil stability, and fish habitat would be protected. However, this alternative may decrease big game use of the irrigated pastures. As residual cover increases and plant productivity decreases over time, forage palatability and big game use will likely decrease. Bighorn sheep and mule deer may avoid the heavy cover found in the pastures in favor of more open habitats. Noxious weed control could increase under this management option.

Social Effects

By maximizing upland bird production, this alternative would likely produce an increase in hunting opportunity at BCWMA. The sole use of the irrigated agricultural lands at BCWMA for upland bird production would likely fit the "recreational publics" perception of how Department lands should be managed. However, management under this alternative would deviate from historic land-use practices.

Economic Effects

Alternative 3 could be initially implemented at little expense to the Department. However, over the long-term, implementing management practices to maintain stand integrity and plant vigor may require additional funding. In addition, this alternative would not generate revenue for future habitat management activities on BCWMA.

Implementing this alternative would likely have little economic impact on local communities.

Table 3. Comparison of the vegetation management alternatives for Big Cottonwood Wildlife Management Area.

Management Emphasis Area	**Alternative 1:** Cattle Grazing	**Alternative 2:** Hay Production	**Alternative 3:** Wildlife Production
Water Quality	Minimum stubble height and riparian exclosure protect water quality	Minimum stubble height and riparian buffer protect water quality	Abundant residual cover protects water quality
Air Quality	No major impacts on air quality	No major impacts on air quality	Controlled burning would impact air quality
Soils	Minimum stubble height and riparian exclosure minimize soil erosion	Minimum stubble height and riparian buffer minimize soil erosion	No annual removal of vegetation/abundant residual cover protects/ prevents soil erosion
Vegetation	Negligible impacts on native vegetation; exclosure protects riparian vegetation	Negligible impacts on native vegetation; buffer protects riparian vegetation	Minimal impacts on native upland and riparian vegetation
Noxious Weeds	Increased potential for noxious weed introduction	No anticipated change in noxious weed abundance or distribution	Likely require more intensive noxious weed control efforts
Wildlife	Adequate residual nesting cover and forage for big game; some displacement or avoidance of livestock; negative effects on ground nesting birds through trampling and exposure to predation	Adequate residual nesting cover and forage for big game; some wildlife disturbance or displacement from preferred habitats and potential negative impacts on late renesting attempts	Maximizes residual cover for upland bird nesting and security habitat; heavy cover and decreased forage palatability may result in decrease use by big game
Fisheries	Protects fish spawning habitat by minimizing impacts on soils and water quality	Protects fish spawning habitat by minimizing impacts on soils and water quality	Protects fish spawning habitat by minimizing impacts on soils and water quality
Rare Species	Minor impacts to rare species; slight displacement and disturbance probabilities	Minor impacts to rare species; slight displacement and disturbance probabilities	Minor impacts to rare species; slight displacement and disturbance probabilities
Hunting, Fishing, and Trapping	No anticipated change in current hunting, fishing, and trapping opportunities	No anticipated change in current hunting, fishing, and trapping opportunities	Maximizes upland gamebird hunting potential; promotes hunting opportunities
Other Recreational Activities	No anticipated change in other recreational activities	No anticipated change in other recreational activities	No anticipated change in other recreational activities
Road/Trail Access	No anticipated change in road/trail access	No anticipated change in road/trail access	No anticipated change in road/trail access

CHAPTER FIVE – DEPARTMENT RESPONSES TO ISSUES, CONCERNS, OPPORTUNITIES, AND ALTERNATIVES

Public input and professional review of issues, concerns, and opportunities has resulted in identification of potential courses of action that comply with the Department's mission to preserve, protect, and perpetuate Idaho's fish and wildlife resources and with all applicable state and federal laws and regulations. This chapter will outline the Department-identified courses of action that address these matters.

The intent of this section is to communicate the course of future management by the Department on BCWMA. It is anticipated that once the decisions regarding management direction are approved, this document will guide future management activities on BCWMA.

ALTERNATIVES SELECTED

The Department has selected Access Management Alternative 1 which emphasizes nonmotorized access only on Big Cottonwood trail and Vegetation Management Alternative 2 which emphasizes management of the irrigated agricultural lands using established hay production practices as a tool to meet annual wildlife habitat objectives.

RATIONALE FOR ALTERNATIVE SELECTION

After considering the range of opportunities and constraints afforded by the lands comprising BCWMA and public desires considering future management, the Department has identified a proposed plan for action. The rationale leading to these decisions is consistent with:

1. Management requirements and authorities for which these specific lands were acquired and for which they are to be managed (described in Chapter one);
2. The mission, goals and objectives of the Department for Wildlife Management Areas (described in Chapter One); and
3. Issues identified by the public and the Department (identified in Chapter Three).

In addition, the selected alternatives provide the following benefits and safeguards needed to ensure healthy, sustainable populations of fish and wildlife on BCWMA:

Access Management Alternative 1: Nonmotorized Access

1. Significantly reduces wildlife disturbance and displacement from preferred habitats.
2. Provides important security habitat for upland bird, waterfowl, and big game production.
3. Ensures soil erosion, stream sedimentation, and native riparian vegetation do not deviate from the current condition by minimizing soil disturbance activities.

4. Maintains management of Big Cottonwood Creek towards the DFC.
5. Ensures Yellowstone cutthroat trout, a species petitioned for listing under the Threatened and Endangered Species Act, and its habitat are protected.
6. Helps satisfy demand for nonmotorized recreational opportunities.
7. Implementation costs are within current budgetary limits.

Vegetation Management Alternative 2: Hay Production on the Irrigated Agricultural Lands

1. Ensures adequate residual cover and vegetation regrowth for ground nesting birds and forage for big game.
2. Riparian buffer and residual cover ensures soil erosion, stream sedimentation, and native riparian vegetation does not deviate from the current condition.
3. Maintains management of Big Cottonwood Creek towards the DFC.
4. Ensures Yellowstone cutthroat trout, a species petitioned for listing under the Threatened and Endangered Species Act, and its habitat are protected.
5. Pasture irrigation for hay production would be considered a beneficial use of water, thereby maintaining the Department's water right on BCWMA.
6. Ensures stand integrity and plant vigor is maintained.
7. Generates annual revenue for management activities on BCWMA.
8. Implementation costs are within current budgetary limits.
9. Hay production closely approximates historic management of the area.

MANAGEMENT GOALS

1. Establish a permanent self-sustaining winter food source and nesting cover for 100-200 Rio Grande wild turkeys.
2. Maintain and improve quality riverine habitat in Big Cottonwood Creek for Yellowstone cutthroat trout.
3. Manage Big Cottonwood Creek for a mosaic of early to mid seral stages (Hansen et al. 1995) characterized by native tree and shrub overstories and native grass and forb understories.
4. Restore the nonirrigated agricultural lands to provide a diverse mix of native grasses, forbs, and shrubs benefiting a wide variety of wildlife species.
5. Establish/maintain permanent reliable nesting, brood-rearing, and winter habitat for local and migrating populations of upland birds.
6. Maintain and/or improve upland vegetation at quality levels to provide forage for 50 California bighorn sheep.
7. Maintain and/or improve upland vegetation in good palatable quality to provide year-round forage and security for 200 mule deer.
8. Provide nonmotorized recreational opportunities.
9. Provide watchable wildlife opportunities.
10. Protect and maintain significant cultural resources.

MANAGEMENT OBJECTIVES AND STRATEGIES

I. Goal: Establish a permanent self-sustaining winter food source and nesting cover for 100-200 Rio Grande wild turkeys.

A. Objective: Develop nesting habitat along Big Cottonwood Creek.

Strategies:

1. Eliminate livestock grazing along Big Cottonwood Creek above and below the irrigation diversion to allow vegetation (herbaceous and woody) regrowth. Beasom and Wilson (1992) suggest that dense concealing cover near water provides excellent nesting habitat. (Target date: Completed)
2. Plant native riparian vegetation in areas where permanent damage has occurred and revegetation potential is poor. (Target date: 2005)
3. Eliminate unauthorized motorized vehicle traffic along trail and on WMA to provide secure and undisturbed nesting cover. (Target date: Completed)

B. Objective: Provide self-sustaining permanent fall/winter habitat for 100-200 Rio Grande wild turkeys.

Strategies:

1. Maintain dense juniper stands on southwest portion of BCWMA for thermal cover and food.

2. Maintain mature cottonwood trees along creek for roost sites.

3. Prune, thin, and fertilize the fruit (apple, plum, and pear) orchard to increase fruit production. Increased fruit production will provide a permanent long-term sustainable fall/winter food source. (Target date: Complete)

4. Irrigate hay pasture to provide a lush green herbaceous vegetation food source during the fall.

5. Plant and cultivate 3, 1 acre corn/millet food plots and a 1 acre fruit/mast orchard. (Target date: Completed Annually)

C. Objective: Monitor Rio Grande wild turkey population parameters.

Strategies:

1. Work closely with the Regional wildlife staff to monitor 5-10 turkeys from each introduction/population augmentation via radio telemetry.

2. Work closely with the Regional wildlife staff to monitor radio-tagged wild turkey habitat use, movements, survival, and production.

II. Goal: Maintain and improve quality riverine habitat in Big Cottonwood Creek for Yellowstone cutthroat trout.

A. Objective: Improve Yellowstone cutthroat trout habitat in Big Cottonwood Creek.

Strategies:

1. Eliminate livestock grazing along Big Cottonwood Creek to allow for recovery of riparian vegetation and narrowing of river channel. (Target date: Completed)

2. Encourage beaver reintroductions throughout Big Cottonwood Creek.

3. Plant native riparian vegetation in areas where permanent damage has occurred and the probability for revegetation is low. (Target date: 2000)

B. Objective: Decrease cutthroat trout mortality in irrigation diversion ditch.

Strategies:

1. Work closely with Regional fisheries staff to develop and fund a fish screen for the irrigation diversion ditches. (Target date: 2005)

C. Objective: Monitor movements, habitat use, survival, and production.

Strategies:

1. Continue to work closely with the Regional fisheries staff to develop monitoring of the Big Cottonwood trout population. (Target date: Completed)

III. Goal: Manage Big Cottonwood Creek for a mosaic of early to mid seral stages characterized by native tree and shrub overstories and native grass and forb understories.

A. Objective: Provide for the establishment and growth of native riparian and wetland woody and herbaceous vegetation.

Strategies:

1. Eliminate livestock grazing along Big Cottonwood Creek above and below the irrigation diversion. (Target date: Completed)

2. Maintain a minimum 50 ft. buffer Big Cottonwood Creek during hay harvest to protect water quality, soils, and riparian vegetation.

3. Plant native riparian vegetation in areas where permanent damage has occurred and revegetation potential is low. (Target date: 2005)

4. Return Big Cottonwood Creek water from irrigation ditch to creek channel at the end of the irrigation season (Approximately 1 August).

B. Objective: Monitor riparian vegetation trend quantitatively and qualitatively.

Strategies:

1. Establish 9 permanent riparian vegetation transects along Big Cottonwood Creek, a) 3 transects north of WMA headquarters; b) 3 transects between headquarters and irrigation diversion; c) 3 transects above (south) of the irrigation diversion. (Target date: Completed)

2. Collect data at transects every third year (last week of July through first week of August) using USFS and BLM riparian monitoring protocol (USDA 1992, BLM 1997)

3. Establish photo-points to qualitatively document riparian changes/trends near vegetation transects. (Target date: Completed)

4. Take 4 photographs at photo-points annually (last week of July through first week of August). The photographs will be taken upstream, downstream, and perpendicular to the stream towards the banks.

IV. Goal: Restore the nonirrigated agricultural lands to provide a diverse mix of native grasses, forbs, and shrubs benefiting a wide variety of wildlife species.

A. Objectives: Restore/rehabilitate 80+ acres of nonirrigated agricultural lands using established range restoration techniques.

Strategies:

1. Establish cheatgrass control measures

a) Fallow ground at least one growing season prior to planting using a combination of mechanical and chemical measures to control cheatgrass and other nonnative annual species.

b) Plant a diverse mix of native grass, forb, and shrub species.

c) Monitor stand establishment and control noxious weeds. (Target Date: 2000)

V. Goal: Establish/maintain permanent reliable nesting, brood-rearing and winter habitat for local and migrating populations of upland birds.

A. Objectives: Develop nesting/brood-rearing habitat for ring-necked pheasants on irrigated pasture.

Strategies:

1. Initiate flood irrigation of pastures in March/April to promote current year's growth.

2. Sharecrop alfalfa/grass pastures in late-June after peak upland bird hatch to promote healthy, vigorous yearly vegetal growth. Sharecrop haying specifications:

a) Maintain minimum 50 ft. buffer along Big Cottonwood Creek to protect water quality, soils, and riparian vegetation.

b) Cut lower elevation hay ground once per year and maintain minimum 6 in. stubble height to allow vegetation regrowth for the following spring.

3. Rehabilitate 34 acres of irrigatable agricultural lands for dense nesting cover.

    a) Fallow ground at least one growing season prior to planting using a combination of mechanical and chemical measures to control cheatgrass and other nonnative annual species.

    b) Plant a diverse mix of native/nonnative grass and forb species.

    c) Irrigate stand, monitor establishment, and control noxious weeds. (Target Date: Completed)

B. Objective: Develop winter food and cover for ring-necked pheasants.

Strategies:

1. Restore and rehabilitate flood irrigation ditches to 3 parcels of land not currently irrigated. The land includes:

    Sec 8 W1/2NW1/4NE1/4SE1/4
    Sec 8 E1/2NW1/4SW1/4SE1/4 (Target date: Completed)

2. Plant 3, 1-acre (or larger) corn/millet food plots. (Target date: Completed Annually)

C. Objective: Develop a self-sustaining California quail population.

Strategies:

1. Release California quail when transplant stocks become available. (Target date: 2000-15% complete)

2. Work closely with Regional wildlife staff to radio-mark 10-20 quail per release.

3. Work closely with Regional wildlife staff to monitor quail habitat use, movements, survival, and production via radio telemetry.

D. Objective: Develop and enhance California quail nesting, brood-rearing, and winter habitat.

Strategies:

1. Eliminate livestock grazing in riparian areas and pasture to allow for enhanced growth of commonly used native shrubs (sumac, wood rose, etc.) and forbs. (Target date: Completed)

2. Supplement shrub growth in pasture where natural regeneration does not occur.

E. Objective: Enhance current chukar populations.

Strategies:

1. Release chukar partridge when transplantable stocks become available to diversify the current gene pool.

2. Work closely with Regional wildlife staff to radio-mark 10-20 chukars per release.

3. Work closely with Regional wildlife staff to monitor radio-tagged chukar habitat use, movements, survival, and production.

F. Objective: Develop mourning dove nesting habitat.

Strategies:

1. Eliminate livestock grazing along Big Cottonwood Creek to enhance shrub growth for nesting doves. (Target date: Completed)

G. Objective: Provide brood-rearing, late-summer/fall habitat for sage grouse.

Strategies:

1. Irrigate pastures to provide lush vegetation for forage for sage grouse adults and hens with broods.

H. Monitor spring and winter sage grouse habitat

Strategies:

1. Work closely with the Regional wildlife staff to document and monitor possible sage grouse strutting grounds and winter habitat use on the state section.

I. Objective: Develop nesting/brood-rearing habitat for gray partridge.

Strategies:

1. Will use the same activities listed in Management Objective A.

J. Objective: Develop winter food and cover for gray partridge.

Strategies:

1. Will use the same activities listed in Management Objective B.

VI. Goal: Maintain and/or improve upland vegetation at quality levels to provide forage for 50 California bighorn sheep.

A. Objective: Provide unobstructed free ranging habitat for California bighorn sheep.

Strategies:

1. Remove eastern border netwire fence to allow unimpeded movement to food and water. (Target date: Completed)

2. Remove all remaining netwire fence on WMA boundary (including cross-fences). (Target date: 1999)

3. Areas where fence is needed, the net wire fence will be replaced:

a) Barbed-wire fence

3 wires, 39 in. maximum fence height, wire spacing from ground up (20,15, and 4 in.), bottom strand smooth and others barbed. (Target date: 2000)

b) Post and rail fence

42 in. fence height, 2 rails, and 20 in. from the ground (Target date: Completed)

B. Objective: Provide additional forage opportunities.

Strategies:

1. Irrigate pasture adjacent to sheep habitat to provide additional forage (140 acres).

2. Remove livestock grazing from nonirrigated rangeland to provide forage for bighorn sheep. (Target date: Completed)

3. Prune fruit trees in orchard (to increase production) to provide additional alternate forage. (Target date: Completed)

4. Plant fruit trees in orchard to provide alternative forage. (Target date: Completed)

5. Work closely with the Regional wildlife staff to evaluate the need to develop supplemental water sources.

C. Objective: Develop secure and undisturbed habitat.

Strategies:

1. Eliminate unauthorized motorized vehicle use through and across the WMA. (Target date: Completed)

2. Facilitate a land exchange with the IDL to secure additional bighorn sheep habitat.

   a. Rehabilitate the northern most 160 acre isolated tract with desirable livestock forage. (Target date: 2002)

   b. Use the rehabilitated 160 acre tract to exchange with IDL for the 640 acre school section adjacent to the WMA. (Target date: 2003)

D. Objective: Monitor movements, habitat use, survival, and production.

Strategies:

1. Work closely with the Regional wildlife staff to monitor bighorn sheep to determine habitat use and production.

VII. Goal: Maintain and/or improve upland vegetation in good palatable quality to provide year-round forage and security for 200 mule deer.

A. Objective: Provide additional forage opportunities.

Strategies:

1. Irrigate lowland pasture to provide additional forage.

2. Remove livestock grazing from nonirrigated rangeland to provide additional forage. (Target Date: Completed)

3. Hay irrigated pasture (according to specifications in Goal 5) to provide lush vegetation for fall and early-winter use.

4. Include desirable mixtures of grasses, forbs, and shrubs for mule deer in all restoration plantings.

VIII. Goal: Provide nonmotorized recreational opportunities.

A. Objective: Eliminate unauthorized motorized vehicle traffic within the boundaries of BCWMA.

Strategies:

1. IDAPA 13.01.03100C states that it is prohibited "to operate any motorized vehicles, including snowmachines, except on established roads. Operation of vehicles on established roads is prohibited when posted against such use."

2. Post signs prohibiting the use of motorized vehicles on Big Cottonwood trail within the boundaries of BCWMA. (Target date: Completed)

3. Eliminate unnecessary gates and lock remaining gates. (Target date: Completed)

4. Strictly enforce unauthorized use of motorized vehicles.

B. Objective: Encourage nonmotorized public access on and through BCMAW.

Strategies:

1. Work closely with BLM and USFS Recreation Staff to develop and fund a moderately developed parking/camping area and interpretive site at trailhead. (Target date: Completed)

2. Work closely with local organized recreational groups to promote nonmotorized use of BCWMA.

3. Work closely with local recreational groups on projects benefiting nonmotorized use of BCWMA.

4. Post signs indicating distance and direction of BCWMA on U.S. Highway 30 northwest of the BCWMA (Completed) and on State Highway 27 south of Burley. (Target date: 1999)

IX. Goal: Provide watchable wildlife opportunities.

A. Objective: Provide additional mountain bluebird habitat

Strategies:

1. Coordinate with a local civic or conservation group to construct and erect bluebird boxes on BCWMA. (Target date: Completed)

B. Objective: Provide neotropical migrant and year-round resident passerine habitat.

Strategies:

1. Eliminate livestock grazing along Big Cottonwood Creek to allow for recovery of riparian vegetation. (Target date: Completed)

2. Work closely with Regional wildlife staff and the State Nongame Coordinator to develop breeding (Ralph et al. 1993) survey on BCWMA to monitor species composition and relative density. (Target date: Completed)

3. Work closely with Regional wildlife staff, State Nongame Coordinator, and a local civic or conservation group to construct and erect American kestrel boxes on BCWMA. (Target date: Completed)

C. Objective: Provide amphibian and reptile year-round habitat.

Strategies:

1. Eliminate livestock grazing along Big Cottonwood Creek to allow for recovery of riparian vegetation. (Target date: Completed)

2. Encourage beaver reintroduction throughout Big Cottonwood Creek.

3. Work closely with the Regional wildlife staff and the State Nongame Coordinator to develop survey routes on BCWMA to monitor species composition and relative abundance. (Target date: 2000)

D. Objective: Provide year-round bat habitat and protect hibernacula and maternity roosts.

Strategies:

1. Work with a local civic or conservation group to construct and erect bat boxes on BCWMA. (Target date: 2000)

2. Work closely with the Regional wildlife staff and the State Nongame Coordinator to survey BCWMA and adjacent IDL, BLM and USFS land for critical bat habitat, species presence, and monitor long-term population trends.

3. Develop and erect gates for appropriate hibernaculum or documented nursery areas. (Target date: 2002)

E. Objective: Develop a wildlife management area brochure (Target date: 1999)

X. Goal: Protect and maintain significant cultural resources.

A. Objective: Maintain, protect, and preserve, if financially feasible, all cultural and historic resources present on BCWMA.

Strategies:

1. Consult and consider recommendations of the Cassia County Historical Society concerning standing structures (homes) on BCWMA.

2. Fence and revegetate gravesite located on BCWMA. (Target date: Completed)

3. Protect and preserve "round corral."

4. Develop and erect interpretive signs for significant historical structures. Periodic maintenance of the retained structures to prevent deterioration. (Target date: 2005)

MONITORING

Long-term monitoring of fish and wildlife population trends and habitat conditions will continue on BCWMA. This information will be used to adapt future management to provide a balance of benefits to a variety of species. Monitoring will include the following:

1. Continue riparian/wetland monitoring, using established USFS (1992) and BLM (1997) protocols, to ensure management of Big Cottonwood Creek towards the DFC.
2. Continue collecting photo-point data to qualitatively document riparian changes/trends through time.
3. Continue breeding bird surveys (Ralph et al. 1993) to monitor species composition and relative density.
4. Continue monitoring bighorn sheep, wild turkey, and California quail habitat use and production via radio telemetry as funding permits.
5. Continue Yellowstone cutthroat trout population monitoring below the irrigation diversion on Big Cottonwood Creek.
6. Establish small mammal monitoring program to determine species composition and relative abundance in wetland/riparian, sagebrush/grass, and agricultural cover types.

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APPENDIX I

BCWMA WILDLIFE SPECIES LIST

AVIAN SPECIES

Herons
Great Blue Heron

Swans, Geese, and Ducks
Mallard

Plovers
Killdeer

Sandpipers
Spotted Sandpiper

Vultures
Turkey Vulture

Eagles and Hawks
Bald Eagle
Golden Eagle
Northern Harrier
Red-tailed Hawk
Swainson's Hawk
Rough-legged Hawk
Ferruginous Hawk
Cooper's Hawk
American Kestrel
Prairie Falcon

Grouse
Sage Grouse
California Quail
Chukar
Gray Partridge
Ring-necked Pheasant
Wild Turkey

Pigeons and Doves
Rock Dove
Mourning Dove

Owls
Barn Owl
Great Horned Owl
Burrowing Owl

Nightjars
Common Nighthawk

Hummingbirds
Black-chinned Hummingbird
Broad-tailed Hummingbird
Roufous Hummingbird

Kingfishers
Belted Kingfisher

Woodpeckers
Northern Flicker (Common Flicker)
Downy Woodpecker

Tyrant Flycatchers
Eastern Kingbird
Western Kingbird
Western Wood-Pewee
Say's Phoebe
Western Flycatcher

Larks
Horned Lark

Swallows
Tree Swallow
Violet-green Swallow
Bank Swallow
Northern Rough-winged Swallow
Cliff Swallow
Barn Swallow

Jays, Crows, and Magpies
Black-billed Magpie
American Crow
Common Raven

Titmice and Chickadees
Black-capped Chickadee
Bushtit

Wrens
House Wren
Marsh Wren
Canyon Wren
Rock Wren

Thrushes
Golden-crowned Kinglet
Blue-gray Gnatcatcher
Mountain Bluebird
Townsend's Solitaire
Hermit Thrush
American Robin

Shrikes
Loggerhead Shrike

Mimic Thrushes
Sage Thrasher

Starlings
European Starling

Warblers and Sparrows
Yellow-rumped Warbler
Yellow Warbler
Wilson's Warbler
Common Yellowthroat
Yellow-breasted Chat

Grosbeaks, Buntings, and Sparrows
Black-headed Grosbeak
Lazuli Bunting
Green-tailed Towhee
Rufous-sided Towhee (Spotted Towhee)
Vesper Sparrow
Song Sparrow
Lark Sparrow
Brewer's Sparrow

Blackbirds and Orioles
Western Meadowlark
Red-winged Blackbird
Brewer's Blackbird
Brown-headed Cowbird
Northern (Bullock's) Oriole
Western Tanager

Weavers
House Sparrow

Finches
American Goldfinch
Purple Finch
House Finch

SMALL MAMMALS

Yellow-bellied marmot
Nuttall cottontail
Black-tailed hare
White-footed deer mouse
Western jumping mouse
Northern grasshopper mouse
Canyon mouse
Western harvest mouse
Great Basin pocket mouse
Northern pocket gopher
Bushy-tailed wood rat
Montane vole
Meadow vole
Townsend's big-eared bat
Small-footed myotis
Porcupine
Raccoon
Beaver
Badger
Long-tailed weasel
Muskrat
Mink
Striped skunk

LARGE MAMMALS

Mule deer
California bighorn sheep
Mountain lion
Bobcat
Coyote
Red fox

REPTILES AND AMPHIBIANS

Gopher snake
Western terrestrial garter snake
Western (Great Basin) rattlesnake
Racer
Sagebrush lizard
Pacific chorus frog

APPENDIX II

WATER FLOW FROM BIG COTTONWOOD CREEK, 1979-1993

Year	Inches
1979	246
1980	3839
1981	795
1982	2877
1983	3174
1984	4422
1985	2874
1986	3896
1987	489
1988	1694
1989	2301
1990	1593
1991	1428
1992	0
1993	3074

APPENDIX III

WILD TURKEY RELEASES AT BCWMA, 1994-99

DATE	NUMBER OF MALES[1]	NUMBER OF FEMALES	TOTAL BIRDS RELEASED
2/10/94	3 (1)	3	6
3/17/95	6 (0)	10	16
11/25/96	4 (0)	4	8
2/15/97	0 (0)	8	8
3/21/98	0 (0)	10	10
12/18/98[2]	11 (7)	24	35
2/18/99[2]	7 (4)	13	20
	31 (12)	72	103

[1] The number of adult males released are in parenthesis.

[2] Release met fully stocked criteria as defined in the Statewide Upland Game Species Management Plan (1990). A release site shall be considered fully stocked when 20 to 25 hens and 8 males (at least three adult toms) have been released in a winter trapping period.

APPENDIX IV

MAJOR ACTIVITIES AT BIG COTTONWOOD WILDLIFE MANAGEMENT AREA, 1993-98

DATE	ACCOMPLISHMENT	BENEFIT
1993 - present	Net-wire fence removal	Facilitate wildlife movement through the management area
1993 - present	Hay production and harvest via sharecrop agreement	Generates revenue for management programs on BCWMA; maintains water right
1993 - present	Building and corral removal	Structures decayed; sites will be rehabilitated with woody cover and grass/forb plantings
1994 - present	3, 1 acre food plots	Winter food supply and cover for upland birds
1994 - present	Riparian vegetation monitoring program	Quantitative monitoring of riparian recovery; develop management to aid recovery
1994 - present	Riparian photo points	Qualitative monitoring of riparian recovery
1994 - present	Turkey, quail, and bighorn sheep monitoring via radio telemetry	Monitor production, recruitment, and habitat use; develop specific management actions based on results
1994 - 1997	Erected kestrel and blue bird boxes	Artificial nest structures to aid production
1994-98	Wild turkey releases	Augment existing wild turkey population
1995 - present	Breeding bird surveys	Monitor species diversity and relative abundance as riparian and upland recovery progresses
1995 - 1998	Post/rail fence construction	Replace net-wire fence to exclude livestock
1996 - present	Fisheries population monitoring	Monitor cutthroat trout population and recolonization as riparian recovery progresses
March 1996	California quail release	Establish wild quail population
1996 - 1998	Pinyon pine, crabapple, and burr oak orchard	Provide an alternative food source and cover for a variety of wildlife
April 1997-98	Youth turkey hunts	Department sponsored youth hunt; first turkey hunting opportunity ever at BCWMA
May 1997	Willow plantings	Facilitate riparian recovery

June 1997	Shrub plantings for California quail	Provide security and nesting habitat and an alternate food source for quail
September 1997	Old fruit orchard rehabilitation	Increase fruit production; provide an alternative food source for a variety of wildlife
1997-98	50 acres restoration of cheatgrass infested agricultural land	Native grass, forb, and shrub planting to benefit a variety of wildlife
1997-98	Building relocation	Remove buildings from bank of creek; rehabilitate with wetland plantings
May 1998	32 acres rehabilitation of cheatgrass infested agricultural land	Irrigated dense nesting cover for upland gamebird production
August 1998	New roof on BCWMA HQ	General facility maintenance

APPENDIX V

FEDERAL AID PROJECT STATEMENT AND PROGRESS REPORT

MINIDOKA HABITAT DISTRICT

ACTIVITY	ACTIVITY CODE	UNITS OF WORK		COST		COMMENTS
		Planned	Actual	Planned	Actual	
HABITAT IMPROVEMENT						
Management Program - Improve big game habitat						
Irrigate grass/alfalfa pastures	1322	2 weeks		1,136		Species benefited: Bighorn sheep, mule deer, turkeys, pheasants, chukars, grey partridge
Restore nonirrigated agricultural lands	1322	2 weeks		1,136		Species benefited: Bighorn sheep, mule deer, turkeys, pheasants, chukars, grey partridge, sage grouse
Layout range riparian transects and photo points	1440	2 weeks		1,136		Species benefited: Bighorn sheep, mule deer, turkeys, pheasants, chukars, grey partridge
Remove unneeded corrals and buildings	1211	2 weeks		1,136		Species benefited:
Maintain fences and remove unneeded ones	1211	2 weeks		1,136		Species benefited:
Management Program - Maintain and improve habitat for upland game birds						
Establish and maintain irrigated food plots	1322	2 weeks		1,136		Species benefited: Turkeys, pheasants, quail, grey partridge
Irrigate and maintain 140 acres grass/alfalfa and 34 acres of dense nesting cover	1322	2 weeks		1,136		Species benefited: Bighorn sheep, mule deer, pheasants, chukars

ACTIVITY	ACTIVITY CODE	UNITS OF WORK		COST		COMMENTS
		Planned	Actual	Planned	Actual	
Evaluate upland bird habitat	1440	2 weeks		1,136		Species benefited: upland birds
HUNTING						
Management Program - Maintain road closure to protect wildlife habitat						
Maintain road closure	1211	2 weeks		1,136		Species benefited: Bighorn sheep, turkeys, cutthroat trout
TECHNICAL ASSISTANCE						
Review of public projects	1710	15 weeks		8,520		Species benefited:
Provide assistance to private landowners	1720	10 weeks		5,680		Species benefited: upland game birds and waterfowl
ADMINISTRATION						
Coordination and administration	1630	9 weeks		5,112		Species benefited: