WYOMING GRAY WOLF MANAGEMENT PLAN

WYOMING GAME AND FISH COMMISSION

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EXECUTIVE SUMMARY

The Wyoming Game and Fish Commission/Department (Commission/Department) will implement the following management plan for gray wolves upon delisting by the federal government. The purpose of this plan is to establish the framework for wolf management in Wyoming that will provide for a recovered, stable, and sustainable population of wolves that is connected genetically to other subpopulations of the Northern Rocky Mountain Distinct Population Segment (NRM DPS). The Department will monitor the wolf population using scientifically accepted methods to determine the number of wolves and breeding pairs[1] in Wyoming outside Yellowstone National Park (YNP) and the Wind River Reservation (WRR). Wolves inside Grand Teton National Park (GTNP) and the National Elk Refuge (NER) will count toward the state's objective of at least 10 breeding pairs and at least 100 wolves. The Department will manage wolves using public harvest and agency control, when necessary, to reduce conflicts with livestock, ungulate herds, or humans. Wolf hunting seasons will primarily coincide with big game hunting seasons in order to provide effective harvest with minimal impacts to wolf dispersal and reproduction. The Commission and Department are committed to maintaining a genetically viable wolf population, and will manage the Wolf Trophy Game Management Area (WTGMA) to facilitate natural dispersal and genetic interchange within the NRM metapopulation. The Department will also implement a genetics monitoring program to document gene flow and genetic connectivity between subpopulations in the NRM. This plan, although it varies in specific circumstances, is compatible with management plans in Idaho and Montana. Population objectives are similar for all three states and, as such, should guarantee that the federal recovery criteria established by the U.S. Fish and Wildlife Service (USFWS) are met and maintained after delisting. The Department is the appropriate agency to assume management authority of wolves following delisting. The Commission is the appropriate authority to direct the management of wolves. Both willingly recognize and will assume that responsibility. Key elements of this management plan include the following:

- The contents of this management plan were developed to be consistent with the agreement reached between the Wyoming Governor's Office and the U.S. Department of the Interior (DOI)/USFWS (see Appendix 1).

- The State of Wyoming will commit to manage for at least 10 breeding pairs and at least 100 wolves in Wyoming outside YNP and the WRR. The State of Wyoming is also committed to coordinate with YNP and the WRR to contribute to the step-down recovery target of at least 15 breeding pairs and at least 150 wolves statewide, including YNP and WRR. In the unlikely event that wolves in YNP and the WRR fall below 5 breeding pairs or 50 wolves for 3 consecutive years while the state continues to meet the objective of at least 10 breeding pairs and at least 100 wolves outside YNP and the WRR, the USFWS would focus any status review on factors that are impacting the wolf population in YNP and the WRR. Because any status review resulting from this scenario would include the entire NRM DPS, the status and management of wolves in Wyoming outside YNP and the WRR would be included. However, Wyoming would not be required to contribute more than 10 breeding pairs and 100 wolves outside YNP and the WRR.

[1]To provide clarity, a glossary of important terms used throughout this management plan is included in Appendix 3 beginning on page 60.

- Wolves will be managed under the dual classifications of trophy game animal and predatory animal.
    - Wolves will be trophy game animals within the area of northwestern Wyoming identified as the WTGMA shown in Figure 1. The boundary and size of the WTGMA will be established by State statute and cannot be changed through Commission rule or regulation.
    - The WTGMA will be seasonally expanded (Seasonal WTGMA) to facilitate natural dispersal of wolves between Wyoming and Idaho. The boundary of the WTGMA will be treated as a flex-line that will move from the Year-round WTGMA boundary to the Seasonal WTGMA boundary on October 15 and will move back to the Year-round WTGMA boundary on March 1 each year. During this timeframe, wolves will be designated as trophy game animals within the Seasonal WTGMA (Figure 1).
    - In this plan, all references to WTGMA mean the Year-round WTGMA with respect to actions and activities taking place from January 1 to December 31, and will include the Seasonal WTGMA with respect to actions and activities taking place from October 15 through the end of February. All references to wolves as a trophy game or predatory animal mean the classification that is in effect at the time of year and in the physical location of the wolf, as defined in this plan.
    - Wolves will be designated as predatory animals in the remainder of the state outside the WTGMA.

- The Department will implement an appropriate and science-based monitoring program to document the number of wolves and breeding pairs in Wyoming outside YNP and the WRR. The monitoring program will rely on accepted techniques that have been used to monitor wolves throughout the NRM such as the use of radio collars (both VHF and GPS) and aerial surveys. Additional scientifically accepted techniques may also be used when available and appropriate. All appropriate monitoring and population status information will be published annually in a report provided to the USFWS and will be made available to the public via the Department's website. The annual report will fulfill the Department's requirement to provide the USFWS with data describing the population status of wolves within the state during the post-delisting monitoring period.

- Management objectives will be assessed primarily through data collection at the WTGMA level (Figure 3). However, all wolves in Wyoming outside YNP and the WRR will be counted toward Wyoming's management objectives. The Department will take into consideration, but not be limited to, the following when developing a wolf hunting program or extending wolf hunting seasons: wolf breeding seasons; short and long range dispersal opportunity, survival, and success in forming new or joining existing packs; conflicts with livestock; and the broader game management responsibilities related to ungulates and other wildlife. Wolf Hunt Areas (WHAs) will be established to regulate public harvest on specific packs and assure management objectives are met. WHAs will be developed during the annual season setting process and will be small enough to direct harvest toward wolves in specific areas while managing harvest to allow the State of Wyoming to meet the objective of at least 10 breeding pairs and at least 100 wolves. Wolf hunting seasons will primarily coincide with big game seasons to provide effective harvest. This will also facilitate

reproduction and effective migration by limiting harvest of wolves during mid to late winter when dispersal activity is high and breeding seasons are occurring. Hunting may be extended beyond this time at the discretion of the Commission to: realize hunting quotas that are not significantly filled during the proposed hunting season, reduce wolf populations in areas where they are causing unacceptable impacts to ungulate herds, alleviate predation and/or conflicts at state operated elk feedgrounds, or reduce wolf populations in areas that experience persistent livestock depredation.

- Wolf hunt areas, harvest seasons and quotas will be recommended by the Department and approved by the Commission on an annual basis to allow for consideration of current wolf population and mortality data. In order to maintain at least 10 breeding pairs and at least 100 wolves, the Department will attempt to collect, to the maximum extent practical, biological information, including genetic material, from all wolves that are killed by the public. Age, sex, and other information must be obtained if the Department is to accurately assess the impact of harvest upon population objectives. Any licensed person who legally kills a wolf during any established season within the WTGMA will be required to notify the Department within 24 hours and will be required to present the unfrozen skull and pelt to a Department representative within five (5) days so that necessary data can be obtained. Reporting periods for wolves killed under trophy game animal status could be extended after inaugural hunting seasons if the Commission determines that extended reporting periods will not increase the likelihood of overharvest. Wolves that are killed in defense of property within the WTGMA will be required to be reported within 72 hours, except that wolves killed under a lethal take permit must be reported within 24 hours.

- Killing of wolves will not be regulated in areas of Wyoming where wolves are designated as a predatory animal. The Commission will not establish zones and areas within the WTGMA in which wolves may be taken as a predatory animal as is permitted with other trophy game species under State statute [W.S. 23-1-302(a)(ii)]. Wolves doing damage to property may be taken under provisions in State statute (W.S. 23-1-304 and W.S.23-3-115). Any person who harvests a wolf designated as a predatory animal, including non-indian owned fee titled land in the WRR, will be required to notify the Department within 10 days of the date the wolf was killed. The person will be required to report the name and address of the person taking the wolf, date the wolf was killed, the sex of the wolf, and the site of kill (identified by the section, range and township, or UTM coordinates). The Department will have no authority over wolves designated as predatory animals but will acquire genetics samples from wolves killed as predatory animals to the maximum extent practical, by the following means:
    - The Department and USDA-APHIS Wildlife Services (Wildlife Services) will sign an agreement that will require Wildlife Services to collect genetics samples from wolves killed under predatory animal status during control actions to the maximum extent practical;
    - The Department will follow up on all reported harvest of wolves designated as a predatory animal to request a genetics sample or to visit kill locations to collect a genetics sample when possible;
    - The agricultural community will assist the Department in collecting genetics samples by educating and requesting their stakeholders who kill wolves under predatory animal status to provide genetics samples;

- The Department's wolf information and education program will encourage the public to provide genetics samples from wolves killed under predatory animal status and explain the benefit to the Department's genetics monitoring program of obtaining as many genetics samples as possible from wolves killed as predatory animals.

- The Department agrees to manage wolves with the goal of continuing to enable successful wolf movement and dispersal between and among the NRM's three subpopulations. To the maximum extent practicable, this management should facilitate an average of at least one effective natural migrant per generation entering into the Greater Yellowstone Area (GYA). Such a metric should be monitored and measured over multiple generations (the exact monitoring interval is to be determined but may be in the range of 3 to 5 generations, equivalent to 12 to 20 years). Conservation measures will include, but are not limited to, revising genetics monitoring protocols, adjusting wolf management strategies to facilitate effective migrants, working with other states to promote natural dispersal into and within the GYA and, if necessary, by relocation or translocation of healthy, wild wolves between subpopulations. The Department will sign a Genetics Memorandum of Understanding (MOU) with the USFWS, Montana, and Idaho formally committing to this objective prior to delisting. The Department will monitor wolf dispersal and genetics using scientifically accepted methods to determine if the population is genetically healthy and gene flow is occurring. To meet genetics monitoring objectives, the Department will collect, to maximum extent practicable, genetic material from all wolves killed under trophy game and predatory animal status, during agency control actions, and for protection of private property, and wolves that die from any other form of mortality. Genetics samples will also be collected from all wolves captured by the Department or its authorized agents.

- Wolves that cause conflicts will be managed using effective techniques currently employed by the USFWS and Wildlife Services designed to minimize conflicts between wolves and other wildlife, livestock, and humans. The Department will amend the cooperative agreement with Wildlife Services that authorizes Wildlife Services to assist the Department in managing conflicts between other trophy game animals and livestock to include wolves. The Department will address conflicts in the WTGMA and Seasonal WTGMA, including compensation for livestock killed or injured by wolves in accordance with State statutes and Commission regulations. Lethal control actions will not be authorized in the event the removal of wolves may result in relisting wolves under the Endangered Species Act (ESA). Property owners within the WTGMA will be allowed to take wolves in the act of "doing damage to private property" as defined in Commission regulation.

- Interactions between wolves and wildlife will be closely monitored, especially on state operated elk feedgrounds. As needed, management actions will be taken to minimize impacts while ensuring at least 10 breeding pairs and at least 100 wolves are maintained in Wyoming outside YNP and the WRR. There will be no agency take of wolves unless wolf predation is determined to be a significant factor causing an "unacceptable impact on a wild ungulate population or herd" as described in Commission regulation. The Department may take wolves that displace elk from feedgrounds in the WTGMA if it results in one of the following conflicts: damage to private stored crops; elk co-mingling with domestic livestock; or displacement of elk from feedgrounds onto highway right of way causing human safety concerns.

- A progressive public information and education program will be developed and implemented by the Department. This program will use a multifaceted approach to educate Wyoming's publics on all aspects of wolf management and conservation.

- The Department will use a variety of potential sources to secure funds to implement the management program for wolves. The potential cost of the management program will ultimately depend on the complexity of the monitoring program, the number and degree of wolf/human conflicts in areas where wolves are trophy game animals, and the area occupied by wolves long-term.

- Wolves can cause both negative and positive economic impacts in Wyoming. Positive impacts may be realized in the gateway communities to YNP from increased tourism. Negative economic impacts generally occur at the site-specific level (specific livestock herds or drainages for ungulates). Negative economic impacts in all areas occupied by wolves in Wyoming should be minimal and manageable while wolves are under state management. If not, management actions will be taken to minimize impacts while ensuring the objective of maintaining at least 10 breeding pairs and at least 100 wolves is met.

INTRODUCTION

The gray wolf (*Canis lupus*) was extirpated from Wyoming by the 1930s. From that time through the early 1990s, there were occasional wolf sightings in Wyoming, but no reproduction was documented. With changing public attitudes through the 1960s and implementation of the ESA in 1973, wolves were protected by the federal government. Public attitudes toward wolves continued to change through the 1980s and 1990s, with the majority of United States citizens viewing wolves as a valuable natural resource and an integral part of natural ecosystems (McNaught 1987, Bath 1991). As attitudes toward wolves changed, a national movement began that would bring wolves back to the western United States, including Wyoming. Wyoming residents were split on their views towards wolves prior to reintroduction, with 49% in favor and 39% opposed to wolf restoration into YNP (Bath 1991).

With the goal of reestablishing a sustainable gray wolf population in the northern Rocky Mountains (NRM; Wyoming, Idaho, and Montana), the USFWS reintroduced 31 wolves to YNP, and 35 wolves to central Idaho in 1995 and 1996 (Bangs et al. 1998). These wolf populations have rapidly expanded in both numbers and distribution, setting forth plans for delisting, including the drafting of state wolf management plans in Idaho, Montana, and Wyoming.

The NRM wolf population is comprised of three recovery areas: northwest Montana, central Idaho, and the GYA. The GYA includes all of Wyoming, including YNP, the WRR, GTNP, the NER, and adjacent parts of Idaho and Montana.

The USFWS' current recovery goal for the NRM gray wolf population is: thirty or more breeding pairs (an adult male and an adult female that raise at least 2 pups until December 31) comprising 300+ wolves in a metapopulation (a population that exists as partially isolated sets of subpopulations) with genetic exchange between subpopulations (Service 1994; Fritts and Carbyn 1995). Step-down recovery targets require Montana, Idaho, and Wyoming to each maintain at least 10 breeding pairs and 100 wolves by managing for a safety margin of at least 15 breeding pairs and at least 150 wolves in mid-winter. Genetic exchange can be natural or, if necessary, agency managed. (74 FR 15123, April 2, 2009) The states were also required to have adequate regulatory mechanisms in place before wolves could be considered for removal from protection of the ESA by the USFWS. This included drafting state wolf management plans. These requirements are intended to assure the gray wolf will not become threatened or endangered again. The USFWS determined that 2002 was the third year in which at least 30 breeding pairs and at least 300 wolves inhabited the NRM recovery area. The purpose of this plan is to establish a framework for wolf management in Wyoming that will provide for a recovered and sustainable population of wolves that is well connected genetically to other subpopulations in the NRM, while minimizing wolf/human conflicts and managing wolves to allow for the long-term health and viability of big game herds.

Upon delisting, management authority for wolves will return to the states in which wolves reside. The Department is the agency charged with the management of wildlife species within Wyoming, and is the appropriate agency to manage wolves within the state. Therefore, the Department will accept the responsibility and challenges of maintaining and managing Wyoming's portion of the NRM wolf population residing in those areas where wolves are designated as trophy game animal outside YNP and the WRR. Wolves inside GTNP and the

NER will count toward the state's objective of at least 10 breeding pairs and at least 100 wolves. A recent analysis of suitable wolf habitat in Montana, Idaho, and Wyoming indicated suitable wolf habitat in Wyoming is mostly restricted to the northwestern corner of the state (Oakleaf et al. 2006). This has been observed throughout the recovery effort because it is extremely rare for breeding pairs to persist outside the suitable habitat areas identified by Oakleaf et al. (2006) in northwest Wyoming.

Prior to 2003, the gray wolf was designated by W.S. 23-1-101(a)(viii) as a predatory animal in Wyoming. This classification was changed in the 2003 Wyoming legislative session to a dual status, following delisting by the USFWS, of "trophy game animal" or "predatory animal" depending on the area they occupied. In early 2004, the USFWS determined Wyoming's regulatory framework was not adequate to propose delisting. In 2007, Wyoming adopted new legislation that increased the area in which wolves would be designated as a trophy game animal and the Wyoming Gray Wolf Management Plan was updated in 2008 to implement these changes. Wolves were removed from protection under the ESA and placed under state management authority in March 2008. Multiple groups sued the USFWS over the terms of the delisting rule. Following a preliminary injunction by Montana Federal District Court in October, 2008 the USFWS requested the Court to remand the delisting rule for further consideration. The USFWS then rejected Wyoming's wolf management framework. The Commission revised the 2008 wolf management plan in November 2008 to address issues the USFWS had identified, however the USFWS held that Wyoming State statute must also be changed to proceed with delisting. The State of Wyoming challenged this decision in Wyoming Federal District Court. In November, 2010 the Court ruled in favor of the State of Wyoming and ordered the USFWS to reassess Wyoming's wolf management framework. The Wyoming Governor's Office subsequently began negotiations with the USFWS and DOI to agree on a wolf management framework that met the requirements of the USFWS. This revised management plan incorporates the terms of the final delisting agreement between the Wyoming Governor's Office and the DOI/USFWS.

The State of Wyoming will commit to manage for at least 10 breeding pairs and at least 100 wolves in Wyoming outside YNP and the WRR. The State of Wyoming is also committed to coordinate with YNP and the WRR to contribute to the step-down recovery target of at least 15 breeding pairs and at least 150 wolves statewide, including YNP and WRR. In the unlikely event that wolves in YNP and the WRR fall below 5 breeding pairs or 50 wolves for 3 consecutive years while the state continues to meet the objective of at least 10 breeding pairs and at least 100 wolves outside YNP and the WRR, the USFWS would focus any status review on factors that are impacting the wolf population in YNP and the WRR. Because any status review resulting from this scenario would include the entire NRM DPS, the status and management of wolves in Wyoming outside YNP and the WRR would be included. However, Wyoming would not be required to contribute more than 10 breeding pairs and 100 wolves outside YNP and the WRR. Wolves in Wyoming will be managed under a dual classification status. Wolves will be designated as a trophy game animal in portions of northwest Wyoming and a predatory animal throughout the remainder of the state. The area where wolves are designated as a trophy game animal shall be known as the Wolf Trophy Game Management Area (WTGMA). The boundary of the WTGMA will expand seasonally to facilitate wolf dispersal and gene flow between central Idaho and GYA wolf populations. The boundary and size of the WTGMA is established by State

statute and cannot be changed through Commission rule or regulation. Wolves will be designated and managed as trophy game animals in the Year-round WTGMA area of northwest Wyoming beginning at the junction of Highway 120 and the Wyoming-Montana state line; southerly along Wyoming Highway 120 to the Greybull River; southwesterly up said river to the Wood River; southwesterly up said river to the Shoshone National Forest Boundary; southerly along said boundary to the Wind River Indian Reservation boundary; westerly, then southerly along said boundary to the Continental Divide; southeasterly along said divide to the Middle Fork of Boulder Creek; westerly down said creek to Boulder Creek; westerly down said creek to the Bridger-Teton National Forest boundary; northwesterly along said boundary to its intersection with U.S. Highway 189-191; northwesterly along said highway to the intersection with U.S. Highway 26-89-191; northerly along said highway to Wyoming Highway 22 in the town of Jackson; westerly along said highway to the Wyoming-Idaho state line; north along said state line to the Yellowstone National Park boundary; easterly, then northerly along said boundary to the Wyoming-Montana state line; easterly along said state line to Wyoming Highway 120 (Figure 1).

The southern boundary of the WTGMA will expand seasonally to include the Snake River Range and northern portions of the Wyoming Range. The boundary of the WTGMA will be treated as a flex-line that will move from the Year-round WTGMA boundary to the Seasonal WTGMA boundary on October 15 and will move back to the Year-round WTGMA boundary on March 1 each year. Wolves will be designated and managed as trophy game animals in the seasonally expanded WTGMA area of northwest Wyoming as follows: beginning at the Year-round WTGMA boundary where the Bridger-Teton National Forest boundary intersects U.S. Highway 189-191 at Hoback Rim; westerly and then southerly along said forest boundary to its intersection with McDougal Gap Road (USFS Road 10125); westerly along said road to Grey's River Road (USFS Road 10138); southerly along said road to Sheep Creek; westerly down said creek to Grey's River; southwesterly up said river to Bear Creek; southwesterly up said creek to the hydrographic divide between Bear Creek and Willow Creek; west from said divide to Willow Creek Road (USFS Road 10080); northwesterly along said road to Lincoln County Road 123; southerly along said road to Grover Park Road (USFS Road 10081); southerly then westerly along said road to Lincoln County Road 172; westerly along said road to the junction with Wyoming Highway 237; westerly along said highway to Wyoming Highway 238; southerly along said highway to Lincoln County Road 134; westerly along said road to the Wyoming-Idaho state Line; north along said state line to Wyoming Highway 22 where the Seasonal WTGMA boundary will rejoin the Year-round WTGMA boundary (Figure 1).

Outside of the WTGMA wolves will be designated as predatory animals. The Department will collect data on wolves outside the WTGMA but will not manage wolves in this area. Predatory animals are regulated under Title 11, Chapter 6 of the Wyoming Statutes, by the Department of Agriculture. The Commission's authority to promulgate regulations for the management of wolves is limited to the WTGMA. However, State statute and Commission regulation will require any person who harvests a wolf designated as a predatory animal, including non-indian owned fee titled land in the WRR, will be required to notify the Department within 10 days of the date the wolf was killed.

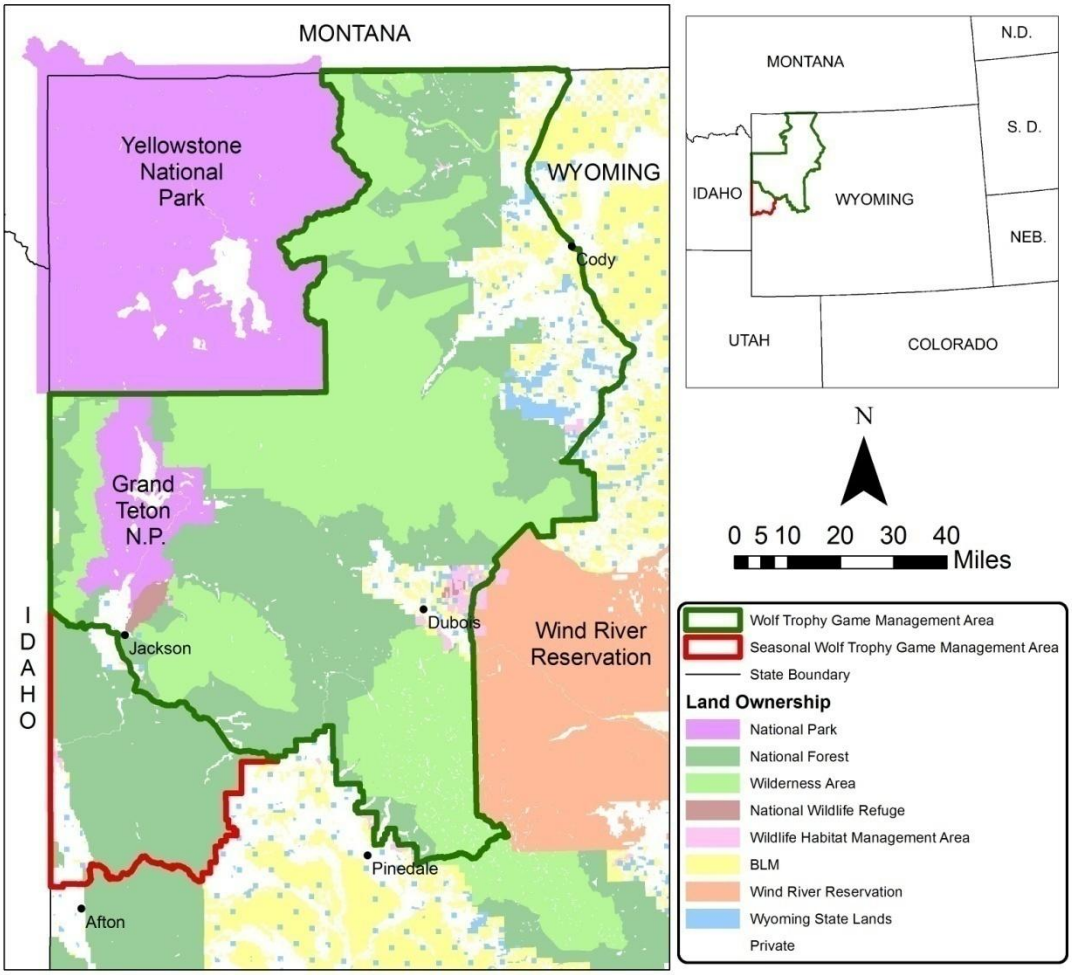

FIGURE 1. Wolf Trophy Game Management Area in northwest Wyoming.

The Department agrees to manage wolves with the goal of continuing to enable successful wolf movement and dispersal between and among the NRM's three subpopulations. To the maximum extent practicable, this management should facilitate an average of at least one effective natural migrant per generation entering into the GYA. Such a metric should be monitored and measured over multiple generations (the exact monitoring interval is to be determined but may be in the range of 3 to 5 generations, equivalent to 12 to 20 years). Conservation measures will include, but are not limited to, revising genetics monitoring protocols, adjusting wolf management strategies to facilitate effective migrants, working with other states to promote natural dispersal into and within the GYA and, if necessary, by relocation or translocation of healthy, wild wolves between subpopulations. The Department will sign a Genetics MOU with the USFWS, Montana, and Idaho formally committing to this objective prior to delisting. The Department will monitor wolf dispersal and genetics using scientifically accepted methods to determine if the population is genetically healthy and gene flow is occurring.

One requirement in the Federal Wolf Recovery Plan for delisting is a minimum of 30 breeding pairs and 300 wolves must be maintained with an equitable distribution among the States of Wyoming, Idaho, and Montana for 3 consecutive years. As of December 2010, there were >343 wolves, >45 documented wolf packs, and >27 documented breeding pairs residing predominantly in Wyoming

(including YNP; Jimenez et al. 2011). This included >243 wolves, >33 documented wolf packs, and >19 breeding pairs in Wyoming outside YNP and the WRR (Jimenez et al. 2011). The NRM wolf population, including the Wyoming segment, has exceeded the criteria for delisting since 2002. It is clearly in the State of Wyoming's best interest for wolves to be delisted and for state agencies to manage the recovered wolf population. The Department is the appropriate agency to assume management responsibility for wolves outside the National Parks and WRR once delisting has occurred, and it is a role the Department wishes to assume.

Wolves are of national interest, and the national public, not just the license-buying public of Wyoming, should share in the funding of wolf management. Supplemental funding will be sought through special federal or state appropriations, public/private foundations, and other sources.

In addition, the success of any management program depends, at some level, upon successful coordination with other agencies and the public. A wolf management program for the State of Wyoming should be sufficiently similar to management programs for the states of Idaho and Montana to facilitate adequate management of the entire GYA wolf population. Although the dual status classification and the management actions it entails are unique to Wyoming, this plan will allow Wyoming, in conjunction with Idaho and Montana, to effectively manage a recovered GYA wolf population. Both Idaho and Montana have finalized their wolf management plans and the USFWS has approved them as adequate regulatory mechanisms for wolf conservation in those states.

WOLF LIFE HISTORY[2]

Physical Characteristics: The wolf is the largest member of the dog family *Canidae*. Pelt color can be highly variable ranging from white to black, with grizzled gray or black being most common in the NRM (Gipson et al. 2002). Weight typically ranges from 80 to 90 pounds (36 to 41 kg) for females and 90 to 110 pounds (41 to 50 kg) for males. Height averages 26 to 32 inches (65 to 80 cm) at the shoulder, and length typically measures 4.5 to 6.5 feet (1.4 to 2.0 m) from nose to tail tip. Approximate track size is 4 inches wide by 5 inches long (9.5 by 12.1 cm), and can be difficult to differentiate from tracks of large domestic dogs.

Reproduction and Social Behavior: Wolves form family groups called packs. A pack consists of at least two individuals of the opposite sex that establish territories, breed, and produce pups. For monitoring purposes, the USFWS defines a "pack" as two adult wolves traveling together within a distinct territory (USFWS 2008). Wolves are sexually mature at 22 months of age (Mech 1970, Kreeger 2003). The dominant male and female in the pack (alpha pair) produce most of the young; however, about 15% of the packs in YNP have had multiple litters (Smith et al. 2006). Breeding occurs during February or March, and pups are born after a 63-day gestation period in April or May. Litter sizes in Wyoming have averaged approximately five pups (USFWS 2002, Smith et al. 2006). Pups remain at a den site for about 6 weeks until they are weaned. The pack then moves to rendezvous sites (home sites) until the pups are old enough to hunt with the pack (e.g., September or October). Once pups begin hunting, these rendezvous sites are no longer used and packs range throughout their territory as a cohesive unit.

[2]From USFWS 1994: Appendix 2, unless direct reference is provided.

Wolves tend to leave the pack during fall through spring to find a mate and establish a new territory and pack (Fritts and Mech 1981, Mech and Boitani 2003, Jimenez et al., in prep.); however, some individuals stay with the pack longer. Pack territories are defended against other wolves. Territory location is advertised to other wolves through scent marking and howling. Territory size appears related to prey density (Ballard et al. 1987, Fuller 1989). Territory sizes of wolves recolonizing northwest Montana average 300-400 mi^2 (777 to 1,036 km^2). Territories of wolves in the GYA average over 200 mi^2 (535 km^2) and range from 50 to 550 mi^2 (Smith et al. 2006). Pack sizes typically range from 2 to 16 wolves, but it appears pack size may be related to size of prey species. For example, wolf packs in Minnesota that preyed primarily on white-tailed deer (*Odocoileus virginianus*) averaged 6.7 wolves (Fuller 1989), whereas wolf packs in Alaska averaged 11.2 wolves where moose (*Alces alces*) were the primary prey species (Peterson et al. 1984). The average number of wolves per pack (N=25) in Wyoming outside of YNP in 2010 was 6.8 wolves (range 2-14) (Jimenez et al. 2011).

Wolf social structure allows wolf populations to quickly compensate for low to moderate levels of mortality, such as mortality occurring under a moderate wolf hunting framework. Wolves become sexually mature at approximately 2 years of age, thus wolf populations contain a reserve of reproductively capable adults that are prevented from breeding by the dominant breeding individuals within the respective pack (Fuller et al. 2003, Mech and Boitani 2003). In addition, approximately 10-15% of wolves in a population are dispersing, lone wolves that are actively searching for breeding opportunities (Fuller et al. 2003). These characteristics of wolf social ecology allow breeding positions left vacant after the death of a breeding individual to be filled quickly in wolf populations, thus the majority of wolf packs reproduce each year as long as late winter mortality of breeding females is restricted (Mech and Boitani 2003). This rapid replacement of breeding individuals following breeder loss explains part of the resiliency of wolf populations to human-caused mortality through harvest or control actions (National Research Council 1997, Mech and Boitani 2003). Other factors that contribute to this resiliency, such as high reproductive potential, are explained below.

Population Growth: Wolves have a high reproductive potential and populations can sustain moderately high levels of mortality (Fuller et al. 2003). Keith (1983) reported an average annual population increase of 29% from seven wolf populations in the United States and Canada. Three populations were exploited through a concentrated effort to reduce these populations using a variety of harvest methods, while four were unexploited, but yielded similar rates of increase. Unexploited wolf populations may increase 28-35% annually. Wolves recolonizing northwest Montana increased an average of 22% per year since 1986 (Fritts et al. 1994). Since 1999, the wolf population in the GYA has increased an average of 14% per year (Figure 2; USFWS et al. 2011). In unexploited populations, wolf density is ultimately limited by prey abundance and/or wolf social ecology (Fuller 1989, Fuller et al. 2003, Cariappa et al. 2011).

Mortality Factors: In areas where human-caused mortality is low, disease, starvation, and killing by other wolves are the primary causes of wolf mortality. Mortality rates in unexploited wolf populations average 45% for yearlings and 10% for adults. However, human exploitation tends to be the highest form of mortality in most wolf populations. In northwest Montana and adjacent Canada, 77% of documented wolf mortalities were human-caused (33 of 44) (USFWS 1993). Since the USFWS began publishing annual reports in 1999 (through 2010), 75% of documented wolf

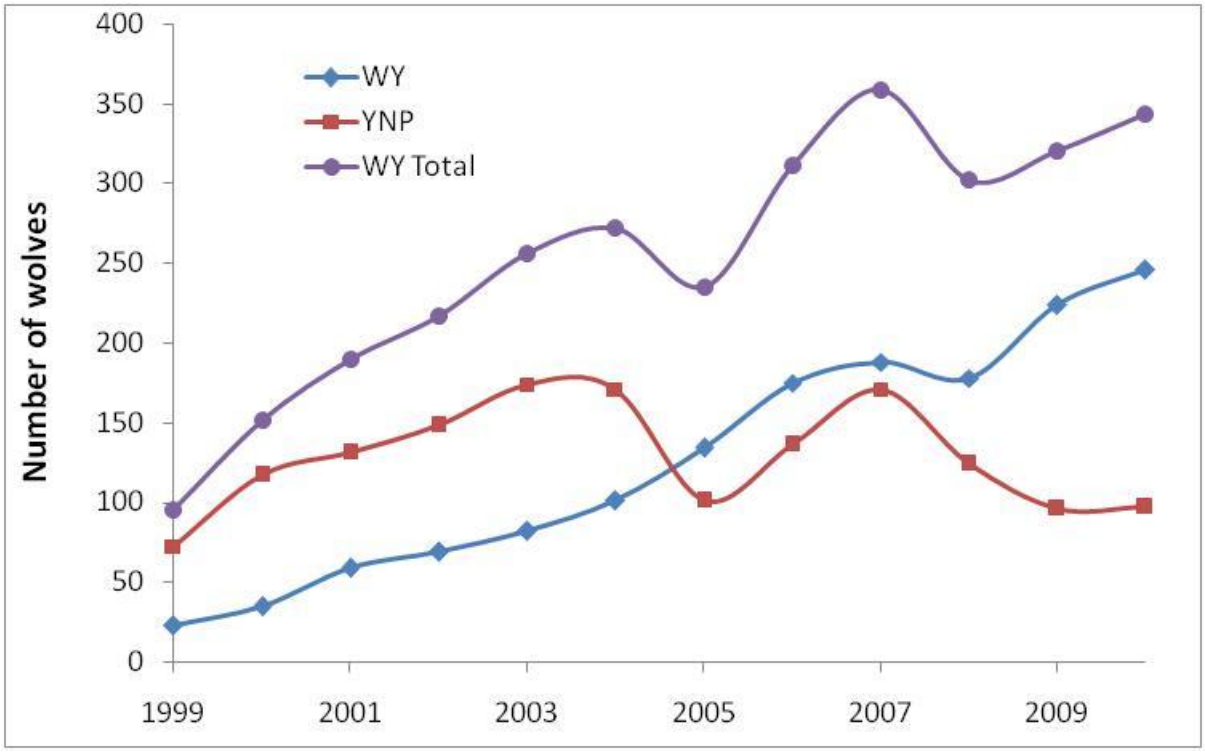

FIGURE 2. Wolf population size in Yellowstone National Park (YNP) Wyoming outside YNP (WY) and the total wolf population in Wyoming (WY Total) from 1999-2010. All data are accessible at http://westerngraywolf.fws.gov.

mortalities in the GYA have been human-caused (including control actions, hunting, vehicle collisions, research-related mortalities, and illegal shootings). Of the 965 documented wolf mortalities, 165 were by natural causes, 584 were from control actions for livestock depredations, 136 were from other human-causes (including vehicle collisions, research-related mortalities, harvest, and illegal shootings), and 80 were from unknown causes. These data may be skewed somewhat because human-caused mortalities are more easily detected than are natural mortalities. During this period, annual wolf mortality rates in the GYA ranged from 14-56% and averaged 31%. Annual population growth rates during this period ranged from -3% to 50% and averaged 14%. Research suggests that annual mortality rates of 22 to >50% may suppress wolf population growth (Keith 1983, Ballard et al. 1987, Fuller 1989, Fuller et al. 2003, Creel and Rotella 2010). Mortality rates and population growth rates reported for wolves in Wyoming outside YNP from 2007 to 2010 suggest that the wolf population in Wyoming can sustain, on average, a 36% mortality rate from human causes and 43% total mortality rate without declining.

Feeding Habits: Wolves are highly efficient predators that feed primarily on large ungulates, but beaver (*Castor canadensis*) and other small mammals may also be utilized at certain times of the year. Prey preference appears related to prey size, availability, and vulnerability. Order of prey preference by wolves tends to be deer (*O.* spp.), elk (*Cervus elaphus*), and bighorn sheep (*Ovis canadensis*) where they coexist, and wolves tend to select elk over moose and bison (*Bison bison*) (Singer 1991). Based on preference and prey availability in the GYA, wolves reintroduced into YNP were expected to select elk most often followed by mule deer (*O. hemionus*), moose, and bison (Singer 1991). Recent studies of wolf-prey relationships in and adjacent to YNP have

documented >85% of wolf kills to be elk, followed by bison, moose, deer, and pronghorn (*Antilocapra americana*) (Smith et al. 2006, Smith et al. 2002, Jaffe 2001, Mech et al. 2001).

Wolves are largely opportunistic, generally taking young-of-the-year and old animals (Peterson et al. 1984, Fuller 1989, Boyd et al. 1994). However, wolves also are known to feed on prime age animals (Potvin et al. 1988). Wolf consumption rates can vary from 6 to 14 pounds/wolf/day (2.7-6.4 kg/wolf/day; Boyce and Gaillard 1992). Singer (1991) speculated that each wolf on the northern range of YNP would consume an average of 9.9 elk, 2.4 mule deer, 0.2 each of bison, moose, and pronghorn, and 0.03 bighorn sheep annually based on prey preference and availability. At the 2010 population level, wolves in Wyoming outside YNP would consume an estimated 2,435 elk, 590 mule deer, and 49 each of bison, moose and pronghorn antelope. It should be noted the estimated predation on moose outside YNP is likely much lower than actual predation because moose have become relatively rare in the northern range of YNP compared to the rest of northwest Wyoming. Smith et al. (2004) documented a kill rate of 1.9 ungulates/wolf/month during November-March in YNP (1995-2000), and kills were 90% elk.

Anticipated impacts of wolf predation on ungulate populations in the GYA indicated population reductions of 5-20% for elk, 3-19% for deer, up to 15% for bison, and up to 7% for moose may occur once the wolf population reached recovery levels (i.e., at least 10 breeding pairs and 100 wolves for 3 consecutive years in the GYA). Impacts on other ungulate populations were expected to be minimal (Boyce and Gaillard 1992). By the end of 2001, there were 218 wolves in the GYA recovery area and by 2010 the population had increased to an estimated 501 wolves, which is much higher than federally mandated recovery criteria (USFWS et al. 2011). There has been a much greater decline in recruitment in some elk herd units adjacent to YNP in Wyoming by comparison to other elk herds in the state (see Table 3). Although the extended drought and other environmental factors may be contributing factors, undoubtedly wolf predation is contributing to these declines. More research on wolf/wildlife interaction is needed to better quantify the effects wolves have on their prey. Ungulate monitoring efforts will be enhanced in those areas with established wolf packs until the effects of wolf predation are better understood.

Livestock Depredation: In the western United States, wolves gained a notorious reputation as livestock killers by the early 1900s, as livestock replaced native ungulates on western rangelands. The impact of wolf predation on livestock during this time contributed to the extermination of the gray wolf from the western United States (Young and Goldman 1944). From 1897-1907 bounties were paid on 20,819 wolves in Wyoming alone [Seton 1929:261; coyotes (*Canis latrans*) were likely mistaken for wolves in some cases]. Wolf depredation on livestock undoubtedly intensified due to the depletion of natural prey and expanding livestock presence.

While livestock losses to wolves are minimal industry-wide, losses to individual operators can be significant (Fritts et al. 1992, Mack et al. 1992). Wolf depredation rates on cattle were 0.12, 0.37, and 0.87 per 1000 available in Minnesota, British Columbia, and Alberta, respectively (Mack et al. 1992). Wolves accounted for 31% of the documented domestic calf mortalities on an allotment in Idaho during 1999 and 2000 (Oakleaf et al. 2003). Depredation rates on sheep were 2.37 and 0.54 per 1,000 available in Minnesota and British Columbia, and annual losses to wolves averaged 33 sheep/year in Alberta (number of sheep available to wolves in Alberta was not documented; Mack et al. 1992). A recovered wolf population in the GYA was expected to account for an average

of 19 cattle (range: 1-32) and 68 sheep (range: 17-110) depredations annually (USFWS 1994). In 2010, 54 cattle, 83 sheep, and 1 dog were confirmed killed by wolves in the GYA; confirmed losses in Wyoming consisted of 26 cattle, 33 sheep, and no dogs (Table 1; USFWS et al. 2011). Control actions included lethally removing 40 wolves in Wyoming. Control of offending wolves, improved livestock management practices (e.g., carcass management, fencing, etc.), compensation for losses, and communication with the public have been suggested as means to enhance wolf recovery where wolf-livestock conflicts exist (Fritts et al. 1992, Mack et al. 1992, Niemeyer et al. 1994, Bangs et al. 2006).

TABLE 1. Confirmed wolf-caused livestock/dog depredations in Wyoming and GYA 1999 – 2010 (USFWS 2011).

YEAR	SHEEP		CATTLE		OTHER LIVESTOCK*		DOGS	
	Wyoming	GYA	Wyoming	GYA	Wyoming	GYA	Wyoming	GYA
1999	0	13	2	4	1	1	6	7
2000	25	39	3	7	0	0	6	8
2001	34	117	18	22	0	0	2	4
2002	0	71	23	33	0	0	0	1
2003	7	90	34	45	10	10	0	0
2004	17	99	75	100	2	4	2	6
2005	27	53	54	61	0	0	1	2
2006	38	41	123	135	1	1	0	0
2007	16	35	55	79	0	13	2	3
2008	26	111	41	60	0	5	0	1
2009	195	477	20	37	0	2	7	13
2010	33	83	26	54	1	1	0	1
Totals	418	1229	474	637	15	37	26	46

* includes horses, llamas, mules, donkeys, goats

ISSUES AND STRATEGIES

LEGAL STATUS

In 1973, the USFWS listed the NRM gray wolf (*C. l. irremotus*) (38 FR 14678, June 4, 1973) pursuant to the Endangered Species Conservation Act of 1969. In 1974, the NRM wolf was listed under the ESA (39 FR 1171, January 4, 1974). Due to questions about the validity of wolf subspecies classification at the time and issues associated with the narrow geographic scope of each subspecies, the USFWS published a rule reclassifying the gray wolf as endangered at the species level (*C. lupus*) throughout the conterminous 48 States (43 FR 9607, March 9, 1978). This rule also provided assurance that this reclassification would not alter the USFWS's intention to focus recovery on each population as separate entities, including the NRM. Accordingly, a recovery plan was developed the NRM wolf population in 1980 (revised in 1987) (USFWS 1980, USFWS 1987).

The 1980 NRM wolf recovery plan's objective was to re-establish and maintain viable populations of the NRM wolf in its former range where feasible (USFWS 1980). This plan did not include recovery goals (i.e., delisting criteria). The 1987 plan specified a recovery criterion of a minimum of 10 breeding pairs of wolves (defined as 2 wolves of opposite sex and adequate age, capable of producing offspring) for a minimum of 3 successive years in each of 3 distinct recovery areas including northwestern Montana, central Idaho, and the GYA area. The 1987 recovery plan recommended that connectivity between these areas be encouraged. Critical reviews of the criteria in the 1994 EIS and in a 2001/2002 peer review each resulted in minor changes to the recovery criteria. The 2009 delisting rule summarized the current recovery criteria as "thirty or more breeding pairs (an adult male and an adult female that raise at least 2 pups until December 31) comprising 300+ wolves in a metapopulation (a population that exists as partially isolated sets of subpopulations) with genetic exchange between subpopulations (Service 1994). Step-down recovery targets require Montana, Idaho, and Wyoming to each maintain at least 10 breeding pairs and 100 wolves by managing for a safety margin of at least 15 breeding pairs and at least 150 wolves in mid-winter. Genetic exchange can be natural or, if necessary, agency managed."

During this process, recovery areas in northwest Montana, central Idaho, and the GYA were identified (USFWS 1987). The following criteria were used to select the three recovery areas: presence of an adequate year-round prey base; at least 3,000 mi^2 (7,770 km^2) of contiguous wilderness, national parks, and adjacent public lands; a maximum of 10% private land; the absence, if possible, of livestock grazing; and isolation from populated and heavily used recreation areas allowing protection of 10 breeding pairs of wolves from human disturbance (USFWS 1987).

Wolves were reintroduced into YNP and central Idaho in 1995 and 1996 as nonessential, experimental populations under Section 10j of the ESA (Bangs and Fritts 1996). Wolves in the northwest Montana portion of the NRM were present when wolves were reintroduced into YNP and central Idaho due to natural emigration from the Canadian population to the north, thus were designated as endangered and were not part of the nonessential, experimental population.

Prior to 2003, the gray wolf was designated by W.S. 23-1-101(a)(viii) as a predatory animal. This classification was changed in the 2003 legislative session, and again in the 2007 legislative session to a dual status of "trophy game animal" or "predatory animal" depending on the location of a pack or individuals. Wyoming Statute and Commission regulation classify wolves as trophy game animals in the Year-round WTGMA depicted in Figure 1 and described on page 8 of this management plan. The WTGMA will be seasonally expanded from October 15 through the end of February to encompass the Snake River Range and northern portions of the Wyoming Range as depicted in Figure 1 and described on page 8 of this management plan. Wolves within the Seasonal WTGMA will be designated and managed as a trophy game animal from October 15 through the end of February each year and will revert to predatory animal status from March 1 through October 14 each year. All references to the WTGMA in this plan mean the WTGMA boundary in effect at the specific time of year, unless otherwise stated. All references to "trophy game animal" and "predatory animal" mean the classification in effect at the specific time of year in the physical location of the wolf.

POPULATION MANAGEMENT

Population Objectives: Upon delisting, Wyoming will maintain at least 10 breeding pairs and at least 100 wolves within the state outside YNP and the WRR. The Commission does not have authority to manage wolves within YNP or the boundaries of the WRR. Breeding pairs and wolves with territories predominantly inside YNP and the WRR will not count toward Wyoming's wolf population objective of at least 10 breeding pairs and at least 100 wolves but will be counted towards the GYA population. Wolves within GTNP and the NER will count towards Wyoming's objective of at least 10 breeding pairs and at least 100 wolves outside YNP and the WRR because wolf packs that inhabit these jurisdictions are transboundary packs that spend some of the year outside these jurisdictions in the WTGMA and are not counted toward other population objectives. All population objectives refer to the number of wolves and breeding pairs present on December 31 of the respective calendar year.

State statute authorizes the Commission to establish regulations pertaining to wolf management in areas where wolves are designated as trophy game animals. Regulations will be drafted to allow regulated public harvest in these areas when the wolf population is sufficient to sustain harvest. The Department will consider the following when developing or recommending extension of wolf hunting seasons: wolf breeding seasons; short and long range dispersal opportunity, survival, and success in forming new or joining existing packs; average mortality and mortality occurring during the current year; conflicts with livestock; and the broader game management responsibilities related to ungulates and other wildlife. Regulated public harvest may also be allowed in the Seasonal WTGMA, but harvest levels and season dates will be set as to not impair the potential for genetic connectivity. The Department and the USFWS do not expect wolf packs to occupy the Seasonal WTGMA long-term because the wolf packs that have formed in this area under federal protections have rarely persisted.

Management of wolves in Wyoming will be conducted at the WTGMA level, including the Year-round and Seasonal WTGMA (Figure 3). The boundary and size of the WTGMA is established by State statute and cannot be changed through Commission rule or regulation. Annual breeding pair objectives will be set at the WTGMA level, while Wolf Hunt Areas (WHA) will be established to regulate public harvest. The Department uses this general approach to manage all other species of big game and trophy game animals. Population objectives are set at the WTGMA level, while Hunt Areas are used to regulate harvest at finer geographic scales. The WTGMA is sufficiently large to manage for a recovered wolf population. The Department expects to delineate approximately 10-12 WHAs throughout the WTGMA. WHAs will be small enough to direct harvest toward wolves in specific areas while managing harvest to maintain at least 10 breeding pairs and at least 100 wolves. WHAs will be established during the season setting process at a later date. Wolf packs that occupy the WTGMA will be actively managed and public harvest will be regulated under appropriate State statutes and Commission regulations to assure at least 10 breeding pairs and at least 100 wolves occupy Wyoming outside YNP and the WRR.

Wolves that occupy areas outside the WTGMA will be designated as a predatory animal. Killing of wolves will not be regulated in areas of Wyoming where wolves are designated as a predatory animal. The Commission will not establish zones and areas within the WTGMA in which wolves

may be taken as a predatory animal as is permitted with other trophy game species under State statute [W.S. 23-1-302(a)(ii)]. Any person who harvests a wolf designated as a predatory animal, including non-indian owned fee titled land in the WRR, will be required to notify the Department within 10 days of the date the wolf was killed. The person will be required to report the name and address of the person taking the wolf, date the wolf was killed, the sex of the wolf, and the site of kill (identified by the section, range and township, or UTM coordinates). The Department will have no authority over wolves designated as predatory animals but will acquire genetics samples from wolves killed as predatory animals to the maximum extent practical, by the following means:

- The Department and Wildlife Services will sign an agreement that will require Wildlife Services to collect genetics samples from wolves killed under predatory animal status during control actions to the maximum extent practical;
- The Department will follow up on all reported harvest of wolves designated as a predatory animal to request a genetics sample or to visit kill locations to collect a genetics sample when possible;
- The agricultural community will assist the Department in collecting genetics samples by educating and requesting their stakeholders who kill wolves under predatory animal status to provide genetics samples;
- The Department's wolf information and education program will encourage the public to provide genetics samples from wolves killed under predatory animal status and explain the benefit to the Department's genetics monitoring program of obtaining as many genetics samples as possible from wolves killed as predatory animals.

The size of the WTGMA was selected based on several criteria. It provides an area of sufficient size to maintain at least 10 wolf breeding pairs and at least 100 wolves outside YNP and the WRR. The WTGMA is large enough to encompass seasonal movements of most current wolf packs and their prey (Figure 3). The amount of data available from radio-collared individuals is marginal for most packs and does not exist for some other packs. As such, the area within this WTGMA should provide suitable habitat to account for unknown movement patterns of most packs (Figure 3). There is currently a sufficient ungulate prey base to support more than 10 breeding pairs of wolves in the WTGMA (at least 21 and 19 breeding pairs were present in 2009 and 2010, respectively). The southern end of the Wyoming and Wind River Ranges were excluded from the WTGMA because of the high potential for persistent conflicts with domestic sheep and cattle that are grazed on both public and private lands in these areas. Several individual wolves and packs have attempted to use the lower portion of the Wyoming and Wind River Ranges in the last few years. Nearly all have been removed from the population due to livestock depredations. The size of the proposed WTGMA allows for some flexibility in where breeding pairs will be maintained. For example, if pack densities are reduced in one area as a result of wolf control aimed at minimizing wildlife or livestock conflicts, those reductions can be offset by maintaining a replacement breeding pair(s) in a less densely occupied portion of the WTGMA.

Population Monitoring: When wolves are delisted and placed under state management, it will be necessary for the Department to monitor breeding pairs and total number of wolves in Wyoming in

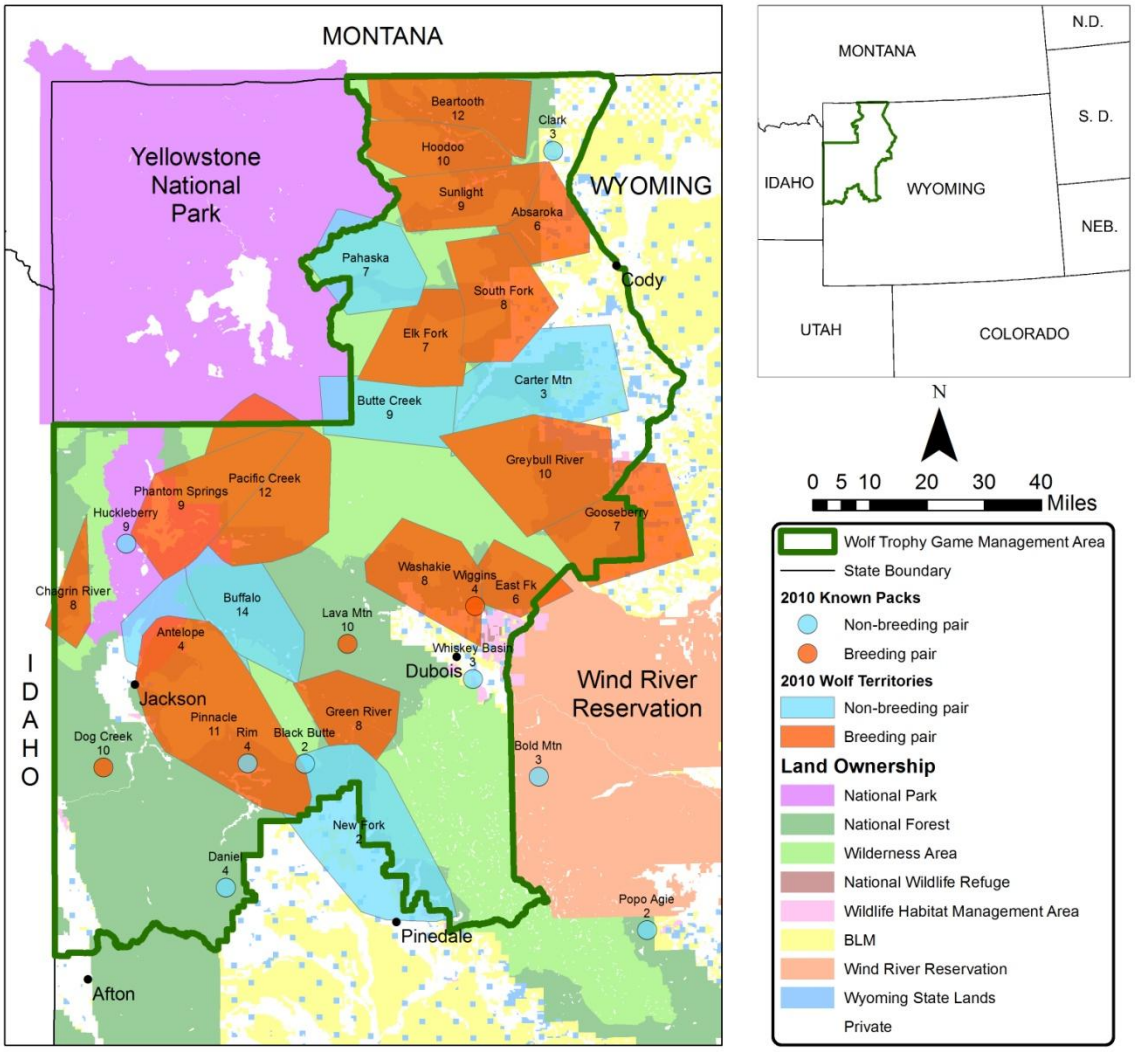

FIGURE 3. Wolf Trophy Game Management Area including wolf pack territories and breeding pair status. (Pack territory labels are pack name and the number of wolves in the pack; all data represented is as of December 31, 2010).

order to document their number, distribution, reproduction, and mortality. The Department will be responsible for monitoring these parameters in all occupied habitat outside YNP, GTNP, the NER, and the WRR. The National Park Service will continue to monitor wolves inside YNP (D. Smith, NPS, pers. comm.) and GTNP (S. Cain, NPS, pers. comm.), the USFWS Lander Fish and Wildlife Conservation Office and Shoshone and Arapahoe Tribal Fish and Game Department will continue to monitor wolves on the WRR (Shoshone and Arapahoe Tribal Fish and Game Department 2007), and USFWS will continue to monitor wolves on the NER (B. Smith, USFWS, pers. comm.). The agencies have agreed to share information regarding wolf population status, cause-specific mortality events, depredation statistics, genetics monitoring, and other pertinent wolf information from within their respective jurisdictions in Wyoming. The Department recognizes the efforts and commitment these agencies have invested in the wolf recovery program, and urges continued federal funding at or above current levels so their wolf programs can continue after wolves are delisted. To maintain at least 10 breeding pairs and at least 100 wolves in Wyoming outside YNP and the WRR, the

Department will prioritize data collection to determine the population status of wolves within the WTGMA. The Department will use a variety of techniques including standard and GPS radio-telemetry monitoring to document wolf abundance, distribution, and pack breeding success. Wolves outside the WTGMA will remain designated as predatory animals and less intensive techniques will be used to monitor those wolves.

The Department will use, in coordination with the agencies mentioned above, standard techniques used by the USFWS to identify and assign transboundary packs to their appropriate jurisdiction. The following criteria will be used to assign wolf packs to their appropriate jurisdiction:

- Packs without radio-collared members will be assigned to the jurisdiction in which the den site for that pack is located, if known, or to the jurisdiction that harbors the majority of the documented evidence for the pack (e.g., tracks, sightings, and other sign) if the location of the den site is unknown;
- Packs with radio-collared members will be assigned to the jurisdiction that harbors the majority of the measured territory regardless of the den location. If two jurisdictions share equal proportions of the measured territory, the pack will be assigned to the jurisdiction in which the den site is located.

Wyoming has adopted the USFWS' definition of what constitutes a successfully reproducing pack [breeding pair] of wolves in Statute. The current criterion defines a breeding pair as an adult male and an adult female successfully rearing at least two (2) pups through December 31. In addition, the Department may choose to use other scientifically accepted methods for estimating the number of breeding pairs in Wyoming (e.g., Mitchell et al. 2008, 2010).

Wolf populations in Wyoming will be monitored using applicable techniques with primary emphasis on extensive radio-collaring (including using GPS technology where appropriate). Monitoring of radio-collared individuals and intensive surveys will be increased during the winter and denning periods when wolves are most visible. The monitoring program will emphasize existing protocols and techniques employed by the USFWS and YNP, which have provided adequate documentation of wolf population status to determine whether the recovery criteria have been met.

Both aerial and ground surveys will be employed to assess reproduction status for all packs during the spring denning period when pups are more visible. If appropriate individuals are radio-collared, the ability to identify breeding males and females and determine pup survivorship through the remainder of the year will be greatly enhanced. By monitoring pack numbers, distribution, breeding success, and mortality, population trends can be tracked over time and appropriate management actions can be implemented to maintain the wolf population at or above at least 10 breeding pairs and at least 100 wolves.

Upon delisting, wolves with active radio-collars will continue to be monitored. Emphasis will be placed on deployment of radio-collars in packs without collared individuals. Several capture techniques, including aerial tranquilizing and trapping, will be used to collar individuals. Personnel from USFWS and YNP have demonstrated use of helicopters during the winter can increase the number of wolves that are collared over a shorter time frame. This greatly reduces the personnel time required to capture a sufficient sample of wolves compared to traditional trapping techniques.

Aerial capture may or may not be applicable in Wyoming depending on the location of specific packs during the winter months. The Department will not be able to use this technique if packs are within wilderness areas because of federal restrictions for landing helicopters in these areas. Trapping will focus on areas with wolf activity but lacking collared individuals to ensure the number and distribution of collars is sufficient to adequately monitor wolf packs. Radio-collars may also be deployed in depredation situations. Radio-telemetry data will be crucial in documenting the number of packs, reproduction, distribution, effective migration, and movements following delisting. Genetic samples will be collected from every wolf handled by the Department or its authorized agents.

In addition to monitoring using radio telemetry, non-invasive techniques such as winter track counts, aerial surveys, hair sampling, scat collection, howling surveys, and observations by field personnel will be used for basic population and distribution data collection (Fuller and Sampson 1988, Boitani 2003, Patterson et al. 2004, Ausband et al. 2009, Stenglein et al. 2010*a*, Stenglein et al. 2010*b*, Ausband et al. 2011).

During periods of snow cover, aerial and ground track counts may be used to document wolf presence or absence. Track counts may also be used to estimate pack size, but they must be done repeatedly to provide accurate information, as wolves often step in each other's tracks while traveling in groups. New developments in aerial track surveys for population estimation may provide another non-invasive and cost-effective monitoring technique (e.g., Patterson et al. 2004). If new techniques are applicable, they will be used when appropriate as part of the monitoring strategy.

Hair samples can be collected from wolves by setting up rubbing posts or hair capture corrals, or collecting hairs from wolf bed sites in snow or at rendezvous sites (Stenglein et al. 2010*b*, Ausband et al. 2011). Hair can then be analyzed to document wolf presence. Scat samples can also be collected in the field to document wolf presence (McKelvey et al. 2006, Adams and Waits 2007, Rutledge et al. 2009). Genetic profiling may be done from hair, scat, blood, or tissue samples, to establish maternity, paternity, effective migration or overall genetic diversity (Adams and Waits 2007, Rutledge et al. 2009, vonHoldt et al. 2008, 2010, Stenglein et al. 2010*b*, Ausband et al. 2011). A collection of genetic samples from wolves in the NRM and an adjacent Canadian source population already exists. The Department will implement a sampling protocol to continue monitoring wolf genetics in Wyoming. This will include the requirement for the public to provide to the Department a genetics sample for all wolves killed under trophy game animal designation. The Department will also collect, when possible, genetic material from all wolves killed under predatory animal status, during agency control actions, and for protection of private property, and any other form of mortality.

In the late spring and summer months, howling surveys at rendezvous sites can help biologists determine whether a pack is raising pups (Ausband et al. 2009). Pup vocalizations are easily distinguished from those of an adult. Although a precise count is usually not possible, wolf howling responses can also indicate relative pack size. Since packs react to artificial howls differently, howling surveys may not work in all cases.

Field reports have been very useful during the federal recovery program. Numerous observations of wolves or sign have led to the discovery of new packs. Observation reports may also confirm pack persistence. The Department will incorporate wolf sightings into its current Wildlife Observation System. Information will also be solicited from the public and used in any long-term monitoring program.

Each monitoring technique has advantages and disadvantages. While no single method will be suited to all packs, the Department will consider a range of techniques, including new methods as they are developed. Corroborating evidence will be gathered using multiple methods, but specific techniques will be tailored to the pack, setting, and appropriate season to collect necessary data. This will facilitate a balance between monitoring responsibilities, information needs, cost effectiveness, and scientific rigor.

The Department will publish the results of all monitoring efforts in an annual report that will be posted on the Department's website and will be provided to the USFWS. The annual report will fulfill the Department's requirement to provide the USFWS with data describing the population status of wolves within the state during the post-delisting monitoring period. The Department will author the sections of the annual report covering Wyoming outside YNP and the WRR. YNP and the WRR will provide similar reports covering their respective jurisdiction to the Department and the Department will combine all reports and provide an executive summary that details the status of wolf populations in the entire State of Wyoming. The Department expects to publish the annual report before mid-March of each year covering the previous calendar year ending on December 31.

Information in the annual report will include wolf population status (i.e., the number of wolves, packs, and breeding pairs) as of December 31 of that year. The annual report will detail all information previously in annual reports published by the USFWS including: wolf population status including population growth, reproduction, and number of wolves, packs, and breeding pairs; number of wolves captured and total number monitored; wolf distribution; cause-specific wolf mortality; genetics monitoring status; wolf depredation of livestock or domesticated animals including compensation; wolf control including wolves killed during agency and private control actions; number and result of lethal take permits issued; wolf hunting including data on harvested wolves; wolf impacts on feedgrounds and any resultant control actions; any unacceptable impacts to ungulates caused by wolves and resultant control actions; current research; public outreach; and funding.

Wolf Mortality: Disease, starvation, and intraspecific strife are the primary causes of wolf mortality in unexploited populations. Average annual mortality rates in unexploited populations are 45% for yearlings, and 10% for adults (USFWS 1994). However, human-caused mortality is a major factor in most wolf populations. Human-caused mortality includes legal and illegal harvest, agency control, vehicle accidents, and research-related mortalities such as capture myopathy. An important component of Wyoming's wolf management program will be to adequately monitor and manage human-caused mortality. Research suggests that annual mortality rates of 22 to >50% may suppress wolf population growth (Keith 1983, Ballard et al. 1987, Fuller 1989, Fuller et al. 2003, Creel and Rotella 2010). All forms of wolf mortality will be considered when making management decisions.

Analysis of radio-telemetry data from wolves in Montana, Idaho, and Wyoming from 1982 through 2004 indicates about 25% of wolves die each year. Human-caused mortality is the major cause of wolf death. Agency control and illegal killing each removed about 12-15% of wolves annually. In addition, another 3% of the radio-collared wolves were accidentally killed each year through vehicle collisions, incidental trapping, and other human activities. About 6% of the wolf population died from natural causes such as disease, territorial strife, accidents, or being killed while attacking prey (Smith et al. 2010). Diseases and parasites have the potential to impact wolf population distribution and demographics (Mech et al. 2008, Almberg et al. 2009). Therefore, Department monitoring will identify and track wolf mortality caused by diseases and parasites.

Because the Department will be required to institute and maintain an active program of wolf population monitoring statewide, it is imperative the Department be promptly notified of all forms of mortality, regardless of location and legal status of wolves. There will be differing time frames for public reporting of harvested wolves but the Department will collect specific biological information from wolves harvested by the public to accurately assess wolf population status and to assure the objective of at least 10 breeding pairs and at least 100 wolves is met.

Legal Wolf Mortality: Upon delisting, legal wolf mortality will result from such things as agency removals, hunter harvest, lethal take permits, or defense of life or private property. The Department or its authorized agent may lethally remove wolves when necessary to mitigate wolf conflicts with wildlife, livestock, or humans (see "Wolf Conflict Management" section of this plan). The killing of wolves in areas where they are designated as predatory animal will also be legal.

The Commission will actively manage public harvest of wolves in the WTGMA under existing State statute and Commission regulation. Commission regulation will allow a property owner to immediately kill a wolf doing damage to private property. Commission regulation will define "doing damage to private property" as "the actual biting, wounding, grasping, or killing of livestock or domesticated animal, or chasing, molesting, or harassing by gray wolves that would indicate to a reasonable person that such biting, wounding, grasping, or killing of domesticated animals is likely to occur at any moment." "Owner" means "the owner, lessee, immediate family, employee, or other person who is charged by the owner with the care or management of livestock or domesticated animals." Wolves killed under authority of this regulation shall be reported to a Department representative within 72 hours. The person reporting shall include the date the animal was killed, its location (identified by the section, township and range, or UTM coordinates), and the name and address of the person taking the wolf. The carcass of the wolf shall not be removed from the site of kill and the area around the carcass shall not be disturbed until investigated by the Department.

Additionally, the Department may issue "lethal take permits" authorizing property owners to kill not more than 2 wolves in areas experiencing chronic wolf depredation within the WTGMA. Commission regulation will define "chronic wolf depredation" as "a geographic area limited to a specific parcel of private land or a specific grazing allotment described on the permit within the Wolf Trophy Game Management Area where gray wolves have repeatedly (twice or more within a two-month period immediately preceding the date on which the owner applies for a lethal take permit) harassed, injured, maimed or killed livestock or domesticated animals." Wolves killed under the authority of a lethal take permit shall be reported to the Department representative specified on the permit within 24 hours. In order to comply with terms of the agreement between

the Governor's Office and the DOI/USFWS, lethal take permits shall expire 45 days after the date they are issued and will be renewable as long as wolf conflicts persist. However, lethal take permits will be immediately suspended or cancelled if the Department determines further lethal control may cause the number of wolves in Wyoming outside YNP and the WRR to decrease below the objective of at least 10 breeding pairs and at least 100 wolves. In addition, lethal take permits will be immediately suspended or cancelled if the Department determines further lethal control may result in the relisting of wolves under the ESA. In either of these circumstances, non-lethal control actions shall be initiated to mitigate continued harassment, injury, maiming or killing of livestock or domesticated animals.

Any licensed person who legally kills a wolf during any established season within the WTGMA will be required to notify the Department within 24 hours and will be required to present the unfrozen skull and pelt to a Department representative within five (5) days so that necessary data can be obtained. Reporting periods for wolves killed under trophy game animal status could be extended after inaugural hunting seasons if the Commission determines that extended reporting periods will not increase the likelihood of overharvest.

Unregulated Public Take: Killing of wolves will not be regulated in areas of Wyoming where wolves are designated as a predatory animal. However, any person who harvests a wolf designated as a predatory animal, including non-indian owned fee titled land in the WRR, will be required to notify the Department within 10 days of the date the wolf was killed. The person will be required to report the name and address of the person taking the wolf, date the wolf was killed, the sex of the wolf, and the site of kill (identified by the section, range and township, or UTM coordinates). The Commission will not establish zones and areas within the WTGMA in which wolves may be taken as a predatory animal as is permitted with other trophy game species under State statute [W.S. 23-1-302(a)(ii)]. Wolves doing damage to private property may be taken under provisions in W.S. 23-1-304 and W.S.23-3-115.

Regulated Public Harvest: Regulated public harvest will be used to manage the wolf population inside the WTGMA. The primary purpose of regulated public harvest of wolves in Wyoming will be to manage the wolf population and alleviate conflicts with livestock, domesticated animals, and unacceptable impacts to big game. Wolf hunting regulations will be developed annually through the same rule-making process used for other wildlife in Wyoming. The Department will generate management recommendations using the most recent wolf population, harvest, and mortality data and will present those recommendations to the public. The Department will then present final recommendations to the Commission following the public input process. The Commission will then vote to approve, amend and approve, or reject the recommendations provided by the Department. Following approval, the Department will be responsible for implementing wolf hunting regulations.

The Department will use an adaptive management approach to employ harvest strategies to meet management objectives. Harvest quotas will be established through the Department's normal season setting process. All forms of wolf mortality will be considered when setting appropriate harvest levels. Seasons will close when the mortality quota is reached or if the Commission deems it necessary to close the season. Wolf license sales will not be restricted (general license). Mountain lion and black bear harvests are similarly managed through unlimited license sales subject

to harvest quotas. The Department could also manage wolf harvest using limited quota seasons. A limited quota season is an alternative strategy that regulates harvest by restricting the number of hunters. Wolf harvest levels will be based on the number of wolves and wolf packs within each WHA and total numbers of wolves and wolf packs at the WTGMA level.

The season setting process implemented by the Department and Commission for all other game species includes several safeguards that minimize the risk of overharvest. For wolf hunting, this will include:

- The Department will consider all forms of mortality when recommending harvest levels and hunting seasons, including the most recent data available;
- The Department will require reporting of any wolf harvested within the WTGMA within 24 hours of the time the kill is made;
- The Department will use a 24-hour call in center where hunters can report kills and check if hunting seasons are open or closed prior to hunting as is used during hunting seasons for other trophy game species;
- Successful hunters will be required to present the skull and pelt of all wolves harvested in the WTGMA to a Department representative within five (5) days of the date the wolf was killed;
- Seasons will close in the respective WHA once the quota has been reached;
- Seasons will close regardless of whether the harvest quota is reached at the end of season date unless the Commission approves an extension to the season;
- The Commission can implement an emergency season closure at any time before or during a wolf hunting season if they deem it necessary

The Department will manage for a buffer above the minimum objective of 10 breeding pairs and 100 wolves because this allows for the flexibility needed to resolve wolf conflicts through control actions. Managing above the objective of 10 breeding pairs and 100 wolves will also compensate for population fluctuations caused by unanticipated and/or undetected sources of mortality (e.g., disease, illegal killing, wolves killed under predatory animal status from packs on the border of the WTGMA, etc.). Therefore, the Department will consider information gathered on the vulnerability of wolves to public hunting, how wolf hunting affects livestock depredation management and predation on big game, and the effects of hunting mortality on the wolf population when recommending wolf hunting quotas to the Commission. The Department plans to manage wolf numbers with graduated increases in hunting quotas over a series of years. This strategy will also provide the opportunity for the Department to understand how to best manage wolves in Wyoming while not risking relisting of wolves under the ESA.

Wolf hunting seasons will primarily coincide with fall big game hunting seasons. During the 2009 wolf hunting season in Montana, wolf harvest occurred relatively rapidly following the start of the season and was closed before the scheduled end of the season. Approximately 78% of harvested wolves during this hunt were taken opportunistically by big game hunters during open big game seasons (Montana Fish, Wildlife and Parks 2009). Therefore, it will be beneficial to overlap wolf hunting seasons with other big game hunting seasons to achieve desired harvest levels. We expect wolf hunting success in Wyoming will be similar to that experienced during Montana's 2009 wolf hunting season, with most wolves being killed opportunistically by hunters pursuing big game and quotas being reached before the proposed end of the season. Scheduling

wolf hunting seasons during big game seasons will also reduce wolf mortality during the breeding season, peak dispersal times, and when female wolves are pregnant. This approach will facilitate the goal of meeting the objective of at least 10 breeding pairs and at least 100 wolves by allowing wolves the opportunity to successfully disperse and reproduce.

The Department will take into consideration, but not be limited to, the following when developing wolf regulations: wolf breeding seasons; short and long range dispersal opportunity, survival, and success in forming new or joining existing packs; conflicts with livestock; and the broader game management responsibilities related to ungulates and other wildlife. The Commission will also consider these variables when considering approval of wolf hunting regulations or when setting or extending wolf hunting seasons outside the general timeframe of big game hunting seasons. Such instances might include setting or extending seasons outside big game hunting seasons to: realize hunting quotas that are not significantly filled during the proposed hunting season, reduce wolf populations in areas where they are causing unacceptable impacts to ungulate herds, alleviate predation and/or conflicts at state operated elk feedgrounds, or reduce wolf populations in areas that experience persistent livestock depredation. The Department will use an adaptive management approach to address appropriate harvest methods if hunting is determined to be inadequate to achieve harvest objectives.

Management recommendations will be based on the population status of wolves at the end of the previous calendar year and will consider any other new information from the current year in preparation for hunting seasons in the fall of the current year. The Department will consider estimated wolf mortality and population growth believed to have occurred during the current calendar year while developing these management recommendations. Wolf seasons and quotas will be set by the Commission on an annual basis. All major wolf management recommendations will be formulated with input from the public. At the appropriate time, Department personnel will propose management options, including WHA boundaries, seasons, and quotas. Once the recommendations have been approved, the public will be afforded the opportunity to comment, in accordance with Wyoming's Administrative Procedure Act. Public comments will be summarized and presented to the Commission, along with the Department's recommendations for final approval.

Persons who legally harvest a wolf within the WTGMA shall be required to comply with the following mandatory reporting criteria. Within 24 hours of killing a wolf, the licensee shall report the harvest to a Department representative. Within five (5) days, the person shall present the unfrozen pelt and skull to a Department employee during business hours for examination and data collection. The licensee also shall furnish to the Department, at the time of reporting, the harvest location including the section, township and range, or UTM coordinates. Reporting periods for wolves killed under trophy game animal status could be extended after inaugural hunting seasons if the Commission determines that extended reporting periods will not increase the likelihood of overharvest.

Illegal Wolf Mortality: Wolves taken outside the framework established by State statute and Commission regulation will be considered to have been taken illegally and will be investigated by Department law enforcement personnel. Appropriate law enforcement and legal action will be taken which could include fines, jail terms, and/or loss of hunting privileges.

Incidental Mortality: Occasionally wolves are killed accidentally (e.g., capture myopathy, vehicle accidents, or as incidental catch during legal trapping of other species). These types of mortalities are rare and have little impact on wolf populations. We will encourage other agencies and the public to report incidental mortalities within a reasonable timeframe. Prompt notification by the public will aid the Department in collecting important information from these types of mortalities.

Research: Research conducted by the Department or their partners will focus on obtaining information that will help meet wolf population objectives, address wolf/ungulate concerns, improve survey techniques, and manage wolf-related conflicts. Priority will be placed on improving techniques to assess the status of the wolf, including gene flow and genetic viability. Future research should investigate wolf habitat use patterns, prey selection and consumption rates, pack and territory sizes, age and rate of dispersal, gene flow, population growth rate, responses to hunting, and mortality factors. Research on wolf/wildlife interactions will be focused in areas of the state where wildlife may be most impacted by wolf predation, such as elk feedgrounds and crucial wintering areas for ungulates. The Department will encourage non-Department researchers to conduct these types of studies.

Currently, the Department, USFWS, and Wyoming Cooperative Fish and Wildlife Research Unit are cooperating on the Absaroka Elk Ecology Project, which is investigating multiple aspects of elk and wolf ecology, including interactions between wolves and the Clark's Fork Elk Herd. The three agencies are also cooperated on the Absaroka Wolf-Livestock Project, which investigated wolf habitat selection and livestock depredation. Information from these studies will support management decisions concerning the Clark's Fork Elk Herd and increase our understanding of wolf-livestock interactions. The Department also cooperated with the USFWS in a completed project that investigated wolf and elk relationships on and around elk feedgrounds in the Gros Ventre drainage of western Wyoming (Jimenez and Stevenson 2003, 2004, Jimenez et al. 2005, 2006). Goals of this research included documenting wolf depredation rates, consumption rates, and wolf/elk interactions including elk movements and displacement. Information gained from this study will be used to manage elk and wolves in this area.

Genetics/Connectivity: The genetic connectivity requirements for delisting wolves requires that the NRM recovery areas are functionally connected through emigration and immigration events, resulting in the exchange of genetic material between subpopulations. This relationship is consistent with the biological intent of the recovery plan and is an underlying prerequisite for successful wolf recovery in the NRM.

Designation of specific habitat linkage zones or migration corridors is impractical for a habitat generalist and highly mobile species like the wolf (Fuller et al. 2003). Outside refuges such as national parks, legal protection across broad landscapes and public education will facilitate those connections (Forbes and Boyd 1997). YNP and wilderness areas function as refugia throughout the geographic distribution of wolves in the NRM. The network of public lands in western Montana, central Idaho, and northwest Wyoming facilitate connectivity between the subpopulations. The legal protections and public outreach described in this plan will preserve the integrity of wolf movement between the GYA subpopulation and other subpopulations in the NRM. Specific linkage corridors are not needed within Wyoming, because the wolf population inhabits one contiguous block in northwest Wyoming.

Sufficient dispersal and exchange of wolves between the three NRM subpopulations will assure genetic variation is maintained in the NRM wolf meta-population. If isolated, the recovered subpopulations may not maintain sufficient genetic viability over the long-term (USFWS 1994, vonHoldt et al. 2008). However, isolation is unlikely if populations remain at or above recovery levels and regulatory mechanisms prevent chronically low wolf numbers or restrict dispersal (Forbes and Boyd 1997, vonHoldt et al. 2008, 2010).

The Department recognizes dispersing wolves will travel through some habitats that are unsuitable for long-term occupancy due to high conflict potential. The majority of these areas will be outside of the WTGMA where the Department has no management authority. Public education efforts will emphasize that lone wolves sighted in previously unoccupied habitat may be dispersing animals, and that these sightings do not necessarily mean a pack is forming in any particular area.

The interagency effort to maintain linkage zones and movement corridors for grizzly bears, forest carnivores, and big game also will benefit wolves in the NRM. A major emphasis of this cooperative effort is to create areas of safe passage for wildlife across highways, railroad lines, and through areas of intense human development (R. Rothwell, WGFD, pers. comm.). The Department is committed, to the extent practical, to ensure that genetic diversity and connectivity issues never threaten the GYA wolf population. This will be accomplished by encouraging the incorporation of effective migrants into the GYA wolf population. Conservation measures will include, but would not be limited to, working with other states to promote natural dispersal into and within various portions of the GYA, and if necessary by relocation or translocation of healthy, wild wolves to promote genetic diversity.

Connectivity between the central Idaho subpopulation and the GYA subpopulation has been well documented (Hebblewhite et al. 2010, vonHoldt et al. 2010). Analyses conducted by vonHoldt et al. (2010) confirmed genetic variability and connectivity within the NRM metapopulation were more than adequate when the NRM wolf population was much lower than the current number ($\geq$5.4 migrants per generation at a population of ~835 wolves in 2004 vs. ~1,614 wolves in 2010). In addition, a new publication is being prepared on the characteristics of dispersing radio-collared wolves since the mid-1990s that will assist in understanding dispersal and management techniques required to facilitate effective gene flow between NRM subpopulations (Jimenez et al., in prep.).

To meet genetics monitoring objectives, the Department will collect, to the maximum extent practical, genetic material from all wolves killed under trophy game animal status, captured by the Department or its authorized agents, during agency control actions, and for protection of private property, and any other form of mortality. The Department will have no authority over wolves designated as predatory animals but will acquire genetics samples from wolves killed as predatory animals to the maximum extent practical, by the following means:

- The Department and Wildlife Services will sign an agreement that will require Wildlife Services to collect genetics samples from wolves killed under predatory animal status during control actions to the maximum extent practical;

- The Department will follow up on all reported harvest of wolves designated as a predatory animal to request a genetics sample or to visit kill locations to collect a genetics sample when possible;
- The agricultural community will assist the Department in collecting genetics samples by educating and requesting their stakeholders who kill wolves under predatory animal status to provide genetics samples;
- The Department's wolf information and education program will encourage the public to provide genetics samples from wolves killed under predatory animal status and explain the benefit to the Department's genetics monitoring program of obtaining as many genetics samples as possible from wolves killed as predatory animals.

The Commission and Department are committed to the goal of enabling successful wolf movement and dispersal between and among the three wolf subpopulations in the NRM. To this end, the Department will sign a Genetics MOU with the USFWS and the states of Montana and Idaho to show formal commitment to this objective. Genetic connectivity will be defined as an average of at least one effective natural migrant per wolf generation (~4 years; vonHoldt et al. 2008) entering into the GYA (including Montana and Idaho portions of the GYA). One effective migrant per generation is commonly suggested as the minimum number required to maintain genetic diversity in wildlife populations (Frankel and Soule 1981, Allendorft 1983). Genetic samples will be collected and genetics will be tested at approximately 3 to 5 year intervals. However, success in achieving the one effective migrant per generation objective will be measured over multiple generations (the exact monitoring interval is yet to be determined but will likely be in the range of 3 to 5 generations, equivalent to 12-20 years). This goal of genetic connectivity is not a relisting trigger. Instead, it is a trigger to conduct effective adaptive management intended to preclude the need to ever consider relisting due to genetic issues.

The Department will coordinate with the USFWS, Montana, and Idaho to develop protocols to monitor genetic connectivity and viability of the NRM wolf population and assess whether genetic connectivity goals are being met. If the desired level of genetic connectivity is not being achieved, the Department will invoke adaptive management which will include, but not be limited to, the following actions as deemed appropriate:

- Improve Genetics Monitoring: The Department, in coordination with Idaho and Montana, will review genetics monitoring protocols and revise them if necessary to improve the Department's ability to detect effective migrants;
- Population Management: Population management, to the maximum extent practicable, should facilitate the above objective through natural dispersal. Therefore, if wolf population management strategies implemented by the Department are identified as a meaningful factor preventing the connectivity objective from being met, population management will be modified as necessary and appropriate. Idaho and Montana may also play a role in sustaining this goal and may be requested to consider their management strategies if necessary to facilitate the desired level of natural gene flow. Outside experts will be consulted as necessary or appropriate to assist in identifying appropriate changes to regional management. Specific actions will include:
    a. The Department, in coordination with other partners as appropriate, will conduct an evaluation of all sources of mortality, with a focus on those within Department

jurisdiction (and the jurisdiction of other partners, as appropriate), to determine which sources of mortality, and the extent to which those sources, are most meaningfully impacting genetic connectivity.

b. The Department, in coordination with other partners as appropriate, will modify management objectives, based on the above evaluation, as necessary to achieve the desired level of gene flow. The extent of actions taken will depend on the level of gene flow as it relates to the genetic connectivity objectives. For example, if the goal is close to the objective, minor modifications of management will be implemented. However, if very low levels of gene flow are documented over numerous generations, more extreme changes to management will be implemented. This adaptive approach will implement specific and appropriate remedial actions as directed by the available data. Changes to all population management objectives shall be considered and modified as appropriate meet to the genetic connectivity requirement.

- Translocation for Genetic Purposes: The Department will coordinate with Montana, Idaho, and the USFWS to develop and implement a plan to improve genetic diversity using translocation of healthy, wild wolves per the direction of the Genetics MOU and the terms of the agreement between the Wyoming Governor's Office and DOI/USFWS. A human assisted migration program, to the extent necessary, will ensure the desired level of effective migrants into the GYA is achieved and maintained.
- Statutory and Regulatory Changes: Additional modifications to State statute and Commission and regulation, beyond those necessary to implement the rest of this plan as written, will only be considered if all of the above techniques, including human assisted migration, fail to achieve the desired gene flow objective to the point that might result in relisting.

The Department will continue to invoke adaptive management in this regard until the goal of genetic connectivity as outlined above is reliably confirmed in the GYA wolf population.

DISTRIBUTION

The reintroduction of wolves into the GYA focused on the large tracts of public lands in the region, especially YNP and the surrounding U.S. Forest Service lands. This area was considered more suitable for reintroduction because of the large populations of natural prey and the lower potential for wolf/human conflicts. Wolf management in Wyoming will continue to focus on this area of the state once wolves are delisted.

By State statute, wolves are designated as trophy game animals in the area of northwestern Wyoming designated as the WTGMA. The majority of wolves, wolf packs, and breeding pairs in Wyoming outside YNP and WRR are found within the WTGMA (Figure 1). The Department will have no management authority for wolves outside the WTGMA except the requirement to report wolves killed within 10 days of the date of the kill.

HABITAT MANAGEMENT

The GYA was chosen for wolf reintroduction because of its high prey densities (i.e., wild ungulates) and the relatively low potential for human disturbance (USFWS 1994). These two

factors, in conjunction with the abundance of federal lands connecting central Idaho, western Montana, and northwestern Wyoming, should provide sufficient wolf habitat. Therefore, the Department will not recommend any land use restrictions within the WTGMA, outside national parks and wildlife refuges, based solely on the presence of wolves.

Wolves are considered habitat generalists that do not require a specific habitat type for survival. Wolf habitat quality is based largely on the abundance of prey, isolation, and low potential for conflict. To maintain wolf habitat, the Department must continue to manage for viable, robust ungulate populations. The Department manages ungulate populations by balancing natural population fluctuations and public hunting. This adaptive management approach will assure adequate prey remains available to sustain a recovered wolf population, as well as the hunting and trapping tradition enjoyed by many in Wyoming. Wolf/prey interactions are discussed further in the "Wolf/Wildlife Interactions" section of this document.

Wolves are not known to demonstrate behavioral aversion to roads. In fact, they readily travel on roads, frequently leaving visible tracks and scat (Singleton 1995). In Minnesota and Wisconsin, wolves have been known to occupy den and rendezvous sites located near logging operations, road construction work, and military maneuvers with no adverse effects [Minnesota Department of Natural Resources (DNR) 2001]. The only concern about road densities stems from the potential for increased accidental human-caused mortalities and illegal killings (Mech et al. 1988, Mech 1989, Boyd-Heger 1997, Pletscher et al. 1997). Although some of the areas within the GYA are administered by the U.S. Forest Service for multiple use purposes and have high road densities, much of the GYA is national parks or wilderness areas that have limited road access and minimal human activity.

WOLF CONFLICT MANAGEMENT

Managing human/wolf conflicts will be an important part of the wolf management program in Wyoming. Emphasis will be placed on preventing or minimizing wolf conflicts by incorporating wolf conflict prevention into the Department's information and education program. When wolf conflicts occur, they will be dealt with in a prompt, appropriate manner.

Wolf-livestock Conflicts: The manner in which wolf-livestock conflicts will be handled, and implementation of a compensation program after wolves are delisted, are issues of major concern. Since wolves were reintroduced into YNP in 1995, Wildlife Services, under the direction of USFWS, has taken the lead in dealing with wolf-livestock conflicts. Wildlife Services personnel, under direction from USFWS, have investigated reports of livestock depredations by wolves in Wyoming and have determined, based on the evidence available, whether wolves were responsible. If it was determined wolves were responsible for the depredation, Wildlife Services implemented appropriate management actions as directed by the USFWS. Management decisions were based on all available data and evidence from the incident(s), and on a case-by-case basis.

The Department will be the lead agency responding to wolf-livestock conflicts in the WTGMA after delisting. The Department cooperative agreement with Wildlife Services that authorizes Wildlife Services to assist the Department in managing conflicts between other trophy game animals and livestock will be amended to include wolves. The Department will decide on the appropriate

management action based on the specific circumstances of each conflict. Management actions could include a variety of responses and will be determined on a case-by-case basis. Management actions are discussed in detail later in this section. The Department recommends continued federal funding to support Wildlife Services involvement and assistance with wolf conflict resolution in Wyoming.

The Department will manage wolf/livestock conflicts using effective techniques currently employed by the USFWS and Wildlife Services. The Department will manage wolf conflicts and implement a compensation program in accordance with State statute and Commission regulation. Lethal control through agency control actions or lethal take permits shall not be authorized in the event the removal of wolves may result in relisting wolves under the ESA. The Department will not restrict control actions based on any management objective (e.g., harvest objectives) other than the objective to maintain at least 10 breeding pairs and at least 100 wolves.

Under conditions described in State statute and Commission regulation, property owners or their agents may kill wolves doing damage to private property, including livestock. Wolves killed under this provision must not be removed from the site and must be reported to the Department within 72 hours to allow the Department to appropriately investigate the scene.

The Department and Wildlife Services will work with livestock producers and non-governmental organizations to minimize wolf-livestock conflicts. Technical assistance may include guidance on carcass disposal, fencing, scare devices, and other non-lethal or lethal control methods.

Compensation for Livestock Losses: The Department recognizes the importance of providing financial compensation to livestock producers who experience losses due to depredation by wolves. Currently, the Department is responsible for compensating for livestock and domesticated animals killed or injured by wolves under State statute and Commission regulation. The Department will continue to pay compensation in accordance with State statute and Commission regulation.

The Department will pursue all possible funding sources for the livestock compensation program, including federal or state appropriations, public/private foundations, and other sources. The Department will attempt to secure alternative funding sources to ensure revenues from hunting license fees do not become a major source of funding for the livestock compensation program.

Other Wolf-Human Conflicts: Past accounts of wolf-human interactions indicate that wild, healthy wolves in North America present little threat to human safety (Young and Goldman 1944, Mech 1970, Mech 1990). However, occasionally, wolves are aggressive toward humans. McNay (2002) concluded the vast majority of wolf-human interactions in Alaska and Canada resulting in human injury were from wolves habituated to humans or conditioned to human foods. The Department will incorporate materials in its information and education program to emphasize the importance of preventing wolves from obtaining human foods and becoming habituated to humans. Incidents involving aggressive behavior of wolves toward humans will be investigated immediately and appropriate management actions will be taken when the incidents happen within the WTGMA.

Management Actions: Management actions will be implemented by the Department in the WTGMA. Appropriate actions will be based on the unique circumstances surrounding each wolf conflict. Possible management actions include:

No Action: No action may be taken after the initial investigation if the circumstances of the conflict do not warrant control, or the opportunity for control is minimal.

Lethal Control: Removal is generally the most effective management option to deal with wolves that kill livestock (Bradley et al. 2005; M. Jimenez, USFWS, pers. comm.). Any wolf doing damage to private property as defined in Commission regulation may be immediately killed by the owner of the property. Upon verification that a wolf or wolves are doing damage to private property, or occupying a chronic wolf depredation area, the Department may: issue a wolf lethal take permit to the owner; authorize Wildlife Services to remove the offending wolf or wolves; or authorize Department personnel to lethally remove the offending wolf or wolves. Removal by means of lethal control will be the preferred method to alleviate livestock depredation problems. However, lethal control through agency control actions shall not be authorized in the event the removal of wolves may result in relisting wolves under the ESA.

Lethal Take Permit: If chronic livestock depredation is experienced, the Department could issue the property owner or property owner-representative a permit to shoot not more than 2 wolves in areas where and when wolves are designated as trophy game animals. Lethal take permits shall expire 45 days after the date they are issued and will be renewable as long as wolf conflicts persist. However, lethal take permits will be immediately suspended or cancelled if the Department determines further lethal control may cause the number of wolves in Wyoming outside YNP and the WRR to decrease below the objective of at least 10 breeding pairs and at least 100 wolves. These types of permits have been issued by the USFWS in Wyoming beginning in 1999. In addition, Commission regulation allows property owners, their lessees, or their agents to kill wolves designated as trophy game animals that are damaging property or attacking livestock.

Lethal take permits will not be authorized if further lethal control may result in relisting wolves under the ESA. Non-lethal control alternatives will be initiated in such circumstances.

Non-lethal Control: Various methods may be used to deter or preclude wolf depredation of livestock, or other nuisance behavior (i.e., scare devices-visual and auditory, shock-collars, electric fences, non-lethal projectiles, etc.). Actively deterring or aversive conditioning wolves may prevent nuisance behavior in some cases (Bangs and Shivik 2001, Bangs et al. 2006).

Relocation: Capture and relocation operations may be initiated when other options are not applicable (Bradley et al. 2005).

WOLF/OTHER WILDLIFE INTERACTIONS

Predator/Prey Interactions: Wildlife populations are affected by various factors including weather, disease, habitat availability and condition, human impacts, and predation. These factors often interact in complex ways that make it very difficult to determine the ultimate cause of population fluctuations. Thus, the influence predators have on their prey may vary not only

between prey populations, but within prey populations as conditions change over time and space. Predation may affect prey populations through juvenile mortality, adult mortality, or a combination of both (Gasaway et al. 1992, Ballard et al. 1997, Kunkel and Pletscher 1999, National Research Council 1997, Mackie et al. 1998, Ballard et al. 2001). Wolves in Minnesota do not appear to impact white-tailed deer populations overall, but there are some localized effects of wolf predation in the poorest quality deer habitat (Mech and Nelson 2000, Minnesota DNR 2001). Studies in YNP identified winter severity as a major influence on the level of wolf predation on elk, with wolf predation higher in more severe winters (Mech et al. 2001, Jaffe 2001). However, wolf predation had an increasingly additive effect on mortality of female elk as the ratio of wolves to elk increased in the Northern Yellowstone Elk Herd (White and Garrott 2005). Negative impacts to other big game herds in the GYA have also been identified (Garrott et al. 2009, Hamlin et al. 2009).

Sensitive Big Game Ranges: Localized impacts of wolves may be greatest on crucial ungulate winter ranges and elk winter feedgrounds in western Wyoming. The Whiskey Mountain winter range near Dubois and crucial ranges on the Shoshone River and near Jackson are very important to the conservation of bighorn sheep populations. In their review of the literature on predation on bighorn sheep, Sawyer and Lindzey (2002) concluded the terrain bighorn sheep frequent prevents predators such as wolves from significantly impacting bighorn populations in most situations. However, when bighorns seek forage away from escape terrain or in timbered areas where predators can approach undetected, wolves can inflict considerable mortality (Sawyer and Lindzey 2002). Sheep populations on these important winter ranges are currently monitored for population fluctuations. This monitoring will continue and help identify impacts of wolf predation.

Potential impacts to specific moose populations in northwest Wyoming are also a concern. Multiple moose herds throughout northwest Wyoming have been declining throughout the last 15-20 years with wolf predation being a potentially limiting factor. For example, the Jackson moose herd has experienced both a decline in trend count and in recruitment beginning in 1999-2001 (Figure 4). Research conducted in other elk-moose-wolf systems suggests that wolf predation may significantly reduce the populations of alternative prey that exist at lower population densities than elk, such as moose and caribou (Hurd 1999, Hebblewhite et al. 2007). The majority of the winter range for moose in this area is adjacent to high density elk winter range, and might potentially exacerbate predation rates on moose by wolves to the point where wolf predation becomes a significant limiting factor for the moose population. Recent studies confirm that moose are an important component of winter diets for wolves in the Jackson area, supporting this contention (USFWS, NPS, unpub. data). Additional predation from the increasing grizzly bear population in the Jackson area may also be affecting the Jackson moose population.

Wyoming has the largest elk-feeding program in the United States, feeding over 23,000 elk annually (Smith 2001). The Department operates 22 elk feedgrounds in the Jackson, Pinedale, Big Piney, and Afton areas of western Wyoming. The USFWS also operates the NER near Jackson. These feedgrounds concentrate elk in lower elevation areas during the midwinter months with the intent of mitigating habitat loss, minimizing damage to private lands in the area, preventing vehicle/elk collisions, and prevent commingling of elk and cattle on winter feedlines.

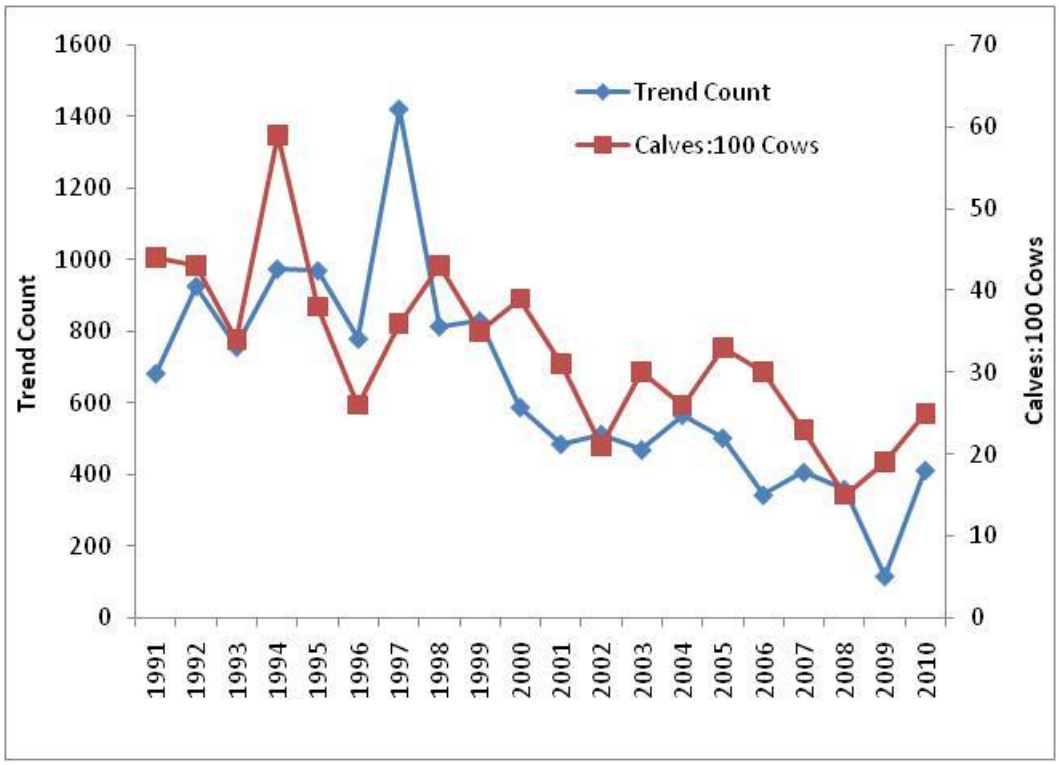

FIGURE 4. Annual (as surveyed in January/February each year) trend counts and calf:cow ratios in the Jackson Moose Herd Unit.

Wolves were first observed in the Jackson area in small numbers during the winter of 1997-1998. In the winter of 1998-1999, 2 separate packs killed an estimated 60 elk on the NER (B. Smith, NER, pers. comm.). Over the next few years, wolves killed fewer elk on the NER, but began killing more elk on and around the Department feedgrounds in the Gros Ventre drainage. To date, the estimated numbers of elk killed by wolves each winter in the NER and Gros Ventre areas represent less than 1% of the total Jackson elk herd. However, calf:cow ratios on the Gros Ventre feedgrounds have been consistently low when the relative number of wolves in the Gros Ventre has been high (Figure 5).

Wolves can also displace wintering elk from native winter ranges and feedgrounds onto adjacent private property, increasing the potential for damage and commingling with livestock. This has been documented on Bald Ridge and along the face of the Beartooth Mountains in the Cody region as well as at multiple Department feedgrounds. Wolf presence was documented on 18 of the Department's 22 elk feedgrounds during the winter of 2009-2010 (Wyoming Game and Fish Department 2010). Predation by wolves at elk feedgrounds has been variable and has been relatively low in recent years. However, wolf presence continues to be documented at the majority of elk feedgrounds, suggesting that wolves will continue to affect elk management at feedgrounds (Figure 6). A study of collared elk on the Gros Ventre feedgrounds found that elk displaced by wolves in that area often returned within a day of being displaced (M. Jimenez, USFWS, pers. comm.; Jimenez et al. 2003-2006). However, there is still potential for conflicts on feedgrounds in several ways (Table 2). These include elk causing damage to stored hay and elk commingling with livestock on livestock feedlines, which causes hay loss and increases risk of brucellosis transmission

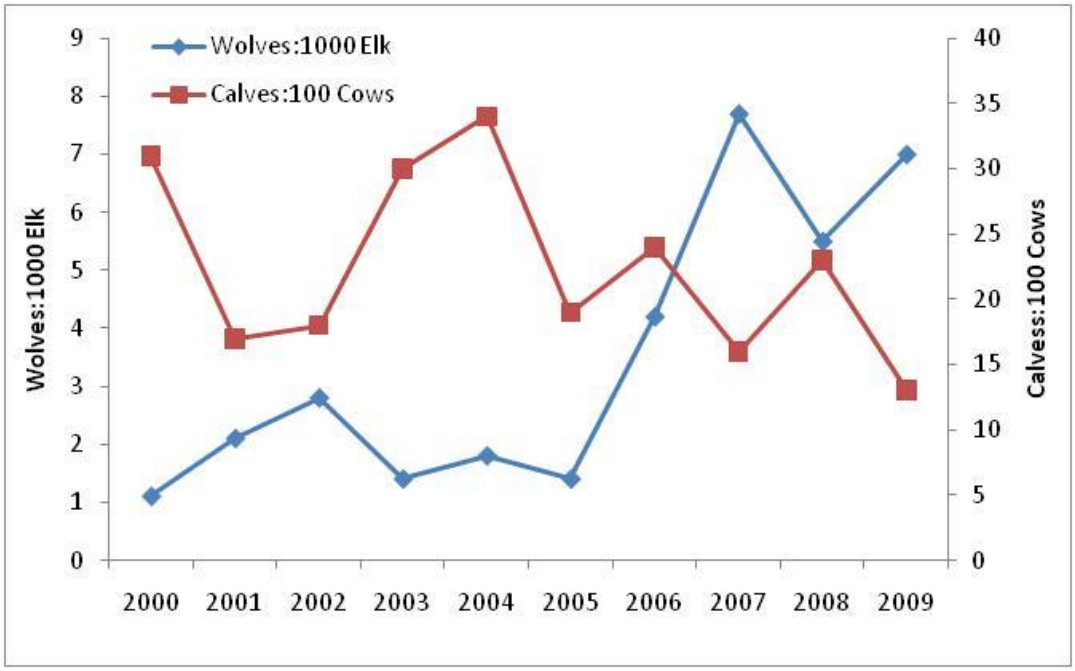

FIGURE 5. Relative wolf abundance (wolves per 1000 elk) and elk calf recruitment (calves per 100 cows) in the Upper Gros Ventre region of the Jackson Elk Herd Unit from 2000-2009.

from elk to cattle. Another potential conflict occurs where feedgrounds are near highway right of way. Elk presence near highways frequently forces the Department to initiate feeding in response to public concerns over vehicle/elk collisions. Displaced elk from feedgrounds often move to adjacent feedgrounds causing crowding. Crowding aggravates the risk of brucellosis transmission among elk. It also is more difficult to implement the vaccination program with crowding and elk reacting to ongoing wolf predation. Hay supplies at feedgrounds are based on elk numbers from previous years. When elk redistribute among feedgrounds, the Department must react to hay shortages. This work is difficult in winter conditions because transport routes are usually unplowed and often shared with recreationists, and hay is difficult to move because of equipment and manpower limitations. Wolf management actions discussed under "Big Game Management" may be desirable to prevent or reduce conflicts at feedgrounds and on native winter ranges.

Big Game Management: Successful wolf conservation in Wyoming will depend, in part, on the availability of natural prey populations. Ungulate populations are important to not only wolves and other carnivores, but to human hunters and others in the state whose income depends upon hunting and other wildlife-related activities. Hunting licenses fund the majority of wildlife management and conservation in Wyoming. This investment has produced abundant ungulate populations throughout the state. Therefore, it is important that the Department balance the wolves' need for prey with the public's investment in these ungulate populations in order to maintain the public's opportunity to hunt and otherwise enjoy them in a sustainable and responsible manner.

Data from studies conducted in YNP provide insight into the rate at which wolves kill prey in the GYA. Jaffe (2001) estimated winter kill rates in the Madison/Firehole area of YNP ranging from

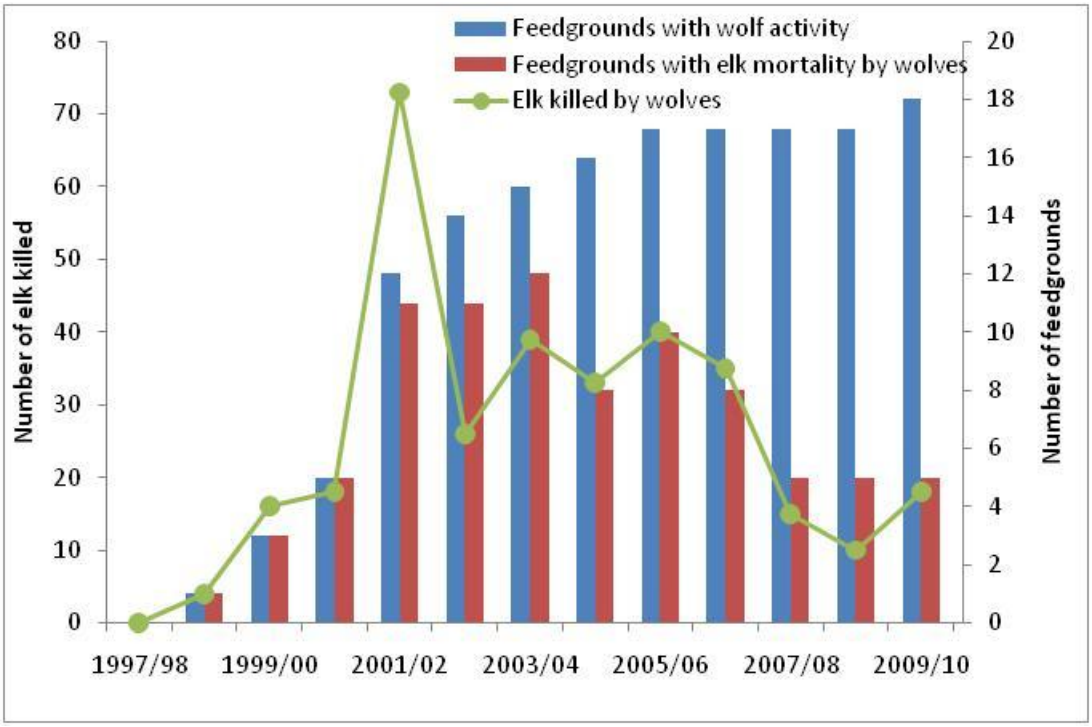

FIGURE 6. Wolf predation statistics collected by the Department at state operated elk feedgrounds in northwest Wyoming from the 1997/1998 to 2009/2010 feeding season.

2.04 kills/wolf/30 days in the winter of 1998-99 to 1.47 kills/wolf/30 days in the winter of 1999-2000. Smith et al. (2004) and White and Garrott (2005) reported similar winter kill rates for the northern range of YNP. Kill rates were 1.6 kills/wolf/30 days in early winter and 2.2 kills/wolf/30 days in late winter, with an overall 3-year average of 1.8 kills/wolf/30 days. These numbers demonstrated kill rates were variable not only between, but within winter seasons. The YNP kill rates are generally higher than most other wolf/ungulate systems, which is characteristic of a re-establishing and expanding wolf population (Jaffe 2001). Because these studies were conducted during winter, they should not be used to estimate annual kill rates for GYA. However, White et al. (2005) estimated annual kill rates "have been closer to 22 ungulates per wolf per year," based on an assumption that summer kill rates are approximately 70% of winter kill rates. Additional research on the northern range of YNP suggests that consumption rates of prey by wolves in summer is roughly half what it is in late winter when prey are more vulnerable to predation (6.5kg/wolf/day vs. 12kg/wolf/day, respectively; Metz 2010). This study also found that ungulate neonates comprise approximately 60% of prey items killed by wolves but only 20% of prey biomass consumed. Additional research would be useful to determine the effects of summer predation on ungulate populations.

It is reasonable to assume wolf predation will have a negative effect on some elk, moose, mule deer, and bighorn sheep populations in northwestern Wyoming and consequently, on hunting opportunity. Because most of the packs that reside outside YNP and the NER are subject to control actions and/or will eventually be hunted under a quota system, impacts to big game populations will be variable and will depend on factors affecting prey vulnerability, wolf:prey ratios, and impacts of hunting and control on wolf populations. Impacts to big game herds outside the WTGMA are

TABLE 2. Potential conflicts anticipated in managing elk at feedgrounds in Wyoming.

Feedground	Elk Damage to Stored Hay or Cattle Feedlines and Brucellosis Transmission to Livestock	Elk on Highway Rights-of-Way	Elk Crowding, Brucellosis, Hay Supply	No Apparent / Identified Conflicts
Alkali	X		X	
Alpine	X(1)	X(1)		
Bench Corral	X		X(2)	
Black Butte	X	X(3)	X	
Cabin			X	
Camp Creek		X	X	
Dell Creek	X			
Dog Creek		X		
Fall Creek	X			
Finnegan	X			
Fish Creek			X	
Forest Park				X
Franz	X		X	
Green River Lakes				X
Horse Creek	X(1)	X(3)	X	
Jewett	X			
McNeel	X		X	
Muddy Creek	X			
North Piney	X(2)		X(2)	
Scab Creek	X			
Soda Lake	X(1)		X	
South Park	X	X(3)		
Totals	**16**	**6**	**11**	**2**

(1) Risk partially mitigated by elk fence.
(2) Risk considered and management options are tested viable.
(3) Conflict has never matured to be a public issue, but elk have been on highway as a result of management.

expected to be minimal because most wolves in this area often become involved in livestock conflicts and are removed. The effect of wolves on elk numbers in the GYA is related to winter severity, with predation rates being higher during years with harsher winter severity (Mech et al. 2001). Mech and Nelson (2000) found that wolf predation impacted hunter harvest of white-tailed deer in areas of relatively lower deer densities in Minnesota. Many elk herds in northwestern Wyoming have been above herd objectives, but are declining. Liberal issuance of antlerless hunting permits and extended seasons, combined with drought and predation, have reduced some of these herds. In the future, it is possible severe environmental conditions may reduce some elk populations in the GYA to the point wolf predation exerts an even stronger influence than they do currently. A simple comparison of relative wolf abundance and elk calf recruitment for elk herds in the GYA suggests recruitment is depressed when wolf abundance exceeds 4-5 wolves per 1000 elk (Hamlin et al. 2009). Data from elk herds in northwest Wyoming suggest that this relationship accurately describes calf recruitment potential, but the ratio of wolves per 1000 elk might be slightly higher than that reported by Hamlin et al. (Figure 7). The migratory portion of the Clark's Fork elk herd and the Upper Gros Ventre portion of the Jackson elk herd have consistently been subjected to high relative wolf abundance and recruitment has been lower during this time, suggesting wolves are impacting these herds (Table 3). Other herds, such as the Cody elk herd and recently the Hoback elk herd, have also had high relative wolf abundance and may begin to experience negative impacts from wolf predation, or may be experiencing negative impacts that have not yet been detected (Table 3).

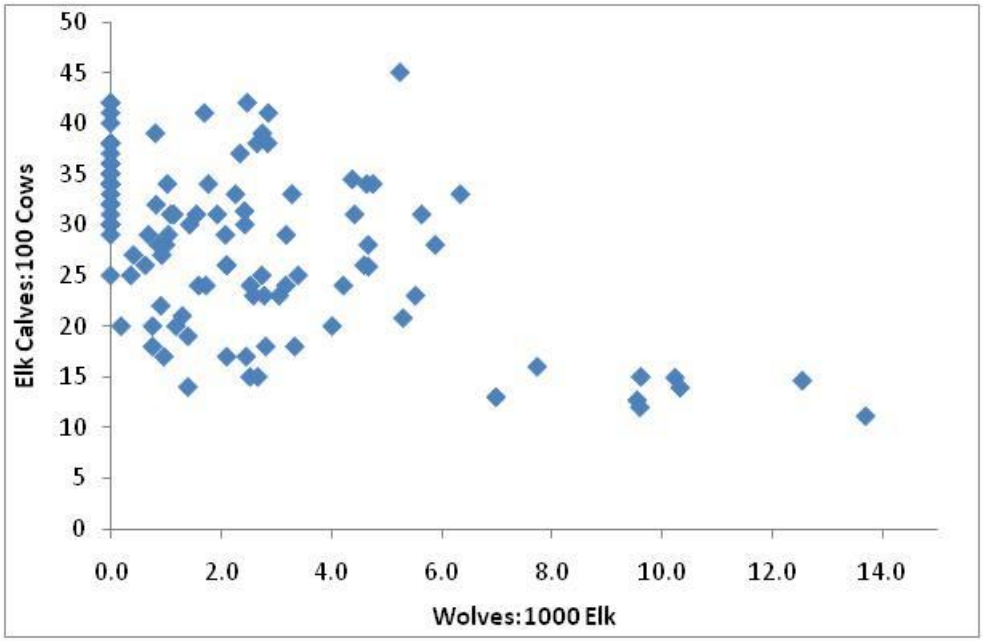

FIGURE 7. Comparison of relative wolf abundance (wolves per 1000 elk) and elk calf recruitment (calves per 100 cows) for elk herds in northwest Wyoming from 2000-2009. Hamlin et al. (2009) suggested 4-5 wolves per 1000 elk is usually associated with depressed calf recruitment. These data suggests ≥7 wolves per 1000 elk depress calf recruitment for elk herds in northwest Wyoming.

Currently, Department biologists consider factors such as big game population objectives, habitat carrying capacity, drought, winter severity, juvenile to adult ratios, predation, and human-caused mortality in determining sustainable big game harvest quotas. Wolf predation will also be factored into these decisions. As with any other source of mortality such as severe winterkill, hunter harvest may be adjusted in response to wolf predation in order to ensure the health of the ungulate populations being impacted.

Management actions may be taken where wolves significantly affect ungulate populations. Wolves may be lethally removed when, based on best scientific data and information available, the Department determines a wild ungulate herd is experiencing unacceptable impacts or when wolf/wild ungulate conflict occurs at state operated feedgrounds. The Department may take wolves that displace elk from feedgrounds in the WTGMA if it results in one of the following conflicts: damage to private stored crops; elk co-mingling with domestic livestock; or displacement of elk from feedgrounds onto highway right of way causing human safety concerns. Elk-comingling with livestock is considered a conflict because elk consume feed intended for livestock causing economic loss to producers and the increased potential for brucellosis transmission from elk to cattle occurs under these circumstances. Wolves will not be lethally removed for causing conflicts on elk feedgrounds if further removal may result in relisting of wolves under the ESA.

Management Actions: In the revised nonessential, experimental population rule for the GYA (73 FR (18):4720-4736), USFWS encouraged states and tribes to define unacceptable impacts to wild ungulate populations. The Commission has defined "unacceptable impact" as any decline in a wild ungulate population or herd that results in the population or herd not meeting the state population management goals or recruitment levels established for the population or herd" in Commission regulation. "Wild ungulate population or herd" means "an assemblage of wild ungulates living in a given area" as defined in Commission regulation.

The Department shall determine an "unacceptable impact" based upon the best scientific data and information available per Commission regulation. The Department will attempt to manage unacceptable impacts to big game herds using public harvest of wolves and if necessary by increasing hunting quotas and extending hunting seasons beyond typical fall big game hunting seasons. The Department will delineate WHAs that are sufficiently small to direct wolf hunting in areas where specific ungulate herds are experiencing unacceptable impacts and maintain wolf pack distribution. This will allow the Department to target specific areas by setting higher wolf hunting quotas while avoiding overharvest in other areas that are not experiencing unacceptable impacts to big game herds. The Department will initiate agency directed control only if public harvest does not adequately alleviate the unacceptable impacts. The Department will not initiate agency directed control actions if it is determined wolves are not a significant factor causing the unacceptable impact or if such control may result in relisting of wolves under the ESA. If agency directed control is required, the Department may use all methods currently employed by the USFWS to deal with wolf conflicts. The Department will use public harvest to maintain wolf populations at their desired level and will not implement agency-directed control solely for the purpose of wolf population maintenance.

TABLE 3. Comparison of relative wolf abundance (wolves per 1000 elk) and elk calf recruitment (calves per 100 cows) for Elk Herd Units in northwest Wyoming from 2000-2009. Hamlin et al. (2009) suggest that elk calf recruitment can be depressed when relative wolf abundance exceeds 4-5 wolves per 1000 elk; values that meet or exceed this threshold are represented in bold in the table.

	CODY		GOOSEBERRY		WIGGINS FORK		GREEN RIVER		Piney		HOBACK	
Year	W:1000Elk	Recruitment	W:1000Elk	Recruitment	W:1000Elk	Recruitment	W:1000Elk	Recruitment	W:1000Elk	Recruitment	W:1000Elk	Recruitment
2000	0.0	31	0.0	30	1.1	31	0.0	32	0.0	38	0.0	35
2001	0.8	20	0.0	30	1.6	31	0.0	30	0.0	36	0.0	42
2002	1.2	20	0.8	39	1.7	24	0.2	20	0.0	34	0.0	38
2003	1.3	21	0.0	25	2.1	26	2.8	23	**6.3**	33	0.0	40
2004	1.0	17	2.1	26	0.9	28	1.0	28	2.9	41	0.0	36
2005	2.7	15	1.4	14	3.2	29	1.6	24	0.0	42	0.0	38
2006	4.0	20	2.5	15	2.6	23	**4.7**	28	2.5	42	0.0	35
2007	3.4	25	2.5	17	3.2	24	2.8	39	2.7	38	1.0	29
2008	**5.9**	28	0.4	25	3.1	23	0.9	27	1.9	31	2.3	37
2009	**5.6**	31	2.4	30	3.3	18	2.1	29	3.0	33	**4.6**	34

	FALL CREEK		JACKSON		JACKSON U. Gros Ventre		CLARKS FORK Migratory		CLARKS FORK Resident	
Year	W:1000Elk	Recruitment	W:1000Elk	Recruitment	W:1000Elk	Recruitment	W:1000Elk	Recruitment	W:1000Elk	Recruitment
2000	0.0	34	0.4	27	1.1	31		23		
2001	0.0	37	0.7	29	2.1	17		24		
2002	0.0	29	0.9	22	2.8	18	**12.5**	15	**5.3**	21
2003	0.0	41	0.6	26	1.4	30		15		26
2004	0.0	32	0.8	18	1.8	34	**9.6**	13	**4.7**	26
2005	0.0	34	2.7	25	1.4	19	**13.7**	11	**4.4**	34
2006	0.0	33	**4.6**	26	4.2	24	**10.2**	15	2.4	31
2007	1.0	34	**4.8**	34	**7.7**	16	**10.3**	14	0.8	32
2008	2.3	33	**4.4**	31	**5.5**	23	**9.6**	12	2.9	38
2009	2.5	24	**5.3**	45	**7.0**	13	**9.6**	15	1.7	41

Under specific conditions, wolf predation may cause unacceptable impacts to wintering elk, deer, moose and bighorn sheep subpopulations on native winter range and to elk on winter feedgrounds, near cattle feed lines, or public highways. In those cases, management actions may also be necessary. The Department will attempt to alleviate the unacceptable impacts through public harvest when and where appropriate. If public harvest is either ineffective or inappropriate for the given situation, the Department may initiate agency directed control. The Department may take wolves that displace elk from feedgrounds in the WTGMA if it results in one of the following conflicts: damage to private stored crops; elk co-mingling with domestic livestock; or displacement of elk from feedgrounds onto highway right of way causing human safety concerns. The Department will not initiate agency directed control actions in or around big game wintering areas if it is determined wolves are not a significant factor causing the unacceptable impact or if such control may result in relisting of wolves under the ESA. If agency directed control is required, the Department may use all methods currently employed by the USFWS to alleviate wolf conflicts.

PUBLIC INFORMATION & EDUCATION

As the Department prepares to assume management of wolves after delisting, it will be necessary to identify and address a broad array of questions concerning wolf biology, ecology, and management. The Department has published information on its website (http://gf.state.wy.us/) that answers many of these questions. Because wolf management will be closely scrutinized, the Department will seek a balanced management approach that acknowledges the complexity of the political, social, and environmental factors associated with wolves and their management. This section will serve as the Department's guide as it prepares to inform its constituents about wolf management in Wyoming.

The objectives of the information and education section of this plan include:

1. Increase public awareness of wolves, their recovery, and state management authority after delisting.
2. Increase awareness of wolf status in Wyoming, the delisting process, and delisting milestones.
3. Increase awareness of the array of management tools the Department will employ after wolves are delisted.
4. Increase awareness of wolf biology and ecology, impacts to prey populations, livestock depredation, and public safety.
5. Increase awareness of the Department's genetics monitoring criteria in order to encourage the public to assist in collecting genetic samples from all wolves killed in Wyoming, including those killed outside the WTGMA, to the maximum extent practical.
6. Assist the agricultural community in informing their stakeholders of the importance of assisting the Department with data collection (e.g., provision of genetics samples from wolves killed under predatory animal status).

Through the print and electronic media, the appropriate branches of the Services Division will produce news releases, video productions, and radio spots for statewide distribution. These

products will be used to convey factual information regarding wolf management policy, actions, and issues of public concern, and answers to questions most likely to be asked about wolf management. The revised wolf management plan will also be posted on the Department's website for the public to review.

Informative articles will continue to be published in the Department's Wyoming Wildlife News, Wyoming Wildlife Magazine, and Hunter Education Newsletter. These articles focus on wolf biology, identification, behavior, population status, and management as it relates to the audience of these publications.

Wolves will be integrated into the Department's ongoing education outreach. Four "target audiences" will be a high priority:

1. Resident and non-resident hunters.
2. Schools, teachers, and youth organizations.
3. The general populace of Wyoming with emphasis on residents of, and visitors to, the GYA.
4. Livestock producers with emphasis on the distribution of information on proven and appropriate techniques that may reduce the number, and frequency of wolf/livestock conflicts. Information on compensation programs will be provided to members of the livestock industry.

The Department will include information on wolves in its annual "Living in Bear and Mountain Lion Country" workshops. The discussion will focus on co-existing with wolves, and will include wolf biology, predation, food habituation, and ways to reduce human-wolf conflicts.

Volunteer hunter education instructors will be given wolf presentations at annual instructor workshops. Each presentation will include information on wolf biology, wolf identification, wolf management, wolf hunting, and conflict prevention.

1. A pocket identification card, similar to that used in bear identification, will be developed and provided to instructors.
2. A one-page handout will be developed for use in the hunter education "classroom."

In Project WILD workshops, teachers will be introduced to wolf education materials and wolf education materials will be acquired and used to the extent practicable and appropriate.

The recommendations in this section will be implemented upon adoption of this management plan.

FUNDING

In accordance with the Commission's 1992 Wolf Position Statement, Department participation in wolf management was predicated upon securing a stable, long-term source of funding. Consistent

with that position, the Commission has taken action to address funding. The Commission will fund operational costs for the wolf management program through the Department's budget. The Commission will request the Wyoming Legislature to provide funds for wolf depredation compensation through a general fund appropriation. The program is currently staffed by one wolf biologist. It is anticipated that additional personnel will have to be added to the program or existing Department personnel may be reassigned to assist in completing wolf management tasks. With delisting close at hand, the issue of funding continues to be of major importance to the state. Efforts to obtain Congressional funding, especially for livestock compensation, are continuing.

In 1997, the Commission began communicating with Congress and the Federal Administration to provide annual federal appropriations for Wildlife Services to help address wolf-related depredation issues in Wyoming. Currently, Wildlife Services receives an annual appropriation from Congress for predator control. A portion of this appropriation is used to manage wolf conflicts in Wyoming. When the wolf is delisted, Wildlife Services may no longer receive sufficient funding to deal with wolf conflicts. The Department will promote and support the continuation of this allocation, as it intends to enter into an MOU with Wildlife Services for their continued assistance in managing wolf conflicts. If this allocation can be maintained it should cover the majority of costs associated with on-the-ground management of conflicts between wolves and livestock. Adequate Congressional funding will result in significant fiscal savings to the Department.

Section 6 and other ESA funding is available only until the end of the post-delisting monitoring period. The Department has coordinated, and will continue to coordinate, with Idaho, Montana, and other appropriate agencies, organizations and interest groups, and political leaders to secure stable funding for its wolf management program.

The Department also will continue to seek contributions from other federal sources to fund wolf management, such as legislative measures similar to Title III of the Conservation and Reinvestment Act, and the State Wildlife Grant Program. Out of necessity, if for no other reason than to provide the state's match for federal funds, the Department will need to annually allocate some money from the Department's budget toward wolf management efforts. The Department also will examine other potential sources of funding at the state level, beyond license revenue, to assist financially with managing wolves once they are delisted. These could include, but not be limited to, private donations, grants from foundations, assistance from non-governmental organizations and funding partnerships with other interested entities.

ECONOMIC IMPACTS

A recovered wolf population in Wyoming will bring both positive and negative economic impacts, but economic benefits are often difficult to gauge. Positive impacts may be realized in the gateway communities to YNP from increased tourism. Wyoming is well known for its abundant wildlife, scenic mountains, national parks and wildlife refuges. Wildlife viewing is among the top activities for visitors and residents alike. Wolves add to the host of viewable wildlife in Wyoming. Negative impacts include economic losses from livestock depredation, and possibly decreased hunter opportunity due to reduced big game numbers. If hunter opportunity decreases, the Department may see reduced license sales and associated income, and local economies may be impacted from the loss of hunters. The outfitting industry also may be negatively impacted if license sales

decrease. However, outfitters also may gain some clientele wanting to view or hunt wolves. These are only a few of the potential economic impacts of wolves in Wyoming.

The economic impacts of wolves is difficult to predict, but will be better understood through time as a sustainable wolf population is established in the GYA and wolf management in Wyoming evolves. For example, the Department has measured significant reductions in hunting opportunity in some areas with high wolf densities around YNP. Wolf predation does not appear to be the sole cause of reduced opportunity, but is contributing to these reductions. This certainly causes reduced income to the Department and local economies that depend on economic investment from hunters. These same local economies were expected to experience positive economic benefits due to increased tourism following wolf reintroduction (USFWS 1994). More recent research suggests that increased wolf-related tourism has indeed provided some economic benefits to gateway communities around YNP (Duffield et al. 2006).

Livestock losses and the associated economic losses caused by wolves in Wyoming from 1995-2010 totaled at least 478 cattle, 482 sheep, 29 dogs, and 15 "other" livestock. From 1995-2006 livestock losses increased as the wolf population increased but since 2006 annual losses have generally decreased despite continued wolf population growth (Table 1; Jimenez et al. 2011). The disparity between livestock losses and the growing wolf population in recent years is likely the result of more intensive control efforts directed by the USFWS in areas with chronic depredation. Research has documented the number of livestock killed by wolves, but not detected (especially sheep and calves), often exceeds confirmed livestock losses (Oakleaf 2003). This is consistent with the Department's experiences handling grizzly bear depredations on livestock. The total economic value of livestock lost due to wolf depredation is difficult to determine, but compensation payments made by the Department provide some estimate of these losses. From 2008 to 2010, the Department paid a total of $243,000 (~$81,000/year) to livestock producers who had verified losses to wolf depredation within the WTGMA. This provides a minimum estimate of economic losses caused by wolves to the Department on an annual basis. The Department is committed to minimizing economic losses to livestock producers resulting from wolf depredation in the WTGMA.

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Appendix I: Terms of the final agreement reached between the Wyoming Governor's Office and the U.S. Department of Interior/U.S. Fish and Wildlife Service.

Points of Agreement

Objectives

The Wyoming wolf management plan will promote the management of a stable, sustainable population of wolves that is well connected genetically with other subpopulations within the Northern Rocky Mountain Distinct Population Segment (NRM DPS). In achieving these goals, the plan will commit to manage for at least 10 breeding pairs (BPs) and at least 100 wolves maintained outside Yellowstone National Park (YNP) and allows for sufficient levels of effective gene flow into the Greater Yellowstone Area (GYA). Sufficient levels of effective dispersal are generally defined as one effective disperser per generation (approx 4 years) as measured over multiple generations. This draft document summarizes the framework for a strategy that will allow the U.S. Fish and Wildlife Service (Service) to approve Wyoming's wolf management framework and return wolf management to the State.

Population Goals

- Wyoming agrees to manage for a population of at least 10 BPs and at least 100 wolves outside (YNP). The wolf populations in YNP and on the lands of sovereign nations will provide the remaining buffer above the minimum recovery goal intended by the step-down management objective of at least 15 BPs and at least 150 wolves statewide.

- The State of Wyoming will monitor the state's wolf population, based on scientifically defensible methods, to document the number of wolves and breeding pairs outside of (YNP).

Trophy Game Management Area (TGMA)

- The current TGMA will be made permanent. Reference to potential Commission diminishment of the TGMA will be removed from statute.

- The TGMA will be expanded from October 15 to February 28th (29th) to protect dispersers during peak dispersal periods. The boundary for this expansion is illustrated in Figure 1 (attached). The TGMA extension will be treated as a flex-line moving from the permanent line to the extension line on October 15th and back to the existing TGMA line on March 1st.

General Management Inside the TGMA

- Wyoming agrees to remove current statutory mandates for aggressive management inside the TGMA.

- Management of wolf depredation on livestock inside the TGMA will continue using all of the techniques currently used under Service management.

- Rules governing defense of property taking shall be similar to 50 CFR 17.84(n) regarding experimental population rules, thus allowing producers to take wolves inside the TGMA found in the act of preying on their livestock.

- Taking of wolves on feedgrounds inside the TGMA will be limited to wolves impacting elk in said area specifically for the purposes of protecting private stack yards, transmittal of brucellosis, or health and safety related to highways.

- Inside the TGMA, hunting seasons will occur primarily in conjunction with fall hunting seasons. However, they may be established outside of that period or extended beyond that period if necessary to achieve management objectives. Wyoming will develop a hunt plan that will take into consideration but not limited to the following, when considering extending their hunting program: wolf breeding seasons; short and long range dispersal opportunity, survival, and success in forming new or joining existing packs; conflicts with livestock; and the broader game management responsibilities related to ungulates and other wildlife.

- Aerial gunning of wolves inside the TGMA directed by Wyoming Game and Fish Department will be allowed to control livestock depredations, to achieve ungulate management objectives if wolves are determined to be a significant cause for not meeting those objectives, or to address human safety issues. However, other Agency directed aerial gunning for routine wolf population maintenance inside the TGMA is prohibited.

- The Wyoming Game and Fish Commission will divide the TGMA into smaller wolf hunt areas than are described in Wyoming's 2008 wolf management plan.

- The Wyoming Game and Fish Commission will include a statement of management intentions in the revised wolf plan. The statement will address the primary timing of hunting seasons and a description of considerations used for establishing or extending seasons outside the primary period.

- While the seasonal expansion area is in TGMA status, this area will be managed to facilitate natural dispersal.

- Consistent with occupancy during periods of Endangered Species Act protection, neither party expects the seasonally expanded portion of the TGMA to maintain any wolf packs long-term.

<u>General Management Outside the TGMA</u>

- All Wyoming wolves outside the TGMA will be managed as predatory animals.

Maintaining the Northern Rocky Mountain Meta-population Structure and Facilitating Gene Flow

- Wyoming agrees with the goal of continuing to enable successful wolf movement and dispersal between and among the NRM's three subpopulations. Both parties agree management, to the maximum extent practicable, should facilitate an average of at least one effective natural migrant per generation entering into the GYA. Such a metric should be monitored and measured over multiple generations (the exact monitoring interval is to be determined but may be in the range of 3 to 5 generations).

- Genetics monitoring protocol will be developed by the States, Service and necessary experts. The goal will be to develop a protocol to determine if the above goal is being met and sustained. Samples will be collected continuously and genetics will be tested at approximately 3 to 5 year intervals.

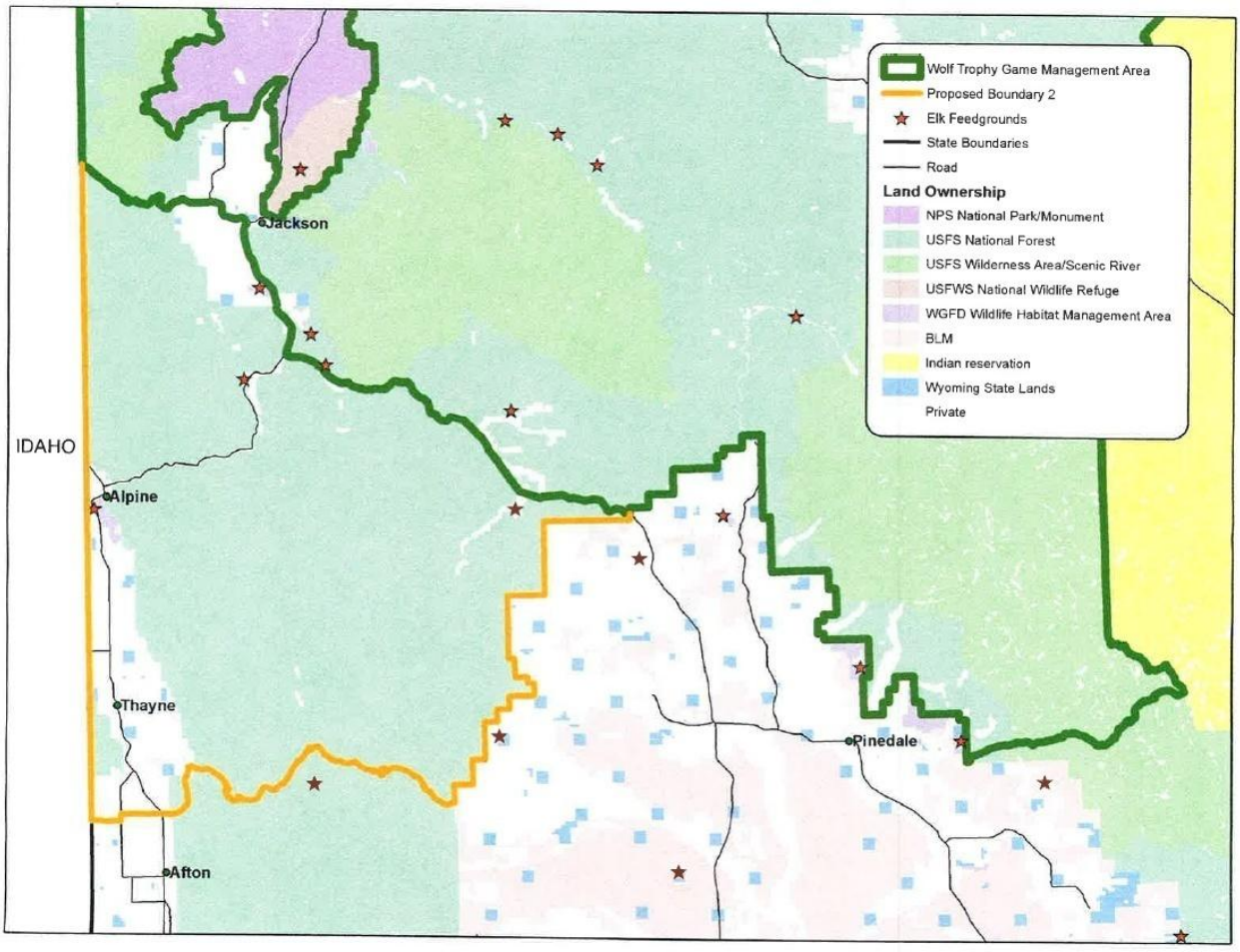
- The mutually agreed upon goal for connectivity into the GYA (discussed above) is not a relisting trigger. Instead, it is a trigger to conduct effective adaptive management intended to preclude the need to ever consider relisting due to potential genetic issues. If the above goal is not met and sustained, a State led effort, in coordination with the Service, will evaluate factors that are contributing to the objective not being met. Potential factors that should be considered include, but are not limited to, sampling and study methods and State management. If State management is identified as a meaningful factor contributing to the goal not being met, State management will be revised. Toward this end, the Wyoming management plan will include a series of specific and measurable triggers and actions to be implemented over time as needed to ensure success of Wyoming's adaptive management strategy. Idaho and Montana may also play a role in sustaining this goal and may be asked to change management if necessary to facilitate the desired level of natural gene flow. Human assisted migration will be employed, in coordination with the States of Idaho and Montana, as necessary.

- The Wyoming Game and Fish Department will sign onto the Genetics MOU already signed by the Service and the States of Idaho and Montana, after it's been modified to reflect Wyoming's commitment to manage for at least 10 BPs and at least 100 wolves outside of YNP.

Statutory and Regulatory Changes

- Wyoming agrees statutory and regulatory changes will be required to implement this agreement and intends to pursue these as necessary to allow implementation of the revised Wyoming wolf management plan to be developed in consideration of the above framework.

Figure 1


Wolf Trophy Game Management Area
Proposed Boundary 2
Elk Feedgrounds
State Boundaries
Road
Land Ownership
NPS National Park/Monument
USFS National Forest
USFS Wilderness Area/Scenic River
USFWS National Wildlife Refuge
WGFD Wildlife Habitat Management Area
BLM
Indian reservation
Wyoming State Lands
Private
IDAHO
Jackson
Alpine
Thayne
Afton
Pinedale

Appendix II: The Genetics Memorandum of Understanding (MOU) signed between the U.S. Fish and Wildlife Service, Idaho Department of Fish and Game, and Montana Fish, Wildlife and Parks. The Wyoming Game and Fish Department will enter into a similar MOU once it has been modified to reflect the State of Wyoming's commitment to manage for at least 10 breeding pairs and at least 100 wolves outside of YNP. The MOU can also be found at: http://www.fws.gov/mountain-prairie/species/mammals/wolf/

Memorandum of Understanding
Protection of Genetic Diversity of Northern Rocky Mountain Gray Wolves

WHEREAS, the United States Fish and Wildlife Service (FWS) has identified a metapopulation of gray wolves in the Northern Rocky Mountains (NRM) consisting of three population areas; northwestern Montana, central Idaho, and the Greater Yellowstone Area (Figure 1);

WHEREAS, the recovery standard adopted by the FWS for delisting of the distinct population segment of gray wolves recommended a metapopulation of at least 30 breeding pairs and at least 300 wolves equitably distributed among the three population areas and states and that no population area remain totally isolated;

WHEREAS, the wolves in northwestern Montana, central Idaho and the Greater Yellowstone Area are currently as genetically diverse as source populations in Canada and inadequate genetic diversity is not a conservation issue at this time because natural conditions, wolf dispersal capabilities, and management frameworks have and will continue to enable successful wolf movement and dispersal between and among population areas into the future;

WHEREAS, genetic exchange has been documented by radio telemetry data and genetic sampling among all three population areas, from both naturally dispersing wolves and relocated wolves; both of which are proven to increase demographic and genetic diversity;

WHEREAS, FWS and Montana and Idaho (the States) desire to maintain the recovered status of the NRM gray wolf metapopulation and promote demographically robust populations and healthy genetic diversity among the three population areas of gray wolves now and into the future;

WHEREAS, as part of the delisting of gray wolves in the NRM, the States committed in their wolf plans to classify wolves as a species in need of management or big game animal and to manage their respective state populations for at least 15 breeding pairs and at least 150 wolves and always maintain at least the minimum number of at least 10 breeding pairs and at least 100 wolves, and promote the interchange of wolves among the three population areas;

WHEREAS, the FWS and the States have historically cooperated on matters of gray wolf conservation and management;

WHEREAS, on July 18, 2008 the Federal District Court in Missoula, Montana enjoined the March 28, 2008, Final Rule that removed the NRM distinct population segment of gray wolves from the federal list of endangered and threatened species based in part on concerns about a perceived lack of sufficiently documented genetic exchange;

WHEREAS, the FWS and the States will secure the recovered status of the NRM gray wolf metapopulation and assure gene flow among the three population areas of gray wolves either by natural connectivity or human-assisted techniques in the unlikely event that the population was showing signs of genetic inbreeding depression or detrimental genetic drift;

THEREFORE, in order to maintain and enhance gray wolf recovery and ensure robust population demographic performance and genetic variation of gray wolves in the NRM into the future, the States and the FWS agree as follows:

1. The States and FWS will coordinate in monitoring of wolf populations, including genetic diversity and cross-boundary packs, and will share information. The States and FWS will report the results of their monitoring no less than annually.

   The States and FWS recognize that genetic diversity within the NRM wolf population is currently high and will jointly collaborate to continue to maintain a demographically robust population and preserve genetic diversity by ensuring opportunities for natural connectivity among the three population areas.

2. The States and FWS agree that natural dispersal among the three population areas facilitates maintenance of genetic diversity and is preferable.

3. If demographic or genetic monitoring suggests that wolf populations are likely to become threatened for genetic-related reasons, and that natural dispersal events were not likely to resolve such threats, translocation or other management techniques will be used to the extent necessary to completely resolve those issues.

4. The States and the FWS further agree to maintain a sufficient population, apply adaptive management principles as outlined in the state plans, along with careful management and regulation of the timing and location of human-caused mortality, to ensure natural dispersal among the population areas.

5. The States, in coordination with the FWS, will establish and maintain a genetic monitoring protocol that will address the collection, storage, analysis and reporting of genetic data and trends from the NRM. Analysis of these genetic data will occur periodically as warranted by demographic trends.

6. The States and the FWS will cooperate by coordinating on the funding and technical aspects of monitoring wolf population demographics and genetic variation of the NRM population. Should human-assisted genetic management strategies become necessary, the States and FWS will coordinate by expediting issuance of permits required by law and provide personnel and equipment.

7. All signatories recognize that each has statutory responsibilities that cannot be delegated and that this MOU can not abrogate any signatory's statutory responsibilities. This MOU is subject to and is intended to be consistent with all appropriate federal and state laws. This MOU does not obligate any of the undersigned agencies to the expenditure of funds except in accordance with lawful appropriations by the respective agencies. The undersigned agencies will take appropriate steps to seek funding to implement this MOU.

8. This MOU will be implemented upon final signature of all parties.

Director, Idaho Department of Fish and Game — Date: 12/08/08

Director, Montana Fish, Wildlife & Parks — Date: 12/8/08

Director, U.S. Fish and Wildlife Service, Region 6 — Date: 12/4/08

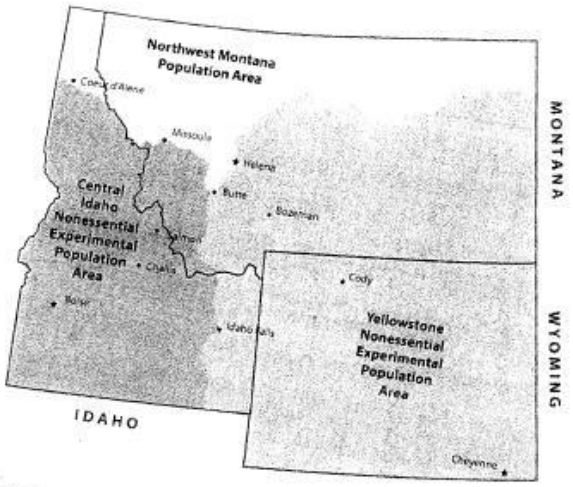


Figure 1. Northern Rocky Mountain wolf population areas.

Appendix II: Glossary of definitions.

1. "Breeding pair" means a pack with an adult male and an adult female gray wolf successfully raising at least two (2) pups of the year until December 31.

2. "Chronic wolf predation area" means a geographic area limited to a specific parcel of private land or a specific grazing allotment described on the permit within the Wolf Trophy Game Management Area where the Department has verified that gray wolves have repeatedly (twice or more within a two (2) month period immediately preceding the date on which the owner applies for a lethal take permit) harassed, injured, maimed or killed livestock or domesticated animals.

3. "Delisting" or "delisted" means the removal of federal protections and management oversight of wolves under the Endangered Species Act and the transfer of management authority of wolves to the respective state.

4. "Depredation" means the confirmed killing or injuring of livestock or domesticated animals by a wolf.

5. "Dispersal" means the permanent movement of an individual wolf out of the territory it currently occupies (usually its natal territory) to a new location or territory, usually in search of breeding opportunities with another dispersing wolf or within an established pack that has experienced loss of a breeding wolf.

6. "Doing damage to private property" means the actual biting, wounding, grasping, or killing of livestock or domesticated animals, or chasing, molesting, or harassing by gray wolves that would indicate to a reasonable person that such biting, wounding, grasping, or killing of livestock or domesticated animals is likely to occur at any moment.

7. "Domesticated animals" means those individual animals which have been made tractable (easily managed or controlled) or tame and are not defined as wildlife. For the purpose of this regulation, only the following animals are considered domesticated: Domesticated alpaca (*Lama pacos*), domesticated camel (*Camelus bactrianus* and *Camelus dromedarius*), domesticated emu (*Dromaius novaehollandiae*), domesticated ostrich (*Struthio camelus*), domesticated peafowl (*Pavo cristatus*), domesticated rhea (*Rhea americana* and *Rhea pennata*), domesticated vicuna (*Vicugna vicugna*), domesticated yak (*Bos grunniens*) and domesticated dogs (*Canis familiaris*) not used in the protection of livestock.

8. "Effective migrant" means a wolf that successfully disperses from one subpopulation in the Northern Rocky Mountain Distinct Population Segment to another and successfully reproduces.

9. "Feedground" means a specific area where ungulates, usually elk, are fed supplemental food by the Department or the USFWS during the winter period.

10. "Genetic connectivity" means the effective interchange between wolf subpopulations in the Northern Rocky Mountains Distinct Population Segment by means of wolves dispersing between subpopulations, surviving, and successfully reproducing, thus establishing a genetic linkage between subpopulations.

11. "Harvest" means the legal killing of a wolf by the public not in defense of property, including killing of a wolf designated as a trophy game animal during an open hunting season using approved methods of take or killing of a wolf designated as a predatory animal using approved methods of take.

12. "Lethal Take Permit" means a permit issued by the Department to an owner to shoot not more than two (2) gray wolves on individual parcels of private land or grazing allotments as designated on the permit for a period of 45 days. Lethal take permits will be renewable as long as the conflict persists.

13. "Livestock" means horses, mules, cattle, swine, sheep, goats, poultry, guard animals or any other animal maintained under domestication. Bison are considered livestock unless otherwise designated by the Wyoming Livestock Board and the Wyoming Game and Fish Commission.

14. "Pack" means two or more adult wolves traveling together in a distinct territory.

15. "Predatory animal" as defined in statute means coyote, jackrabbit, porcupine, raccoon, red fox, skunk or stray cat; and gray wolves in areas that they are not designated as a trophy game animal.

16. "Relisting" means the reinstatement of federal protections for wolves under the Endangered Species Act and removal of wolves from state management authority.

17. "Take" means hunt, pursue, catch, capture, shoot, fish, seine, trap, kill, or possess, or attempt to hunt, pursue, catch, capture, shoot, fish, seine, trap, kill, or possess.

18. "Trophy game animal" as defined in statute means black bear, grizzly bear, mountain lion; and gray wolves in areas that they are designated as a trophy game animals. Trophy game animals managed by the Department as directed by Commission regulation and Wyoming statute using regulated harvest and standard wildlife management techniques.

19. "Unacceptable impact on a wild ungulate population or herd" means any decline in a wild ungulate population or herd that results in the population or herd not meeting the state population management goals or recruitment levels established for the population or herd.

20. "Wild ungulate population or herd" means an assemblage of wild ungulates living in a given area.

21. "Wolf control" or "control" means the killing of a wolf or wolves by the Department, or its designated agent, a licensed control agent, or the public in order to prevent a conflict. Conflicts include "depredation", "doing damage to private property", and/or "unacceptable impacts on a wild ungulate population or herd".