Rocky Mountain Wolf Recovery
2005 Interagency Annual Report

A cooperative effort by the U.S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, Montana Fish, Wildlife & Parks, Idaho Fish and Game, and USDA Wildlife Services.

NPS photo by D. Stahler

This cooperative annual report presents information on the status, distribution and management of the Northern Rocky Mountain wolf population from January 1, 2005 to December 31, 2005. It is also available at:

http://westerngraywolf.fws.gov/annualreports.htm

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Note to Readers:

Because of the transition to state-led management in Montana and Idaho, the 2005 Interagency Annual Report has a different organization and look than in previous years. This year's interagency report is comprised of separate sections, one each for the individual annual reports from the states of Montana and Idaho respectively, federal agencies for Wyoming and Yellowstone National Park combined, and the overall U.S. Fish and Wildlife Service Northern Rockies Recovery Program. This type of organization makes for some degree of overlap and duplication between sections. However, U.S. Fish and Wildlife Service requires Montana and Idaho to submit an annual report each year. By incorporating their state annual reports in this modified structure, the public can still access information about gray wolves in the northern Rockies in a single, comprehensive report. I hope you find this is useful.

Please let us know what you think about the new format so we can make improvements next year.

Thank you,

Ed Bangs
U.S. Fish and Wildlife Service Northern Rockies Wolf Recovery Program Coordinator

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NORTHERN ROCKIES SUMMARY

The gray wolf *(Canis lupus)* population in the Northern Rocky Mountain (NRM) states (Idaho, Montana, and Wyoming) continued to increase in distribution and abundance (Figure 1, Tables 4a, 4b). Estimates of wolf numbers at the end of 2005 were 565 wolves in the Central Idaho Recovery Area (CID), 325 in the Greater Yellowstone Recovery Area (GYA), and 130 in the Northwest Montana Recovery Area (NWMT) for a total of 1,020 wolves (Figure 1, Table 4a). By state boundaries, there were an estimated 512 wolves in the state of Idaho, 252 in Wyoming and 256 in Montana (Table 4b). Of approximately 134 packs (groups of 2 or more wolves), 71 packs met the definition of "breeding pair," defined as an adult male and female raising 2 or more pups until December 31 (Tables 4a, 4b). This made 2005 the sixth year in which 30 or more breeding pairs were documented and well distributed within the 3-state area. Biological recovery criteria have been met for removing NRM wolves from the Endangered Species list. No other confirmed wolves or wolf packs were documented in states adjacent to Montana, Idaho and Wyoming in 2005.

Wolves in the NRM subsisted mainly on elk, white-tailed deer, mule deer, moose, and bison. Livestock depredations in 2005 included 97 cattle, 244 sheep, 11 dogs and 2 horses that were confirmed as killed by wolves (Tables 5a, 5b). Approximately 36 of 132 known wolf packs (27%) were involved in confirmed livestock depredations. In response, 103 wolves were lethally removed within the 3-state area (about 9% of the 2005 wolf population). No wolves were relocated in 2005. As new packs form within the original core recovery areas and individual animals disperse, the 3 populations increasingly resemble and function as a single, large meta-population (Figure 1). Numerous research projects are underway, examining wolf population dynamics, predator-prey interactions and livestock depredation.

NORTHERN ROCKIES BACKGROUND

Gray wolf populations were extirpated from the western U.S. by the 1930s. Subsequently, wolves from Canada occasionally dispersed south into Montana and Idaho but failed to survive long enough to reproduce. Eventually, public attitudes toward predators changed and wolves received legal protection with the passage of the Endangered Species Act (ESA) in 1973. Wolves began to successfully recolonize northwest Montana in the early 1980s. By 1995, there were 6 wolf packs in northwest Montana. In 1995 and 1996, 66 wolves from southwestern Canada were reintroduced to Yellowstone National Park (YNP) (31 wolves) and CID (35 wolves).

The NRM wolf population contains 3 core recovery areas: the NWMT (Figs. 1, 2) includes northern Montana and the northern Idaho panhandle; the GYA (Figs. 1, 3) includes Wyoming and adjacent parts of Idaho and Montana; the CID (Figs. 1, 4) includes central Idaho and adjacent parts of southwest Montana. Wolves in the 3 recovery areas are managed under different guidelines, depending upon their designated status under the ESA.

In 2003, NWMT wolves were reclassified from endangered, the most protected classification under the ESA, to threatened, a less restrictive classification. On January 31, 2005, and August 19, 2005, the U.S. District Courts in Oregon and Vermont, respectively, concluded that the 2003 final rule was "arbitrary and capricious" and violated the ESA (Defenders of Wildlife v. Norton 03-1348-JO, D. OR 2005; National Wildlife Federation v. Norton 1:03-CV-340, D. VT. 2005). The Court's rulings invalidated the April 2003 changes to the ESA listing for the gray wolf. Therefore, the gray wolf in the Rocky Mountains, outside of areas designated as nonessential, experimental populations, reverted back to the endangered status that existed prior to the 2003 reclassification.

The GYA and CID wolves are classified as nonessential experimental populations (as allowed by section 10(j) of ESA) and managed with more flexible options than an endangered or threatened population. In 2005 a new 10(j) experimental population regulation allowed even more management flexibility for wolves in the experimental population areas in states with approved wolf management plans (Montana and Idaho). Currently the states of Montana and Idaho manage wolves in their states, with federal funding and according to federal guidelines.

The U.S. Fish and Wildlife Service (USFWS), responsible for administering the ESA for terrestrial and freshwater species and some marine mammals, determined that 30 or more breeding pairs composed of at least 300 wolves, with an equitable distribution among the 3 states for 3 successive years, constitutes a viable and recovered wolf population. That criterion (including the temporal element) was met at the end of 2002. If Wyoming had an adequate state regulatory framework for wolf management and other provisions required for delisting continued to be met, the USFWS would propose to delist (removal from protection under the ESA) the wolf population in the NRM. Our recently published advanced notice of proposed rulemaking fully explains our intention to complete this process as soon as possible (71 FR 6634).

Montana Gray Wolf Conservation and Management in the Northern Rockies Wolf Recovery Area

A cooperative effort by Montana Fish, Wildlife & Parks, USDA Wildlife Services, Glacier National Park, Yellowstone National Park, and The Confederated Salish and Kootenai Tribes

FWP photo by Kent Laudon

This report presents information on the status, distribution, and management of wolves in the State of Montana, from January 1, 2005 to December 31, 2005.

It is also available at: www.fwp.mt.gov/wildthings/wolf

This report may be copied in its original form and distributed as needed.

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MONTANA EXECUTIVE SUMMARY

Wolf recovery in Montana began in the early 1980's. Gray wolves increased in number and expanded their distribution in Montana because of natural emigration from Canada and a successful federal effort that reintroduced wolves into Yellowstone National Park (YNP) and the wilderness areas of central Idaho. The U.S. Fish and Wildlife Service (USFWS) approved the Montana Gray Wolf Conservation and Management Plan in early 2004, but delisting in the northern Rockies (NRM) was delayed. When federal funding became available later in 2004, Montana Fish, Wildlife & Parks (MFWP) began managing wolves in northwestern Montana under a cooperative agreement with USFWS. In 2005, Montana expanded its responsibility for wolf conservation and management statewide under a new cooperative agreement. The agreement allows Montana to implement its federally-approved state plan to the extent possible and within the guidelines of federal regulations.

Using federal funds, MFWP monitors the wolf population, directs problem wolf control and take under certain circumstances, coordinates and authorizes research, and leads wolf information and education programs. MFWP wolf management specialists were hired in 2004 and are based throughout western and central Montana. A program coordinator is based in Helena.

The Montana wolf population increased from 2004 to 2005. The increase is due to a modest increase in actual wolf numbers and the increased monitoring efforts that led to verification of packs that actually existed in 2004 but were not counted in the 2004 estimate. A total of 46 verified packs of 2 or more wolves yielded a minimum estimate of 256 wolves in Montana. Nineteen packs qualified as a breeding pair according to the federal recovery definition. Across the southern Montana experimental area (Central Idaho and Greater Yellowstone areas combined), there were 27 packs, 9 of which met the breeding pair criteria. Across northwest Montana, there were 19 packs, 10 of which met the breeding pair criteria.

Mange was documented in several packs in the Greater Yellowstone area. That is believed to account, in part, for the poor pup survival in 2005. Additionally, most live wolves from which Montana personnel obtained a bloods sample demonstrated exposure to several canine viral diseases but these animals survived the exposure. It is not clear to what extent these diseases contributed to poor pup survival. Two other external parasites were also documented.

Montana Wildlife Services (WS) confirmed 23 cattle, 33 sheep, 1 dog and 2 horses were killed by wolves in calendar year 2005. Additional losses most certainly occurred, but could not be confirmed. Most depredations occurred on private property. Thirty five wolves were killed to reduce the potential for prevent further depredations, 7 of which were killed by private citizens under the new 2005 10(j) regulations in the experimental area of southern Montana.

Wolves in Montana prey primarily on elk, deer, and moose. Numerous research projects are investigating wolf-ungulate relationships. Montana Fish, Wildlife & Parks recently compiled research results of wolf-ungulate interactions in southwest Montana. This report and other information about wolves and the Montana program are available at www.fwp.mt.gov/wildthings/wolf.

INTRODUCTION AND BACKGROUND

Wolf recovery in Montana began in the early 1980's. Gray wolves increased in number and expanded their distribution in Montana because of natural emigration from Canada and a successful federal effort that reintroduced wolves into Yellowstone National Park (YNP) and the wilderness areas of central Idaho. Montana contains portions of all 3 federal recovery areas: the Northwest Montana Endangered Area (NWMT), the Central Idaho Experimental Area (CID), and the Greater Yellowstone Experimental Area (GYA) (Figure 1).

The biological requirements for wolf recovery in the northern Rocky Mountains of Montana, Idaho, and Wyoming were met in December 2002. Before the U.S. Fish and Wildlife Service (USFWS) can propose to delist gray wolves, federal managers must be confident that a secure, viable population of gray wolves will persist if protections of the Endangered Species Act (ESA) were removed. To provide that assurance, the states of Montana, Idaho, and Wyoming developed wolf conservation and management plans and adopted other regulatory mechanisms in state law.

In late 2003, all 3 states submitted wolf management plans to USFWS for review. Based on the USFWS's independent review of the state management plans and state law, analysis of the comments of independent peer reviewers and the states' responses to those reviews, USFWS approved the Montana and Idaho management plans as being adequate to assure maintenance of their state's share of the recovered tri-state wolf population. Wyoming's plan, however, was not approved. USFWS will not propose delisting until the Wyoming plan and associated state laws can be approved.

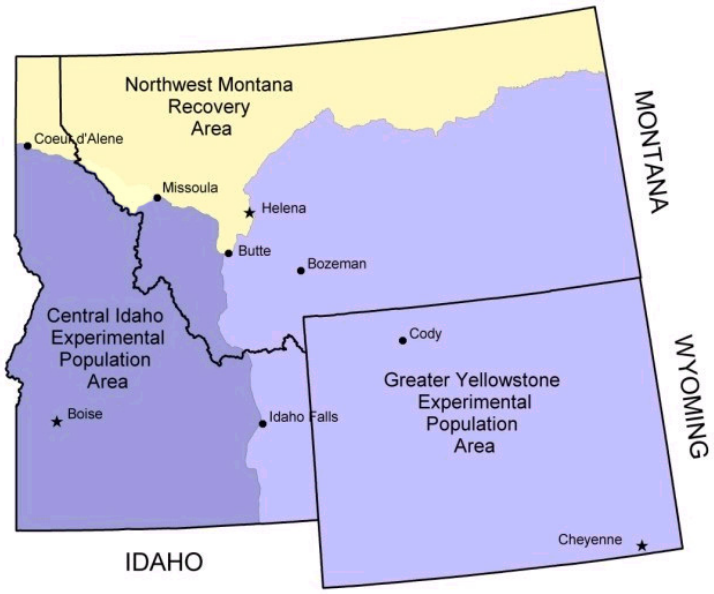

Figure 1. Northern Rockies gray wolf recovery area comprised of the states of Montana, Idaho, and Wyoming

After amending its Record of Decision to comply with the Montana Environmental Policy Act, MFWP increased its role in day-to-day wolf recovery and management in northwest Montana under an interim interagency cooperative agreement even though wolves remain protected under the federal Endangered Species Act. USFWS provided direct funding.

In 2005, MFWP expanded its responsibility for wolf conservation and management statewide. Additional federal funding became available through Congress, beginning in federal fiscal year 2004. A new MFWP-USFWS interagency cooperative agreement was finalized in June 2005. With a clear agreement in place and federal funding to support the work, MFWP became the lead agency for wolf conservation and management statewide in June 2005, though its role and participation gradually increased from spring 2004 to June 2005. The agreement is effective through June 2010, or until the wolf population in Montana is removed from the federal list of threatened or endangered species, or until amended by either party.

The cooperative agreement allows Montana to implement its approved state plan to the extent possible and within the guidelines of federal regulations. The cooperative agreement authorizes Montana to conduct traditional wolf management such as population monitoring, direct problem wolf control, take wolves under certain circumstances, coordinate and authorize research, and coordinate and lead wolf information and education programs. Montana is committed to maintaining the recovered status of its share of the NRM wolf population.

This annual report presents information on the status, distribution, and management of wolves in the State of Montana from January 1 to December 31, 2005.

STATEWIDE PROGRAM OVERVIEW

The Montana Wolf Conservation and Management Plan is based on the work of a citizen's advisory council. Completed in 2003, the foundations of the plan are to recognize gray wolves as a native species and a part of Montana's wildlife heritage, to approach wolf management similar to other wildlife species such as mountain lions, to manage adaptively, and to address and resolve conflicts.

However, because wolves are still listed, some elements of Montana's plan cannot be implemented. The legal classification and federal regulations place wolves into 2 separate categories in Montana – endangered in northern Montana and experimental non-essential across southern Montana (Figure 2). Wolf-livestock conflicts are addressed and resolved using a combination of the statewide adaptive management triggers identified in the Montana plan and the federal regulations. In northwest Montana, the 1999 Interim Control Plan provides less flexibility to agencies and livestock owners. In contrast, more flexibility is provided through the revised 10(j) regulations (finalized in February 2005).

In the early stages of implementation, a core team of experienced individuals led wolf monitoring efforts and worked directly with private landowners. MFWP's wolf team also worked closely with and increasingly involved other MFWP personnel in program activities. As

time goes by, Montana wolf conservation and management will transition to a more fully integrated program, led and implemented at the MFWP Regional level. USDA Wildlife Services (WS) investigates injured and dead livestock, and MFWP works closely with them to resolve conflicts.

Overview of Wolf Ecology in Montana

Wolves were distributed primarily in the NRM region of western Montana east to the Beartooth face near Red Lodge. Montana wolf pack territories average around 200 square miles in size but can be 300 square miles or larger. Montana packs include a combination of public and private lands. The average pack territory in Montana is comprised of 30% private land. Most Montana packs do not live strictly in back country wilderness area. Of the 46 packs in Montana, only 2 reside most of the year in wilderness areas. Many others live in areas of remote public lands. But the majority live in areas where mountainous terrain, intermountain valleys, and public / private lands come together.

Dispersal distances in the northern Rockies average about 60 miles, but dispersals over 500 linear miles have been documented. A 500-mile radius from any wolf pack in YNP, Glacier National Park (GNP), or any pack in western Montana would plausibly reach all the way to Montana's eastern border. Montanans should be aware that wolves are established well enough in the northern Rockies now that a wolf could appear where none has been seen for decades. Wolves are capable of covering long distances in relatively short periods of time and often travel separately or in smaller groups. The travel ability of wolves, combined with the fact that packs split, with sub-groups traveling separately, can give an impression that there are more wolf packs and territories than is actually the case. Pack monitoring efforts, especially when combined with public / agency wolf reports, eventually leads to a conclusion about how many packs exist.

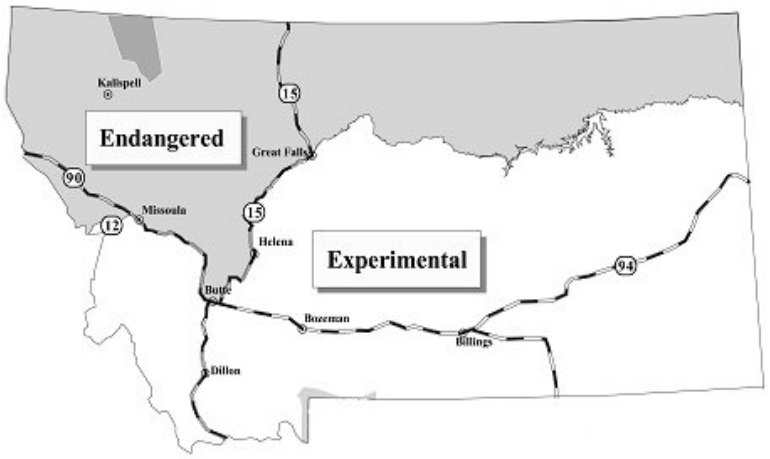

Figure 2. Map of the interim federal wolf management areas showing the endangered area where the 1999 Interim Wolf Control Plan applies and the experimental area where the 10(j) regulations apply. The central Idaho and Greater Yellowstone experimental areas are shown as one since the approved status of Montana's state wolf plan allows the special 10(j) regulations to apply equally in each area.

Wolf packs are family groups that consist of a breeding pair and their offspring of the current year and/or previous years and occasionally unrelated wolves. Offspring usually disperse from the natal pack at 1, 2 or 3 years of age. From, 1995 to 2005, the average pack in Montana was approximately 6 animals. It is less than the average pack size in the states of Idaho and Wyoming. Average pack sizes in the experimental area across southern Montana are slightly larger than in the endangered area of northwest Montana, but still approximately 6 animals.

Montana wolves can be black, gray, or nearly white. Wild wolves are sometimes mistaken for coyotes or domestic dogs. But a wolf's large size, long legs, narrow chest, large feet, and wide / blocky head and snout distinguish it from the other canid species. Adult male wolves average about 100 pounds, but can weigh as much as 130 pounds. Females weigh slightly less.

Population Estimation and Monitoring Methods

The statewide Montana wolf population was estimated on a calendar year basis (January to December). A mid-year estimate is completed and made available, usually in September. It was based on preliminary denning and litter information for packs that carried over from the previous calendar year and any "new" packs that were verified by mid-year. A year-end estimate was made on December 31, based upon the best available information.

There can be considerable changes between September and December estimates. Some packs may appear in the mid-year estimate but drop out between the September and the December estimate if it was not verified during the second half of the year. Some "new" packs were verified for the first time between the mid-year and year-end estimates. The mid-year estimate and the final year-end estimate were both considered minimum counts because of the significant logistical challenges associated with monitoring a wide-ranging species with large home ranges. It was not possible to count every wolf in Montana, but MFWP did use all available information that could be verified.

Wolf monitoring is conducted using a variety of tools and techniques in combination, as is the case for other wildlife species. Common wolf monitoring techniques include: radio telemetry, howling and track surveys, reports from the public and other natural resource agency professionals, and reports from private landowners. MFWP made a concerted effort in 2005 to invite the public to help monitor wolves in Montana by sharing information about wolves or wolf sign they observed while afield. The MFWP website now offers a way for the public to report their information electronically (see www.fwp.mt.gov/wildthings/wolf). Public reports were a tremendous help in prioritizing MFWP's field efforts. A wolf pack must be verified by agency personnel to be included in the final statewide population estimate.

A typical sequence is as follows. MFWP and other agency cooperators receive a report of a wolf observation, wolf sign, or injured/dead livestock from the public or an agency colleague. Because it is very difficult to gauge the reliability and validity of the report and it is even more difficult to verify given how much wolves travel and environmental conditions which obliterate tracks or degrade scats, these reports are logged into a database with as much spatially explicit information as is provided. Reports of lone animals or wolf sign must eventually be linked to

other reports to build a pattern or cluster, which in turn helps direct and prioritize field efforts. If MFWP receives reports of multiple individuals (group of wolves or multiple sets of tracks), pair bonding and pack territory establishment are highly likely. These eventually can form a pattern as well.

MFWP has and will continue to use volunteers who systematically search areas of current wolf reports, areas of past wolf activity, or noted "gaps" in wolf activity despite adequate prey base. MFWP personnel also conduct systematic searches. Track logs are taken during these "routes" and waypoints recorded when wolf sign is found.

The next step occurs when patterns and field reconnaissance yield enough information to validate wolves were in the area. A decision was made about whether to try and capture a wolf or not. Many factors were considered when prioritizing field efforts across the state. Not all packs needed to have radio collars, while others should have had one or more collars. Regardless, radio telemetry has been the standard technique with other protocols developed and validated based on a sample of collared packs. Project staff spent much of their time throughout the year conducting ground-based trapping operations and helicopter darting in winter. Reliable information about specific packs and the overall statewide population was essential to implement the approved state plan and adhere to the federal regulations.

If a pack was trapped and a radio collar is deployed, MFWP flew 1 to 2 times per month to locate the collared animal. In addition, wolves were ground tracked to determine where they localized throughout the year and the number of wolves traveling together. Den sites and rendezvous sites were visited to determine if reproduction had taken place. Additional information may be collected, such as ungulates killed, identification of private lands used by wolves, identification of public land grazing allotments where conflicts could occur, or common travel patterns.

At the end of the year, MFWP compiled information gathered through field surveys, telemetry, and public reporting. This results in a greater understanding of wolf pack distribution, individual pack sizes, pelage colors, mortality, pup production, home range sizes and patterns of use within the territory, dispersal events, and disease. The information also guided decision-making when livestock depredations were confirmed. MFWP also gained insight into the large area wolves inhabit, the dynamics of pack size, and territory shifts within and between years.

MFWP estimated the number of individual wolves (adults and pups of the year) in each pack having a radio-collared member. Reliable estimates were made for packs without collars, based on public and other agency reports. The number of wolves in radio-collared packs was added to the number of wolves in verified, uncollared packs, resulting in the minimum statewide population total. If lone dispersing animals were accounted for reliably, they are also included.

Through it's monitoring program, MFWP was required to also tally and report the number of "breeding pairs" according the federal recovery definition of "an adult male and a female wolf that have produced at least 2 pups that survived until December 31." Montana is required to maintain at least 10 breeding pairs as an absolute minimum. Packs of 2 or more wolves that met

the recovery definition are considered "breeding pairs" and noted as such in the summary tables. Not all packs in Montana satisfy the breeding pair criteria. This can be caused by the loss of 1 or both adults because of mortality or dispersal, lack of denning activity, or the loss of pups to the extent the surviving litter consists of 1 pup.

The total number of packs was determined by counting the number of packs with 2 or more individual animals that existed on the Montana landscape on December 31. If a pack was removed because of livestock conflicts or otherwise did not exist at the end of the calendar year (e.g. disease, natural/illegal mortality or dispersal), it was not included in the year-end total or displayed on the Montana wolf pack distribution map for that calendar year.

Such comprehensive information allowed Montana to document the maintenance of its share of the recovered NRM tri-state population and that the Montana population was secure in 2005. The Montana wolf population was more intensively monitored on a consistent, year-round basis than any other wildlife species in the state.

In 2005, several wolf pack territories straddled administrative boundaries. Examples of transboundary packs included: the former Kootenai pack (U.S. / Canadian border), Chief Joseph (YNP / Montana state border), and Fish Creek (Montana / Idaho border). NRM wolf program cooperators have agreed that packs will be tallied in the population in the administrative area where the den site was located. If the den site was not known with certainty, amount of time, percent of territory, or the number of wolf reports were the next criteria considered for determining pack residency. One of the project partners generally had the lead for wolf monitoring, but the information was shared equally. This assures that all packs were accounted for, but none were double-counted in population estimates. Transboundary packs were included in the table (Tables 1, 2, 3) for the administrative region in which the animals were counted.

Montana Statewide Wolf Population and Distribution

The Montana wolf population is very dynamic. Some packs do not persist from year to year for a variety of reasons. About the same number of new packs formed or were verified for the first time in 2005 as the number of 2004 packs that no longer existed at the end of 2005. The loss of packs in the Montana population could be due to a variety of factors, including mortalities and poor pup production due to parasites and disease, and lethal control to address conflicts with livestock. In some cases, some packs that were either verified or suspected in 2004 no longer existed by the end of 2005.

The Montana wolf population increased from 2004 to 2005. The increase was due to a variety of factors. Some of the increase was attributed to a real increase in wolf numbers in 2005, since many new packs formed and produced pups in 2005. Of greater significance however, was MFWP's increased efforts to monitor wolves compared to previous years. MFWP's field staff monitored the population year round, using a variety of techniques. In addition, MFWP made a concerted effort to gather wolf reports from the public and other agency professionals. Many of the "new" packs verified in 2005 were likely present in 2004 but were not confirmed and

included in the 2004 population estimate. Additionally, several transboundary packs were tallied in the Montana population for the first time.

There were a total of 46 packs (2 or more wolves), resulting in an estimated minimum of 256 wolves in Montana at the end of 2005 (Figure 3). The average number of wolves per pack increased from about 4.5 wolves per pack in 2004 to 5.5 wolves per pack in 2005. There were 19 breeding pairs statewide. In the NWMT endangered area, there were a total of 19 packs, 10 of which met the breeding pair criteria. There was an estimated minimum of 126 wolves in the endangered area at the end of 2005. This was significantly greater than the 2004 estimates, due in part to the formation of several new packs, increased monitoring efforts that verified packs formed, but not tallied in 2004, strong pup survival, and the inclusion of a few transboundary packs in the Montana population estimate.

In the experimental area across southern Montana, there were 27 packs, 9 of which met the breeding pair criteria. In the Montana portion of the GYA, there was an estimated minimum of 66 wolves in 16 packs, and 3 of the packs met the breeding pair criteria. Overall pup production and survival was down in 2005. In the Montana portion of CID, there was an estimated minimum of 64 wolves in 11 packs, and 6 of the packs met the breeding pair criteria. This was about the same number of wolves as estimated in 2004, but the number of packs and breeding pairs doubled. Overall across the southern Montana experimental area, minimum estimated wolf numbers and the number of breeding pairs was stable from 2004 to 2005, but the number of packs increased.

Of notable interest for western Montana was that wolf pack distribution expanded primarily within areas already expected to have wolves (Figure 4). The number of wolf packs in western Montana increased significantly from 2004 to 2005. This could be due to higher wolf dispersal into Montana from Idaho than from the GYA.

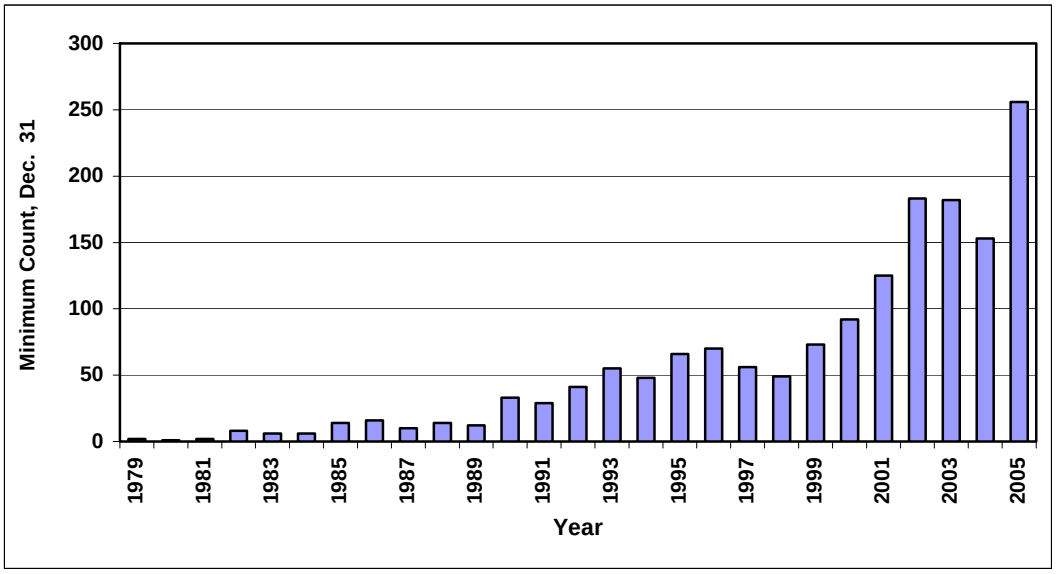

Figure 3. Minimum estimated number of wolves in the State of Montana, 1979-2005.

Wolf Health Monitoring

MFWP's Wildlife Research Laboratory (Lab) in Bozeman played an important role in Montana's wolf monitoring program. In 2005, MFWP's wildlife veterinarian drafted a biomedical protocol that guided wolf capture, physical or chemical immobilization procedures, and animal care and handling procedures. Supplementary training was provided, and routine consultation assured adherence to the protocol. Additionally, lab personnel carried out routine wolf health and disease surveillance by collecting information from both live and dead wolves.

Blood samples collected by MFWP and WS from live-captured wolves were sent to the Lab. Blood was screened for exposure to various diseases, and some was archived in a DNA repository. Twenty-one blood samples were collected and submitted to the lab in 2005. Usable samples were forwarded for hematology, biochemistry, and serology screening. All of the hematology and biochemistry results were within normal limits expected for wolves. However, serology results indicated that most of those individuals had been exposed to some common canid viral and bacterial diseases: canine parvovirus, canine distemper, canine adenovirus, and leptospirosis. The presence of these antibodies in blood collected from live wolves indicated exposure at some time in the animal's life, but that it survived the exposure. While there has been much speculation about the cause of low pup counts in southwest Montana and inside YNP, clinical evidence to confirm the cause/s was very difficult to obtain.

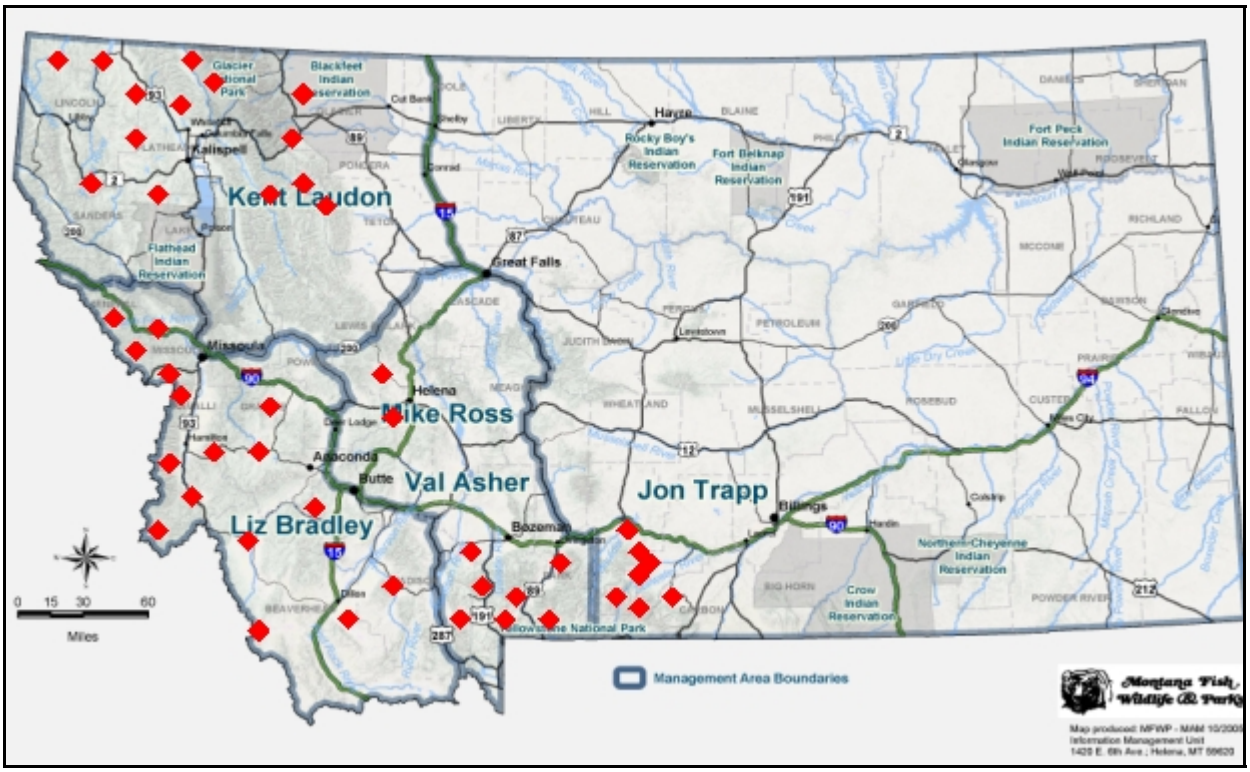

Figure 4. Verified wolf pack distribution in the State of Montana as of December 31, 2005.

Additionally, MFWP developed a protocol that called for all dead wolves found in Montana to be submitted to the lab for necropsy examination. Unless special instructions were provided, a standard basic procedure was followed. Typical information collected includes cause of death, body weight, evidence of ectoparasites, etc. Various biological data were also collected. The first premolar, the skull, and a tissue sample were collected and stored. Salvageable hides were retained and processed for educational purposes. The veterinarian had discretion to complete a more in-depth necropsy if preliminary findings warranted additional examination. Abnormal or suspect tissues were submitted to the Montana State Diagnostic Laboratory (or occasionally elsewhere) for further evaluation. Lab personnel may also assist and consult during USFWS law enforcement investigations to determine cause of death and examine physical evidence.

In 2005, a total of 48 wolves (25 males, 10 females, 3 unknowns) were processed. The majority was killed in response to wolf-livestock conflicts. Cause of death could not be determined for 5 wolves. Five wolves were struck and killed by vehicles in 2005. Eight wolves were euthanized for various reasons, including spinal trauma and extremely poor health (e.g. mange).

Several packs in southwest Montana (Montana portion of the GYA) were documented with symptoms associated with Sarcoptic mange (*Sarcoptes scabeii)*. Thus far, mange has been detected in wolf packs living primarily east of the continental divide. Mange is caused by an external mite that burrows into the wolf's skin causing, irritation, hair loss, lesions and scabs. In advanced cases, it can be fatal because of a chronically weakened immune system, secondary infections, or even hypothermia due to hair loss. The mite is spread by direct body contact with an infected animal or by contact with something that an infected animal contaminated. It was impossible to effectively treat infected wild, free-ranging wolves for logistical and environmental reasons.

Nine wolves out of the 48 total examined at the Lab in 2005 (~19%) exhibited chronic skin disease characterized by varying degrees of hair loss, scaling and crusting. One wolf died of starvation associated with mange. Mange affected the survival of individual wolves and may in fact affect population trends. The potential for mange to affect overall population trends in Montana is not known. Mange and the viral diseases mentioned previously may be have greater negative effects on pups since their immune systems are still developing.

In addition to mange, three more pathogens were identified in Montana in 2005. Biting dog lice (*Tricodectes canis*) was documented in Montana for the first time in 2005. Two wolves from the Battlefield pack were found to have a single louse parasite. These lice have been found on wolves in Alaska and Minnesota. Another second unusual pathogen was identified in a pup that was euthanized in southwest Montana. Muscular sarcocystosis (*Sarcocytis sp.)*, which was considered a rare finding in canids, was confirmed. The clinical significance of this unusual finding is unknown. The third pathogen of interest was trichinosis (*trichinella* larvae found in skeletal muscle). It was also documented in this same pup, but it is somewhat common in predators. It is transmitted by the ingestion of infected muscle tissue from another host. Work in Alaska indicates that *trichinella* infection has no measurable impact on either individual wolves or the population.

Wolf – Ungulate Relationships

In mountainous areas with harsh winter weather conditions, less productive vegetation, and multiple predator species including grizzly bears, wolf predation seemed to be more influential than in areas where livestock were present seasonally or year round. Outside national parks, Montana's wolves routinely encountered livestock. Lethal wolf control to resolve wolf-livestock conflicts seemed to decrease local wolf densities to a point where wolf predation did not appear to significantly affect elk populations (See Hamlin 2005).

Montana elk herds that inhabit YNP seasonally have declined, due in part to predation where local wolf densities (among other predator species) were high. In a few areas, MFWP curtailed hunter opportunity in 2004 and 2005. Yet in other areas where wolves and elk interact, elk numbers are stable or increasing. Two thirds of the hunting districts in southwest Montana (all of which support wolves) are currently offering the most liberal hunting opportunities seen in nearly 30 years as a management response to higher elk populations.

Research has shown that elk use habitat differently since wolves have returned. One study showed that when wolves were in the local area, elk spent less time in open areas and more time in forested areas. This seems to have affected individual hunters on individual days. Hunters may need to adjust their strategies.

MFWP biologists now consider wolf activity among the many factors potentially affecting big game populations and hunter success. MFWP earmarked money from the federally-funded wolf program to increase big game monitoring efforts to keep closer tabs on prey populations. This supplements existing data on ungulates populations. In 2005 and early 2006, additional surveys for moose were initiated in the North Fork Flathead River, in the White Sulphur Springs area, and south of Phillipsburg. Additional moose survey efforts will be directed at moose populations along the Beartooth face south of Billings and in southwest Montana. Additional elk and moose surveys will be conducted along the Montana-Idaho border, west of Missoula.

In addition, MFWP is actively involved in various research projects that are investigating predator-prey relations, population dynamics of black bears and mountain lions, large carnivore monitoring techniques, and wildlife diseases. See Hamlin (2005) on the MFWP website wolf pages under "Wolves – Big Game" for additional information on what MFWP has learned so far.

Wolf – Livestock Interactions

Montana wolves routinely encounter livestock on both public grazing allotments and private land. Wolves are opportunistic predators, most often seeking wild prey. However, some wolves "learn" to prey on livestock and teach this behavior to other wolves. Wolf depredations are very difficult to predict in space and time. Between 1987 and 2005, the vast majority of cattle (88%) and sheep (91%) wolf depredation incidents confirmed by WS occurred on private lands. The likelihood of detecting injured or dead livestock is probably higher on private lands where there was greater human presence than on remote public land grazing allotments. The magnitude of under-detection of loss on public allotments was not known. Nonetheless, most cattle

depredations occurred in the spring or fall months while sheep depredations occurred more sporadically throughout the year.

WS investigated reports of injured or dead livestock or domestic dogs in Montana. Estimated on a federal fiscal year basis from 2002-2004, slightly more than half of investigations were verified as wolf-caused. The rest were not "confirmed" or "probable" wolf-related (i.e. injuries or death which could be due to a different predator species, poisonous plants, lightning, disease, etc). In the cases that were either classified as a "confirmed" or a "probable" wolf depredation, MFWP had to decide how to address the problem with WS's help and coordination with the livestock producer.

Because wolves are still listed under ESA, wolf-livestock conflicts were addressed using a combination of the approved state plan and federal regulations. Among other things, MFWP considered the number of breeding pairs statewide and in the respective interim management areas (endangered area or experimental area), where the incident occurred, and a pack's previous history with livestock when deciding what to do. MFWP and WS tried to connect the management response and the damage closely in space and time, targeting the offending animal/s. WS personnel carried out the lethal control work. MFWP strove to assure the security of the overall wolf population, while addressing depredation losses and control in an incremental fashion.

Both MFWP and WS also provided advice and technical information to individual livestock producers about proactive strategies that may decrease their risk of wolf depredations. Project personnel also worked collaboratively with interested private organizations and local-level community groups (e.g. watershed groups) to provide technical advice and to investigate non-lethal methods of deterring livestock conflicts.

Non-lethal deterrents were explored proactively to hopefully prevent wolf depredations and were considered after confirmed and probable wolf-caused losses. MFWP personnel collaborated with other wolf managers from around the world to discuss new ways to address conflicts and to exchange "experiences." MFWP and WS staff worked closely to share information throughout the year. This collaboration allowed for timely and well thought out decisions with respect to the application of both non-lethal and lethal tools when conflicts occurred.

While wolves remain listed under ESA, there are two different classifications and legal frameworks for addressing wolf-livestock conflicts (Figure 2). Wolves across northern Montana are classified as endangered, which offered both livestock producers and MFWP less flexibility. The 1999 Interim Control Plan ultimately guided decisions about lethal control. Citizens cannot harass or kill wolves on private lands, state leases, or federal lands. State and federal agency personnel were responsible for all harassment activity and lethal control of all wolves in the endangered area.

Wolves across southern Montana are classified as experimental, nonessential. Because Montana has a federally-approved management plan, additional flexibility became available to both MFWP and livestock producers in February 2005. Known as the 10(j) regulations, members of

the public in the experimental area had the ability to non-injuriously harass wolves that were too close to livestock any time. If wolves were seen actively chasing or attacking livestock on private or federally permitted lands during the active permit, livestock owners, their immediate family members or employees could legally take the wolf. Physical evidence that demonstrated that an attack was imminent was required. All cases of harassment or lethal take had to be reported to MFWP within 24 hours. The 10(j) regulation was patterned after the Montana "defense of property" statutes that will take effect upon delisting allowing take "in the act" of attacking domestic livestock

Depredation Incidents

The majority of wolf-livestock interactions took place in the experimental area across southern Montana. Livestock densities (number of cattle and sheep per square mile) in south central Montana counties are some of the highest of any in Montana. Habitat, ungulate distribution, and landscape features placed wolves and livestock in closer proximity in space and time than other parts of the state.

Between 1987 and 2005, most confirmed cattle depredation events in Montana occurred in spring (March, April, May) when calves were small and most vulnerable. A smaller spike occurred in the fall (September and October), presumably as food demands of the pack increased and pups are traveling with the pack. In addition, wild ungulates were still well dispersed on summer range and young-of-the-year ungulates were more mobile. Most confirmed sheep depredation events in Montana occurred in July and October. Because of their smaller size relative to cattle or other classes of livestock, sheep can be vulnerable to wolf predation year round.

WS confirmed a total of 23 cattle, 33 sheep, 1 dog (several others were injured and survived), 1 colt and 1 horse killed by wolves in Montana in 2005 (Figure 5). Additional investigations were determined to be probable wolf depredations. Furthermore, some livestock producers reported "missing" livestock and suspected wolf predation. Other reported indirect losses include poor weight gain and aborted pregnancies. There is no doubt that there are undocumented losses. It is difficult to quantify direct and indirect economic losses in totality.

In the endangered area across northern Montana, 2 wolves were lethally controlled – one from a pack near Helena and one on the Blackfeet Reservation. Both conflicts involved cattle and were confirmed by WS. In the experimental area across southern Montana, 33 wolves were killed in lethal control actions. Private citizens killed 7 of the 33 (21%) under the 10(j) regulations in 2005. All incidents occurred on private property, and most incidents involved cattle. Each incident was investigated by USFWS Law Enforcement Agents and was determined to be within the parameters established by the 10(j) regulation.

Defenders of Wildlife: Bailey Wildlife Foundation Wolf Compensation Trust
(source: http://www.defenders.org/wolfcomp.html)

In 1987, Defenders of Wildlife created at $100,000 fund to compensate livestock producers in the NRM for verified livestock losses due to wolves. The goal was to help reduce wolf-related economic losses as a result of wolf recovery. The trust expanded to $200,000 in 1999. In the fall of 2000, the wolf and grizzly bear compensation fund and trusts were renamed the Bailey Wildlife Foundation Wolf Compensation Trust. This is the only compensation program currently available in Montana.

The program pays for 100% of the fall market value for a WS-confirmed wolf-caused loss up to $2000 per animal and 50% of the market value for probable losses. Livestock losses covered include: sheep, cattle, horses, mules, goats, llamas, donkeys, pigs, chickens, geese, turkeys, herding dogs and livestock guarding dogs. Consult the website for instructions on submitting claims.

From 1987 to 2004, Defenders of Wildlife paid a total of approximately $182,000 in claims in the State of Montana (Figure 6). Between 2000 and 2004, the average per year was $26,000, although the annual amount ranged from $7,935 to $54,757.

Development of a Montana-based Reimbursement Program

The Montana Wolf Conservation and Management Plan called for creation of a Montana-based program to address the economic impacts of verified wolf-caused livestock losses. The plan identified the need for an entity independent from MFWP to administer the program. The plan also identified that the reimbursement program would be funded through sources independent from MFWP's wolf management dollars and other MFWP funds intended for fish and wildlife management.

In keeping with Montana's tradition of broad-based citizen participation in wolf conservation and management, a diverse, 30-member working group met 4 times in 2005. The working group was comprised of private citizens, representatives from non –governmental organizations, and representatives from state and federal agencies. The group agreed to a general draft framework that seeks to decrease risk of livestock loss by employing a variety of proactive techniques and to reimburse damages when they occur. A smaller subcommittee continues to meet into 2006. Their work is still ongoing.

Of particular concern to all participants was the need to secure funding for both the proactive work and the loss reimbursement components of the Montana wolf program. The working group explored a variety of funding mechanisms. The creation of an adequately funded loss reduction and damage mitigation program will help determine the degree to which people will share the land with wolves, to which the success of wolf recovery can be assured into the future, and the degree to which individual livestock operators who are adversely affected economically by wolf recovery are able to remain viable. Maintaining private lands in agricultural production provides habitat for a wide variety of wildlife in Montana and is vital to wolf conservation in the long run.

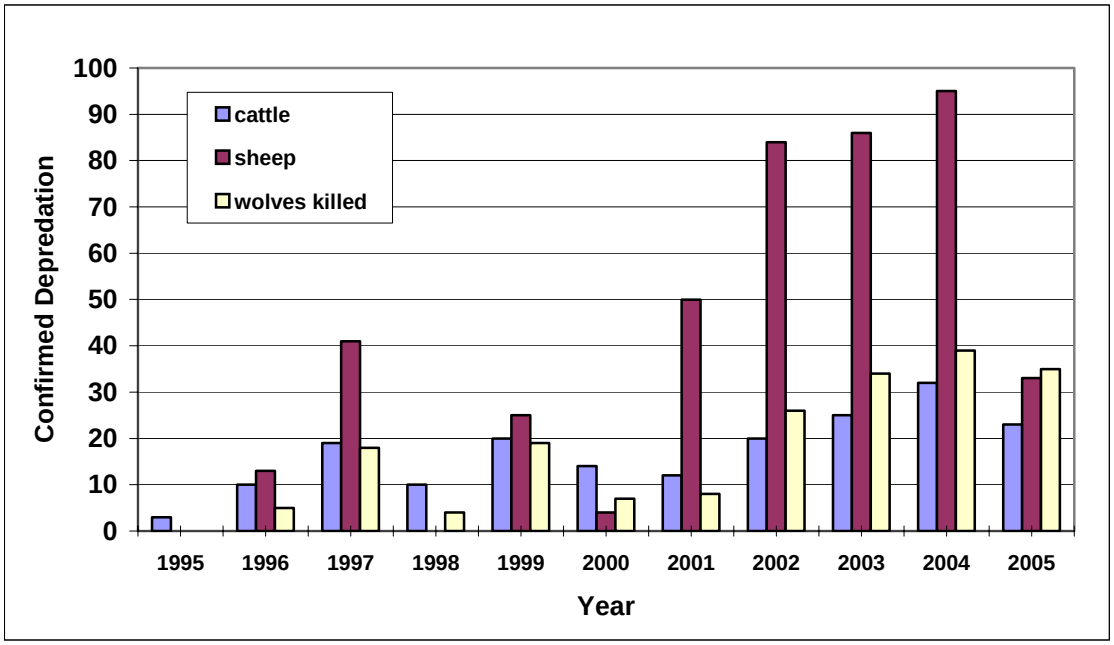

Figure 5. Confirmed cattle and sheep depredation and the number of wolves lethally controlled in the State of Montana based on investigations by USDA Wildlife Services, 1995-2005.

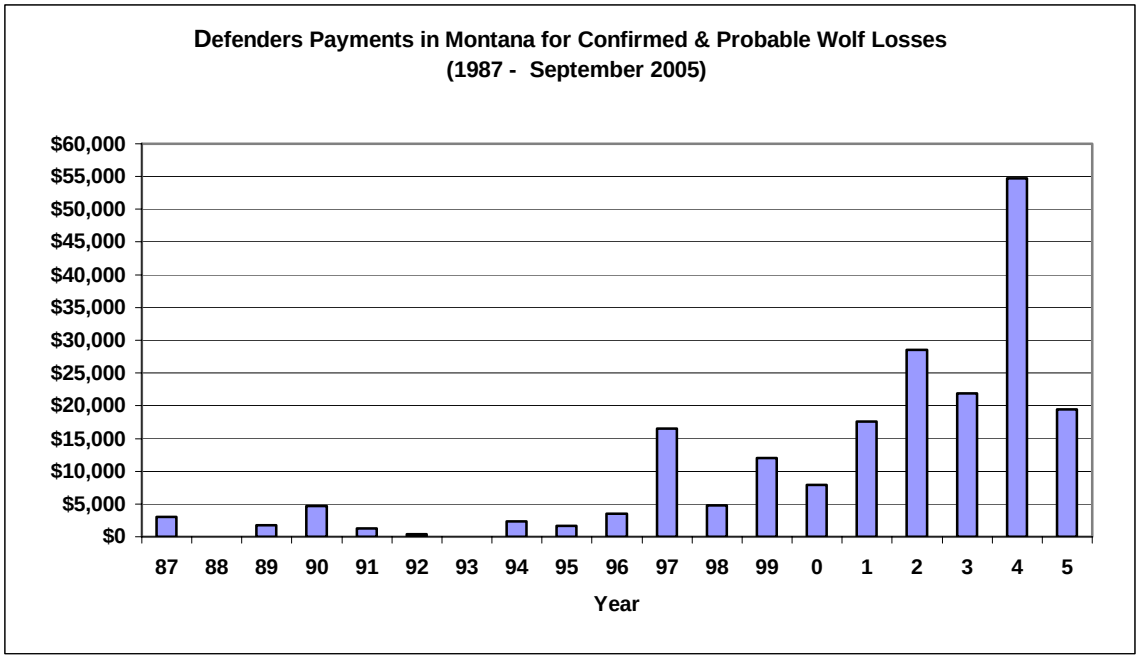

Figure 6. Compensation payments paid in Montana by Defenders of Wildlife, through September 2005. Source: http://www.defenders.org/wolfcomp.html.

PACK SUMMARIES

Northwest Montana Endangered Area

Overview

MFWP captured 11 wolves in the Montana Portion of the NWMT recovery area in 2005. Seven were newly radio collared, 1 was recollared, and 4 were too small to collar and released. The Nez Perce Tribe (NPT) captured and collared 2 wolves in the Fish Creek Pack. WS wildlife specialist, Theodore North, collared 2 wolves that were incidentally captured by a fur trapper.

At the end of 2005, 20 radio collared wolves (16% of the population) from 13 packs or pairs were being monitored in northwest Montana. These packs, together with uncollared packs that were documented, totaled 19 packs containing 126 wolves in the Montana portion of the NWMT recovery area (Figs 1, 2; Tables 1a, 4a). One radio collared pack, Kootenai North (formerly Kootenai) appears to be spending most, if not all, of its time north of the U.S. border. Radio collared wolves were located from aircraft approximately 1 - 2 times per month. Radio collared wolves in and around GNP were located more frequently from the ground by GNP staff.

Packs included in the Montana portion of the NWMT recovery area as of December 2005 were: Candy Mountain, Fish Creek, Fishtrap, Great Bear, Halfway, Hog Heaven, Kintla, Kootenai South, Lazy Creek, Livermore, Marias, Murphy Lake, Ninemile, Red Shale, Spotted Bear, Spotted Dog, Superior, Whitefish, and Wolf Prairie. There was not enough information in the Lonepine area to distinguish from the Hog Heaven Pack, so that pack is no longer counted. Newly documented wolf packs included the Livermore, Marias, Spotted Dog and Superior Packs.

The former Kootenai Pack territory, spanning the Montana and British Columbia border, appears now to be occupied by 2 packs. They are now referred to as Kootenai North (Canada), and Kootenai South (U.S.). Kootenai South likely denned in Montana and will therefore be counted as a NWMT pack in 2005. Kootenai North was counted as a NWMT pack since they were not located in the United States during 2005. Along the transboundary area between Montana and the Idaho Panhandle, the Calder Mountain pack was documented through the cooperative efforts of Idaho Department of Fish and Game and MFWP. It was believed to have denned in Idaho and was therefore counted towards the Idaho wolf population. Along the transboundary area between the NWMT and CID recovery areas, the Fish Creek pack was counted in the NWMT population.

Reproduction was confirmed in the Candy Mountain, Fish Creek, Fishtrap, Halfway, Kintla, Kootenai South, Lazy Creek, Murphy Lake, Ninemile, Red Shale, Spotted Bear and Wolf Prairie packs. Ten of these packs met the criterion to be counted as breeding pairs. Pup survival was uncertain in the Fishtrap pack. Pup production was uncertain in the Hog Heaven and Whitefish packs. The breeding status of the Great Bear, Livermore, Marias, Spotted Dog, and Superior packs was unknown because project personnel could not confirm denning activity and no pups were subsequently observed or reported by the public.

Ten wolf mortalities were documented in the Montana portion of the NWMT recovery area population in 2005. The causes of death included 3 illegal kills, 2 vehicle collisions, 2 lethally removed in a control action, and 3 from unknown causes. A total of 3 radio-collared wolves (Fish trap, Kintla, and Whitefish), were missing due to either radio collar failure or dispersal.

Verified Packs

Candy Mountain

- 9 wolves; breeding pair
- no depredations reported

History: The Candy Mountain pack was first discovered as a new pair and an adult female (351) was radio collared in 2003. In 2004, denning was suspected but breeding pair status could not be verified. This is the first year this pack counted as a breeding pair. The Candy Mountain territory is in the Yaak River drainage.

2005 Activities: In February, this pack numbered 5-6 wolves. On August 2, a 3-year-old female was captured and collared. On August 4, a 38 lb female pup was captured, but it was too small to collar and was released. By the end of 2005, this pack numbered 9 animals (5 adults, 4 pups), which is the highest documented for this pack.

Fish Creek

- 12 wolves; breeding pair
- no depredations reported

History: The Fish Creek pack was first documented in 2001 and is believed to have had a continuous tenure in the Fish Creek area since then.

2005 Activities: This pack was uncollared in January of 2005. In May, a black bear hunter reported seeing 5 wolves near the Fish Creek drainage. NPT personnel were working in the area and followed up in June and counted 9 pups (3 gray, 6 black). They set traps and captured a breeding female and an adult male. At this time, it was unknown whether this was the Fish Creek pack or the Lupine pack. Monitoring through the rest of 2005 found this pack using a territory most similar to the Fish Creek pack. Though they are considered a Montana/Idaho border pack, the Fish Creek pack is still counted as a Montana pack for 2005 since they denned in Montana and the majority of 2005 aerial telemetry locations were in Montana.

Fishtrap

- 7 wolves; not a breeding pair
- 1 calf confirmed killed, 1 sheep confirmed killed

History: The Fishtrap pack was first documented in 2000. Its territory is in and around the Thompson River drainage.

2005 Activities: In February, this pack numbered 8-9 wolves. One pup was seen on May 11. Three radio collars were monitored throughout most of 2005 and therefore no trapping to radio collar was conducted. In August, a calf was confirmed injured by wolves. That calf later died of the injuries. The cattle were on a public grazing allotment and most non-lethal tools were not practical for widely distributed cattle. In October, 8-9 wolves were seen during a monitoring flight, and it could not be determined how many, if any, were pups. In October, a sheep was confirmed killed. . The owner penned them close to the ranch house to prevent further depredations. By the end of 2005 this pack numbered seven animals and #326 has been missing since fall. The number of pups was unknown, and there was not enough information to confirm this pack as a breeding pair.

Great Bear

- 2 wolves; not a breeding pair
- no depredations reported

History: The Great Bear pack was first discovered as a new pair in 2003 after a wolf dispersed from the Spotted Bear pack and paired with another wolf of unknown origin. This pack inhabits in the Great Bear Wilderness. In early 2004, the radio collar could no longer be located.

2005 Activities: This pack was known to have 7 animals during the 2004/2005 winter. U.S. Forest Service personnel reported a minimum of 2 wolves during summer and fall. There are no functioning radio collars in this pack. We relied on agency and public reports, and they have been reliable and consistent. There was no further information regarding either wolf numbers or breeding status this year.

Halfway

- 7 wolves; breeding pair
- 2 calves confirmed killed; 1 calf confirmed injured / euthanized; 1 wolf removed by WS

History: The Halfway pack was first documented in its current territory between Avon and Helmville in 2002. It was believed to have been started by a female member of the nearby Castle Rock pack, which was eliminated in 2002 after repeated livestock depredations. Throughout most of 2002, 2003 and 2004, it was probably 2 or 3 wolves. In August 2004, the Halfway pack was joined by a male wolf that had dispersed from a pack near Calgary, Alberta Canada. The male was wearing a GPS-satellite radio collar and appeared to have crossed the international border on the east side of GNP in mid-May 2004, and continued traveling south down the east Front of the Rockies.

2005 Activities: The GPS collar worn by the male wolf detached as scheduled and was retrieved within the normal home range of the Halfway pack in January 2005. It was returned to colleagues in Alberta. The pack was located in its usual home range throughout 2005. In March, 2 calves were confirmed killed. Calving operations were dispersed throughout the entire Halfway's pack territory so non-lethal deterrents were not practical. The adult male, known to have had been involved in cattle depredations in Alberta, was

killed by WS. In April, another calf was confirmed injured by wolves and was later euthanized. Other calves had their tails bitten off. This pack produced a litter of pups, but it was rarely seen together during monitoring flights. Reliable reports indicated the pups survived, as 7 animals are reported consistently by area landowners at the end of 2005.

Hog Heaven

- 3 wolves; not a breeding pair
- no depredations reported

History: The Hog Heaven pack was first observed as a new pair in 2001, after 2 wolves from the Parsnip group (a group of wolves translocated from the Boulder Creek pack as a management response to cattle depredations), traveled separately to the Hog Heaven/Browns Meadow area and paired. The alpha female died in March of 2004 and the pack numbered only three animals by the end of that year. Its territory is west of Flathead Lake.

2005 Activities: This pack had 3 wolves prior to this year's denning season. It was never clear whether Hog Heaven denned and subsequently reared pups. An adult wolf was found dead on November 14. This mortality is under investigation. By the end of the year, 3 wolves were still being observed in the Hog Heaven pack, and it is not known whether the additional wolf was a pup or another adult. This pack was not a breeding pair.

Kintla

- 9 wolves; breeding pair
- no depredations reported

History: The Kintla pack was first documented as a pack in 2000 in the old North Camas territory. The North Camas pack had previously existed from 1990 to 1996 and then fell apart as the neighboring South Camas pack grew to 18 animals in 1997. From 1997 to 1999, South Camas appeared to be the only pack in the area until 2000, when the Kintla pack established itself in the old North Camas territory. (See Whitefish pack summary below for additional historical information). Much of Kintla's home range is within GNP and in the North Fork Flathead River drainage.

2005 Activities: In February, this pack numbered 7 wolves. Three pups were observed on July 12. On December 21, a dead wolf was retrieved from the southern extent of the Kintla pack home range and the cause of mortality was unknown. At the end of 2005, Kintla had 6 adults and 3 pups.

Kootenai

It is believed that the Kootenai pack is now functioning as 2 different packs.

History: This pack's home range historically covered an area of about 15-20 miles on either side of the U.S./Canada border west of Koocanusa Reservoir. It was established in part by an adult female (a Grave Creek pack disperser #133 in 2001). She appeared to have denned in Canada about 15 miles north of the border. In 2004, that pack denned for the first time on

the U.S. side and was counted in the NWMT population estimate. The original radio collared animal #133 is missing, and we assumed the collar was no longer functioning due to its age. The remaining radio collar #329 (captured in June 2004), has not been located in the U.S. since December 16, 2004.

2005: Since spring 2005, #329 has been located north of the border consistently. Concurrently, on August 3, an active rendezvous site was found in the former Kootenai Pack territory. This active rendezvous site was about 4 miles from the previous year's den site or about 15 miles from #329M's locations. Two animals were captured and collared at that newly discovered rendezvous site in August 2005. All 3 collars (1 in North and 2 in South Kootenai packs, respectively) were monitored throughout 2005. Through 2005, there did not seem to be a relationship between #329M and the other 2 collared wolves. The resulting 2 packs are now named Kootenai North (Canada) and Kootenai South (U.S.)

Kootenai North

- 4 wolves; unknown breeding status; not counted in Montana population estimate
- no depredations reported

2005 Activities: Adult male wolf #329M was located in Canada during the denning season and was located again until August. During this period, another pack of wolves was found about 4 miles from the 2004 den site in the U.S. The Kootenai North pack was monitored in Canada to determine their location and breeding status as it related to the southern group and NW Montana populations. Because this pack was located in Canada much or all of 2005, it was not counted towards the NWMT population. We will continue to monitor the collared animal from the south side of the border.

Kootenai South

- 7 wolves; breeding pair
- no depredations reported

2005 Activities: On August 3, a rendezvous site was discovered about 4 miles from the Kootenai Pack 2004 den area. On August 4, a 33 lb female pup was captured and released because it was too small to collar. On August 5, a 39 lb male pup was captured, and it was also released because it was too small to collar. On August 14, a 105 lb 2-year-old male was captured and collared. On August 17, a 74 lb 2-year-old female was captured and collared. During this period, the former Kootenai collared wolf #329M was known to be in Canada about 15 miles north of the border. The Kootenai South territory is west of Koocanusa Reservoir, in the upper E Fork Yaak River. It had 5 adults and 2 pups at the end of the year.

Lazy Creek

- 9 wolves; breeding pair
- no depredations reported

History: The Lazy Creek pack was first discovered as a newly formed pair in 2001. This pack filled the vacant territory left by the Whitefish pack when it crossed the Whitefish range

to the east and displaced the South Camas pack in 2001. Its territory is north of Whitefish Lake.

2005 Activities: In January, this pack numbered 5 wolves. Since February, it had 4 members after 1 radio-collared animal was missing. On June 20, a 2 or 3-year-old male was captured and collared. By the end of the year, this pack was the largest ever recorded with 9 members (4 adults, 5 pups).

Livermore

- 4 wolves; not a breeding pair
- no depredations reported

History: The history of this pack prior to 2005 is unknown.

2005 Activities: A Blackfeet Tribe wildlife biologist discovered and photographed this pack at a bait station used to lure and capture grizzly bears.

Marias

- 6 wolves; not a breeding pair
- no depredations reported

History: New pack in 2005.

2005 Activities: On December 12, an adult male was killed by a vehicle on Highway 2 near Marias Pass. After that incident, MFWP, GNP, and the Blackfeet Tribe biologists received numerous wolf reports that were later verified. Six wolves occupied an area that included southern GNP, the Blackfeet Reservation, and the Lewis and Clark National Forest.

Murphy Lake

- 3 wolves; not a breeding pair
- no depredations reported

History: The Murphy Lake pack was first documented 14 years ago in 1991. This pack has had confirmed depredations in only 2 of the last 14 years. Its territory is between Whitefish and Eureka.

2005 Activities: Although we reported only 2 animals in the pack at the end of 2004, subsequent tracking in early winter 2005 suggested 4-5 five animals just prior to denning. There were several visuals of an unknown radio collared animal, which was assumed to be the alpha female, wearing a non-functional radio collar. On, May 14, a different female wolf was recaptured and recollared. On May 16, a 2 or 3-year-old male wolf was captured and collared. A collared wolf was found dead in July, and the mortality is under investigation. On September 22, 6 wolves were observed. At the end of the year, visual observations confirmed the presence of 3 animals in this pack.

Ninemile

- 7 wolves; breeding pair
- no depredations reported

History: The Ninemile pack has inhabited the Ninemile drainage since 1990.

2005 Activities: In January 2005, 3 wolves were thought to be in the Ninemile pack, 2 gray adults and a radio-collared black yearling male (499M). In July, MFWP personnel documented 5 pups (4 black and 1 gray). In October, a male wolf was found dead and the carcass was taken to the MFWP Wildlife Lab in Bozeman. Cause of death could not be determined because of advanced decomposition of the carcass. Two wolves were incidentally captured by trappers in October and December, 2005. Each was collared and released with the help of WS. At the end of 2005, 7 wolves were documented in this pack: 2 gray adults, 1 gray pup, and 4 black pups.

Red Shale

- 7 wolves; breeding pair
- no depredations reported

History: The Red Shale pack (historically referred to as Gates Park or Sun River) was first documented as a pair in 2000 and was believed to have had a continuous tenure in the North Fork of the Sun River ever since. This pack was radio collared in 2002, but has not had a functioning collar since March 2004. Monitoring this pack was coordinated between MFWP and U.S. Forest Service. We rely on agency and public reports to confirm wolf activity and numbers.

2005 Activities: This pack has not had a functioning radio collar since March 2004. Pack information in 2005 was provided by the U.S. Forest Service and public reports. The pack seemed to use traditional areas. The pack had 4 adults and 3 pups at the end of the year.

Spotted Bear

- 6 wolves, breeding pair
- no depredations reported

History: A Murphy Lake female wolf dispersed to the Bitterroot Valley and mated with an unknown male wolf forming the Bass Creek pack in 1998. The Bass Creek pack was involved in cattle depredations in June, 1999. The entire pack (8 pups and 2 adults) was removed from the wild and held at a facility in McCall, Idaho. The alpha male died in a handling accident while in captivity. The alpha female and surviving pups were translocated to a holding pen in the Spotted Bear drainage of the South Fork of the Flathead River in December, 1999. This pen was intended to hold the pack for several days to allow acclimation to the new area in hopes that the pack would settle in that area on the edge of the Bob Marshall Wilderness. The first night that the pack was held in the pen, a male wolf #117 from the Pleasant Valley pack, translocated to the same area almost a year previous, was hanging around the pen. The Bass Creek pack was released the next day and joined with the

former Pleasant Valley male wolf. The new group established a territory and became the Spotted Bear pack.

2005 Activities: This pack was uncollared from January through the middle of September 2005, but wolf activity was confirmed by U.S. Forest Service personnel and public reports. On September 12, during MFWP trapping operations, the pack was observed with 6-7 total wolves – having at least two pups, and a very light gray animal wearing a radio collar. We assumed this animal is the original alpha female whose collar is no longer functioning. On September 13, a 105 lb 2-year-old male wolf was captured and radio collared. On September 15, the wolf was located 19 miles north of his capture location. On September 18, he was located on the west side of the reservoir after apparently swimming it. In that general area, the reservoir is about ¾ mile across at its narrowest point. The wolf could not be located through the fall months but was later found again within the normal Spotted Bear home range in December. This pack had 4 adults and 2 pups at the end of the year.

Spotted Dog

- 11 wolves; not a breeding pair
- 1 calf confirmed killed

History: The Spotted Dog pack was first verified in July 2005, but was believed to have existed the previous year, possibly longer. MFWP first received reports in the area from landowners, contractors, and hunters in late 2004. Its territory appeared to be primarily south of Avon, but reports of at least 8 animals were received north of Avon.

2005 Activities: Seven animals were reported early in 2005 by local landowners and contractors working in the area. Efforts were made to place a collar in this pack in July, September, and October. Area landowners and contractors consistently reported up to 11 animals in the same general area through December 2005. We suspected that pups were produced based on the wolf numbers reported at the end of 2005. Because pups were never observed or verified, this pack did not qualify as a breeding pair.

Superior

- at least 2 wolves; not a breeding pair
- 1 colt confirmed injured

History: New pack in 2005.

2005 Activities: Wolf activity was reported south of Superior in spring, 2005. In June, a colt was confirmed attacked by wolves but survived. WS initiated a trapping effort to collar and release but nothing was caught. MFWP volunteers also surveyed the area and were unable to turn up much fresh sign. Reports continued to come in during hunting season. MFWP personnel cut tracks of two wolves in the area in December 2005. No reproduction was documented. Based on sightings, this pack is believed to be a Montana/Idaho border pack but probably spends the majority of its time in Montana.

Whitefish

- 7 wolves; not a breeding pair
- no depredations reported

History: The Whitefish pack was first documented in 1996 and formerly occupied a territory north of Whitefish Lake. In 2001, the Whitefish pack crossed the Whitefish Range to the east and established a new territory in the North Fork Flathead River drainage, displacing the former South Camas pack. Much of the Whitefish pack's home range is now within GNP.

2005 Activities: Prior to denning, this pack numbered 6-7 wolves, including 1 gray and 5-6 black. The pack localized during the denning season, but no pups were ever documented. This pack still has 1 gray and 6 black wolves at the end of 2005.

Wolf Prairie

- 8 wolves; breeding pair
- 1 probable calf killed

History: The Wolf Prairie pack was first documented in 2004, after receiving livestock depredation complaints. Its territory is west of Kalispell.

2005 Activities: This pack numbered 4 wolves prior to the denning season. In April, a calf was determined a probable kill approximately 2 miles from the Wolf Prairie pack den site. A Radio Activated Guard (RAG) Box was set up to deter further incidents and warn the operators of any nearby collared wolves. No further losses occurred. Pups were observed on May 27. On September 11, a wolf was hit and killed on Wolf Creek Road, within the Wolf Prairie home range. It was assumed to be from of the Wolf Prairie pack. On December 19, we observed 8 wolves (3 adults, 5 pups), which is the largest recorded since they have been monitored.

Miscellaneous / Lone Individuals

On April 6, WS lethally removed an adult female lone wolf that had been involved in cattle depredations on the Blackfeet Reservation. This animal had extensive mange. It was thought to be a lone animal.

On September 29, a Montana Department of Natural Resources and Conservation forester reported a wolf carcass. The carcass was in advanced stages of decomposition but was confirmed to be less than two years old but sex was unknown. The specific cause of death is unknown. Its pack affiliation was unknown, but the carcass was found in an area between Murphy Lake, Lazy Creek, and the former Grave Creek packs.

On November 11, hunters reported a wolf carcass in an area near the former Apgar pack territory. This mortality is under investigation. There area other unverified wolf reports in this area.

On November 16, a 2-3 year old uncollared male wolf was struck and killed by a vehicle on Highway 200 west of the continental divide and a few miles east of Lincoln. The closest verified packs were the Halfway, Spotted Dog, and the Red Shale packs. Numerous wolf reports were obtained on the east side of the continental divide between Stemple Pass and Highway 12 to the south. Scouting efforts in this area late in 2005 and in the Alice Creek area near Lincoln did not verify a pack. So, it is unknown whether this male was affiliated with a nearby pack or a single disperser.

There is a U.S./Canada transboundary group of wolves on the east side of Glacier and Waterton Lakes parks. Numbers fluctuated widely in reports and through time. Reports indicated that these wolves most of their time in Canada and therefore are not counted in the Montana portion of the NWMT recovery area.

Suspected Packs

DeBorgia: During archery and rifle season 2005, MFWP personnel received several reports of wolves south of the town of DeBorgia in western Montana. Reports indicate a pack possibly as large as 6+ wolves. MFWP personnel will be investigating this area in 2006.

Frenchtown/Dixon: Landowners north of Frenchtown (west of Missoula) reported seeing a group of 5 wolves (1 black, 4 gray) in this area on several occasions during fall 2005. There also were several sightings near Dixon to the northwest of Missoula, one by a Confederated Salish and Kootenai Tribe game warden, who reported seeing 5 wolves. The Ninemile pack was not located out of the Ninemile drainage in 2005 and the pelage colors did not match up with the Ninemile pack; therefore this is an area of new suspected wolf activity for 2005.

Other Miscellaneous Information

Lonepine: There wasn't enough information in the Lonepine area to distinguish it from the Hog Heaven Pack so that pack was no longer counted.

Southern Montana Experimental Area

Montana Portion of the Greater Yellowstone Experimental Area

Overview

Packs in the Montana portion of the GYA have been documented from Red Lodge to Dillon. Several packs live on the borders of YNP. Both agencies (YNP and MFWP) monitor these packs through flights and ground tracking. The location of den sites and the percent area / time in an area determine where that pack will be tallied in the population estimates. See the respective pack summaries below.

Twenty-one packs were monitored at 1 point or another during 2005, but only 16 packs in the Montana portion of the GYA were still present at the end of 2005. Of the 16 left at the end of the year, only 3 met the breeding pair criteria. We partly attributed this decline in breeding pairs to mange, which seemed to negatively affect pup survival for 2005. Eight packs had individuals confirmed to be infected with mange. Heavy lethal control on chronic depredating packs late in 2004 and early 2005 may also have been a factor. We did not document the wolves recolonizing vacant territories (i.e. "backfill") during wolf breeding season (January / February). Lower wolf numbers inside YNP could also partly explained the difference, as fewer animals in the YNP population may translate to fewer animals dispersing out of YNP into Montana.

During 2005, 6 packs out of the original 21 present in January 2005, were involved in confirmed depredations on domestic livestock or dogs (Table 1b), resulting in the lethal removal of 19 wolves. Two of the 6 packs no longer exist. Overall livestock conflicts and the amount of lethal control were both less in 2005 than in 2004.

MFWP and WS staff radio collared seven wolves in this area in 2005. Seven collared animals from the previous year were lost due to control actions or natural mortalities. One wolf collared in 2005 was controlled making a total of eight collars lost in 2005. Three collared animals are considered missing. By December 31, 11 wolves wore active radio collars, and 10 packs had at least one collar.

Project staff documented the dispersal of 3 wolves from their natal territories, two of which successfully formed their own packs (Deadhorse and Donohue). Another dispersing male joined the existing Moccasin Lake pack.

Verified Packs

Mill Creek

- 2 wolves; not a breeding pair
- 2 shoot-on-sight permits issued to private landowners in December 2004; 2 pups removed by permit early 2005; no depredations reported in 2005

History: The Mill Creek pack formed in 2000. It spent a fair amount of time on or near private property on the east side of Paradise Valley and the Yellowstone River. Numerous livestock depredations (cattle and sheep) were confirmed on private property in 2004.

2005 Activities: Due to repeated livestock depredations in 2004, lethal control was ongoing in January 2005. Shoot-on-sight permits had been issued to landowners in December 2004. Two pups were shot under the permit in January 2005, and both had severe cases of mange. The breeding female remained in the Mill Creek territory. Although few visuals were obtained, she appeared to look unaffected by the mange parasite and seemed to be traveling alone most of the year. She did not successfully whelp and raise pups this year. A telemetry flight in December 2005 confirmed she was with 1 other black wolf.

Lone Bear

- no longer exists
- 3 wolves removed by WS

History: The Lone Bear pack formed in 2002. It spent a fair amount of time on or near private property at the northwest end Paradise Valley. Numerous livestock depredations (mostly sheep) were confirmed on private property in 2004.

2005 Activities: Repeated sheep depredations were confirmed on private property in 2004. Control actions were ongoing in January 2005 to remove the remaining wolves in the Lone Bear pack territory. A total of 3 wolves were killed in January and February. A female originally collared in the Lone Bear territory dispersed from the area and moved south. It was found in early February traveling with an unmarked gray wolf. They started the Donahue pack in 2005 (see below).

Casey Lake

- 3 wolves; not a breeding pair
- no depredations reported

History: The Casey Lake pack formed in 2004. Its territory is north of YNP on the east side of the Yellowstone River in the Paradise Valley. Three pups were caught in August 2004, all of which showed signs of being infected with the mange parasite. Nonetheless, the pack was intact at the end of 2004 and it qualified as a breeding pair.

2005 Activities: The presence of mange appears to have disrupted this pack in 2005. An adult male wolf died of mange in March and his carcass was retrieved. Project personnel did not find evidence that the pack was still intact through the summer months and no pups were produced in 2005. However, winter snow tracking at the end of 2005 confirmed the presence of at least 3 animals in the Casey Lake territory.

Donahue

- 2 wolves, not a breeding pair
- no depredation reported

History: New pack in 2005

2005 Activities: A disperser from the Lone Bear pack moved south and was found traveling with an unmarked gray wolf as early as February 2005. Although breeding status was unknown, residents reported two adults and three pups in the Donohue/Hyalite areas of Paradise Valley during the summer. The last location of this pack was obtained in September and its status is unknown.

Beartrap

- 8 wolves; breeding pair
- no depredations reported

History: The Beartrap pack formed in 2002. It occupied a territory at the north end of the Gallatin Mountain range near the Spanish Peaks consistently since then.

2005 Activities: Two adults and 1 yearling were documented prior to April 2005. Although no collars existed in this pack, consistent sightings by project personnel and landowners indicated that pups were produced and the pack was together and still in the same territory.

Freezeout Pack

- 5 wolves; not a breeding pair
- 2 injured guard dogs confirmed and 2 calves confirmed killed; 6 wolves removed by WS; 3 shoot-on-sight permits issued but no wolves killed by permit

History: The Freezeout pack first formed in 2001 in the Gravelly Range east of Dillon. It has been one of the larger sized packs in the Montana portion of the GYA outside YNP.

2005 Activities: In early summer 2005, the Freezeout Pack was believed to be seven adults and three to four pups. In August, project personnel captured a pup and an adult male wolf. The pup had his collar chewed off by pack mates two days afterward. The adult male was fitted with a GPS radio collar as part of the cooperative wolf-ungulate research studies ongoing in southwest Montana. In September, 2 guard dogs were confirmed injured and one calf was confirmed killed in 2 separate incidents. Agency lethal control was authorized and WS removed 6 wolves, one of which was the GPS-collared individual. Shoot-on-sight-permits were issued to the livestock owners, but no wolves were taken by private citizens. No more depredations were reported in 2005. The GPS collar was redeployed on an adult female.

Bear Creek

- no longer exists
- no depredations reported

History: Bear Creek pack started as a pair of wolves in 2004 and the territory was in the Madison River drainage south of Ennis.
2005 Activities: This pack consisted of 2 animals, 1 of which was radio collared. The collared wolf was seen traveling alone outside of the Bear Creek territory through April and has not been located since. No activity in the area was documented or reported. The fate of the unmarked gray adult was unknown. The pair no longer exists.

Chief Joseph

- 5 wolves; not a breeding pair
- WS investigated 1 suspected depredation and concluded that the heifer died while giving birth and had been scavenged

History: The Chief Joseph pack began as a pair of wolves in 1996 in the northwest part of YNP. It started out primarily in YNP and had been counted as a YNP pack for most years. Although the pack consistently denned within the park boundary, it has spent more and more

time in Montana. Through time, Montana project personnel did more of the monitoring. The Chief Joseph pack was included in the population estimate for the Montana portion of the GYA in 2005.

2005 Activities: An adult female wolf died of natural causes and her carcass was retrieved in March. Mange was suspected as this animal was seen during the hunting season of 2004 with extensive hair loss. A second animal was retrieved and confirmed hit by a car. It also had signs of hair loss. Den sites were investigated to determine if the pack had pups. Minimal evidence of pup production was found, so it was not a breeding pair for 2005. A radio collared adult male traveled alone during the second half of 2005. He also has mange. The status of this pack was somewhat unknown by the end of 2005. We believe there is still a pack with up to 5 animals remaining. Local landowners in the Paradise Valley consistently reported as many as 5 animals in areas traditionally used by this pack.

Cougar Creek II

- 8 wolves; border pack and counted in the YNP population
- no depredations reported

History: The Cougar Creek pack first formed in 2001 inside YNP. Its home range was mostly inside YNP and NPS personnel did all the monitoring. Since 2002, it has had 10 to 12 members.

2005 Activities: The Cougar Creek pack has been considered a YNP pack since 2001 and NPS personnel did all the monitoring. However, the pack appeared to split and some of its members began spending more time in Montana outside the Park, beginning in the fall of 2005. By November, 8 wolves appeared to be settling into a portion of the Chief Joseph pack's old territory. YNP and Montana personnel will be monitoring this new group in 2006.

Deadhorse

- 6 wolves; breeding pair
- no depredations reported

History: New pack in 2005.

2005 Activities: A dispersing male wolf from the Freezeout pack was found in the Upper Gallatin / Taylor Fork drainage in the spring. Four pups were successfully raised.

Wedge

- 8 wolves; breeding pair
- 1 confirmed injured heifer which was later euthanized; no control requested or authorized

History: New pack in 2005.

2005 Activities: In December 2004, project personnel found a female wolf, a disperser from the Leopold pack inside YNP, in the Upper Madison drainage. Two wolves were captured

and radio collared. One received a regular VHF collar and the other was fitted with a GPS collar as part of the cooperative wolf ungulate research study (see Field Studies and Research section below). The pack denned and successfully raised a litter. In September, a wounded heifer was confirmed and later euthanized. No lethal control was requested and none was initiated. The collared dispersing female may have died late in the year. It could not be investigated in December due to the snow conditions in the remote mountainous area. It will be investigated as early in 2006 as backcountry conditions permit. Mange is suspected in this pack.

Homestead

- no longer exists
- no depredations reported

History: New pack in 2005.

2005 Activities: Starting in January 2005, project personnel received reports of a black and gray wolf in the Bear and Indian Creek areas of the Upper Madison. Landowners began reporting a sickly pup in July. Upon investigation, a total of 4 wolves were found dead or subsequently euthanized due to severe mange. All carcasses were transported to the MFWP Lab for in-depth examination. All were confirmed to be in very poor condition and each had mange.

Sage Creek

- 6 wolves; not a breeding pair
- depredations in the area, unknown if this pack was involved

History: New pack in 2005.

2005 Activities: A dog was killed by wolves in Sage Creek in January. During a flight, WS saw 2 uncollared gray wolves 6 miles to the east of the ranch where the dog was attacked. One of the wolves was missing half of its tail and this pair came to be known as the 'Bobtail pair.' A calf was killed in the same area in March, and the same pair of wolves was believed responsible. In April, 7 buck sheep were killed in the Blacktail drainage and in October, 5 more buck sheep were killed in the same area. In early December, a guard dog was injured and 1 ewe was injured. During hunting season there were multiple reports of wolves in the upper Blacktail and upper Sage Creek drainages. WS flew the area on numerous occasions and MFWP investigated from the ground, but no wolves were found. Then in mid-January of 2006, while doing helicopter work on coyotes, WS found 6 gray wolves in Basin Creek and darted, collared and released an adult male. None of these wolves appeared to have a bobtail. In early 2006, numerous Dillon residents reported seeing a group of 3 wolves (1 black, 2 gray) just east of town. So it is unknown whether the 'Bobtail pair,' an unknown Dillon trio, or the Sage Creek pack was involved in the previous depredations.

Phantom Lake

- no longer exists
- 1 sheep and 2 calves confirmed, 1 probable calf 1 confirmed injured livestock guarding dog; 4 wolves removed by WS, 4 shoot-on-site permits issued but no wolves killed

History: The Phantom Lake pack formed in 2004. It was confirmed to have killed 13 calves and 49 sheep in the latter half of 2004. Two wolves were lethally controlled in 2004 and the pack did not meet breeding pair requirements. Control actions were initiated in 2004 and were completed in 2005.

2005 Activities: At the beginning of 2005, there appeared to be 3-4 wolves left in the pack occupying the area between the West Rosebud and Red Lodge along the north foothills of the Beartooth Plateau. Agency lethal control had been initiated because of repeated depredations in 2004. Between January 2005 and May 2005, several additional depredation incidents were confirmed on private property (1 ewe confirmed dead, 1 injured guard dog confirmed, 2 dead calves confirmed, 1 dead calf probable). Shoot-on-site permits were issued. WS removed a total of 4 wolves. No wolves were taken by private citizens on the permits. Wolf activity was not documented after June, and no further depredations were reported.

Rosebud

- 3 wolves; not a breeding pair
- no depredations reported

History: New pack formed late in 2005.

2005 Activities: No wolves or wolf sign was reported in this area until October 2005. Public wolf reports indicated 3 animals traveling in the foothills of the Beartooth Plateau. In November, project personnel verified tracks of 3 animals between the West and East Rosebud drainages. Due to mild weather conditions, a brief trapping session was conducted in December, but no wolves were captured.

Moccasin Lake

- 2 wolves; not a breeding pair
- 2 probable calf depredations; range riders patrolled in their territory

History: This pack formed in 2004. Its territory is south of Big Timber.

2005 Activities: In January 2005, 4-5 wolves were thought to be present, 1 of which was collared. Although the pack seemed to localize during the denning period, no pups were ever seen with the pack. There were two probable calf depredations during the year. In both cases non-lethal techniques were used to deter further problems (see below). Project personnel trapped and collared a 2-year-old male in July (SW28M). Wolf SW28M was seen several times with the collared female (242F) and two other wolves until September-October. At that time, SW28M left the Moccasin Lake pack territory and seemed to settle in the Mission Creek territory to the west. Also in the October time frame, the Moccasin female

242F was joined by an adult male (473M) that had left the Swan Lake pack in YNP. From October to December, they were located together, but no other wolves were seen.

The Boulder Watershed Group's Wildlife Subcommittee received a grant from the Natural Resource Conservation Service, Environmental Quality Incentives Program. In partnership with MFWP, the U.S. Forest Service, and Bozeman-based Predator Conservation Alliance, the Watershed group hired 3 range riders for the period July – October to increase human presence in and around the livestock. It was hoped that increased human presence would discourage wolves from depredating livestock and that injured and dead livestock would be detected more rapidly. Two riders worked on public grazing allotments and 1 rider worked on private lands. See the Field Studies and Research section below for more detail on this project.

Mission Creek

- 3 wolves; not a breeding pair
- no depredations reported

History: The Mission Creek pack first formed in 2002. Its territory is southeast of Livingston.

2005 Activities: Pack dynamics appeared to be greatly affected by mange in 2005. A visual early in the year revealed 4 wolves, with 3 showing severe mange and 1 with a mild case. The two collared wolves were often separated when located during telemetry flights. There was no evidence of successful breeding. In October, the alpha male succumbed to mange and died. Also in October, 457F was seen with SW28M (formerly of the Moccasin Lake pack). In subsequent flights, 457F seemed to be traveling independently of SW28M. The status of the other Mission Creek wolves was unknown.

SW28M

- 2 wolves; not a breeding pair
- no depredations reported

History: This group formed in late fall, 2005. Its territory slightly overlapped the Mission Creek territory.

2005 Activities: This group consists of a 2-year-old male wolf (SW28M, caught in Moccasin Lake territory in July 2005) and another wolf of unknown origin. In October, SW28M was seen traveling with 457F. He looked healthy, but she was showing obvious signs of mange. In subsequent flights SW28M was seen traveling with another, uncollared gray wolf. It is unclear if 457F is still with members of the Mission Creek pack, or if she was moving alone.

SW57

- 2 wolves; not a breeding pair
- 1 confirmed calf; 1 wolf shot under the 10(j)

History: This group was documented in fall 2005. Its territory slightly overlapped the Mission Creek territory.

2005 Activities: In October WS confirmed that wolves had killed a calf, and traps were set to gain more information. A gray colored wolf (SW57F) was captured at the site. Further monitoring showed that this collared wolf and at least one other was occupying a small area between the Moccasin Lake and Mission Creek packs, but remaining separated from them. In December, a ranch manager in the West Boulder drainage saw three wolves chasing his cattle. The ranch manager shot one wolf as per the 10(j) regulations before any cattle were injured or killed. SW57F continued to move in the area between the Moccasin Lake and Mission Creek / SW28M packs.

Carbonate Mountain

- 5 wolves; not a breeding pair
- no depredations reported

History: New in 2005. The home range of this pack was unclear, but activity has been verified in the Boulder drainage and near Carbonate Mountain in the Absaroka-Beartooth Wilderness.

2005 Activities: Public reports of wolves in the area around Carbonate Mountain in the Absaroka Beartooth Wilderness were received beginning in September. Numerous hunters and the local MFWP game warden reported seeing 3-5 wolves. In past years, there had been wolf activity in this area occasionally. Project personnel were able to establish a trap line for a few days before hunting season started. Although there was evidence that 5 wolves had been in the area, none were captured.

Buffalo Fork

- 2 wolves; not a breeding pair
- no depredations reported

History: The Buffalo Fork pack formed in 2003. In June 2003, the only radio-collared member of the pack died and contact was lost. At the end of the year, 3 wolves were believed to be left in the pack. Its territory was north of YNP in the Buffalo Fork drainage. There is no evidence that any of this pack's territory was in YNP in 2005.

2005 Activities: Numerous public reports were received from backcountry recreationists. In July 2005, project personnel backpacked through the historic Buffalo Fork territory in the Absaroka Beartooth Wilderness to look for wolf sign and listen for missing collars. Fresh wolf sign and evidence of at least 2 adults and 1 pup was found in the vicinity of the old territory. Because of the remote location of this pack, little is known about is status or size.

Miscellaneous / Lone Individuals

A female wolf dispersed from the Leopold pack and was found localized in the Jardine, Montana area just north of the YNP boundary for several spring and summer months. Her status and whether she associated with other wolves was unknown, as no visuals or reports of other wolves in the area were received in 2005. In late January 2006 she was recaptured during a YNP effort and is part of the Hellroaring pack, an offshoot of the Leopold pack. She was tallied in the GYA - YNP table.

A sick, unmarked wolf was found in a pasture and reported by a landowner north of Gardiner in April. Project personnel responded and euthanized the animal on site. Lab results showed this pup was severely dehydrated and that it had been exposed to canine parvo virus, canine distemper, and canine hepatitis at some point in its life. Histology did not reveal active viral infection at the time of its death.

A lone, unmarked wolf was killed while harassing mules on private property in the Jardine, Montana area in March. The new 10(j) regulations had gone into effect by that time. This was the first wolf killed in Montana since the new regulation took effect.

In May, 12 sheep were confirmed killed on private property at the northwest end of the Paradise Valley. One unmarked gray was seen in the area. WS investigated and saw tracks of possibly 2 wolves. WS was authorized to remove up to 2 wolves, and traps were set on site to remove the offender/s. After 8 nights, the traps were pulled as no wolves had returned to the site.

On June 27, an uncollared yearling male wolf was struck and killed by a vehicle on Interstate 90 near Deer Lodge. The closest verified pack is Spotted Dog, but it was unknown if this wolf was affiliated with that pack. This mortality is tallied in the Montana portion of the GYA.

Suspected Packs

Wolf activity increased in December 2005 via reports from landowners in the Cameron, Montana area of the Madison valley. This area has supported wolf packs in the past, but conflicts with livestock or disease were factors leading up to the removal or disbanding of packs over the years. Project personnel will make efforts to radio collar animals in the area during the 2006 trapping season as activity continues to be reported.

Other Miscellaneous Information

Seven packs that were either verified or suspected to exist in 2004 no longer exist in the Montana wolf population. This was due to either the lack of any activity in the area over the last year or due to elimination of the pack because of chronic livestock depredations. Therefore, they were removed from the 2005 population table.

Redrock: southwest Montana; no sightings, reports, or wolf activity in 2005.

Sheep Mountain: Paradise Valley; pack eliminated due to chronic depredation in 2004.

Taylor Peak: Madison Valley; pack died out in 2004 and no longer exists due to mange.

Sentinel: Madison Valley; pack eliminated due to chronic depredations in 2004.

Ennis Lake: pack eliminated due to chronic depredations in 2004.

Red Lodge: south of Red Lodge; no sightings, reports, or wolf activity in 2005.

Dillon Pair: southwest Montana; pack eliminated due to chronic depredations in 2004.

Montana portion of the Central Idaho Experimental Area

Overview

In 2005, a minimum estimate of 64 wolves in 11 packs was verified in the Montana portion of the CID. The population estimate has doubled in this area since 2004, partly due to increased field monitoring efforts and because the Big Hole pack (near Lolo Pass), which usually tallied in Idaho, denned and spent most of their time in Montana in 2005. The Big Hole pack counts as a Montana pack for the first time in 2005.

Packs that were verified in 2004 and still existed in 2005 are the Battlefield, Black Canyon, Painted Rocks, Big Hole, Sapphire, and Willow packs. New documented packs in 2005 include the Sula, Brooks Creek, and Skalkaho packs. The Lake Como pack, which had been verified in years prior to 2004, was verified again in 2005. And the Mt Haggin pack, which was suspected in 2004, was confirmed in 2005. The Grassy Top pack dropped off as a verified pack for 2005 due to few sightings in the area. This pack may still exist but may spend more time in Idaho.

At the end of 2005, 6 (55%) of 11 packs were being monitored using ground and aerial telemetry. Six wolves in 5 packs were captured and radio-collared in the Montana portion of the CID in 2005. Five were collared during MFWP trapping efforts, and 1 was radio-collared by WS in response to a depredation. Radio-collared wolves were located 1-2 times per month by fixed-wing aircraft.

Seven of the 11 packs monitored in the MT portion of the CID occupy the Idaho/Montana border: Battlefield, Black Canyon, Painted Rocks, Big Hole, Sula, Lake Como, and Brooks Creek. The Battlefield, Big Hole, and Brooks Creek packs have been verified to spend time in Idaho. The others were only suspected to spend time in Idaho, based on proximity of sightings or telemetry locations. Because these 7 packs denned in Montana, or are known to have spent most of their time in Montana, they were counted as Montana packs for 2005. MFWP conducts most of the monitoring of these packs in close coordination with IDFG and the NPT, with the exception of the Big Hole pack, which was monitored by both the NPT and MFWP.

Reproduction was confirmed in 7 packs: Battlefield, Black Canyon, Painted Rocks, Big Hole, Sapphire, Willow, and Sula packs. A minimum estimate of 17 pups was produced and six packs (Battlefield, Sula, Willow, Sapphire, Big Hole, and Painted Rocks) met the breeding pair requirement. Only 1 pup was documented in the Black Canyon pack and the alpha female was killed before the end of the year. The Brooks Creek pack localized during denning season but no pups were ever seen or heard. Reproductive status of the Mt Haggin, Lake Como, and Skalkaho packs was unknown.

Two packs (Battlefield and Black Canyon) were confirmed to kill livestock. Fourteen wolves were killed in response to depredations: 5 were shot by private citizens [10(j)] and 9 by WS. Depredation and control statistics in this area were very similar to 2004. Two other wolves were known to have died: 1 was incidentally killed in a coyote snare and 1 died for unknown reasons.

Verified Packs

Battlefield

- 5 wolves; breeding pair
- 4 calves, 1 horse, 1 foal confirmed killed; 6 wolves removed by WS and 3 wolves removed by private landowners under the new 10(j) regulation

History: Wolf packs have inhabited the Big Hole Valley intermittently for many years. Most wild ungulates migrate out of the valley during the winter season and conflicts with livestock developed each time a pack formed. The Battlefield pack formed in 2002. Conflicts with livestock in 2004 resulted in removal of 5 pack members.

2005 Activities: In January 2005, MFWP personnel documented 9 wolves in the Battlefield pack, including a radio-collared yearling female. Though there were 8 wolves at the end of 2004, a ninth black wolf appeared to be satelliting the pack at this time. During a routine monitoring flight in February, MFWP personnel located 4 members of the pack near a dead horse, which was later confirmed as a wolf kill by WS. At this time, at least 2 of the 4 observed wolves had signs of sarcoptic mange. A week later, 2 wolves (a female pup and an adult female) were killed by WS in the vicinity of the dead horse. Both showed signs of mange.

In early March, a landowner in the Big Hole Valley legally shot an adult male wolf under the 10(j) regulations. The wolf was chasing cattle on private land. This wolf turned out to be B144M, originally collared in the Moyer Basin pack in Idaho in early 2003. He dispersed at the end of 2003 and was caught in a coyote trap in Paradise Valley, Montana in December of 2003. He was monitored in Paradise Valley through spring of 2004 and then disappeared. He was found to be in breeding condition at the time of his mortality and was thought to have probably been the alpha male of the Battlefield pack. He showed signs of excessive hair loss and mange was confirmed by personnel at the MFWP Lab. Because mange had been found recently in Paradise Valley, it was speculated that B144M may have picked it up in Paradise

Valley and brought it with him to the Big Hole. The landowner who shot B144M said he was traveling with another wolf that also appeared to have mange.

In mid-April, a second wolf (adult male) was caught chasing cattle on private property in the Big Hole Valley and was legally [10(j)] shot. In late April, a third wolf (adult male) was also caught chasing cattle on private property and was legally (10(j)) shot. In early May, a foal was confirmed killed by wolves. While control work was ongoing, 3 calves, in 2 separate incidents, were confirmed killed in late May. The collared Battlefield female appeared to be traveling alone at this time and could not be located with the remaining pack members. She was killed by WS in early July. At this time we suspected that 3 wolves were left, including the alpha female. Reproductive status was unknown at this time.

In September, another calf was confirmed killed and control efforts resumed. WS set traps and caught and killed 3 wolves (1 adult male, 1 female pup, and 1 male pup). The male pup was necropsied at the MFWP Lab was found to have a single dog-biting louse parasite. Lice have not been documented on wolves in Montana before but have been found on wolves in Alaska and Minnesota. At this time, WS also caught, radio-collared and released 1 female pup, thus confirming that indeed the pack had denned and produced pups in 2005. No other depredation incidents were documented through the rest of 2005.

Five wolves (2 adults, 3 pups), all gray, were seen during a MFWP monitoring flight in late October. Subsequent flights through the end of 2005 found the Battlefield pack in Idaho around the Gibbonsville area. Though it is considered a Montana/Idaho border pack, it is still counted as a Montana pack for 2005 since we believe it denned in Montana, livestock depredations occurred in Montana, and the majority of the territory is in Montana. No mange was documented in the Battlefield pack after B144M was shot, and it remains unknown whether other wolves in the pack recovered or were never infected. All 5 wolves appeared to have healthy coats at the end of 2005.

Black Canyon

- 4 wolves; not a breeding pair
- 3 yearling heifers and 6 sheep confirmed killed, 1 heifer confirmed injured, 1 colt confirmed injured, 1 dog confirmed injured; 3 wolves removed by WS

History: The Black Canyon pack (4 wolves) was first confirmed in 2004.

2005 Activities: Although it was first documented in 2004, little information was known about the Black Canyon pack. In January 2005, a pup born in 2004 was incidentally killed in a coyote snare in Horse Prairie. At the end of 2005, the pack did not have a radio collar despite the combined efforts of WS and MFWP to place a collar in this pack over 5 unsuccessful trapping sessions. These trapping efforts were often conducted in response to multiple depredation incidents that occurred between February and October 2005. A total of 3 yearling heifers and 6 sheep were confirmed killed. A heifer, a colt and a domestic dog were confirmed injured. In October, WS removed an adult male, an adult breeding female, and a male pup in the Big Hole Valley that were believed to be part of the Black Canyon

pack, as the Battlefield pack was located farther north. At the end of 2005, 4 wolves were believed to remain in the Black Canyon pack. At least one pup was produced and confirmed by project personnel in June.

Painted Rocks

- at least 4 wolves; breeding pair
- no depredations reported

History: Wolf activity was first documented in the Painted Rocks area (West Fork of the Bitterroot River near the Montana-Idaho border) with the dispersal of Idaho female B67 in 2001. B67 was monitored through 2002,and the pack has not been collared since. At least four wolves have been in the area continuously and appeared to spend the majority of their time on the Montana side of the border.

2005 Activities: Six wolves were thought to be in the Painted Rocks pack at the beginning of 2005. Thanks to a reliable sighting from the public, MFWP personnel found a rendezvous site in September. We confirmed that at least two pups were produced in 2005 based on evidence found at this rendezvous site. MFWP initiated 2 different trapping sessions, but no wolves were caught. December snow tracking efforts confirmed a minimum of 4 wolves at the end of 2005.

Big Hole

- 9 wolves; breeding pair
- no depredations reported

History: The Big Hole pack formed in 1997 by two wolves (B7 and B11) that were first released in 1995 as part of the original reintroduction efforts. B7 and B11 were translocated out of the Big Hole Valley, Montana twice in 1996 and 1997 before settling and establishing a territory near Lolo Pass, west of Missoula. The Big Hole pack has had a continuous tenure in its home range since 1997.

2005 Activities: Because they denned and spent most of their time in Montana, the Big Hole pack was officially counted as a Montana pack in 2005. However, all field work was conducted by NPT personnel out of Idaho in coordination with MFWP. Monitoring flights were conducted by both the NPT and MFWP. Original alphas, B7 and B11, founders of this pack and members of the initial reintroduction in 1995, were both observed in 2005. However, their social status within the pack was unknown. Each of these wolves is now at least 10 years old and likely nearer to 12 years old. The pack produced a minimum of 2 pups in 2005, based on howling surveys. The estimated pack size at the end of 2005 was a minimum of 9 wolves based on field observations. The sole radio-collared wolf remained with the pack.

Sapphire

- 14 wolves; breeding pair
- no depredations reported

History: Wolf activity was first documented in the remote areas of the East Fork of the Bitterroot River and the east side of the Sapphire Mountains in 2001.

2005 Activities: In January 2005, 8 wolves (5 adults, 3 pups) were estimated in this pack. Wolf reports were received intermittently, though from consistent areas through most of the spring, summer and early fall. MFWP placed the first radio-collar in this pack in early October 2005. Monitoring was ongoing to determine the full extent of this pack's territory. Fourteen wolves (13 black and 1 gray) were seen from the air in early 2006, at least 4 of which are pups.

Sula

- 7 wolves; breeding pair
- no depredations reported

History: New pack in 2005. Because a yearling wolf was caught in April 2005, this pack likely existed and had pups in 2004 but was not documented until 2005.

2005 Activities: A MFWP biologist was surveying elk from a fixed wing in April 2005 when he spotted 5 wolves (4 black, 1 gray) just west of Sula at the south end of the Bitterroot Valley. MFWP personnel started trapping in the area soon thereafter and caught two wolves, a black yearling female and a gray adult male. In mid-July, a hiker reported seeing a collared wolf in poor condition. The female wolf was found dead during the next monitoring flight, and her cause of death remained unknown because of advanced decomposition. Ten wolves (5 adults, 5 pups) were counted by MFWP personnel in this pack in mid-summer (3 gray and 7 black). By the end of 2005, only 7 wolves were observed, at least 2 of which were adults and 2 of which were pups.

Skalkaho

- 6 wolves; not a breeding pair
- no depredations reported

History: New pack in 2005. Wolf activity was reported east of Hamilton in 2004. WS and USFWS each attempted to place a collar in this pack that summer, but efforts were unsuccessful. However, at that time, it was unclear whether Skalkaho and Sapphire were the same pack.

2005 Activities: Throughout 2005, MFWP received numerous reports of wolves from a large area ranging from the East Fork of the Bitterroot to as far north as the Calf Creek Wildlife Management Area east of Hamilton. Most reports were of gray animals, although several were of a single black. Because of the large extent of the area, it's possible that 2 different packs were using the area but only 1 was confirmed by the end of the year. In April and May, MFWP initiated trapping efforts and caught 1 gray wolf. Unfortunately, it pulled out of the trap before it could be anesthetized. Wolves were seen on numerous occasions in the Sleeping Child drainage during hunting season. In December, a MFWP biologist saw 6 gray

wolves in the foothills east of Hamilton from a fixed wing plane. No information on reproduction was obtained during 2005.

Lake Como

- at least 3 wolves; not a breeding pair
- no depredations reported

History: This pack first produced pups and was documented as a breeding pair with 5 members at the end of 2002. Since then, very little was known about wolf activity in this area until 2005.

2005 Activities: Throughout 2005, MFWP received numerous reports in the Tin Cup, Spoon Creek, and Rock Creek/Lake Como areas. In the fall, a U.S. Forest Service biologist verified tracks of 3 wolves and saw 1 black wolf. No information on reproduction was obtained during 2005.

Brooks Creek

- 4 wolves; not a breeding pair
- no depredations reported

History: New pack in 2005. The Bass Creek pack first established in this area in 1998. After repeated conflicts with livestock on private property, the entire pack was translocated to the Spotted Bear area of the South Fork of the Flathead River and established the Spotted Bear pack (see northwest Montana pack summaries above). No wolves were thought to have recolonized the Bass Creek area until 2005.

2005 Activities: After numerous reports of wolves on and near private property, project personnel initiated trapping efforts in April. An adult male was caught and radio-collared. The Brooks Creek pack localized during denning season, but no pups were ever seen or confirmed. Four adult wolves have been seen in the pack since then. Its home range appeared to slightly overlap the Montana-Idaho border, so it was considered a border pack.

Willow Creek

- 6 wolves; breeding pair
- no depredations reported

History: The Willow pack was first confirmed between Drummond and Phillipsburg in 2002.
2005 Activities: In early 2005, 2 wolves still appeared to be using the area but it was unknown whether they were related to the original Willow pack of 2002. In July, Alice Whitelaw and her dog Tsavo (Working Dogs for Conservation, Bozeman) found fresh wolf sign in the area historically used by this pack. MFWP personnel caught an adult male wolf. This wolf was originally collared in the Buffalo Ridge pack in Idaho in January 2003 and disappeared from its natal pack at the end of 2003. Its whereabouts were unknown until it was captured in the Willow territory. At the end of 2005, 6 wolves were seen (2 adults and 4 pups).

Mt. Haggin

- at least 2 wolves; not a breeding pair
- no depredations reported

History: The Mt. Haggin pack, south of Butte, was first documented as a group of three of wolves in 2001. Intermittent reports of wolves and wolf sign have been submitted each year since 2001.

2005 Activities: MFWP personnel were able to follow up on reports from the public in the Fleecer Mountain area and confirmed that at least 2 wolves were present in September 2005. Trapping was not initiated at the time due to excessive human activity in the area during archery season. A volunteer spent a week in the area in October scouting but did not turn up any more fresh sign. Several other sightings came in during the hunting season, suggesting that this may be a larger pack. However, additional wolves were not verified by project personnel.

Miscellaneous / Lone Individuals

A single black wolf was first reported in the Hall, Montana area in the spring of 2005. In late March, a calf died and was considered a probable wolf kill. On May 23, a black uncollared female wolf was shot under the 10(j) regulations when she was discovered harassing cattle on private property. This wolf was believed to be the same wolf seen earlier in the spring.

On May 27, a disperser from the Morgan Creek pack in Idaho (B228M) was shot under the 10(j) regulations when he was discovered chasing cattle on private property in the Big Hole Valley.

Suspected Packs

Grassy Top: In 2005, there were only a few scattered reports of wolves in the Big Sheep Creek/Grassy Top area south of Dillon, Montana. The most reported together were 2 wolves. IDFG personnel received a number of reports of wolf activity around the Leadore, Idaho area to the south and west. We believed that these might be the same wolves seen on the Montana side. The total number of reports from both sides of the state border was small, and we were still not able to verify the existence of a pack on either side. However, because fewer reports were gathered on the Montana side, it appeared that if wolves had settled in the area, it would be considered an Idaho pack.

Other Miscellaneous Information

In mid-October, a rancher in the Hall area reported that 2 black wolves killed a deer close to their ranch. Later in the winter Bart Smith (WS) found fresh tracks of 2 wolves in this area when the Willow pack was known to have been in the Upper Willow Creek drainage for several days. No black wolves were known to be in the Willow pack. This area will be surveyed in 2006.

OUTREACH AND EDUCATION

MFWP had an extensive outreach and education program on wolves and the state program in 2005. Outreach activities take a variety of forms and include: meeting people in the field, visiting landowners on their ranches, phone conversations and email to share information and answer questions, and granting interviews with the media, writers, and others. MFWP wolf staff also gave presentations at organized functions. MFWP also prepared and distributed a variety of printed outreach materials and media releases to help Montanans become more familiar with the Montana wolf population, the state's plan, and the current federal regulations. During the course of the year, MFWP staff note their formal efforts in the USFWS Wolf Weekly report. However, the vast majority of public contacts made by the MFWP wolf staff and others in MFWP on a day-to-day basis throughout 2005 were not reflected in the USFWS Wolf Weekly report.

Other MFWP staff and volunteers were instrumental in accomplishing MFWP's outreach efforts. These included area game wardens, area wildlife biologists, block management personnel, information officers and front desk staff, staff of the Education Bureau, State Parks employees, the Helena staff (who work closely with the MFWP Commission, the legislature, and a variety of other elected or appointed officials), hunter education instructors, etc.

An important specific initiative in 2005 was the redesign of the wolf pages on the MFWP website. The pages were updated with new information on a variety of subjects with respect to wolf conservation and management in Montana. In January of 2006 alone, there were 1,200 visits to the wolf pages. In the fall, MFWP launched an application for hunters and other recreationists to report wolves and wolf activity through the website. Wolf reports helped MFWP monitor existing packs and document wolf activity in new areas leading to the verification of new packs. About 200 reports were received from late October to December 2005 alone. See www.fwp.mt.gov/wildthings/wolf.

A wide variety of media requests were received, ranging from daily newspapers, magazines, documentary filmmakers, to authors. Additionally, the MFWP website receives email comments and questions from a wide variety of interested publics. Efforts were made provide a timely response to as many as possible.

MFWP wolf staff gave at least one presentation at an organized function every week. A minimum of 79 presentations was given in 2005, reaching at least 2,129 people. When broken down by category, the majority of presentations were made to other agency/government professionals and livestock interests. However, no single group or setting dominated our efforts.

Outreach Categories:

- Civic: Kiwanis Club, Rotary Club, Lions Club, etc.
- Teacher/school: K-12 and teachers
- College/Professional: colleges and adult education
- Hunting: hunting, outfitting, road and gun, etc.
- Livestock: livestock groups, permittees, etc.

- Agency/government: Forest Service, BLM, NPS, county, etc.
- Conferences: Wildlife Society, Chico, IWC, etc.
- Other: all other

Outreach Categories	# of Programs	Number of public
Civic	4 (5 %)	85 (4%)
Teacher/school	8 (10 %)	307 + (14%)
College/professional	8 (10%)	210 (10%)
Hunting	7 (9%)	200 + + + (9%)
Livestock	15 (19%)	262 + + + (12%)
Agency/government	17 (21%)	235 + + + + (11%)
Conferences	9 (11%)	400 + + (19%)
Other	11 (14%)	430 + (20%)
Total:	79	2,129

+ indicates an event that did not specify numbers. For instance in Agency/government, there were four more events where numbers were not noted.

RESEARCH AND OTHER FIELD STUDIES

Effects of Wolves, Hunters, and Human Access on Elk Spatial Dynamics

Investigators: Jamin Grigg and Robert Garrott (Department of Ecology, Montana State University, Bozeman MT 59717, Ken Hamlin, Craig Jourdonnais, Mike Ross (Montana Fish Wildlife & Parks, 1400 S. 19th, Bozeman MT 59715)

Collaborators: Montana State University, Montana Fish Wildlife & Parks, Montana Department of Livestock, Denver Zoological Foundation, and numerous landowners in the Madison Valley, MT.

This project focuses on measuring differing behavioral patterns of elk when exposed to various types and levels of risk, particularly wolf predation pressure and human hunting pressure.

Building upon previous graduate research in the Madison Valley of southwestern Montana, we are placing 50 GPS collars and 17 VHF collars on adult, female elk on winter range over a two year period. Coupled with the resource of at least 1 GPS collar and 2 VHF collars on the resident Wedge wolf pack, we are studying how elk on this winter range behaviorally respond to the various risks of wolf predation and late-season hunting. We will also be documenting off-take by wolves and hunters and measuring functional equivalency of these two types of predators. A second focus of this research involves evaluating the impacts of roads, trails and hunting seasons on elk summer and fall distribution and timing of migration. By assessing how elk respond to predation pressure by both wolves and human hunters, and how climatic conditions and varying levels of human use of the landscape factor in, we build upon four years

of previous research conducted on the wildlife dynamics of the Madison Valley and compliment ongoing research in two nearby sister study sites.

Deployed GPS collars are scheduled to blow off after approximately one year, at which point they will be retrieved and stored locations will be downloaded and analyzed. Locations stored at 30-minute (elk) and 3-hour (wolf) intervals on the GPS collars, combined with locations obtained through intensive daily ground telemetry monitoring of GPS and VHF collars, will enable analyses of both fine and broad-scale spatial distribution of wolves and elk on multiple temporal scales. By intensively researching elk responses to various types and levels of risk, we can address questions regarding how differing threats influence elk behavior. Data collection should be completed in winter 2006.

References:
Grigg, J. and Garrot, R . Lower Madison valley wolf/ungulate research project, 2004/2005 annual report.

Responses of elk to wolves- behavior, nutrition, and demography.

Investigators: Scott Creel, David Christianson (Department of Ecology, Montana State University, Bozeman, MT 59717), Ken Hamlin, Craig Jourdonnais, Mike Ross (Montana Fish Wildlife & Parks, 1400 S. 19th, Bozeman MT 59715)

This project continued a six-winter study of elk responses to wolves in the Gallatin Canyon, Montana. In this area, elk population size and calf:cow ratios have been depressed since recolonization by wolves in a manner that is not fully explained by direct predation alone. This project measured behavioral responses of elk to wolves and is measuring the affects of these responses for nutrition, survival, and reproduction of elk. Elk behavior was strongly dependent on temporal and spatial variation in wolf activity. Behavioral responses included changes in activity budgets, herd size and habitat selection. These responses were different between sexes, possibly because of differing nutritional constraints facing male and female elk in winter. These behavioral responses strongly suggest that winter foraging is influenced by wolf activity. The project continues to investigate changes in foraging strategies, diet selection, diet quality, nutrient balances, and body condition in winter as wolf predation risk varies, while monitoring changes in elk recruitment, demography, and population size. Data collection should be completed in winter 2006.

Recent project publications:
Christianson D & Creel S (in press) A review of environmental factors affecting winter elk diets. *Journal of Wildlife Management.*

Creel S, Winnie JA, Maxwell B, Hamlin K & Creel M 2005. Elk alter habitat selection as an antipredator response to wolves. *Ecology* 86:3387-3397.

Creel S & Winnie J 2005. Responses of elk herd size to fine-scale spatial and temporal variation in the risk of predation by wolves. *Animal Behaviour* 69:1181-1189.

Relative contributions of habitat complexity and prey physical condition to predation by cougars and recolonizing wolves

Investigators: Todd C. Atwood[1], Eric M. Gese[2], and Kyran E. Kunkel[1]

[1]Department of Forest, Range, and Wildlife Sciences, Utah State University, Logan, UT 84322; [2]USDA/APHIS/WS/National Wildlife Research Center, Department of Forest, Range, and Wildlife Sciences, Utah State University, Logan, UT 84322

Summary: When a recolonizing predator enters an already complex predator-prey system, specific antipredator behaviors may conflict and avoidance of one predator may enhance vulnerability to another. We studied the patterns of prey selection by recolonizing wolves (*Canis lupus*) and cougars (*Puma concolor*) in response to prey habitat shifts in the northern Madison Range, Montana. Elk (*Cervus elaphus*) were the primary prey for wolves and mule deer (*Odocoileus hemionus*) were the primary prey for cougars, but elk made up an increasingly greater proportion of cougar kills annually. While both predators preyed disproportionately on bull elk, wolves were most likely to prey on bulls in poor physical condition. Although we found that the predators partitioned hunting habitats, structural complexity at wolf kill sites increased over time, whereas complexity of cougar kill sites remained static. We concluded that habitat shifts in prey were attempts by formerly naïve prey to lessen predation risk from wolves. However, shifting to more structurally complex habitats might have made prey more vulnerable to cougars. Habitat shifts may represent a compromise to minimize overall risk, following a change in predator exposure.

The effects of recolonizing wolves on coyote scavenging

Investigators: Todd C. Atwood[1] and Eric M. Gese[2.]

[1]Department of Forest, Range, and Wildlife Sciences, Utah State University, Logan, UT 84322; [2]USDA/APHIS/WS/National Wildlife Research Center, Department of Forest, Range, and Wildlife Sciences, Utah State University, Logan, UT, USA, 84322

Summary: Wolf recolonization of the Greater Yellowstone Ecosystem provides a rare opportunity to identify nascent behaviors facilitating coexistence between sympatric canids. Accordingly, we investigated behavioral interactions between putatively naïve coyotes (*Canis latrans*) and recolonizing wolves (*Canis lupus*) at ungulate carcasses in Montana's Madison range. We employed a quasi-experimental study design consisting of a 3-level carcass treatment (actual wolf presence, wolf presence simulated, wolf absence) to assess factors influencing coyote risk assessment, carrion consumption, and aggressive encounters with wolves. Socially dominant coyotes (alphas and betas) responded to actual and simulated wolf presence by increasing the proportion of time spent vigilant while scavenging. Vigilance behavior was more

pronounced when scavenging closer to protective cover, where lateral occlusion inhibited the ability of coyotes to scan for, and possibly escape from, returning wolves. Despite greater time spent vigilant, alpha coyotes consumed the greatest amount of carrion biomass. This was accomplished by feeding on carcasses in earlier stages of consumption when organs and large muscle tissues were still present. This suggests that alpha coyotes might trade-off greater risk for higher quality food items. Coyotes would aggressively confront wolves, and numeric superiority and the stage of carcass consumption were influential in determining whether coyotes were able to displace wolves from carcasses. Coyotes rely on a gradient of risk-sensitive behaviors, ranging from elevated vigilance to aggressive confrontation, to manage risk associated with wolf presence. Identification of these behaviors, and their sensitivity to numeric and social factors, is an important step in elucidating mechanisms of sympatry in social canids.

Range Rider Projects and their Effectiveness in southwest Montana

Collaborators: Montana Fish Wildlife & Parks, Madison Valley Ranchlands Group, Boulder Watershed Association, individual livestock producers, Turner Endangered Species Fund, USDA Forest Service, Predator Conservation Alliance, the Sun Ranch, USDA Wildlife Services, USDA Natural Resources and Conservation Service, Sweet Grass County Conservation District, and MSU Extension Service.

The Range Riders Project is a collaborative effort between ranchers, government agencies, and conservationists. The primary goal of these efforts is to reduce livestock/predator interactions. Secondary goals and objectives are to reduce livestock depredation from predators, to detect injured or dead livestock more rapidly, to preserve the evidence and increase the likelihood that an investigation would yield a definitive conclusion about whether or not it was a predation event and the species responsible, to improve livestock management and range conditions, to increase knowledge about livestock/predator interactions in space and time, and to build relationships among project partners. All project collaborators provided funding and in-kind contributions. In particular, significant funding was provided through the Natural Resources and Conservation Service's Environmental Quality Incentives Program.

Range Rider projects were implemented in both 2004 and 2005 on a combination of public grazing allotments and private lands in a variety of settings in the Madison Valley south of Ennis and in the Boulder River Valley south of Big Timber. Although the rider protocols varied from place to place, the underlying premise is similar: increased and continual human presence and immediate response to wolves that are interacting with livestock. The rider response towards wolves when they are interacting with livestock ranges from non-lethal harassment to a lethal bullet. By responding as closely as possible in space and time to the inappropriate behavior (e.g., chasing livestock), the wolves are more likely to associate that behavior with something negative than if they had not been harassed while behaving inappropriately.

Even though the rider(s) are out day and night, cattle on public grazing allotments and in some circumstances on private lands are dispersed across a wide area. Livestock may also be in rugged, partially forested terrain. Nonetheless, use of horses and vehicles (where applicable)

allows the rider to cover as much ground as possible while checking on livestock. There is still a good chance they will not be in exactly the right location at the exactly the right time to respond to the wolves. However, the chances of preventing a depredation are expected to be better than when/where human presence is more limited or infrequent.

Due to the incredible number of variables from place to place, there is no clear evidence that these efforts have actually prevented depredations. However, when surveyed, many participating producers said they thought it was helpful and indicated an interest in continuing their participation. Efforts to collect information to better understand the effectiveness of this technique will continue in 2006.

A Pilot Study to Test Scat Detection Dogs to Monitor Gray Wolf Packs in Montana

Collaborators: Working Dogs for Conservation, Twin Spruce Foundation, Montana Fish, Wildlife and Parks, U.S. Fish and Wildlife Service, Turner Endangered Species Fund and Denver Zoological Foundation.

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This project focused on obtaining preliminary information on the potential value of using scat detection dogs to monitor wolf populations in Montana. Particularly, to determine whether scat detection dogs can identify presence/absence of wolf activity in a given area and if they could assist in narrowing down areas of recent wolf activity to enhance trapping and collaring efforts (Whitelaw et al. 2006).

Domestic canines have a long history of locating wildlife and their sign. Aside from hunting applications, dogs have been used to assist in conservation efforts for decades by locating the species of interest or their sign such as hair, urine, nests and dens and feces.

Two veteran detection dogs (Dog 1) a 8 year old German Shepherd female and (Dog 2) a 5 year old German shepherd male were trained to detect wolf scat. Of the two, Dog 2 was deployed in 2 areas in western Montana where wolf presence had been verified but where radio-collars had not yet been used to monitor the packs. Roads and trails were surveyed in each area. All transects were searched with the dog off-leash to maximize the area covered. At the time of collection, the location of each scat was recorded using a hand held GPS unit. Additional locations of wolf sign (tracks, kill sites) were also recorded. We noted habitat type, and whether the sample was found on a road, hiking or game trail or in vegetation.

We determined that specially trained detection dogs are effective in locating areas of recent wolf activity. MFWP successfully captured and radio collared a wolf in an area surveyed by Dog 2 and where the detection dog had indicated recent activity. Dog 2 often indicated scats (and in

one instance an apparent old wolf kill) in vegetation while experienced wolf biologists missed these signs while surveying.

Literature Cited
Whitelaw, Alice R., L. H. Bradley, V. J. Asher. February 2006. : A Pilot Study to Test Scat Detection Dogs to Monitor Gray Wolf Packs in Montana. Results and progress report, 2006.

LAW ENFORCEMENT

The USFWS Office of Law Enforcement remained the lead agency investigating wolf deaths in Montana. The number of investigations increased this year mainly due to the investigations of wolves killed for harassing livestock under the 10(j) regulations. To date, no evidence of illegal action has been found during the investigation of wolves killed for harassing of livestock. The State of Montana has laws that protect wolves and the state wardens work closely with the USFWS in all enforcement cases.

FUNDING

MFWP's core wolf program is funded through 2 separate federal sources. Approximately half is obtained through a direct annual Congressional appropriation and half is obtained directly from USFWS. These sources are identified in the state-federal wolf cooperative agreement and are transferred on a federal fiscal year cycle. Federal funds can be spent anywhere in Montana for the wolf management and conservation activities specified in the cooperative agreement. Although the agreement states that a total of $637,000 is to be available to Montana annually, federal budget constraints have resulted in Congressional recessions (across the board percentage cuts). Therefore, Montana received about $607,000 in federal fiscal year 2005. Montana may renegotiate the responsibilities identified in the agreement in the future if adequate federal funds are not available and Montana is unable to fulfill the responsibilities described in the agreement.

Montana allocated its wolf budget in ways typical of any other wildlife conservation and management program. The vast majority of dollars were allocated to population monitoring. Funds were also allocated to support: the MFWP Wildlife Research Lab in Bozeman, MFWP law enforcement assistance, outreach and information / education activities, miscellaneous field equipment, research, increased ungulate monitoring, and additional step-down planning and program development. In-kind contributions and investments were made by the many private citizens who supported or were affected by the success of wolf recovery, by interested non-governmental organizations, and other state and federal agencies.

Montana USDA WS was funded through the regular Congressional budgeting process for federal agencies. In federal fiscal year 2005, WS spent an estimated $152,179 investigating wolf complaints and carrying out lethal control activities.

In 2004, Montana coordinated the efforts of Idaho and Wyoming to prepare a tri-state Congressional budget request. MFWP's director presented it to the Congressional Sportsmen's Caucus in fall 2004. The message presented was a celebration of recovery success, accompanied by the honest assessment that securing the investment into the future will require an ongoing national commitment to funding.

How well the nation's wolves and grizzly bears fare in the NRM depends on how well they are accepted by the people who live, work and recreate in these areas. The establishment of adequately funded conservation and management programs will determine the degree to which people will share the land, how well they will tolerate wolves and grizzly bears, and how successfully they will rise to the challenges posed by species recovery. Those challenges are shared by everyone, not just residents of the tri-state area.

PERSONNEL AND ACKNOWLEDGEMENTS

By now, literally hundreds of people have assisted with wolf recovery efforts in a wide variety of ways, and we are indebted to them all. Since 2000, countless more have assisted with the development of the Montana wolf plan and many more continue to assist during the transition from federal management to state management. We especially want to acknowledge the support and understanding from our families and friends.

The MFWP wolf team is comprised of Kent Laudon in Kalispell, Carolyn Sime in Helena, Mike Ross and Val Asher in Bozeman, Liz Bradley in Dillon, and Jon Trapp in Red Lodge. But the wolf team is part of a much bigger team of tremendously dedicated agency professionals that make up Montana Fish, Wildlife & Parks. Wolf work is also supported by and carried out by others throughout the agency. We thank Adam Messer of MFWP Information Services for his patience, good humor, and expertise in creating the maps for this report, his work on all our other wolf project data requests, and for his help with data management. Regional biologists and game wardens, information officers, front desk staff, and program managers contribute their time and expertise in a variety of ways and have been invaluable in helping the wolf program get off to a solid start. We appreciate the MFWP Helena staff from all the Divisions who contributed their expertise and time; they also provided support and a steady hand while helping us get a variety of program activities underway during this first year -- right down to finding vehicles, cell phones, computers, uniforms and field equipment. We thank Caryn Amacher, Denise Dawson, Donna Campbell, Rebecca Cooper, Adam Brooks for assisting us with interagency cooperative agreements, grant agreements, and budgeting. We appreciate the wise counsel and participation of the MFWP legal staff, especially Bob Lane and Martha Williams. We appreciate the work and dedication of the MFWP Website Team of Beth Stephenson and Ira Miller who created the on-line wolf public reporting system and cheerfully revamped the wolf web pages amidst volumes of other work. Jay Lightbody and Don Bartsch at the Print shop prepared and printed outreach materials. We thank the staff of the Communications and Education Division for their thoughtful reviews of our work and for their media contributions throughout the year. The Montana Governor's Office, MFWP Director's Office, and the MFWP Commission deserve

special recognition for their strong commitment to move forward despite the delisting delay; they provided important leadership and steady guidance.

The Montana wolf management program also benefited from the volunteer contributions of Jonathan Durbridge and Mischa Connine, who were very dedicated to the job and worked almost literally non-stop. Tyler Hollow spent many days afield scouting out pubic wolf reports and ground tracked the Halfway and Spotted Dog packs outside of Helena. Janeen Hetzler, Nathan Stone, Erin Fairbank, Kristina Davis, and Stephanie Naftal assisted with scouting and trapping efforts in southwest Montana. Allie Hunter assisted with public sighting data entry. MSU graduate students Jamin Grigg and Dave Christianson and technicians Stewart Lilly and Julee Shamhart put in long hours in the field in southwest Montana. Amy Edmonds, Glacier National Park, conducted ground monitoring for the Kintla and Whitefish Packs. Salish Kootenai Confederated Tribes biologist Stacey Courville and Blackfeet Tribe biologist Dan Carney monitored wolves in and around their respective tribal reservations.

USFWS personnel in Montana included wolf recovery coordinator Ed Bangs (Helena) who shepherded the development of the state-federal cooperative agreement and freely shared information and data about wolves in Montana. We are especially grateful for the financial support and his confidence in the developing state program. Law enforcement agents Rick Branzell (Special Agent, Missoula) and Doug Goessman (Special Agent, Bozeman) investigated wolf mortalities throughout Montana and provided important guidance about the federal regulations. Dominic Dominici (USFWS Agent in Charge, WY) provided valuable guidance and information about a variety of subjects and the interpretation of federal regulations. By year's end, Joe Fontaine (Helena) had accepted a new position managing a national wildlife refuge in Mississippi. We are especially grateful to him for all the experience and knowledge he shared, the information he was able to retrieve off the top of his head at a moment's notice, and his support, good humor, and encouragement as we took the reins. We wish him well.

WS investigates suspected wolf damage and carries out wolf control activities in Montana. We thank them for contributing their expertise to the Montana wolf program and for their willingness to complete investigations in a timely fashion, 7 days a week. WS personnel involved in wolf management in Montana in 2005 included state director Larry Handegard, eastern district supervisor Paul J. Hoover, western district supervisor Kraig Glazier, wildlife specialists Dennis Biggs, John Bouchard, Steve Demers, Michael Hoggan, Dan Thomason, Alan Brown, Brian Noftsker, Mike Thomas, Chad Hoover, R.R. Martin, Graeme McDougal, Theodore North, James Rost, Pat Sinclair, John Maetzold, Paul Bucklin, Bart Smith, and James Stevens, and pilots Stan Colton, Tim Graff, Eric Waldorf, Jake Wimmer, and Larry Lundquist.

The Montana Wolf Management program field operations also benefited in a multitude of ways from the continued cooperation of other state and federal agencies and private interests such as The Blackfeet Tribal Wildlife Program, USDA Forest Service, Montana Department of Natural Resources and Conservation ("State Lands"), U.S. Bureau of Land Management, Plum Creek Timber Company, Glacier National Park, Yellowstone National Park, Idaho Fish and Game, Montana Department of Natural Resources and Conservation, Canadian Provincial wildlife

professionals, Defenders of Wildlife, Predator Conservation Alliance, Boulder Watershed Group, and the Madison Valley Ranchlands Group.

We deeply appreciate and thank our pilots whose unique and specialized skills, help us find wolves, get counts, and keep us safe in highly challenging, low altitude mountain flying. They include David Hoerner (Red Eagle Aviation, Kalispell), Steve Davidson (Selway Aviation, Hamilton), Doug Chapman (Montana Aircraft, Bozeman), Roger Stradley (Gallatin Flying Service, Belgrade), Steve Ard (Tracker Aviation Inc., Belgrade), Mark Duffy (Bozeman).

The citizens of Montana deserve special recognition for their cautious willingness to craft a balanced plan that recognizes that wolves are a native species now back on the landscape where people live, work and recreate, to accept the responsibility for wolf conservation and management, and their willingness to move forward knowing that it will continue to be controversial, challenging, and that hard decisions have to be made. We also appreciate the time they take to send us wolf report postcards, on-line wolf reports, or to call us on the phone with their information. The individuals who served on the original Montana Wolf Management Advisory Council and the Wolf Compensation Working Group continue to serve Montana informally by sharing their perspectives and being a source of information in their respective communities.

And lastly, the countless private landowners in Montana whose property is used by wolves, sometimes at great cost to the owner, deserve our respect, our understanding and attention to their new challenges, and our gratitude.

APPENDIX 1

MONTANA CONTACT INFORMATION

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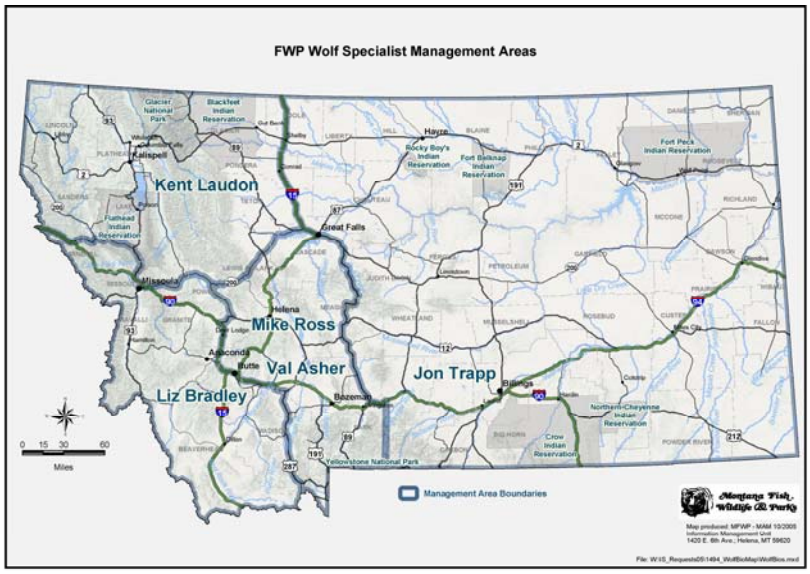
USDA Wildlife Services
(to request investigations of injured or dead livestock):
Larry Handegard
USDA WS State Director, Billings
(406) 657-6464 (w)

Kraig Glazier
USDA WS West District Supervisor, Helena
(406) 458-0106 (w)

Jim Hoover
USDA WS East District Supervisor, Columbus
(406) 322-4303 (w)

Montana Fish, Wildlife & Parks Wolf Specialist Areas of Responsibilities



MONTANA FISH WILDLIFE & PARKS ADMINISTRATIVE REGIONS

STATE HEADQUARTERS
MT Fish, Wildlife & Parks
1420 E 6th Avenue
PO Box 200701
Helena, MT 59620-0701
(406) 444-2535

REGION 1
490 N Meridian Rd
Kalispell, MT 59901
(406) 752-5501

REGION 2
3201 Spurgin Rd
Missoula, MT 59804
(406) 542-5500

REGION 3
1400 South 19th
Bozeman, MT 59718
(406) 994-4042

HELENA Area Res Office (HARO)
930 Custer Ave W
Helena, MT 59620
(406) 495-3260

BUTTE Area Res Office (BARO)
1820 Meadowlark Ln
Butte, MT 59701
(406) 494-1953

REGION 4
4600 Giant Springs Rd
Great Falls, MT 59405
(406) 454-5840

LEWISTOWN Area Res Office (LARO)
215 W Aztec Dr
PO Box 938
Lewistown, MT 59457
(406) 538-4658

REGION 5
2300 Lake Elmo Dr
Billings, MT 59105
(406) 247-2940

TO REPORT A DEAD WOLF OR POSSIBLE ILLEGAL ACTIVITY:

U.S.Fish and Wildlife Service

- Special Agent, Missoula MT: (406) 329-3000
- Special Agent, Bozeman, MT: (406) 582-0336
- Special Agent, Casper, WY: (307) 261-6365

Montana Fish, Wildlife & Parks

- Dial 1-800-TIP-MONT

TO SUBMIT WOLF REPORTS ELECTRONICALLY AND TO LEARN MORE ABOUT THE MONTANA WOLF PROGRAM, SEE:

- www.fwp.mt.gov/wildthings/wolf

APPENDIX 2

Gray Wolf Chronology in Montana

1800

- Wolves are common throughout Montana.

1884

- Wolf-bounty law initiates Montanas official eradication effort.

1915

- Federal authorities begin wolf control in the West.

1925

- Wolf populations eliminated from most of the West.

1936

- Gray wolf believed extinct in Montana although wolves and wolf sign still occasionally observed.

1950

- Wolves still seen in Wyoming, Montana, and Idaho occasionally but no self-sustaining breeding documented; wolves, likely dispersing from Canada, are killed in Montana and Idaho in every decade through 2000.

1973

- Montana protects wolves as state endangered species.

1974

- Wolves protected under federal Endangered Species Act of 1973.

1979

- A wolf is monitored in British Columbia, just north of Glacier National Park.

1980

- A lone wolf kills livestock near Big Sandy, Montana and is killed by the U.S. Fish and Wildlife Service. This is Montana's first documented wolf depredation in more than 50 years.

1986

- A wolf den is confirmed in Glacier National Park. The Magic Pack establishes a territory in the North Fork Flathead River valley, in the western portion of Glacier National Park.

- A pack denned on the Blackfeet Reservation, but was not discovered until 1987 when they began to depredate on livestock.

1987

- Camas Pack established in the North Fork of the Flathead River valley in Glacier National Park.
- First livestock depredation occurs on the Blackfeet Reservation.

1990

- The U.S. Congress establishes a Wolf Management Committee to recommend wolf recovery strategies for Yellowstone National Park and central Idaho.

1991

- Congress directs the US Fish and Wildlife Service to prepare a Draft Environmental Impact Statement on wolf recovery in Yellowstone National Park and central Idaho.

1993

- An estimated 45 wolves in five packs occupy the federal Northwestern Montana Recovery Area. One pack establishes west of Helena, founded by a female wolf which disperesed from Canada.

1994

- Federal EIS on the reintroduction of wolves into Yellowstone National Park and central Idaho completed. Wolves to be reintroduced into Yellowstone National Park and central Idaho for three to five years under the Endangered Species Acts experimental, non-essential rules that grant additional management flexibility. Wolf recovery is defined as 30 breeding pairs--an adult male and an adult female raising two or more pups to Dec. 31--in Montana, Idaho, and Wyoming for three successive years.

1995

- Fifteen wolves from four packs captured in Canada are relocated to Yellowstone National Park and 17 individual wolves are released in central Idaho.

1996

- Yellowstone National Park receives 17 more wolves from Canada and 10 wolf pups from a depredating pack in northwestern Montana. Twenty wolves are released in central Idaho and first pups are produced in the wild.

1999

- Governors of Montana, Idaho, and Wyoming renew a 1997 Memorandum of Understanding to coordinate public involvement to pursue plans to manage a recovered wolf population in the northern Rockies and to assure a timely delisting.

2000

- Montana Governor Marc Racicot appoints 12 Montana citizens to the Montana Wolf Management Advisory Council. The council, chaired by rancher Chase Hibbard of Helena, is charged to advise Montana Fish, Wildlife & Parks on wolf management in anticipation of the wolf's delisting.
- US Fish and Wildlife Service determines there are 30 breeding pair in the tri-state Rocky Mountain Recovery Area, marking 2000 as the first year of the three-year countdown to meet wolf population recovery goals.
- An estimated 97 wolves in 8 breeding pairs are counted in Montana.

2001

- Montana Wolf Management Advisory Council presents its Report to the Governor to Governor Judy Martz, who directs MFWP to draft wolf conservation and management planning document.
- Montana Legislature removes the gray wolf from Montana's list of predatory species once the wolf is delisted. Upon delisting, wolves will be legally reclassified in Montana as species in need of management. New law includes provisions for the defense of life and private property when a wolf is attacking, killing, or threatening to kill a person, or livestock.
- Montana Fish, Wildlife & Park's draft of the Montana Wolf Conservation and Management Planning Document is reviewed, amended and approved by the Montana Wolf Management Advisory Council.
- An estimated 35 breeding pair, in 51 packs, are counted in the tri-state Rocky Mountain Recovery Area, totaling about 550 wolves. The US Fish and Wildlife Service determines 2001 is second year of the three-year countdown to trigger an official proposal to delist the wolf.
- An estimated 123 wolves in 7 breeding pairs are counted in Montana.

2002

- Montana Wolf Conservation and Management Planning Document is released in January. Montana Fish, Wildlife & Parks begins to develop an environemntal impact statement (EIS) on the state management of wolves. The public is invited to participate at community work sessions around the state and asked to identify issues and help develop management alternatives.
- Montana Fish, Wildlife & Parks develops draft EIS with five alternatives.
- An estimated 43 breeding pairs are counted in the tri-state Rocky Mountain Wolf Recovery Area, totaling about 663 wolves. The US Fish and Wildlife Service determines 2002 is the third year of the three-year countdown to trigger official proposal to delist the wolves.
- U.S. Fish and Wildlife Service announces that the northern Rockies gray wolf population has achieved biological recovery under the federal Endangered Species Act.
- An estimated 183 wolves in 17 breeding pairs are counted in Montana.

2003

- Montana's EIS process includes a 60-day public comment period and statewide community work sessions. The final EIS recommends the adoption of the "updated council" alternative. The Montana Fish, Wildlife & Parks Commission approves the adoption of the preferred alternative – the Council's Update.
- State conservation and management plans completed by Montana, Idaho, and Wyoming and submitted to USFWS.
- States of Montana, Idaho, and Wyoming request funding from Congress.
- U.S. Fish and Wildlife Service expected to begin the official administrative process of delisting gray wolves in the northern Rockies.
- An estimated 761 wolves in 51 breeding pairs are counted in the tri-state Rocky Mountain Wolf Recovery Area at the end of the year.
- An estimated 182 wolves in 10 breeding pairs are counted in Montana.

2004

- U.S. Fish and Wildlife Service approves state management plans from Montana and Idaho and rejects Wyoming's plan. Delisting is officially delayed until the impasse is resolved.
- Montana Fish, Wildlife & Parks and the Montana Fish, Wildlife & Parks Commission approve amending the Record of Decision to pave the way for interim state participation in northwest Montana through a limited cooperative agreement.
- In February, Montana Fish, Wildlife & Parks and U.S. Fish and Wildlife Service complete a cooperative agreement covering northwest Montana.
- Montana Fish, Wildlife & Parks receives federal funding and hires staff who begin implementing the state plan prior to delisting and in consultation with U.S. Fish and Wildlife Service.
- Montana Fish, Wildlife & Parks begins close coordination with USDA Wildlife Services to investigate and resolve wolf-livestock conflicts.
- An estimated 835 wolves in 66 breeding pairs are counted in the tri-state Rocky Mountain Wolf Recovery Area at the end of the year.
- An estimated 153 wolves in 15 breeding pairs are counted in Montana.

2005

- Wolves in northwest Montana recoveyr area reclassified as "endangered" by court order.
- U.S. Fish and Wildlife Service adopts more flexibile regulations [known as 10(j) regulations] for the experimental population areas of Montana and Idaho.
- Montana Fish, Wildlife & Parks and U.S. Fish and Wildlife Service complete a cooperative agreement paving the way for Montana to assume independent and full reponsibility for wolf management and conservation statewide. Montana begins implementing the state plan to the extent allowed by federal regulations throughout the state. Funding from U.S. Fish and Wildlife Service and through special Congressional appropriations fund Montana Fish, Wildlife & Park's wolf team.

- Montanans form a diverse working group of private citizens, non-governmental organizations, and state and federal agencies to begin developing the Montana Livestock Loss Reduction and Mitigation Program. Work is ongoing.
- An estimated 256 wolves in 19 breeding pairs are counted in Montana.

IDAHO
Wolf Recovery, Conservation, and Management 2005 Interagency Annual Report

A cooperative effort by the Idaho Department of Fish and Game, Nez Perce Tribe, U.S. Fish and Wildlife Service, and USDA Wildlife Services.

This cooperative annual report presents information on the status, distribution and management of the Idaho wolf population from January 1, 2005 to December 31, 2005.

It is also available at: http://fishandgame.idaho.gov/cms/wildlife/wolves/

or http://www.nezperce.org/Programs/wildlife_program.htm

This report may be copied and distributed as needed.

Suggested citation: Nadeau, M. S., and C. Mack. 2006. Idaho Wolf Recovery Report. Pages 64-80 *in* U.S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, Montana Fish, Wildlife and Parks, Idaho Fish and Game, and USDA Wildlife Services. 2006. Rocky Mountain Wolf Recovery 2005 Annual Report. C. A. Sime and E. E. Bangs, eds. USFWS, Ecological Services, 585 Shepard Way, Helena, Montana. 59601. 130pp.

IDAHO EXECUTIVE SUMMARY

In January 2005, the U.S. Fish and Wildlife Service (USFWS) published and adopted new regulations [10(j) Rule] governing wolf management within the Nonessential Experimental Population Areas of Idaho south of Interstate Highway 90. (Endangered and Threatened Wildlife and Plants; Regulation for Nonessential Experimental Populations of the Western Distinct Population Segment of the Gray Wolf [50 CFR Part 17.84 FR 70:1286-1311]. The new 10(j) Rule allowed States, with USFWS approved wolf management plans, to petition the Secretary of Interior for certain wolf management authorities as an interim measure to delisting. In January 2006, the Secretary of Interior and Governor of Idaho signed a Memorandum of Agreement (MOA), which transferred most wolf management responsibilities to the State of Idaho. The Idaho Department of Fish and Game (IDFG) is the primary State agency responsible for carrying out wolf management activities in Idaho. In April 2005, the Governor of Idaho and the Nez Perce Tribe (NPT) signed an MOA that outlined responsibilities between the State of Idaho and the NPT in regards to wolf conservation and management. This annual progress report is a cooperative effort between IDFG and NPT, with contributions from USDA Wildlife Services (WS) summarizing wolf activity and related management in Idaho during 2005.

By the end of 2005, biologists documented 59 resident wolf packs in Idaho, observed a minimum of 370 wolves, and estimated the population at 512 wolves (Appendix A). In addition, 11 documented border packs have established territories that straddle state boundaries between Idaho, Montana, and Wyoming and likely spend some time in Idaho. Of the 40 packs known to have reproduced, 36 qualified as breeding pairs by the end of 2005. These 40 reproductive packs produced an estimated minimum 123 pups, two of which were known to have subsequently died.

In Idaho, wolf packs ranged from near the Canadian border south to Interstate Highway 84; and from the Oregon border east to the Montana and Wyoming borders. Dispersing lone wolves were occasionally reported in previously unoccupied areas. Eleven new packs were documented during 2005. More than 500 wolf observations were reported on IDFG's online website report form during 2005.

Forty-three wolves were confirmed to have died in Idaho in 2005. Of known mortalities, agency control and legal landowner take in response to wolf-livestock depredation accounted for 26 deaths, illegal take10 deaths, other human causes 6 deaths, and natural causes 1 death. One additional mortality was suspected.

During the 2005 calendar year, 26 cattle, 218 sheep, and 9 dogs were classified by WS as confirmed or probable kills by wolves.

ACKNOWLEDGEMENTS

Wolf management in Idaho is a cooperative effort between the U.S. Fish and Wildlife Service (USFWS), USDA Wildlife Services (WS), the State of Idaho, and the Nez Perce Tribe (NPT). The USFWS provided principal funding for wolf management in Idaho. We would like to thank the leadership and friendship of USFWS staff Ed Bangs, Gray Wolf Recovery Coordinator; Joe Fontaine; Jeff Foss, Snake River Basin Office Supervisor; and Steve Duke, division chief. The USFWS' Law Enforcement division's efforts in investigating wolf mortalities continued to aid wolf recovery. Our thanks go to Senior Agent Craig Tabor and Special Agents Scott Bragonier and Scott Kabasa. We especially acknowledge and thank Carter Niemeyer, retired USFWS Idaho Gray Wolf Recovery Coordinator, who for the last 5 years oversaw the wolf recovery effort in Idaho, and without whose leadership, knowledge, mentoring, and friendship, the transition to State management would not have occurred as smoothly.

We thank the WS field agents that responded to wolf depredation complaints and implemented wolf control actions in Idaho. Personnel involved in wolf control and management in 2005 included District Supervisors Charles Carpenter, Craig Maycock and Todd Grimm, Wildlife Specialists Jeff Ashmead, Doug Hansen, Doug Hunsaker, Gary Looney, Justin Mann, Kelly Parker, Shane Robinson, Eric Simonson, Dave Thomas, Wolf Specialist Rick Williamson, and pilots Joe Dory and Sam Kocherhans.

We would like to thank all IDFG personnel who in their day-to-day workload have taken on extra requirements this controversial species brings to Idaho. In particular, we would like to thank Dave Spicer, Lauri Hanauska-Brown, and Martha Wackenhut for assuming regional wolf coordinator responsibilities. Linda Thurston and Adam Gall worked as seasonal wolf biologists in the Clearwater and Panhandle Regions, respectively. Additionally, research, management, and enforcement staff have assisted in radio-collaring wolves including George Pauley, Mark Hurley, Pete Zager, Craig White, Mike Scott, Clay Hickey, Bret Stansberry, Mark Bowman, Josh Stanley, Nate Borg, and Dave Overman. Other headquarter staff that helped develop and oversee the program included Director Steve Huffaker, Terry Mansfied, Jim Unsworth, and Brad Compton. The Communications staff assisted a great deal in developing website, brochure, and outreach materials. Thanks to Roger Fuhrman, Sue Nass, Ed Mitchell, Steve Liebenthal, Niels Nokkentved, Linn French, Eric Stansbury, and Gina Glahn. Enforcement Bureau Chief Jon Heggen provided much assistance and leadership with his officers. Wildlife Lab personnel Dr. Mark Drew and Julie Mulholland provided much needed assistance. We couldn't conduct our work without assistance and leadership of other agency staff. The Governor's Office of Species Conservation director Jim Caswell and program advisor Jeff Allen provided insight, assistance, and oversight of a very controversial species.

The NPT's Gray Wolf Recovery Program received and appreciated the support of many dedicated agencies and organizations. We gratefully recognize the Bureau of Indian Affairs, the Defenders of Wildlife, the National Wildlife Federation, the U.S. Forest Service, the Wolf Education and Research Center, and all of the many individuals who generously contributed financial support and in-kind services. NPT's Executive Committee and Wildlife Program

Director Keith Lawrence provide unwavering support, input, and policy guidance. The U.S. Forest Service is recognized for its assistance in providing logistical support, wolf sighting reports, and friendship at the many districts within wolf range.

Dr. Clarence Binninger, NPT Wolf Recovery Program veterinarian, continues to work with us in seeking ways to make wolf capture as safe as it can be. We would like to thank Suzanne Stone of Defenders of Wildlife for her assistance in developing and applying non-lethal techniques to address wolf-livestock conflicts. Thanks also to Jim and Holly Akenson, University of Idaho Taylor Ranch; Kyran Kunkel; Wayne Melquist; and all of the guides and outfitters for their information and assistance.

Project back-country pilots and staff continued to support our often-demanding requests with courtesy. We truly appreciate your expertise, patience, and skill. We specifically recognize Mike Dorris, and Rod Nielson, McCall Aviation; Steve and Michele Wolters, Northstar Aviation; Gene Mussler, Sawtooth Aviation; Sam Kocherhans WS; and Pete Nelson, Middle Fork Aviation.

INTRODUCTION

In 1974, the gray wolf (*Canis lupus*) was listed under the Endangered Species Act (ESA) and protected as an endangered species in the continental U.S. The USFWS is mandated to recover federally listed species, including gray wolves. In the early 1980s, individual wolves, naturally dispersing from Canada, recolonized portions of northwest Montana near Glacier National Park. The first USFWS wolf recovery plan was developed through interagency cooperation in 1980 and was revised in 1987 (USFWS 1980; 1987). The 1987 plan called for establishing 3 northern Rocky Mountain (NRM) wolf recovery areas: northwest Montana (NWMT), the greater Yellowstone Area (GYA), and central Idaho (CID). The plan called for natural recovery in NWMT and wolf reintroductions into Yellowstone National Park (YNP) and CID. Following the guidelines of the 1987 plan, the USFWS developed an Environmental Impact Statement (EIS) for the reintroduction of gray wolves into YNP and CID (USFWS 1994). The EIS designated the GYA and CID recovery areas as Nonessential Experimental Population Areas and called for reintroductions of wolves as nonessential experimental populations, a less protective classification under section 10(j) of the ESA, to facilitate wolf management and conflict resolution (Figure 1). The Secretary of Interior approved the Final EIS in 1994. In 1995 and 1996, 66 wolves were captured in Alberta and British Columbia, Canada, respectively, 31 of which were reintroduced into YNP and 35 into CID.

Also in 1994, the USFWS developed a Final Rule, which provided management guidelines for recovering nonessential experimental wolf populations in the GYA and CID recovery areas. These guidelines differed somewhat from federal guidelines for fully endangered wolves in the NWMT recovery area. The state of Idaho contains portions of all 3 NRM recovery areas (Figure 1). Wolves south of Interstate Highway 90 (I-90) are classified as nonessential experimental and

are managed according to the provisions of the Final Rule. Wolves north of I-90 are classified and managed under a fully endangered ESA classification.

Efforts between the State of Idaho and the USFWS to develop a state wolf recovery plan were terminated in 1995 when the state legislature rejected a draft plan and forbade the IDFG to engage in wolf recovery activities. In 1995, the NPT completed, and the USFWS approved, the Wolf Recovery and Management Plan for Idaho, providing the mechanism for the USFWS to enter into a Cooperative Agreement with the NPT to recover and manage wolves in the CID recovery area. Wildlife Services also became partners with the USFWS to assist in investigating and implementing wolf control actions in response to depredations on livestock.

In March 2002, the Idaho Legislature accepted and passed the Idaho Wolf Conservation and Management Plan (http://fishandgame.idaho.gov/cms/wildlife/wolves/wolfplan.pdf). In April 2003, the Legislature passed House Bill B294 allowing the State to participate in wolf management, and IDFG to assist the Governor's Office of Species Conservation in implementing the State of Idaho's Wolf Conservation and Management Plan, as well as participate in wolf management with USFWS and NPT.

In 2003 and 2004, the IDFG participated in wolf management in cooperation with other governments and agencies. The IDFG also started to develop a statewide program in preparation for overseeing wolf management in Idaho. Wolves were monitored and managed under cooperative agreements and work plans between cooperating governments and agencies.

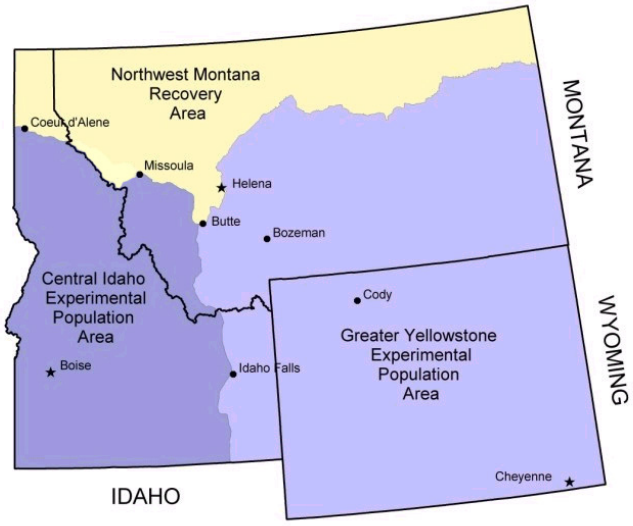


Figure 1. Recovery areas established by the U.S. Fish and Wildlife Service to restore gray wolf populations in the northern Rocky Mountains of Idaho, Montana, and Wyoming.

In December 2002, the NRM wolf population attained the established population recovery goal of 30 breeding pairs of wolves well distributed throughout the 3 states of Idaho, Montana, and Wyoming for 3 consecutive years (USFWS et. al. 2003). In 2003, the USFWS adopted regulations that reclassified, or down-listed, wolves from endangered to threatened in Idaho north of I-90; however, in early 2005, a federal court judge remanded these regulations. Consequently, wolves north of I-90 remained classified as fully endangered.

The ultimate goal of federal, state, and tribal governments is to recover and remove wolves from the protections of the ESA (delisting process). The USFWS will initiate the delisting process when the northern Rocky Mountain wolf population meets or exceeds established population goals, and the 3 states of Idaho, Montana, and Wyoming each have USFWS-approved wolf management plans and other legislation and regulations in place to insure long-term conservation of wolves. By 2003, most federal delisting requirements had been met. Wolf population recovery goals were met in 2002 and the states of Idaho and Montana had USFWS approved wolf management plans and adequate state laws in place. Wyoming's adopted wolf management plan, however, was not approved by the USFWS. In response, Wyoming sued the federal government requesting court approval of their plan. Consequently, delisting was delayed until Wyoming makes USFWS requested adjustments to its plan or federal courts rule that the USFWS accept Wyoming's plan.

In response to this delay, in February 2005, the USFWS revised the Final Rule (10(j) Rule). The new 10(j) Rule (Endangered and Threatened Wildlife and Plants; Regulation for Nonessential Experimental Populations of the Western Distinct Population Segment of the Gray Wolf [50 CFR Part 17.84]) applies only within the Nonessential Experimental Population Areas for states with USFWS-approved wolf management plans; currently Idaho and Montana. The 10(j) Rule is an interim measure to provide Idaho and Montana with more local wolf management authorities until Wyoming's situation is resolved and wolves can be delisted.

The 10(j) Rule allowed the states of Idaho and Montana to petition the Department of Interior to assume many day-to-day wolf management authorities. In January 2006, a Memorandum of Agreement (MOA) between the Secretary of Interior and the Governor of Idaho was signed that transferred most management authorities previously held by the USFWS to Idaho. The State of Idaho currently oversees daily management of wolves in Idaho and coordinates between agencies to fulfill obligations under the 10(j) Rule, the ESA, and the state wolf management plan.

In May 2005, a MOA was signed between the NPT and State of Idaho that outlined wolf monitoring and management responsibilities shared between the 2 governments. Under the MOA the NPT is responsible for monitoring wolves within IDFG Clearwater Region and McCall Subregion, while the State of Idaho is responsible for monitoring wolves across the rest of the state and management statewide.

This report fulfills annual USFWS requirements to summarize and report wolf status and management activities in Idaho. The goal of the State of Idaho, NPT, USFWS, and WS is to

continue to maximize our knowledge of wolves in Idaho while reducing conflicts and continuing toward the eventual delisting of wolves in the northern Rocky Mountains.

STATEWIDE SUMMARY

Previous progress reports by the NPT and the USFWS summarized wolf status within the Central Idaho Nonessential Experimental Population Area including central Idaho and portions of southwestern Montana. However, this report summarizes the status of wolves and wolf management within the borders of the State of Idaho, including portions of all 3 NRM recovery areas: endangered wolves in the NWMT recovery area north of I-90 and nonessential experimental wolves within Idaho portions of the CID and GYA recovery areas south of I-90.

Central Idaho, a vast, mountainous, and remote area, is one of the largest remaining undeveloped blocks of public land in the conterminous U.S. Central Idaho includes 3 contiguous Wilderness Areas, the Selway-Bitterroot, Frank Church-River of No Return, and Gospel Hump, encompassing almost 4 million acres (1.6 million ha), which represents the largest block of federally-designated Wilderness in the lower 48 states.

Three major mountain chains and 2 large river systems create a very diverse landscape, ranging from sagebrush-covered flatlands in the southern part of Idaho, to extremely rugged peaks in the central and northern parts. A moisture gradient also influences the habitats of both wolves and their prey, with wetter maritime climates in the north, supporting western red cedar-western hemlock vegetation types, grading into continental climates of Douglas-fir and Ponderosa pine to the south. Elevations vary from 1,500 feet (457 m) to just over 12,000 feet (3,657 m). Annual precipitation varies from less than 8 inches (20 cm) at lower elevations to almost 100 inches (254 cm) at upper elevations.

MONITORING

The Idaho wolf population has continued to expand in both numbers and packs since initial reintroductions in 1995 (Tables 3 and 4; Figures 1 and 4). The status of 67 documented and suspected wolf packs and potential mated pairs, and areas of suspected wolf activity was investigated during 2005. By the end of 2005, 59 wolf packs were documented in Idaho, including 11 new packs, and a minimum of 370 wolves was observed or monitored with radio telemetry by wolf program personnel. Using techniques established in previous years, the Idaho population was estimated tat 512 wolves (Appendix A). In addition, the wolf program identified 6 areas occupied by suspected packs where wolf presence was verified although numbers and status of wolves remained unknown, and 11 areas of suspected wolf activity where presence of wolves was suspected but was not verified. Finally, 3 packs were retroactively added as documented packs for 2004 based on information obtained in 2005.

Distribution, Reproduction, and Population Growth

Wolves were well distributed in the state from near the Canadian border, south to the Snake River plan, and east to the Montana and Wyoming borders (Figure 4). Of the 59 documented packs monitored during 2005, territories of all were wholly or predominantly on US Forest Service (USFS) public lands; 24 included at least a portion of their territory within federally designated wilderness.

Of 59 documented packs, a minimum of 40 produced litters and 36 qualified as breeding pairs (Table 3). A minimum of 123 wolf pups was documented in 2005; two of which were known to have died. Wolf pup counts were conservative estimates because not all pups were observed at packs that were monitored and some documented packs were not visited. Minimum documented litter size ranged from 1-6 pups. Average minimum litter size for those packs where counts were believed complete (n = 30) was 3.5 pups per litter. Nine new breeding pairs were documented and the reproductive status of 17 extant packs was not verified during 2005.

Between 2004 and 2005, the Idaho wolf population increased by an estimated 21%. This rate of growth is expected to decrease in the future as the wolf population reaches human social and biological carrying capacity. The human social carrying capacity for wolves will likely be below the biological carrying capacity as wolves are managed in concert with other wildlife values, livestock concerns, and other management objectives. Ultimately the citizens of Idaho, not habitat or prey availability will determine the number and distribution of wolves in the state.

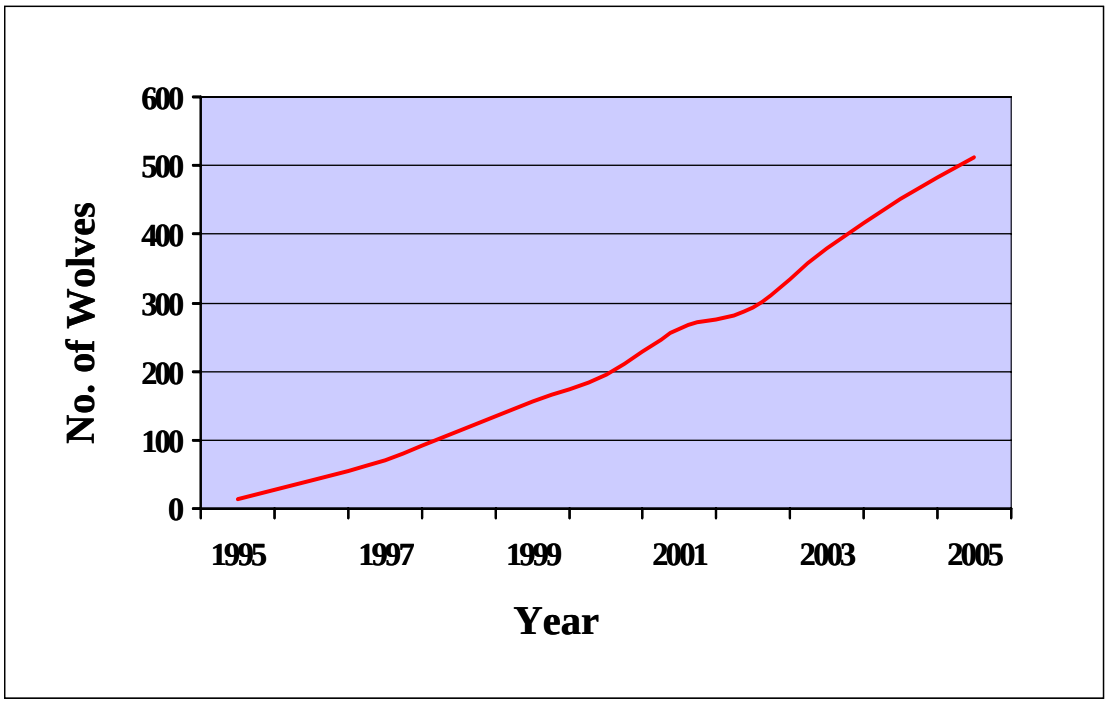


Figure 2. Estimated number of wolves in Idaho, 1995-2005.

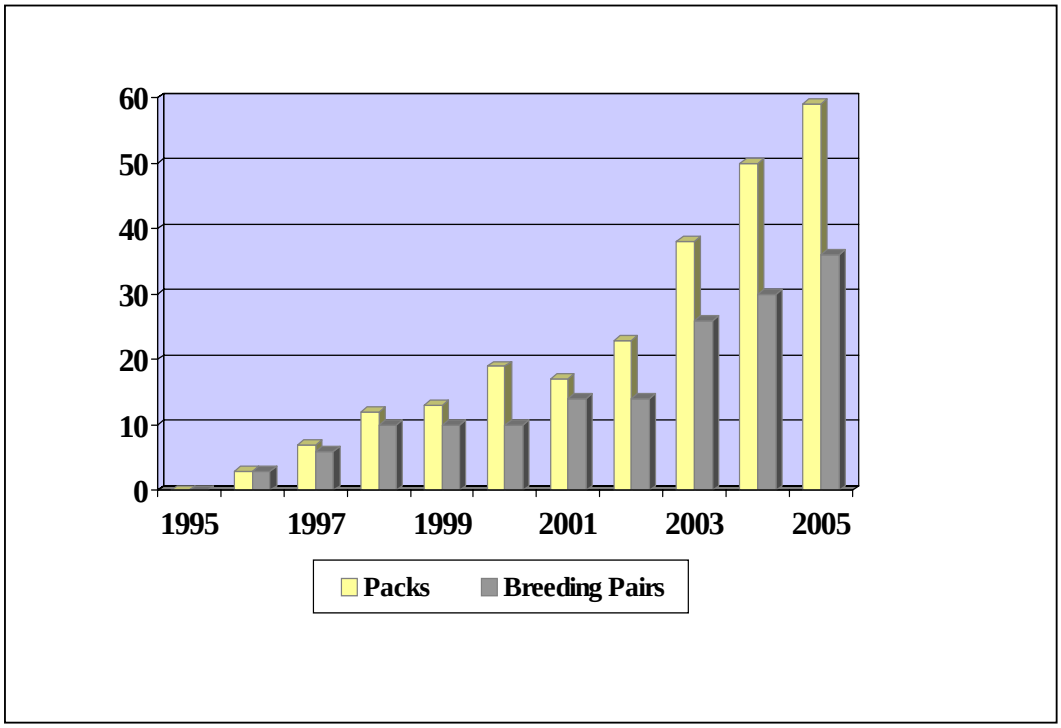


Figure 3. Number of documented wolf packs and breeding pairs in Idaho, 1995-2005.

Mortality

Forty-three documented, and 1 suspected, wolf mortalities were recorded in 2005 (Table 3). All but 1 confirmed mortality of known cause (97%; *n* = 39) were human-related (control [*n* = 23], illegal take [*n* = 10], legal take [*n* = 3], other human causes [*n* = 2]), and natural [*n* = 1]). These figures are underestimates of the true amount of overall mortality occurring within the wolf population, as documenting mortalities of uncollared wolves that are not lethally controlled by agencies is difficult. Only 1 wolf death due to natural causes was recorded, another indication that mortality was underestimated, as more individuals likely succumbed to non-human-related factors. There were no means to estimate deaths of pups that occurred prior to or after our visits to den and rendezvous sites.

More wolves (*n* = 23) were lethally controlled in Idaho in 2005 than in any previous year. This mortality stemmed from removals in 6 packs: the Buffalo Ridge pack (1 individual) near Clayton, Idaho; the Chesimia pack (4 individuals, including the suspected alpha female)

southeast of Elk River, Idaho; the Copper Basin pack (9 individuals) between Ketchum and Mackay, Idaho; the Hyndman pack (the suspected alpha female) east of Hailey, Idaho; the Moyer Basin pack (the suspected alpha male) southwest of Salmon, Idaho; the Partridge Creek pack (4 individuals, including the alpha female) north of McCall, Idaho; a dispersing wolf from the

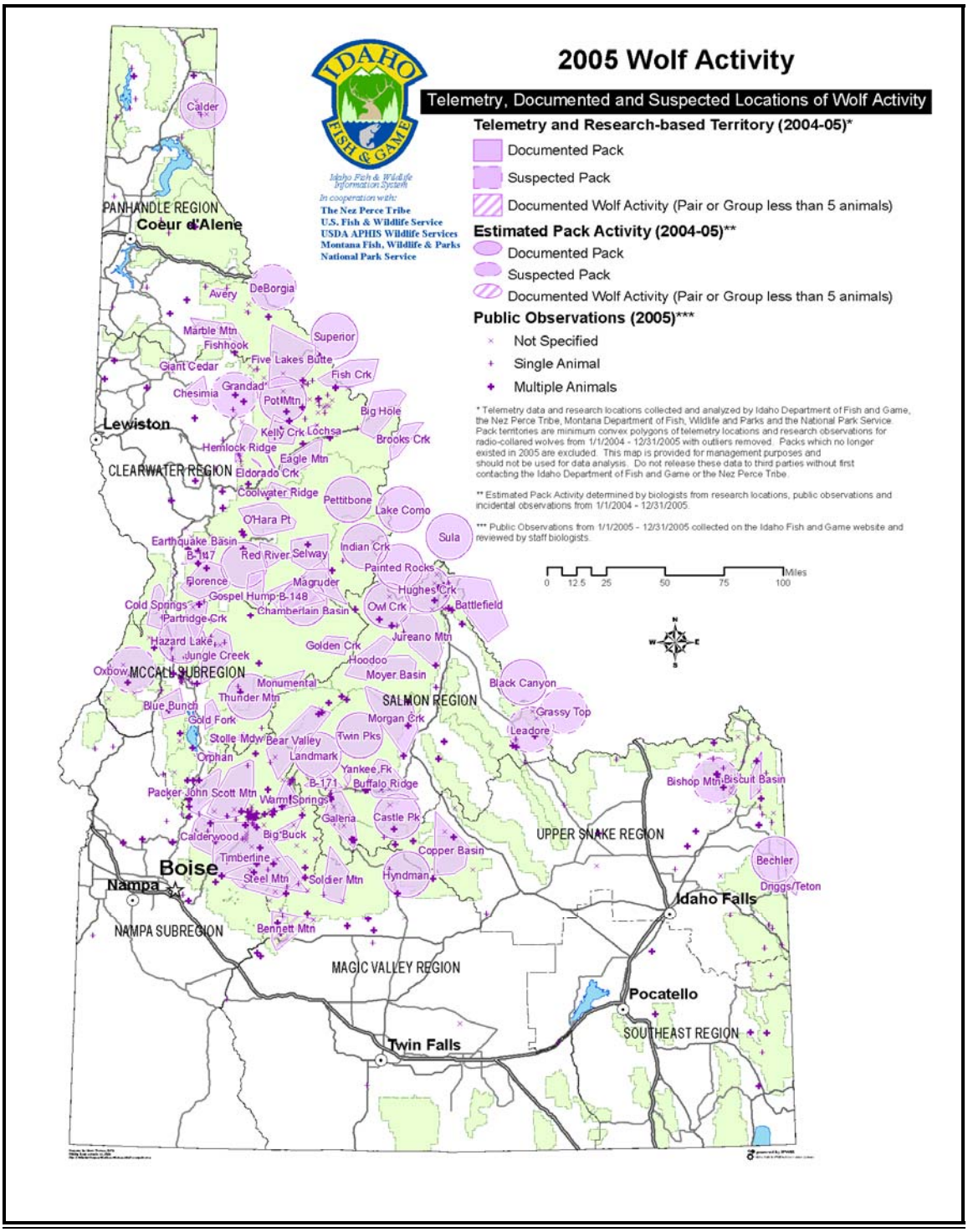


Figure 4. Distribution of documented and suspected wolf packs, other documented non-pack wolf groups, and public wolf reports in Idaho, 2005.

Buffalo Ridge pack taken near Mackay, Idaho; and 2 wolves removed north of McCall whose pack affiliations were uncertain. Three wolves from the Orphan pack were legally shot by landowners that were issued shoot-on-sight permits after chronic livestock depredations. Two of these wolf carcasses were recovered but the third was not. It was believed to have died. Finally, 1 wolf was taken in the act of attacking livestock on private property by a landowner near Mackay, Idaho.

Since 1995, human factors were the greatest source of documented mortality for wolves. Wolves lethally controlled and legally taken, both radio-collared and uncollared, were well documented. Illegal take, especially of uncollared animals, was difficult to document. The number of radio-collared wolves documented or suspected to have been illegally killed, in proportion to the total number of radio-collared wolves monitored during 2005, was used to generate an estimate of illegal take statewide. This is a minimum estimate in that some radio-collars are likely destroyed when wolves are illegally killed, precluding documentation. This computation, based on 96 radio-collared wolves during 2005, suggests that 41-47 wolves were illegally killed in 2005. This represented 7-8% of the pre-mortality population estimate and would be additive to other sources of mortality. Other sources of mortality (other/unknown [6%], other human causes [4%], and lethal control [4%]) represented 14% of the pre-mortality population estimate. Total mortality for Idaho was estimated at 21-22% of the pre-mortality population estimate.

Livestock and Dog Mortalities

During 2005, WS conducted 85 depredation investigations involving reported wolf-killed livestock. Of those, 47 (55%) involved confirmed wolf depredations, 8 (9%) involved probable wolf depredations, 17 (20%) were possible/unknown wolf depredations, and 13 (15%) were due to causes other than wolves. During calendar year 2005, WS reported 26 cattle, 218 sheep, and 9 dogs that were classified as confirmed or probable wolf kills (Table 5). Nonlethal techniques were used to reduce wolf-livestock conflicts when appropriate.

LAW ENFORCEMENT

During 2005, USFWS Special Agents and IDFG Conservation Officers cooperatively investigated and reported 18 known and suspected cases of unlawful take of wolves. Of the 18 wolves killed, eleven were shot, one was poisoned, and the cause of death for six was unknown. Two investigations have resulted in guilty pleas and were adjudicated through the federal court system. Other investigations are ongoing.

RESEARCH AND MANAGEMENT

Agencies continue to coordinate and support scientific research assisting in long-term wolf conservation and management.

Statewide Elk and Mule Deer Ecology Study

During 2005, the IDFG began an intensive, multi-year effort to scientifically measure the effects of wolf predation, habitat condition, and forage nutrition on elk and mule deer populations across representative landscapes in Idaho. Elk and deer were radio-collared in 12 project areas encompassing 20 big game management units across the state. Long-term goals include radio-collaring 300 adult female elk, 300 adult female deer, 100 6-month-old elk calves, 100 6-month-old deer fawns, 100 newborn elk calves, and 100 newborn deer fawns. Research objectives include 1) determine survival, cause-specific mortality, pregnancy rates, and body condition for radio-collared animals; 2) monitor wolf distribution and abundance within project areas; 3) develop habitat condition and trend maps for Idaho; and 4) manipulate predator populations in project areas and monitor ungulate population responses. This research will help identify and evaluate specific predator and habitat management actions necessary to achieve ungulate population objectives. Secondly, this research will provide contemporary estimates of non-hunting mortality, survival, and productivity of elk and deer populations for determining appropriate hunting seasons.

Effects of Wolf Predation on North Central Idaho Elk Populations

The IDFG developed a proposal to evaluate effects of wolf predation on elk populations in the Lolo and Selway elk management zones. Elk populations in these 2 zones are below established state management objectives. The proposal included a review of elk population data, cause-specific mortality research being conducted on elk, wolf population data, and modeling conducted to simulate impacts of wolf predation on elk using estimated population parameters. Additionally, this proposal identified conservation measures already implemented, and future management actions and objectives proposed, in an attempt to improve and monitor elk populations in these areas. The proposal calls for removal of 75% or up to 43 wolves, within the Lolo elk management zone to enhance female elk survival.

Developing Monitoring Protocols for the Long Term Conservation and Management of Gray Wolves in Idaho

Gray Wolf recovery efforts in the northern Rocky Mountains (Idaho, Montana, and Wyoming) have met with much success, as all 3 states support viable recovered wolf populations. Monitoring and estimating recovering wolf populations in the northern Rocky Mountains has, to date, relied on time intensive and expensive radio telemetry techniques. Although this approach worked well with initial small population sizes, these techniques are no longer appropriate or

cost-effective given the current, much larger recovered population size and nearly statewide distribution.

The NPT, University of Montana Cooperative Wildlife Research Unit, the USFWS, and the IDFG are collaborating on a multi-year research effort to develop less intensive and more cost-effective approaches for estimating wolf population numbers across the varied landscapes of Idaho. We are proposing a 3.5-year research effort to develop standardized wolf monitoring protocols for estimating wolf population parameters appropriate for meeting post-delisting monitoring and management needs, help implement wolf management plans, address wolf management goals and objectives, and insure long-term conservation and management of the species.

Multiple study areas will be identified throughout the state representative of landscape constraints including snow and timber cover, access, and terrain to assess logistical application of methods. Intensive wolf trapping and radio-collaring efforts will be conducted in each study area to evaluate the ability of protocols to index know population levels. Cost, effort, logistical considerations, accuracy and precision for each protocol will be evaluated to determine its ability to address management goals.

Standardized monitoring protocols will be important in satisfying the USFWS' 5-year post-delisting monitoring requirements and will be crucial to insure sustainability of the population through effective post-delisting conservation and management of wolves. Results of this effort will also be useful to other states, particularly Montana and Wyoming, developing monitoring protocols for wolves across the northern Rocky Mountains.

OUTREACH

Program personnel presented informational talks and status reports throughout the year to various federal and state agencies, public and private institutions, special interest groups, and rural communities. Additionally, scores of informal presentations to small groups or individuals were conducted during this time.

The IDFG online wolf reporting system provided an opportunity for the general public and professionals to record wolf observations in Idaho. During 2005, the IDFG received over 500 wolf observations online that assisted biologists in identifying new packs; recording the movements, size, and distribution of known packs; providing information on wolf behavior and other important information.

APPENDIX A

Population Estimation Techniques used to determine wolf population numbers in Idaho.

Since wolves were first reintroduced into Idaho, annual winter wolf population estimates have been calculated using the same technique. Following this technique, for any given year, the wolf population is estimated by starting with the previous end-of-year estimate, adding all documented reproduction and immigration, and subtracting all documented mortality and emigration for the current year. Mathematically this techniques is represented as:

Wolf Population Estimate = Last year's population estimate + documented pups produced + immigrants – documented mortalities – emigrants

Using this technique, the 2005 wolf population estimate is 512 wolves:

(422) + (123) + (12) – (44) – (2) = 512 wolves

This technique has worked well for the first several years after wolves were reintroduced when the population was relatively small and most wolves were radio-collared. As most, if not all, packs could be actively monitored using radiotelemetry, reproduction, mortality, and dispersal could be accurately assessed. For small recovering populations monitored using radiotelemetry, this technique is essentially a total count method.

Using the same population estimation technique from year to year is important to assess population trends across years. Idaho wolf population estimates have increased every year since wolves were first reintroduced in 1995. The 2005 estimate indicated a 21.6% population increase from the previous year (*lamda* = 1.22).

As the Idaho wolf population expanded, our confidence in this technique has waned because it became increasingly difficult to document all packs; a smaller proportion of the wolf population was radio-collared increasing the difficulty for monitoring status of known packs; and reproduction, mortality, and dispersal became more difficult to assess. Static funding and personnel in the face of an expanding wolf population and workload added to the challenge of collecting sufficient data required by this technique to accurately estimate the growing number of wolves.

We have, for the past few years, explored additional methods of estimating the wolf population that are more appropriate given a much larger fully recovered population and applicable for the types of data we are able to collect. Our efforts have recently focused on one of the most promising methods that we anticipate having peer reviewed and implemented by 2006.

APPENDIX B

IDAHO PERSONNEL WORKING ON WOLVES DURING 2005

Idaho Department of Fish and Game

Steve Huffaker, Director
Jim Unsworth, Wildlife Bureau Chief
Brad Compton, Big Game Manager
Steve Nadeau, Large Carnivore Manager/wolf program coordinator
Jason Husseman, Regional Biologist (full time)
Michael Lucid, Regional Biologist (full time)
Linda Thurston, Regional Biologist (seasonal)
Adam Gall, Technician (contractual work)
Brent Thomas, GIS data management specialist
Dave Spicer, Regional Biologist (assume some regional duties)
Lauri Haunuska-Brown (assume some regional duties)
Many other staff contributed time and effort assisting the wolf program

Nez Perce Tribe

Aaron Miles, Natural Resource Manager
Keith Lawrence, Wildlife Program Director
Curt Mack, Wolf Recovery Project Leader
Jim Holyan, Wolf Biologist
Isaac Babcock, Wolf Biologist
Tyler Hollow, Wolf Biologist
Mary Allen, Office Assistant
Venus St. Martin, Office Assistant
Sean Babcock, Volunteer
Barry Braden, Volunteer
Kelsey Dalton, Volunteer
Janeen Hetzler, Volunteer
Cason Johnson, Volunteer
Stuart Phelps, Volunteer
Erin Simmons, Volunteer

U.S. Fish and Wildlife Service, Snake River Basin Office

Jeff Foss, Supervisor
Carter Niemeyer, Idaho Wolf Recovery Coordinator
Steve Duke

U.S.D.A. Wildlife Services

Mark Collinge, State Director
Todd Grimm, Area Supervisor
Rick Williamson, Wolf Specialist
Many other field agents contributed to the wolf program

APPENDIX C

CONTACTS FOR IDAHO WOLF MANAGEMENT

Idaho Fish and Game Regional Offices at:

Headquarters Wildlife Bureau	(208) 334-2920
Panhandle Region	(208) 769-1414
Clearwater Region	(208) 799-5010
Southwest Region	(208) 465-8465
McCall Subregion	(208) 634-8137
Magic Valley Region	(208) 324-4350
Southeast Region	(208) 232-4703
Upper Snake Region	(208) 525-7290
Salmon Region	(208) 756-2271

For information about wolves in Idaho and IDFG management:

- http://fishandgame.idaho.gov/cms/wildlife/wolves/

To contact IDFG via email:

- http://fishandgame.idaho.gov/inc/contact.cfm

The Nez Perce Tribe's Idaho Wolf Recovery Program:

Telephone; (208) 634-1061
Fax; (208) 634-3231
Mail; P.O. Box 1922
McCall, ID 83638-1922
Email; cmack@nezperce.org
jholyan@nezperce.org

For information about the Nez Perce Tribe's Wildlife Program and to view Recovery Program Progress Reports, please visit the following website:
http://www.nezperce.org/Programs/wildlife_program.htm

U.S. Fish and Wildlife Service Northern Rocky Mountain Wolf Recovery:
For information about wolf recovery in the Northern Rocky Mountains, please visit the USFWS website at the following:

- http://www.westerngraywolf.fws.gov/

- http://fishandgame.idaho.gov/wildlife/wolves

To report wolf sightings within Idaho:

- http://fishandgame.idaho.gov/wildlife/wolves/report.cfm

To report livestock depredations within Idaho:

USDA/APHIS/Wildlife Services	
State Office, Boise, ID	(208) 378-5077
District Supervisor, Boise, ID	(208) 378-5077
District Supervisor, Gooding, ID	(208) 934-4554
District Supervisor, Pocatello, ID	(208) 236-6921
Wolf Specialist, Arco, ID	(208) 681-3127

To report information regarding the illegal killing of a wolf or a dead wolf within Idaho:

U.S. Fish and Wildlife Service Senior Agent, Boise, ID	(208) 378-5333
Citizens Against Poaching (24hr) or any IDFG Office	1-800-632-5999

WYOMING WOLF RECOVERY 2005 ANNUAL REPORT

A cooperative effort by the U.S. Fish and Wildlife Service, National Park Service, and USDA Wildlife Services

Photo by Lisa Robertson 2006

This cooperative report presents information on the status, distribution, and management of wolves in Wyoming, including Yellowstone National Park, from January 1, 2005 to December 31, 2005.

This report may be copied and distributed as needed.

Suggested Citation*:* Jimenez, M.D., D.W. Smith, D.R. Stahler, D.S. Guernsey, and R.F. Krischke. 2006. Wyoming Wolf Recovery 2005 Annual Report. Pages 81-101 *in* U.S. Fish and Wildlife Service. 2006. Rocky Mountain Wolf Recovery 2005 Annual Report. C.A. Sime and E. E. Bangs, eds. USFWS, Ecological Services, 585 Shepard Way, Helena, Montana. 59601. 130pp.

WYOMING AND YELLOWSTONE NATIONAL PARK

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WYOMING and YELLOWSTONE NATIONAL PARK SUMMARY

The total gray wolf (*Canis lupus*) population in Wyoming decreased approximately 7% from 272 wolves in 2004 to 252 wolves in 2005. The wolf population in Wyoming includes wolf packs Yellowstone National Park (YNP) that are not otherwise counted in the Montana or Idaho population. The number of wolves within YNP decreased approximately 31% from 171 wolves in 2004 to 118 wolves in 2005. However, the number of wolves in Wyoming outside YNP increased approximately 33% from 101 wolves in 2004, to 134 wolves in 2005. YNP contained 13 wolf packs including 7 breeding packs that produced at least 69 pups, but only 22 survived. Wyoming outside YNP had at least 13 packs including 9 packs with at least 47 surviving pups.

Numerous ongoing research projects are investigating predator-prey relationships, wolf population dynamics, interactions between wolves and other predators, and livestock depredations.

Wolves in Wyoming preyed primarily on elk, but also preyed on moose, deer, and bison. Wolves were confirmed responsible for killing at least 81 livestock and 1 dog. Twenty-two probable depredations were also recorded. Ten of the 13 packs in Wyoming outside YNP were involved in at least 1 depredation. Forty-one wolves (approximately 22% of the wolf population outside YNP) were killed in control actions to reduce further livestock depredations.

PERSONNEL

Wyoming Outside Yellowstone National Park

Wolves in Wyoming outside YNP were monitored by Project Leader Mike Jimenez (USFWS), Jim Pehringer [USDA Wildlife Services(WS)], Steve Cain, Sarah Dewey [Grand Teton National Park (GTNP)], and volunteers Susannah Woodruff, Karen Colclough, Lydia Dixon, Dylan Taylor, Leah Samberg, Ronnie Hegemann, and Rebecca Hanson. In 2005, the USFWS and WS combined funding to create a wolf management specialist position (Jim Pehringer, WS) stationed in Cody, Wyoming and work under the direction of the USFWS.

USFWS law enforcement agents in Wyoming were Dominic Domenici (Resident Agent-in-Charge, Casper), Tim Eicher (Special Agent, Cody), and Roy Brown (Special Agent, Lander).

Wyoming employees of WS who were involved with wolf control or management in 2005 included state director Rod Krischke, district supervisors Craig Acres and Merrill Nelson, specialists Jim Pehringer, Rod Merrell, Arnold DeBock, Tracy Frye, Stephen Moyles, Michael Peterson, Jed Edwards, Will Ross, Matt Lumley, and pilot Ted Jensen.

Yellowstone National Park

Three full-time employees worked for the Yellowstone Wolf Project in 2005: Project Leader Douglas Smith, Project Biologist Dan Stahler, and Biological Science Technician Debra Guernsey. Rick McIntyre worked as a seasonal employee on the Druid Peak Pack Road Management Project. Emily Almberg also worked on the Druid Road Management Project, through the Yellowstone Park Foundation (YPF). Abby Nelson, Matt Metz and Katie Yale worked the winter and/or summer months as biological technicians. Other Volunteers (see *Acknowledgments*) staffed the two early (Nov-Dec) and late (March) winter study periods: Erin Albers, Emily Almberg, Jessica Auer, Jack Bean, Adam Fahnestock, Stefani Farris, Tim Hudson, Angela Jardine, Laura Kelly, Scott Laursen, Matt Metz, Abby Nelson, and Elissa Pfost.

MONITORING

Yellowstone National Park

Population status: At the end of December 2005, at least 118 wolves in 13 packs (Cougar Creek I & II were considered as 1 pack) occupied YNP. This represents a loss of 53 wolves (31%), the largest population drop of any year since reintroduction. Most of the decline was attributable to very poor pup survival. Disease was suspected as the cause for the high pup mortality. Three packs either left YNP or dissolved, and two others declined substantially and will likely disappear. The Biscuit Basin pack moved out of YNP and now resides in Idaho, The Specimen Ridge and Geode Creek packs no longer exist. The Nez Perce and Swan Lake packs will likely dissolve in 2006. In late December 2005, the alpha female of Nez Perce was killed by the Gibbon Meadows pack and the surviving pack members split up and dispersed. Despite a count of 13 packs, only 11 are likely to survive. Of these 11 packs, 7 counted as breeding pairs in 2005.

Five (not counting the Swan Lake pack) of these packs (51 wolves, down 33 wolves (35%) use the northern area (1000 km^2; called the northern range) and 6 (not counting Nez Perce) packs (60 wolves, down 25%) use the rest of YNP. Pack size ranged from 4 (Druid Peak) to 17 (Yellowstone Delta) and averaged 9.0 individuals.

Despite the significant decline, wolf distribution was largely unchanged from 2004. Wolf range continues to be the northern range, Pelican Valley, Hayden Valley, the Madison-Firehole area, north of the Madison River, the Thorofare, and Bechler area.

Reproduction: At least 69 pups were born and 22 survived. Pup survival was especially poor on the northern range (8 of 49 pups survived until winter; 16% survival). The Druid Peak, Swan Lake, and Nez Perce packs had pups, but none of them survived. Mollie's pack did not have any pups probably because the breeding female (alpha) died shortly before the breeding season and was not replaced. The Slough Creek and Leopold packs had more than 1 litter. Slough Creek had a confirmed 4 breeding females (15 pups born; 3 survived). Leopold had at least 3 and

possibly 4 breeding females (19 pups born; 2 survived). Average pups produced per pack was 6.9 (including packs with multiple breeders; range 1-19). The number of pups that survived per pack was 2.2 (range 0-5), for an overall pup survival of 32%.

Den sites were again visited and scats picked up for summer food habits. The Swan Lake, Leopold, Delta, Bechler, Gibbon Meadows, Cougar Creek and Nez Perce wolves denned in a previously used dens. The Agate Creek, Slough Creek, Druid Peak, and Hayden Valley packs denned in new dens in 2005.

Mortalities: Not counting over-summer pup mortality, 25 radio-collared wolves died in 2005. Four old adults (>6 years old), 14 adults (2-5 yrs), 6 yearlings, and 1 pup including 13 males and 12 females were known to have died. Nine (36%) died due to intraspecific strife, 5 (20%) to natural but unknown cause, 3 (12%) to mange, 2 (8%) to interspecific killing, 2 human caused (8%), 1 (4%) malnutrition, and 3 (12%) were unknown cause of death. Overall, this was a 15% mortality rate.

Wyoming outside Yellowstone National Park

Population status*:* We combined 3 census techniques to estimate the total number of wolves in Wyoming outside YNP: 1) direct observations of wolves, 2) winter track counts of wolves traveling in snow, and 3) confirmed reports of wolf sightings from other agencies. We counted the number of wolves in packs containing radio collared wolves using visual observations from the ground and aerial telemetry flights. Twelve wolves were radio collared in 2005. We monitored 23 radio-collared wolves in 12 packs (17% of the population). We tracked wolves in winter and counted the different sets of wolf tracks in snow. In areas where repeated sightings were confirmed, we incorporated those observations into our estimates. We averaged the high and low population estimates to calculate other statistics used to describe the wolf population in Wyoming.

As of December 31, 2005, we estimated that at least 134 wolves inhabited western Wyoming outside YNP in 2005. Thirteen packs contained 112 wolves and another 22 wolves (single wolves and smaller groups of non-breeding wolves) were located throughout the western portion of the state. Pack size ranged from 5 to 15 and averaged 8.6 wolves.

Reproduction: Nine packs produced at least 47 pups that survived past December 2005: Washakie, East Fork, Teton, Flat Creek, Sunlight, Absaroka, South Fork, Wood River, and Carter Mountain Packs. Mean litter size was 5.2 pups per litter. No pups were produced by the Driggs/Teton Pack. We were not able to confirm pup production in 3 packs: Pacific Creek, Beartooth, and Greybull River.

Population growth: In 2004, it was reported that wolf population numbers increased in Wyoming outside YNP from 82 wolves in 2003, to 89 wolves in 2004. Two new packs (Pacific Creek and East Fork Packs) were confirmed in 2005, but these packs probably existed in 2004.

Past reports indicated that ≥ 6 wolves were in the Pacific Creek Pack in 2004. Trapping a yearling wolf in 2005 indicated that the East Fork Pack existed in 2004. Based on corrected estimates, we report an increased growth in 2004 of 23% from 82 wolves in 2003 to 101 wolves in 2004. In 2005, the wolf population increased 33% from 101 wolves in 2004 to 134 wolves in 2005.

Mortalities: In 2005, a total of 51 wolves (28% of the total population) were known to have died in Wyoming outside YNP. Causes of mortality included: control = 41 (80% of documented mortality); under investigation = 5 (10%); natural = 3 (6%); and vehicles = 2 (4%).

In 2004, mange was documented in 2 packs in the Sunlight Basin area east of YNP (Sunlight and Absaroka packs). We suspect the wolves infested with mange in the Absaroka Pack died but healthy wolves recolonized the area and continued to use the same general home range. Three wolves infested with mange from the Sunlight Pack were collared in 2004; however, none of these wolves had mange in 2005. No mange was seen in any packs in Wyoming in 2005.

Miscellaneous wolves in Wyoming: In 2005, we documented at least 22 single wolves or small groups of non-breeding wolves throughout western Wyoming. In addition, repeated reports of wolf sightings, tracks, or howling were recorded south of Rock Springs, south of Baggs, southwest of Lander, and in the Big Horn Mountains. Wolf sightings and wolf movements will be monitored through out winter/spring to confirm the presence of wolves and to document future pack formation.

General Location	# of wolves	Comments
Pinedale/Cora	4	no radio collars
Daniel	≥ 4	no radio collars
Big Piney	4	no radio collars
Upper Green River	4	collared dispersing wolf
Kemmerer/Hamsfork	≥ 2	no radio collars
Jackson	1	collared dispersing wolf
Jackson	1	collared dispersing wolf
Alpine/Afton	> 2	no radio collars
Minimum total:	22 wolves	

Population movement and dispersals in Wyoming: Numerous uncollared wolves dispersed south and east of YNP and recolonized new areas in western Wyoming. Many dispersing wolves attempted to settle in southwest Wyoming where thousands of sheep and cattle grazed. Wolves were lethally removed when they chronically killed livestock (see *Livestock Depredation and Management* section). At least 8 radio collared wolves dispersed in 2005 from YNP to various areas in northwest Wyoming.

YNP Dispersing Wolves	Natal Pack	New Location	Fate
#341f	Nez Perce	Jackson, WY	single wolf
#485f	Nez Perce	NW Wyoming	unknown
#395f	Delta	NW Wyoming	unknown
#400f	Delta	NW Wyoming	mortality
#343m	Molly	NW Wyoming	mortality
#44f	Delta	NW Wyoming	mortality
#350m	Druid	Jackson, WY	pair of wolves

RESEARCH

Yellowstone National Park

Wolf-prey relationships: Wolf–prey relationships were documented by observing wolf predation directly and by recording the characteristics of wolf prey at kill sites. Wolf packs were monitored during two winter-study sessions, 30-day periods in March and November–December during which wolves were intensively radio-tracked. The Leopold, Geode Creek (March), Slough Creek, and Hellroaring (Nov.-Dec.) packs were monitored by two person teams from the ground and from aircraft; the Swan Lake, Agate Creek, Mollie's, Gibbon Meadows, Nez Perce, and Cougar Creek packs were monitored from aircraft only. The Yellowstone Delta, Bechler, and Biscuit Basin packs were rarely located by ground or air due largely to their absence from the park or poor conditions for aerial monitoring in southern YNP. Project staff recorded and entered into a data base behavioral interactions between wolves and prey, predation rates, the total time wolves fed on their kills, percent consumption of kills by wolves and scavengers, characteristics of wolf prey (e.g., sex, species, nutritional condition), and characteristics of kill sites. In addition, similar data were collected opportunistically throughout the year during weekly monitoring flights and ground observations. The abundance and sex-age composition of elk within wolf pack territories were also estimated from the ground.

Composition of Wolf Kills: Project staff detected 316 kills (definite, probable, and possible combined) made by wolves in 2005, including 244 elk (77 %), 29 bison (9 %), 4 moose (1%), 6 deer (2 %), 1 pronghorn (<1%), 1 badger (< 1%), 2 skunk (1%), 4 coyotes (1 %), 2 ravens (1%), 9 wolves (3 %), and 14 unknown prey (4 %). The composition of elk kills was 18 % calves (0–12 months), 11 % cows (1-9 years old), 12 % old cows (= 10 years old), 43 % bulls, and 16 % elk of unknown sex and/or age. Bison kills included 9 calves (unknown sex), 10 cows, 6 bulls, and 4 unknown sex and age.

Predation rates (calculated via the double count method) for the period of 1995-2000 showed wolves residing on the northern range killed an average of 1.8 elk/wolf/30-day study period during the winter. Using a slightly different method (minimum kill rate), in winters 2004 through 2005, wolves on the northern range killed an average of 0.9 ungulates/wolf/30-day study. Although methods of calculation are not directly comparable, this decline of 50%

suggests changing ecological conditions on the northern range. A significant increase in scavenging on winter-killed bison and elk by wolf packs for winters 2004 and 2005 likely maintained wolf food consumption despite kill rates declining. Prey selection also appeared to be changing with fewer elk calves and more bulls taken.

Winter Studies: During the 2005 March winter study (30 days), wolves were observed for 404 hours from the ground. The number of days wolf packs were located from the air ranged from 3 (Biscuit Basin) to 18 (Leopold, Geode, Druid Peak, Slough Creek, Agate Creek). Sixty-nine definite or probable wolf kills were detected, including 60 elk, 3 bison, 2 mule deer, 1 moose, and 3 unknown species. Among elk, 7 (12%) were calves, 15 (25%) were cows, 33 (55%) were bulls, 5 (8%) were of unknown sex adult. In addition, 16 ungulates that died from other natural causes (winter kill, cougar kill, stuck in mud) were scavenged by wolf packs, including 9 bison and 7 elk. Of note, the 25-member Leopold pack had an unusually low kill rate in March because they scavenged 4 bison and 3 elk carcasses.

During the 2005 November–December winter study (30 days), wolves were observed for 296.5 hours from the ground. The number of days wolf packs were located from the air ranged from 9 (Druid Peak) to 18 (Leopold, Hellroaring, Slough Creek, Agate Creek, Cougar Creek). Fifty-five definite or probable wolf kills were detected during the November-December 2005 Winter Study, including 44 elk, 5 bison, 2 deer, 2 moose, 2 unknown. Among elk, 11 (25%) of the kills were calves, 12 (27%) were cows, 18 (41%) were bulls, and 3 (7%) were elk of unknown sex and age.

Summer Studies

Summer Predation: In the summer of 2005, project staff continued efforts to document summer predation patterns by wolves. Documenting the predatory habits of wolves in summer is problematic due to the lack of snow for tracking, increased nighttime activity of wolves, lack of pack cohesiveness, and smaller prey packages leading to quick consumption and loss of evidence. Traditionally, the best data concerning wolf summer food habits have come from analysis of scat contents collected at den and rendezvous sites. Although this effort on scat collection continued in 2005, downloadable GPS collars were deployed to facilitate a greater understanding of summer wolf predation.

The Wolf Project deployed five GPS (Global Positioning System) collars in the 2005 capture season to enhance our understanding of 1) seasonal predation patterns; 2) spatial and temporal interactions with other wolf packs and other carnivores; 3) movements with respect to dens during pup rearing season; and 4) territory size, use, and overlap. Using GPS radio collars with downloadable data acquisition technology, weekly data gathering on collars was attempted. Collars programmed to collect location data every 30 minutes for the summer season provided researchers with a high resolution of wolf movements and allowed wolf kills to be found, even newborn elk calves.

Unfortunately, challenges associated with malfunctioning collars or the death of the wolves wearing GPS collars made summer predation patterns difficult to document. Geode alpha male 227M, who was wearing a summer predation GPS collar, was killed by the neighboring Leopold pack in March. Another Geode wolf, pup 488M, was fitted with a summer predation GPS collar as well, but due to death of the alpha male and strife with the Leopold pack, the Geode pack dismantled and disappeared. Wolf 488M dispersed and spent the summer alone. We followed him all summer with successful tracking of his movements and feeding patterns, but as a lone wolf, we documented him only scavenging. He died in late summer due to starvation, but the GPS data showed that he survived as a lone wolf for over 3 months by scavenging over 10 carcasses ranging from 2 weeks to 4 months old, most of which consisted of only bone and hide. Another summer predation collar on Leopold's 470F worked well until early summer, after which it malfunctioned and prevented staff from downloading data. Summer predation studies will continue with newer collars in 2006.

Summer Scavenging**:** An important aspect of wolf ecosystem effects as it relates to wolf restoration is the effect on scavenger guilds in the Yellowstone ecosystem. Research on wolf and scavenger interactions has been conducted since 1998 through support from Canon and Yellowstone Center for Resources (YCR). This research, largely done in the winter, has monitored how wolves influence the abundance and distribution of carrion, both spatially and temporally, as well as how they facilitate food acquisition by other carnivores. Although we have learned a great deal about the magnitude and relative importance of wolf-killed carcasses to the winter scavenger communities, we know little about the impact on summer scavengers, both vertebrate and invertebrate communities. In summer 2005, project staff, in collaboration with Dr. Chris Wilmers (University of California, Davis) began a pilot project to document invertebrate diversity and abundance at summer carcasses. This effort will continue in 2006 with increased monitoring efforts.

Collaborative Research inside Yellowstone National Park: The wolf project and the Yellowstone Park Foundation provided direct and indirect support for collaborative research with scientists at other institutions, primarily universities.

Wolf Project Students – Direct Assistance

Adult cow elk (Cervus elaphus) seasonal distribution and mortality post-wolf (Canis lupus) reintroduction in Yellowstone National Park, Wyoming.

Graduate Student: Shaney Evans (Master of Science candidate)
Committee Chair: Dr. L. David Mech, University of Minnesota, St. Paul

Project Narrative: As part of a three-tiered study, "Multi-trophic level ecology of wolves (*Canis lupus*), elk (*Cervus elaphus*), and vegetation in Yellowstone National Park, Wyoming," seasonal distributions and movements of elk will be examined to evaluate the behavioral effects of wolves on elk and establish baseline data for future analyses. Individual elk radio-locations will be

paired with wolf radio-locations to establish the proximity of elk to wolves. Comparisons of individual differences in cow elk distribution will be investigated with respect to several variables including: age, presence of calf, pregnancy status, nutritional condition, group size, spatial and temporal factors, and wolf density. In addition, a survival analysis will provide information on relative factors influencing mortality of cow elk in Yellowstone's Northern Range herd.

Project Activity in 2004: Thesis writing continued, and a co-authored paper titled "Survival of adult female elk in Yellowstone following wolf recovery" was accepted for publication in the Journal of Wildlife Management.

Anticipated Completion Date: March 2006

A behavioral analysis of the effect of predator and prey densities on wolf predation.

Graduate Student: Daniel MacNulty (Ph.D. Candidate)
Committee Chair: Dr. Craig Packer, University of Minnesota

Project Narrative: The mathematical expression for a predator's "kill rate" (i.e. kills per predator per time) is fundamental to analyses of predator-prey dynamics. Predictions of dynamics vary widely according to how kill rate models assume that kill rate changes with predator and prey densities. Little is known, however, about the behavioral processes generating the relationship between kill rate and predator-prey densities, especially in natural environments. This is an important knowledge gap because it hinders progress in predator-prey theory and confounds predictions of predator-prey dynamics. This study will examine the behavioral mechanisms that cause wolf kill rate to vary with elk, bison and wolf densities in Yellowstone National Park. The analyses will be based on direct observations of wolves and ungulates recorded during 8 intensive 30-day study periods from 1995 to 2003. Individual-level analyses of wolf kill rate and its behavioral parameters (i.e. attack rate, handling time, search time) will be completed with general linear and non-linear mixed models to account for correlation among repeated measurements of individual wolves. The results are expected to clarify the basic biology underlying models of wolf kill rate, and thereby strengthen attempts to anticipate the effects of wolf predation on ungulate populations.

Project Activity in 2005: Data analysis & dissertation writing.

Anticipated Completion Date: Summer 2006

Other Research -- Indirect Assistance or Collaborative Work with the Wolf Project

Topic	*Collaborator*	*Institution*
Wolf-cougar interactions	Toni Ruth,	Wildlife Conservation Society
Wolf-coyote interactions	Robert Crabtree, Jennifer Sheldon	Yellowstone Ecological Research Center
Wolf-bear interactions	Charles Schwartz, Mark Haroldson, Kerry Gunther	Interagency Grizzly Bear Study Team, Bear Management Office/YCR
Wolf-carnivore interactions	Howard Quigley	Beringia South
Wolf population genetics	Robert Wayne Bridgett vonHoldt	University of California, Los Angeles
Wolf-elk relationships-Madison-Firehole Watershed	Bob Garrott, Matt Becker, Claire Gower	Montana State University
Wolf-elk calf mortality	P.J. White, L. David Mech Shannon Barber	University of Minnesota
Wolf-pronghorn	P.J. White, John Byers	YCR, University of Idaho
Wolf-willow	Evelyn Merrill, Francis Singer, Roy Renkin, Bill Ripple, David Cooper, Tom Hobbs, Don Despain	Univ of Alberta, USGS, YCR, Colorado State Univ.
Wolf –aspen	William Ripple, Eric Larsen, Roy Renkin, Matt Kauffman	Oregon State University, Univ of Wisconsin at Stevens Point, YCR, Univ. of Montana
Wolf –trophic cascades	L. David Mech; Mark Boyce, Nathan Varley; Rolf Peterson Dan MacNulty	USGS; University of Alberta; Michigan Technological University University of Minnesota
Wolf predation	Tom Drummer, John Vucetich, Rolf Peterson	Michigan Technological University
Wolf survival	Dennis Murray	Trent University

Wyoming outside Yellowstone National Park

Winter predation: USFWS Wolf Recovery Program

Cooperators: Grand Teton National Park, National Elk Refuge, Bridger-Teton National Forest, and Wyoming Game and Fish Department.

Since wolves first recolonized areas near Jackson, Wyoming in 1999, we monitored wolves (*Canis lupus*) each winter to determine prey selection of wolves. Our winter field seasons began in late December and continued through the end of March, depending on snow conditions. We used radio telemetry to locate collared wolves daily. We tracked wolves in snow to locate carcass remains of ungulates killed or scavenged by wolves in Bridger-Teton National Forest, Grand Teton National Park, and on state managed feed grounds in the Gros Ventre River drainage. From 2000 through 2005, we located a total of 231 ungulates killed by wolves. Winter prey species consisted of 97% elk (*Cervus elaphus*) and 3% moose (*Alces alces*) (n=225 elk; n=6 moose). Prey composition of elk killed by wolves from 2000 through 2005 was 47% calves, 43% cows, 10% bulls. Mean age of adult elk was 9.3 years and the oldest elk killed was 23 years old. Prior to wolf recolonization in 1999, elk calf/cow ratios in the Gros Ventre River drainage declined from 1989 through 1999 and the 10-year average ratio was 28.8 calves/100 cows. Since wolf recolonization, calf/cow ratios averaged 25.5 calves/100 cows.

In 2005, we maintained a year-round field crew of 4-5 members and we were able to extend our field season throughout the entire year. We divided the calendar year into 4 data collection periods: winter (December, January, February, and March); spring (April and May); summer (June, July, and August); and fall (September, October, and November). During our 2005 field season, we located and investigated 90 carcasses of ungulates killed by wolves. Prey species consisted of 93% elk and 7% moose (n=84 elk and n=6 moose). Prey composition of elk killed by wolves was 47% calves, 39% cows, and 14% bulls. Prey composition of moose killed by wolves was 50% calves, 33% cows, and 17% bulls. Results of our 2005 field season include:

***Winter**:* In winter, we located and confirmed 45 ungulates killed by wolves. Prey species included 43 elk and 2 moose calves. Three additional moose (1 cow and 2 calves) were recorded as possible wolf-kills. Prey composition of elk killed by wolves was 53% calves, 26% cows, and 21% bulls.

***Spring**:* During spring, we located 27 ungulates killed by wolves. Prey species consisted of 92% elk and 8% moose (n=25 elk and n=2 moose). Prey composition of elk killed by wolves in spring was 32% calves, 60% cows, and 8% bulls. Prey composition of moose killed by wolves included 1 yearling female and 1 calf.

***Summer/Fall**:* We used 2 techniques to describe summer and fall food habits of wolves. We collected several hundred scats from den and rendezvous sites used by the Teton and Flat Creek Packs. Scats were autoclaved to kill pathogens and selected hairs were identified microscopically to identify prey species. Scat analysis is ongoing and results will estimate frequency of

occurrence, relative biomass, and the relative numbers of prey species consumed by wolves. In addition to scat analysis, we collaborated with Grand Teton National Park and Beringia South to locate carcasses of wolf-killed ungulates during summer and fall. We placed a downloadable GPS collar on a 2-year old wolf. The collar was programmed to collect location data 4-24 times per day and was downloaded once a week. When logistically possible, researchers investigated all location points on the ground to locate carcasses of wolf-killed ungulates. After 7 months deployment, the collar was recovered prematurely; however, we located 18 ungulates killed by wolves. Prey species consisted of 89% elk and 11% moose (n=16 elk and n=2 moose). Prey composition of elk killed by wolves was 50% calves, 44% cows, and 6% bulls. Wolves killed 1 yearling female and 1 bull moose. Additional GPS collars will be placed on wolves in 2006 and our summer/fall predation study is ongoing.

Wolf-elk interactions on state feed grounds: USFWS Wolf Recovery Program

Cooperators: National Elk Refuge and Wyoming Game and Fish Department.

In December 1999, the USFWS Wolf Recovery Program collaborated with the NER and WYG&F Dept. to determine potential impacts of wolves on elk wintering on traditional winter range and state managed feed grounds in the Gros Ventre River drainage. In 2000 and 2001, we recorded the locations of 32 elk marked with numbered neck bands 4 times a week to determine if elk left the area when wolves were present. NER biologists radio collared 20 elk in the Gros Ventre River drainage in 2002 and collared 5 elk in 2003. We located radio collared elk 4-6 times a week and located radio collared wolves daily during winters 2002 through 2005. Results of this 5-year study will be published spring 2006, but preliminary results suggest that elk responded in 3 ways to wolves hunting on feed grounds by: 1) remaining on the feed ground even when wolves killed elk; 2) leaving the area but returning within days; and 3) leaving the feed ground where wolves killed elk and gathering in larger herds on adjacent feed grounds absent of wolves. Wolves did not displace radio collared elk from the Gros Ventre River drainage during the entire study.

Other Collaborative Research Projects with the USFWS Wolf Recovery Program

Topic	**Collaborators**	**Institution**
Cougar-wolf interactions	Howard Quigley Derek Craighead	Beringia South
Bear-wolf interactions	Steve Cain	GTNP
Habitat use & wolf movements	Steve Cain	GTNP
Wolf population genetics	Robert Wayne Bridgett vonHoldt	University of California, Los Angeles
Wolf-coyote competition: Implications for pronghorn persistence	Eric Gese Kim Berger	Utah State University

A comparison of wolf and cougar kill sites in the southern Yellowstone Ecosystem

Graduate Student: Susannah Woodruff, Prescott College, Prescott, Arizona
Investigators: Howard Quigley and Derek Craighead (Beringia South) and David Parsons (Prescott College).

Cooperators: USFWS, GTNP, USFS, and WYG&F.

Legal protection of reintroduced wolves (*Canis lupus*) under the Endangered Species Act and state management of cougars (*Puma concolor*) have contributed to these predators recolonizing significant portions of their historic ranges in the Rocky Mountains. Understanding how wolves and cougars use habitat in the Greater Yellowstone Ecosystem could provide insights into their ecological roles and contribute to their long-term management. From 2000 to 2006, radio collared sympatric wolves and cougars were tracked in winter and spring to locate and identify kill sites. Using GIS technology, we are currently analyzing field data to: 1) identify habitat factors (vegetation cover type, distance to rivers and streams, slope, aspect, elevation, and human development) associated with wolf and cougar kill sites; 2) compare and contrast kill site characteristics; and 3) compare and contrast winter versus spring kill site characteristics.

WOLF MANAGEMENT

Wolf Management inside Yellowstone National Park

Area Closures: To prevent human disturbance of young pups, visitor entry was closed to areas surrounding the Slough Creek Pack's den until July 1. This closure in Slough Creek Flats area southwest of the Slough Creek Campground was about 1 square mile in size and was centered on the pack's den site. Hundreds of visitors were still able to observe adults and pups from a safe distance, providing both protection to the pack and enjoyment to visitors. Temporary closures (1-2 weeks) around the Agate Creek and Hayden pack dens were put into effect until those packs moved to more remote dens or rendezvous sites. Den sites for the Leopold, Mollie's, and Nez Perce packs were protected from disturbance incidental to closures for the Blacktail (March 15 to June 30) Pelican Valley (April 1 to July 3), and Firehole (March 15 to through Memorial Day Weekend) Bear Management Areas. The areas around the other park packs' den sites were not closed because of historically low visitor use.

Druid Road Management Project: Since wolf reintroduction, the Lamar Valley has become the premier location worldwide to observe free-ranging wolves. The main pack of interest is the Druid Peak pack, which has denned in the valley since 1997. Each year visitor numbers have grown and in 2000, the Yellowstone Center for Resources (YCR), Resource and Visitor Protection, and Division of Interpretation cooperated to better deal with the opportunities and problems that accompany increasing visitor numbers.

As a result, we initiated the Druid Road Management Project with the following objectives: 1) *Human Safety* - protect visitors that are viewing wolves alongside the road, and control both traffic along the road and parking to prevent an accident; 2) *Wolf Safety* - protect wolves from vehicle strikes, permit wolves to cross roadway without harassment from visitors, and protect the closed area around the den from visitor intrusion; 3) *Visitor Enjoyment* - through protection of natural wolf behavior, preserve visitor opportunity to view wolves and interpret wolf and other wildlife ecology to visitors; and 4) *Wolf Monitoring and Research* - continue to monitor and study the denning behavior, predation, activity, and interactions of wolves with other wildlife.

This was the sixth year that private funds were used to manage wolf viewing in Lamar Valley and surrounding area. This year was radically different from the past five seasons, however. For the first time since establishing themselves on the northern range, the Druid Peak pack did not return to their traditional den site near the road in Lamar Valley. As a result, project staff did not need to monitor or control vehicular traffic in that traditional den area. Instead efforts were focused on managing the Slough Creek wolf viewing area.

Surprisingly, only two accidents were reported at Slough Creek but no one was injured and traffic overall was less of an issue, especially after the Slough Creek road opened. Prior to that there was not enough parking. Despite the loss of viewing the Druid Peak pack, the Slough Creek Pack denned just west of Slough Creek, in a location that was visible from the Northeast Entrance Road and from the Slough Creek Campground Road. Large numbers of visitors were able to see adult wolves and pups at or near the den area from early April through late July (second largest number of visitors to see wolves, 2002 was highest). Two staff members from the Division of Interpretation were assigned to the northern range this season to help educate the public about wolves, spending most of their time in the Slough Creek area working alongside Wolf Project staff. Emily Almberg worked on the Road Management Project for about 40% of her time this summer and spent the rest of her work time doing other Wolf Project duties.

Wyoming portion of Greater Yellowstone Area: Management and Livestock Depredation

WS and USFWS investigated potential livestock depredations in Wyoming. Depredations were classified as confirmed, probable, or other based on specific criteria agreed upon by the USFWS and WS. The following livestock depredation statistics were based on reported livestock loses and do not reflect lost or missing livestock. In 2005, wolves in Wyoming outside YNP were confirmed responsible for killing at least 81 livestock and 1 dog. In addition, there were 22 probable depredations. Confirmed livestock depredations included 54 cattle (39 calves, 15 cows/yearlings) and 27 sheep (21 ewes and 6 lambs). In addition, 19 lambs were found dead in a pasture where wolves had killed other sheep, but the cause of mortality could not be determined. One guard dog and 7 horses were injured by wolves, but survived the attacks. The number of confirmed depredations recorded in 2005 decreased approximately 12% from 2004 when 92 livestock were lost to wolves. Ten of the 13 packs in Wyoming were involved in at least 1 depredation incident. WS documented 27% (n=22) of all confirmed depredations on public grazing allotments and 73% (n=59) on private property.

Control actions in response to confirmed livestock depredations included trapping and radio collaring wolves; intensive monitoring; increasing riders on grazing allotments; harassing wolves with rubber bullets, lights, and cracker shells; moving livestock to different pastures; lethally removing wolves; and issuing shoot-on-sight (SOS) permits. Non-lethal control was routinely considered but was often not applicable in many areas in Wyoming due to: 1) specific wolf packs chronically killing livestock year after year; 2) unpredictable travel patterns and movements by wolves; and 3) very large wolf home ranges that covered vast areas where cattle grazed on public grazing allotments. When non-lethal control methods were not effective, wolves were lethally removed in attempts to prevent further livestock depredations. Four SOS permits were issued and livestock producers killed 1 wolf on private property. In 2005, 41 wolves (approximately 22% of the wolf population outside YNP) were lethally removed in control actions. The following is a brief summary of wolf packs in Wyoming, including those involved in confirmed depredations that occurred in 2005 and the subsequent control responses:

Wyoming Wolf Packs in 2005

1) Washakie Pack: Wolves from the Washakie Pack have chronically killed livestock in the Dunoir Valley since 1998. In 2004, 3 wolves were trapped, radio collared, and released onsite. Six wolves were lethally removed in control actions in response to wolves killing 8 calves in 2004. In 2005, 1 calf was recorded as a confirmed wolf-kill. No control actions were taken and no other depredations were reported. The Washakie Pack consisted of 10 wolves (4 adults and 6 pups).

2) East Fork Pack: The East Fork Pack consisted of 10 wolves (4 adults and 6 pups) and formed in 2004. The pack's home range included the East Fork of the Wind River drainage and the Horse Creek drainage. One dead calf and 1 dead yearling bull were recorded as confirmed wolf-kills and 2 additional calves were recorded as probable wolf-kills. A yearling female wolf was trapped, radio collared, and released on-site.

3) Teton Pack: The Teton Pack (11 wolves: 7 adults and 4 pups) killed at least one adult cow on private property. A yearling wolf was trapped, radio collared, and released. No additional depredations by the Teton Pack were reported during summer 2005.

4) Flat Creek Pack: The Flat Creek Pack (8 wolves: 3 adults and 5 pups) formed in 2005 north of Jackson, Wyoming. The pack spent most of the summer and fall in areas where no livestock were grazed. No depredations were reported.

5) Pacific Creek Pack: In 2004, wolves recolonized the Pacific Creek drainage north of Grand Teton National Park. Field crews were not able to confirm pup production in 2005, but it is believed that the pack consisted of approximately 11 wolves. The pack killed 4 cattle (2 cows, 1 calf, 1 steer) during summer 2005. Trapping efforts were not possible due to the high probability of catching non-target grizzly bears and the large area used by the wolves. Radio collaring efforts will continue during winter and spring 2006.

6) Driggs/Teton Pack: The Driggs/Teton Pack (5 wolves) formed in 2005 when a dispersing male wolf from the Teton Pack joined 4 other wolves. The pack spent much of the summer and fall in areas where livestock were grazed; however, no depredations were reported.

7) Beartooth Pack: The Beartooth Pack (≥ 6 wolves: 6 adults and unconfirmed pups) used areas during summer and fall 2005 where no livestock were grazed. No depredations were reported.

8) Sunlight Basin Pack: Wolves from the Sunlight Basin Pack (15 wolves: 7 adults and 8 pups) killed 2 calves during summer 2005. Wolves and cattle in the area were closely monitored, but no additional depredations occurred.

9) Absaroka Pack: In 2004, 2 wolves were lethally removed from the Absaroka Pack in response to wolves killing at least 7 calves in 2004. One calf was killed by wolves from the Absaroka Pack (10 wolves: 4 adults and 6 pups) in 2005. Wolves and cattle in the area were closely monitored, but no additional depredations occurred.

10) South Fork Pack: This new wolf pack (9 wolves: 4 adults and 5 pups) formed in the South Fork of the Shoshone River drainage in 2005. Wolves from the South Fork Pack killed 3 calves in summer 2005. Two wolves were trapped, radio collared, and released. No further depredations were reported.

11) Wood River Pack: The Wood River Pack (5 wolves: 2 adults and 3 pups) killed 1 calf in summer 2005. Wolves and cattle in the area were closely monitored, but no additional depredations occurred.

12) Greybull River: In 2004, the Greybull River Pack killed at least 4 cattle on private property. Control actions were attempted but were unsuccessful. In 2005, the pack killed at least 5 calves and 1 heifer. Depredations stopped after 2 wolves were killed in control actions. The Greybull River Pack consisted of ≥ 6 wolves (6 adults and unconfirmed pups).

13) Carter Mountain: In 2004, the Carter Mountain Pack killed 4 adult cows. The alpha male was removed and no additional depredations were reported. In 2005, the pack killed at least 7 calves and 1 heifer. Six wolves were killed in repeated control actions in attempt to prevent further depredations. No additional depredations were reported in late fall 2005, and the Carter Mountain Pack consisted of 6 wolves (2 adults and 4 pups).

Packs removed in control actions

Daniel Pack: The Daniel Pack was first discovered in 2003 in the Wyoming Range, near Daniel, Wyoming. The pack's home range overlapped large tracts of private land and vast grazing allotments containing thousands of sheep and cattle. The Daniel Pack first began killing livestock in 2003. Four wolves were trapped and radio collared in response to chronic livestock depredations. Since 2003, the Daniel Pack killed at least 20 livestock (confirmed depredations)

and was implicated in another 20 probable depredations. Due to the logistics of the area and several unsuccessful capture efforts, we determined that non-lethal control over such a large scale would be ineffective. Five wolves were removed in 2004. No further depredations were reported until 3/23/05 when WS confirmed wolves from the Daniel Pack killed 1 cow and severely injured another cow on private property. The injured cow was later euthanized. Both cows were expected to deliver calves within the week. The following day, the Daniel Pack killed another yearling cow on private property. Due to the pack's history of chronic depredations and the pack's large home range, the USFWS authorized WS to remove the remaining pack members. The livestock owners and 2 family members were issued SOS permits to kill wolves on their private property. On 3/28/05, WS aerial gunned all 5 wolves located at the previous depredation site. No other wolves were seen at that time and no further depredations occurred during spring 2005. The Daniel Pack formed again during summer 2005 and consisted of 8 wolves. Between 7/18/05 and 12/7/05, W.S. confirmed that the Daniel Pack killed at least 4 cows/yearlings and 6 calves. One additional dead calf was recorded as a probable wolf-kill. Several control efforts were attempted, but were unsuccessful. Based on: 1) the pack's history of chronic livestock depredation over the past 3 years; 2) repeated unsuccessful control attempts in 2005; 3) the potential for further depredations occurring within the thousands of sheep and cattle in the area; and 4) the pack killing at least 10 calves in 2005, the USFWS authorized WS to remove all remaining wolves in the Daniel Pack. In December 2005, 6 wolves were shot from a fixed-wing plane. Further control actions were attempted, but 2 wolves still remain in the area.

Green River Pack: Wolves in the Upper Green River drainage have chronically killed livestock since 2002 when they denned in an area with several thousand cattle grazing on USFS allotments. At least 10 cattle were killed in 2002; 9 cattle and 1 sheep were killed in 2003; and 20 cattle and 2 herding dogs were killed in 2004. After repeated depredations, the entire pack was removed in 2004 in an attempt to prevent further livestock losses. In 2005, the Green River Pack formed again and produced pups in the same area where thousands of cattle graze during summer. In mid-July, 2 calves were killed by the Green River Pack. At that time, we believed the Green River Pack consisted of 4 adults and 4 pups. In an effort to prevent further depredations, the USFWS authorized lethal control and WS killed 1 adult (non-breeding) female wolf. Two more depredations occurred soon after the lethal control action. USFWS and WS planned to collar the breeding female and then remove the previously collared male wolf. WS tried unsuccessfully to trap near carcasses of cattle killed by wolves, but grizzly bears kept disturbing the trap sites. Due to human safety issues associated with catching grizzly bears in wolf traps, WS pulled their traps. Wolf depredations continued and by July 31st, 9 calves and 1 yearling cow had been killed (confirmed by WS) by Green River wolves. Due to the chronic depredation history of wolves that have recolonized the Green River drainage and the logistics of very large grazing allotments, the USFWS and WS concluded that non-lethal control would not be effective and would not stop further depredations. On 8/1/05, the USFWS authorized lethal control and WS removed 6 additional wolves. In 2005, a total of 7 wolves were killed in the Green River drainage in response to chronic livestock depredation.

Owl Creek Pack: The Owl Creek Pack began as 3 adult wolves that denned west of Meeteetse, Wyoming in 2004 and produced 4 pups. The pack had a large home range on private and public

land within habitat that varied from wide open sage brush to dense timbered mountains. The pack killed at least 10 calves and 1 horse in 2004. In 2005, WS confirmed 1 yearling/cow killed by the Owl Creek Pack. The entire pack, except for 1 adult female, was killed in early January 2005 in several control actions after repeated livestock depredations. Later in winter 2005, the surviving female wolf paired with another adult male wolf to form the Wood River Pack and produced 3 pups in spring.

Farson Pack: An uncollared dispersing male and female wolf denned and produced 6 pups near Farson, Wyoming amongst thousands of ewes and lambs grazing on public and private land. After the wolves killed at least 13 ewes and 2 lambs, it was determined that depredations would continue throughout the summer and the female and 4 pups were killed in control actions. Two pups were later found dead and the male wolf was not located again and was suspected to have died prior to control being implemented.

Prospect Mountain: On August 17, 2005, 33 dead sheep (14 ewes and 19 lambs) were found on private property at the base of the Prospect Mountains, near Farson, Wyoming. One dead ewe was recorded as a confirmed wolf-kill and 12 dead ewes were recorded as probable kills. Nineteen lamb carcasses were so decomposed that it was impossible to determine the cause of death. On November 16, 2005, 4 wolves (1 adult male wolf, 1 collared female wolf that dispersed from the Greybull River Pack, and 2 pups) were removed when 4 additional dead ewes were recorded as confirmed wolf-kills and 1 dead ewe was determined to be a probable wolf-kill. DNA samples were taken from all controlled wolves to determine if wolves in the Prospect Mountains were related to the Farson Pack.

Other Depredations: Single wolves or small groups of non-breeding wolves in southwest Wyoming were responsible for 4 confirmed cattle depredations and 7 confirmed sheep depredations. In addition, 5 calves were recorded as probable wolf-kills.

OUTREACH

In 2005, the USFWS Wyoming Wolf Recovery Program personnel gave approximately 21 formal presentations to public schools, universities, wildlife symposiums, state and federal management agencies, livestock association meetings, state legislature committees, and environmental groups. We were also interviewed for numerous magazine and newspaper feature stories.

USFWS LAW ENFORCEMENT – WYOMING

Enforcement efforts continued in Wyoming. The Office of Law Enforcement continues to use traditional enforcement along with programs designated to prevent illegal killing of wolves. Fast and appropriate response to wolf problems by USFWS and WS has done much to ensure that individuals do not become frustrated and illegally kill wolves. Currently, the State of Wyoming has no laws to protect wolves.

ACKNOWLEDGEMENTS

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Numerous agencies and agency personnel have contributed to the recovery program and we thank Dave Skates and Laurie Connel (USFWS Lander); USFS; Nancy Hall, Dave Cunningham, and Lance Koch at Bridger-Teton National Forest; Shoshone National Forest; Steve Cain and Sarah Dewey from Grand Teton National Park; Barry Reiswig and Eric Cole at the National Elk Refuge; Bureau of Land Management; Wyoming Game and Fish Department; and Howard Quigley and Derek Craighead from Beringia South.

U.S. Fish and Wildlife Service
Northern Rocky Mountain
Program Update

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NORTHERN ROCKIES FUNDING

Wolf Recovery and Management in Federal Fiscal Year 2005

Wolf recovery has been almost entirely funded by federal appropriations. Wolf recovery in the NRM from 1973 through 2005 cost approximately $21,223,000 (rounded to nearest $1,000, with no adjustments for inflation and not including USDA Wildlife Services (WS) costs for investigating reports of suspected wolf damage and problem wolf control beyond the $100,000/year provided to WS by the USFWS 1992-2003). In FY 2005, WS reported spending $152,000 in Montana, $213,000 in Idaho, and $153,000 in Wyoming for investigations of suspected wolf attacks on livestock and problem wolf control for a total of about $518,000.

If recovery continued at the current rate and management costs remain within predictions, additional cost to federal taxpayers of $2,727,000 [assuming approximately $518,000/year in WS expenditures] will be incurred annually each year wolves remain listed. Until Wyoming's wolf management plan can be approved by the USFWS, the wolf population will not be proposed for delisting and will remain under the protections of the federal ESA.

In FY 2005 (1 October, 2004 to 30 September, 2005), total USFWS funding for wolf recovery and management issues in the northwestern U.S. (nearly all funding was spent in Montana, Idaho, and Wyoming) was about $2,189,000. Most of that funding was directly allocated to the states of Montana [$316,000] and Idaho [$1,063,000] by Congress in federal appropriations language in the federal budget. Another nearly $245,000 was provided directly to MFWP from the USFWS Region 6 base funding. It was allocated as follows:

In FY06, funding for wolf recovery will be slightly higher than FY05 levels. Region 6 of the USFWS (which includes Montana and Wyoming) received about $955,000 in FY05. Of that, FY05 Congressional allocations of $316,000 were designed to help fund MFWP for wolf management in Montana. A base USFWS FY05 budget of about $639,000 was used to conduct the usual recovery, monitoring, management, control, and information program in Montana and Wyoming, finalize and implement a new nonessential experimental population rule for states/tribes with approved wolf management plans (finalized January 6, 2005), coordinate wolf management issues in the northwestern U.S., responding to correspondence and Freedom of Information Act requests, and other administrative and legal mandates.

Region 6 is also the lead for supporting the Department of Justice on litigation issues related to wolf recovery involving the northwestern U.S. (see Litigation). FY05 R-6 funding was allocated for overall program coordination and administrative support [$160,000], wolf management in Montana ($245,000 to MFWP & $34,000 by USFWS [in FY06 all that funding goes to MFWP]), and wolf management in Wyoming by the USFWS [$200,000, that includes part of a year for a new agreement for $52,000 to support a cooperative WS/USFWS position in Cody, WY]. In FY06, funding of field work in Wyoming was increased to $260,000. In FY05, funding that Congress had previously earmarked in FY04 for state wolf management in Wyoming [$203,000] and $300,000 to support additional wolf monitoring in R-6 [$200,000 for the Greater

Yellowstone Area] and R-1 [$100,000 Frank-Church in Idaho] were eliminated. As a consequence of these funding cuts, a $100,000/year cooperative agreement with WS is no longer funded by the USFWS.

Funding levels for USFWS in Region 1 for FY05 were similar to those proposed in FY06. In FY05, USFWS Region 1 (Idaho) received **$**1,045,000 in Congressional earmarks which were used to fund the NPT ($343,000) and the Idaho Governor's Office of Species Conservation and IDFG ($720,000**;** $90,000 of which was distributed to livestock producers for missing livestock and make up the remaining 50% for livestock reimbursed at a 50% value by the private compensation program in ID). The USFWS Boise, Idaho wolf recovery program received an additional $99,000.

In addition, WS maintained a $100,000 Congressional directive for responding to complaints of wolf damage as well as a $1,300,000 directive for Montana, Idaho, and Wyoming for investigating and addressing predator damage, including predation by wolves. This directive recognized and helped fund the increased costs of conducting coyote control in the presence of wolves. Yellowstone National Park maintained their NPS-funded wolf monitoring and research program at about the $168,000 level in FY05, but a majority of field work and research projects are now funded by private donations.

In addition to federal funding, the private TESF funded the salary and benefits for an experienced wolf field biologist in Bozeman, Montana [valued at $60,000/yr]. That biologist is a MFWP volunteer, and logistic and field support and direct supervision are provided by the MFWP (costing about $20,000/yr in federal transfer funding). That employee helps MFWP monitor wolves and resolve conflicts between wolves and private landowners in southwest Montana.

Defenders of Wildlife (DOW) provided a compensation program for livestock killed by wolves, with expenditures of more than $500,000 from 1987 through December 2005. During the last 5 years, DOW paid an average of about $84,000/year in compensation to livestock producers in Montana, Idaho, Wyoming, and Utah for confirmed and probable wolf-caused damage to livestock and livestock herding and guarding animals. Additionally, DOW shared the cost of proactive and non-lethal methods to help livestock operators avoid or reduce conflicts with wolves. These methods included providing livestock guarding dogs, fencing, fladry, range riders, carcass removal, and alternative pasturing for livestock. Universities in Idaho, Montana and Wyoming also provided substantial funding and support for their graduate students conducting various wolf research projects.

In FY05, Congress directed funding increases in Idaho but reduced or eliminated the earmarks to the USFWS and Wyoming that were in the FY04 budget. Funding in FY06 appears similar to that allocated in FY05.

Funding Sources for Wolf Management for FY2004 and FY2005 [$1,000]

Fiscal Year [Oct 1 – Sept 30]	2005	2006*
USFWS-Region 6	$ 639	$ 731
MT [congressional earmark]	$ 316	$ 316
WY	$ 0	$ 0
SUBTOTAL	$ 955	$1,047
USFWS-Region 1	$ 99	$ 99
Idaho OSC & IDFG	$ 720	$ 720
Nez Perce Tribe	$ 343	$ 343
SUBTOTAL [all are congressional earmarks]	$1,162	$1,162
USDA WS [all of NRM]	$ 518	$ 518
TOTAL	**$2,625**	**$2,727**

* estimated

NORTHERN ROCKIES PLANNING AND LEGAL ISSUES

Reclassification and Delisting of the Gray Wolf

Wolves, once common throughout North America, became protected under the ESA because human persecution nearly eliminated them from the contiguous U.S. By 1974, there were no known breeding packs of wolves left in the NRM of the United States. ESA prohibited people from harming wolves and mandated that all federal actions seek to conserve and not jeopardize wolves. Ultimately, 3 distinct wolf recovery programs, Midwest, NRM, and Southwest, were initiated. In the NRM, 2005 marked the sixth consecutive year that 30 or more breeding pairs and over 300 wolves, well distributed among Montana, Idaho, and Wyoming were documented. The population of 1,020 wolves has achieved biological recovery objectives.

USFWS can propose delisting of the NRM wolf population when it determines that the population has recovered biologically, and it is reasonably assured that wolves would not become threatened again if ESA protections were removed. The ESA contains several checks and balances to ensure that any decision to delist a species is scientifically sound and will not result in a species being relisted. The ESA requires that all decisions be based on the best scientific data available.

Prior to delisting, USFWS is mandated to examine all of the factors that may have caused a species to become threatened and to determine that they are not likely to cause the species to become threatened again. Regulating the level of human-caused mortality is the primary factor that must be resolved before delisting can occur. ESA requires that USFWS determine that regulations, other than the ESA, will prevent unchecked human-caused mortality from once again driving wolves toward extinction.

Wildlife mortality is typically regulated by state fish and wildlife management agencies. The USFWS requested that Montana, Idaho, and Wyoming develop state wolf management plans so that wolves would be adequately conserved under state management. In addition, the USFWS believed that state wolf plans would help the public to understand the consequences of delisting and would provide a solid administrative foundation for the final decision. The USFWS provided various degrees of funding and assistance to the states while they developed their wolf management plans. State laws, as well as state management plans, must be consistent with long-term conservation of the wolf population. The links for the state wolf plans for Montana, Idaho and Wyoming are available at http://westerngraywolf.fws.gov.

Montana, Idaho and Wyoming completed their respective state wolf plans by September 2003. The USFWS immediately sent the 3 state plans for independent peer review. Peer reviewers were asked, "In combination, would the 3 state plans assure conservation of the wolf population at or above recovery levels." Twelve North American wolf management and research experts were asked to review those plans. Eleven reviews were received. They were then reviewed by the state wildlife management agencies to allow each state to provide their perspectives on the reviewers' comments. On December 10, 2003 the 3 states provided their responses back to the USFWS, completing the peer review process. After further internal and legal review of both state laws and state plans at the USFWS Regional Office and Washington D.C. level, recommendations were provided to the USFWS Director.

In early January 2004, the USFWS Director determined that Montana's state wolf management plan was an outstanding professional effort and deserved special recognition. Montana's wolf management plan was clearly adequate as a regulatory mechanism to maintain and conserve a recovered wolf population. Idaho's wolf management plan was also adequate as a regulatory mechanism to maintain a recovered wolf population, assuming step-down planning followed through on their plan's overall policy commitments.

The Wyoming state wolf plan called for wolves to be considered "trophy game" in YNP, GTNP and contiguous wilderness areas and considered as "predators" throughout the remainder of the state (and as trophy game in a larger area of northwest Wyoming if less than 8 packs were outside the national narks). The combination of large areas and the uncertainty of monitoring wolf mortality under predatory animal status, the alternation between "predatory animal" and "trophy game" status in certain areas and the potentially limited area in which human-caused mortality of wolves could be regulated were major concerns.

Wyoming's unique and complex proposed regulatory framework and the explicit direction provided by Wyoming law, did not assure the USFWS that Wyoming's plan will conserve wolves at or above a recovered level in Wyoming. The Director determined that Wyoming must designate wolves as trophy game [or similar WYGF state legal designation] statewide so the WYGF has legal authority to manage them, and Wyoming must clearly commit to always managing for 10 or more well distributed breeding pairs and over 100 wolves. The USFWS will not propose that the wolf population be delisted until Wyoming state laws and their state plan can assure that Wyoming's portion of the NRM wolf population will remain secure without the ESA protections.

On February 8, 2006 the U.S. Fish and Wildlife Service published an Advanced Notice of Proposed Rulemaking (50 CFR 17 Vol. 71 No 26:6634-6660). It lays out the USFWS's current thinking about a NRM Distinct Population Segment [DPS] for the gray wolf and what a delisting proposal might resemble if Wyoming had an approved state regulatory framework for wolf management outside the National Parks in Wyoming. It included relevant data, a thorough analysis of USFWS's rationale for the DPS border, and why the USFWS believes all threats to the wolf population, except Wyoming state law, have been resolved. It requested extensive public comment on all those concepts and several alternative options (outlined in the Public Comments Solicited Section of 71 FR 6634, February 8, 2006).

If Wyoming modified their state law and wolf management plan and they were approved by the USFWS, a delisting proposal would be published and public and peer review comment requested. After analysis of new information, the USFWS could withdraw the proposal, modify it, or finalize it. Upon delisting, each state would be responsible for the conservation and management of wolves within its respective borders. Coordination among the 3 states is expected, and already established through a memorandum of understanding signed by the respective governors. After the wolf population is delisted, the ESA requires a mandatory, minimum 5-year post-delisting oversight period. That period, during which the USFWS reviews the implementation of state management plans, provides a safety net to ensure that the species is able to sustain itself without ESA protection. If wolves became threatened again, the USFWS could relist them by emergency order.

Nationwide Wolf Reclassification

The reclassification of wolves nationwide was completed on April 1, 2003. The rule created a new Western Distinct Population Segment (DPS) for wolves, consisting of Wyoming, Montana, Idaho, Washington, Oregon, California, Nevada and the northern halves of Utah and Colorado. This proposal did not change the status of wolves in the experimental nonessential population areas (CID and GYA) but changed the status of wolves in the rest of the Western DPS from endangered to threatened. Wolves were also reclassified to threatened in 22 north-central and northeastern states (Eastern DPS), and delisted in all or part of 14 southeastern states. The reclassification and accompanying special rule [4d] allowed wolves to be managed under virtually the same rules throughout the northwestern U.S. Activities that are allowed under

threatened status include the use of less-than-lethal munitions to harass wolves away from livestock and the ability for livestock owners to legally kill a wolf caught in the act of attacking livestock, herding or guarding animals, or dogs on private property. The activities of government agencies in managing depredating wolves were not significantly different under the threatened status. This effort was overturned in court (see *Litigation*).

The Experimental Population Rule

The USFWS's February 7, 2005 10(j) regulation expanded the authority of States and Native American Tribes with USFWS-approved wolf management plans to manage gray wolves in the experimental population areas of CID and GYA. Gray wolves were reintroduced in the NRM as nonessential experimental populations under the ESA in 1995 and 1996. This designation allowed Federal, State and Tribal agencies and private citizens more flexibility in managing wolves within the experimental population areas. The rule also allowed the states and tribes with USFWS-approved wolf management plans to lead wolf management in their states. Only 2 States, Montana and Idaho, where there are about 800 wolves, presently fit that category. At this time, this regulation does not apply to the state of Wyoming because it does not have a USFWS-approved wolf management plan.

In June 2005, the USFWS and MFWP signed a cooperative agreement transferring the decision-making authority for all wolf management activities in Montana, including endangered wolves in northern Montana. The state had been managing wolves in northwestern Montana since early 2004 when MFWP signed a cooperative agreement with the USFWS to assume wolf management authorities when USFWS biologist Tom Meier left to take a job with the NPS in Alaska. In January 2006, the Governor of Idaho signed a Memorandum of Agreement with the Secretary of the Interior giving Idaho Department of Fish and Game the decision-making authority for all wolf management activities in Idaho. Carter Niemeyer the USFWS Recovery Coordinator for Idaho retired in January 2006, and Joe Fontaine the Assistant Wolf Recovery Coordinator and USFWS Project Leader for wolf Recovery in Montana stopped working on wolf issues in February 2005 and took an Assistant Refuge Manager job in central Mississippi in Feb 2006. As of 2006, all wolf management in the states of Montana and Idaho is being conducted with federal funding but by the state wildlife agencies which hired staff to assume those duties. The USFWS still manages wolves in Wyoming.

Litigation

State of Wyoming, et al. vs. United States Department of the Interior, et al., United States District Court for the district of Wyoming, Civil Action No. 04CV01123J. This case involved the USFWS not approving the Wyoming state wolf management plan. The case was expanded by interveners to include alleged failure to properly manage wolves in Wyoming and failure to conduct additional NEPA compliance. A related legal issue between Wyoming and the Department of the Interior also involved Freedom of Information Act issues about the USFWS's

withholding of certain documents because they were related to internal deliberations and attorney-client privilege. The Wyoming District Court ruled in the USFWS favor based on procedural grounds in 2005. Wyoming appealed that case to the 10th Circuit Court of Appeals in Denver Colorado, and it is still under consideration. Oral Arguments are scheduled for March 2006. In addition Wyoming filed a petition, dated June 28, 2005 to establish a NRM DPS [solely Montana, Idaho, and Wyoming] and delist it from the ESA. In its 90-day finding the USFWS determined that it contained enough information that further review was warranted and is reviewing their petition more closely. A final USFWS determination on that petition will be made by late summer or early fall 2006. Wyoming also requested the management flexibility afforded to Montana and Idaho by the 2005 experimental rule to be expanded to include all of Wyoming.

State of Wyoming vs. Michael D. Jimenez, United States District Court for the District of Wyoming, Case No. 04-CR-98J and State of Wyoming vs. Michael D. Jimenez, United States Court of Appeals for the Tenth Circuit. This case involved Park County, Wyoming, allegations that a USFWS biologist violated state law by trespassing and littering (leaving immobilized radio collared wolves) on private property during a routine wolf capture and radio-collaring operation near Meeteeste, Wyoming, in early 2004. The District Court ruled that Mr. Jimenez was immune from such state charges because he was carrying out his official duties as a federal employee. Wyoming appealed to the 10th Circuit Court and it is still under consideration.

Defenders of Wildlife et al. vs. Gale Norton et al., United States District Court of Oregon, Civil No. 03-1348 JO. This case involved the April 2003 reclassification of the gray wolf, the USFWS's establishment and listing of 3 gray wolf DPS (Eastern, Western and Southwestern), the special 4(d) rules within the Western and Eastern DPS. The Defender of Wildlife's et al. litigation primarily involved the Western DPS. On January 31, 2005, the U.S. District Court in Portland, Oregon, issued a decision that reversed the USFWS's April 2003 reclassification of the gray wolf to threatened status throughout the northern United States, eliminated all 3 DPS's, revoked the delisting of wolves in the southeastern U.S. [original listing was wrong as there were only red wolves in the SE US], and revoked both the 4(d) rules that authorized problem wolf management in the Western DPS and Eastern DPS. Under that ruling wolves outside the experimental nonessential areas are now considered endangered [except Minnesota where they remained threatened] and will be managed according to the authorities and rules in place prior to April 2003. This court order eliminated the special 4(d) rule that allowed landowners outside of the experimental nonessential areas in the northwestern U.S. to legally kill or harass wolves that were seen physically attacking their livestock and dogs on their private land. No wolves had been taken under those provisions in the nearly 2 years they had been in effect. As a result of the court order, wolf control outside the experimental population areas can only be implemented by the USFWS or its designated agents. Outside the experimental population areas private citizens cannot harm or kill wolves. USFWS immediately began to explore legal and other options/strategies with its state and federal partners.

National Wildlife Federation et al. vs. Gale Norton et al., United States District Court of Vermont, Civil No. 1:03-CV-340. This case also involved the April 2003 reclassification of the gray wolf to threatened status and the USFWS's establishment and listing of 3 gray wolf DPS (Eastern, Western and Southwestern). This litigation was resolved in mid-2005 and like the Oregon District Court, the Vermont District Court determined the USFWS improperly applied the DPS policy and did not conduct the required analyses. That court also vacated the 2003 reclasssification rule as it applied to the Eastern United States. In late 2005 the Service and Justice Department determined they would not appeal either the Oregon or Vermont Federal District Courts rulings.

ABBREVIATIONS AND ACRONYMS

Central Idaho wolf recovery area	CID
Defenders of Wildlife	DOW
Distinct Population Segment	DPS
Endangered Species Act	ESA
Glacier National Park	GNP
Grand Teton National Park	GTNP
Greater Yellowstone wolf recovery area	GYA
Idaho Department of Fish and Game	IDFG
Montana Fish, Wildlife and Parks	MFWP
Montana State University	MSU
Nez Perce Tribe	NPT
Northwest Montana Wolf Recovery Area	NWMT
Northern Rocky Mountains	NRM
Predator Conservation Alliance	PCA
Turner Endangered Species Fund	TESF
University of Montana	UM
USDA/APHIS/Wildlife Services	WS
U.S. Fish and Wildlife Service	USFWS
U.S. Forest Service	USFS
U.S. National Park Service	NPS
Wyoming Game and Fish Department	WYGF
Yellowstone Center for Resources	YCR
Yellowstone National Park	YNP

CONTACTS

For further information or to report wolf sightings, please contact:

Please remember wolf management in Montana and Idaho is conducted by MT FWP and IDFG and they should be the first point of contact in each state for everything except law enforcement-

Montana Fish, Wildlife and Parks, Helena, MT:	(406) 444-3242
Montana Fish, Wildlife and Parks, Kalispell, MT:	(406) 751-4586
Montana Fish, Wildlife and Parks, Dillon, MT:	(406) 683-2287
Montana Fish, Wildlife and Parks, Red Lodge, MT:	(406) 446-0106
Montana Fish, Wildlife and Parks, Bozeman, MT:	(406) 994-6371
MFWP, TESF Volunteer, Bozeman, MT	(406) 556-8514
Nez Perce Tribal Wolf Program, McCall ID:	(208) 634-1061
Idaho Fish and Game, Boise, ID	(208) 334-2920
Idaho Fish and Game, Salmon, ID	(208) 756-2271
Idaho Fish and Game, Nampa, ID	(208) 465-8465
U.S. Fish and Wildlife Service, Helena MT:	(406) 449-5225
U.S. Fish and Wildlife Service, Jackson, WY:	(307) 330-5620
U.S. Fish and Wildlife Service, Boise ID:	(208) 378-5639
Yellowstone Center for Resources, YNP WY:	(307) 344-2243

To report livestock depredations:

USDA/APHIS/Wildlife Services, Montana:	(406) 657-6464
USDA/APHIS/Wildlife Services, Wyoming:	(307) 261-5336
USDA/APHIS/Wildlife Services, Idaho:	(208) 378-5077
USDA/APHIS/Wildlife Services toll free:	(866) 487-3297

To report discovery of a dead wolf or information regarding the illegal killing of a wolf:

U.S. Fish and Wildlife Service Special Agent, Billings, MT:	(406) 247-7355
U.S. Fish and Wildlife Service Special Agent, Missoula, MT:	(406) 329-3000
U.S. Fish and Wildlife Service Special Agent, Bozeman, MT:	(406) 582-0336
U.S. Fish and Wildlife Service Special Agent, Casper, WY:	(307) 261-6365
U.S. Fish and Wildlife Service Special Agent, Lander, WY:	(307) 332-7607
U.S. Fish and Wildlife Service Special Agent, Cody, WY:	(307) 527-7604
U.S. Fish and Wildlife Service Special Agent, Boise, ID:	(208) 378-5333
U.S. Fish and Wildlife Service Special Agent, Idaho Falls, ID	(208) 523-0855
U.S. Fish and Wildlife Service Special Agent, Spokane, WA	(509) 928-6050

WEBSITES

USFWS Rocky Mountain weekly and annual wolf updates:
http://westerngraywolf.fws.gov/
USFWS Midwestern gray wolf recovery, national wolf reclassification proposal:
http://midwest.fws.gov/wolf/
USFWS Endangered Species Program:
http://endangered.fws.gov/
USDA/APHIS/Wildlife Services:
http://www.aphis.usda.gov/ws/
National Wildlife Research Center:
http://www.aphis.usda.gov/ws/nwrc/
Nez Perce Tribe Wildlife Program and 2001 progress report:
http://www.nezperce.org/Programs/wildlife_program.htm
Turner Endangered Species Fund:
http://www.tesf.org/
Yellowstone Park Foundation:
http://www.ypf.org/
Yellowstone Wolf Tracker:
http://www.wolftracker.com/
Yellowstone National Park wolf pack data:
http://www.nps.gov/yell/nature/animals/wolf/wolfup.html
Wolf Restoration to Yellowstone:
http://www.nps.gov/yell/nature/animals/wolf/wolfrest.html
Montana Fish, Wildlife and Parks wolf management planning:
http://www.fwp.mt.gov/wildthings/tande/wolf/wolf.html
Montana State University wolf-ungulate research:
http://www.homepage.montana.edu/~rgarrott/wolfungulate/index.htm
Idaho Fish and Game:
http://www.state.id.us/fishgame/
Idaho Office of Species Conservation:
http://www.state.id.us/species/
Wyoming Game and Fish Department:
http://gf.state.wy.us/
Wyoming agricultural statistics:
http://www.nass.usda.gov/wy/
Idaho agricultural statistics:
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Montana agricultural statistics:
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National agricultural statistics:
http://usda.mannlib.cornell.edu/reports/nassr/livestock/
Defenders of Wildlife wolf compensation trust:
http://www.defenders.org/wolfcomp.html
International Wolf Center:
http://www.wolf.org/
Wolf Recovery Foundation:
http://forwolves.org/
Wolf news reports:
http://www.forwolves.org/ralph/wolfrpt.html
National Wildlife Federation wolf information:
http://www.nwf.org/wildlife/graywolf/
Montana Stockgrowers' Association
http://www.mtbeef.org/index.htm
National Geographic wolf information:
http://www.nationalgeographic.com/tv/specials/wolf/intro.html
Wolf Education and Research Center:
http://www.wolfcenter.org/
People Against Wolves:
http://home.centurytel.net/PAW/home.htm

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Table 1a: Montana Portion of Northwest Montana Wolf Recovery Area: wolf packs and population data, 2005.

REF.		RECOV		PACK SIZE DEC 2005			MORTALITIES			KNOWN		CONTROL		CONFIRMED LOSSES 6			
#	WOLF PACK 1	AREA	STATE	ADULT	PUP	TOT	NAT	HUMAN 2	UNKN 3	DISPERSED	MISSING 4	KILLED 5	MOVED	CATTLE	SHEEP	DOGS	OTHER
1	Candy Mtn	NWMT	MT	5	4	9											
2	Fish Creek #	NWMT	MT	3	9	12											
3	Fishtrap	NWMT	MT	?	1	7					1			1	1		
4	Great Bear	NWMT	MT	2	?	2											
5	Halfway	NWMT	MT	3	4	7						1		3			
6	Hog Heaven	NWMT	MT	?	?	3		1									
7	Kintla	NWMT	MT	6	3	9			1		1						
8	Kootenai South	NWMT	MT	5	2	7											
9	Lazy Creek	NWMT	MT	4	5	9											
10	Livermore	NWMT	MT	?	?	4											
11	Marias	NWMT	MT	?	?	6		1									
12	Murphy Lake	NWMT	MT	1	?	3		1									
13	Ninemile	NWMT	MT	2	5	7			1								
14	Red Shale	NWMT	MT	4	3	7											
15	Spotted Bear	NWMT	MT	4	2	6											
16	Spotted Dog	NWMT	MT	?	?	11								1			
17	Superior #	NWMT	MT	2	0	2											
18	Whitefish	NWMT	MT	?	?	7					1						
19	Wolf Prairie	NWMT	MT	3	5	8		1									
	Misc/Lone	NWMT	MT					2	1			1		4			
	MT Total in NWMT	NWMT	MT	44+	43+	126	0	6	3	0	3	2	0	9	1	0	0

1 Underlined packs are counted as breeding pairs toward recovery goals.

2 Excludes wolves killed in control actions.

3 Does not include pups that disappeared before winter.

4 Collared wolves that ceased transmitting in 2005.

5 Includes agency lethal control.

6 Includes only domestic animals confirmed killed by wolves.

Border pack shared with State of Idaho; dens in Montana and majority of time in Montana.

file: FINAL 2005 NWMT Table 1a 2-19-06.xls

Table 1b: Montana Portion of the Greater Yellowstone Experimental Area: wolf packs and population data 2005

Montana portion of Greater Yellowstone Experimental Area

REF. #	WOLF PACK 1	RECOV AREA	STATE	PACK SIZE DEC 2005 ADULT	PUP	TOT	MORTALITIES NAT	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL KILLED 5	MOVED	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
	~~Phantom~~ [7]	GYA	MT	0	0	0						4		2	1		
20	Rosebud	GYA	MT	3	0	3											
21	Moccasin Lake	GYA	MT	2	0	2											
22	Mission Creek	GYA	MT	3	0	3	1										
23	SW 28	GYA	MT	2	0	2											
24	SW 57	GYA	MT	2	0	2						1		1			
25	Carbonate Mountain	GYA	MT	5	0	5											
26	Buffalo Fork	GYA	MT	2	1	3											
27	Mill Creek	GYA	MT	2	0	2						2					
	~~Lone Bear~~ [7]	GYA	MT	0	0	0				1		3					
28	Donohue	GYA	MT	2	?	2					1						
29	Chief Joe %	GYA	MT	5	0	5	1	1									
30	Casey Lake	GYA	MT	3	0	3	1										
31	Deadhorse	GYA	MT	2	4	6											
	~~Bear Creek~~ [7]	GYA	MT	0	0	0					1						
	~~Homestead~~ [7]	GYA	MT	0	0	0	2	2			1						
32	Freezeout	GYA	MT	?	?	5				1		6		2			
33	Beartrap	GYA	MT	3	5	8											
34	Wedge	GYA	MT	2	5	7			1					1			
	~~Dillon Pair~~ [7]	GYA	MT	0	0	0						2					
35	Sage Creek	GYA	MT	2	?	6											
	Misc/Lone	GYA	MT	2	0	2		2				1		1	25	1	
	MT Total in GYA	GYA	MT	42+	15+	66	5	5	1	2	3	19	0	7	26	1	0

1 Underlined packs are counted as breeding pairs toward recovery goals.

2 Excludes wolves killed in control actions.

3 Does not include pups that disappeared before winter.

4 Collared wolves that ceased transmitting in 2005.

5 Includes agency lethal control and take by private citizens under 10j regulation.

6 Includes only domestic animals confirmed killed by wolves.

7 Pack did not exist on December 31, 2005 and is not displayed on the map; see pack narrative.

% Dens just inside the Yellowstone National Park boundary but nearly 100% of the territory is within the State of Montana.

Table 1c: Montana Portion of the Central Idaho Experimental Area (Montana statewide totals): wolf packs and population data 2005

Montana portion of Central Idaho Experimental Area

REF. #	WOLF PACK1	RECOV AREA	STATE	PACK SIZE DEC 2005 ADULT	PUP	TOT	MORTALITIES NAT	HUMAN2	UNKN3	KNOWN DISPERSED	MISSING4	CONTROL KILLED 5	MOVED	CONFIRMED LOSSES6 CATTLE	SHEEP	DOGS	OTHER
36	Lake Como #	CID	MT	?	?	3											
37	Brooks Creek #	CID	MT	4	?	4											
38	Mt Haggin	CID	MT	2+	?	2											
39	Big Hole #	CID	MT	4+	2+	9											
40	Sula#	CID	MT	2+	2+	7			1								
41	Skalkaho	CID	MT	?	?	6											
42	Sapphire	CID	MT	2+	4+	14											
43	Painted Rocks#	CID	MT	2+	2+	4+											
44	Battlefield#	CID	MT	2	3	5						9		4			2
45	Willow Creek	CID	MT	2	4	6											
46	Black Canyon#	CID	MT	?	?	4		1				3		3	6		
	Misc/Lone	CID	MT	0	0	0						2					
	MT Total in CID	CID	MT	20+	17+	64	0	1	1	0	0	14	0	7	6	0	2
	MT in NWMT total (Table 1a)	NWMT	MT	44+	43+	126	0	6	3	0	3	2	0	9	1	0	0
	MT in GYA total (Table 1b)	GYA	MT	42+	15+	66	5	5	1	2	3	19	0	7	26	1	0
	MT in CID total (Table 1c)	CID	MT	20+	17+	64	0	1	1	0	0	14	0	7	6	0	2
	MT STATE TOTAL			**106+**	**75+**	**256**	**5**	**12**	**5**	**2**	**6**	**35**	**0**	**23**	**33**	**1**	**2**

1 Underlined packs are counted as breeding pairs toward recovery goals.

2 Excludes wolves killed in control actions.

3 Does not include pups that disappeared before winter.

4 Collared wolves that ceased transmitting in 2005.

5 Includes agency lethal control and take by private citizens under 10j regulation.

6 Includes only domestic animals confirmed killed by wolves.

Border pack shared with State of Idaho; dens in Montana and majority of time in Montana.

file: FINAL 2005 SWMT Table 1 b and c 2-19-06.xls

Table 2: Wyoming wolf packs and population data 2005, and totals for Greater Yellowstone Recovery Area

REF.		RECOV		PACK SIZE DEC 2005			MORTALITIES			KNOWN		CONTROL		CONFIRMED LOSSES 6			
#	WOLF PACK 1	AREA	STATE	ADULT	PUP	TOT	NAT	HUMAN 2	UNKN 3	DISPERSED	MISSING 4	KILLED 5	MOVED	CATTLE	SHEEP	DOGS	OTHER
	Yellowstone National Park Northern Range																
47	Swan Lake*	GYA	WY	3	0	3	4			2							
48	Leopold	GYA	WY	12	2	14	1										
49	Hellroaring Group	GYA	WY	7	0	7	1										
50	Agate	GYA	WY	5	3	8				2	1						
51	Slough	GYA	WY	12	3	15											
52	Druid	GYA	WY	4	0	4	1		1	1							
53	Unknown Group*	GYA	WY	3	0	3											
54	Geode (pack disbanned)	GYA	WY	0	0	0	2			3	3						
	Yellowstone National Park Non-Northern Range																
55	Mollie's	GYA	WY	7	0	7	2		1	1							
56	Yellowstone Delta	GYA	WY	12	5	17				1							
57	Bechler	GYA	WY	5	4	9											
58	Nez Perce*	GYA	WY	4	0	4	3			1	1						
59	Cougar Creek I	GYA	WY	5	0	5	1			1							
60	Cougar Creek II	GYA	WY	8	0	8											
61	Gibbon Meadows	GYA	WY	6	3	9	1			1							
62	Hayden *	GYA	WY	3	2	5											
	Total Inside YNP	GYA	WY	96	22	118	16	0	2	13	5	0	0	0	0	0	0
	Wyoming Outside Yellowstone National Park																
63	Washakie	GYA	WY	4	6	10					3			1			
64	East Fork	GYA	WY	4	6	10								2			
65	Teton	GYA	WY	7	4	11	2	1	1		2			1			
66	Flat Creek	GYA	WY	3	5	8		1									
67	Pacific Creek	GYA	WY	11	?	11								4			
68	Beartooth	GYA	WY	6	?	6			1								
69	Sunlight Basin	GYA	WY	7	8	15	1				1			2			
70	Absaroka	GYA	WY	4	6	10		1			2			1			

Table 2: Wyoming wolf packs and population data 2005, and totals for Greater Yellowstone Recovery Area

REF.		RECOV		PACK SIZE DEC 2005			MORTALITIES			KNOWN		CONTROL		CONFIRMED LOSSES 6			
#	WOLF PACK 1	AREA	STATE	ADULT	PUP	TOT	NAT	HUMAN 2	UNKN 3	DISPERSED	MISSING 4	KILLED 5	MOVED	CATTLE	SHEEP	DOGS	OTHER
71	South Fork	GYA	WY	4	5	9								3			
72	Wood River	GYA	WY	2	3	5								1			
73	Greybull River	GYA	WY	6	?	6						2		6			
74	Carter Mtn.	GYA	WY	2	4	6						6		6			
75	Driggs/Teton	GYA	WY	5	0	5											
	Misc. outside YNP	GYA	WY	22	?	22	1		3			33		27	27	1	
	Total outside YNP	GYA	WY	87	47	134	4	3	5	0	8	41	0	54	27	1	0
	Total Wyoming in GYA	GYA	WY	183	69	252	20	3	7	13	13	41	0	54	27	1	0
	WY part of GYA (Table 2)	GYA	WY	183	69	252	20	3	7	13	13	41	0	54	27	1	0
	MT part of GYA (Table 1b)	GYA	MT	42+	15+	66	5	5	1	2	3	19	0	7	26	1	0
	ID part of GYA (Table 3)	GYA	ID	5	2	7	0	1	0	0	0	0	0	0	0	0	0
	GYA TOTAL			**230**	**86**	**325**	**25**	**9**	**8**	**15**	**16**	**60**	**0**	**61**	**53**	**2**	**0**

1 Underlined packs are counted as breeding pairs toward recovery goals.

2 Excludes wolves killed in control actions.

3 Does not include pups that disappeared before winter.

4 Collared wolves that ceased transmitting in 2005.

5 Includes agency lethal control.

6 Includes only domestic animals confirmed killed by wolves.

* No collars; numerous reliable, verified reports.

file: FINAL 2005 WY and YNP Table 2 2-19-06

Table 3a: Idaho Portion of Central Idaho Experimental Area: wolf packs and population data 2005.

REF		RECOV		MINIMUM ESTIMATED PACK SIZE DEC 2005			DOCUMENTED AND SUSPECTED MORTALITIES			KNOWN		CONTROL		CONFIRMED LOSSES 6			
#	WOLF PACK 1	AREA	STATE	ADULT	PUP	TOT	NATURAL	HUMAN 2	UNKN 3	DISPERSED	MISSING 4	KILLED 5	MOVED	CATTLE	SHEEP	DOGS	OTHER
76	Avery	CID	ID	2	2	4											
77	Bear Valley	CID	ID	5	3	8											
78	Bimerick Meadow	CID	ID	2	2	4											
79	Blue Bunch	CID	ID	2	4	6									37		
80	Buffalo Ridge	CID	ID	3	6	9					1	1		2			
81	Calderwood	CID	ID	4	?	4											
82	Carey Dome	CID	ID	1+	?	9									4		
83	Castle Peak/East Pass	CID	ID	?	?	?		1							25	1	
84	Chamberlain Basin	CID	ID	?	?	6											
85	Chesimia	CID	ID	3	2	5						4		4		5	
86	Cold Springs	CID	ID	?	?	3		1									
87	Coolwater Ridge	CID	ID	7	4	11										1	
88	Copper Basin	CID	ID	2	2	4						9		8			
89	Eagle Mountain	CID	ID	2	4	6											
90	Earthquake Basin	CID	ID	2	6	8											
91	Eldorado	CID	ID	3	2	5											
92	Fishhook	CID	ID	2	2+	5											
93	Five Lakes Butte	CID	ID	3	2	5											
94	Florence	CID	ID	9	6	15								1			
95	Galena	CID	ID	8	3	11				1					7		
96	Gold Fork	CID	ID	2	2	4											
97	Golden Creek	CID	ID	5	2	7		3[a]		2							
98	Gospel Hump	CID	ID	?	?	?											
99	Hazard Lake	CID	ID	?	?	3?									7		

Table 3a: Idaho Portion of Central Idaho Experimental Area: wolf packs and population data 2005.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2005 ADULT	PUP	TOT	DOCUMENTED AND SUSPECTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL KILLED 5	MOVED	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
100	Hemlock Ridge	CID	ID	4	2	6											
101	Hoodoo	CID	ID	2+	2+	7											
102	Hughes Creek	CID	ID	3	5	8											
103	Hyndman	CID	ID	1	2	3						1			3		
104	Indian Creek	CID	ID	?	?	?											
105	Jungle Creek	CID	ID	2+	2+	8									2		
106	Jureano Mountain	CID	ID	8	3	11											
107	Kelly Creek	CID	ID	9	2	11											
108	Landmark	CID	ID	?	?	?											
109	Lochsa	CID	ID	3	3	6											
110	Magruder	CID	ID	?	?	?					1						
111	Marble Mountain	CID	ID	1+	?	?											
112	Monumental	CID	ID	12	2	14											
113	Morgan Creek	CID	ID	8	5	13				2							
114	Moyer Basin	CID	ID	5	5	10						1		1			
115	O'Hara Point	CID	ID	2	6	8				1							
116	Orphan	CID	ID	2	3	5		1				3		2			
117	Owl Creek	CID	ID	?	?	9											
118	Packer John	CID	ID	4	3	7			1								
119	Partridge Creek	CID	ID	?	?	?						5			17	1	
120	Pettitbone	CID	ID	?	?	?											
121	Pot Mountain	CID	ID	?	?	?											
122	Red River	CID	ID	4	2	6					1						
123	Scott Mountain	CID	ID	8	0	8					2						

Table 3a: Idaho Portion of Central Idaho Experimental Area: wolf packs and population data 2005.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2005 ADULT	PUP	TOT	DOCUMENTED AND SUSPECTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL KILLED 5	MOVED	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
124	Selway	CID	ID	?	?	6											
125	Soldier Mountain	CID	ID	8	4	12									18		
126	Steel Mountain	CID	ID	10	4	14					1				52	1	
127	Stolle Meadow	CID	ID	3	1	4											
128	Thunder Mountain	CID	ID	?	?	?											
129	Timberline	CID	ID	3	3	6		1	1								
130	Twin Peaks	CID	ID	?	?	?											
131	Warm Springs	CID	ID	5	2	7		1			1						
132	Yankee Fork	CID	ID	6	2	8											
	Lone/Paired	CID	ID	0	0	0		2				1		1			
	Idaho minimum count			180+	117+	339											
	Unknown wolves [7]	CID	ID			162	1	3	2			2		1	12		
	ID Total in CID	ALL	ID	180+	117+	501	1	13	4	6	7	27	0	20	184	9	0

Table 3b: Idaho Portion of Northwest Montana Recovery Area: wolf packs and population data 2005.

REF #	WOLF PACK1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2005 ADULT	PUP	TOT	DOCUMENTED AND SUSPECTED MORTALITIES NATURAL	HUMAN2	UNKN3	KNOWN DISPERSED	MISSING4	CONTROL KILLED 5	MOVED	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
133	Calder Mountain#	NWMT	ID	2	2	4											
	ID Total in NWMT			2	2	4	0	0	0	0	0	0	0	0	0	0	0

Table 3c: Idaho Portion of Greater Yellowstone Experimental Area (and Idaho Statewide totals): wolf packs and population data 2005.

REF #	WOLF PACK1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2005 ADULT	PUP	TOT	DOCUMENTED AND SUSPECTED MORTALITIES NATURAL	HUMAN2	UNKN3	KNOWN DISPERSED	MISSING4	CONTROL KILLED 5	MOVED	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
134	Biscuit Basin	GYA	ID	5	2	7		1									
	ID Total in GYA			5	2	7	0	1	0	0	0	0	0	0	0	0	0
	ID STATE TOTAL	ALL	ID	187+	121+	512	1	14	4	6	7	27	0	20	184	9	0

Table 3d: Central Idaho Experimental Area: wolf population data 2005.

MT in CID (Table 1c)	CID	MT	20+	17+	64	0	1	1	0	0	14	0	7	6	0	2
ID in CID (Table 3a)	ALL	ID	180+	117+	501	1	13	4	6	7	27	0	20	184	9	0
CID TOTAL	CID	ID/MT	200+	134+	565	1	14	5	6	7	41	0	27	190	9	2

1 Underlined packs are counted as breeding pairs toward recovery goals.

2 Excludes wolves killed in control actions.

3 Does not include pups that disappeared before winter.

4 Collared wolves that became missing in 2005.

5 Includes agency lethal control and take by private citizens under 10j regulation.

6 Includes only domestic animals confirmed killed by wolves.

7 See narrative text for explanation.

[a] Two wolves killed while dispersing.

file: FINAL 2005 ID Table 3 a b c d 2-19-06.xls

Table 4a: Northern Rocky Mountain minimum fall wolf population and breeding pairs* 1979-2005, by Federal Recovery Area

Minimum fall wolf population by recovery area:

Year	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05
Recovery Area																											
NWMT	2	1	2	8	6	6	13	15	10	14	12	33	29	41	55	48	66	70	56	49	63	64	84	108	92	59	130
GYA																	21	40	86	112	118	177	218	271	301	335	325
CID																	14	42	71	114	156	196	261	284	368	452	565
TOTAL	2	1	2	8	6	6	13	15	10	14	12	33	29	41	55	48	101	152	213	275	337	437	563	663	761	846	1020

Breeding pairs by recovery area:

Year	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05
Recovery Area																											
NWMT								1	2	1	1	3	2	4	4	5	6	7	5	5	6	6	7	12	4	6	11
GYA																	2	4	9	6	8	14	13	23	21	31	20
CID																		3	6	10	10	10	14	14	26	29	40
TOTAL								1	2	1	1	3	2	4	4	5	8	14	20	21	24	30	34	49	51	66	71

* By the standards of the Rocky Mountain Gray Wolf Recovery Plan and wolf reintroduction environmental impact statement, a breeding pair is defined as an adult male and an adult female wolf, accompanied by 2 pups that survived at least until Dec 31. Recovery goals call for 10 breeding pairs per area, or a total of 30 breeding pairs distributed through the 3 areas, for 3 years.

NOTE: Each year, wolf packs discovered in the current year that contain $\geq$ 2 yearlings and $\geq$ 2 adults are added to the previous year's breeding pair and population totals; similarly, if evidence in the current year indicates that < 2 pups or < 2 adults survived on December 31 of the previous year, that wolf pack is deleted from the previous year's breeding pair counts and population totals. Therefore, breeding pair counts and population totals are updated in current annual reports.

file: FINAL 2005 BP by REC AREA 2-19-06 Tab4a & Fig5.xls

Table 4b: Northern Rocky Mountain minimum fall wolf population and breeding pairs* 1979-2005, by State

Minimum fall wolf population by state:

Year	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05
State																											
MT	2	1	2	8	6	6	13	15	10	14	12	33	29	41	55	48	66	70	56	49	74	97	123	183	182	152	256
WY																	21	40	86	112	107	153	189	217	234	272	252
ID																	14	42	71	114	156	187	251	263	345	422	512
TOTAL	2	1	2	8	6	6	13	15	10	14	12	33	29	41	55	48	101	152	213	275	337	437	563	663	761	846	1020

Breeding pairs by state:

Year	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05
State																											
MT								1	2	1	1	3	2	4	4	5	6	7	5	5	7	8	7	17	10	15	19
WY																	2	4	9	6	7	12	13	18	16	25	16
ID																		3	6	10	10	10	14	14	25	26	36
TOTAL								1	2	1	1	3	2	4	4	5	8	14	20	21	24	30	34	49	51	66	71

* By the standards of the Rocky Mountain Gray Wolf Recovery Plan and wolf reintroduction environmental impact statement, a breeding pair is defined as an adult male and an adult female wolf, accompanied by 2 pups that survived at least until Dec 31. Recovery goals call for 10 breeding pairs per area, or a total of 30 breeding pairs distributed through the 3 areas, for 3 years.

NOTE: Each year, wolf packs discovered in the current year that contain $\geq$ 2 yearlings and $\geq$ 2 adults are added to the previous year's breeding pair and population totals; similarly, if evidence in the current year indicates that < 2 pups or <2 adults survived on December 31 of the previous year, that wolf pack is deleted from the previous year's breeding pair counts and population totals. Therefore, breeding pair counts and population totals are updated in current annual reports.

file: FINAL 2005 BP by STATE 2-19-06 Tab4b & Fig6.xls

Table 5a: Northern Rocky Mountain States confirmed wolf depredation1 and wolf management, 1987-2005 by recovery area.

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	TOTAL
Northwest Montana Recovery Area:																				
cattle	6	0	3	5	2	1	0	6	3	9	16	9	13	10	8	9	6	6	9	121
sheep	10	0	0	0	2	0	0	0	0	0	30	0	19	2	5	13	3	1	1	86
other 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	1	0	10
dogs	0	0	0	1	0	0	0	0	3	1	0	0	2	3	1	4	0	0	0	15
wolves moved	0	0	4	0	3	0	0	2	2	10	7	0	4	0	5	0	0	0	0	37
wolves killed	4	0	1	1	0	0	0	0	0	4	14	4	9	4	3	9	14	1	2	70
Greater Yellowstone Recovery Area:																				
cattle									0	0	5	3	4	7	22	33	45	100	61	280
sheep									0	13	67	7	13	39	117	71	90	99	53	569
other 3									0	0	0	0	1	0	0	0	10	4	0	15
dogs									1	0	0	4	7	8	4	1	0	6	2	33
wolves moved									6	8	14	0	0	6	8	0	0	0	0	42
wolves killed									0	1	6	3	9	6	9	23	38	55	61	211
Central Idaho Recovery Area:																				
cattle									0	2	1	9	16	15	10	10	13	24	27	127
sheep									0	24	29	5	57	39	16	15	118	170	190	663
other 3									0	0	0	0	0	0	0	0	0	0	2	2
dogs									0	1	4	1	6	0	1	4	6	3	9	35
wolves moved									0	5	0	3	15	10	5	0	0	0	0	38
wolves killed									0	1	1	0	5	10	7	14	7	30	41	116
Total, 3 Recovery Areas:																				
cattle	6	0	3	5	2	1	0	6	3	11	22	21	33	32	40	52	64	130	97	528
sheep	10	0	0	0	2	0	0	0	0	37	126	12	89	80	138	99	211	270	244	1318
other 3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	5	10	5	2	27
dogs	0	0	0	1	0	0	0	0	4	2	4	5	15	11	6	9	6	9	11	83
wolves moved	0	0	4	0	3	0	0	2	8	23	21	3	19	16	18	0	0	0	0	117
wolves killed2	4	0	1	1	0	0	0	0	0	6	21	7	23	20	19	46	59	86	103	396

1 Numbers of animals confirmed killed by wolves in calendar year.

2 Includes wolves legally shot by ranchers. Others killed in government control efforts.

3 Total livestock other than cattle and sheep confirmed killed by wolves between 1987 and 2005 are 9 llamas, 12 goats and 6 horses.

Since 1987, Defenders of Wildlife has made compensation payments totalling more than $300,000 for wolf damage to livestock and guard dogs. Information on the compensation program is available at http://www.defenders.org/wolfcomp.html

file: FINAL 2005 DEP by REC AREA 2-19-06 Table 5a.xls

Table 5b: Northern Rocky Mountain confirmed wolf depredation1 and wolf management, 1987-2005 (by state)

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	TOTAL
Montana																				
cattle	6	0	3	5	2	1	0	6	3	10	19	10	20	14	12	20	24	36	23	214
sheep	10	0	0	0	2	0	0	0	0	13	41	0	25	7	50	84	86	92	33	443
other 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	3	2	14
dogs	0	0	0	1	0	0	0	0	4	1	0	1	2	5	2	5	1	4	1	27
wolves moved	0	0	4	0	3	0	0	2	8	22	20	0	14	6	17	0	0	0	0	96
wolves killed	4	0	1	1	0	0	0	0	0	5	18	4	19	7	8	26	34	40	35	202
Wyoming																				
cattle									0	0	2	2	2	3	18	23	34	75	54	213
sheep									0	0	56	7	0	25	34	0	7	17	27	173
other 3									0	0	0	0	1	0	0	0	10	2	0	13
dogs									0	0	0	3	6	6	2	0	0	2	1	20
wolves moved									0	0	1	0	0	0	0	0	0	0	0	1
wolves killed									0	0	2	3	1	2	4	6	18	29	41	106
Idaho																				
cattle									0	1	1	9	11	15	10	9	6	19	20	101
sheep									0	24	29	5	64	48	54	15	118	161	184	702
other 3									0	0	0	0	0	0	0	0	0	0	0	0
dogs									0	1	4	1	7	0	2	4	5	3	9	36
wolves moved									0	1	0	3	5	10	1	0	0	0	0	20
wolves killed									0	1	1	0	3	11	7	14	7	17	27	88
Total, 3 States																				
cattle	6	0	3	5	2	1	0	6	3	11	22	21	33	32	40	52	64	130	97	528
sheep	10	0	0	0	2	0	0	0	0	37	126	12	89	80	138	99	211	270	244	1318
other 3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	5	10	5	2	27
dogs	0	0	0	1	0	0	0	0	4	2	4	5	15	11	6	9	6	9	11	83
wolves moved	0	0	4	0	3	0	0	2	8	23	21	3	19	16	18	0	0	0	0	117
wolves killed2	4	0	1	1	0	0	0	0	0	6	21	7	23	20	19	46	59	86	103	396

1 Numbers of animals confirmed killed by wolves in calendar year.

2 Includes wolves legally shot by ranchers. Others killed in government control efforts.

3 Total livestock other than cattle and sheep confirmed killed by wolves between 1987 and 2005 are 9 llamas, 12 goats and 6 horses.

Since 1987, Defenders of Wildlife has made compensation payments totalling more than $300,000 for wolf damage to livestock and guard dogs. Information on the compensation program is available at http://www.defenders.org/wolfcomp.html

file: FINAL 2005 DEP by STATE 2-19-06 Table 5b.xls

Figure 1. Central Idaho, Northwest Montana and Greater Yellowstone Wolf Recovery Areas

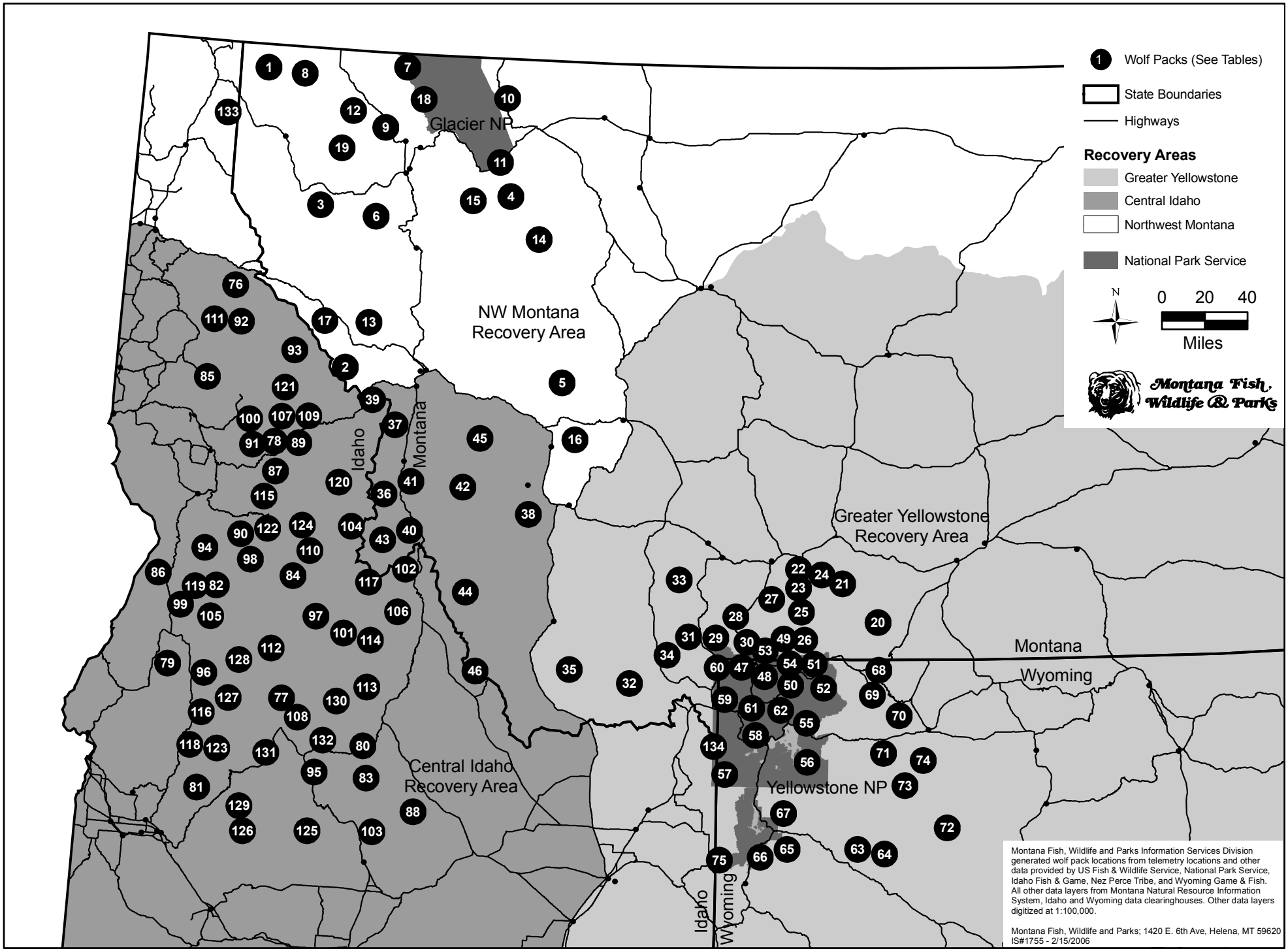
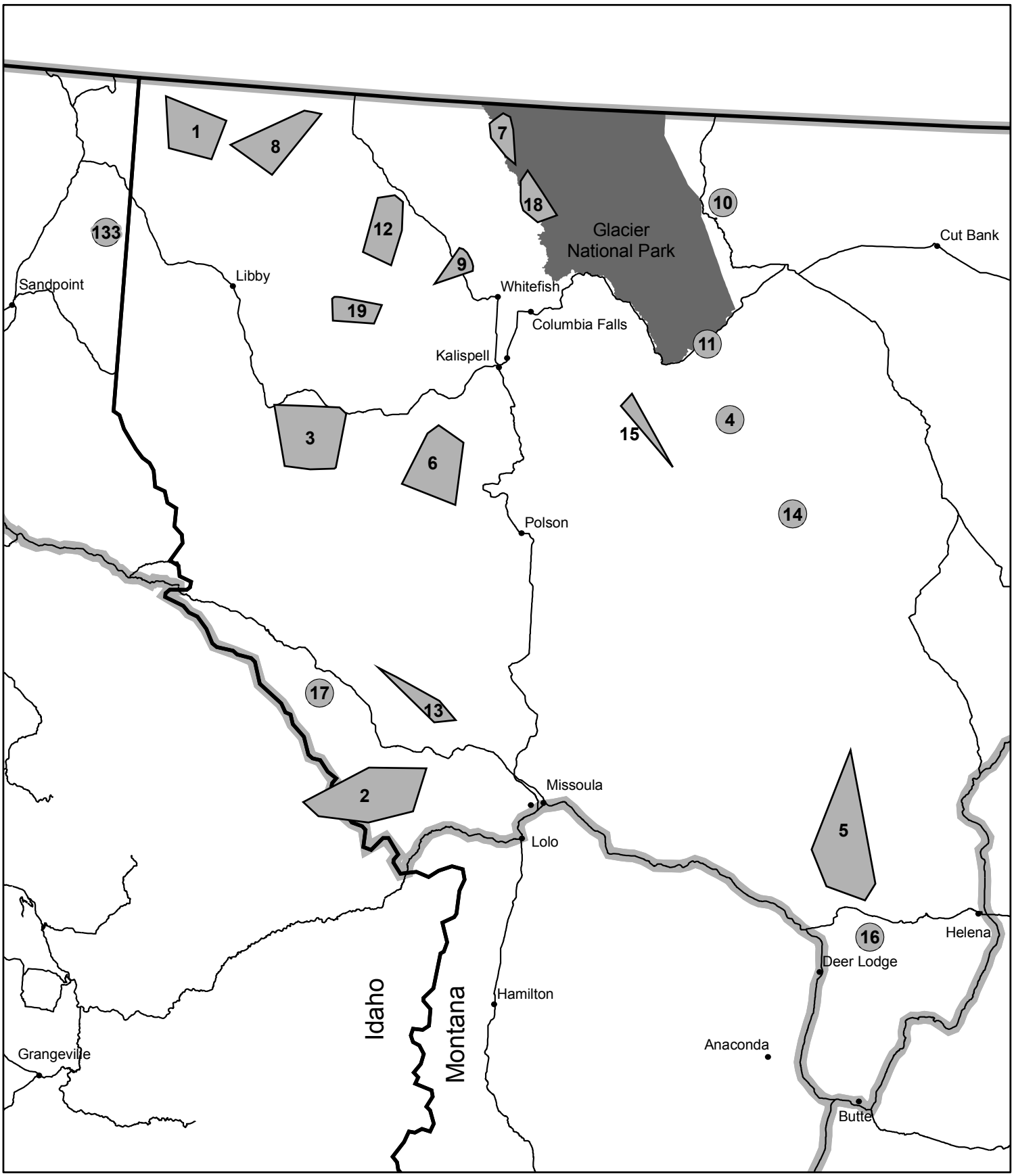


Figure 2. Northwest Montana Wolf Recovery Area



Montana Fish, Wildlife and Parks Information Services Division generated wolf pack locations from telemetry locations and other data provided by US Fish & Wildlife Service, National Park Service, Idaho Fish & Game, Nez Perce Tribe, and Wyoming Game & Fish. All other data layers from Montana Natural Resource Information System, Idaho and Wyoming data clearinghouses. Other data layers digitized at 1:100,000.

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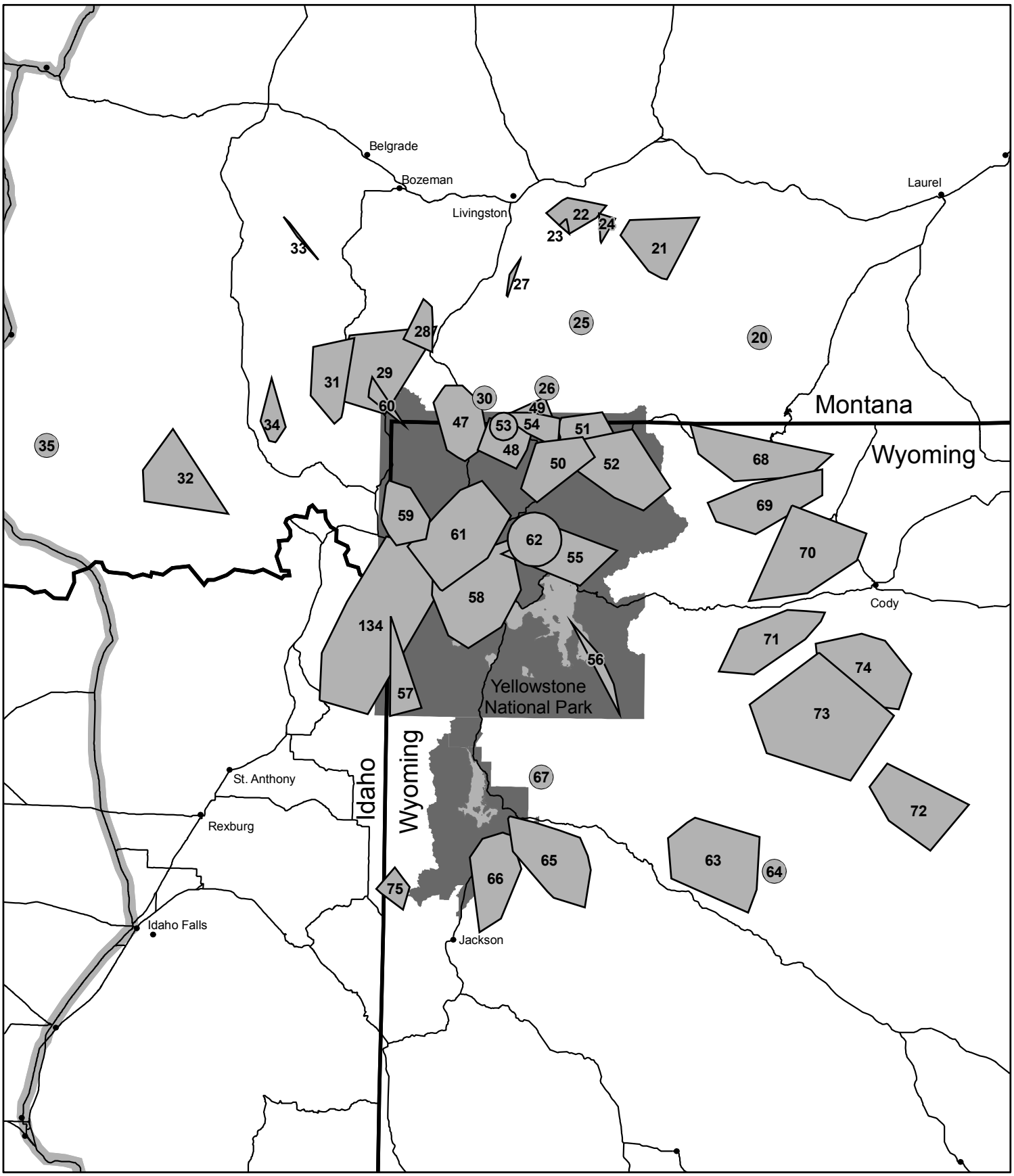
Figure 3. Greater Yellowstone Wolf Recovery Area



Montana Fish, Wildlife and Parks Information Services Division generated wolf pack locations from telemetry locations and other data provided by US Fish & Wildlife Service, National Park Service, Idaho Fish & Game, Nez Perce Tribe, and Wyoming Game & Fish. All other data layers from Montana Natural Resource Information System, Idaho and Wyoming data clearinghouses. Other data layers digitized at 1:100,000.

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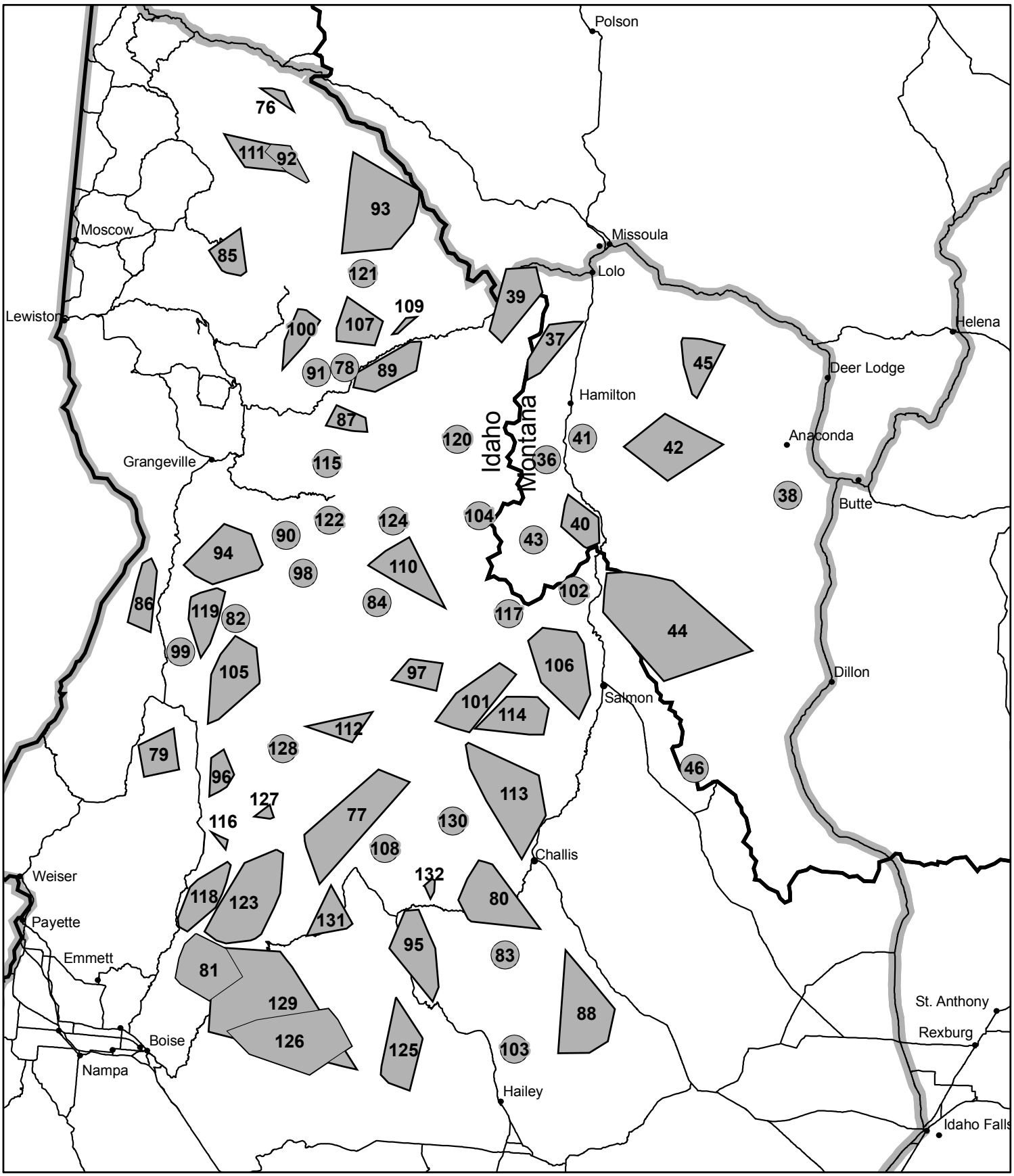
Figure 4. Central Idaho Wolf Recovery Area



1 Wolf Pack Distribution (See Tables)

Recovery Area Boundary

State Boundary

Major Highways

National Park Service

N

0 10 20 40

Miles

Montana Fish, Wildlife & Parks

Montana Fish, Wildlife and Parks Information Services Division generated wolf pack locations from telemetry locations and other data provided by US Fish & Wildlife Service, National Park Service, Idaho Fish & Game, Nez Perce Tribe, and Wyoming Game & Fish. All other data layers from Montana Natural Resource Information System, Idaho and Wyoming data clearinghouses. Other data layers digitized at 1:100,000.

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Figure 5. Northern Rocky Mountain Wolf Population Trends 1979-2005, by Recovery Area

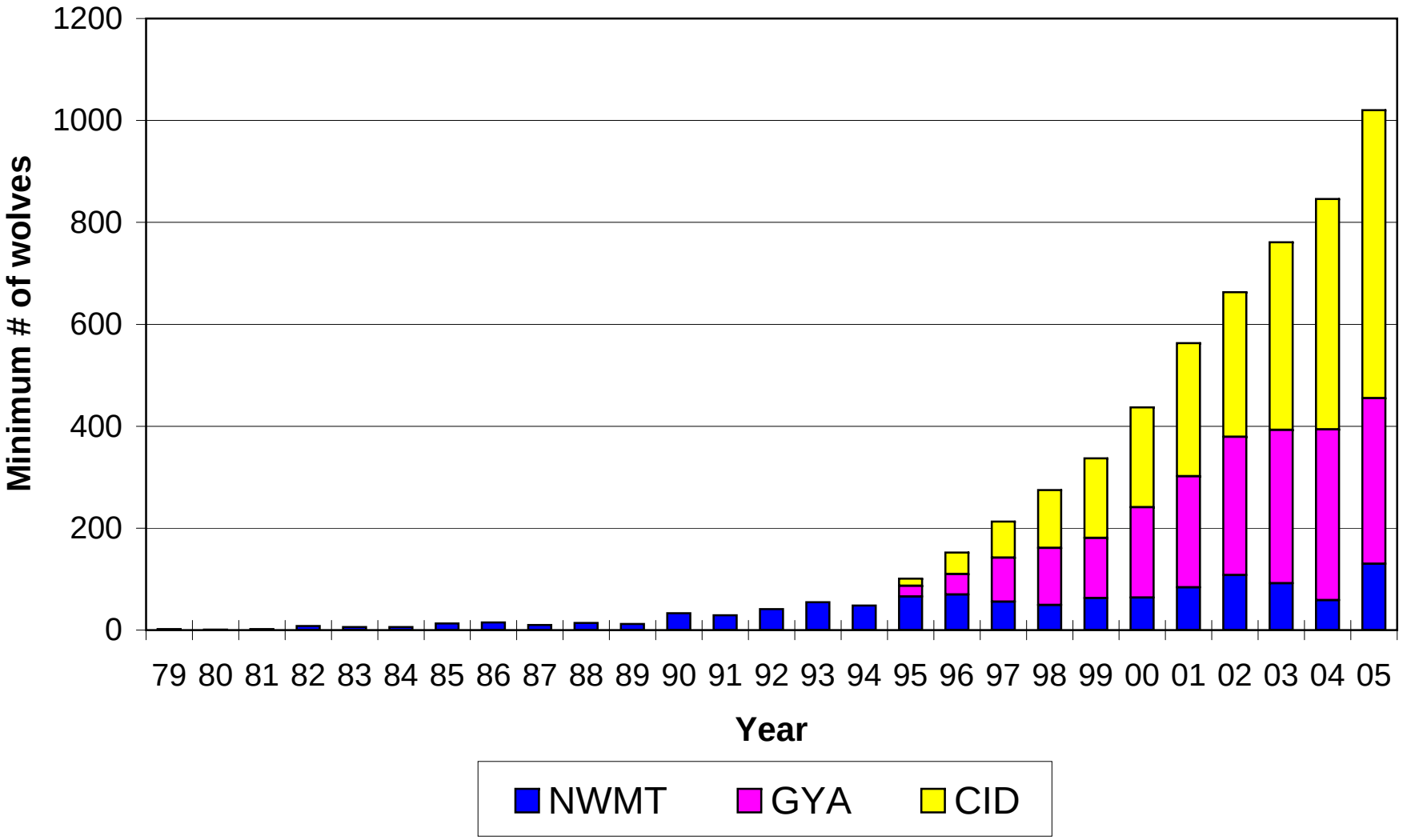

Figure 6. Northern Rocky Mountain Wolf Population Trends 1979-2005, by State