THE GEOGRAPHIC AND ECONOMIC IMPORTANCE OF HUNTING IN SOUTHWESTERN MONTANA, USA

by

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GLOSSARY

Asset: Any land owned, operated, or managed by Montana Fish, Wildlife and Parks

Consumer Surplus: the value that consumers receive above and beyond what they pay to participate in an activity

Direct effect: The income and employment generated by hunter purchases at local businesses

Hunter-related expenditures: Any expenditure directly supported by hunters through general license and permit fees, or Pittman-Robertson related funds

Indirect effect: The use of revenues from local businesses to purchase goods and services

Induced effect: an employee's use of wages to purchase goods or services

Multiplier: The ratio of the direct, indirect, and induced effects on an economy to the direct effects.

Total economic impact: the combined direct, indirect, and induced effects of expenditures within a given region

ABSTRACT

Montana's big game species were at one time brought to near extinction through exploitation and the myth of superabundance. Today they are seen as one of the state's most prized possessions, with millions of dollars spent annually on their sustainability through the management efforts of Montana Fish, Wildlife and Parks. Funding for Montana Fish, Wildlife, and Parks is provided through a hunter and manufacturer sponsored excise equipment tax provided through the Federal Aid in Wildlife Restoration Program, or as it is more commonly referred to, the Pittman-Robertson Act, as well as state hunter license and permit fees. Conservation efforts provided through these funds are directly and indirectly responsible for increased harvest numbers and hunter participation, as well as the expansion of lands conserved to sustain these wildlife populations. By providing a healthy and diverse variety of game species, the Montana Fish, Wildlife and Parks is able to continually attract hunters to the state. This in turn, increases hunter expenditures that fund additional conservation efforts, while at the same time contributing to local economies via food, lodging, equipment, and transportation expenditures. The objective of this study was to determine the relationships between hunter-supported expenditures by Montana Fish, Wildlife and Parks, hunter participation rates, species' harvest rates, and hunters' economic impact on communities. It is hypothesized that there will exist a positive relationship and feedback the between amount of hunter-related expenditures, hunter participation and harvest rates, and hunters' economic impact on local communities. The importance of this study was to develop a methodology by which these relationships can be determined, and hence, used elsewhere, as well as to demonstrate to regional hunting and non-hunting community, the importance and value of hunting.

Keywords: Hunting, Conservation, Montana-southwest, Montana Fish, Wildlife and Parks

OBJECTIVES AND GEOGRAPHY

Objectives

The objective of this study was to determine if a relationship between hunter-supported expenditures by Montana Fish, Wildlife and Parks existed with hunter participation numbers, harvest numbers, and hunters' economic input on local communities. It was hypothesized that there existed a positive relationship and feedback between the amount of hunter-related expenditures, the amount of hunter participation and harvest rates, and hunters' economic input to local communities. This study developed a methodology by which these relationships were studied, and hence, it can be used elsewhere for additional studies. This study also demonstrated the economic importance and value of hunting.

Background

Montana's big game species are today seen as one of the state's most prized possessions, with millions of dollars spent annually on their sustainability through the management efforts of Montana Fish, Wildlife and Parks. This is especially seen in the over 18,000 square miles (4,661,979 hectares) that constitute Montana Fish, Wildlife and Parks Region Three (Figure 1), where high-quality game species and amenity-driven destinations attract hunters from around the world.

However, the present state of abundant game species and high hunter participation and harvest rates has not historically been the case (Books 2000). Montana's big game

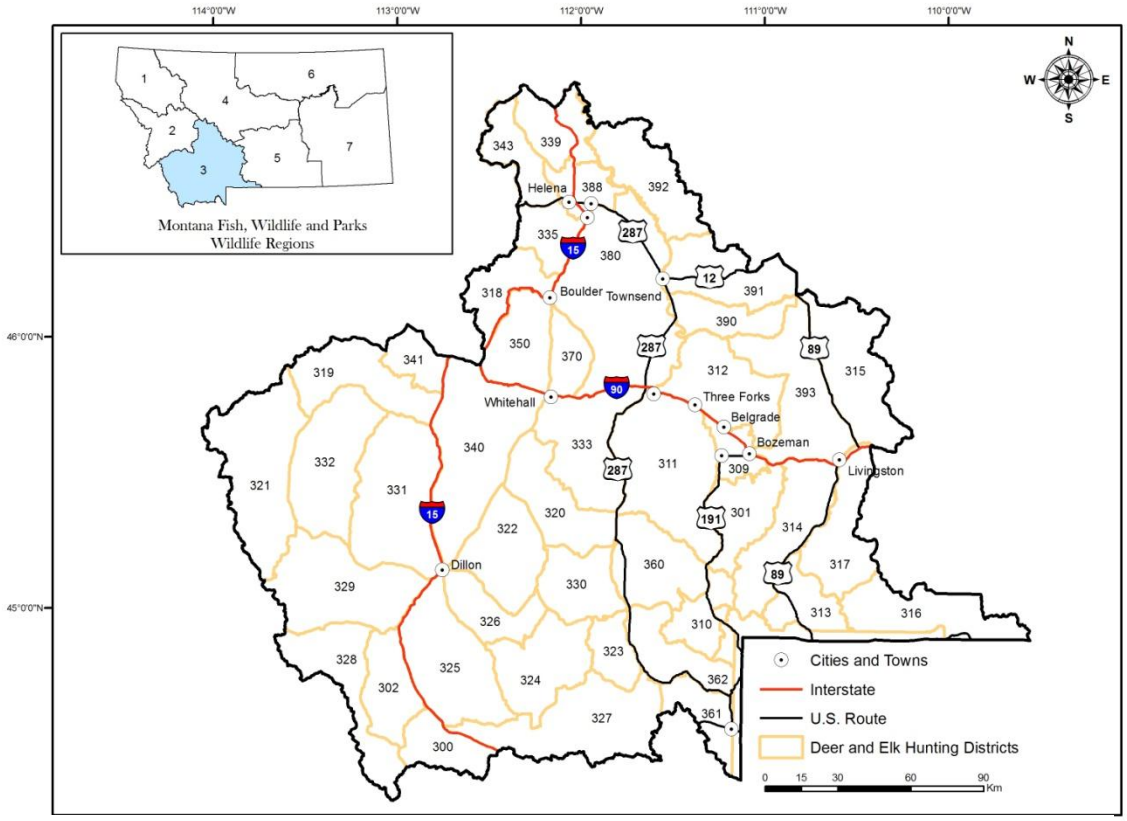

Figure 1. Montana Fish, Wildlife and Parks Region 3 Base Map (NRIS 2008)

species were at one time brought to near extinction through exploitation and the myth of superabundance (Foss 1971). Beginning with the gold rush and the cattle ranching era of the 1860s, and culminating with the devastating droughts of the 1910s and 1930s, Montana's wildlife were in a perilous state and in need of a boost. This boost came from the introduction of the Federal Aid in Wildlife Restoration Program, or as it is commonly known, the Pittman-Robertson Act. The program is based on a self-imposed, and hunter-supported, manufacturers excise tax on rifles, shotguns, handguns, archery equipment, and ammunition. This federal program allocates funds to state wildlife agencies up to 75 percent of approved eligible program costs, with state wildlife agencies providing the remaining 25 percent

through general license and permit fees. Allocation of funds to state wildlife agencies is based on a formula that takes into consideration the size of each state as well as the total number of licensed hunters (Harmon 1987; and USFWS 2006). The funding is used for a variety of projects including research, land acquisitions, maintenance of existing sites and employee salaries amongst others.

Geography

Field Characteristics

The area of study for this research is located within Montana Fish, Wildlife and Parks Region 3, and consists of seven counties, including Beaverhead, Broadwater, Gallatin, Jefferson, Madison, Park and portions of Deer Lodge. Sixty percent of the areas 18,000 square miles are administered by the U.S. Forest Service and the Bureau of Land Management, and contain favorable hunting experiences due to high species numbers, resulting in greater economic input from hunters's at the local level (MFWP 2005a). Land use in the region includes agricultural, residential, industrial and multi-use public lands. These varying land uses all contribute to the health of the local wildlife populations (Burlingame 1942).

Land Use and Management

The area's abundant public lands, which are typically located at higher elevations were at one time seen as "storehouses" of natural resources available for exploitation and consumption (Power 1991). Today they are also used for multiple recreational activities including hunting, hiking, fishing and horseback riding. Recreational activities account for

over 80 percent of forest-related employment within the Greater Yellowstone Ecosystem, while timber related employment accounts for only 11 percent (Power 1991). This shift from consumption to recreational use has also shifted local economic inputs from timber harvests and other extractive industries to inputs from recreational activities such as hunting. (Books 2000).

As demographic changes have taken place over the past 125 years, land use changes have competed with traditional agricultural lands, especially those which surround cities, shifting land use to urban and suburban uses, depleting wildlife of habitat and migratory corridors (Prato 2005). Rasker (1993) suggests that it is the region's natural amenities that have been the catalyst for its growing economy, and that the challenge for local decision makers is the sustainability of these amenities. However, as these economies changed through increases in industry and non-labor income, specifically retirement accounts, those with the financial ability have begun to move further into the suburban and mountain periphery of cities, in some cases settling on the edge of public lands, further disrupting traditional wildlife habitats (Hansen et al. 2002; Clendenning et al. 2005).

Study Area

Political and Demographic Characteristics of Counties

As of 2005, Madison County (1,026,412 ha) had a total population of 7,274 people, with a per capita average income of $27,715, and an unemployment rate of 3.1 percent. The county's primary industry subsector is accommodation and food services. There are over 416,333 ha of land currently under cultivation (MDLI 2006a). Outdoor

recreation, specifically those relating to the Madison River and its adjacent public lands are also prominent to the local economy, especially in the town of Ennis. The county includes the state's first town, Virginia City, which was founded in 1864, as well as the towns of Pony, Sheridan, and Twin Bridges (Merrill and Jacobson 1997).

Gallatin County (682,214 ha) has continually been the state's fastest growing county with an overall increase of 14.5 percent between 2000 and 2005. It boasts a population of 78,210 and a per capita average income of over $30,000. The primary industry subsector is retail trade, however accommodation and food services also rank relatively high due to the large tourism industry sustained from winter recreational activities at the Bridger Bowl Ski Area and Big Sky Resort in Madison county, and to the county's close proximity to Yellowstone National Park. Today, Gallatin County is considered the state's top producer of alfalfa hay, and was at one time considered a key source of canning peas, nationwide. A traditional celebration occurs annually to acknowledge the industry with the Sweet Pea Festival, in August. The county also includes the cities of Belgrade, Three Forks, Manhattan, and West Yellowstone, at the west entrance to Yellowstone National Park (MDLI 2005b, Merrill and Jacobson 1997).

Jefferson County (430,013 ha) has seen population increases in recent years due to migration from the surrounding cities of Helena, Butte and Bozeman (MDLI 2006b). The 11,170 residents (2005) of the county have a per capita average income of $28,436, with health care and social services being the top industry, and mining, public administration and education also being well represented (MDLI 2006b). The region is well known for its radon

mines, used for health purposes. Currently only four mines are active in the United States, all of which are located in the Boulder River valley of Jefferson County (Erickson 2000).

Park County (729,389 ha), named for its proximity to Yellowstone National Park, boasts a per capita income of $25,720. Economic activity in the county is created primarily through the retail trade industry, with tourism, recreation, and the food and accommodations industries also large economic subsectors (MDLI 2005b).

Beaverhead County (1,443,141 ha) is the largest county in the state of Montana. As of 2005, it had a population of 8,773 and a per capita average income of $26,554. Educational services were the top industry subsector in terms of employment due to the University of Montana-Western Montana College in Dillon. Because the county is the state's top producer of cattle, the agricultural subsector plays an important role in local economic activity, as well as accommodations and food services and retail trade (MDLI 2005c).

Broadwater County (321,148 ha) was home to 4,517 people in 2005, with a per capita income of $22,782. Primary industry subsectors include manufacturing, accommodations and food services, health care and social assistance. Canyon Ferry Lake, the third largest water body within the state is located in the county, and is a recreation destination for Montanans and non-residents, alike. Agriculture is also present within the county with ranches and farms accounting for over 50 percent (452,744 acres) of the total land area of the county (MDLI 2005d).

Deer Lodge County (192,067 ha) has a per capita income of $23,604 and was home to 16,304 residents in 2005. The county was historically known for the Anaconda Copper Mining Company and its smelting and mining operations, but is now considered to

be a recreational destination with signature golf courses designed by famed champion Jack Nicklaus, Discovery Basin ski area, and the Mount Haggin Wildlife Management Area, (the state's largest). The health care and social assistance industries were among the county's largest due to the Warm Springs State Hospital, and the Galen State Hospital (MDLI an2005e).

Physical Characteristics

The region is home to the Anaconda, Absaroka, Beaverhead, Blacktail, Bridger, Bitterroot, Elkhorn, Gallatin, Gravelly, Madison, Pioneer, Ruby, Snowcrest, Tobacco Root, and Tendoy mountain ranges (Figure 2), most of which are managed by public agencies. Wildlife species use these mountain environments for migratory corridors and summer ranges. The lower elevation waterways and riparian zones, including the Yellowstone, Gallatin, Madison, Jefferson, Missouri, Beaverhead, and Big Hole rivers, as well as the state's largest reservoirs, Hebgen, Clark Canyon, and Canyon Ferry are used by game species for primary winter range (MFWP 2005a)

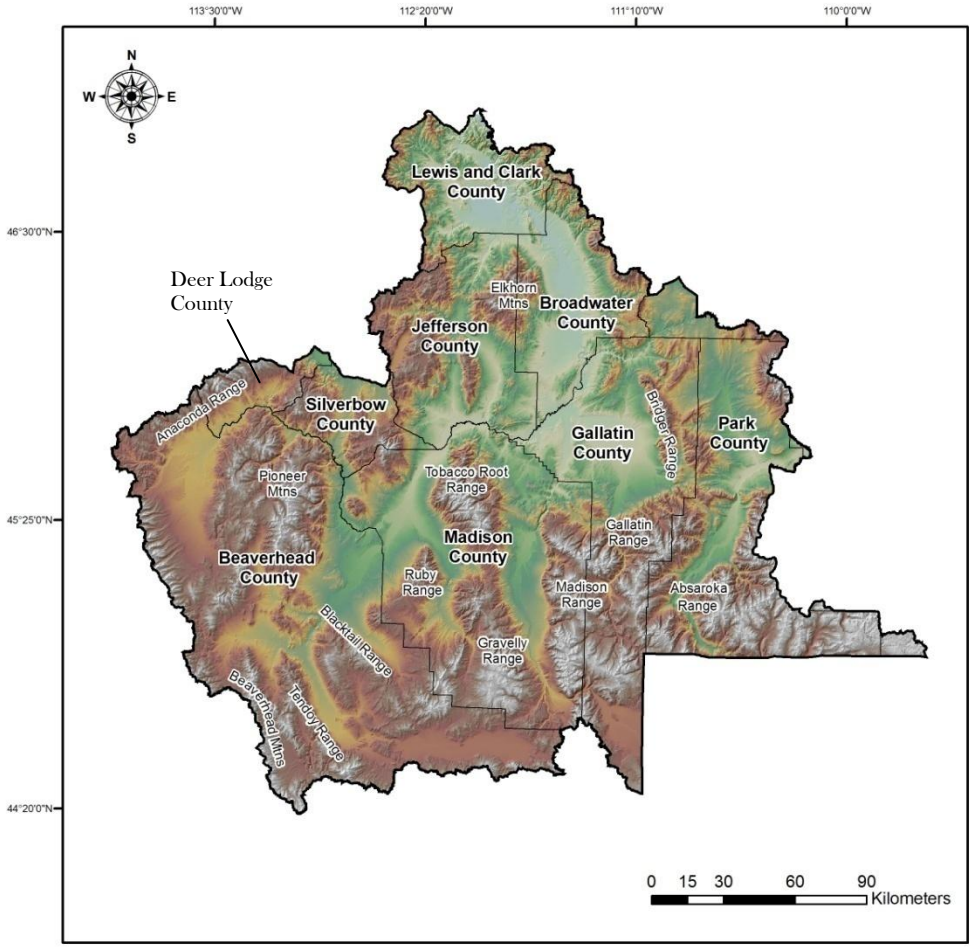

Figure 2. Montana Fish, Wildlife and Parks Region 3 Topography (NRIS 2008)

Geology

Most of the major cities and towns are located on alluvium and tertiary basin fill, while many of the mountain ranges are composed of early Precambrian metamorphic (1200 million years ago), and Cenozoic-Mesozoic (225-70 million years ago) extrusive rock (Taylor et. al 1974)(Figure 3). Another dominant geologic feature of this region is the abundance of metamorphic basement rock that formed between 2.7 and 1.6 billion years ago, including gneiss, schist, and marble. Two primary areas of volcanic activity are also located within the study area, the Elkhorn Mountains and the Absaroka Mountains, both of which consist primarily of andesite (Alt 1986). Also during the Precambrian, the area from Three Forks northwards into Canada was filled with an inland seaway which is responsible for a high percentage of the sedimentary rock at both low and high elevations. This area also continues to see plate tectonic and volcanic hot spot-induced structural changes (MFWP 2005a). Lastly, mountain ranges in the eastern portion of this region, specifically the Gallatin Range, are overlain by extrusive (volcanic) igneous rock. Higher elevations have also been heavily influenced by glacial processes which are seen today in the numerous troughs, cirques, tarns, and horns (MFWP 2005a).

Ecotypes

Montana Fish, Wildlife and Parks (2005a) recognizes three separate ecotypes (Intermountain and Foothills Grassland, Shrub Grassland and Montane) within the study area (Figure 4), each defined by unique characteristics including climate, vegetation, soil,

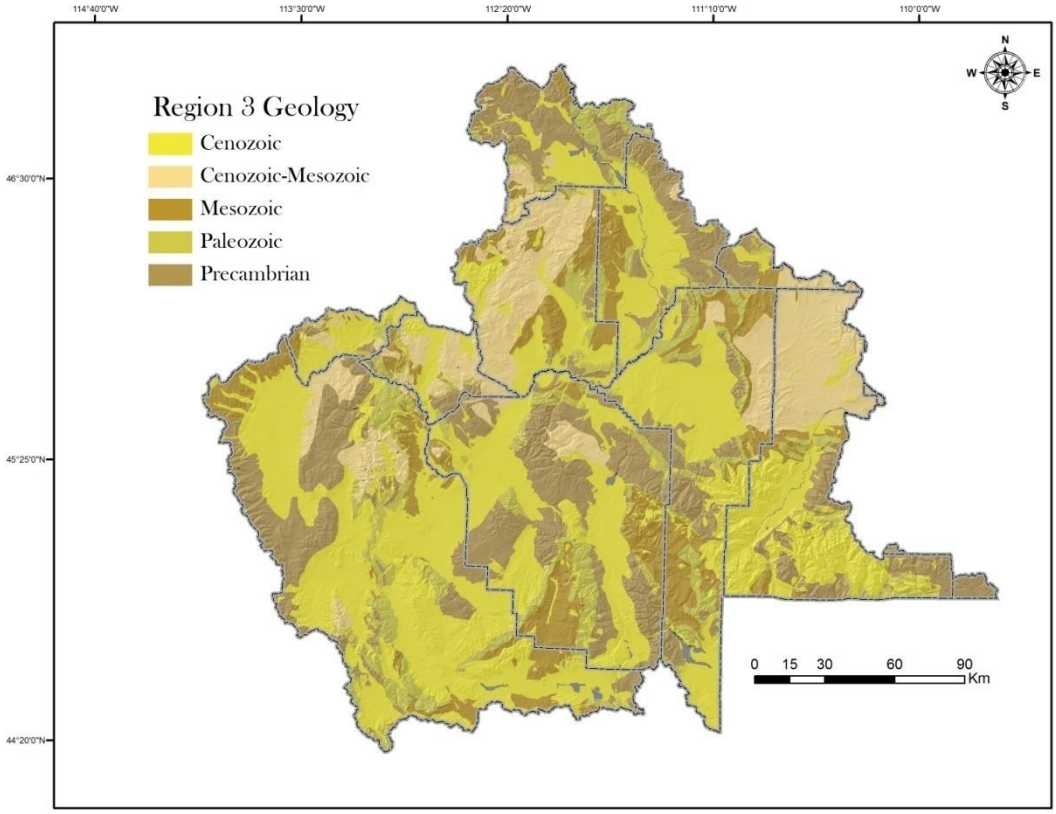

Figure 3. Montana Fish, Wildlife and Parks Region 3 Geology (NRIS 2008)

topography, and anthropogenic use. The physical characteristics of these 3 ecotypes contribute to the region being one of the most productive in regards to game species in the state (MFWP 2005a). It is also these ecotypes that continually draw urban and residential development into the area, making it one of the fastest growing in the state (MFWP 2005a).

Intermountain-Foothill Grassland Ecotype: The Intermountain-Foothill Grassland ecotype is defined by lush riparian zones created from meandering rivers in the valley basins, grasslands between mountain ranges and the foothills, with elevations ranging from 900m

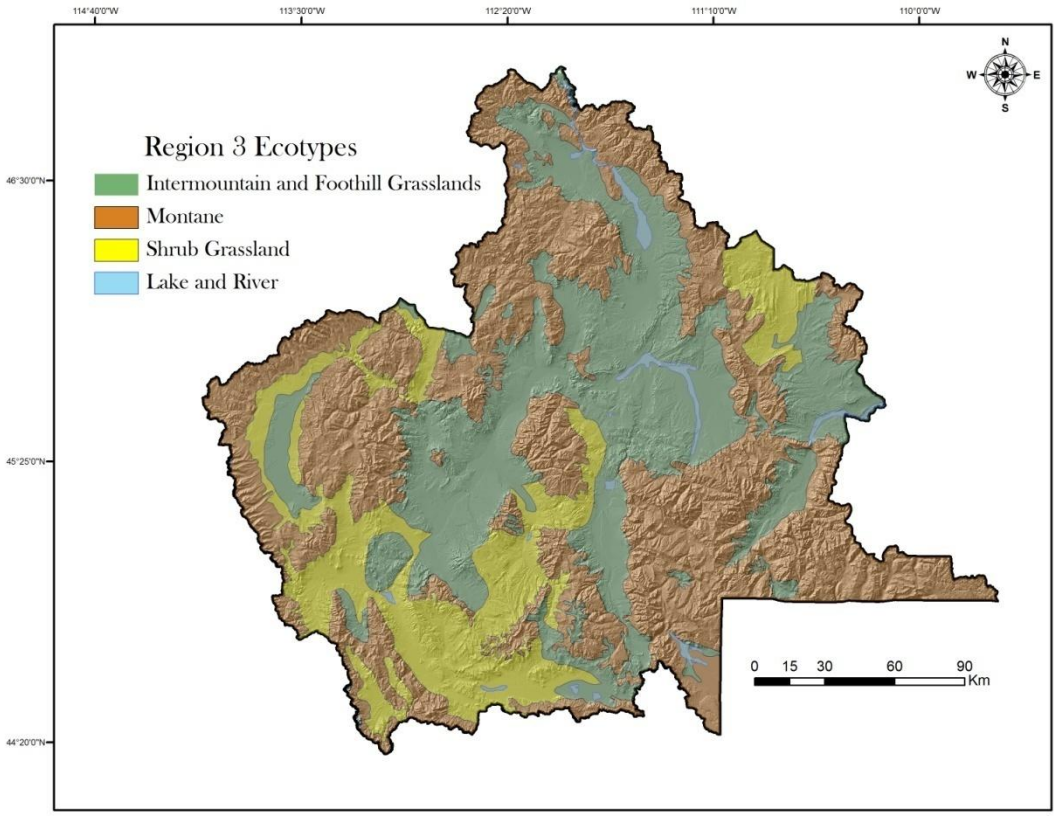

Figure 4. Montana Fish, Wildlife and Parks Region 3 Ecotypes (NRIS 2008)

(3000ft) at the foothills of the Tobacco Roots, to 1675m (5500ft) along the foothills of the Madison Range, relatively moderate annual temperatures, and some of the most productive soil in the West (MFWP 2005a). While these characteristics provide ideal habitat for game species, they are also sought for anthropogenic uses including agriculture and urban development. The ecotype receives an annual average of 39cm (15.4 in) of precipitation, with valley bottoms receiving as little as 23cm (9 in) per year, and higher elevations up to 51cm (20 in). Temperatures also vary with elevation, with average January temperatures between -9.4 and -5 °C (15 and 23° F), and average July temperatures ranging from 27 to

30°C (80 to 86°F) (MFWP2005a). An average annual frost-free period of between 90 and 125 days exists. Soils are dominated by glacial till and tertiary valley fill. Species include: rough fescue (*Festuca scabrella*), and Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Agropyron spicatum*), and arrowleaf balsamroot (*Balsamorhiza sagitatta*). Wyoming Big sagebrush (*Artemisia tridentate spp. Wyomingensis*), as well as needle and thread (*Stipa comata*), Kelsey phlox (*Phlox kelseyi*) and willow (*Salix spp*.) are also present. Mule deer (*Odocoileus hemionus*) elk (*Cervus canadensis*), and white-tailed deer (*Odocoileus virginianus*) are some of the dominant game species (MFWP 2005a).

Shrub-Grassland Ecotype: The Shrub/Grassland ecotype is common in higher elevation mountain valleys and non-forested slopes between 1,676 and 2,438m (5500-8000ft). This ecotype is dominated by high variation in average daily temperatures, with January averages between -35 and -12°C (-31 and 10°F), and July averages of between 17 and 39°C (63 and 102°F) (MFWP 2005a) (MFWP 2005a). High elevation meadows having growing seasons as short as 30 days, while lower areas can have as many as 130 days. Because of this high variation, these areas are commonly thought of as transition areas for wildlife. These areas are also heavily sought after for residential development because of their inspiring viewsheds (MFWP 2005a). Shrubs and grasses include: Wyoming big sagebrush, silver sagebrush (*Artemisia cana*), and greasewood (*Sarcobatus vermiculatus*) (MFWP 2005a).

Montane Forest Ecotype: The Montane Forest ecotype begins at the foothill/mountain interface and may continue to the mountain peaks above. Elevations range

from 1,371 and 3,352m (4,500 to 11,000ft), with higher elevations located west of the Continental Divide. Soils typically contain an acidic duff layer which is underlain by a heavily leached layer as well as a clay layer (MFWP 2005a). Of great importance also is the orographic effect present within these mountain environments, with increasing precipitation and decreasing temperature with increased elevation. The average daily temperature range in January is between -13 and -3.9°C (8 and 25°F), while July average daily temperatures range between 10.5 and 15.5°C (51 and 60°F). The average annual precipitation is 94 cm (37 in), with areas above 3352 m (11,000 ft), receiving over 152cm (60 in) (MFWP 2005a). The largest portion of this precipitation falls during the winter months in the form snow, typically between 2.03 to 7.62 m (6.7 to 25 ft) per year, with most areas covered with at least 2.54 cm (1 in) of snow for up to 260 days per year. The vegetation of the area is dominated by coniferous forest species which vary by elevations, including Douglas fir (*Pseudotsuga.glauca*), lodgepole pine (*Pinus contorta subsp. murrayana*), subalpine fir (*Abies lasiocarpa*), whitebark pine (*Pinus albicaulis*), as well as limber pine (*Pinus flexilis*) (MFWP 2005a).

Big Game Species

Montana is home to 12 big game species include Rocky Mountain elk, mule deer, white-tailed deer, pronghorn antelope (*Antilocapra americana*), Shiras moose (*Alces alces shirasi*), bighorn sheep (*Ovis canadensis*), Rocky Mountain goat (*Oreamnos americana missoulae*), mountain lion (*Felis concolor*), and black bear (*Ursus americanus*). These species with the exception of bison (Bison bison) are managed by the Wildlife Division of Montana Fish, Wildlife and Parks. The Wildlife Division's goal is to produce and maintain

the optimum yield of big game species (MFWP 2005a). Optimum yield is considered the quantity of game species that will provide the greatest benefit to the species' population. (Bolen and Robinson 1994). One of the primary duties of the Wildlife Division is to establish big game seasons which have been historically based on forage conditions, hunter participation and harvest trends, and species population conditions (Mussehl and Howell 1971).

The Rocky Mountain elk or wapiti once flourished along the mountains and inter-mountain valleys of western, central and southern Montana, but were fragmented with westward European expansion. Today they are found primarily within the Intermountain Foothill Grasslands and Shrub Grasslands of central and western Montana (MFWP 2005a). Their preferred habitat includes slopes of less than 20 percent, elevations between 1,135 to 2,062 m (3,723 to 6,765 ft) (Edge et. al 1987), and east-facing aspects for thermoregulation (Ager et. al 2003). Winter browse includes; willow, Rocky Mountain maple (*Acer glabrum*), serviceberry (*Amelanchier alnifolia*), chokecherry (*Prunus virginiana*), sagebrush (*Artemisia tridentate*), poplar (*Populus spp*.), and Rocky Mountain juniper (*Juniperus scopulorum Sarg.*). Summer grasses include rough and Idaho fescue and bluebunch wheatgrass (Mussehl and Howell 1971; Pitt 1975).

Mule Deer are found above approximately 2,500 m (8,200 ft) in Region 3. A primary consideration in habitat selection is the distance between open country and forested cover of heavy timbered draws and coulees (Mussehl and Howell 1971). Browse includes mountain mahogany (*Cercocarpus leditlius),* bitterbrush (*Purshia tridentata*) , chokecherry,

serviceberry, common sagebrush, silver sagebrush , rabbitbrush (*Chrysothamus viscidifulorus*), and dogwood (*Cornaceae spp.)(*Pitt 1975).

White-tailed deer are seasonally found in closed canopy forests of Douglas-fir and ponderosa pine with south and southwest facing aspects, as well as in bottom lands and valley floors. Browse includes serviceberry, skunkbrush (*Rhus trilobata*), chokecherry, snowberry (*Symphoricarpos albus*), maple, bitterbrush, juniper, with Oregon grape (*Mahonia aquifoloium*) being the most commonly used (Mussehl and Howell 1971; Pitt 1975).

Pronghorn antelope are typically found in open prairies, and sagebrush grasslands. Sagebrush is the primary forage during the spring and summer, with browse such as abbitbrush, snowberry, salt- brush, grama grass and wheatgrass (*Triticum aestivum*) common throughout the year (Mussehl and Howell 1971; Pitt 1975). Further, during winter months the species feeds on both agricultural alfalfa and wheat (Schemnitz 1994).

The Shiras moose is the largest native big game species within the state and is found in dense stands of willow, spruce and subalpine-fir, Douglas fir, and various deciduous species within nearby wetlands including willow, aspen and maple. High elevation species of forage include huckleberry (*Gaylussacia kunth*), and subalpine fir, and at lower elevations, forage includes Douglas-fir, dogwood, serviceberry, and chokecherry (Mussehl and Howell 1971; Pitt 1975).

Bighorn sheep are found within mountainous regions with sparse vegetation, rocky cliffs, and low snow depth. They graze on sedges, sagebrush, fescue grasses, wheatgrass and as well as bluegrass (*Poa L. spp.*) (Mussehl and Howell 1971; Pitt 1975).

Rocky Mountain goats spend the summer months at elevations above 3000 m, and winter months as low as 1,500 m (4,921 ft). They prefer steep, rocky slopes above the timberline, where limited access to vegetation reduces interaction with other species (Pitt 1975). Grasses are the primary forage in winter and fall, with forbs and shrubs being the primary forage in spring and summer (Mussehl and Howell 1971).

Mountain lions prefer a broken country of mountains, forests, and wetlands, and primarily feed on deer, but may also feed on rabbits, mice, birds, and even elk (Mussehl and Howell 1971; Pitt 1975). Today they are found throughout the state of Montana (Alt 2008 personal communication).

Black bears are found within the forested and mountainous portions of the region, especially within stands of ponderosa pine and Engelmann spruce. They avoid areas that have been logged. Forage includes grasses, sedges, and forbs during the spring months, just after their emergence from hibernation, and fruits, nuts and berries during the summer and autumn months. They, along with mountain lions have also been known to kill animals, eat carrion, and since the settlement era, have been known to feed on garbage (Mussehl and Howell 1971; Pitt 1975).

HISTORICAL PERSPECTIVES OF WILDLIFE CONSERVATION

Introduction

At no other time than now in our country's history has the pressures of modernization, industrialization, and settlement been more pronounced on the landscape (Gibeau et. al 2002), especially within the mountainous West (Hernandez 2004). These pressures are manifested on the landscape through the values and perceptions of those who call this region home (Egan and Luloff 2000). As economic opportunities allow migration and settlement into these once seemingly remote areas (Gude et al. 2006), human-made environments are pushing wildlife into the periphery and destroying what remains of widlife habitat (Gartner 1987). In order to understand the economic impacts of hunting, a history of wildlife conservation and its funding is needed.

Montana Perspectives: 1900-1930

The turn of the century saw the ascendance of some of the most influential hunter-conservationists in the nation, most notably Theodore Roosevelt. Throughout his career, Roosevelt believed that all natural resources could be used and effectively harvested if decision makers followed "wise-use" policies. This was in contrast to the going sentiment across the country which viewed wildlife as an inexhaustible resource (Harmon 1987). All told Theodore Roosevelt added nearly 150 million acres to the forest preserves, five national parks (Crater Lake, Wind Cave, Platt Sully's Hill, Mesa Verde, and Platt National Park), 18 national monuments, four game preserves, over fifty federal bird reservations. Further, he established the Boone and Crockett Club with fellow conservationist George "Bird" Grinnell

which would use its social and political relationships to influence game laws and promote a conservation ethic nationwide, forever changing the way Americans viewed wildlife and wildlife conservation (Harmon 1987)

By 1901, in Montana, wildlife exploitation within the mining and timber camps of southwestern Montana prompted Governor Rickard to appoint W.F. Scott as the state's first Game Warden, thus beginning the Department of Fish and Game. Scott, in-turn, appointed eight deputy wardens who covered 18,000 square miles each, earning $100 each month. In 1907, Montana was one of only four states in the nation where elk hunting was legal. Species such as moose, bison and caribou were protected by law (Books 2000). In 1910, a Fish and Game Warden named Avare was responsible for relocating 25 elk from Yellowstone National Park to Fleecer Mountain, marking the beginning of the state's relocation program (Curtis 2007; Books 2000). Wildlife numbers, statewide, were declining rapidly by the mid 1920s, and pressure placed on public officials from individuals and hunting groups prompted the Montana legislature to authorize the Fish and Game Commission to regulate seasons for all species. It also authorized the establishment of game reserves for the protection of wildlife, of which 33, totaling over 2 million acres, were created by the end of the decade. The Commission also authorized the state's first land purchase specifically for game management at Red Rocks Lake, in 1926 (Books 2000). Prior to World War II, game management in Montana was based on the philosophy that hunters were the primary contributor to species decline (Mussehl and Howell 1971).

Montana Perspectives: 1930 – 1960

The Fish and Game Commission hired their first wildlife biologist Robert Cooney in 1941, who brought a scientific background to the field of game management (Books 2000). During this era, the Game Management Division of the Fish and Game Department established objectives to provide a surplus of animals that would be available to hunters (Mussehl and Howell 1971). To meet this objective, Mr. Cooney initiated the first statewide wildlife inventory with the help of Bill Bergeson, Faye Couey, Hector LaCasse, James Beer and Merle Rognurd who surveyed every county from the North Dakota border westward (Books 2000).

The 1940s were also marked by a dramatic change in post-war technology (including four-wheel drive automobiles, snowmobiles, and the proliferation of aircraft) that facilitated more effective transplanting of game species (Books 2000). These advances were possible because of an increase in funding through hunting licenses and permits which nearly doubled from 154,000 in 1941 to nearly 300,000 in 1950 (Books 2000).

In 1957, Pat McVay and Mel Ruder, in conjunction with the Montana legislature established the Hunter Safety Program requiring all hunters under the age of 18 to complete the program which consisted of at least 12 hours of in-class and hands-on training. The program today incorporates aspects of outdoor survival skills, animal identification and landowner relations, while at the same time emphasizing the importance of personal responsibility and the conservation ethic. As of 2007, 300,000 Montanans have graduated from the Hunter Safety Program, with over 1,500 volunteers teaching over 500 courses across the state annually (Curtis 2005; McKean 2007).

Montana Perspectives: 1960 – 1980

The 1960s and 1970s saw the acquisition of many of the prime elk winter and summer ranges within Montana Fish, Wildlife and Parks Region 3, where future hunter-contributed expenditures would occur. These included the Fleecer Mountain Game Range, the Gravelly-Blacktail winter range, and the Madison-Wall Creek and Mount Haggin Wildlife Management Areas (Mussehl and Howell 1971; Books 2000). Research during this time led to the Department's banning of the aerial spraying with chlorinated hydrocarbon chemicals including Dichloro-Diphenyl-Trichloroethane (DDT) after they were found to be detrimental to species survival (Books 2000). In 1972, the Hunter Orange program was established requiring hunters to wear a minimum of 400 square inches of orange florescent material above the waist at all times, increasing substantially the visibility of hunters and increasing safety (MFWP 2007b). Lastly, the Department of Fish and Game officially changed its name to Montana Fish, Wildlife and Parks in 1979 (Books 2000).

Montana Perspectives: 1980 – Present

One of the growing concerns throughout the hunting community beginning in the 1980s was the decreasing availability of lands open to hunting as landownership changed hands throughout the state. To combat these concerns the Landowner-Sportsman Program was established in 1986 and was later renamed the Block Management Program (Books 2000). The Block Management Program allows landowners to receive financial assistance, up to $12,000 annually, for opening their lands to public hunting through two options. The first option, Type I, allows hunters to access parcels without prior approval of the landowner, while the second option, Type II, requires either a representative of Montana Fish, Wildlife

and Parks or the landowner to issue permission for access. As of 2007, there were 84 Block Management Areas within Region 3, covering over 293,500 ha (Dickson 2004; MFWP 2007b).

In the early 1980s, Montana Fish, Wildlife and Parks wanted to establish a fund in addition to the Pittman-Robertson Act that would give them enhanced ability to purchase lands critical to habitat conservation. To accomplish this, House Bill 526, also known as the Habitat Montana Program was passed in 1987. The program allows Montana Fish, Wildlife and Parks to acquire lands with a preference given to conservation easements and leases, before fee-title purchase (MFWP 2005a). Along with this came the requirement that Montana Fish, Wildlife and Parks Commission compile a list of habitats that were threatened and critical to species survival in the form of a comprehensive habitat acquisition plan. These acquisitions also need to be evenly distributed across the state. Funding for the program is through a portion of big game license revenues, 92 percent of which comes from non-resident hunters (MFWP 2005a), and other funding sources such as moose and sheep license auctions (Econ Inc. 1992).

Montana Fish, Wildlife and Parks envisioned seven key benefits from the Habitat Montana Program, and each acquisition would be required to contribute to at least one of the seven benefits. These benefits included: conservation and enhancement of water and wildlife, contributions to hunting and fishing opportunities for the public, incentives for habitat conservation on private lands, contribution to non-game recreational activities, protection of open space and scenic areas, promotion of habitat-friendly agriculture, and maintenance of local tax bases through payments in lieu of taxed private real estate. Because

of the large scope of these goals, several organizations over time have been able to effectively work in conjunction with Montana Fish, Wildlife and Parks on conservation efforts. These organizations include the American Farmland Trust, Montana Land Reliance, Rocky Mountain Elk Foundation and the Nature Conservancy, as well as countless hunting groups across the state (MFWP 2005a). The state legislature, in 1989, established House Bill 720, requiring a social and economic impact analysis to be conducted for each proposed land acquisition. These analyses are in addition to the environmental assessment and formal management plans already in existence, and is required to be completed for public viewing and comment prior to acquisition (Econ Inc. 1992; MFWP 2005a).

All legislation passed into law in Montana is considered 'Sunset Law' which establishes a timetable wherein the legislation will automatically terminate at a particular date unless recreated by subsequent legislation (Adams and Sherman 1978). The sunset date for House Bill 526 was March 1, 1994, but in 1991 the state senate passed Senate Bill 252 that extended the sunset date to 1996. The bill also required the Montana Fish, Wildlife and Parks Commission to hire an independent contractor to assess the wildlife habitat protection programs within the state and make recommendations based on their findings before 1993 (Econ Inc. 1992). The contractor found that public values were shifting increasingly towards a non-consumptive use of wildlife as human population migration towards urban areas increased. It also concluded that hunter participation would continue to decline as demographic trends shifted and fewer and fewer young Montanans ventured outdoors to hunt. Finally, it emphasized the important role that hunters play in the conservation movement through their involvement in the political process and their financial support of

game species. Based on this assessment, seven critical stakeholders in Montana's wildlife were identified: first, sportsmen, followed by private landowners, environmentalists, government officials, land managers, local businesses, and guides and outfitters (Econ Inc. 1992; Canyon Consulting 1992).

Additional funding for wildlife habitat protection programs statewide comes from a variety of sources including the Upland Game Bird Enhancement Program, the Procurement and Sale of Artwork for Waterfowl Stamps Program, the River Restoration Program, and several others specifically relating to big game species. One of these other programs is the Mountain Sheep License Auction which was authorized in 1985 through House Bill 252, and allows the auction of one male mountain sheep license each year. Since its inception, the sheep auction has been conducted by the Foundation for North American Wild Sheep who may retain up to 10 percent of the auction price for administrative costs. As of 2006, the Mountain Sheep License Auction has brought in more than $3 million (Table 1), seventy percent of which is available to species management (MFWP 2008b). In 1987, the legislature authorized the auctioning of one male Shiras moose license each year through House Bill 282. Since 1988, the auction has collected nearly $250,000 for moose conservation efforts with organizations such as the Boone and Crockett Club, the Montana Outfitters and Guides Association and Skyline Sportsmen's Association implementing the auctions (MFWP 2008b).

Other big game auctions include one male elk license and one male mule deer license approved through House Bill 20 in 2003, and one male mountain goat license established in 2005 through House Bill 14. One provision of the mule deer, elk, and

mountain goat license is that they are available through auction or lottery, and have resulted in profits to date of $29,500 for mule deer, $79,000 for elk, and $13,500 for mountain goats (MFWP 2005a; MFWP 2008b). Revenues from the auctioning and lottery of big game licenses also benefit management efforts. Health monitoring was conducted on bighorn sheep herds, as well as the captured and relocated of seventy-four sheep in 2004, and 167 in 2005 to various states throughout the region including Utah and Idaho (MFWP 2008b). Additionally, captures and relocations of sheep occurred in the Taylor-Hillgard Wilderness Unit of the Lee Metcalf Wilderness Area in Region 3. Moose and elk population monitoring has also taken place, as well as migration studies concerning moose in the Red Rocks Wildlife Refuge (Econ Inc. 1992).

The first year that funding was made available through the Habitat Montana program, Montana Fish, Wildlife and Parks purchased two properties, the Robb-Ledford Wildlife Management Area in Region 3 and the Blackfoot-Clearwater Wildlife Management Area in Region 2. In 1990, the Department obtained its first conservation easement, with Habitat Montana funds. This easement consists of 160 acres in the Dome Mountain Wildlife Management Area. By 2004, the program was generating nearly $3 million annually, and Montana Fish, Wildlife and Parks held 43 Habitat Montana properties covering over 370,000 acres (82 percent held in conservation easement, 14 percent as fee-title purchases, and 4 percent leased) (MFWP 2005a). Of these, 103,387 acres were in Region 3 at a cost of over $15 million, all of which provide public hunting access opportunities (MFWP 2005a, MFWP 2007a).

Table 1. Mountain Sheep and Shiras Moose Auction Revenues to Montana (MFWP 2008b)

Mountain Sheep License Auction

Year	Bid Amount
1986	$79,000.00
1987	$109,000.00
1988	$93,000.00
1989	$74,000.00
1990	$61,000.00
1991	$80,000.00
1992	$88,000.00
1993	$205,000.00
1994	$310,000.00
1995	$281,000.00
1996	$220,000.00
1997	$238,000.00
1998	$300,000.00
1999	$130,000.00
2000	$95,000.00
2001	$100,000.00
2002	$90,000.00
2003	$132,500.00
2004	$160,000.00
2005	$160,000.00
2006	$115,000.00

Total	$3,120,500.00

Shiras Moose License Auction

Year	Bid Amount
1988	$7,250.00
1989	$13,000.00
1990	$10,000.00
1991	$4,000.00
1992	$9,000.00
1993	$13,000.00
1994	$9,000.00
1995	$14,000.00
1996	$13,500.00
1997	$17,000.00
1998	$14,000.00
1999	$10,000.00
2000	$11,000.00
2001	$13,500.00
2002	$20,000.00
2003	$19,000.00
2004	$17,250.00
2005	$15,000.00
2006	$13,000.00

Total	$242,500.00

Montana Fish, Wildlife and Parks Funding Sources

Federal Aid in Wildlife Restoration Act

Between 1910 and 1920, the estimated number of hunters in the United States doubled from 3 million to over 6 million, in large part due to the victory in World War I and the economic boom that followed (Harmon 1987). With increased hunter numbers came increased pressure on wildlife resources, and it was not long before resource managers realized that serious problems lay ahead if human population growth and urban expansion were not managed. John B. Burnham was one of the first to suggest that the existing state and federal refuge system, enacted by President Benjamin Harrison in 1892, and later expanded by President Theodore Roosevelt, could serve sportsmen as well as the wildlife the refuges were designed to protect. The issue, however, was how to raise the needed funds to create hunting grounds within the refuge system, while simultaneously expanding the system. The answer came from George A. Lawyer, chief United States Game Warden, who suggested a hunting stamp that each waterfowl hunter would be required to purchase in addition to their standard license. Burnham soon enlisted members of the Bureau of Biological Survey, the U.S. Forest Service, as well as Aldo Leopold, to help in the cause. Finally in 1929, the Migratory Bird Conservation Act was signed into law; however the provisions for the hunting stamp and its funding for shooting grounds were removed (Harmon 1987).

With the prospect of a hunting stamp quickly losing ground, hunter-conservationists, Jay Norwood "Ding" Darling, and Carl Shoemaker lent their abilities to the cause (Harmon 1987). Darling, a nationally syndicated cartoonist and two time recipient of the Pulitzer Prize for editorial cartooning eventually would become the founder of the

Cooperative Wildlife Research Unit Program providing cooperation between State and Federal Agencies and universities to facilitate wildlife education (Bissonette et. al. 2000). Shoemaker, who was once head of the Oregon Fish and Game Commission, with the help of Darling, established the National Wildlife Federation in 1936 at the first annual North American Wildlife Conference (Harmon 1987). A year later at the second annual meeting in St. Louis, Missouri, the organization began to formulate what would become the Pittman-Robertson Program. Once the groundwork was laid, Shoemaker gained the endorsement of state wildlife agencies, conservation groups, and the Bureau of Biological Survey before heading to New York City to meet with leaders from the firearms industry. In attendances at this meeting were representatives from DuPont, the Federal Cartridge Company, and the Remington Arms Company, all of whom supported the creation of a manufacturers' excise tax on firearms and ammunition to support wildlife conservation efforts (Harmon 1987).

The next step for Shoemaker was to gain support from the legislature. This was accomplished by first enlisting the help of Senator Charles L. McNay of Oregon, followed by Senator Key Pittman from Nevada, and finally Congressman A. Willis Robertson from Virginia. On June 20, 1937 the Federal Aid in Wildlife Restoration Act was brought before the Senate, but not before Robertson would add the provision that ensured its passage (Harmon 1987):

"…no money apportioned under this Act to any State shall be expended therein until its legislature,…shall have assented to the provisions of this Act and shall have passed laws for the conservation of wildlife which shall include a prohibition against the diversion of license fees paid by hunters for any other purpose than the administration of said State fish and game department." (USFWS 2000. Public Law. 106-580, pp. 53*)*

Within 12 months of its enactment, 43 of 48 states had signed on, with Montana doing so in 1941. In 1938, it was announced at the 32nd Annual International Association of Game, Fish and Conservation Commissioners Conference that three uses of funds were allowed: 1) for the acquisition of lands for wildlife rehabilitation, 2) for the development of suitable habitats, and 3) for projects that attempted to solve issues related to rehabilitation (Harmon 1987).

Throughout the program's early years Congress refused to appropriate all of the collected funds, including appropriating only $2 million of the $3 million that was collected in 1938. This trend would continue until 1951 when Congress conceded to allowing permanent and indefinite appropriations. This was not, however, the end of the story, because nearly 20 years had passed since the Program's introduction and Congress had never released the impounded funds. In 1954, Congressman Lee Metcalf of Montana and others introduced bills to release these funds, and in 1956 a total of $13 million was released (Harmon 1987).

The program was initiated with an 11 percent manufacturers' excise tax on sporting rifles, shotguns and ammunition in 1937 and has been modified only slightly since. In 1970, the Dingman-Hart Bill, a 10 percent handgun tax was signed into law by President

Nixon, with an 11% tax on archery equipment being added in 1972. Sportsmen groups and conservationists, alike, realized that with increased sportsmen in the field there existed an increased threat of accidents, thus up to one-half of the funds from handguns and archery equipment were legally designated for hunter education and safety, with the remainder being available for restoration projects. With increased funding for wildlife restoration projects came increased responsibility at the state level to ensure that funds continued to be available. First, only states within the contiguous United States, and the commonwealths of Puerto Rico, northern Mariana Islands, Guam, Virgin Islands, and America Samoa were eligible for funding (the Commonwealths were not qualified for hunter education funding). Second, as mentioned above, if states did not enact legislation prohibiting the use of general license fees for non-wildlife related projects they did not qualify for funding. Third, if lands were purchased or structures build, they must be maintained and remain in their original intended wildlife related usage. Fourth, any funding used for non-wildlife related purposes would need to be immediately repaid by the state, or the state would become ineligible for future funding. Fifth, any loss of control of funding or assets acquired with general license fees would be considered a diversion of those fees and the state would lose eligibility. Finally, states who received Pittman-Robertson funding must maintain accurate and up-to-date records regarding all expenditures and have their records available for audit. Further, there exist over thirty environmental compliances that must be met in order for projects to be accepted (Harmon 1987).

Pittman-Robertson funding is allocated via two methods through the U.S. Fish and Wildlife Service's Division of Federal Aid, and both must be approved by the Secretary

of the Interior. The first is that the Fish and Wildlife Service may retain up to 8 percent of total funding for administrative purposes, and second is through grant applications by state wildlife agencies. The program itself is on a reimbursement basis, with states applying for and receiving reimbursement for funding upon the completion of projects. Only 75 percent of the total cost is covered through the program, with the states being responsible for the remaining 25 percent. The allocation process begins with the commonwealth of Puerto Rico receiving one-half of one percent of the wildlife restoration tax, and the other four Commonwealths receiving one-sixth of one percent. The remainder of the tax is split between states based on the total area of each state, and the total number of paid hunter licenses within that state, with no state receiving more than five percent, and no less than one-half of one percent. Hunter education and safety money is split between states based on the total population of each state, with no state receiving more than three percent, or less than one percent. Further, if funds are not used within two years of their allocation they are returned to the Fish and Wildlife Service and applied to the Migratory Bird Conservation Act fund (Harmon 1987).

With this funding, Montana developed three wildlife management goals: 1) the development and sustainability of game populations that were consistent with existing habitat and other anthropogenic land uses, 2) the maintenance of a maximum surplus of game species and, 3) the provision of maximum recreational opportunities for sportsmen. Further the state began to hire scientifically trained biologists to manage its wildlife resource, purchase lands specifically for wildlife habitat, and established hunting districts to better monitor both wildlife and hunter populations (Harmon 1987).

Montana Variably Priced License and Permits

Beginning in 1901, the Montana legislature wrote into law a provision that required nonresident hunters to purchase a $25 license for hunting big game and a $15 license for hunting game birds. In 1905, the first resident hunting and fishing licenses appeared at a cost of one-dollar, with over 30,000 resident licenses being sold that year. These funds would begin a tradition of hunter-sponsored and funded conservation efforts that continue to this day (Books 2000). Because nearly 1 in 4 Montanans hunt, resident and non-resident hunter licenses and permits play a critical role in the funding of conservation efforts throughout the state (Heberlein 1991; Lewis et al. 2004). Hunting licenses and permits are available to both Montana residents and non-residents, and are priced according to the species hunted and residency status. To qualify as a resident hunter, one must have lived consecutively in Montana for at least 180 days prior to purchasing a license, must have registered their vehicle with the state, must have filed a Montana income tax return, and must not apply or possess resident hunting or fishing licenses from another state. Further, upon gaining residency status, the license holder must continue to reside within the state of Montana for at least 120 days per year (MFWP 2007c).

There are several prerequisites to be eligible to hunt in Montana. First, each year hunters must first obtain a conservation license and provide the licensing agent their social security number in order to track potential license suspensions. Beginning in 2001, Montana Fish, Wildlife and Parks began the implementation of the Automated Licensing System for distribution of licenses and permits. The Automated License System allows Montana Fish,

Wildlife and Parks to easily identify license holders and participation numbers and allows for a lifetime permit identification number to be issued for each hunter (MFWP 2007c).

Several different types of licenses are available to resident and non-resident hunters once the conservation license has been purchased. General licenses include Deer A Licenses that allow the harvest of one deer during the general season, and Deer B licenses, allowing the harvest of one deer during a specific time frame, of certain species and sex, and within a pre-determined hunting district. A General Elk license allows the harvest of one elk, while the Elk A7 license allows the harvest of an antlerless elk during a specific time and hunting district, and an Elk A9 license (resident), B12 (non-resident) allows the harvest of a second antlerless elk. Special licenses and permits also exist including a Landowner Preference License allowing both resident and non-resident landowners to qualify for preference in the drawing for deer, elk and antelope licenses. Special licenses are also available for hunters with disabilities, youth hunters, veterans, current members of the armed forces and non-resident children of residents (MFWP 2007c).

Due to the popularity of many game species licenses within the state, a bonus point system was established to allow those who fail to obtain a permit in one year a better chance the following year. The program works by charging resident hunters ($2) and non-resident hunters ($20) each year to accumulate one bonus point for each unsuccessful year. These points are then transferred the following year into an extra entry in the license lottery for the game species selected. All hunters are also eligible to purchase an unlimited number of $5 Supertags for deer, elk, bighorn sheep, moose, and mountain lion. Each entry is placed into a lottery and the winners are allowed to hunt one species of their choice in any hunting district

in the state. The proceeds from this lottery are used to increase hunter access opportunities, as well as regulation enforcement efforts (MFWP 2007c).

LITERATURE REVIEW

This study differed from previous studies in its temporal scale, its spatial scale, its methodology and its data sources. The temporal scale of this study began in 1980 and continued to 2006, unlike previous studies that typically focused on a single year or season. The spatial scale differed in that this study was based on southwestern Montana, while other studies have traditionally focused on entire states or the aggregation of several states. The methodology differed in its inclusion of the IMPLAN input-output model, and data sources included hunter participation and harvest rates for comparison purposes which was not seen in previous studies.

While public perception of wildlife valuation has changed from utilitarian to protectionist in recent decades (Manfredo et al. 2003), the economic importance of outdoor recreation and tourism as a whole has increased significantly (Lovegrove and Rohdy 1972; Bergstrom et al 1990; English and Bergstrom 1994; Grado et al. 2001; Cooper et al. 2002). This can also be said for single recreational activities such as hunting (Johnson and Moore 1993), with Jackson et. al. (2005) suggesting that a need exists for economic models of hunter impacts that are temporally and spatially replicable. Increased attention to these activities is a result of increasing local, state and federal concern for rural economic development, conversion of traditional agricultural lands to non-productive land use schemes, decreases to resource management agencies budgets (Bergstrom et al. 1990), and hunter attrition (Burger et al. 1999). Grado et al. (2001) found that waterfowl hunting in Louisiana could be used to determine the value of waterfowl in the state, as well as enhance support for land acquisitions and develop conservation programs and resource management

programs. Further, for resource management agencies to effectively allocate manpower and funding, it is essential that they have a clear understanding of how these resources benefit the agency, its objectives, and the general public (Martin and Gum 1978; Verburg et al. 2004; Wallace et al. 1991).

Consumptive and non-consumptive uses of wildlife and their habitat benefit mankind aesthetically, culturally, ecologically and economically (Balmford et al. 2002). Economically, wildlife can be viewed as having value based on its economic impacts and its economic and option values. Economic impacts are the direct spending, including trip related and equipment expenditures, as well as expenditures by resource management agencies, that have an effect on a local or regional economies, as well as those from secondary (multiplier) effects that reverberate through an economy (Ransom 2001; Pickton and Sikorowski 2004). Economic value, relates to the value received from a resource after considering the expenditures to participate in an activity (Bockstael et al. 2000).

Wildlife Valuation Techniques

Economic Importance Methods

The field of ecological economics was developed out of a need to bridge traditional economics and the natural sciences (Gowdy 2000). Wildlife, according to Fried et al. (1995) is traditionally considered to be a non-market good because it is not commonly priced or traded in the open market. Erickson (2000) however has shown that wildlife and their associated habitat can be assigned a value through calculating how much is spent on their use, or how much a recreationist is willing to pay for the resource. Once wildlife have

been assigned values, those values can be converted into market prices, and studied using a standard cost-benefit analysis. The traditional methods that exist to research the economic impacts of tourism and outdoor recreation (hunting) on local economies include: input-output modeling and cost-benefit analysis (Zhou et al 1997; Jackson et al 2005).

Input-Output Modeling

Input-output models have been used widely (e.g. the economic impact of leafy spurge (*Euphorbia esula*) on wildlands in Wyoming, South Dakota and Montana (Wallace 1991; Wallace et al. 1992; Bangsund et al. 1993), the economic impacts of elderly migration in Florida (Sastry 1992), and the recreation and tourism impacts in North Dakota (Coon et al. 1990)). The objective of an input-output model is to measure multipliers within an economy (Wallace et al. 1991). Bergstrom et al. (1990) defined a multiplier as the ratio of the direct, indirect and induced effects on an economy to the direct effects, and can be used as an effective method by which to assess the effects that recreational spending has on other sectors of an economy (Zhou et al. 1997). Direct effects are defined, for example, as the income and employment generated by consumer purchases at local businesses. Indirect effects occur, for example, when businesses use their revenues to purchase goods and services, and induced effects result, for example, when households (employees) purchase consumer goods and services with their wages (Johnson and Moore 1993; Koontz and Loomis 2005; Eiswerth et al. 2005).

Input-output models first developed by Isard (1951) and Leontief (1953) have continually been updated and improved upon with varying degrees of success according to Richardson (1985). These models are capable of calculating the total economic impact of an

industry by combining the direct, indirect and induced effects that industry has on local economies. In order for an input-output model to be implemented, the final demands, or expenditures of consumers, must be known. From this information the model is used to calculate the employment, output, and income generated from multiple sectors of the economy based on final demands (Eiswerth et al. 2005; Koontz and Loomis 2005). Several regional input-output models exist today that reduce both the time and cost of economic impact analysis, including the Impact Analyses and Planning (IMPLAN) model, the REMI model, and the RIMS II model (Rickman and Schwer 1995).

The IMPLAN Model: The IMPLAN model has three primary functions: the retrieval of data, model development, and impact analysis (Lindall 2006). The model was originally designed by the U.S. Department of Agriculture and Forest Service in conjunction with the Federal Emergency Management Agency and the University of Minnesota (Grado et al. 2001). IMPLAN consists of a national county-level database of 10 industrial groups and 508 distinct industrial sectors which correspond to Standard Industrial Categories or National Accounting Industrial Codes, and are based on the primary commodity or services produced. Industrial sector data includes inputs and outputs from other sectors, value added, employment, wages and business taxes paid, imports and exports, final demand by households and government, capital investments, business inventories, marketing margins, and inflation factors (Mulkey and Hodges 2000 p.5). These data are provided by the U.S. Bureau of Economic Analysis, the U.S. Department of Commerce, and other federal and state agencies (Johnson and Moore 1993; Mulkey and Hodges 2000; Grado et al. 2001). One of the primary advantages of IMPLAN is that it allows the user to decide between a number

of varying multiplier options including: TYPE I, which includes direct and indirect effects, Type II that involves direct, indirect and induced effects, and Type SAM (Social Account Matrices) which includes all three effects, as well as the effects of taxes and savings (Mulkey and Hodges 2000; Lindall 2006). It should be noted, however, that IMPLAN databases are static, and thus must be updated on a regular basis, if not annually (Ransom 2001; Lindall 2006).

Numerous studies have been conducted that specifically implement the IMPLAN model to determine the economic impacts of outdoor recreation. Ransom (2001) used the model to show that anglers spent an average range between $545 and $1,100 per salmon on the Sacramento River of California, between $22 and $46 per ocean commercial salmon in the Pacific Ocean, and between $69 and $112 per ocean recreational salmon in the Pacific Ocean (all values in 1998 U.S. dollars). Caudill and Henderson (2005) used IMPLAN to estimate expenditure impacts to local communities within 30 miles of wildlife refuges in the United States, Southwick Associates Inc. (2006) used the model to estimate the impact of bicycle-based (~$132 billion), camp-based (~$273 billion), paddle-based (~$36 billion), snow-based (~$66 billion), trail-based recreation (~$83 billion), as well as fishing (~$125 billion), hunting (~$75 billion), and wildlife viewing (~$107 billion) in the United States. Moisey and Yuan (1991) used it to show that non-residents engaging in wildland-related recreation contributed substantially to Montana's economy, and Silberman (2002) used the model to estimate the economic importance of fishing and hunting on a county basis for the state of Arizona. Finally, Taylor (2004) used hunter expenditures to conclude that hunters spent over $230 million dollars in 2001, with a total (direct, indirect, and induced) economic

impact of nearly $350 million (2003 U.S. dollars) and accounting for nearly 1 percent of all economic activity within Montana.

Gross Expenditure Model

Another method by which to estimate the economic benefits of recreational activities is through the General Expenditure Model, more commonly known as the trip-related expenditure model (Bart et al. 1979; Johnson and Moore 1993). Trip-related expenditures include travel costs, food and accommodations, clothing, equipment, etc. (Grado et al. 2001). Eiswerth et al. (2005) have shown that economists often use this approach to show changes in consumer behavior and spending patterns at the local and regional levels. Problems, however, do exist with this method, including how to separate expenditures outside the study area, how to accommodate for multiple-destination excursions, as well as how to determine if expenditures represent import substitution, or the use of one resource in place of another (Johnson and Moore 1993). Further, Sorg and Loomis (1985) noted that gross expenditure models only calculate cost, and cannot measure consumer surplus because, for example, gross expenditures from hunting would be replaced by other activities if hunting was not available within a given region.

Pickton and Sikorowski (2004) used trip-related expenditures as part of their study of the economic impacts of hunting, fishing, and wildlife watching in Colorado. They concluded that big game hunters' spent over $250 million in pursuit of game in 2002, with a total of $845 million in expenditures for all wildlife-related recreation. Further, they found that non-resident big game hunters spent on an average, $300 per day, for a total non-resident contribution of $332 million, or 42 percent of all hunter expenditures. Lovegrove and Rohdy

(1972) used a gross expenditure model to estimate the total economic impact of fishing and hunting expenditures in Grand County, Colorado. They found that hunters spent $368,000 in 1968, with a total economic impact to the county of $702,000. Wallace et al. (1991) concluded in their study of hunter expenditures in the state of Alabama that hunting was an economically important industry to the state, with over $500 million (1991 U.S. dollars) spent during the 1986-1987 hunting season alone. They further concluded that the hunting industry was able to re-distribute income from more developed regions of the state to less developed regions where hunting traditionally occurred, and thus should be evaluated as a method to stimulate rural economic development plans.

Economic Value Methods

Consumer surplus, as mentioned above, is the value that recreationists receive above and beyond what they pay to participate in an activity (Whitehead 1993), and according to Ransom (2001), can be calculated based on the formula: Willingness-to-Pay = Expenditures + Consumer Surplus. Cooper et al. (2002) suggest that wildlife resource managers are concerned with consumers' willingness-to-pay because it gives them insight into what management techniques will be most beneficial to recreationists. Several methods exist to estimate consumer surplus, most importantly the travel cost method and the contingent valuation method (Sorg and Loomis 1985).

Travel Cost Method

The most popular method to estimate consumer surplus is through the Hotelling-Clawson-Knetsch method (Cocheba and Langford 1978), or as it is more commonly known,

the Travel Cost Method. The Travel Cost Method was first developed by Hotelling (1947) when he measured the cost travelers were willing to pay to travel to national parks in the United States. This method was later popularized with a formal methodology by Clawson and Knetsch (Kerkvliet et al. 2002). The method creates a demand curve based on the distance traveled (a measure of price) and the number of trips taken (a measure of quantity). This allows for an estimation of the amount the participant would be willing to pay in addition to their current expenditures for continued access to the activity (Brooks 1988; Loomis 2000).

Numerous studies have used the Travel Cost Method to estimate the value of big game species within Montana. Brooks (1988) used a modified Travel Cost Method to estimate the net economic value of deer hunting in 1985, and concluded that statewide, deer hunters spent over $63 million dollars. Resident deer hunters spent on average $55 per trip, or $31 per day, and non-residents $542 per trip, or $86 per day. The average expenditure for all deer hunters in the state of Montana was $146 per trip, or $73 per day (all values in 1984 U.S. dollars).

Duffield (1988) conducted a similar study to estimate the net economic value of elk hunting in Montana for 1985. He concluded that the estimated expenditure of elk hunters for 1985 was $58 million, with resident hunters spending on average $81, and non-residents $1399, for an average per trip expenditure of $285. He further estimated that the state average value of elk hunting was $185 per trip, or $66 per day, with an annual economic value of $38 million. This was estimated by multiplying the value per day by the total number of hunter days (all values in 1984 U.S. dollars).

Finally, Loomis and Cooper (1988) estimated the net economic value of antelope hunting in Montana in 1985, using the Travel Cost Method, to be $6 million, with a state average of $143 per trip, or $62 per day. The authors also found that the estimated net economic value of antelope hunting for Montana Fish, Wildlife and Parks Region 3 was $133 per permit. Further, they were able to conclude that the average expenditure per resident antelope hunter per trip was $58 and $434 for non-residents. This averaged $115 per trip or, $50 per day, with $4.3 million spent statewide (all values in 1984 U.S. dollars).

Contingent Valuation Method

Another method to estimate recreationists' consumer surplus is the contingent valuation method. The contingent valuation method has been used effectively since the 1960s, and has also been recommended by the U.S. federal government for performing cost-benefit analysis (Loomis 2000). The contingent valuation method is a survey-based method (mail, e-mail, telephone, in-person) in which respondents are asked questions regarding their recreation of choice. For example, questions might be: "Traditionally how much could an activity increase in price before you would move to an alternative activity?" (Bart et al. 1979; Fried et al. 1995; Carson 2000; Loomis 2006). The model, however, is based on having a contingent market in place (Whitehead 1993). That measurement bias exists from respondents who are unwilling or unable to effectively answer the survey (Stevens et al. 1991). Further, Balkan and Khan (1988) urge that while the contingent valuation method may allow for the estimation of existence values for activities such as hunting, a more robust and accurate method is needed that does not rely upon hypothetical situations. Such a method, the Direct Consumer Surplus method, where respondents were asked directly to

estimate their consumer surplus for a given activity, was used by Cocheba and Langford (1978).

Loomis (2006) used the contingent valuation method to estimate net consumer surplus for anglers on the South Fork of the Snake River, in Wyoming. Survey respondents were asked if they would be willing to pay a value between $2 and $950 more than they paid per trip in 2006, if catch rates increased by 100 percent, or the size of fish caught increased by 25 percent. The study found that the 2006 value per trip to the South Fork Snake River was $14.7 million, but that an increase of 100 percent in catch rates would increase the value to $23.4 million, while an increase of 25 percent in fish size would result in a value of $23.3 million. For the Henry's Fork of the Snake River, Idaho, the 2006 value was $15.1 million, and a 100 percent increase in catch would result in $25.6 million, with no additional increase in value with an increase in fish size. Adams et al. (1989) implemented the contingent valuation method to elicit feedback from hunters for a proposed ring-necked pheasant stocking program in Oregon through an increase in user fees. The authors were able to show that hunters were willing to pay an increased user fee to support such a program.

National Survey of Fishing, Hunting and Wildlife-Associated Recreation

Prior to the mid-1950s, limited economic impact analysis was conducted in about a quarter of all states, but this data and the methodology developed to obtain it were not consistent, precluding agencies from aggregating data (McDowell and Mock 2004). Beginning in the 1950's, state wildlife agencies were in need of economic data to support management decisions and to facilitate relationships with wildlife users and non-users. In

1953, the International Association of Game, Fish and Conservation Commissioners passed a resolution requesting a survey of hunters and anglers to gage their economic impact at the national level, thus creating the U.S. Fish and Wildlife Service National Survey of Fishing, Hunting and Wildlife-Associated Recreation, one of the primary methods of estimating the economic importance of outdoor recreation (McDowell and Mock 2004).

Since 1955, the survey has been conducted every five years by the U.S. Fish and Wildlife Services, with the U.S. Bureau of the Census undertaking the actual survey (with the exception of 1955 and 1975)(Fisher and Grambsch 1989). The survey was changed from a primarily in-person and mail-in questionnaire project prior to 1991, to a primarily telephone based survey, thereafter. This change, while saving money and increasing reliability, no longer allowed for the comparison of prior surveys to those conducted after 1991 (McDowell and Mock 2004).

The survey is conducted in two phases, the first of which is an initial screening to determine the likelihood of recreational participants living within contacted households, and the second consisting of follow-up interviews to collect detailed survey related data. Within Montana, in 1996, 727 households were initially screened, 448 of which were followed up to collect detailed data. Only those participants 16 years of age or older were included in the survey, and each participant was assigned into one of six participation categories based on their level of activity (active, avid, average, infrequent, inactive, nonparticipant). Those participants who were deemed “active” or “avid”, and who also responded that they were likely to fish or hunt in 1996 were retained in the survey. Of the initial 448 follow-up participants, 363 (89 percent) were designated for detailed sportsmen interviews (U.S.

Department of the Interior, Fish and Wildlife Service 1996). The 2001 survey followed the same procedures as the 1996 survey, resulting in 232 persons that were selected for detailed interviews within the state, of which 212 provided detailed data (U.S. Department of the Interior, Fish and Wildlife Service 2001).

Numerous studies have used the U.S. Fish and Wildlife Service National Survey of Fishing, Hunting and Wildlife-Associated Recreation to estimate the impacts of outdoor recreation including, Burger et als. (1999) study of northern bobwhite quail hunting in the southeastern United States, and Whittington et als. (2005) research on the economic impact of hunting and fishing on Mississippi counties. Duda et. al. (1995) used the survey to estimate hunting and fishing participation in the United States. Jagnow et al. (2006) studied the decline in hunter access to private property, and Mangum and Shaw (1984) interpreted data from the survey to evaluate alternative methods for funding conservation efforts. Caudill and Henderson (2005) profiled wildlife refuge visitors' expenditures in local communities, while Southwick et. al. (2005) described the importance of hunting and trapping to the well-being of wildlife and the general public of North America. Southwick Associates, Inc. (2006) reported on the economic contribution of outdoor recreation, and finally, Flather et al. (1999) referenced the Nation Survey as "the most comprehensive tool available to research the long-term trends of hunter participation in the country".

DATA SOURCES AND METHODOLOGY

Since the objective of this study was to chronicle the historical and economic impact of hunting in southwestern Montana over time, multiple methods of data acquisition and analysis were necessary. By implementing the archival methodology of the historian and the empirical research of the geographer, a chronological appraisal of hunter impacts was cataloged.

Primary and Secondary Economic Model Data and Sources

This study provides an estimate of the primary and secondary economic impacts of hunting between 1991 and 2006 within Montana Fish, Wildlife and Parks Region 3. Primary economic impacts include all direct expenditures, while secondary economic impacts include indirect and induced expenditures. The model also addressed the contributions of Montana Fish, Wildlife and Parks that directly support wildlife conservation efforts within Region 3 between 1980 and 2006, and is based on a similar study in Colorado by Pickton and Sikorowski (2004).

Primary expenditures were examined through the 1991, 1996, 2001, and 2006 *U.S. National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* produced by the U.S. Fish and Wildlife Service and the U.S. Bureau of the Census, as well as through general license and permit fee expenditures from Montana Fish, Wildlife and Parks.

Secondary economic effects, including indirect and induced, within Region 3 were estimated using the IMPLAN input-output model developed by the U.S. Forest Service (Minnesota, IMPLAN Group, Inc., 2008). Direct and secondary effects were then combined

to produce the total economic impact of hunting in Montana Fish, Wildlife and Parks Region 3.

Montana Department of Fish, Wildlife and Parks Expenditure Data

Montana Fish, Wildlife and Parks expenditures were researched through year-end fiscal statements held on microfiche at the Montana Fish, Wildlife and Parks headquarters in Helena, Montana. Expenditures were cataloged in Microsoft Excel for each year between 1980 and 1999 based on their relevance to hunting as determined by the author within the study area as discussed below. Beginning in 2000, all financial data within Montana Fish, Wildlife and Parks were transferred from microfiche to digital format. Data from 2000 to 2006 were obtained through Caryn Amacher (personal communication 2007), in Microsoft Excel format.

Montana Fish, Wildlife and Parks is comprised of eight administrative divisions, each assigned a specific identifier; Administration (1000), Field Services (2000), Fisheries (3000), Enforcement (4000), Wildlife (5000), Parks (6000), Capital (7000), and Education and Safety (8000). Montana Fish, Wildlife and Parks further divides the state of Montana into seven wildlife regions which allows for the identification of expenditures within a given region based on the combination of identifiers. Wildlife expenditures within Region 3 for example are assigned a project number beginning with 53, 5 for the Wildlife Division and 3 for Region 3. Individual projects are further identified based on successive numbers after the Division and Region identifiers, such as 5322 for Wildlife Survey and Inventories, or 5330 for Mule Deer Research in the Bridger Mountain Range. Project identifiers were not consistent throughout the study period due to changes in project accounting, and were thus

aggregated by hand by common project names such as Canyon Ferry Wildlife Management Area, which included project number 5304 Canyon Ferry Wildlife Management Area General, and 53661 Canyon Ferry Wildlife Management Area Operations and Maintenance. Further, not all projects were identified through the 53 prefix, but rather through the location of the project as submitted by the project coordinator. This discrepancy was because some projects were not identified within a specific region even though they were conducted within Region 3. An example of this is the Montana State University Wildlife Lab which has a project identifier of 5891. These projects were researched by reviewing all regional identifiers above 7, indicting no regional affiliation, and selecting only those that occurred within Montana Fish, Wildlife and Parks Region 3.

Project Funding

According to the 2006 Annual Report (MFWP 2006), while general license and permit fees and Pittman-Robertson funds provide the majority (63 percent) of available funding for Montana Fish, Wildlife and Parks, other forms do exist, including portions of lodging, coal severance tax, fuel taxes, light vehicle registration fees, and non-resident state park fees. Federal funding also is provided through the Land and Water Conservation Fund, and the State Wildlife Grant Program. Thus, Montana Fish, Wildlife and Parks created unique account numbers to identify the funding source for each project. General license and permit fees came from account number 02409, while Pittman-Robertson funding came from account number 03703. Each project where Pittman-Robertson and general license and permit expenditures occurred that were directly related to wildlife operations based on project title was entered into a Microsoft Excel worksheet based on Regional, Divisional, and

Project identifiers as well as its funding sources. Yearly data were then aggregated for each project to provide total Pittman-Robertson and general license and permit expenditures for the study period.

Hunter Participation and Harvest Data

Hunter participation and harvest data were provided by Montana Fish, Wildlife and Parks through Jennifer Dykstra (personal communication, 2007). Data were originally stored on microfiche, but were converted to the Adobe Acrobat Document format in 2006/2007 for placement on the Montana Fish, Wildlife and Parks website. Data were aggregated by species-hunted and year-harvested, and were later disaggregated and entered into Microsoft Excel 2007 based on species-hunted, wildlife region, and hunting district for the years 1980-1999. In the year 2000, Montana Fish, Wildlife and Parks hunter participation and harvest data were converted to digital format and were provided through the Montana Fish, Wildlife and Parks website, and disaggregated as mentioned above. It should be noted that hunter participation data from 1996 – 1998 remains in "draft" format (J. Dykstra. personal communication, 2007).

Hunter Participation and Harvest Comparison

Hunter participation and harvest data were obtained through year-end harvest surveys obtained from the MFWP Region 3 headquarters in Bozeman, Montana. Because the majority of hunter participation comes from deer and elk hunters (MFWP 2007a; MFWP 2007b), deer and elk hunter participation and harvest rates were used as a proxy for all hunter expenditures. Further, because of large variations in rates, a value of 50 percent change was

chosen to indicate a substantial change in annual hunter-related expenditures, hunter participation and harvest rates.

The first four hunting districts and projects in the results and discussion chapter were chosen based on the large total amount of Montana Fish, Wildlife and Parks hunter-related expenditures that occurred. Hunting districts and projects, thereafter, were given in consecutive order based on their identification number. Hunting Districts 319 and 341 present a special case where data disaggregation varies from other hunting districts. The two Montana Department of Fish, Wildlife and Parks assets within these districts, the Fleecer Mountain and Mt. Haggin Wildlife Management Area's are split between the two districts. To allow for similar analysis methods to other districts, ArcMap Version 9.2 was used to calculate the acres within each district and Wildlife Management Area compared to their total acreage. Once this was established, the percentage of each Wildlife Management Area within a given district was used to calculate expenditures based on the total expenditure for the site.

Economic Input-Output Analysis

An economic input-output model was used to estimate the total economic impact of hunters within the study area. Because of its proven performance in a previous wildlife study (Taylor 2004), the Impact Analysis and Planning (IMPLAN) model was used (Minnesota, IMPLAN Group, Inc., 2008). Data for this model was collected through the U.S. Department of the Interior's *National Survey of Fishing, Hunting and Wildlife-Associated Recreation* for the years 1991, 1996, 2001, and 2006 in the state of Montana.

Data was categorized by trip-related expenditures (food, lodging, transportation, rental fees, guide fees, access fees etc.), hunting, auxiliary and special equipment expenditures (rifles, ammunition, clothing, camping gear, campers, 4 wheel-drive vehicles, cabins etc.), and other miscellaneous expenditures (magazines and books, membership dues, land leases and ownership, licenses, hunting stamps, tags and permits etc.)

Data Disaggregation

Because the National Survey of Fishing, Hunting and Wildlife-related Recreation (U.S. Department of Interior, 1991, 1996, 2001, 2006) provides data at the state level, it was determined that the most effective method by which to disaggregate this data to Montana Fish, Wildlife and Parks Region 3 was by using deer and elk hunter participation rates within the study area as proxy for all hunter numbers for each year the survey was conducted. Disaggregation of statewide hunter expenditures to Region 3 was conducted by taking the total number of deer and elk hunting participants within the state of Montana for 1991, 1996, 2001, and 2006, and dividing it by the total number of deer and elk hunting participants within Region 3 for the same years. This number could then be used to deflate statewide hunter expenditures to Montana Fish, Wildlife and Parks Region 3 expenditures.

Model Implementation

The first step in creating an economic input-output model with the IMPLAN software package was to define the study area, in this case, Montana Fish, Wildlife and Parks Region 3. Once selected, the software automatically removed any industry that was not present within the study area to increase processing time. Next, the software estimated

imports based on the regional purchase coefficients. Regional purchase coefficients represent the proportion of a good or service that is produced within the study area. Once the regional purchase coefficients were created, IMPLAN removed all imports, leaving only those goods and services produced within the study area. This was followed by the creation of two separate models: the descriptive model, which describes the economic interactions between industries, and the predictive model which sets the multipliers allowing predictions to be made based on economic changes within the study area between industrial sectors (Lindall 2006).

IMPLAN Descriptive Model

The descriptive model was constructed by selecting the specific industrial sectors that were most closely related to the National Survey of Fishing, Hunting and Wildlife-related Recreation (U.S. Department of Interior, 1991, 1996, 2001, 2006) expenditures. Industrial sectors are based on National Accounting Industrial Codes (Table 2). Once industrial sectors were selected, expenditure data from the National Survey of Fishing, Hunting and Wildlife-related Recreation (U.S. Department of Interior, 1991, 1996, 2001, 2006) were entered into the model after they were deflated to constant dollars for the survey year under study, and disaggregated from the statewide values as discussed above (Lindall 2006). To adjust economic data to constant dollars for each study year, the All Urban Consumer Price Index of the U.S. Department of Labor - Bureau of Labor Statistics was used (2006). For each individual year, the December to December All Urban Consumer Price

Table 2. National Survey of Fishing, Hunting and Wildlife-related Recreation Expenditures (NSFHWAR) and National Accounting Industrial Codes (NAIC). (U.S. Department of Interior, 1991, 1996, 2001, 2006; Lindall 2006)

NAIC	Industrial Sector	NSFHWAR Category
395	Ground Passenger Transportation	Transportation
405	Food and Beverage Stores	Groceries
409	Sporting Goods - Hobby - Book	Equipment
409	Sporting Goods - Hobby - Book	Magazines and Books
450	All other Misc. Professional	Misc. Services
481	Food Services and Drink Place	Bar and Restaurant
493	Civic - Social - Professional	Membership Dues
504	Other State and Local Government - Non Education	Licenses
721	Accommodation and Food Services	Lodging

Index percentage was taken and multiplied by each successive year's All Urban Consumer Price Index percentage to establish an overall All Urban Consumer Price Index percentage change. The overall All Urban Consumer Price Index percentage for each individual year was then multiplied by that year's economic data, to arrive at an adjusted value.

IMPLAN Predictive Model

The predictive model is estimated via five sets of multipliers, and corresponds to five measures of economic activity: total industry output, personal income, total income, value added, and employment. Each of the multiplier sets consists of four types of multipliers (as discussed in Chapter 3); Type I, Type II, Type III, Type SAM. The Type SAM multiplier was used for the input-output analysis conducted for this study. Type SAM multipliers are the direct, indirect, and induced effects, that include induced effects such as social security, income tax, savings and commuting, and is suggested as the default by the

software manufacturer (Olson and Lindall 2008). It is the predictive model that allows for the estimation of the direct, indirect, and induced effects of hunters on economies within the study area (Lindall 2006).

Spatial Visualization of Data

The use of geographic information sciences (GIS) was implemented to spatially analyze land acquisitions, hunter-related expenditures, hunter participation rates and harvest rates. Datasets were obtained through Montana Fish, Wildlife and Parks (2008), and the Montana Natural Resource Information System Geographic Clearinghouse (2008). Outputs include maps depicting the spatial distribution of Montana Fish, Wildlife and Parks expenditures based on properties managed by Montana Fish, Wildlife and Parks within Region 3. These managed properties include: Regional Headquarters and Field Offices, Enforcement Field Offices, Wildlife Field Offices, Affiliated Lands/Fisheries, Affiliated Lands/Parks, Affiliated Lands/Wildlife, Brood Ponds, Conservation Easements, Fishing Access Sites, Fishing Access Areas, Fisheries Greenways, Fish Traps, Hatcheries, State Parks, Wildlife Habitat Protection Areas, and Wildlife Management Areas. Also located within Montana Fish, Wildlife and Parks Region 3 are numerous sites where wildlife management and research have taken place. Management and research efforts include mule deer research in the Bridger Mountain Range northeast of Bozeman, and elk research in the Elkhorn Mountains south of Helena. Montana Fish, Wildlife and Parks asset data were obtained through the Montana Fish, Wildlife and Parks Landbook (2007a), provided by James Colegrove (personal communication 2007).

Spatial Distribution of Attributes

To determine spatial and geographic coincidence between Montana Department of Fish, Wildlife and Parks expenditures, hunter participation and harvest rates, a schema was developed for each variable based on its numeric value. This was accomplished by classifying each variable by its hunting district number implementing the natural (jenks) breaks statistical method in ArcMap version 9.2 (ESRI 2007). In this method classes are assigned based on trends in data distribution (Longley et. al. 2005). Four classification classes were established for each variable so that the data could be split into quarters and comparisons could be made among variables.

RESULTS AND DISCUSSION

Comparative graphs illustrate the timing and directional response of inputs and outputs of resources for each hunting district for which expenditures occurred. Within the graphs, breaks in data lines indicate missing data. Graphs can be compared between hunting districts to look for overall regional inputs and outputs over time. All economic values have been adjusted to 2006 dollars.

Expenditure Trends in Montana Fish, Wildlife and Parks within Region 3

Total hunter-related expenditures from general license and permit fees and Pittman-Robertson Funds have seen substantial variation, with a trend towards long-term decline since 1980 (Figure 5) (Appendix A). It has been suggested by Caryn Amacher (personal communication 2007) that this decline may be in part due to the completion of several projects within Region 3 between 2000 and 2002. Total expenditure increases occurred in 1986 (by 37 percent), 1987 (by 25 percent) for a total input of $14 million and an increase of 62 percent, marking the largest funding within Region 3. In 1995, an increase of 111 percent contributed $4.2 million. Between 1987 and 1994, decreases in funding amounted to a total of 67 percent and $1.5 million.

The large overall increases in expenditures in 1982, 1987 and 1995 were largely the result of increases in Pittman-Robertson related expenditures. In 1982, Pittman-Robertson-related expenditures increased over 83 percent compared to a 23 percent increase in general license and permit fees. In 1995 an increase of 185 percent in Pittman-Robertson

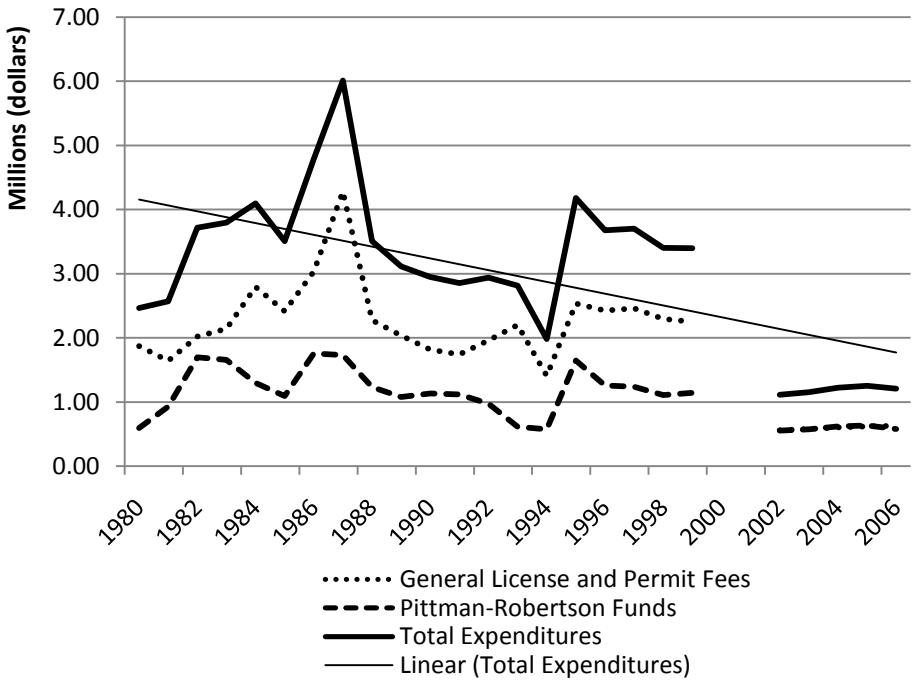

Figure 5. Region 3 Expenditures by Funding Source (2006 dollars) (MFWP 2007c)

funds saw an 80 percent increase in general license and permit fee funds. Further, decreases in total expenditures in 1988 and 1994 witnessed the opposing trend, where changes to general license and permit fee funding were larger (47 and 36 percent, respectively) than those from Pittman-Robertson funding sources (29 and 6 percent, respectively). Differences in overall trends that exist between general license and permit fees and Pittman-Robertson funds are due to the manner in which the later expenditures are allocated to Montana Fish, Wildlife and Parks. Distribution of Pittman-Robertson funds is based on the total population of the state, the overall geographic size of the state, and the number of hunting licenses sold annually, within the state.

Expenditures by Project Category

At the categorical level (Table 3) (Appendix B), wildlife-related research, regulation enforcement, and wildlife–related management expenditures constituted over 67 percent of all hunter-related expenditures within Region 3 between 1980 and 1999. Wildlife-related research, which includes projects conducted through Montana State University, general wildlife surveys and inventories had the highest overall expenditures totaling $18.6 million between 1980 and 1999. At a close second, regulations and law enforcement activities contributed an additional $17.7 million, while wildlife-related management initiatives including access, hunter management, and habitat management saw over $10 million in hunter-related expenditures.

Individual Project Expenditures

Individual project expenditures varied between projects but typically included salaries, personal services, and operating expenses. Salaries included regular pay, sick leave, vacation, holiday, etc. Personal services included employee benefits such as retirement account funding, workers compensation and health insurance. Operating expenses varied the greatest between projects due to the unique needs of individual projects. Examples of operating expenses to perform conservation efforts included: consultant and professional services, supplies and materials, travel expenses, transportation expenses, communication expenses, repair and maintenance expenses, as well as expenses for education and training.

Table 3. Wildlife-related Research, Enforcement and Wildlife-management Expenditures of Hunter-related Funds

Project Category	Wildlife-related Research	Wildlife-related Enforcement	Wildlife-related Management	Total Hunter-Related Expenditures
1980	$0	$960,238	$565,785	$2,468,920
1981	$100,291	$841,913	$548,968	$2,571,713
1982	$1,143,722	$938,740	$663,333	$3,720,644
1983	$1,275,546	$957,167	$699,607	$3,798,302
1984	$1,271,807	$985,468	$714,175	$4,095,621
1985	$1,623,753	$680,281	$99,398	$3,508,004
1986	$2,159,810	$753,419	$438,258	$4,792,250
1987	$1,470,656	$2,233,629	$908,870	$6,011,183
1988	$489,660	$618,471	$676,937	$3,509,703
1989	$728,952	$671,027	$643,538	$3,113,927
1990	$786,080	$631,814	$657,210	$2,949,324
1991	$775,313	$654,935	$669,356	$2,857,999
1992	$645,592	$639,943	$629,527	$2,938,392
1993	$585,085	$610,713	$595,780	$2,817,462
1994	$295,150	$607,360	$143,946	$1,984,337
1995	$1,245,064	$1,014,524	$285,673	$4,181,635
1996	$1,003,885	$1,022,732	$313,243	$3,680,116
1997	$1,031,431	$1,028,891	$331,515	$3,702,359
1998	$1,006,086	$994,067	$315,183	$3,406,029
1999	$974,593	$918,767	$367,608	$3,397,712
Total	$18,612,475	$17,764,098	$10,267,912	$69,505,633

Expenditures by Hunting District

Between 1980 and 2006, Montana Fish, Wildlife and Parks facilitated several research and land acquisition projects within Region 3 that were funded primarily through hunter-related expenditures (Appendix C) (Figure 6). Of the 15 hunting districts where

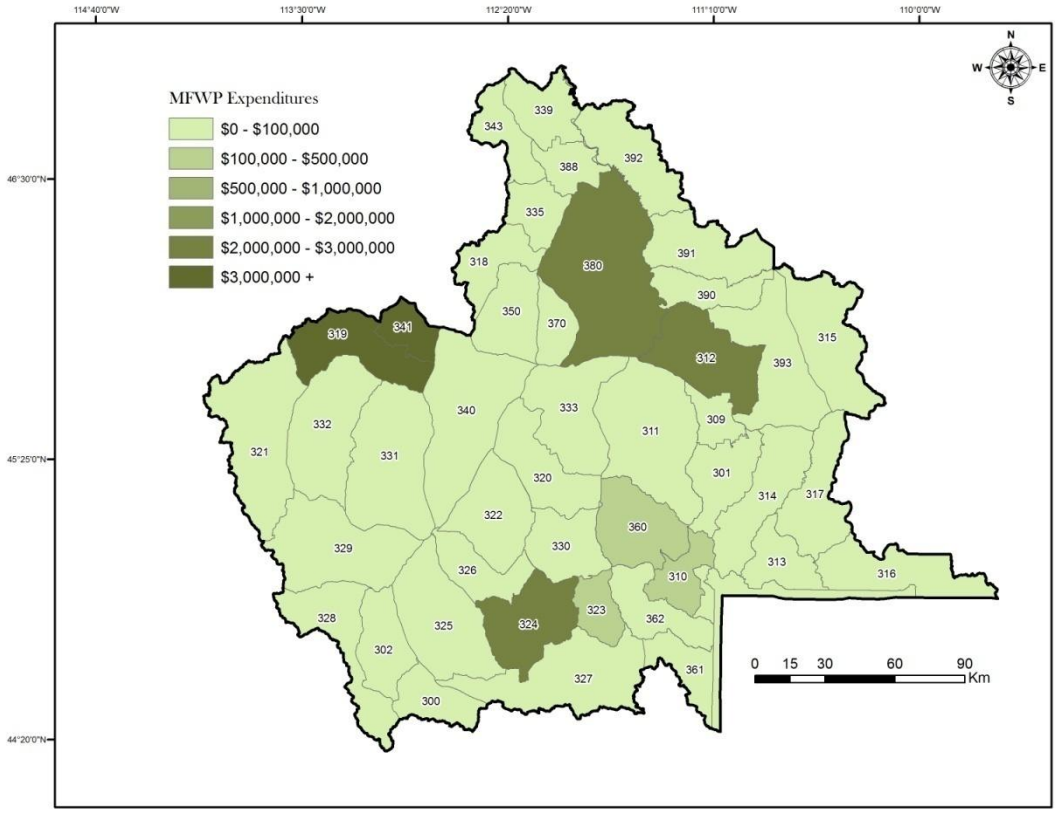

Figure 6. MFWP Region 3 Expenditures by Hunting District (MFWP 2008b)

expenditures occurred, 6 hunting districts received over $1 million between 1980 and 1999, 2 received between $100,000 and $1 million, while 7 received below $100,000.

Hunting District 319-341

Hunting District 319 includes both the Fleecer Mountain Wildlife Management Area (Figure 7), and the Mount Haggin Wildlife Management Area (Figure 8) saw substantial increases in hunter-related expenditures in 1985 (52 percent), 1986 (121 percent), 1994 (78 percent), 1995 (56 percent) and 1999 (104 percent)(Figure 9). These expenditures

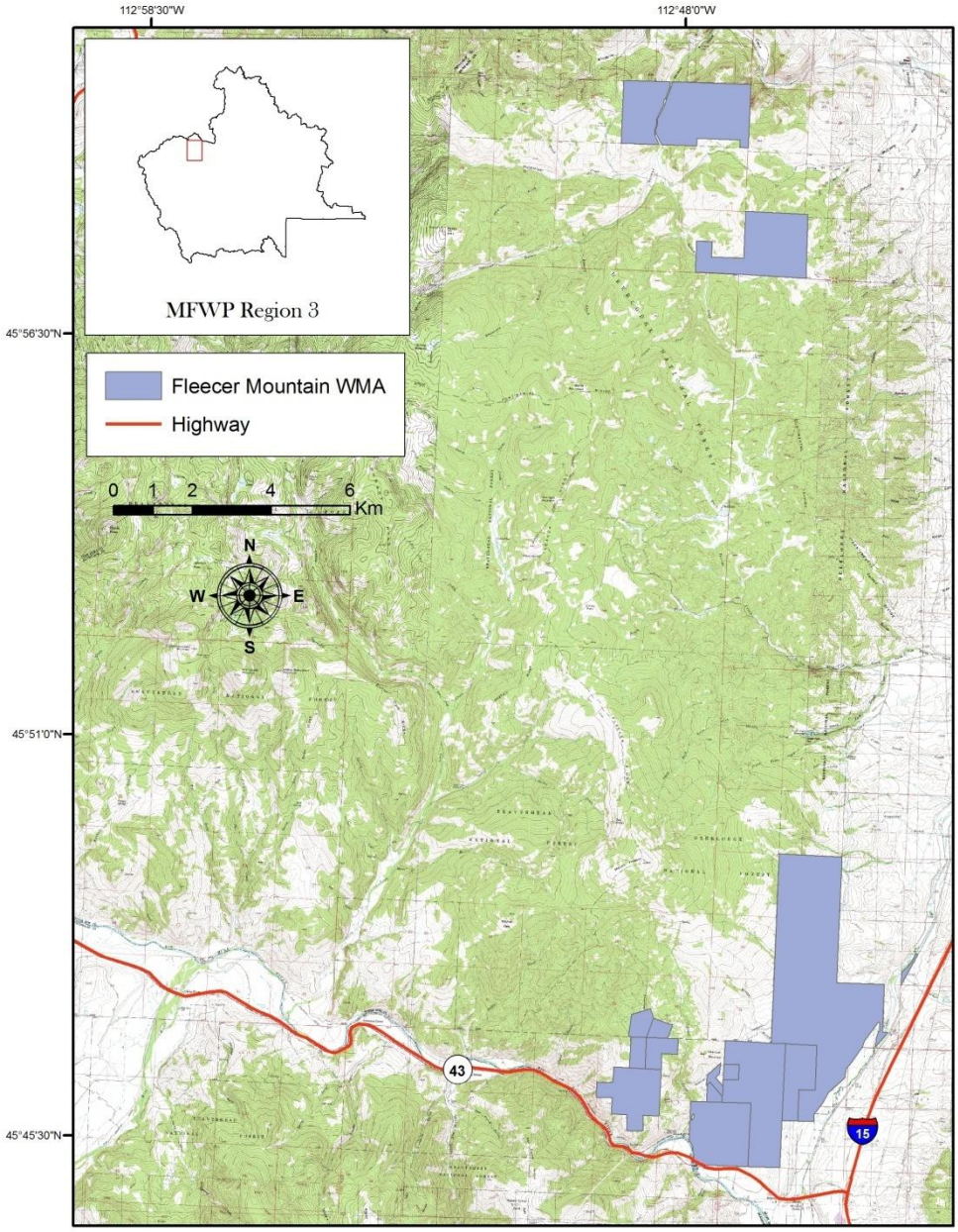

Figure 7. Fleecer Mountain Wildlife Management Area (NRIS 2008).

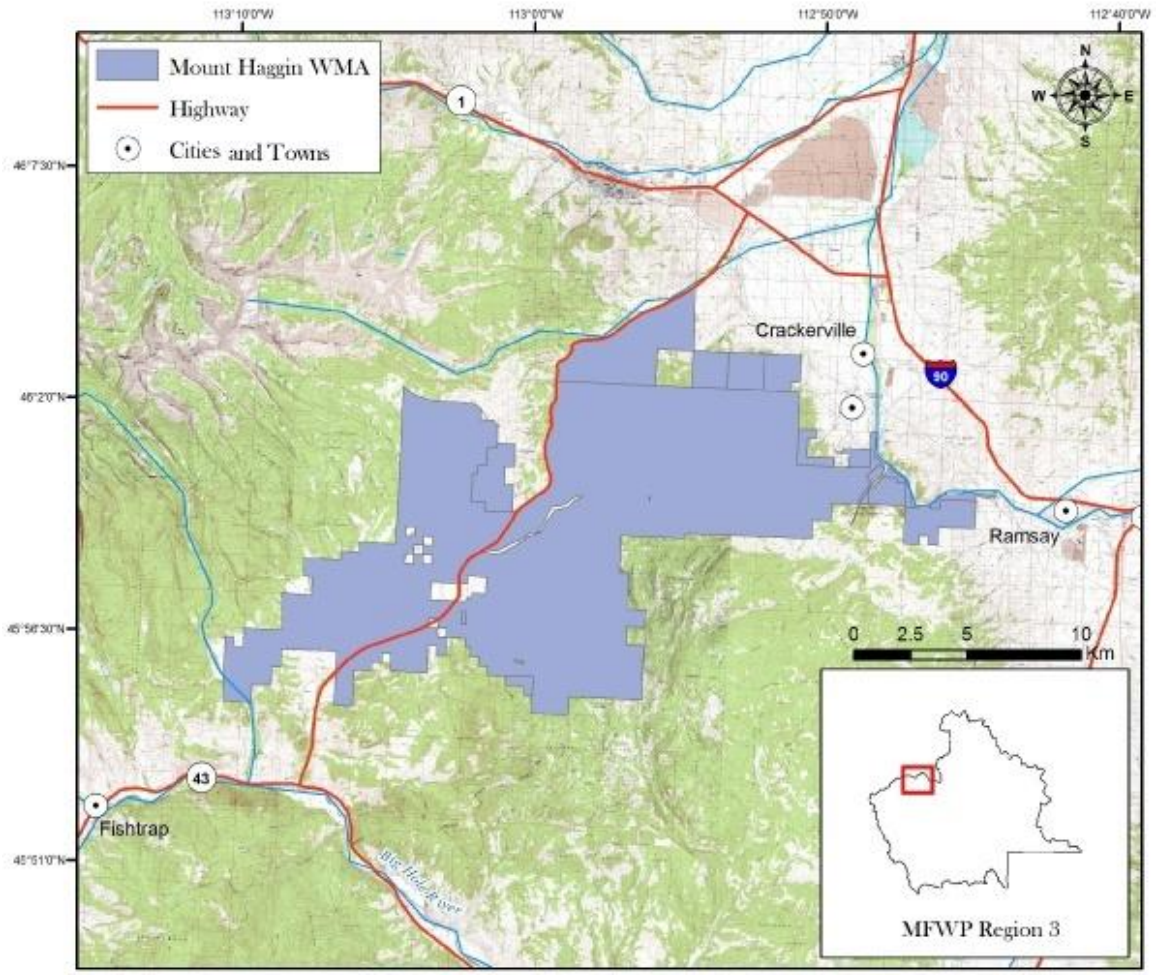

Figure 8. Mount Haggin Wildlife Management Area (NRIS 2008).

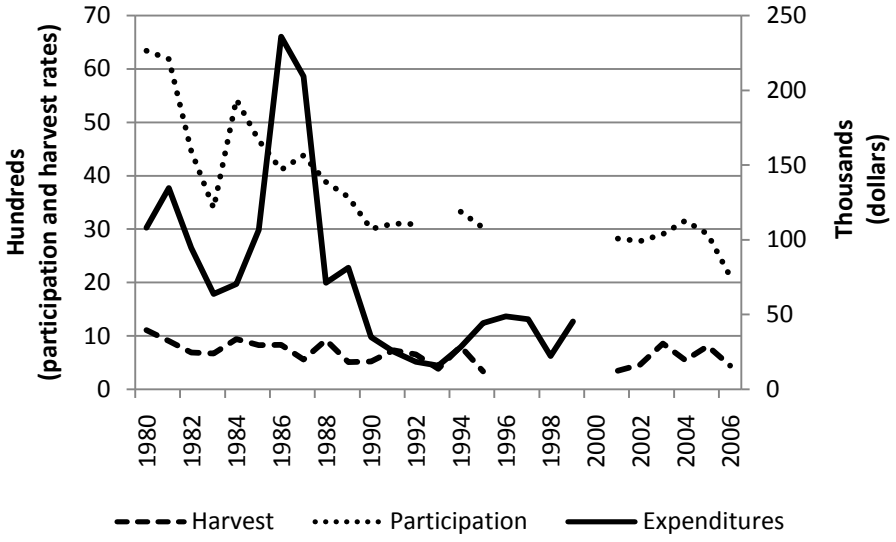

Figure 9. HD 319: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

corresponded to increases in participation rates (31 percent), and harvest rates (40 percent) within one year. Substantial decreases in hunter-related expenditures occurred in 1988 (66 percent), 1990 (57 percent), and 1998 (52 percent). Overall decreases occurred in hunter participation rates in the study period with limited variation. Harvest rates increased in 1988 (66 percent), 1994 (110 percent), and 2003 (85 percent), and decreased (58 percent) in 1995.

As in Hunting District 319, substantial increases in hunter-related expenditures also occurred in Hunting District 341 in 1985 (80 percent), 1986 (98 percent), 1994 (78 percent), 1995 (56 percent), and 1999 (104 percent). These expenditures corresponded to increases in hunter participation rates within one year 58 percent of the time, and harvest rates 73 percent of the time. Substantial decreases in hunter-related expenditures occurred in 1988 (62 percent), 1990 (57 percent), and 1998 (52 percent). Substantial increases in hunter participation rates occurred until at least 1994 (Figure 10). Harvest rates increased in 1983

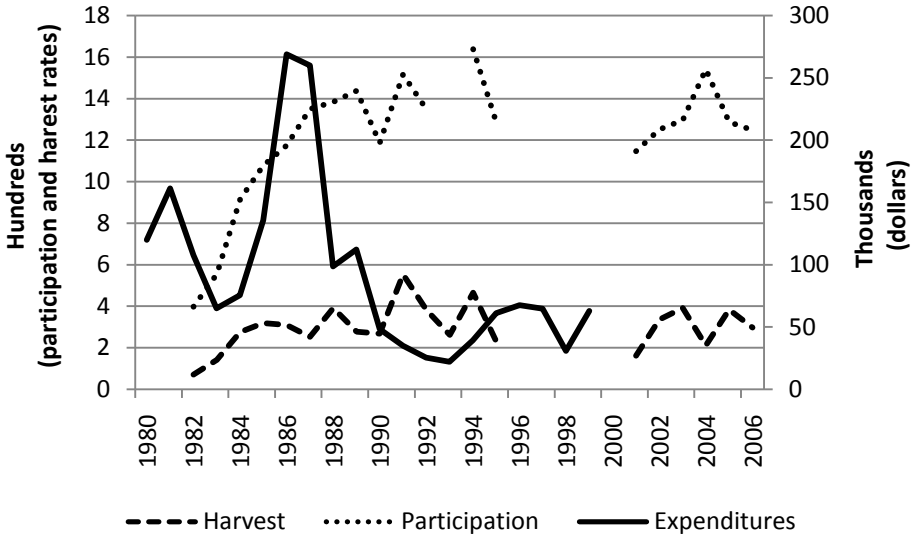

Figure 10. HD 341 Expenditures, Hunter Participation and Harvest Comparison (MFWP 2007a)

(99 percent), 1984 (93 percent), 1988 (54 percent), 1991 (106 percent), 1994 (78 percent), 2002 (16 percent), and 2005 (81 percent), decreasing substantially only in 1995 (50 percent).

Land acquisitions at the Fleecer Mountain Wildlife Management Area (Table 4), included, 877 acres from the Montana Department of Natural Resources and Conservation in 1994, and 71 acres from Daryl Lassila and the estate of T. Helehan in 1998. An increase in 1994 of 110 percent occurred in harvest rates, perhaps as an initial response to the asset acquisition, but subsequently declined.

According to Montana Fish, Wildlife and Parks (2007b), of all the assets acquired via fee-title, lease or conservation easement by the agency where hunter-related expenditures occurred within Region 3(Table 5), the Mount Haggin Wildlife Management Area had the largest overall acquisitions (7,898 acres). The majority of these acres were acquired through fee-title from the Mount Haggin Ranch, Pegasus Gold Corporation, Beal Mountain Mining

Table 4. Fleecer Mountain Wildlife Management Area Asset Acquisitions (MFWP 2007b)

Transaction Date	Fee-Title Acres	Ease/Lease Acres
1994	0	877
1998	0	<1
1998	71	0
Total	71	877

Table 5. Mount Haggin Wildlife Management Area Asset Acquisitions (MFWP 2007b)

Transaction Date	Fee-Title Acres	Ease/Lease Acres
1982	3,879	0
1988	953	0
1988	30	0
1992	1,000	0
2002	306	0
2006	1,460	0
2006	0	270
Total	7,628	270

Inc, and the U.S. Bureau of Reclamation. An additional 270 acres were acquired through conservation easements and leases from the Greenway Service District. These acquisitions correspond to periods of increased hunter participation, especially in 1982, and 2002 (Figure 8 and 9).

The Mount Haggin Wildlife Management Area was established when the Montana Department of Fish and Game acquired a 55,000 acre (85 square mile) parcel from the Nature Conservancy who held the land until funding became available in 1976. Funding for the acquisition came from three sources: the Land and Water Conservation Fund provided $1.5 million; general license and permits fees contributed an additional $450,000, with the remainder of the cost being donated by the original owners, Mount Haggin Livestock Inc. (Newell and Ellis 1982). Original objectives for the acquisition were to provide an environment where multiple recreatioal opportunities could take place, primarily hunting and fishing (Frisina 1986). Because the area provides year-round critical range, including calving and fawning habitat for numerous big game species, considerable research has been conducted, including Frisina's (1981) research on elk, deer and moose. This included the capture and collaring of mule deer with radio transmitters, and the subsequent monitoring of animals within the Wildlife Management Area. Research was also conducted on hunter participation numbers which were acquired through the installation of loop detectors which count vehicle numbers at major access points that monitored motor vehicle traffic. Frisina noted that an upward trend in elk numbers existed from 1973 to 1981, with the underlying cause being improved habitat conditions and increased regulations on female elk harvests (Frisina 1986). Three other programs were also added including a season-long, big game check station on the weekends and during holidays, a deer jaw turn-in program, and a post-season hunter questionnaire.

Hunting District 380

Hunting District 380 contains two substantial areas of management and hunter-related expenditures: the Canyon Ferry Wildlife Management Area and the Elk Research Project in the Elkhorn Mountain Range (Figure 11). Hunter-related expenditures show increases between 1980 and 1988, with only one year (1985) decreasing (Figure 12). A recovery in expenditures of $193,000 in 1986 and a $148,000 increase in 1987 also occurred. Expenditures by Montana Fish, Wildlife and Parks corresponded to increases in hunter participation rates within one year 64 percent of the time, and harvest rates 43 percent of the time. Participation rates rose overall, at least until 1991 when data became unavailable. Specifically, substantial increases in expenditures occurred in 1984 (341 percent), 1986 (116 percent), and 1988 (167 percent) for a total input of $1.7 million during this time. Substantial decreases occurred in 1989 (64 percent) 1997 (76 percent), and 1998 (54 percent). Increases in hunter participation rates between 1984 and 1990 may be in response to the increased hunter-related expenditures during this time. The only substantial change in harvest rates was a 70 percent decrease in 2003, although data which might reflect the substantial hunter-related expenditures increases from 1984 to 1988 does not exist. The Canyon Ferry Wildlife Management Area acquired 5,129 acres (Table 6), between 1996 and 1997. 5,000 acres were leased from the U.S. Bureau of Reclamation and 129 acres were purchased through fee-title access from William R. Higgins and the 51 Ranch Company.

The Elkhorn Wildlife Management Unit in the Elkhorn Mountain Range was first proposed by Senators Mansfield and Metcalf in 1974, and was later established through U.S.

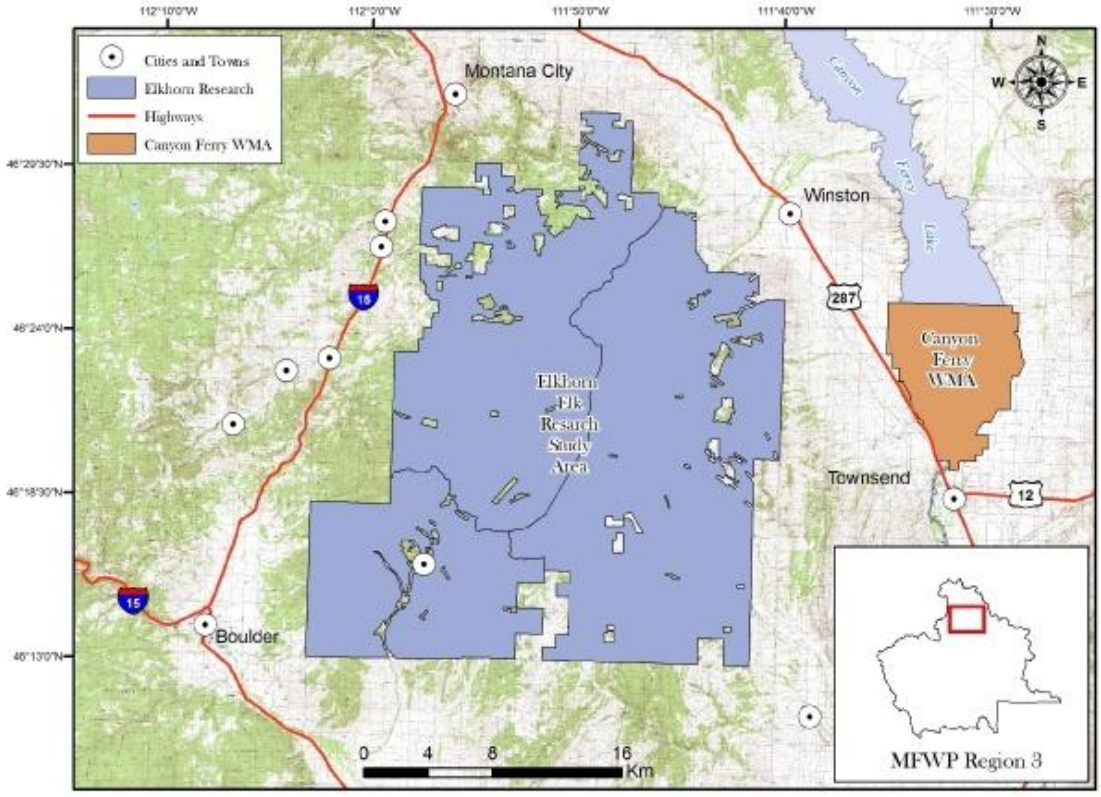

Figure 11. Canyon Ferry Wildlife Management Area and Elkhorn Mountains Elk Research Study Area (NRI 2008)

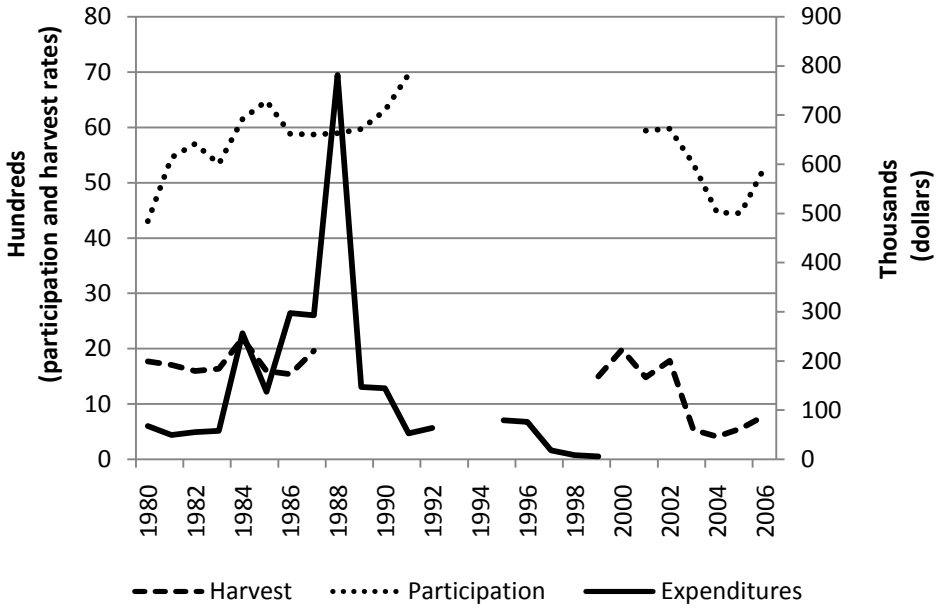

Figure 12. HD 380: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

Table 6. Canyon Ferry WMA Asset Acquisitions (MFWP 2007b)

Transaction Date	Fee-Title Acres	Ease/Lease Acres
1996	129	0
1997	0	5,000
Total	129	5,000

Senate Bill 393. At that time the proposed Wilderness Management Unit included over 85,000 acres (Kennett et al. 2004), and today encompasses a vast array of additional lands managed by a variety of organizations including the U.S. Forest Service (160,000 acres), the BLM (70,000 acres), and private landowners (20,000 acres) with Montana Fish, Wildlife and Parks overseeing wildlife management throughout the Wilderness Management Unit.

Hunting District 380 has traditionally been one of the most heavily accessed hunting districts in the state (Desimone 1987). Between 1982 and 1991, survey and inventory research was conducted under the direction of the Elk Monitoring Program to improve the quality of elk habitat and hunter experience within the Wildlife Management Unit (Kennett et al 2004). Research includes surveys and inventories of elk populations through radio-collars, on-the-ground analysis, and the examination of harvested animals (Kennett et al 2004). Creative harvest regulations have stabilized herd sizes, allowing for the survival of older elk, a prospect that was all but impossible due to open seasons until the 1980's (Desimone 1987).

Hunting District 312

Expenditures (Figure 13) by Montana Fish, Wildlife and Parks of $4.7 million within Hunting District 312 occurred at several locations including; the Gallatin Forks and Fairweather fishing access sites, the Missouri Headwaters State Park, as well as the Bridger Mountain Range where research on mule deer took place.

While hunter-related expenditures, hunter participation and harvest rates fluctuated throughout the study period, substantial changes did occur. A decrease in hunter-related expenditures of 89 percent occurred in 1988, while an increase of 62 percent in harvest rates occurred in 1994. Hunter-related expenditures corresponded to increases in hunter participation rates within one year 55 percent of the time, and harvest rates 62 percent of the time. In 1986 hunter participation rates increased by 65 percent, while harvest rates were maintained or slightly increased. The decline in hunter participation rates of 51 percent between 1980 and 1983 may in part be due to poor harvest rates during this period. Further, a slight increase in participation and harvest rates does occur following periods of hunter-related expenditure, possibly suggesting that a relationship exists (MFWP 2007b).

Mule deer research, including population ecology and agricultural game damage took place in the Bridger Mountain Range (Figure 14) beginning in the mid-1950's (Wilkins 1957), and was the largest source of hunter-related expenditures within the hunting district ($2.4 million) throughout the study period. In the 1970s, six separate studies were conducted by graduate students at Montana State University on mule deer population dynamics and survey methodology research (Schwarzkopf 1973, Bucsis 1974, Hamlin 1974, Morton 1976, Steery 1979, Youmans 1979, Pac et. al. 1991, Mackie et. al. 1998). These studies suggest in

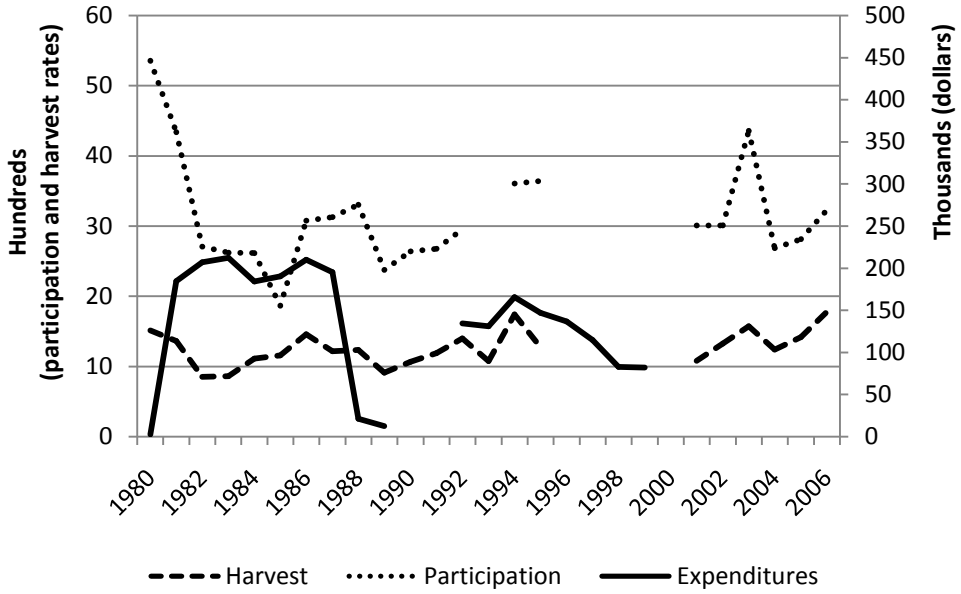

Figure 13. HD 312 Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

part that male mule deer losses within the Bridger Mountain Range were sufficient enough to cause decline within the population, and that harvest rates were not uniform throughout the study area due to differing hunter access potential.

Statewide deer research by Montana Fish, Wildlife and Parks biologists began in July of 1975, with the initial goal of gaining a better understanding of deer population biology and habitat relationships. This was accomplished by selecting representative study areas statewide and conducting multi-year studies on both mule and white-tailed deer. One study site for mule deer was the mountain-foothill ecotype located in the Bridger Mountain Range, studied by Pac (1976) between 1971 and 2006. Pac's research results documented the seasonal distribution, migration, population dynamics, and habitat selection of mule deer on

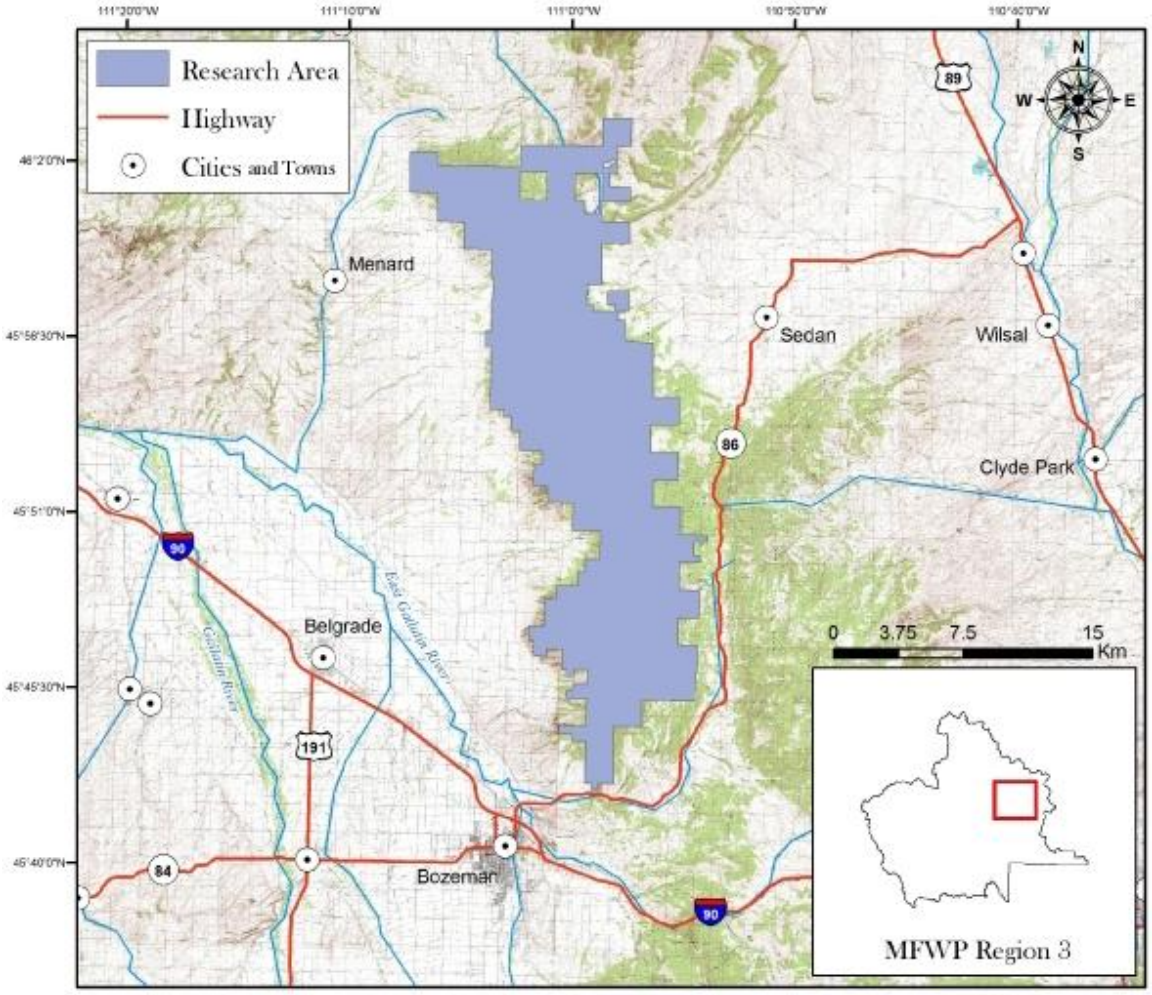

Figure 14. Bridger Mountain Mule Deer Research Study Area (NRIS 2008)

the Armstrong winter range in the Bridger Mountains. Population studies were conducted through aerial surveys and radio collars during the early winter, with winter mortality rates being used to reconstruct spring populations. Vegetation cover types were collected through aerial photography analysis. Lastly, a mail-questionnaire was developed and sent to hunters to determine harvest success rates, the distribution of hunters within the study area, and other hunter population-related factors (Mackie et. al 1998).

Hunting District 310

Hunter-related expenditures within Hunting District 310 increased to $26,000 in 1985, but fluctuated as low as $16,000 in 1982 and 1986, after which hunter-related expenditures ceased (Figure 15). At the height of funding, hunter participation rates were at their lowest (12,000), but rebounded upwards to 27,000 within 8 years. Hunter-related expenditures corresponded to increases in hunter participation rates within one year 33 percent of the time, and harvest rates 67 percent of the time. Harvest rates fluctuated, with increases in 1985 (64 percent), 1994 (130 percent), and 2003 (71 percent), and decreases occurring in 1993 (53 percent). Interestingly, in 1985 while harvest rates were increasing, participation rates were near their lowest. The acquisition of 1,760 acres from the Rocky Mountain Elk Foundation in 1995 and 1999 (Table 7) was accomplished without hunter-related expenditures.

Numerous studies and research initiatives have occurred in Hunting District 310, beginning in 1934 with the establishment of the Gallatin Game Check Station located 32 km north of Big Sky, Montana. The purpose of this station was to allow Montana Fish, Wildlife

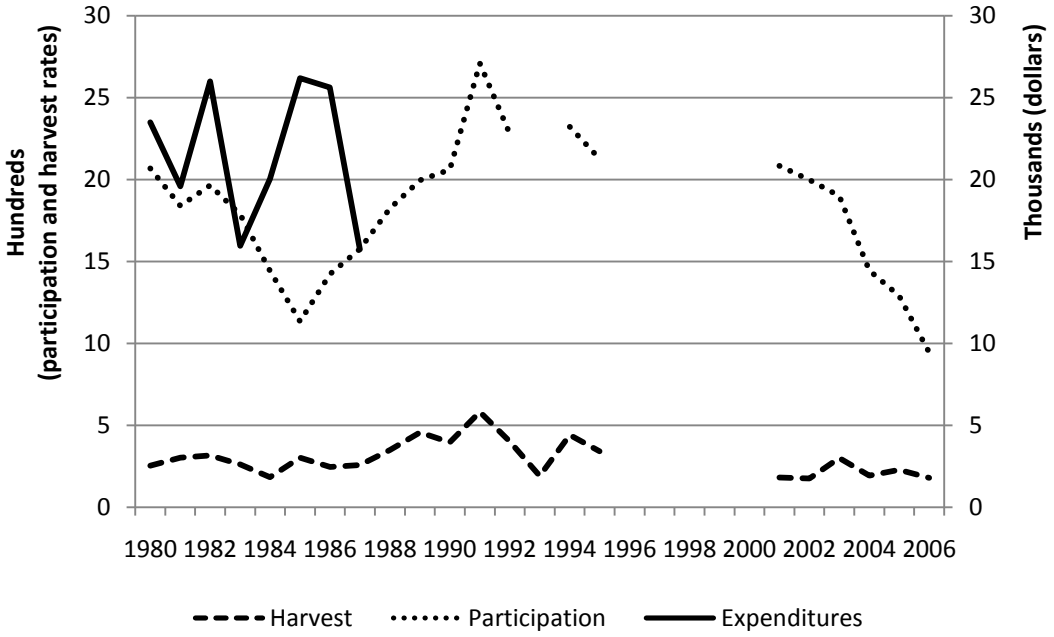

Figure 15. HD 310: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

Table 7. Gallatin Wildlife Management Area Asset Acquisitions (MFWP 2007b)

Transaction Date	Fee-Title Acres	Ease/Lease Acres
1995	960	0
1999	800	0
Total	1,760	0

and Parks the ability to maintain regulation compliance, inform hunters of existing conditions, gather critical biological data, and control the distribution of hunters (Taylor and Frisina 1982).

The Gallatin Elk Range, later named the Gallatin Wildlife Management Area (Figure 16) was established in 1945 when the department purchased 6,188 acres from the Northern Pacific Railroad (MFWP 2007 Landbook). Early research included Taylor's (1981) monitoring of the Gallatin elk herd through radio relocation flights. This research concluded that of the 1,682 elk that inhabited the Gallatin and Madison Ranges within the district, 600 were harvested in 1981 (this conflicts with survey data collected by Montana Fish, Wildlife and Parks). Taylor (1981) noted, however, that his harvest values were an increase from previous years due to an extended harvest season of six weeks, and less than normal precipitation, allowing the elk to have easier migration. Taylor's (1986) research continued with additional elk migration pattern studies, as well as brucellosis testing at the Veterinary Diagnostic Laboratory at Montana State University. Of the 155 animals tested within the district, only one animal tested positive for the disease (Taylor 1986).

Hunting District 302

Expenditures within Hunting District 302 (Figure 17) were restricted to the Clark Canyon Reservoir area and occurred only until 1988. The district saw a substantial increase of 128 percent in expenditure rates in 1983, as well as an increase of 75 percent in 1986. Hunter-related expenditures corresponded to increases in hunter participation rates within one year 38 percent of the time, and harvest rates 75 percent of the time. Harvest rates

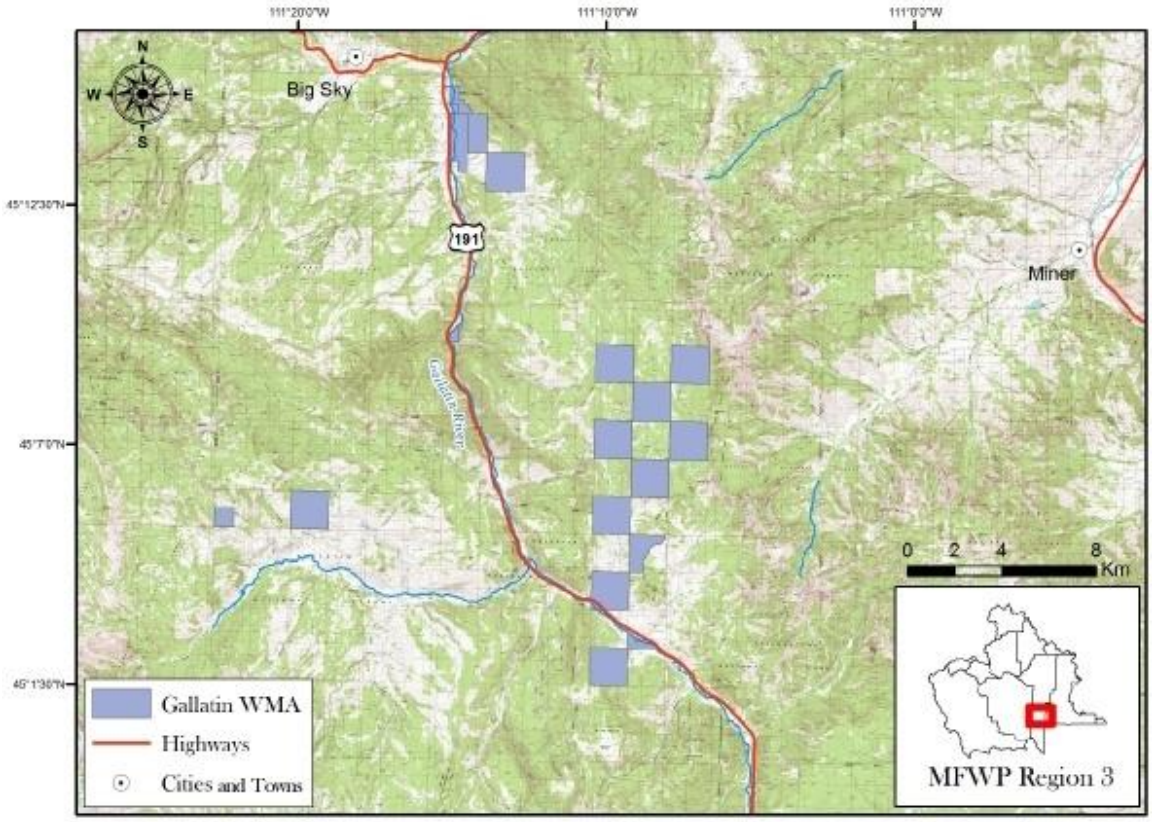

Figure 16. Gallatin Wildlife Management Area (NRIS 2008)

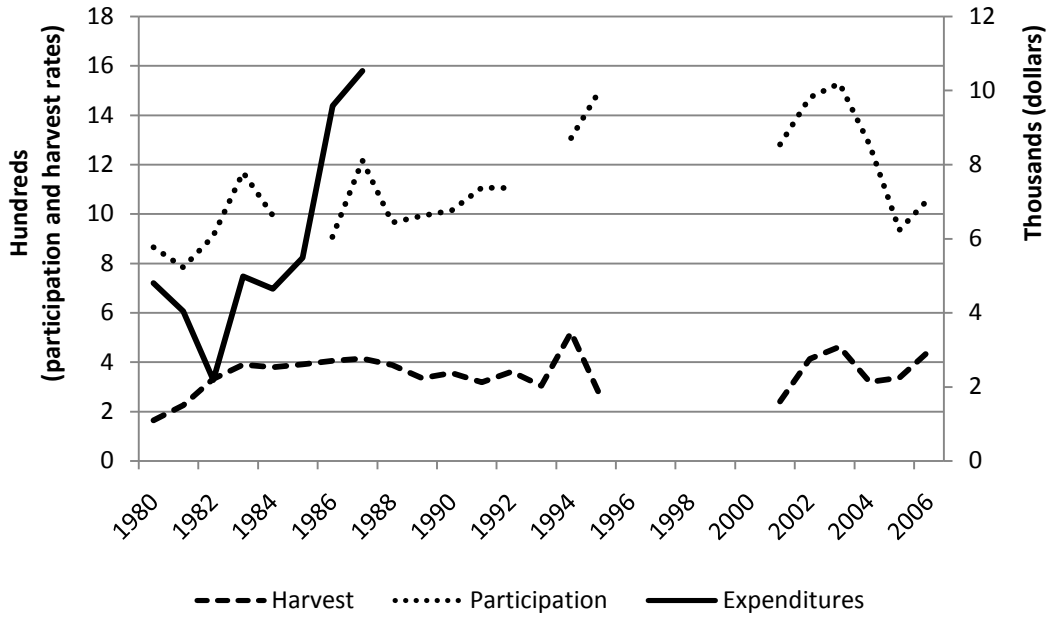

Figure 17. HD 302: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

were steady until 1994 when a 71 percent increase occurred, followed immediately by a 50 percent decrease in 1995. A substantial increase in harvest rates of 72 percent also occurred in 2002 although this too was followed by a period of decline. Overall, participation rates fluctuated through the study period.

Hunting District 309

Expenditures within Hunting District 309 in the early 1980s occurred prior to the official establishment of this hunting district in 2004. Funds were used to study deer populations on agricultural lands in the Gallatin Valley. Hunter participation and harvest data are unavailable for this hunting district.

Hunting District 311

The hunter-related expenditures within Hunting District 311 ($78,854) (Figure 18) (that occurred at the Cobblestone, Cameron Bridge, and Drouillard Fishing Access Sites) in 1980 and 1981 seem to have stimulated both hunter participation and harvest rates enough to witness a steady increase in both at least until 1992, including a 172 percent increase in participation in 1982, and a 23 percent increase in harvest rates. Hunter-related expenditures corresponded to increases in hunter participation rates within one year 33 percent of the time, and harvest rates 67 percent of the time, with no increases occurring longer than 3 years from an expenditure.

Hunting District 323

The variable hunter-related expenditures, a total of $265,000, which occurred at the Madison-Wall Creek Wildlife Management Area (Figure 19) between 1980 and 1987, seem to have been sufficient enough to facilitate a long term hunter participation increase (115 percent) beginning in 1987 and continuing until 1995 (Figure 20). Harvest rates were variable, with an overall slight increase throughout the study period. Hunter-related expenditures corresponded to increases in hunter participation rates 50 percent of the time, and harvest rates 50 percent of the time within one year of the expenditure.

Two land acquisitions did occur during the study period with differing results (Table 8). The acquisition of 320 acres in 1984 from the American Public Land Exchange was followed by increases in hunter participation for the following 10 years. A period of

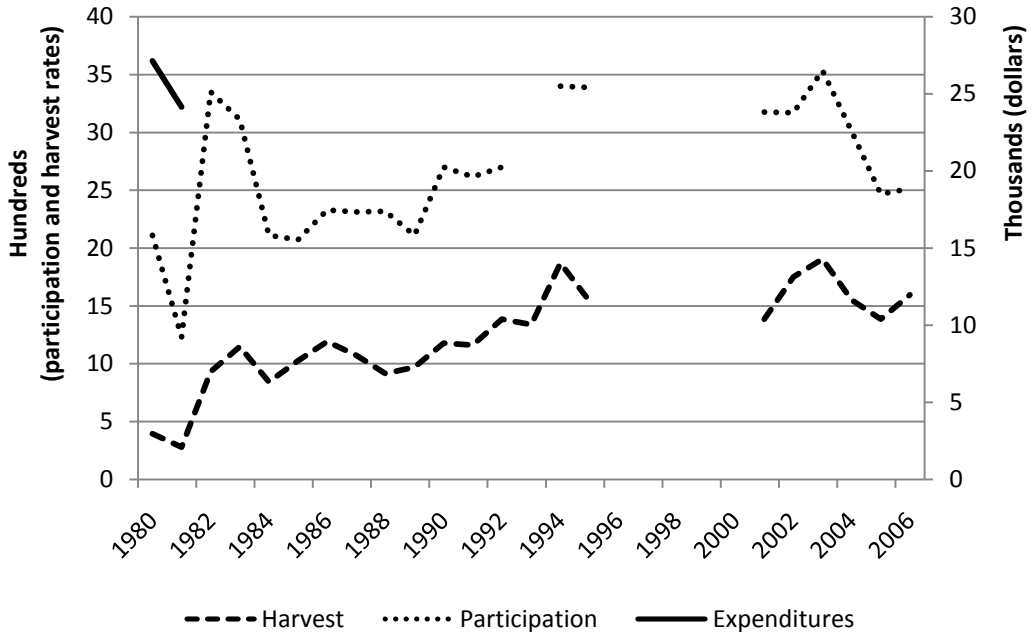

Figure 18. HD 311: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

decline occurred in participation after acquiring 918 acres in 2002 from the Montana Department of Natural Resources and Conservation, followed by an increase. This possibly suggests that a combination of land acquisitions and funding were critical to the increases seen in the mid-1980s, although a small lag in hunter participation and harvest rates also exists which may be related to hunters' perception that new acquisitions will take time to produce productive harvests. It may also relate to the length of time the environment needs to respond to the expenditures.

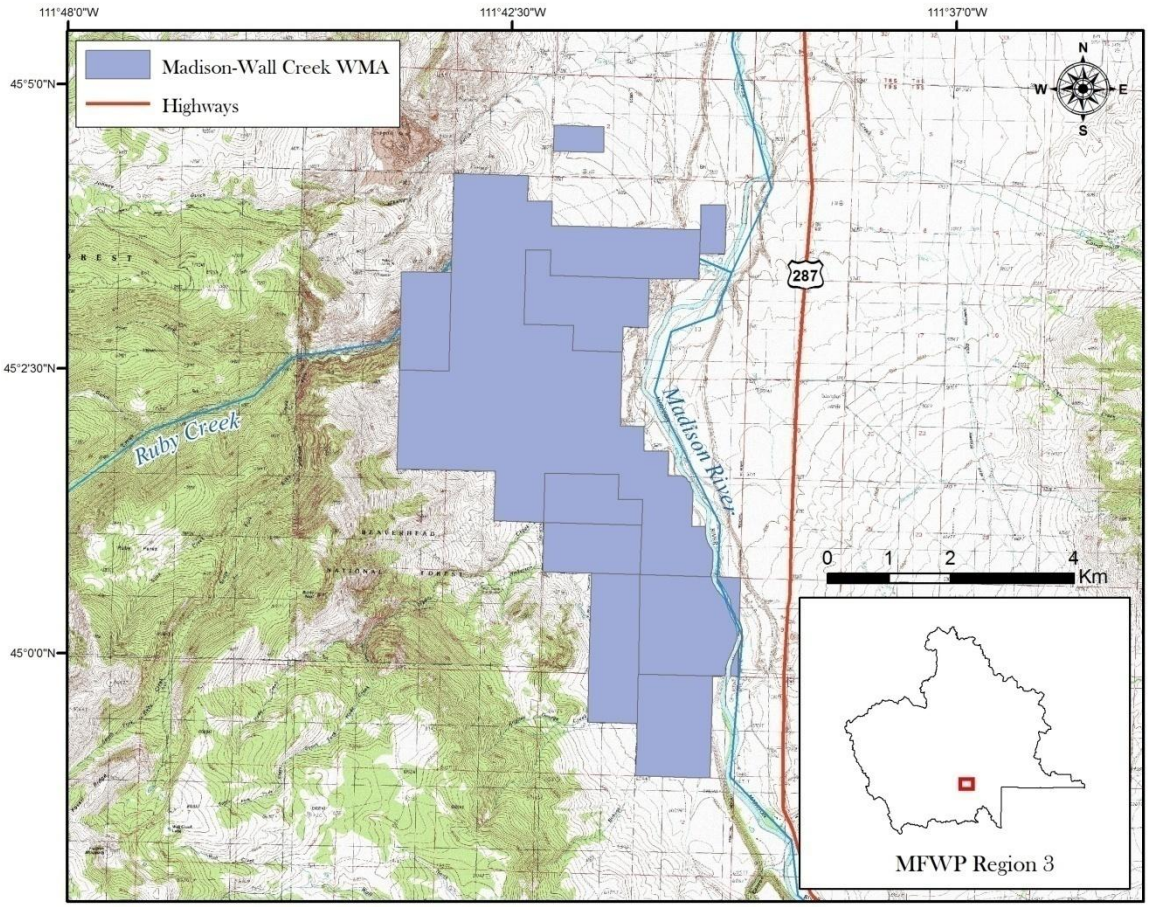

Figure 19. Madison-Wall Creek Wildlife Management Area (NRIS 2008)

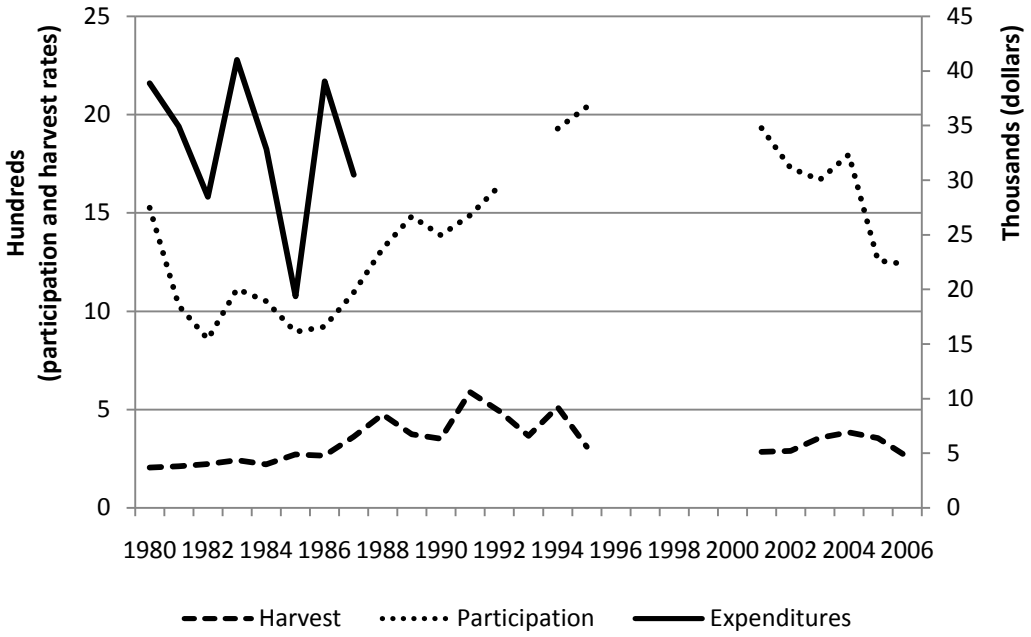

Figure 20. HD 323: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

Table 8. Madison-Wall Creek Wildlife Management Area Asset Acquisitions (MFWP 2007b)

Transaction Date	Fee-Title Acres	Ease/Lease Acres
1984	320	0
2002	0	918
Total	320	918

Hunting District 324

Hunting District 324, which includes the Gravelly-Blacktail Wildlife Management Area (Figure 21), received two major hunter-related expenditure periods (Figure 22), with an increase of nearly 400 percent in 1988, followed by a period of slight decline. A continuation of hunter-related funding occurred with additional increases in 1995 of 64 percent, for a total input of $2 million. A 68 percent decrease in funding occurred between 1995 and 1999, after which hunter-related expenditures ceased. Participation (16 percent) and harvest rates (12 percent) had already started increasing prior to the hunter-related expenditure period (1988-1995), and were somewhat maintained, although variable, with subsequent declines especially within participation rates. Further, nearly 6,500 acres of land were leased through the Montana Department of Natural Resources and Conservation in 1997 and 2003 (Table 9) (MFWP 2007a). Hunter participation and harvest rates continued to decline, even after the acquisition of lands in 2003. Hunter-related expenditures corresponded to increases in hunter participation rates 54 percent of the time, and harvest rates 47 percent of the time within one year of the expenditure, with only 7 percent of increases occurring after 3 years of a hunter-related expenditure.

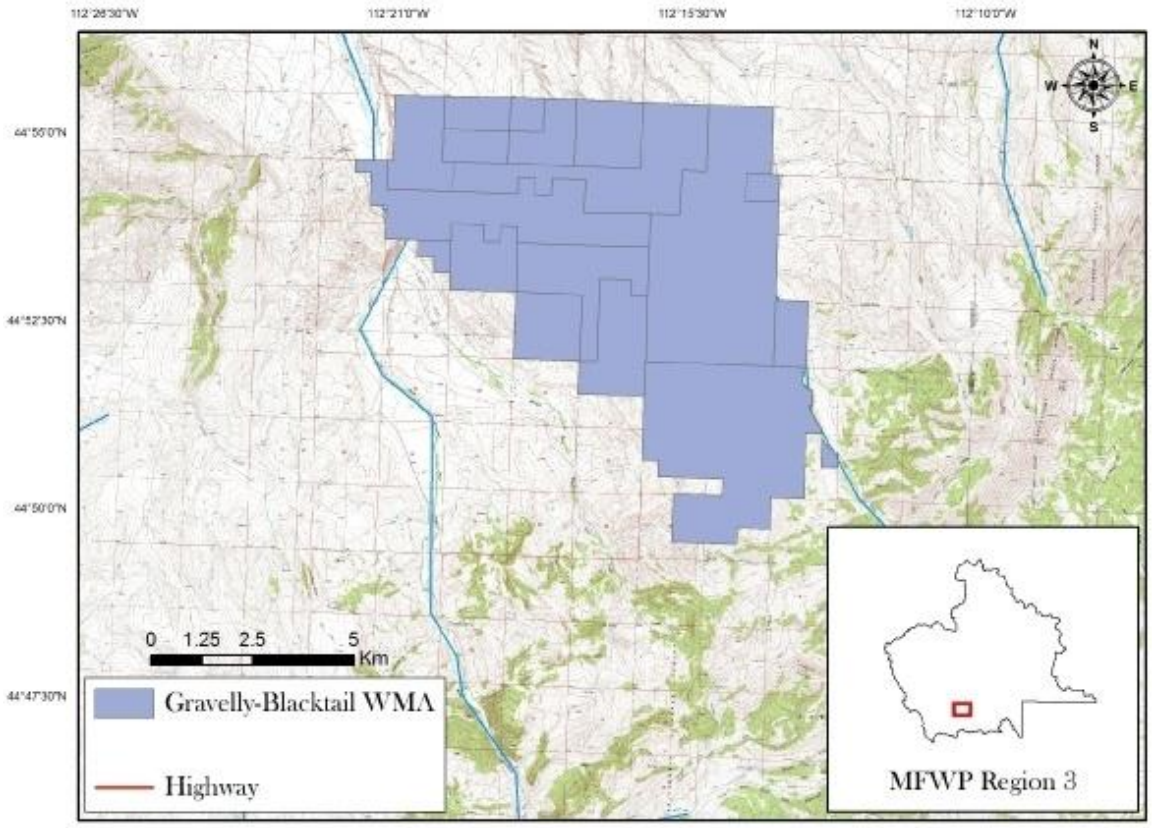

Figure 21. Gravelly-Blacktail Wildlife Management Area (NRIS 2008)

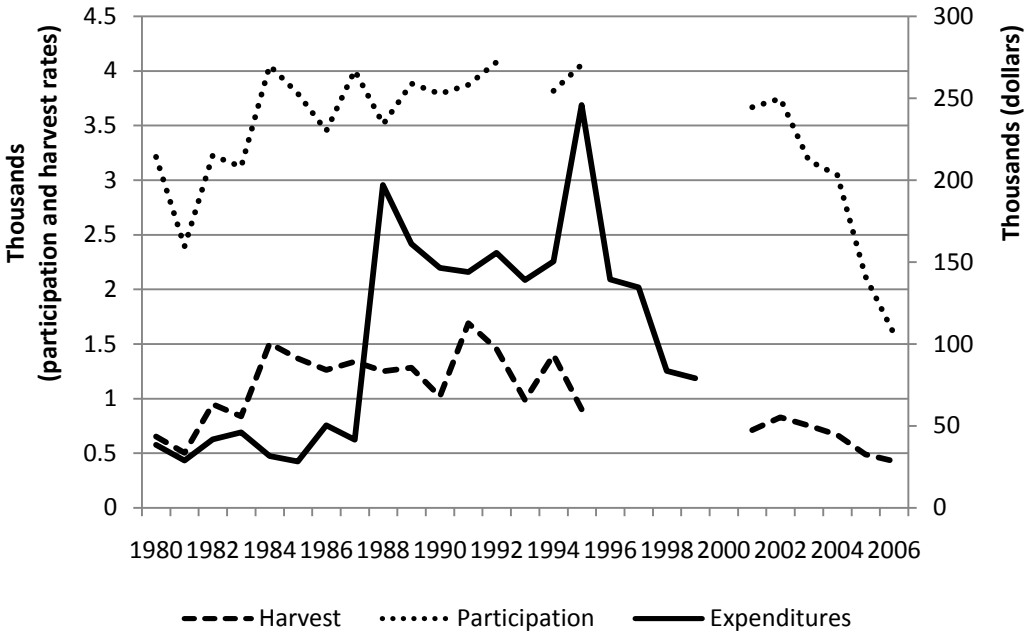

Figure 22. HD 324: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

Table 9. Gravelly-Blacktail Wildlife Management Area
Asset Acquisitions (MFWP 2007b)

Transaction Date	Fee-Title Acres	Ease/Lease Acres
1997	0	2964
1997	0	3197
2003	0	320
Total	0	6481

Hunting District 325

Two years of hunter-related funding occurred within Hunting District 325 (1981-1982) (Figure 23). Increases in both harvest (50 percent) and participation (50 percent) rates corresponded to the introduction of funds within one year, including an increase of 114 percent in harvest rates and 83 percent in participation rates.

Hunting District 330

Two years of hunter-related funding totaling over $45,000 in 1980 and 1981 within Hunting District 330 (Figure 24) may be related to increases in participation rates from 1985 to 2006. Harvest numbers varied during the study period, but show a slight overall increase.

Hunting District 331

The $3,100 in hunter-related expenditures in Hunting District 331 in 1980 and 1981 resulted in initial increases (50 percent) in both participation and harvest rates (Figure 25). Thereafter, fluctuating participation and harvest numbers occurred, with substantial increases in harvest rates occurring in 1988 (52 percent), 1991 (66 percent), and 1994 (88 percent), with a decline of 55 percent in 1995. Participation rates showed similar trends during this time although no changes over 50 percent occurred. Hunter participation and harvest rates show some opposing trends between 1986 and 1991.

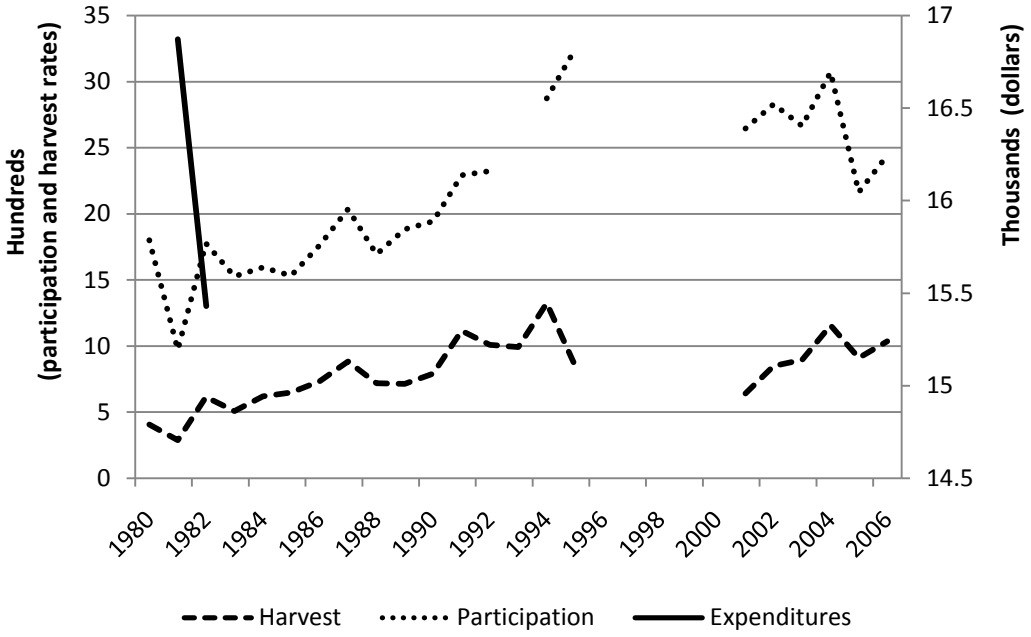

Figure 23. HD 325: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

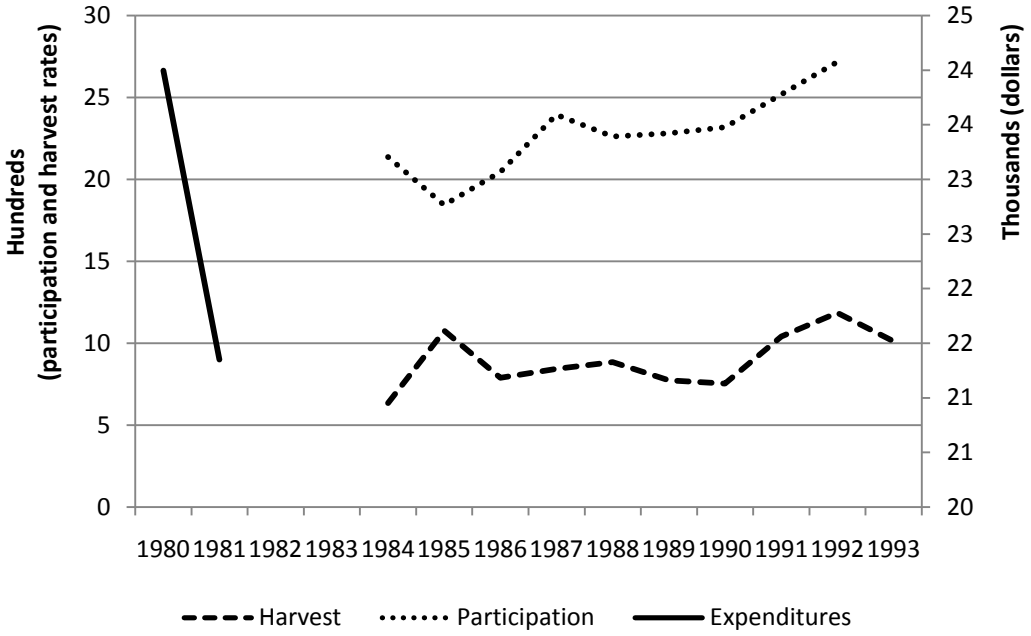

Figure 24. HD 330: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

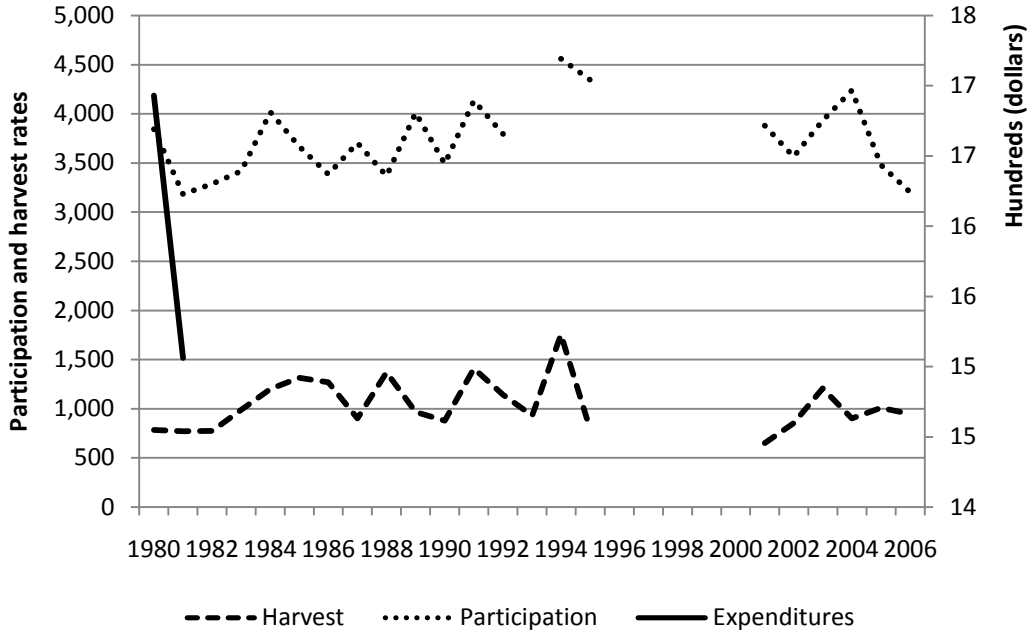

Figure 25. HD 331: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

Hunting District 360

Of the $142,000 in total hunter-related expenditures that occurred in Hunting District 360, the majority, 63 percent, was spent at the Madison-Bear Creek Wildlife Management Area (Figure 26 and 27). An expenditure of $46,000 occurred in 1980, with expenditures continuing until 1987, although at substantially decreased rates including only $5,000 in 1985. These expenditures correspond to an increase of 89 percent in hunter participation between 1983 and 1991, and a 208 percent increase in harvest rates. Both participation and harvest rates also saw increases between 2001 and 2006. As a whole, hunter-related expenditures corresponded to increases in hunter participation rates within one year 50 percent of the time, and harvest rates 75 percent of the time. No participation

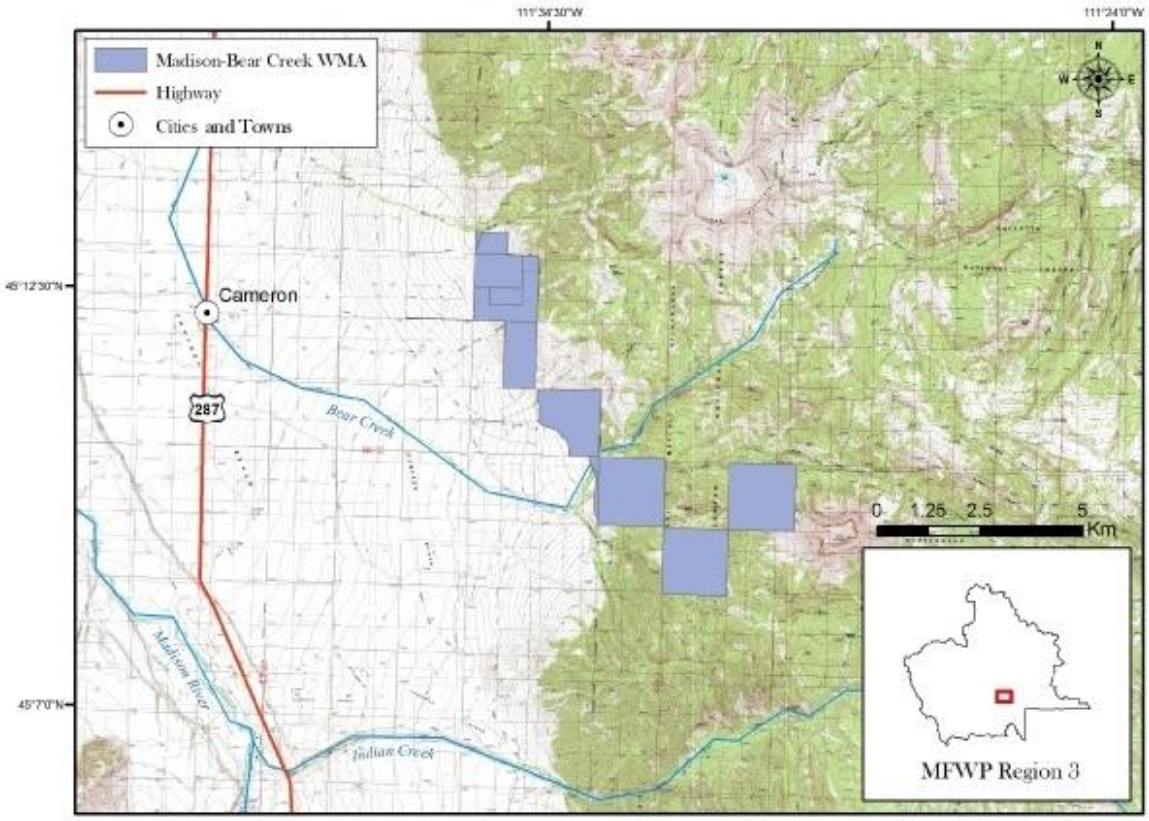

Figure 26. Madison-Bear Creek Wildlife Management Area (NRIS 2008)

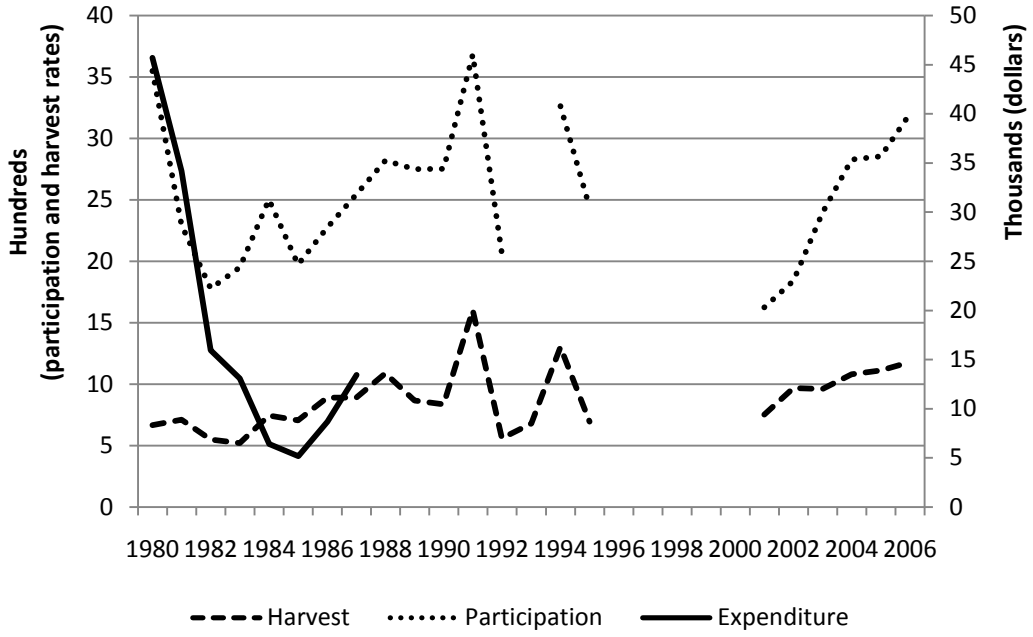

Figure 27. HD 360: Expenditures, Hunter Participation and Harvest Comparison (MFWP 2007a)

increases occurred longer than 3 years after an expenditure, while increases in harvest rates occurred longer than 3 years from an expenditure 12 percent of the time.

Hunting District 361

Hunting District 361 received limited hunter-related expenditures of $1,056 in 1980 and 1981 (Figure 28). While both participation and harvest rates fluctuated consistently throughout the study period, both showed a positive overall trend. Substantial increases in harvest rates occurred in 1981 (95 percent), 1987 (97 percent), 1991 (271 percent), and 1994 (206 percent), while substantial decreases in harvest rates occurred in 1989 (54 percent), and 1993 (84 percent). The only year of substantial change in participation rates was 1994 which

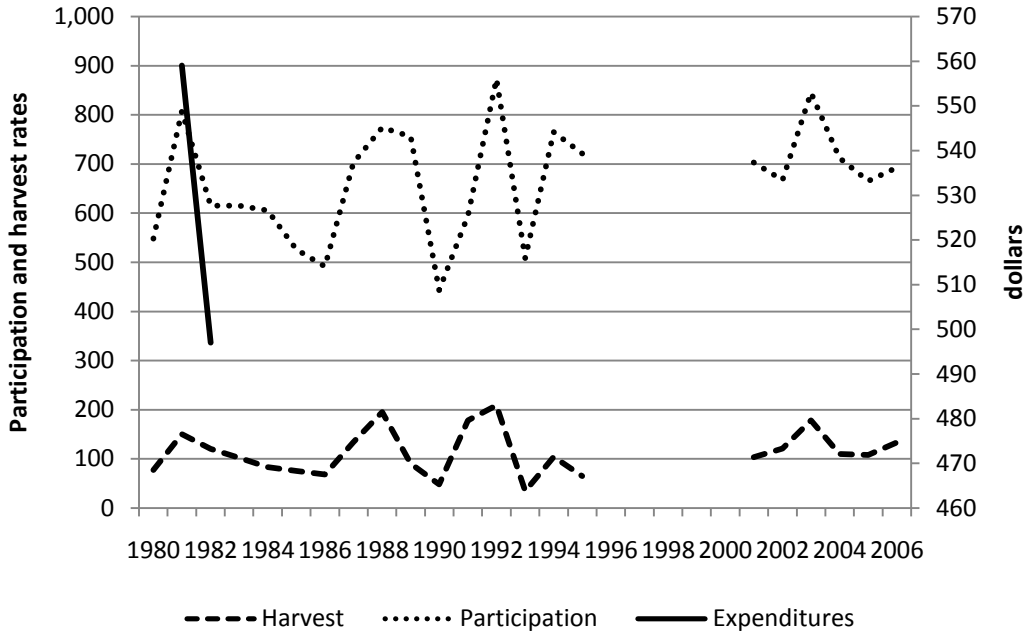

Figure 28. HD 361: Expenditure, Hunter Participation and Harvest Comparison (MFWP 2007a)

saw a 51 percent increase. Increases in participation or harvest rates occurred at a minimum of 5 years from the original expenditure in all instances within this hunting district.

Montana Fish, Wildlife and Parks Region 3 Expenditures,
Hunter Participation and Harvest Comparison

Over $83 million in hunter-related expenditures occurred in Montana Fish, Wildlife and Parks Region 3 between 1980 and 2006. General overall trends suggest that expenditures decreased 51 percent during this time (Figure 29). As with overall expenditures, participation and harvest rates varied throughout the study period, although not at a similar magnitude. Hunter-related expenditures corresponded to increases in hunter

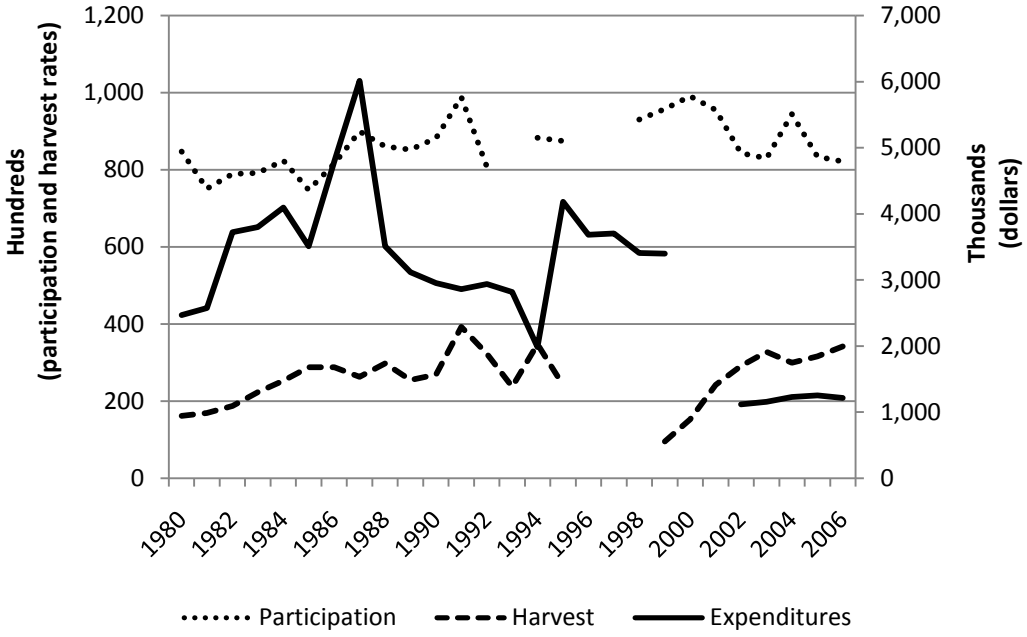

Figure 29. Expenditures, Hunter Participation and Harvest - Region 3 Comparison (MFWP 2007a).

participation rates within one year 50 percent of the time, and harvest rates 54 percent of the time (Table 10). Within two years of hunter-related expenditures, hunter participation increased 31 percent of the time, while harvest rates increased 29 percent of the time. The largest overall decrease in hunter participation occurred between 1991 and 1992, when nearly 18,000 (18 percent) fewer hunters participated. Prior to this time, expenditures had been declining since 1987, which perhaps resulted in the substantial decrease in hunter participation rates. The largest overall increase in harvest rates occurred in 2000 when 5,000 (60 percent) more deer and elk were harvested than the previous year. Hunter participation rates decreased 3 percent overall, with an average annual decrease of 1 percent, while harvest rates increased 111 percent overall, with an average annual increase of 11 percent indicating increased hunter success.

Table 10. Expenditure Input to Participation and Harvest Output (MFWP 2007a)

Harvest	
Increase w/n 1 year:	54%
Increase w/n 2 year:	29%
Increase w/n 3 year:	14%
Increase w/n 4 year:	1%
Increase w/n 5 year+:	2%
Participation:	
Increase w/n 1 year:	50%
Increase w/n 2 year:	31%
Increase w/n 3 year:	11%
Increase w/n 4 year:	5%
Increase w/n 5 year +:	3%

Geographic and Spatial Relationships

Spatial Distribution of Montana Fish, Wildlife and Parks Expenditures

A spatial pattern emerges in a horse-shoe form when hunting districts with hunter-related expenditures are compared to those without expenditures (Figure 30). Total district level expenditures by Montana Fish, Wildlife and Parks that were above $100,000 showed some spatial aggregation in 3 areas of Region 3 (Figure 31). This is especially true for expenditures above $2 million, but is also maintained in amounts below $500,000 as is the case in Hunting District 360 and 310.

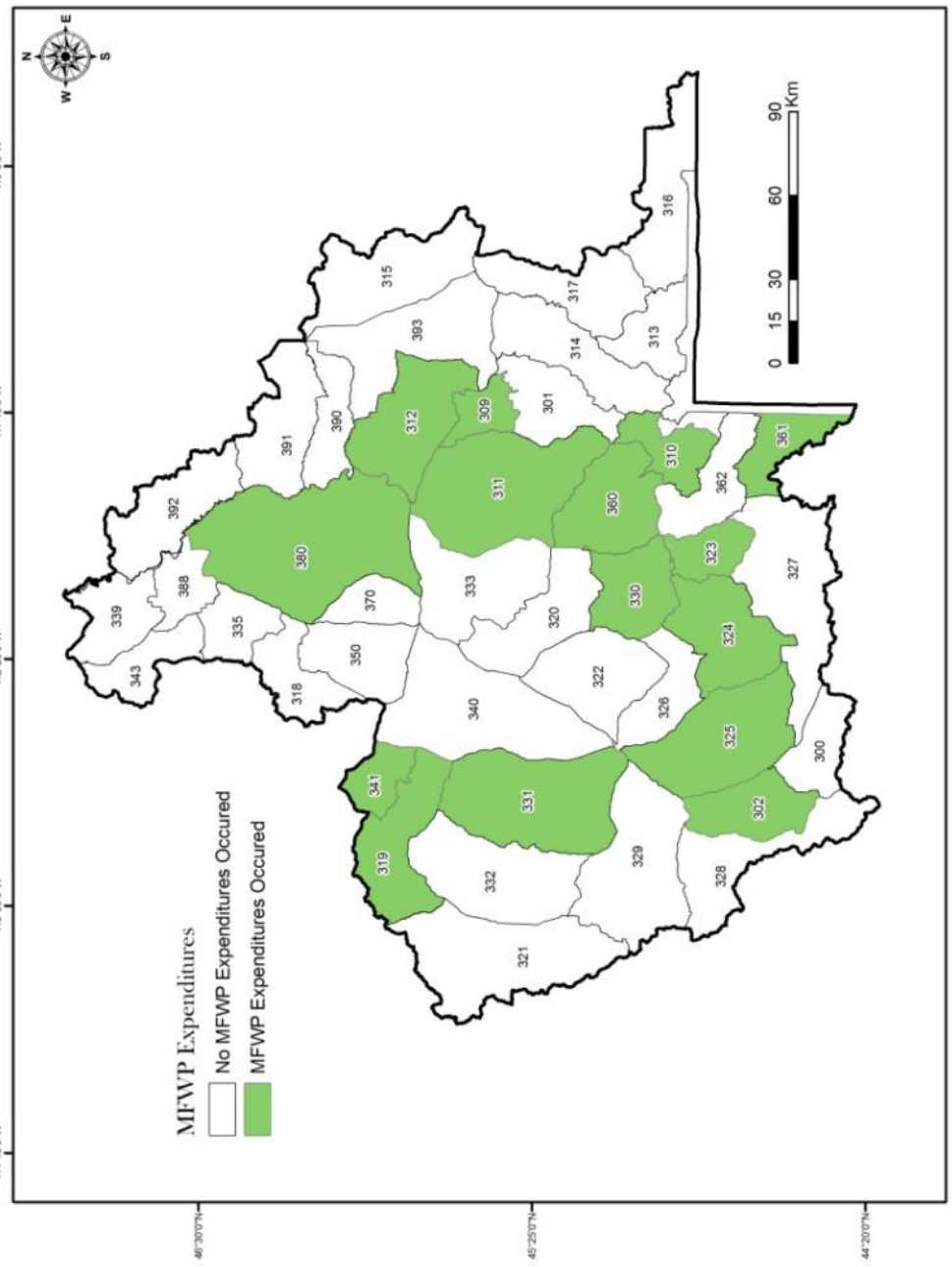

Figure 30. MFWP Hunting Districts where Expenditures Occurred (MFWP 2007; 2008b)

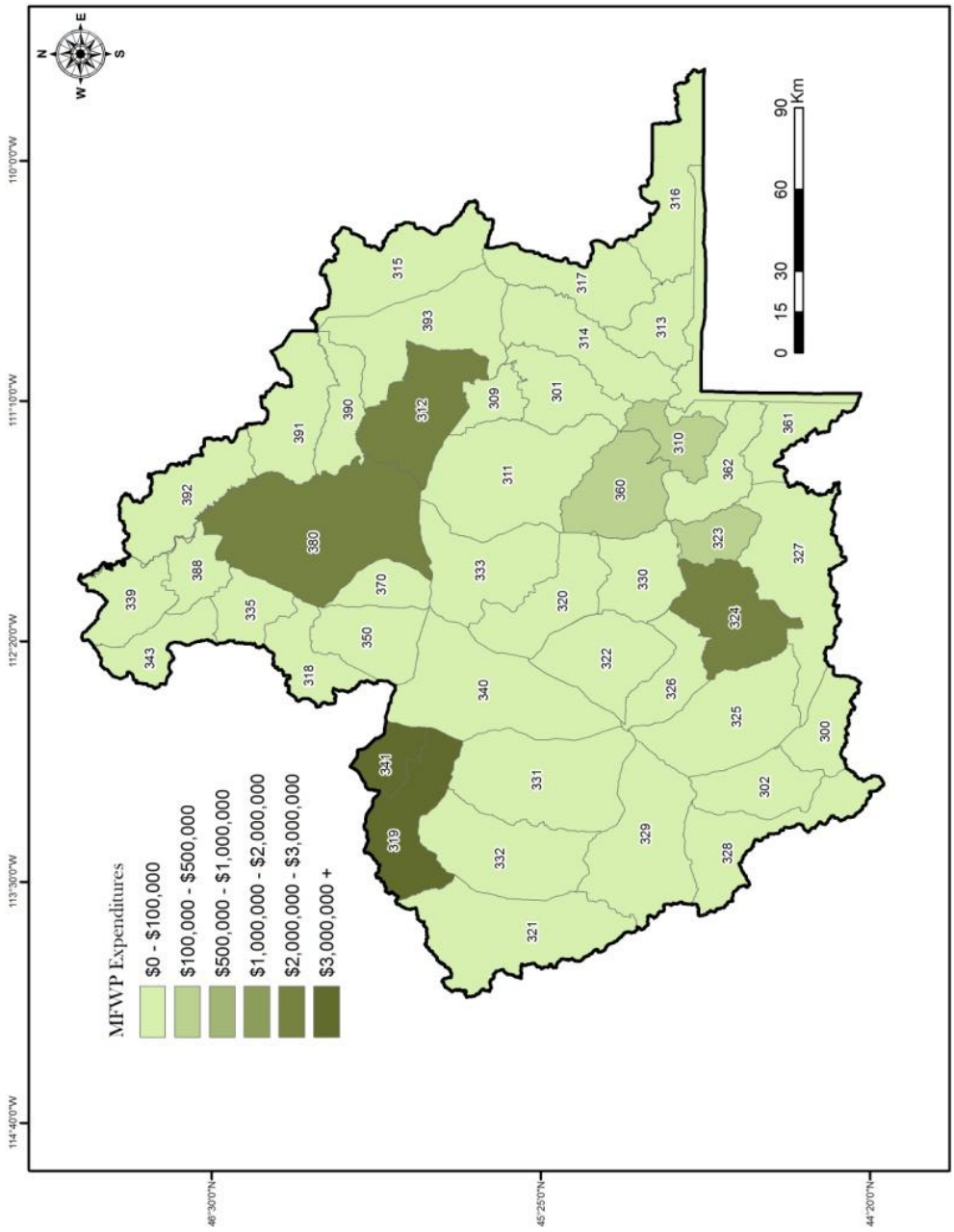

Figure 31. Total Hunter-related MFWP Expenditures (MFWP 2007,; 2008b)

Spatial Distribution of Expenditure,
Participation and Harvest Rates

Montana Department of Fish, Wildlife and Parks expenditure data, hunter harvest (Figure 32) and participation rates (Figure 33) were classified into quartiles for comparison purposes. Hunting districts were used to determine what, if any, relationship existed between district, expenditures, participation rates, and harvest rates. It was found that three of the top five hunting districts within each of the above mentioned categories occurred in the top quarter of all categories. Those hunting districts were 312, 324 and 380, while districts 319 and 331 occurred in the top quarter in two out of the five. It was also determined that those hunting districts that received the greatest funding also produced the highest participation and harvest rates (Table 10). This may be partially explained by the fact that the top three hunting districts contained 14 or more percent of lands managed by Montana Fish, Wildlife and Parks, and over 23 percent of these lands allowed hunting. This, however, was not the case in regards to hunting district 331 which saw one of the lowest overall expenditure rates, but was included in the top quarter of harvest rates. One possible explanation of this may be that over 80 percent of the nearly 500,000 acres within the hunting district allowed hunting, although less than 1 percent of those lands were managed by Montana Fish, Wildlife and Parks.

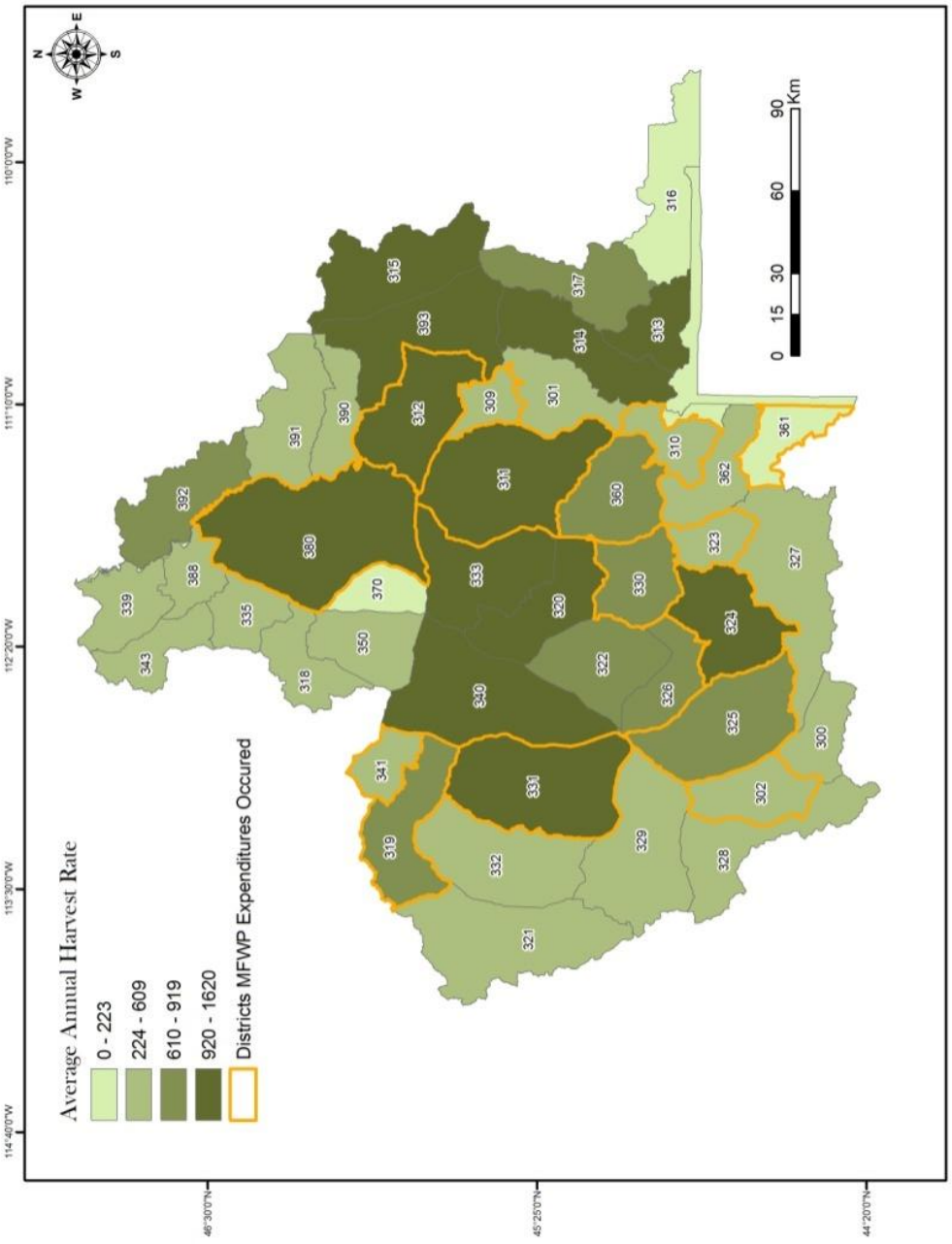

Figure 31. MFWP Region 3 Average Annual Harvest Rates (MFWP 2007; 2008b)

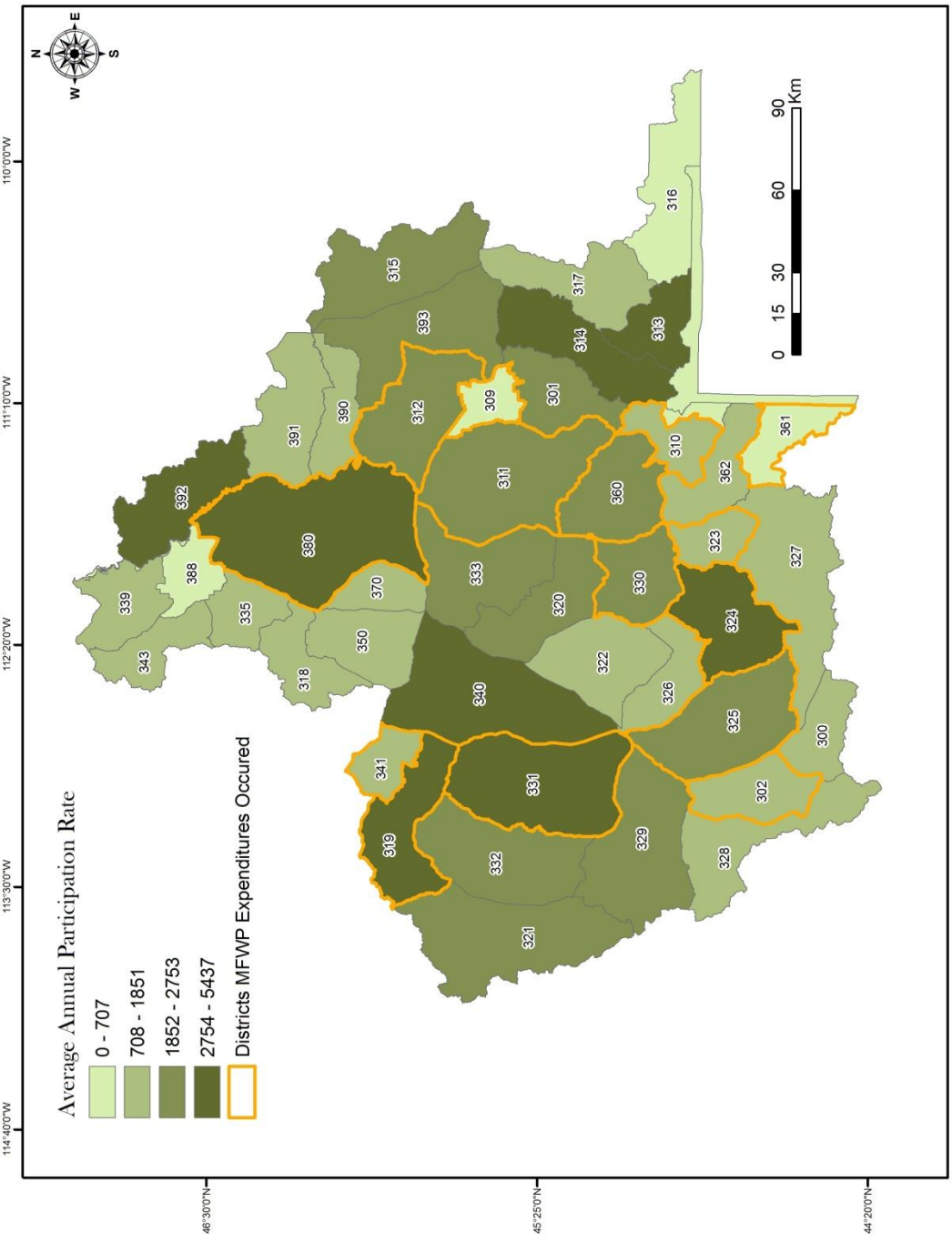

Figure 32. MFWP Region 3 Average Annual Participation Rates (MFWP 2007; 2008b)

Table 11. Region 3 Acres, Expenditures, Participation and Harvest Rates (MFWP 2007a; MFWP 2008a)

District	Total Acres	FWP Acres	Huntable Acres	% FWP	% Huntable	$ Expenditures	Participation	Harvest
300	156,086	0	109,739	0	70	0	24,728	8,022
301	210,815	1	177,771	0	84	0	63,577	13,779
302	199,972	0	160,968	0	81	46,270	25,417	8,157
309	96,368	551	3,083	1	3	51,005	1,413	1,097
310	140,208	5,416	38,227	4	27	172,576	42,644	6,997
311	529,284	1,578	145,386	0	27	77,854	59,618	27,458
312	330,809	57,023	75,407	17	23	2,414,051	69,594	28,307
313	160,581	5,408	87,833	3	55	0	79,931	30,131
314	308,861	257	123,272	0	40	0	87,113	31,393
315	371,642	8	74,302	0	20	0	60,646	30,992
316	297,912	3	115,035	0	39	0	17,599	4,009
317	273,239	390	179,904	0	66	0	37,545	15,501
318	176,041	0	143,171	0	81	0	35,933	6,471
319	286,986	29,658	259,817	10	91	1,506,975	84,192	15,539
320	269,304	19	120,706	0	45	0	60,579	24,976
321	499,314	9,209	325,744	2	65	0	49,674	8,919
322	291,573	170	75,552	0	26	0	39,699	20,405
323	118,308	7,054	114,745	6	97	264,921	32,974	7,861
324	296,169	40,619	261,605	14	88	2,081,337	79,842	23,746
325	405,580	226	252,780	0	62	32,300	49,497	18,605
326	172,152	4,866	81,047	3	47	0	42,917	18,696
327	450,204	801	269,804	0	60	0	38,107	8,947
328	299,074	9,992	229,618	3	77	0	26,397	7,254
329	440,821	7,846	295,988	2	67	0	49,745	13,018
330	213,381	93	118,778	0	5	45,346	48,009	15,999
331	490,476	606	391,325	0	80	3,199	85,437	23,720
332	392,410	1,913	318,287	0	81	0	55,541	11,285
333	342,975	3,189	137,237	1	40	0	53,034	24,767
335	139,187	92	75,799	0	54	0	7,156	2,845
339	188,585	19,728	73,207	10	39	0	7,344	3,689
340	539,436	117	261,585	0	48	0	72,667	23,706
341	109,864	36,745	107,428	33	98	1,860,936	25,277	6,266
343	160,582	11,096	91,847	7	57	0	8,959	3,172
350	224,931	3,961	189,465	2	84	0	36,886	7,322
360	279,060	13,341	122,658	5	44	142,532	57,125	20,180
361	143,966	5	115,103	0	80	1,056	15,809	2,614
362	196,170	256	148,105	0	75	0	30,337	9,958
370	118,170	3,429	47,200	3	40	0	19,978	4,176
380	728,111	175,003	296,255	24	41	2,527,070	108,489	30,077
390	157,278	0	14,783	0	9	0	33,485	9,528
391	277,340	2,502	70,629	1	25	0	29,135	9,778
392	284,871	0	211,886	0	74	0	55,287	14,076
393	394,794	10,655	49,576	3	13	0	59,694	21,802

With the exception of Hunting District 324, all of the top ranked districts were immediately adjacent to cities with populations of over 1,000, and near critical transportation infrastructure. Proximity to larger communities might facilitate an increased rate in both resident and non-resident hunter access and participation, and in-turn, species harvest. Larger communities, however, also tend to exact a greater impact on their surrounding environments which may impact hunting.

Geographic Comparison of Hunting Districts

Elevations range between 1054 and 3881 meters through Region 3, and vary considerably between hunting districts. Hunting Districts 309, 322, 312, and 380 which are concentrated in the north and east portions of the study area are dominated by intermountain and foothill grasslands ecotypes, with limited areas designated as Montane and no areas designated shrub-grasslands ecotypes (MFWP 2005a). Districts 302, 319, 324, 325, 330 and 341 which are concentrated in the western portion of the study area, are dominated by shrub-grassland ecotypes, with limited areas of intermountain and foothill grasslands, and little to no areas designated as Montane (MFWP 2005a). Lastly, Hunting Districts 310, 323, 331, 360 and 361, located in the southeastern portion of the study area, are almost entirely defined as Montane ecotypes (MFWP 2005a).

Hunting districts with the highest total hunter-related expenditure rates were located in areas designated as Intermountain and Foothill Grasslands (37 percent) and/or Montane ecotypes (42 percent), with only Hunting District 324, having expenditures above $2 million, occurring in an area dominated by a Shrub-grassland ecotype (19 percent). These relationships are consistent with deer and elk tendency's to limit their use of grasslands until

winter snows and reduced forage force them from higher elevations often after the hunting season (Ager et al. 2003). Hunter participation and harvest rates also correspond to areas dominated by Montane, and Intermountain and Foothill Grassland ecotypes, for the reasons mentioned above in regards to deer and elk.

Direct, Indirect and Induced Hunter Economic Impacts within Region 3

The total economic impact of hunters is calculated through the combination of direct, indirect and induced effects. Direct effects are defined as the income and employment generated by hunter purchases at local businesses. Indirect effects are defined as revenues businesses use to purchase goods and services. Induced effects are defined as employee purchases of goods and services with their wages (Johnson and Moore 1993; Koontz and Loomis 2005; Eiswerth et al. 2005).

Direct Expenditures of Hunters: 1991-2006

Between 1991 and 2006 direct hunter expenditures within southwestern Montana increased 123 percent, with the largest overall increase (172 percent) occurring within total trip-related expenditures (Table 12) including the food, lodging, transportation and other trip costs. Also of note, was a 112 percent increase over this time period in other total expenditures. The largest overall hunter economic impact occurred within equipment

Table 12. Direct Expenditures of Hunters within Region 3

	1991	1996	2001	2006
Total Trip Related	13,373,335	33,264,086	38,366,826	36,482,357
Food and Lodging	6,425,277	14,708,600	15,077,199	13,197,686
Transportation	6,564,195	12,104,046	13,134,725	13,814,388
Other Trip Costs[1]	383,863	6,451,439	10,154,902	9,470,283
Total Equipment Expenditures	20,546,431	27,718,680	35,474,076	39,818,040
Hunting Equipment	13,392,809	11,780,773	11,996,329	17,211,878
Auxiliary Equipment[2]	4,009,577	2,606,224	8,169,787	4,509,750
Special Equipment[3]	3,144,045	13,331,683	15,307,960	18,071,689
Total Other Expenditures	4,248,464	11,251,780	11,418,710	9,005,215
Magazines and Books	84,969	262,827	204,603	180,104
Membership Dues and Contributions	348,374	633,522	1,222,960	738,428
Other[4]	3,789,630	10,355,098	9,991,147	8,086,683
Total	38,168,230	72,234,546	85,259,612	85,305,613

* adjusted to 2006 dollars

[1] Includes boating costs, equipment rental, guide fees, access fees, heating and cooking fuel

[2] Includes tents, special clothing, etc.

[3] Includes boats, campers, 4x4 vehicles, cabins, etc.

[4] Includes land leasing and ownership, licenses, stamps, tags, and permits

Source: US Fish and Wildlife Services. 1991, 1996, 2001, 2006. National Survey of Fishing, Hunting, and Wildlife-Related Recreation

expenditures, with nearly $124 million spent between 1991 and 2006. Hunting equipment, including guns and ammunition, accounted for on average 21 percent of all expenditures.

Overall, direct hunter expenditures increased between 1991 and 2001 (123 percent), while they decreased overall between 2001 and 2006, including decreases of 5 percent in trip related expenditures, 21 percent in other expenditures, and a 12 percent increase in equipment expenditures.

At the statewide level, these trends in most cases are maintained although deviations do exists (Table 13). While Region 3 saw overall increases (123 percent) in direct expenditures between 1996 and 2001, Montana as a whole saw a 107 percent increase. This was reversed between 2001 and 2006 when Region 3 maintained equal direct expenditures, while Montana saw a 13 percent increase. Because direct hunter expenditures are calculated with the number of hunter participants, these variations suggest that while nearly a third of all statewide hunter expenditures occurred within Region 3, hunters are highly mobile and may not necessarily hunt consistently within the same region annually.

Indirect Expenditures of Hunters: 1991-2006

Between 1991 and 2006 total hunter-contributed indirect expenditures increased 124 percent, from nearly $8 million in 1991 to nearly $18 million in 2006, with the largest increase (78 percent) taking place between 1991 and 1996 (Table 14). The largest overall change in indirect expenditures occurred in the professional services industry which saw an increase of 120 percent. The highest overall expenditures occurred in the real estate and rental ($12 million), transportation and warehousing ($ 5.9 million), and professional services industries ($5.5 million). These results suggests that businesses spend the majority of revenues on their property, the storage and transportation of goods, as well as on professional services such as lawyers, accountants, guide services, and marketing and management firms. It should also be noted that while direct hunter expenditures were highest within the retail trade industries ($124 million), specifically total equipment sales,

Table 13. Direct Expenditures of Hunters within Montana

	1991	1996	2001	2006
Total Trip Related	46,662,020	131,478,600	124,204,680	132,808,000
Food and Lodging	22,418,970	58,136,760	48,809,320	48,044,000
Transportation	22,903,680	47,842,080	42,520,960	50,289,000
Other Trip Costs[1]	1,339,370	25,499,760	32,874,400	34,475,000
Total Equipment Expenditures	71,690,270	109,560,000	114,840,000	144,951,000
Hunting Equipment	46,729,970	46,564,320	38,835,640	62,657,000
Auxiliary Equipment[2]	13,990,150	10,301,280	26,448,000	16,417,000
Special Equipment[3]	10,970,150	52,694,400	49,556,360	65,787,000
Total Other Expenditures	14,823,670	44,473,440	36,965,718	32,782,000
Magazines and Books	296,473	1,038,840	662,360	655,640
Membership Dues and Contributions	1,185,893	2,504,040	3,959,080	2,622,560
Other[4]	13,193,066	40,929,240	32,344,278	29,503,800
Total	133,175,960	285,512,040	276,010,398	310,541,000

* adjusted to 2006 dollars

[1] Includes boating costs, equipment rental, guide fees, access fees, heating and cooking fuel

[2] Includes tents, special clothing, etc.

[3] Includes boats, campers, 4x4 vehicles, cabins, etc.

[4] Includes land leasing and ownership, licenses, stamps, tags, and permits

Source: US Fish and Wildlife Services. 1991, 1996, 2001, 2006. National Survey of Fishing, Hunting, and Wildlife-Related Recreation

indirect-expenditures within retail trade were no higher than the average for all indirect expenditures.

Induced Expenditures of Hunters: 1991-2006

Between 1991 and 2006, induced expenditures of hunters (Table 15) increased 115 percent, totaling nearly $85 million, with employees contributing, on average, 17 percent

Table 14. Indirect Expenditures of Hunters within Region 3: 1991-2006

Industry	1991	1996	2001	2006
Agriculture and Forestry	63,348	139,022	145,222	129,841
Mining	1,635	2,833	3,306	3,392
Utilities	370,064	584,405	708,665	744,575
Construction	220,957	358,864	435,182	449,948
Manufacturing	645,943	1,157,473	1,339,575	1,324,575
Wholesale Trade	409,365	739,859	832,855	840,412
Transportation & Warehousing	879,065	1,461,810	1,715,459	1,809,238
Retail Trade	454,936	711,162	865,584	922,532
Information	753,497	1,186,839	1,483,070	1,572,945
Finance & Insurance	538,018	893,274	1,064,007	1,121,071
Real Estate & Rental	1,797,805	2,841,390	3,502,987	3,694,682
Professional Services	777,114	1,324,685	1,638,816	1,711,992
Administrative	447,150	738,022	900,514	934,877
Educational Services	74,982	118,475	175,584	153,727
Health & Social Services	333	527	727	670
Arts, Entertainment, Recreation	73,380	124,287	146,537	149,609
Accommodation & Food	266,791	418,624	511,878	540,533
Government	140,223	235,582	281,699	290,036
Total	7,914,606	14,073,787	16,996,439	17,714,768

adjusted to 2006 dollars

of their wages to the health and social services industries and 13 percent to the retail trade industry. This is in contrast to the less than 1 percent of hunter-contributed indirect expenditures that are spent on health and social services.

Total Economic Impact of Hunters: 1991-2006

The total economic impact of hunters within Montana Fish, Wildlife and Parks Region 3 between 1991, 1996, 2001, and 2006 was $422,924,844 million (Table 16). Hunter-contributed expenditures increased the highest between 1991 and 1996 (86 percent), and the least between 2001 and 2006 (<1 percent). The largest change in expenditures

Table 15. Induced Expenditures of Hunters within Region 3: 1991-2006

Industry	1991	1996	2001	2006
Agriculture and Forestry	87,875	169,726	192,509	188,858
Mining	4,723	9,122	10,346	10,150
Utilities	246,488	476,078	539,982	529,736
Construction	87,790	169,561	192,322	188,677
Manufacturing	476,604	920,530	1,044,099	1,024,299
Wholesale Trade	446,657	862,689	978,494	959,940
Transportation & Warehousing	345,787	667,865	757,520	743,161
Retail Trade	1,531,186	2,957,385	3,354,380	3,290,786
Information	361,238	697,708	791,368	776,367
Finance & Insurance	975,207	1,883,547	2,136,396	2,095,901
Real Estate & Rental	828,732	1,600,651	1,815,503	1,781,043
Professional Services	345,456	667,226	756,794	742,445
Management of Companies	15,053	29,074	32,977	32,352
Administrative & Waste Services	131,455	253,897	287,980	282,520
Educational Services	60,823	117,475	133,247	130,726
Health & Social Services	2,026,957	3,914,938	4,440,469	4,356,268
Arts, Entertainment, Recreation	220,563	426,002	483,190	474,035
Accommodation & Food Services	934,464	1,804,853	2,047,142	2,008,350
Other Services	794,948	1,535,388	1,741,502	1,708,499
Government	1,718,138	3,318,458	3,763,951	3,692,659
Total	11,640,144	22,482,172	25,500,172	25,016,771

adjusted to 2006 dollars

between 1991 and 2006 occurred in the professional services industry (692 percent increase), while nearly all remaining industries saw increases of at least 100 percent. Hunters contributed 33 percent of their total expenditures to the retail trade industry, with roughly 13 percent being contributed to government agencies, accommodation and food services, and transportation and warehousing industries, each.

Table 16. Total Economic Impact of Hunters within Region 3: 1991-2006

Industry	1991	1996	2001	2006
Agriculture and Forestry	151,224	308,748	337,731	318,700
Mining	6,357	11,954	13,652	13,542
Utilities	616,552	1,060,482	1,248,647	1,274,311
Construction	308,747	528,425	627,504	638,625
Manufacturing	1,122,547	2,078,003	2,383,674	2,348,875
Wholesale Trade	856,022	1,602,547	1,811,349	1,800,352
Transportation & Warehousing	7,789,047	14,233,721	15,607,704	16,366,787
Retail Trade	22,617,520	31,650,056	39,898,644	44,211,460
Information	1,114,736	1,884,548	2,274,438	2,349,312
Finance & Insurance	1,513,225	2,776,822	3,200,402	3,216,972
Real Estate & Rental	2,626,537	4,442,041	5,318,491	5,475,725
Professional Services	1,506,433	8,443,351	12,550,512	11,924,719
Management of Companies	172,656	253,134	312,860	341,029
Administrative	578,605	991,919	1,188,494	1,217,397
Educational Services	135,805	235,950	308,831	284,452
Health & Social Services	2,027,290	3,915,465	4,441,196	4,356,938
Arts, Entertainment, Recreation	293,943	550,288	629,727	623,645
Accommodation & Food Services	7,626,533	16,932,078	17,636,220	15,746,571
Other Services	1,629,524	2,981,504	3,929,352	3,458,364
Government	5,647,992	13,909,138	14,036,797	12,069,378
Total	58,341,294	108,790,175	127,756,224	128,037,151

Hunter-contributed Job Opportunities: 1991-2006

Hunters' expenditures increased jobs by 108 percent between 1991 and 2006, with the largest overall increase (356 percent) occurring in the professional services industries (Table 17). As with the total economic impact of hunters, employment opportunities also increased the greatest between 1991 and 1996 (77%), and maintained this amount between 2001 and 2006. The largest number of jobs occurred in the retail trade,

Table 17. Hunter-contributed Job Opportunities: 1991-2006

Industry	1991	1996	2001	2006
Agriculture and Forestry	1.7	4	3.8	3.6
Mining	0	0	0	0
Utilities	4	6	8	8
Construction	4	7	8	8
Manufacturing	8	15	17	17
Wholesale Trade	11	21	23	23
Transportation & Warehousing	202	370	404	424
Retail Trade	652	907	1,146	1,273
Information	9	15	18	19
Finance & Insurance	13	24	2	28
Real Estate & Rental	32	53	64	66
Professional	27	91	127	123
Management of Companies	4	6	7	8
Administrative & Waste Services	14	24	29	30
Educational Services	5	9	12	11
Health & Social Services	34	66	75	74
Arts - Entertainment & Recreation	10	18	21	20
Accommodation & Food Services	195	434	452	403
Other Services	36	67	93	77
Government	98	265	257	209
Total	1,360	2,401	2,792	2,824

accommodation and food services, and transportation and warehousing industries. These increases correspond to similar increases in total hunter-contributed expenditures.

Direct, indirect and induced hunter-contributed expenditures, as well as hunter-contributed employment opportunities all saw their largest increases between 1991 and 1996. Small decreases (1 percent) between 2001 and 2006 correspond to a decrease of 9 percent in hunter participation within Region 3 (Figure 28), while the increases between 1991 and 1996 correspond to a 12 percent decrease (Figure 28) in hunter participation suggesting that other

mechanisms exist that impact hunter-contributed expenditures outside the perview of this study.

Average Annual Expenditure: MFWP versus Hunters

Average annual hunter expenditures to local communities in Montana Fish, Wildlife and Parks Region 3 were $813 per hunter, or $2,659 per deer or elk harvested. This is in contrast to Montana Fish, Wildlife and Parks, who spent on average $33 annually per hunter, or $112 per species harvested (Table 18). This had a total direct economic impact in southwestern Montana of $1.6 billion between 1980 and 2006. Hunting District 380 saw the highest overall estimated expenditures with $88 million (from 108,489 hunters), followed by Hunting District 314 ($70.8 million, from 87,113 hunters), Hunting District 331 ($69.5 million, from 85,437 hunters), Hunting District 319 ($68.4 million, from 84,192 hunters), and Hunting District 324 $65 million (from 79,842 hunters) and Hunting District 313 $65 million (from 79,931 hunters). Overall, while per hunter expenditures by Montana Fish, Wildlife and Parks decreased over time, the amount hunters spent annually increased or held constant. The same relationship exists when considering expenditures per animal harvested by hunters and Montana Fish, Wildlife and Parks, although per harvest expenditures by hunters has decreased since its peak in 1996.

Table 18. Average Annual Expenditure per MFWP, Hunter, Harvested Species in Region 3

	Participation	Harvest	FWP Expenditures	Hunter Expenditures	FWP Expenditure Per Hunter	Hunter Expenditure Per Hunter	FWP Expenditure Per Harvest	Hunter Expenditure Per Harvest
1991	98,746	39,197	2,585,003	38,168,230	26	387	72	974
1996	78,699	19,855	3,680,120	72,239,546	47	918	185	3,638
2001	92,982	24,209	3,793,353	85,259,612	41	917	157	3,522
2006	82,901	34,116	1,211,442	85,305,613	15	1,029	36	2,500
Average	88,332	29,344	4,067,480	70,243,250	33	813	112	2,659

CONCLUSION

Through the implementation of the public trust doctrine, Montana Fish, Wildlife and Parks has been charged with the sustainability and management of the state's wildlife population for the benefit of all. This study has described the process by which Montana Fish, Wildlife and Parks funds these efforts through hunter-generated revenues from general license and permit fees, and hunter-imposed taxation through the Pittman-Robertson Act.

The primary objective of this study was to determine the economic importance of hunting to Region 3 of southwestern Montana. The secondary objective was to develop a replicable methodology for similar studies in other locations. Lastly, this study set out to see if a spatial and temporal coincidence occurs between expenditures by Montana Fish, Wildlife and Parks, and hunter participation and species harvests. The use of input-output modeling which implemented IMPLAN software in conjunction with data from the National Survey of Fishing, Hunting and Wildlife-related Recreation, as well as the Gross Expenditure Model with data from Montana Fish, Wildlife and Parks has been shown to be effective in examining the economic impact of hunters. Further, spatial and temporal relationships were shown to occur in this study.

Since the first territorial legislature was called to session in 1864, the citizens of Montana have placed wildlife as one of their top priorities (Books 2000). Initial management efforts that focused on predator control, open hunting seasons and bag limits proved unsuccessful. Undeterred, the Montana Fish and Game Commission hired biologists in the early 1940's who introduced the scientific method to the decision making process. Today's policies and procedures are established through multiple decision makers from both the

public and private sectors. While the scientific method is invaluable to this process, additional inputs are needed as perceptions, values and policies change to reflect varying constituents. As such, this study has attempted to show that hunters contribute financially a considerable amount to wildlife habitat and conservation, and should thus be adequately represented in this process.

When hunters purchase guns and ammunition they are initiating a process in which the user pays and the user benefits. These hunter-related expenditures are taxed, and the tax is returned to Montana Fish, Wildlife and Parks Region 3 through the Pittman-Robertson Act. This taxation averages over $1 million per year in Region 3. An additional $2 million is added each year through general license and permit fees, all of which is used by Montana Fish, Wildlife and Parks for wildlife management including research, regulation enforcement and administration.

Hunter-related expenditures benefit both hunters and non-hunters. One method by which Montana Fish, Wildlife and Parks has benefited both hunters and non-hunters alike is through the acquisition of lands. While land assets managed and acquired by Montana Fish, Wildlife and Parks Since may be used by hunters for a select number of months each year, they are open and available to all for the majority of the year. Further, even those who may not value these lands for their use today should reflect on the value they gain from their existence for future generations. This study has shown that the acquisition of additional lands resulted in a positive impact in the number of hunter participants 35 percent of the time within the hunting district where the acquisition occurred (Table 10). This in-turn has direct,

indirect and induced economic implications within local communities as more hunters are drawn to the area.

Expenditure rates by Montana Fish, Wildlife and Parks fluctuated between 1980 and 2006, and have ultimately seen a long-term decline of over 50 percent, averaging just $32 per hunter annually as of 2006. This does not suggest, however, that these expenditures did not produce positive results for hunters and local communities. In fact, the research conducted in this study has shown just the opposite to be true. Minor contributions by game management agencies have had lasting impacts in the form of increased hunter participation and harvest rates. This study has shown that expenditure levels have a relationship to participation and harvest rates, with higher expenditure rates equating to higher participation and harvest rates. Between 1980 and 2006, hunter-related expenditures resulted in an increase in hunter participation during the subsequent year 51 percent of the time, and an increase in harvest rates 52 percent of the time (Table 10). Further, of the 15 hunting districts where expenditures occurred, 47 percent saw overall increases in hunter participation rates, while 40 percent saw overall increases in harvest rates. Some unexpected results did exist as evidenced by hunting districts where limited funding resulted in high participation and harvest rates.

On average, individual hunters directly spent $813, or over $70 million in total, annually, within Region 3. The total hunter-related economic impact (direct, indirect and induced effects) between 1991 and 2006 averaged over $100 million annually within the study area. Within Montana Fish, Wildlife and Parks Region 3, hunter-related expenditures to local communities have shown an increasing or stabilizing trend between 1991 and 2006.

Between 1991 and 2006, hunter-related expenditures increased 123 percent, while between 2001 and 2006 they showed limited change. While Region 3 hunter-related expenditures may account for nearly one-third of statewide expenditures, they have slowed slightly relative to the state as a whole which saw an increase of 133 percent between 1991 and 2006, with an increase of 13 percent between 2001 and 2006. Compared to all economic activity in southwestern Montana, this study has shown that the hunting industry contributed in 2006 over $85 million to Region 3. Further, hunters have contributed nearly $2 billion dollars to southwestern Montana since 1980, an amount that further speaks to the impact that hunters have to local communities.

The user-pay, user-benefit model suggests that when hunters acquire guns and ammunition to pursue their recreation of choice they are contributing towards the improvement of wildlife habitat and sustainable wildlife populations through the Pittman-Robertson Act. These hunters further contribute to the conservation initiatives of agencies such as Montana Fish, Wildlife and Parks by purchasing hunting licenses and permits. Combined, these license revenues and Pittman-Robertson funds support the management goals and objectives of Montana Fish, Wildlife and Parks. Hunters also contribute to local communities through trip-related expenditures, contributing to the livelihoods of both hunters and non-hunters. By having a positive economic impact to local communities, local businesses and community members might influence decision and policy makers to acquire additional lands, and manage game populations to support hunting in order to continually bring additional hunter expenditures to the region.

This model has been successful in Montana, but questions arise for the future. How will Montana Fish, Wildlife and Parks continue to cope with decreasing hunter participation rates, at least in the short term (3 percent overall, 12 percent since 2000), and thus decreases in hunter-related funding (Figure 28)? Traditionally increased management costs have been supplemented by increases in general license and user fees. Further, at what point do wildlife agencies attempt to allocate funds from outside the hunting community, and at what point does the general public begin to contribute to conservation efforts themselves through the taxation of outdoor recreation equipment (Chris Hunter; personal communication 2008, Maffly 2008)?

This study has shown that the tools necessary to conduct a study of the economic importance of hunting exist, and are in most cases readily available, and replicable. This is not to say, however, that in all cases data will be easily cataloged as this study found. The advent of digital technology has greatly reduced the time needed to query or catalog data, but in most cases data prior to the year 2000 may not be found in this format unless specific departmental policy has dictated as such. Data abounds, at least through Montana Fish, Wildlife and Parks in microfiche or microfilm format, but the processing of this form of data is subject to numerous users errors and should only be used as an estimate without verification. One of the largest issues encountered in this study was the management of vast amounts of data in varying formats. A standard format should be implemented as early as possible in any project cycle, with particular attention paid to nomenclature and naming conventions to ensure accuracy in analysis. Further, an accurate appraisal of hunter participation and harvest rates was not always possible due to inconsistencies and omissions

in data from Montana Fish, Wildlife and Parks. This was especially evident for the years 1993 – 1999.

Future researchers must refine the methodology to incorporate a statistical appraisal of results. They must also delve deeper into the correlation between agency expenditures, participation and harvest rates, and hunter expenditures, always being conscious of the ever evolving and modified spatial landscape of wildlife agencies. Additional attention must also be paid to the collection of data held on microfiche and the transferability of that data to the digital realm. Further, the scope of this study only allowed for analysis of hunter expenditures on public lands while many hunters spend money to hunt on private land within the study area.

The public trust doctrine was established so that wildlife populations could be managed at the state level for the benefit of all. To date these efforts have been funded primarily by hunters, although they are just one of many stakeholders who benefit from this resource. By educating the hunting and non-hunting public about the direct and indirect benefits of hunting, it is hoped that a more favorable environment will be created that is mutually beneficial for all stakeholders. It is hoped that this research has contributed to this end. Further, the rates of hunter attrition (Maffly 2008) should be mitigated and the current financial support by hunters should be complimented by non-hunters. While this has been attempted previously and failed (Franklin and Reis 1996), it is time once again to bring the issue of wildlife conservation funding to the general public. The economic importance of hunters cannot be underestimated, however it is the duty of decision makers and scientists to

take this knowledge and apply it appropriately to management initiatives for the benefit of all.

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APPENDICES

APPENDIX A

MONTANA FISH, WILDLIFE AND PARKS

EXPENDITURES BY YEAR

APPENDIX A

1980 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
1310	Region 3 Headquarters	201,825	0	201,825
4301	Enforcement Base	931,620	0	931,620
4311	Enforcement Base Wildlife	628	0	628
43011	Wildlife Damage	27,989	0	27,989
5361	Wildlife Mgmt FA	141,449	424,336	565,785
5371	Gallatin WMA	5,874	17,621	23,495
5372	Bear Creek WMA	4,389	13,165	17,553
5373	Wall Creek WMA	9,717	29,148	38,866
5374	Fleecer WMA	10,005	30,014	40,020
5375	Canyon Ferry WMA	16,854	50,557	67,410
5376	Clark Canyon WMA	1,201	3,602	4,802
5377	Blacktail WMA	9,578	28,731	38,309
5381	Mt. Haggin WMA	188,015	0	188,015
6301	FAS O&M	144,255	0	144,255
6310	Helena Valley Reservoir O&M	14,888	0	14,888
7341	Gallatin Forks FAA	972	0	972
7342	Eight Mile Ford FAS	27,649	0	27,649
7343	Maiden Rock FAS	1,693	0	1,693
7344	Raynold's Pass FAA	559	0	559
7345	Valley Garden FAS	480	0	480
7346	Fairweather FAA	1,490	0	1,490
7347	Cobblestone FAA	27,126	0	27,126
7348	Varney Bridge FAS	23,996	0	23,996
8341	Information Officer	79,494	0	79,494
	Total	1,871,747	597,174	2,468,920

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1981 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
1310	Region 3 Headquarters	146,405	0	146,405
4301	Enforcement Base	821,674	0	821,674
43011	Wildlife Damage	19,812	0	19,812
4311	Enforcement Base Wildlife	427	0	427
5361	Wildlife Mgmt FA	137,244	411,723	548,968
5371	Gallatin WMA	4,897	14,689	19,585
5372	Bear Creek WMA	2,284	6,852	9,137
5373	Wall Creek WMA	8,725	26,171	34,896
5374	Fleecer WMA	8,329	24,985	33,314
5375	Canyon Ferry WMA	12,288	36,860	49,148
5376	Clark Canyon WMA	1,011	3,033	4,045
5377	Blacktail WMA	7,186	21,555	28,741
5381	Mt. Haggin WMA	112,952	0	112,952
53811	Mt. Haggin WMA Timber Sales	0	42,738	42,738
53611	Mt. Haggin Surveys - Timber	0	106,679	106,679
58931	Bridger Mule Deer Research	45,621	136,857	182,478
58934	Big Game Research	4,291	64,352	68,643
58935	Other Big Game Research	966	2,899	3,865
58936	Gallatin Valley Deer Research	0	27,782	27,782
6301	FAS O&M	130,400	0	130,400
7331	Pipe Organ FAS	16,871	0	16,871
7332	Cameron Bridge FAS	9,948	0	9,948
7333	Drouillard FAS	3,942	0	3,942
7341	Gallatin Forks FAA	865	0	865
7342	Eight Mile Ford FAS	24,600	0	24,600
7343	Maiden Rock FAA	1,506	0	1,506
7344	Raynolds Pass FAA	497	0	497
7345	Valley Garden FAA	427	0	427
7346	Fairweather FAA	1,326	0	1,326
7347	Cobbelstone FAA	24,135	0	24,135
7348	Varney Bridge FAS	21,350	0	21,350
8341	R-3 Information Officer	74,569	0	74,569
	Total	1,644,549	927,176	2,571,725

*adjusted to 2006 dollars

APPENDIX A CONTINUED

1982 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
1310	Region 3 Headquarters	165,266	0	165,266
4301	Enforcement Base	938,740	0	938,740
5361	Wildlife Mgmt FA	165,836	497,497	663,333
5371	Gallatin WMA	6,499	19,493	25,992
5372	Bear Creek WMA	3,983	11,947	15,930
5373	Wall Creek WMA	7,227	21,225	28,452
5374	Fleecer WMA	7,865	23,592	31,456
5375	Canyon Ferry WMA	13,849	41,544	55,393
5376	Clark Canyon WMA	547	1,640	2,186
5377	Blacktail WMA	10,408	31,220	41,628
5381	Mt. Haggin WMA	110,463	0	110,463
5382	Mt. Haggin WMA -Per Timber	0	15,836	15,836
5341	MT Haggin Fence/Timber Sales	0	44,315	44,315
5831	Bridger Mule Deer Res	52,035	154,995	207,030
8324	Big Game Research	23,699	69,985	93,684
5835	Other Big Game Research	131	392	523
5846	Wildlife Planning	21,537	63,499	85,035
5847	Peregrine Falcon SEI	25,321	8,440	33,761
5848	Rocky Mtn. Bald Eagle Ecology	0	3,835	3,835

APPENDIX A CONTINUED

1982 MONTANA, FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUTED

Project	Title	GLF	PR	Total
5853	Nongame Wildlife	24,306	71,803	96,109
5862	Harvest Surveys	97,628	291,765	389,393
5891	Wildlife Lab (MSU)	42,057	125,055	167,112
5892	Small Game Research	1,358	4,072	5,430
5894	Fur Bearer Research (MSU)	34,393	102,067	136,460
5896	Bobcat Research (MSU)	0	9,536	9,536
5897	Eastern Montana Cat Study (MSU)	0	10,756	10,756
5911	Mackie Contract - MSU	0	53,639	53,639
5912	MSU Student Studies	570	1,709	2,279
5914	Student Bighorn Sheep-Mtn Lion	38,520	0	38,520
5915	Ag - Gallatin Valley Deer	0	17,649	17,649
6301	FAS O&M	129,230	0	129,230
7331	Pipe Organ FAS	15,429	0	15,429
7332	Cameron Bridge FAS	9,098	0	9,098
7333	Drouillard FAS	3,605	0	3,605
8341	Information Officer	73,517	0	73,517
	Total	2,023,114	1,697,508	3,720,621

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1983 MONTANA, FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
1310	Region 3 Headquarters	169,220	0	169,220
4301	Enforcement Base	957,167	0	957,167
5351	Region Wildlife	66,392	0	66,392
5361	Wildlife Management	158,307	474,908	633,215
5371	Gallatin WMA	3,984	11,948	15,932
5372	Bear Creek WMA	3,271	9,813	13,085
5373	Wall Creek WMA	10,249	30,744	40,993
5374	Fleecer WMA	7,868	23,602	31,469
5375	Canyon Ferry WMA	14,520	43,558	58,079
5376	Clark Canyon WMA	1,246	3,738	4,984
5377	Blacktail WMA	11,501	34,500	46,001
5381	Mt. Haggin WMA	92,670	0	92,670
5341	Mt. Haggin Fence/Timber Sales	0	311	311
6312	Mt. Haggin O&M	0	4,140	4,140
5831	Bridger Mule Deer Study	53,078	159,229	212,306
5834	Big Game Research	24,689	74,063	98,752
5836	Wildlife - Livestock Grazing	20,142	60,421	80,563
5846	Wildlife Planning	22,446	67,335	89,781
5847	Peregrine Falcon SEI	40,890	13,630	54,520
5848	Rocky Mountain Bald Eagle Ecology	3,371	1,124	4,495

APPENDIX A CONTINUED

1983 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
5853	Nongame Wildlife	24,265	72,792	97,058
5854	Pheasant Habitat Enhancement	2,635	0	2,635
5855	Printing Research Publications (MSU)	23,253	0	23,253
5856	Research State -Wide Activities (MSU)	69,619	0	69,619
5862	Harvest Surveys	71,550	214,646	286,196
5891	Wildlife Lab (MSU)	42,441	127,318	169,759
5892	Small Game Research	6	18	24
5894	Fur Bearer Research (MSU)	40,492	121,686	162,178
5896	Bobcat Research (MSU)	0	0	0
5897	Eastern Montana Cat Study (MSU)	0	5,239	5,239
5911	Mackie Contract - MSU	0	58,837	58,837
5912	MSU Student Studies	4,817	14,451	19,268
5914	Student Bighorn Sheep-Mtn Lion	23,919	7,973	31,892
5915	Ag - Gallatin Valley Deer	0	5,574	5,574
5916	Rocky Mountain Front ML/DR	0	15,901	15,901
6301	FAS O&M	120,515	0	120,515
6316	Canyon Ferry DSM	17,668	0	17,668
8341	Information Officer	38,604	0	38,604
	Total	2,140,794	1,657,502	3,798,296

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1984 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
10311	Wildlife Damage	23,281	0	23,281
10300	R-3 Headquarters	197,616	0	197,616
4301	Enforcement Base	963,446	0	963,446
4304	Parks Enforcement	14,252	0	14,252
4318	Conservation Officer	7,770	0	7,770
5321	Elkhorns Wildlife Coordinator	81,971	0	81,971
5322	Elkhorns	90,260	0	90,260
5351	Region Wildlife	78,007	0	78,007
5361	Wildlife Management FA	159,045	477,123	636,168
5371	Gallatin WMA	20,037	0	20,037
5372	Bear Creek WMA	6,386	0	6,386
5373	Wall Creek WMA	32,832	0	32,832
5374	Fleecer WMA	29,544	0	29,544
5375	Canyon Ferry WMA	52,414	0	52,414
5376	Clark Canyon WMA	4,645	0	4,645
5377	Blacktail WMA	31,509	0	31,509
5381	Mt. Haggin WMA	87,925	0	87,925
7310	Mt. Haggin Ranch Fencing/DNRC	28,309	0	28,309
5831	Bridger Mule Deer Study	46,060	138,175	184,235
5834	Big Game Research	50,858	152,569	203,427
5836	Wildlife - Livestock Grazing	18,450	55,346	73,796
5837	White Tailed Deer Study	33,917	101,749	135,667
5847	Peregrine Falcon SEI	16	147	163
5853	Nongame Wildlife	92,992	0	92,992
5854	Pheasant Habitat Enhancement	2,138	0	2,138
5856	Research State -Wide Activities (MSU)	52,812	0	52,812
5862	Harvest Surveys	85,106	255,315	340,422
5891	Wildlife Lab (MSU)	156,565	0	156,565
5894	Fur Bearer Research (MSU)	31,092	93,271	124,362
5911	Mackie Contract - MSU	59,176	0	59,176
5912	MSU Student Studies	7,572	22,715	30,287
6301	FAS O&M	141,655	0	141,655
6316	Canyon Ferry DSM	31,409	0	31,409
8341	Information Officer	74,933	0	74,933
8342	Hunter Safety - Region 3	3,393	1,786	5,179
	Total	2,797,393	1,298,197	4,095,590

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1985 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2300	Region 3 Headquarters	196,722	0	196,722
2311	Wildlife Mgt Control	49,540	0	49,540
4301	Enforcement Base	40	0	40
4318	Conservation Officer	57	0	57
430110	Enforcement Big Game	480,855	0	480,855
430125	Enforcement Small Game	43,469	0	43,469
430135	Enforcement Non-Game	2,724	0	2,724
430137	Enforcement Endangered Specie	3,864	0	3,864
430198	Enforcement Benefits	142,297	0	142,297
4318	Conservation Officer	57	0	57
431810	Conservation Officer - Big Game	6,600	0	6,600
431825	Conservation Officer - Small Game	210	0	210
431870	Conservation Officer - Parks	109	0	109
5321	Elkhorns Wildlife Coordinator	921	0	921
532112	Elkhorns Wildlife Coordinator - Elk	72,451	0	72,451
532198	Elkhorns Wildlife Coordinator - Benefits	9,818	0	9,818
535111	R-3 Deer	6,121	0	6,121
535112	R-3 Elk	57,965	0	57,965
535113	R-3 Antelope	4,466	0	4,466
535114	R-3 MSE/SHE/Goat	4,357	0	4,357
535115	R-3 Black Bear	1,452	0	1,452
535116	R-3 Grizzly Bear	480	0	480
535117	R-3 Mountain Lion	1,117	0	1,117
535126	R-3 Upland Game Bird	175	0	175
535127	R-3 Water Fowl	4,997	0	4,997
535128	R-3 Furbearers	26	0	26
535135	R-3 Non-Game	822	0	822
535137	R-3 Endangered Speices	1,207	0	1,207
535198	R-3 Benefits	16,157	0	16,157
5361	R-3 Wildlife Mgmt FA W-130-R-12	14	42	56
536111	S&I (FA) - Deer	25,349	76,042	101,391
536112	S&I (FA) - Elk	78,229	234,680	312,908
536113	S&I (FA) - Antelope	6,979	20,934	27,912
536114	S&I (FA) - MSE/Sheep/Goat	8,466	25,395	33,861
536115	S&I (FA) - Black Bears	3,310	9,927	13,237
536116	S&I (FA) - Grizzly Bear	1,740	5,217	6,957

APPENDIX A CONTINUED

1985 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
536117	S&I (FA) - Mountain Lion	2,559	7,674	10,233
536126	S&I (FA) - Upland Game Bird	2,299	6,894	9,193
536127	S&I (FA) - Waterfowl	4,201	12,601	16,802
536128	S&I (FA) - Furbearers	901	2,701	3,601
536198	S&I (FA) - Benefits	18,263	54,786	73,049
5371	Gallatin WMA W-123-D-12	12,933	0	12,933
537112	Gallatin - Elk	10,434	0	10,434
537113	Gallatin - Antelope	1,371	0	1,371
537114	Gallatin - MSE/Sheep/Goat	367	0	367
537116	Gallatin - Grizzly Bear	26	0	26
537117	Gallatin - Mountain Lion	563	0	563
537135	Gallatin - Non Game	4	0	4
537198	Gallatin - Benefits	490	0	490
537212	Bear Creek - Elk	4,864	0	4,864
537226	Bear Creek - Upland Game Bird	96	0	96
537235	Bear Creek - Non Game	184	0	184
537298	Bear Creek - Benefits	19	0	19
5373	Wall Creek WMA W-123-D-12	4,752	0	4,752
537311	Wall Creek - Deer	24	0	24
537312	Wall Creek - Elk	9,444	0	9,444
537313	Wall Creek - Antelope	29	0	29
537317	Wall Creek - Mountain Lion	116	0	116
537335	Wall Creek - Non Game	4,827	0	4,827
537398	Wall Creek - Benefits	163	0	163
537411	Fleecer - Deer	859	0	859
537412	Fleecer - Elk	14,423	0	14,423
537416	Fleecer - Grizzly Bear	80	0	80
537427	Fleecer - Waterfowl	205	0	205
537435	Fleecer - Non Game	50	0	50
537498	Fleecer - Benefits	376	0	376
5375	Canyon Ferry WMA W-123-D-12	430	0	430
537511	Canyon Ferry - Deer	249	0	249
537512	Canyon Ferry - Elk	187	0	187
537516	Canyon Ferry - Grizzly Bear	3	0	3

APPENDIX A CONTINUED

1985 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
537526	Canyon Ferry - Upland Game Bird	587	0	587
537527	Canyon Ferry - Waterfowl	43,899	0	43,899
537528	Canyon Ferry - Furbearers	19	0	19
537598	Canyon Ferry - Benefits	8,714	0	8,714
537611	Clark Canyon - Deer	1,196	0	1,196
537612	Clark Canyon - Elk	1,576	0	1,576
537613	Clark Canyon - Antelope	318	0	318
537614	Clark Canyon - MSE/Sheep/Goat	87	0	87
537615	Clark Canyon - Black Bear	29	0	29
537626	Clark Canyon - Upland Game Bird	839	0	839
537627	Clark Canyon - Waterfowl	363	0	363
537698	Clark Canyon - Benefits	1,079	0	1,079
537711	Blacktail - Deer	2,046	0	2,046
537712	Blacktail - Elk	24,696	0	24,696
537716	Blacktail - Grizzly Bear	173	0	173
537735	Blacktail - Non Game	390	0	390
537798	Blacktail - Benefits	877	0	877
538111	Mt. Haggin - Deer	17,889	0	17,889
538112	Mt. Haggin - Elk	47,005	0	47,005
538113	Mt. Haggin - Antelope	715	0	715
538114	Mt. Haggin - MSE/Sheep/Goat	1,061	0	1,061
538115	Mt. Haggin - Black Bear	678	0	678
538127	Mt. Haggin - Waterfowl	1,035	0	1,035
538128	Mt. Haggin - Furbearers	14	0	14
538135	Mt. Haggin - Non Game	1,603	0	1,603
538198	Mt. Haggin - Benefits	3,437	0	3,437
5382	MT Haggin WMA -Per Timber Sales	19,226	0	19,226
538211	Mt. Haggin Timber Cons - Deer	317	0	317
538212	Mt. Haggin Timber Cons - Elk	466	0	466
5386	Mt. Haggin Fire	35,244	0	35,244
7310	Mt Haggin Ranch Fenching/DNRC	97,487	0	97,487
5383	R-3 Block Management Pilot Study	9,776	0	9,776
5831	Bridger Mule Deer Study	0	1	2
583111	Brider Research Deer	38,889	116,663	155,551

APPENDIX A CONTINUED

1985 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

583112	Bridger Research - Elk	23	70	93
583198	Bridger Research - Benefits	6,239	18,717	24,956
583411	Elk Res - Deer	46	137	183
583412	Elk Res - Elk	44,855	134,559	179,414
583416	Elk Res - Grizzly Bear	101	303	405
583498	Elk Res - Benefits	6,123	18,368	24,491
5837	White Taile Deer Study	22	65	87
5847	Peregrine Falcon S&I	98	23,683	23,781
5853	Non-Game Wildlife	14	0	14
585311	WL Sur & Inven - Deer	336	0	336
585335	WL Surv & Invent - Nongame	40,742	0	40,742
585337	WL Surv & Invent - Endang Species	25,243	0	25,243
585398	WL Surv & Invent - Benefits	13,393	0	13,393
5856	Research Statewide Activities	150	0	150
585611	Res Stwd Act IV - Deer	20,500	0	20,500
585612	Res Stwd Activ - Elk	15,929	0	15,929
585612	Res Stwd Activ - Antelope	793	0	793
585614	Res Stwd Activ - MSE/SHE/Goat	1,734	0	1,734
585616	Res Stwd Activ - Grizzly Bear	710	0	710
585617	Res Stwd Activ - Mountain Lion	310	0	310
585626	Res Stwd Activ - Upland Game Bird	1,517	0	1,517
585628	Res Stwd Activ - Furbearers	4,302	0	4,302
585635	Res Stwd Activ - Nongame	193	0	193
585637	Res Stwd Activ - Endangered Species	61	0	61
585698	Res Stwd Activ - Benefits	2,075	0	2,075
586211	Harvest Survey - Deer	13,334	40,000	53,333
586212	Harvest Survey - Elk	30,885	92,654	123,539
586213	Harvest Survey - Antelope	6,844	20,531	27,375
586214	Harvest Survey - MSE/SHE/Goat	9,243	27,729	36,972
586215	Harvest Survey - Black Bears	5,768	17,304	23,071
586216	Harvest Survey - Grizzly Bear	251	752	1,003
586226	Harvest Survey - Upland Game Birds	2,003	6,009	8,012

APPENDIX A CONTINUED

1985 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
586227	Harvest Survey - Other Birds	1,426	4,278	5,705
586228	Harvest Survey - Furbearers	2,061	6,182	8,243
586298	Harvest Survey - Benefits	2,188	6,564	8,752
5891	Wildlife Lab	1,097	0	1,097
589110	Wildlife Lab (MSU) - Big Game	14,563	0	14,563
589111	Wildlfie Lab (MSU) - Deer	9,769	0	9,769
589112	Wildlife Lab (MSU) Operations - Elk	13,015	0	13,015
589114	Wildlife Lab (MSU) - MSE/SHE/Goat	4,343	0	4,343
589115	Wildlife Lab (MSU) - Black Bear	7,705	0	7,705
589116	Wildlife Lab (MSU) - Grizzly Bear	53,246	0	53,246
589117	Wildlife Lab (MSU) - Mountain Lion	7,555	0	7,555
589127	Wildlife Lab (MSU) - Waterfowl - Other Birds	699	0	699
589128	Wildlife Lab (MSU) - Furbearers	1,745	0	1,745
589135	Wildlife Lab (MSU) - Nongame	629	0	629
589198	Wildlife Lab (MSU) - Benefits	45,370	0	45,370
5894	Fur Bearer Research	56	168	224
589412	Mammal Res - Elk	148	443	590
589428	Mammal Res - Furbearers	20,022	60,063	80,085
589498	Mammal Res - Benfits	3,482	10,446	13,928
5910	West Montana Bobcat Study	384	1,152	1,536
591025	West MT Bobcat Study - Small Game	3	10	14
591028	West MT Bobcat Study - Furbearer	3,491	10,472	13,962
5911	Mackie Contract - MSU	19,878	0	19,878
591111	Mackie Contract MSU - Deer	38,576	0	38,576
5912	MSU Student Terry Deer Studies	13,827	0	13,827
591211	MSU Terry Deer Study - Deer	4,971	14,912	19,883
631001	Parks - Wildlife	466	0	466
6311	MISC R3 FAS O&M	119,554	0	119,554
6321	Misc R3 SP's	7,251	0	7,251
6324	Missouri Headwaters SP O&M	21,576	0	21,576
6351	River Management	525	0	525
834110	Information Officer - Big Game	24,298	0	24,298
834125	Information Officer - Small Game	711	0	711

APPENDIX A CONTINUED

1985 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
834135	Information Officer - Nongame	285	0	285
834170	Information Officer - Dept Site Rec	2,052	0	2,052
834180	Information Officer - Off Site Rec	338	0	338
834198	Informaiton Officer - Benefits	22,385	0	22,385
834210	Hunter Safety - Big Game	894	2,681	3,575
834225	Hunter Safety - Small Game	1	2	3
834298	Hunter Safety - Benefits	275	825	1,101
	Total	2,415,381	1,092,636	3,508,017

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1986 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
230001	Game Damage Pers Serv	182	0	182
230011	Game Damage Pers Serv - Deer	1,783	0	1,783
230012	Game Damage Pers Serv - Elk	765	0	765
230013	Game Damage Pers Serv - Antelope	181	0	181
230016	Game Damage Pers Serv - Grizzly	362	0	362
230020	Game Damage Pers Serv - Buffalo	2,445	0	2,445
231101	Game Damage Pers Serv - Other	1,055	0	1,055
231120	Game Damage Opns - Buffalo	8,794	0	8,794
231111	WL Mgt Cntl - Deer	36,967	0	36,967
231112	WL Mgt Cntl - Elk	4,098	0	4,098
231113	WL Mgt Cntl - Antelope	704	0	704
231115	Wl Mgt Cntl - Black Bear	4,031	0	4,031
231116	Wl Mgt Cntl - Grizzly Bear	6,253	0	6,253
4301	Enforcement Base	517	0	517
430101	Hunter Ed Pers Serv	3,807	0	3,807
430110	R-3 Enforcement Big Game	441,251	0	441,251
430111	Game Damage Pers Serv - Deer	15,535	0	15,535
430112	Game Damage Pers Serv - Elk	9,654	0	9,654
430113	Game Damage Pers Serv - Antelope	1,349	0	1,349
430115	Game Damage Pers Serv - Black Bear	8,669	0	8,669
430116	Game Damage Pers Serv - Grizzly	14,661	0	14,661
430120	Game Damage Pers Serv - Buffalo	21,874	0	21,874
430125	R-3 Enforcement Small Game	47,620	0	47,620
430128	Game Damage Pers Serv - Other	2,497	0	2,497
430198	R-3 Enforcement Benefits	148,246	0	148,246
431601	Field Admin - Outfitters	11,562	0	11,562
431602	Field Admin - License Agents	10,522	0	10,522
436110	Saturation Patrols	15,654	0	15,654
531712	Elk Allow Harvest Eval	7,232	21,695	28,927
531811	Mule Deer Allow Harvest Eval	3,909	11,726	15,635
532111	Elkhorn WL Coord	90,760	0	90,760
532112	Elkhorns WL Coord - Elk	85,380	0	85,380
532198	Elkhorns WL Coord - Benefits	4,876	0	4,876
53260	Landowner COOP MGT	48,036	0	48,036
532611	Landowner COOP MGT - Deer	16,783	0	16,783

APPENDIX A CONTINUED

1986 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
532612	Landowner COOP MGT - Elk	30,245	0	30,245
532698	Comp Time Vacation Sick Leave	287	0	287
53510	R3 Wildlife	202,584	0	202,584
535110	Game Damage Pers Serv	481	0	481
535111	R3 - Deer	9,839	0	9,839
535112	R-3 Elk	99,806	0	99,806
535113	R-3 Antelope	850	0	850
535114	R-3 MSE/Sheep/Goat	1,857	0	1,857
535115	R-3 Black Bear	1,268	0	1,268
535116	R-3 Grizzly Bear	83	0	83
535117	R-3 Mountain Lion	1,581	0	1,581
535118	R-3 Sheep	1,378	0	1,378
535119	R-3 Goat	1,136	0	1,136
535120	R-3 Buffalo	204	0	204
535126	R-3 Upland Game Bird	774	0	774
535127	R-3 Waterfowl	9,764	0	9,764
535128	R-3 Furbearers	25	0	25
535135	R-3 Non-Game	631	0	631
535137	R-3 Endangered Species	549	0	549
535198	R-3 Wildlife Benefits	8,675	0	8,675
5361	Wildlife Management FA	40	119	159
53610	R3 WL Survey and Inventory	155,506	454,919	610,425
536111	S&I (FA) - Deer	23,793	71,375	95,169
536112	S&I (FA) - Elk	88,306	226,123	314,430
536113	S&I (FA) - Antelope	5,361	16,082	21,443
536114	S&I (FA) - MSE/Sheep/Goat	3,634	10,900	14,534
536115	S&I (FA) - Black Bears	3,452	10,353	13,805
536116	S&I (FA) - Grizzly Bear	659	1,978	2,637
536117	S&I (FA) - Mountain Lion	1,120	3,359	4,479
536118	S&I (FA) - Sheep	2,660	7,979	10,639
536119	S&I (FA) - Goat	3,211	9,632	12,844
536120	S&I (FA) - Buffalo	253	757	1,010
536126	S&I (FA) - Upland Game Bird	4,381	13,140	17,521
536127	S&I (FA) - Waterfowl & OTR MIG	3,858	11,573	15,431
536128	S&I (FA) - Furbearers	2,108	6,324	8,432

APPENDIX A CONTINUED

1986 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
536198	S&I (FA) - Benefits	12,669	38,006	50,675
5371	Gallatin WMA	230	0	230
53710	Gallatin Game Range	12,810	0	12,810
537112	Gallatin WMA - Elk	11,603	0	11,603
537114	Gallatin WMA - MSE/SHE/Goat	210	0	210
537117	Gallatin WMA - Mountain Lion	630	0	630
537198	Gallatin WMA - Benefits	136	0	136
53720	Bear Creek WMA	8,683	0	8,683
537212	Bear Creek WMA - Elk	7,961	0	7,961
537227	Bear Creek WMA - Waterfowl & Other MIG	370	0	370
537298	Bear Creek WMA - Benefits	351	0	351
53730	Wall Creek WMA	19,519	0	19,519
537312	Wall Creek WMA - Elk	18,839	0	18,839
537311	Wall Creek WMA - Deer	90	0	90
537313	Wall Creek WMA - Antelope	225	0	225
537398	Wall Creek WMA - Benefits	303	0	303
537370	Weed Control	62	0	62
5374	Fleecer WMA	303	0	303
53740	Fleecer WMA	38,405	0	38,405
537411	Fleecer WMA - Deer	3,413	0	3,413
537412	Fleecer WMA - Elk	34,274	0	34,274
537412	Fleecer WMA - Upland Game Bird	227	0	227
537470	Fleecer WMA - Weed Control	137	0	137
537498	Fleecer WMA - Benefits	52	0	52
53750	Canyon Ferry WMA	57,974	0	57,974
537512	Canyon Ferry WMA - Elk	125	0	125
537526	Canyon Ferry WMA - Upland Game Bird	826	0	826
537527	Canyon Ferry WMA - Waterfowl	49,195	0	49,195
537570	Canyon Ferry WMA - Weed Control	463	0	463
537598	Canyon Ferry WMA - Benefits	7,365	0	7,365
5385	Canyon Ferry O&M	117	0	117
53760	Clark Canyon WMA	4,794	0	4,794
537611	Clark Canyon WMA - Deer	1,526	0	1,526
537612	Clark Canyon WMA - Elk	1,297	0	1,297
537615	Clark Canyon WMA - Black Bear	258	0	258

APPENDIX A CONTINUED

1986 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
537626	Clark Canyon WMA - Upland Game Bird	1,154	0	1,154
537627	Clark Canyon WMA - Waterfowl	259	0	259
537635	Clark Canyon WMA - Nongame	290	0	290
537698	Clark Canyon Benefits	11	0	11
5377	Blacktail WMA	2,604	0	2,604
53770	Blacktail WMA	25,136	0	25,136
537711	Blactail WMA - Deer	74	0	74
537712	Blacktail WMA - Elk	22,406	0	22,406
537798	Blacktail WMA - Benefits	52	0	52
5381	Mt. Haggin WMA	2,548	0	2,548
53810	Mt. Haggin WMA	61,458	0	61,458
538110	Game Damage Pers Serv - Big Game	34	0	34
538111	Mt Haggin WMA - Deer	13,045	0	13,045
538112	Mt Haggin WMA - Elk	40,196	0	40,196
538113	Mt Haggin WMA - Antelope	241	0	241
538114	Mt Haggin WMA - MSE/SHE/Goat	655	0	655
538115	Mt Haggin WMA - Black Bear	310	0	310
538125	Game DaM Pers Serv - Small & Nongame	414	0	414
538126	Mt Haggin WMA - Upland Game Bird	724	0	724
538128	Mt Haggin WMA - Furbearers	345	0	345
538135	Mt Haggin WMA - Nongame	647	0	647
538170	Mt Haggin WMA - Weed Control	105	0	105
538198	Mt Haggin WMA - Benefits	21,948	0	21,948
5382	Mt. Haggin Timber Consultation	60,500	0	60,500
538211	Mt Haggin Timber Consultation - Deer	25,070	0	25,070
538212	Mt Haggin Timber Consultation - Elk	56,980	0	56,980
53820	Mt. Haggin Timber Consultation	142,549	0	142,549
538970	Weed Control	1,930	0	1,930
5389	Weed Control (EPP)	2,167	0	2,167
53890	Weed Control	4,097	0	4,097
5831	Bridger Mule Deer Res	29	86	115
583111	Bridger Research - Deer	39,669	119,002	158,671
583112	Bridger Research - Elk	2	7	10
583198	Bridger Research - Benefits	6,513	19,538	26,051
583411	Elk Research - Deer	1	2	3

APPENDIX A CONTINUED

1986 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
583412	Elk Research - Elk	49,855	149,560	199,415
583498	Elk Research - Benefits	4,443	13,329	17,772
585601	Research Statewide Act - WL Prog	8	0	8
585610	Game Damage Pers Serv - Big Game	226	0	226
585611	Res Stwd Activ - Deer	20,982	0	20,982
585612	Res Stwd Activ - Elk	10,121	0	10,121
585611	Res Stwd Activ - Antelope	1,223	0	1,223
585615	Res Stwd Activ - Black Bear	30	0	30
585616	Res Stwd Activ - Grizzly Bear	9	0	9
585619	Res Stwd Activ - Goat	57	0	57
585625	Game Dam Pers Serv - Small & Nongame	96	0	96
585626	Res Stwd Activ - Upland Game Bird	421	0	421
585628	Res Stwd Activ - Furbearers	813	0	813
585635	Res Stwd Activ - Nongame	0	0	0
585637	Res Stwd Activ - Endangered Species	0	0	0
585698	Res Stwd Activ - Benefits	550	0	550
586211	Harvest Survey - Deer	19,158	56,107	75,265
586212	Harvest Survey - Elk	20,427	61,278	81,705
586213	Harvest Survey - Antelope	25,354	76,061	101,415
586214	Harvest Survey - MSE/SHE/GT	8,034	24,101	32,135
586215	Harvest Survey - Black Bear	4,666	13,998	18,664
586216	Harvest Survey - Grizzly Bear	2,125	6,373	8,498
586218	Harvest Survey - Sheep	4,743	14,228	18,971
586226	Harvest Survey - Upland Game Bird	527	2,030	2,557
586227	Harvest Survey - Waterfowl	56	167	222
586228	Harvest Survey - Furbearers	378	1,134	1,513
586298	Harvest Survey - Benefits	2,743	8,228	10,971
5891	Wildlife Lab (MSU)	59	177	236
589110	Wildlife Lab Operations - Big Game	8,272	24,815	33,087
589111	Wildlife Lab Operations - Deer	3,397	10,190	13,587
589112	Wildlife Lab Operations - Elk	3,407	10,222	13,629
589113	Wildlife Lab Operations - Antelope	33	98	131
589114	Wildlife Lab Operations - MSE/SHE/GT	57	172	229
589115	Wildlife Lab Operationse - Black Bear	574	1,722	2,296

APPENDIX A CONTINUED

1986 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
589116	Wildlife Lab Operations - Grizzly	11,501	34,502	46,003
589117	Wildlife Lab Operations - Mt. Lion	235	704	939
589118	Wildl'ife Lab Operations - Sheep	188	564	753
589120	Wildlife Lab Operations - Buffalo	82	247	329
589126	Wildlife Lab Operations - Upland Game Bird	51	153	204
589128	Wildlife Lab Operations - Furbearers	266	796	1,062
589135	Wildlife Lab Operations - NonGame	14	42	56
589198	Wildlife Labn Operations - Benefits	2,644	7,932	10,576
5894	Furbearer Research	155	464	619
589412	Mammal Res - Elk	25	76	101
589428	Mammal Res - Furbearers	20,047	60,138	80,184
589498	Mammal Res - Benfits	2,187	6,560	8,747
591111	Mackie Contract MSU - Deer	16,409	31,304	47,714
591211	MSU Terry Deer Study - Deer	3,295	9,885	13,179
589410	Mammal Research	22,259	66,774	89,033
631001	Parks - Wildlife	577	0	577
6311	Misc FAS O&M	92,454	0	92,454
6321	Misc SP's	2,024	0	2,024
63111	Misc FAS-Weed Control	3,018	0	3,018
6324	Missouri Headwaters SP O&M	25,034	0	25,034
63241	Missouri Headwaters SP - Weed Control	246	0	246
834110	R-3 Information Officer	60,221	0	60,221
834210	R-3 Hunter Safety	2,416	7,247	9,663
	Total	3,036,169	1,756,055	4,792,224

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1987 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - WL	35,717	0	35,717
40301	Wildlife Support	682,894	0	682,894
4301	Enforcement Base	223	0	223
43010	Enforcement Base	762,529	0	762,529
430101	Enforcement - Wildlife	602,036	0	602,036
430403	Enforcement - Parks Sites	8,707	0	8,707
43050	Game Damage	46,531	0	46,531
430501	Game Damage Pers Serv	46,531	0	46,531
43160	Field Administration	23,741	0	23,741
431601	Field Administration - Outiftters	16,056	0	16,056
43610	Saturation Patrols	18,426	0	18,426
436102	Field Aministgration - License Agents	7,685	0	7,685
436101	Saturation Patrols	18,270	0	18,270
531712	Elk Allow Harvest Eval	7,327	21,982	29,309
53170	Elk Allow Harvest Eval	7,327	21,982	29,309
53180	Mule Deer Allow Harvest Eval	3,808	11,423	15,231
531811	Mule Deer Allow Harvest Eval	3,808	11,423	15,231
5321	Elkhorns Wildlife Coordinator	563	0	563
53210	Elkhorn WL Coord	92,108	0	92,108
532112	Elkhorns WL Coord - Elk	91,536	0	91,536
53260	Landowner COOP MGT	13,104	0	13,104
532611	Landowner COOP MGT - Deer	4,667	0	4,667
532612	Landowner COOP MGT - Elk	8,438	0	8,438
5351	R-3 Wildlife	94	0	94
53510	R-3 Wildlife	116,631	0	116,631
535101	Game Damage Pers Serv	27	0	27
535111	R-3 Deer	7,726	0	7,726
535112	R-3 Elk	83,792	0	83,792
535113	R-3 Antelope	1,967	0	1,967
535114	R-3 MSE/Sheep/Goat	2,077	0	2,077
535115	R-3 Black Bear	3,170	0	3,170
535117	R-3 Mountain Lion	923	0	923
535118	R-3 Sheep	1,267	0	1,267
535119	R-3 Goat	1,422	0	1,422

APPENDIX A CONTINUED

1987 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
535126	R-3 Upland Game Bird	2,682	0	2,682
535127	R-3 Waterfowl	1,970	0	1,970
535128	R-3 Furbearers	2,760	0	2,760
535135	R-3 Non-Game	324	0	324
535198	R-3 Wildlife Benefits	5,814	0	5,814
5361	Wildlife Management FA	278	835	1,114
53610	R3 WL Survey and Inventory	146,515	439,516	586,031
536111	S&I (FA) - Deer	14,482	43,444	57,926
536112	S&I (FA) - Elk	96,068	288,194	384,262
536113	S&I (FA) - Antelope	5,452	16,355	21,807
536114	S&I (FA) - MSE/Sheep/Goat	2,507	7,519	10,026
536115	S&I (FA) - Black Bears	2,500	7,498	9,998
536116	S&I (FA) - Grizzly Bear	158	475	633
536117	S&I (FA) - Mountain Lion	1,195	3,584	4,779
536118	S&I (FA) - Sheep	3,185	9,552	12,737
536119	S&I (FA) - Goat	2,378	7,132	9,510
536120	S&I (FA) - Buffalo	9	26	35
536126	S&I (FA) - Upland Game Bird	2,130	6,389	8,519
536127	S&I (FA) - Waterfowl	3,442	10,323	13,765
536128	S&I (FA) - Furbearers	1,110	3,328	4,438
536198	S&I (FA) - Benefits	11,621	34,860	46,481
53710	Gallatin Game Range	7,863	0	7,863
537112	Gallatin WMA - Elk	7,863	0	7,863
53720	Bear Creek WMA	6,720	0	6,720
537212	Bear Creek WMA - Elk	6,720	0	6,720
53730	Wall Creek WMA	30,491	0	30,491
53740	Fleecer WMA	19,814	0	19,814
537412	Fleecer WMA - Elk	19,814	0	19,814
5375	Canyon Ferry WMA	520	0	520
53750	Canyon Ferry WMA	54,296	0	54,296
537526	Canyon Ferry WMA - Upland Game Bird	659	0	659
537527	Canyon Ferry WMA - Waterfowl	52,593	0	52,593
537570	Weed Control	523	0	523
5385	Canyon Ferry O&M	75	0	75
53760	Clark Canyon WMA	5,266	0	5,266

APPENDIX A CONTINUED

1987 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
537611	Clark Canyon WMA - Deer	1,730	0	1,730
537612	Clark Canyon WMA - Elk	2,727	0	2,727
537626	Clark Canyon WMA - Upland Game Bird	809	0	809
53770	Blacktail WMA	20,739	0	20,739
537712	Blacktail WMA - Elk	20,739	0	20,739
53810	Mt. Haggin WMA	71,439	0	71,439
538111	Mt. Haggin WMA - Deer	2,209	0	2,209
538112	Mt. Haggin WMA - Elk	63,373	0	63,373
538113	Mt. Haggin WMA - Antelope	534	0	534
538114	Mt. Haggin WMA - MSE/Sheep/Goat	1,103	0	1,103
538115	Mt. Haggin WMA - Black Bear	569	0	569
538127	Mt. Haggin WMA - Waterfowl	178	0	178
538128	Mt. Haggin WMA - Furbearers	1,378	0	1,378
538135	Mt. Haggin WMA - Non-Game	809	0	809
538170	Mt. Haggin WMA - Weed Control	134	0	134
538198	Mt. Haggin WMA - Benefits	1,153	0	1,153
538211	Mt. Haggin WMA - Timber Cons - Deer	30,991	0	30,991
538212	Mt. Haggin WMA - Timber Cons - Elk	99,325	0	99,325
538970	Weed Control	5,103	0	5,103
5382	Mt. Haggin Timber Consultation	10,420	0	10,420
53820	Mt. Haggin Timber Consultation	140,737	0	140,737
53890	Weed Control	5,103	0	5,103
5831	Bridger Mule Deer Res	6	18	23
583111	Bridger Research - Deer	52,278	118,529	170,807
5834	Elk Research	37	111	148
583412	Elk Research - Elk	55,767	167,298	223,065
585611	Res Stwd Activ - Deer	20,548	0	20,548
585612	Res Stwd Activ - Elk	19,072	0	19,072
585613	Res Stwd Activ - Antelope	124	0	124
585626	Res Stwd Activ - Upland Game Bird	433	0	433
585628	Res Stwd Activ - Furbearers	496	0	496
5862	Harvest Surveys	53	160	214
586211	Harvest Survey - Deer	27,523	82,565	110,088
586212	Harvest Survey - Elk	16,638	49,913	66,551
586213	Harvest Survey - Antelope	18,519	55,555	74,074

APPENDIX A CONTINUED

1987 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
586214	Harvest Survey - MSE/SHE/Goat	16,833	50,496	67,328
586215	Harvest Survey - Black Bear	1,003	3,010	4,013
586218	Harvest Survey - Sheep	334	1,003	1,337
586227	Harvest Survey - Waterfowl	4	13	17
589110	Wildlife Lab Operations - Big Game	21,358	64,071	85,428
589111	Wildlife Lab Operations - Deer	419	1,257	1,676
589112	Wildlife Lab Operations - Elk	1,231	3,693	4,924
589115	Wildlife Lab Operationse - Black Bear	684	2,051	2,735
589116	Wildlife Lab Operations - Grizzly	6,391	19,171	25,562
589117	Wildlife Lab Operations - Mt. Lion	10	29	39
589198	Wildlife Labn Operations - Benefits	2,000	5,999	7,999
5891	Wildlife Lab (MSU)	9	26	35
5894	Furbearer Research	179	537	717
589412	Mammal Res - Elk	0	0	0
589428	Mammal Res - Furbearers	25,333	75,994	101,326
589498	Mammal Res - Benfits	0	0	0
591111	Mackie Contract MSU - Deer	0	48,490	48,490
5912	MSU Student Terry Deer Studies	157	472	629
591211	MSU Terry Deer Studies - Deer	4,667	14,001	18,668
6311	Misc FAS O&M	111,225	0	111,225
631101	Misc FAS - WL	81	0	81
6324	Missouri Headwater SP O&M	24,236	0	24,236
8341	Information Officer	216	0	216
83410	R-3 Information Officer	76,320	0	76,320
834101	Information Officer - Wildlife	51,040	0	51,040
834103	Information Officer - Parks	3,447	0	3,447
83420	Hunter Safey	0	9,969	9,969
834201	Hunter Education Wildlife	0	9,969	9,969
	Total	4,280,901	1,730,241	6,011,142

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1988 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Region 3 Game Damage Opns - Wildlife	20,377	0	20,377
4301	Enforcement Base	4,189	0	4,189
430101	Enforcement Wildlife	559,521	0	559,521
430501	Game Damage Pers Serv	42,865	0	42,865
431701	Conservation Officer	776	0	776
4361	Saturation Patrols	2,737	0	2,737
436101	Saturation Patrol Travel - Wildlife	8,382	0	8,382
5301	Wildlife	122,899	0	122,899
5311	Deer	31,609	94,823	126,431
5321	R-3 Elk	83,664	250,985	334,649
5331	R-3 Moose	3,999	11,995	15,994
5336	R-3 Sheep	3,410	10,227	13,637
5346	Black Bear	1,730	5,190	6,921
5356	Mountain Lion	647	1,940	2,586
5366	Waterfowl	1,895	5,684	7,579
5371	Furbearers	2,237	6,711	8,948
5381	NonGame	130	391	521
5341	Mountain Goat	2,709	8,125	10,834
5318	Mule Deer Allow Harvest	2,683	8,050	10,733
5361	Wildlife Management FA	3,801	11,403	15,204
5302	WMA	97,363	0	97,363
5303	Mt. Haggin WMA	33,433	0	33,433
5305	Mt. Haggin Timber Consultant	136,421	0	136,421
5304	Canyon Ferry WMA	30,805	0	30,805
53661	Canyon Ferry O&M	403,859	260,844	664,703
5307	Landowner COOP	15,709	0	15,709
5312	Bridger Mtn Mule Deer Monitor	3,024	9,072	12,096
5322	Elkhorn Coordinator	85,909	0	85,909
5323	Elk Allow Harvest	6,232	18,695	24,927
5326	Landowner COOP	4,396	13,187	17,583
5332	Red Rocks Moose Study	3,500	0	3,500
5903	Harvest Surveys	76,480	229,437	305,917
5908	Bio-Economic Pref/Aff Surveys	16,170	47,762	63,932
5918	Consultant Deer Eval/Mackie/MS	0	73,802	73,802
5922	Elk Research/Gravelley Mts/Snow	49,241	147,718	196,959

APPENIX A CONTINUED

1988 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
6311	R-3 FAS's	107,090	0	107,090
63111	Weed Control	2,973	0	2,973
63112	Hazard Trees	197	0	197
6323	Lewis and Clark Caverns SP	13	0	13
8300	Conservation Education (Safety)	69,554	9,264	78,818
834101	Information Officer - Wildlife	44,037	0	44,037
834103	Information Officer - Parks	678	0	678
834201	Hunter Education - Wildlife	480	8,212	8,692
8343	Hunter Education Enforcement	0	1,052	1,052
9300	R-3 HQ General	181,704	0	181,704
6301	R-3 Administration	5,240	0	5,240
7321	R-3 HQ Disposal	411	0	411
	Total	2,275,182	1,234,568	3,509,750

* adjusted to 2006 dollars

APPENDIX A

1989 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - Wildlife	55,716	0	55,716
2823	Block Management Program	12,592	0	12,592
4301	Enforcement Base	203	0	203
430101	Enforcement Wildlife	525,222	0	525,222
430501	Game Damage Pers Serv	97,053	0	97,053
4306	Trespass	519	0	519
4317	Conservation Officer	67	0	67
431701	Conservation Officer	1,604	0	1,604
4361	Saturation Officer	27	0	27
436101	Saturation Officer	46,332	0	46,332
5301	Wildlife	115,488	0	115,488
5302	WMA	97,773	0	97,773
5303	Mt. Haggin WMA	44,406	0	44,406
5304	Canyon Ferry WMA	51,439	0	51,439
5305	Mt. Haggin Timber Consultant	149,257	0	149,257
5307	Landowner COOP	14,467	0	14,467
5309	WMA Weed Control	4,695	0	4,695
5311	R-3 - Deer	28,012	84,033	112,046
5312	Bridger Mtn Mule Deer Monitor	3,131	9,394	12,525
5318	Mule Deer Allow Harvest	4,760	14,085	18,845
5321	R-3 Elk	87,790	263,365	351,155
5322	Elkhorn Coordinator	95,497	0	95,497
5323	Elk Allow Harvest	6,687	20,061	26,748
5326	R-3 Antelope	4,768	14,303	19,072
5331	Gravelly Elk Research	2,378	7,133	9,511
5336	R-3 Sheep	1,928	5,785	7,713
5341	Mountain Goat	1,798	5,393	7,191
5346	Black Bear	1,288	3,864	5,152
5356	Mountain Lion	607	1,820	2,427
5361	Upland Game Birds	2,254	6,761	9,015
5366	Waterfowl	2,168	6,504	8,672
5371	Furbearers	1,210	3,628	4,838
5381	NonGame	192	577	769
58911	Perfrine Falcon Reintro	25,387	0	25,387
58921	Black Footed Ferret Study	0	40,236	40,236

APPENDIX A CONTINUED

1989 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
5902	Wildlife Lab (MSU)	30,844	92,529	123,374
5903	Harvest Surveys	78,704	236,108	314,812
59085	Bio-Economic Pref/Aff Surveys	11,189	33,565	44,754
5918	Consultant Deer Eval/Mackie/MS	0	35,304	35,304
5919	Mule Deer Research - Pac	22,496	67,485	89,981
5922	Elk Research/Gravelly Mts/Snow	43,599	117,435	161,034
6301	R-3 Administration	5,507	0	5,507
6311	R-3 FAS's	94,122	0	94,122
63111	Weed Control	3,798	0	3,798
631101	Wildlife Program Activities	157	0	157
63112	Hazard Trees	843	0	843
834101	Information Officer - Wildlife	36,563	0	36,563
834103	Information Officer - Parks	2,120	0	2,120
8342	Hunter Education	0	752	752
834201	Hunter Education - Wildlife	0	8,014	8,014
8343	Hunter Education - Enforcement	0	292	292
9300	Headquarters General	218,855	0	218,855
	Total	2,035,513	1,078,425	3,113,937

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1990 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns-Wildlife	27,049	0	27,049
2823	Block Management	27,049	0	27,049
4301	Enforcement Base	704	0	704
430101	Enforcement Wildlife	594,614	0	594,614
4305	Game Damage Pers Serv Wildlife	10,960	0	10,960
430501	Game Damage Pers Serv	7,246	0	7,246
4306	Off-Highway Vehicle	3,568	0	3,568
4361	Saturation Patrols	81	0	81
43611	Saturation Patrols - Buffalo	4,388	0	4,388
43612	Saturation Patrols - Elk Hunt	10,254	0	10,254
5301	Wildlife	117,289	0	117,289
5302	WMA	77,012	0	77,012
5303	Mt. Haggin WMA	43,104	0	43,104
5304	Canyon Ferry WMA	47,775	0	47,775
5305	Mt. Haggin Timber Consultant	40,000	0	40,000
5307	Landowner COOP	27,164	0	27,164
5309	WMA Weed Control	7,523	0	7,523
5311	R-3 Deer	30,392	91,172	121,564
5318	Mule Deer Allow Harvest	4,189	12,566	16,754
5321	R-3 Elk	92,874	278,078	370,953
5322	Elkhorn Coordinator	96,907	0	96,907
5323	Elk Allow Harvest	6,457	19,370	25,827
5326	R-3 Antelope	3,831	11,491	15,322
5331	Gravelly Elk Research	2,776	8,112	10,889
5336	R-3 Sheep	1,508	4,524	6,032
5341	Mountain Goat	1,826	5,476	7,301
5346	Black Bear	800	2,400	3,200
5356	Mountain Lion	314	942	1,256
5361	Upland Game Birds	1,340	4,019	5,359
5366	Waterfowl	1,042	3,126	4,169
5371	Furbearers	1,191	3,574	4,765
58921	Black Footed Ferret Study	0	25,176	25,176
5902	Wildlife Lab (MSU)	35,829	107,483	143,312
5903	Harvest Surveys	79,070	237,204	316,274
5908	Bio-Economic Pref/Aff Surveys	12,130	36,388	48,518

APPENDIX A CONTINUED

1990 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
5918	Consultant Deer Eval/Mackie/MS	0	56,816	56,816
5919	Mule Deer Research/Pac	35,630	106,886	142,515
5922	Elk Research/Gravelly Mts/Snow	36,588	109,761	146,349
6301	R-3 Administration	14,112	0	14,112
63111	Weed Control	8,815	0	8,815
834101	Information Officer - Wildlife	41,059	0	41,059
834103	Information Officer - Parks	2,299	0	2,299
8342	Hunter Education	0	7,133	7,133
8343	Hunter Education Enforcement	0	283	283
9300	Headquarters General	260,596	0	260,596
	Total	1,817,355	1,131,980	2,949,335

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1991 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - Wildlife	23,187	0	23,187
2823	Block Management Program	24,316	0	24,316
4301	Enfocement Base	1,147	0	1,147
430101	Enforcement Wildlife	602,569	0	602,569
4305	Game Dam Pers Serv - Wildlife	18,448	0	18,448
430501	Game Damage Pers Serv	1,584	0	1,584
4306	Off-Highway Vehicle	2,993	0	2,993
4317	Conservation Officer	1,089	0	1,089
431701	Conservation Officer Wildlife	116	0	116
43611	Saturation Patrol - Buffalo	17,470	0	17,470
43612	Saturation Patrol - Elk Hunt	9,520	0	9,520
5301	Wildlife	125,734	0	125,734
5302	WMA	74,274	0	74,274
5303	Mt. Haggin WMA	36,824	0	36,824
5304	Canyon Ferry WMA	189	0	189
5305	Mt. Haggin Timber Consultant	23,405	0	23,405
5307	Landowner COOP	26,871	0	26,871
5309	WMA Weed Control	3,671	0	3,671
5311	R-3 Deer	139,874	0	139,874
5321	R-3 Elk	90,390	271,164	361,554
5323	Elk Allow Harvest	6,343	19,027	25,370
5326	R-3 Antelope	2,389	7,168	9,557
5331	Gravelly Elk Research	1,456	4,367	5,822
5336	R-3 Sheep	1,389	4,166	5,555
5341	Mountain Goat	1,507	4,520	6,027
5346	Black Bear	736	2,208	2,944
5361	Upland Game Birds	2,015	6,044	8,059
5366	Waterfowl	1,310	3,930	5,241
5371	Furbearers	1,094	3,283	4,377
5381	NonGame	109	326	435
58921	Black Footed Ferret Study	0	26,021	26,021
5902	Wildlife Lab (MSU)	37,347	112,037	149,383
5903	Harvest Surveys	80,716	242,142	322,858
5908	Bio-Economic Pref/Aff Surveys	9,462	28,384	37,847
5918	Consultant Deer Eval/Mackie/MS	0	61,929	61,929

APPENDIX A CONTINUED

1991 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
5919	Mule Deer Research/Pac	32,833	98,495	131,328
5922	Elk Research/Gravelly Mts/Snow	35,975	107,921	143,896
5948	Soutwest MT Marten Study	14,754	0	14,754
5954	Canyon Ferry WMA	52,188	0	52,188
6301	Administration	12,496	0	12,496
63111	Weed Control	4,364	0	4,364
63121	Weed Control	93	0	93
63131	Weed Control	48	0	48
7308	Harrison Lake Improvements	0	113,250	113,250
7321	Headquarters Disposal	1,921	0	1,921
8341	Information Officer	847	0	847
8342	Hunter Education	0	389	389
8343	Hunter Education Enforcement	0	132	132
834101	Information Officer Wildlife	43,492	0	43,492
834103	Information Officer - Parks	767	0	767
9300	Headquarters General	216,037	0	216,037
	Total	1,785,358	1,116,904	2,902,262

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1992 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - Wildlife	16,122	0	16,122
2823	Block Management Program	16,548	0	16,548
28231	Block Management Program	17,910	0	17,910
28232	Block Management Program	8,779	0	8,779
4301	Enforcement Base	1,794	0	1,794
430101	Enforcement - Wildlife	577,266	0	577,266
4305	Game Damage Pers Serv	15,542	0	15,542
430501	Game Damage Pers Serv	386	0	386
4306	Off-Highway Vehicle	3,567	0	3,567
4317	Conservation Officer	1,430	0	1,430
431701	Conservation Officer	380	0	380
43611	Saturation Patrol - Buffalo	30,578	0	30,578
43612	Saturation Patrol - Elk Hunt	8,999	0	8,999
5301	Wildlife	104,196	0	104,196
5302	WMA	125,741	0	125,741
5303	Mt. Haggin WMA	44,001	0	44,001
5304	Canyon Ferry WMA	64	0	64
5309	WMA Weed Control	9,893	0	9,893
5311	R-3 Deer	132,502	0	132,502
5321	R-3 Elk	87,823	263,462	351,284
5323	Elk Allow Harvest	6,113	18,338	24,450
5326	R-3 Antelope	1,138	3,412	4,550
5331	Gravelly Elk Research	1,461	4,383	5,844
5336	R-3 Sheep	1,620	4,860	6,481
5341	LCA - Bighorn Sheep Study	566	1,698	2,264
5346	Black Bear	478	1,434	1,911
5356	Mountain Lion	477	1,430	1,907
5361	Upland Game Birds	3,193	9,578	12,771
5366	Waterfowl	963	2,889	3,852
5371	Furbearers	1,952	5,857	7,810
58921	Black Footed Ferret Study	15,734	0	15,734
5901	Research Southwest Activities	43,925	0	43,925
5902	Wildlife Lab (MSU)	40,968	122,902	163,871
5903	Harvest Survey	74,798	224,388	299,185
5908	Bio-Economic Pref/Aff Surveys	6,145	18,433	24,578

APPENDIX A CONTINUED

1992 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
5918	Consultant Deer Eval/Mackie/MS	0	68,004	68,004
5919	Mule Deer Research/Pac	33,572	100,714	134,287
5922	Elk Research/Gravelly Mts/Snow	38,878	116,629	155,507
6301	Administration	11,760	0	11,760
63111	Weed Control	6,012	0	6,012
63121	Weed Control	357	0	357
63131	Weed Control	78	0	78
63191	Weed Control	584	0	584
6329	Visitor Services EPP	44,297	0	44,297
7321	Headquarters Disposal	153,377	0	153,377
8341	Information Officer	49,590	0	49,590
8342	Hunter Education	0	6,063	6,063
8343	Hunter Education - Enforcement	0	300	300
9300	Headquarters & Pers Services	209,934	0	209,934
9304	Office Support	12,114	0	12,114
	Total	1,963,606	974,774	2,938,380

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1993 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - Wildlife	12,891	0	12,891
2823	Block Management Program	12,692	0	12,692
28231	Block Management Program	19,703	0	19,703
28232	Block Management Program	14,596	0	14,596
4301	Enforcement Base	1,015	0	1,015
4305	Game Damage Pers Serv	14,953	0	14,953
4306	Off-Highway Vehicle	4,994	0	4,994
4308	Enforcement - State Lands Access	336	0	336
43046	Enforcement - Game Farms	3,810	0	3,810
43047	Enforcement - Bison Control	26,396	0	26,396
430101	Enforcement - Wildlife	559,209	0	559,209
5301	Wildlife	40,952	0	40,952
5302	WMA	137,991	0	137,991
5303	Mt. Haggin WMA	38,038	0	38,038
5309	WMA Weed Control	6,457	0	6,457
5311	R-3 Deer	119,104	0	119,104
5321	R-3 Elk	89,272	267,794	357,067
5323	Information and Education	6,592	19,775	26,367
5326	R-3 Antelope	2,112	6,334	8,446
5331	Gravelly Elk Research	1,440	4,318	5,758
5336	R-3 Sheep	4,574	13,720	18,294
5341	LCA - Bighorn Sheep Study	1,008	3,023	4,031
5346	Black Bear	973	2,918	3,891
5361	Upland Game Birds	2,324	6,970	9,294
5366	Waterfowl	957	2,871	3,828
5371	Furbearers	751	2,252	3,002
5381	NonGame	376	1,128	1,504
5901	Research Southwest Activities	35,765	0	35,765
5902	Wildlife Lab (MSU)	156,678	0	156,678
5903	Harvest Survey	302,458	0	302,458
5908	Bio-Economic Pref/Aff Surveys	7,932	23,793	31,725
5918	Consultant Deer Eval/Mackie/MS	0	52,700	52,700
5919	Mule Deer Research/Pac	32,748	98,242	130,990

APPENDIX A CONTINUED

1993 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
5922	Elk Research/Gravelly Mts/Snow	34,744	104,228	138,972
6301	Administration	11,208	0	11,208
63111	Weed Control	4,203	0	4,203
63121	Weed Control	420	14	434
63131	Weed Control	81	0	81
6329	Visitor Services EPP	43,241	0	43,241
7321	Headquarters Disposal	152,318	0	152,318
8341	Information Officer	51,281	0	51,281
8342	Hunter Education	0	6,739	6,739
8343	Hunter Education - Enforcement	0	306	306
9300	Headquarters & Pers Services	235,047	0	235,047
9304	Office Support	8,684	0	8,684
	Total	2,200,323	617,128	2,817,450

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1994 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - Wildlife	9,295	0	9,295
2823	Block Management Program	32,996	0	32,996
4301	Enforcement Base	859	0	859
430101	Enforcement - Wildlife	555,857	0	555,857
43046	Enforcement - Game Farms	4,750	0	4,750
43047	Enforcement - Bison Control	26,420	0	26,420
4305	Game Damage Pers Serv	10,850	0	10,850
4306	Off-Highway Vehicle	1,289	0	1,289
4361	Late Elk Hunts	7,335	0	7,335
5301	Wildlife	39,124	0	39,124
5302	WMA	148,553	0	148,553
5303	Mt. Haggin WMA	67,741	0	67,741
5312	Bridger Mtn Mule Deer Monitor	34,974	0	34,974
5313	Access and Hunter Management	7,560	22,678	30,238
5314	Game Damage Assistance	5,180	0	5,180
5320	Administration - Federal Aid	9,625	28,872	38,497
5322	Survey and Inventory	73,789	221,361	295,150
5323	Information and Education	9,934	29,800	39,734
5324	Habitat - Federal Aid	18,647	55,937	74,584
5330	Bridger Mtn Mule Deer Monitor	32,677	98,029	130,706
5331	Gravelly Elk Research	36,696	113,592	150,288
6301	Administration	8,089	0	8,089
63111	Weed Control	6,392	0	6,392
63121	Weed Control	620	0	620
63131	Weed Control	419	0	419
8341	Information Officer	51,801	0	51,801
8342	Hunter Education	0	6,677	6,677
8343	Hunter Education - Enforcement	0	421	421
9300	Headquarters & Pers Services	196,854	0	196,854
9304	Office Support	8,680	0	8,680
	Total	1,407,006	577,367	1,984,373

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1995 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - Wildlife	94,697	0	94,697
2312	Damage Hunts	3,679	0	3,679
2823	Block Management Program	47,821	0	47,821
4301	Enforcement Base	903,640	0	903,640
43046	Enforcement - Game Farms	2,728	0	2,728
43047	Enforcement - Bison Control	65,088	0	65,088
4305	Game Damage Pers Serv	35,126	0	35,126
4308	Enforcement - State Lands Access	524	0	524
4361	Late Elk Hunts	7,418	0	7,418
5301	Wildlife	98,610	0	98,610
5302	WMA	157,498	0	157,498
5303	Mt. Haggin WMA	49,563	0	49,563
5304	Canyon Ferry WMA	6,788	0	6,788
5305	Mt. Haggin Timber Consultant	55,978	0	55,978
5306	Blacktail Road Maint - PR	0	95,027	95,027
5307	Landowner COOP	0	101,044	101,044
5313	Access and Hunter Management	14,820	44,459	59,279
5314	Game Damage Assistance	9,808	0	9,808
5320	Administration - Federal Aid	11,050	33,149	44,199
5322	Survey and Inventory	95,295	282,235	377,530
5323	Information and Education	11,140	33,377	44,517
5324	Habitat - Federal Aid	31,946	95,837	127,784
5330	Bridger Mtn Mule Deer Monitor	36,721	110,160	146,881
5331	Gravelly Elk Research	37,702	113,090	150,792
5332	Elkhorn Mts Study	18,195	54,582	72,777
5822	Soutwest MT Waterfowl - Fed Aid	33,281	99,841	133,122
5823	MSU Contract	72,225	160,387	232,612
5830	Wildlife Lab (MSU)	48,090	144,266	192,356
5831	Harvest Survey	74,361	223,078	297,439
5825	Bio-Economic Pref/Aff Surveys	3,001	9,003	12,004
6301	Administration	16,685	0	16,685
6311	Fishing Access	177,484	0	177,484
63111	Weed Control	10,143	0	10,143
63121	Weed Control	3,066	0	3,066

APPENDIX A CONTINUED

1995 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
7318	Daily Lake	0	36,546	36,546
8341	Information Officer	48,098	0	48,098
8342	Hunter Education	0	8,753	8,753
8343	Hunter Education - Enforcement	0	305	305
9300	Headquarters & Pers Services	243,857	0	243,857
9304	Office Support	8,648	0	8,648
9307	Area Office	1,641	0	1,641
	Total	2,536,415	1,645,140	4,181,555

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1996 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - Wildlife	68,724	0	68,724
2312	Damage Hunts	9	0	9
2823	Block Management Program	50,465	0	50,465
4301	Enforcement Base	983,998	0	983,998
43046	Enforcement - Game Farms	1,373	0	1,373
43047	Enforcement - Bison Control	18,688	0	18,688
4305	Game Damage Pers Serv	11,354	0	11,354
4308	Enforcement - State Lands Access	734	0	734
4361	Late Elk Hunts	6,585	0	6,585
5301	Wildlife	106,789	0	106,789
5302	WMA	129,106	0	129,106
5303	Mt. Haggin WMA	50,047	0	50,047
5304	Canyon Ferry WMA	6,671	0	6,671
5305	Mt. Haggin Timber Consultant	66,457	0	66,457
5313	Access and Hunter Management	16,965	50,932	67,897
5314	Game Damage Assistance	13,989	0	13,989
5320	Administration - Federal Aid	14,256	42,765	57,021
5322	Survey & Inventory	86,569	259,699	346,267
5323	Information and Education	12,254	36,760	49,014
5324	Habitat - Federal Aid	34,640	103,917	138,557
5330	Bridger Mtn Mule Deer Monitor	34,150	102,448	136,598
5331	Gravelley Elk Research	34,851	104,550	139,401
5332	Elkhorn Mts Study	17,321	51,830	69,151
5822	Soutwest Waterfowl - Fed Aid	32,253	96,757	129,010
5830	Wildlife Lab (MSU)	48,830	146,484	195,314
5831	Harvest Survey	80,963	242,885	323,848

APPENDIX A CONTINUED

1996 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
5825	Bio-Economic Pref/Aff Surveys	2,362	7,084	9,446
6301	Administration	10,746	0	10,746
6304	FAS Weed Control	10,902	0	10,902
6311	Fishing Access	118,924	0	118,924
630101	Weed Control	121	0	121
631101	Weed Control	4,794	0	4,794
8341	Information Officer	51,121	0	51,121
8342	Hunter Education	0	8,506	8,506
8343	Hunter Education - Enforcement	0	940	940
9300	Headquarters & Pers Services	255,008	0	255,008
9308	Butte Area Office	42,548	0	42,548
	Total	2,424,565	1,255,556	3,680,121

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1997 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - Wildlife	46,468	0	46,468
23111	BA Game Damage	99,492	0	99,492
2312	Damage Hunts	3,681	0	3,681
4301	Enforcement Base	950,885	0	950,885
43046	Enforcement - Game Farms	915	0	915
43047	Enforcement - Bison Control	17,555	0	17,555
4305	Game Damage Pers Serv	33,403	0	33,403
4307	Inc. Landowner Contracts	19,291	0	19,291
4308	Enforcement - State Lands Access	876	0	876
4361	Late Elk Hunts	5,966	0	5,966
5301	Wildlife	122,133	0	122,133
5302	WMA	132,752	0	132,752
5303	Mt. Haggin WMA	48,397	0	48,397
5304	Canyon Ferry WMA	7,480	0	7,480
5305	Mt. Haggin Timber Consultant	63,326	0	63,326
5313	Access and Hunter Management	17,607	52,818	70,424
5314	Game Damage Assistance	21,216	0	21,216
5320	Administration - Federal Aid	18,203	54,606	72,808
5322	Survey and Inventory	74,132	222,389	296,520
5323	Information and Education	11,668	35,003	46,671
5324	Habitat - Federal Aid	34,740	104,218	138,958
5330	Bridger Mtn Mule Deer Monitor	28,695	86,084	114,779

APPENDIX A CONTINUED

1997 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
5331	Gravelly Elk Research	33,682	100,826	134,508
5332	Elkhorn Mts Study	2,746	8,239	10,985
5822	Soutwest MT Waterfowl - Fed Aid	30,374	91,118	121,492
5823	MSU Contract	0	50,800	50,800
5830	Wildlife Lab (MSU)	52,365	157,090	209,455
5831	Harvest Survey	86,941	260,818	347,759
5825	Bio-Economic Pref/Aff Surveys	1,351	4,053	5,405
6301	Administration	12,035	0	12,035
630101	Weed Control	5	0	5
6304	FAS Weed Control	10,065	0	10,065
6311	Fishing Access	108,432	0	108,432
631155	Vandalism Costs	699	0	699
631101	Weed Control	3,719	0	3,719
631201	Weed Control	242	0	242
8341	Information Officer	51,785	0	51,785
8342	Hunter Education	0	8,732	8,732
83421	B/A Hunter Education	0	1,154	1,154
8343	Hunter Education - Enforcement	0	1,554	1,554
83431	B/A Hunter Education Enforcement	0	727	727
9300	Headquarters & Pers Services	256,849	0	256,849
9304	Office Support	40	0	40
9307	Helena Office	3,789	0	3,789
9308	Butte Area Office	48,130	0	48,130
	Total	2,462,128	1,240,229	3,702,357

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1998 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - Wildlife	78,787	0	78,787
4301	Enforcement Base	965,775	0	965,775
430101	Confiscated Game	2,819	0	2,819
4305	Game Damage Pers Serv	19,380	0	19,380
4308	Enforcement - State Lands Access	58	0	58
4361	Late Elk Hunts	6,035	0	6,035
5301	Wildlife	105,807	0	105,807
5302	WMA	120,628	0	120,628
5303	Mt. Haggin WMA	53,170	0	53,170
5304	Canyon Ferry WMA	8,571	0	8,571
5313	Access and Hunter Management	18,443	55,329	73,772
5314	Game Damage Assistance	13,562	0	13,562
5320	Administration - Federal Aid	18,112	54,335	72,447
5322	Survey & Inventory	63,723	194,913	258,636
5323	Information and Education	14,967	44,913	59,880
5324	Habitat - Federal Aid	33,901	101,702	135,603
5330	Bridger Mtn Mule Deer Monitor	20,691	62,071	82,762
5331	Gravelly Elk Research	20,871	62,609	83,480
53471	LCA - Grizzly Bear	0	7,613	7,613
5351	Grizzly Specialist	16,483	868	17,351
5822	Soutwest MT Waterfowl - Fed Aid	31,134	93,399	124,533
5823	MSU Contract	50,821	0	50,821
5830	Wildlife Lab (MSU)	50,308	150,902	201,210
5831	Harvest Survey	83,411	250,229	333,640
5825	Bio-Economic Pref/Aff Surveys	3,071	9,211	12,282
6301	Parks Operations	10,721	0	10,721
630101	Weed Control	3,840	0	3,840
6311	Non-Motorboat FAS	106,602	0	106,602
631155	Vandalism Costs	1,018	0	1,018
631101	Weed Control	252	0	252
6313	WB - FAS	2,266	6,798	9,064
631301	Weed Control	1	4	5
634501	Weed Control	0	25	25
8341	Information Officer	53,280	0	53,280
8342	Hunter Education	0	11,462	11,462

APPENDIX A CONTINUED

1998 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
8343	Hunter Education - Enforcement	0	983	983
9300	Headquarters & Pers Services	258,651	0	258,651
9304	Office Support	10,998	0	10,998
9307	Helena Office	50,513	0	50,513
	Total	2,298,670	1,107,366	3,406,036

* adjusted to 2006 dollars

APPENDIX A CONTINUED

1999 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES

Project	Title	GLF	PR	Total
2311	Game Damage Opns - Wildlife	78,418	0	78,418
4301	Enforcement Base	912,684	0	912,684
430101	Confiscated Game	123	0	123
4305	Game Damage Pers Serv	14,974	0	14,974
4361	Late Elk Hunts	5,961	0	5,961
5301	Wildlife	105,857	0	105,857
5302	WMA	113,624	0	113,624
5303	Mt. Haggin WMA	41,494	0	41,494
5304	Canyon Ferry WMA	5,856	0	5,856
5305	Mt. Haggin Timber Consultant	66,859	0	66,859
5313	Access and Hunter Management	16,789	48,904	65,693
5314	Game Damage Assistance	16,065	0	16,065
5320	Administration - Federal Aid	16,734	50,199	66,933
5322	Survey & Inventory	73,153	218,940	292,093
5323	Information and Education	10,875	32,624	43,499
5324	Habitat - Federal Aid	36,802	110,403	147,205
5330	Bridger Mtn Mule Deer Monitor	20,528	61,581	82,109
5331	Gravelley Elk Research	19,752	59,253	79,005
53471	LCA - Grizzly Bear	460	22,642	23,102
5351	Grizzly Specialist	24,464	1,288	25,752
5822	Soutwest MT Waterfowl - Fed Aid	25,642	76,922	102,564
5823	MSU Contract	11,663	37,721	49,384
5830	Wildlife Lab (MSU)	50,736	151,161	201,898
5831	Harvest Survey	83,218	244,792	328,009
5825	Bio-Economic Pref/Aff Surveys	162	482	644
6301	Parks Operations	10,557	0	10,557
6311	Non-Motorboat FAS	110,969	0	110,969
6313	WB - FAS	5,082	1,692	6,774

APPENDIX A CONTINUED

1999 MONTANA FISH, WILDLIFE AND PARKS HUNTER FUNDED EXPENDITURES CONTINUED

Project	Title	GLF	PR	Total
631301	Weed Control	52	0	52
6345	Hauser Lake State Park	0	13,231	13,231
8341	Information Officer	55,767	0	55,767
8342	Hunter Education	0	12,956	12,956
8343	Hunter Education - Enforcement	0	715	715
9300	Headquarters & Pers Services	262,644	0	262,644
9304	Office Support	5,903	0	5,903
9307	Helena Office	48,341	0	48,341
	Total	2,252,208	1,145,507	3,397,714

* adjusted to 2006 dollars

APPENDIX B

MONTANA FISH, WILDLIFE AND PARKS EXPENDITURES

BY CATEGORY

Appendix B

Montana Fish, Wildlife and Parks Region 3 Expenditures by Category

Project	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Research	0	100,291	1,143,722	1,275,546	1,271,807	1,623,753	2,159,810	1,470,656	489,660	728,952
Enforcement	960,238	841,913	938,740	957,167	985,468	680,281	753,419	2,233,629	618,471	671,027
Wildlife Management	565,785	548,968	663,333	699,607	714,175	99,398	438,258	908,870	676,937	643,538
Administration	201,825	146,405	165,266	169,220	220,897	246,262	0	0	187,356	218,855
Mt. Haggin WMA	188,015	262,369	170,614	97,121	116,234	226,178	427,767	429,456	169,854	193,663
Bridger Research	0	182,478	207,030	212,306	184,235	190,378	184,846	170,830	21,168	12,525
FAS General	243,109	235,868	157,362	138,183	141,655	119,554	95,472	111,307	107,090	94,122
Gravelly-Blacktail WMA	38,309	28,741	41,628	46,001	31,509	28,182	50,272	41,479	196,959	161,034
Education	79,494	74,569	73,517	38,604	80,112	54,748	69,883	150,961	133,277	47,739
Canyon Ferry WMA	67,410	49,148	55,393	58,079	83,823	54,088	116,064	108,666	695,509	51,439
WMA General	0	0	0	0	0	0	0	0	97,363	102,467

Appendix B

Montana Fish, Wildlife and Parks Region 3
Expenditures by Category

Project	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Elkhorns Research	0	0	0	0	172,232	83,190	181,016	184,207	85,909	95,497
Game Damage	0	0	0	0	0	0	15,568	35,717	20,377	55,716
Landowner COOP	0	0	0	0	0	0	95,351	26,209	15,709	14,467
Fleecer WMA	40,020	33,314	31,456	31,469	29,544	15,994	76,810	39,627	0	0
Block Management	0	0	0	0	0	0	0	0	0	12,592
Parks General	0	0	0	0	0	7,776	2,601	0	3,183	10,305
Wall Creek WMA	38,866	34,896	28,452	40,993	32,832	19,354	39,038	30,491	0	0
Gallatin WMA	23,495	19,585	25,992	15,932	20,037	26,189	25,620	15,726	0	0
Capital	0	0	0	0	0	0	0	0	0	0
Bear Creek WMA	17,553	9,137	15,930	13,085	6,386	5,162	17,366	13,440	0	0
Missouri Headwaters	0	0	0	0	0	21,576	25,280	24,236	0	0
Clark Canyon WMA	4,802	4,045	2,186	4,984	4,645	5,489	9,589	10,532	0	0
Weed Control	0	0	0	0	0	0	8,194	5,103	0	0
Total	2,470,901	2,573,706	3,722,603	3,800,279	4,097,574	3,509,537	4,794,210	6,013,129	3,520,810	3,115,926

Appendix B

Montana Fish, Wildlife and Parks Region 3 Expenditures by Category

Project	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Research	786,080	775,313	645,592	585,085	295,150	1,245,064	1,003,885	1,031,431	1,006,086	974,593	18,612,475
Enforcement	631,814	654,935	639,943	610,713	607,360	1,014,524	1,022,732	1,028,891	994,067	918,767	17,764,098
Wildlife Management	657,210	669,356	629,527	595,780	143,946	285,673	313,243	331,515	315,183	367,608	10,267,912
Administration	260,596	217,958	375,425	396,049	244,031	298,345	354,576	381,616	392,609	383,821	4,861,110
Mt. Haggin WMA	83,104	60,229	44,001	38,038	67,741	105,542	116,504	111,723	53,170	108,353	3,069,676
Bridger Research	0	0	134,287	130,990	165,680	146,881	136,598	114,779	82,762	82,109	2,359,883
FAS General	0	0	0	0	0	177,484	129,826	118,496	115,666	117,743	2,102,936
Gravelly-Blacktail WMA	146,349	143,896	155,507	138,972	150,288	245,819	139,401	134,508	83,480	79,005	2,081,337
Education	50,773	1,368	55,953	58,326	98,632	101,672	109,581	110,624	125,606	112,937	1,628,375
Canyon Ferry WMA	47,775	52,377	64	0	0	6,788	6,671	7,480	8,571	5,856	1,475,200
WMA General	84,535	77,945	135,634	144,449	148,553	157,498	129,106	132,752	120,628	113,624	1,444,556

Appendix B

Montana Fish, Wildlife and Parks Region 3

Expenditures by Category

Project	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Elkhorns Research	96,907	0	0	0	0	72,777	69,151	10,985	0	0	1,051,870
Game Damage	27,049	23,187	16,122	12,891	14,474	108,183	82,723	170,857	92,348	109,457	784,669
Landowner COOP	27,164	26,871	0	0	0	101,044	0	0	0	0	306,815
Fleecer WMA	0	0	0	0	0	0	0	0	0	0	298,235
Block Management	27,049	24,316	43,237	46,990	32,996	47,821	50,465	0	0	0	285,466
Parks General	22,928	17,002	63,089	59,167	8,089	29,894	10,746	12,735	11,739	23,788	283,041
Wall Creek WMA	0	0	0	0	0	0	0	0	0	0	264,921
Gallatin WMA	0	0	0	0	0	0	0	0	0	0	172,576
Capital	0	113,250	0	0	0	36,546	0	0	0	0	149,796
Bear Creek WMA	0	0	0	0	0	0	0	0	0	0	98,059
Missouri Headwaters	0	0	0	0	0	0	0	0	0	0	71,092
Clark Canyon WMA	0	0	0	0	0	0	0	0	0	0	46,272
Weed Control	0	0	0	0	7,431	0	4,915	3,966	4,122	52	33,784
Total	2,951,325	2,859,994	2,940,372	2,819,443	1,986,367	4,183,550	3,682,117	3,704,354	3,408,034	3,399,713	69,514,155

APPENDIX C

MONTANA FISH, WILDLIFE AND PARKS REGION 3 EXPENDITURES BY HUTNING DISTRICT

APPENDIX C

MONTANA FISH, WILDLIFE AND PARKS REGION 3 EXPENDITURES BY HUNTING DISTRICT

District															
302		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
	Expenditures	4,802	4,044	2,186	4,984	4,645	5,489	9,589	10,531						
	Harvest	164	225	332	390	380	391	405	414	388	336	356	318	361	304
	Participation	866	784	910	1,169	994		907	1,217	965	992	1,014	1,107	1,105	
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
	Expenditures														
	Harvest	521	258						240	413	463	320	337	446	
	Participation	1,307	1,508						1,282	1,472	1,529	1,280	936	1,064	
309		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
	Expenditures		27782	17649	5574										
	Harvest														
	Participation														
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
	Expenditures														
	Harvest												585.1	512.1	
	Participation												700.2	713.4	

APPENDIX C CONTINUED

MONTANA FISH, WILDLIFE AND PARKS REGION 3 EXPENDITURES BY HUNTING DISTRICTS

310	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	23,495	19,585	25,992	15,932	20,037	26,189	25,620	15,726						
Harvest	254	302	315	261	183	301	246	257	349	457	396	581	402	191
Participation	2,067	1,838	1,963	1,786	1,441	1,133	1,422	1,575	1,823	1,995	2,060	2,708	2,281	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures													
Harvest	440	341						180	175	299	192	227	178
Participation	2,322	2,126						2,082	1,997	1,900	1,444	1,290	944

311	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	27,126	38,025	12,703											
Harvest	394	279	932	1,147	843	1,026	1,191	1,073	915	970	1,178	1,161	1,385	1,338
Participation	2,109	1,230	3,347	3,111	2,108	2,071	2,328	2,311	2,317	2,108	2,697	2,615	2,697	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures													
Harvest	1,869	1,541						1,384	1,751	1,905	1,551	1,386	1,595
Participation	3,397	3,386						3,173	3,169	3,533	3,007	2,466	2,512

APPENDIX C CONTINUED

MONTANA FISH, WILDLIFE AND PARKS REGION 3 EXPENDITURES BY HUNTING DISTRICT

312	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	2,462	184,669	207,030	212,306	184,235	190,378	210,125	195,066	21,168	12,525			134,287	130,990
Harvest	1,511	1,361	852	863	1,111	1,159	1,457	1,218	1,235	910	1,065	1,191	1,397	1,075
Participation	5,354	4,338	2,705	2,620	2,616	1,866	3,076	3,126	3,302	2,373	2,638	2,674	2,954	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures	165,680	146,881	136,598	114,779	82,762	82,109							
Harvest	1,742	1,278						1,078	1,328	1,573	1,239	1,416	1,779
Participation	3,607	3,641						3,009	3,009	4,357	2,683	2,814	3,225

319	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	108,181	134,514	94,621	63,763	70,385	106,671	235,733	209,299	71,339	81,338	34,904	25,296	18,481	15,976
Harvest	1112	906	691	674	943	831	838	559	926	514	521	734	654	383
Participation	6,337	6,179	4,463	3,392	5,426	4,664	4,113	4,382	3,886	3,601	3,005	3,108	3,096	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures	28,451	44,328	48,932	46,924	22,331	45,508							
Harvest	804	337						350	466	860	545	814	444.1
Participation	3,325	3,028						2,826	2,777	2,910	3,159	2,906	2,118

APPENDIX C CONTINUED

MONTANA FISH, WILDLIFE AND PARKS REGION 3 EXPENDITURES BY HUNTING DISTRICT

323	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	38,866	34,896	28,452	40,993	32,832	19,354	39,038	30,491						
Harvest	205	212	223	243	222	271	265	361	475	374	351	588	493	366
Participation	1,525	1,027	857	1,112	1,051	895	920	1,093	1,318	1,481	1,385	1,486	1,634	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures													
Harvest	512	311						284	290	356	384	354	261
Participation	1,927	2,038						1,930	1,727	1,667	1,796	1,257	1,238

324	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	38,309	28,741	41,628	46,001	31,509	28,182	50,272	41,479	196,959	161,034	146,349	143,896	155,507	138,972
Harvest	651	502	947	835	1,503	1,366	1,261	1,338	1,249	1,280	1,018	1,688	1,453	984
Participation	3,212	2,393	3,223	3,122	4,046	3,793	3,449	4,004	3,510	3,883	3,788	3,872	4,079	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures	150,288	245,819	139,401	134,508	83,480	79,005							
Harvest	1,398	900						709	827	750	665	488	426
Participation	3,815	4,057						3,665	3,746	3,176	3,045	2,116	1,592

APPENDIX C CONTINUED

MONTANA FISH, WILDLIFE AND PARKS REGION 3 EXPENDITURES BY HUNTING DISTRICT

325	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures		16,871	15,429											
Harvest	406	287	615	508	620	647	732	884	719	714	790	1,116	1,008	993
Participation	1,801	973	1,776	1,528	1,594	1,533	1,762	2,036	1,695	1,883	1,944	2,292	2,323	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures													
Harvest	1,324	853						641	850	895	1,158	910	1,037
Participation	2,872	3,243						2,646	2,828	2,665	3,072	2,164	2,441

330	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	23,996	21,350												
Harvest					634	1,074	789	842	884	773	752	1,039	1,184	1,011
Participation					2,135	1,842	2,044	2,393	2,260	2,280	2,317	2,516	2,716	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures													
Harvest	1,271	818						626	642	721	852	748	766
Participation	3,410	3,470						2,654	2,912	2,633	2,825	2,275	1,811

APPENDIX C CONTINUED

MONTANA FISH, WILDLIFE AND PARKS REGION 3 EXPENDITURES BY HUNTING DISTRICT

331	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	1,693	1,506												
Harvest	784	771	775	989	1,200	1,315	1,268	903	1,370	968	880	1,410	1,143	931
Participation	3,843	3,181	3,284	3,417	4,014	3,666	3,383	3,702	3,368	4,010	3,492	4,132	3,794	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures													
Harvest	1,754	795						651	853	1,207	903	1,010	948
Participation	4,560	4,345						3,879	3,564	3,930	4,236	3,479	3,201

341	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	119,854	161,169	107,449	64,827	75,393	135,502	268,843	259,784	98,516	112,325	48,201	34,933	25,521	22,062
Harvest			72	143	276	320	310	254	391	278	268	553	382	262
Participation			398	555	915	1,078	1,175	1,350	1,384	1,437	1,187	1,516	1,349	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures	39,290	61,214	67,572	64,799	30,838	62,845							
Harvest	466	232						163	336	391	212	384	299
Participation	1,638	1,287						1,147	1,251	1,296	1,541	1,286	1,248

APPENDIX C CONTINUED

MONTANA FISH, WILDLIFE AND PARKS REGION 3 EXPENDITURES BY HUNTING DISTRICT

360	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	45,682	34,164	15,930	13,085	6,386	5,162	8,683	13,440						
Harvest	667	711	548	520	744	706	889	891	1,087	866	835	1,601	559	679
Participation	3,548	2,293	1,779	1,951	2,503	1,975	2,272	2,543	2,820	2,749	2,753	3,681	2,061	

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures													
Harvest	1,302	694						753	968	960	1,080	1,112	1,180
Participation	3,262	2,439						1,625	1,840	2,395	2,828	2,854	3,201

361	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures		559	497											
Harvest	77	150	120	102	83	75	68	134	195	90	48	178	209	34
Participation	548	807	615	615	605	526	491	702	774	756	443	595	873	508

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures													
Harvest	104	65						103	121	178	110	108	133
Participation	765	721						703	667	845	712	665	692

APPENDIX C CONTINUED

MONTANA FISH, WILDLIFE AND PARKS REGION 3 EXPENDITURES BY HUNTING DISTRICT

380	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Expenditures	82,298	49,148	55,393	58,079	256,055	137,278	297,080	292,873	781,418	146,936	144,683	52,377	63,685	
Harvest	1,770	1,706	1,597	1,635	2,186	1,594	1,536	1,959						
Participation	4,301	5,453	5,701	5,338	6,145	6,475	5,878	5,871	5,890	5,967	6,306	6,957		

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Expenditures		79,564	75,821	18,465	8,571	5,856							
Harvest						1,493	1,984	1,478	1,780	529	405	552	781
Participation								5,936	5,972	5,336	4,460	4,446	5,270