Montana Gray Wolf
Conservation and Management
2007 Annual Report

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

MFWP Photo by Stefanie Bergh

This report presents information on the status, distribution, and management of wolves in the State of Montana, from January 1, 2007 to December 31, 2007.

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

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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 an interagency 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 2006 to 2007. The increase is due to a real increase in actual wolf numbers primarily in NWMT and far western Montana. The greatest increase occurred in the Montana portion of the Central Idaho Recovery Area south of Lolo Pass and west of I-15.

A total of 73 verified packs of 2 or more wolves yielded a minimum estimate of 422 wolves in Montana. Thirty-nine packs qualified as a Breeding Pair according to the federal recovery definition (an adult male and female with two surviving pups on December 31). Across the southern Montana experimental area (Central Idaho and Greater Yellowstone areas combined), there were 37 packs, 16 of which met the Breeding Pair criteria. A minimum of 209 wolves were estimated (87 in the GYA and 122 in the CID). Across the northwest Montana endangered area, there were 36 packs, 23 of which met the breeding pair criteria. A minimum of 213 wolves was estimated in the NWMT endangered area.

Montana Wildlife Services (WS) confirmed that 75 cattle, 27 sheep, 3 dogs, 1 llama, and 12 domestic goats were killed by wolves in calendar year 2007. Additional losses (both injured and dead livestock) most certainly occurred, but could not be confirmed. Most depredations occurred on private property. Seventy three wolves were killed to reduce the potential for further depredations. Of the 73, 62 were killed by USDA Wildlife Services, 7 were killed by private citizens under the 2005 10j regulations and 4 were killed by private citizens who had been issued a permit 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.

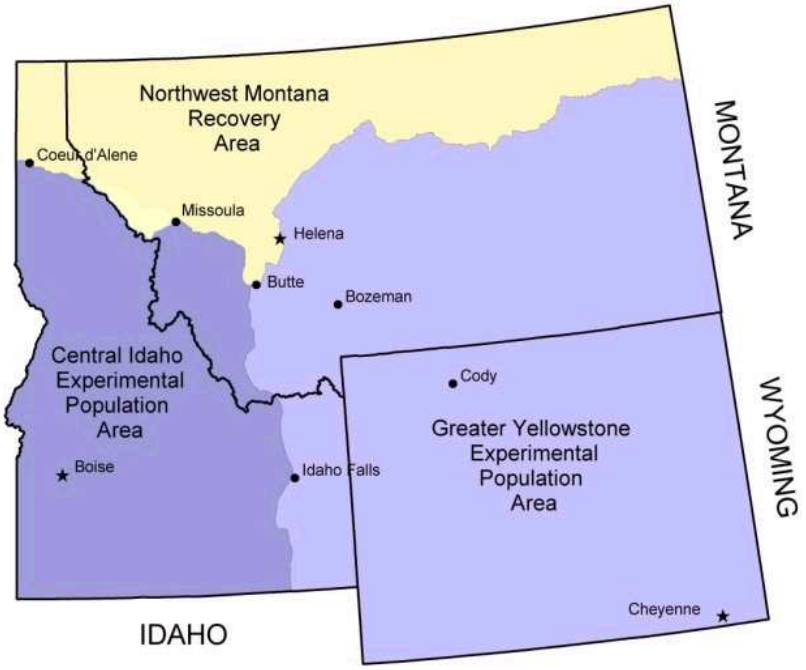


Figure 1. Northern Rockies gray wolf recovery area comprised of the states of Montana, Idaho, and Wyoming

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.

In 2007, USFWS proposed changes to the federal regulation pertaining to the 10j experimental area across southern Montana. Between 200,000 and 300,000 public comments were received and USFWS was expected to make a decision early in 2008.

Also in 2007, USFWS proposed a Northern Rockies Distinct Population Segment and to delist gray wolves from the federal Endangered Species Act. Two alternative delisting scenarios were discussed. One option was delisting within the states of Montana and Idaho only. The other option included Wyoming, pending USFWS acceptance of its state management plan and state law. Between 200,000 and 300,000 comments were received. USFWS is expected to make a final decision early in 2008.

This annual report presents information on the status, distribution, and management of wolves in the State of Montana from January 1 to December 31, 2007.

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 about 30% private land. Most Montana packs do not live strictly in back country wilderness areas. Of the 73 packs in Montana, 10 (about 14% of all Montana packs) reside most of the year in remote backcountry or wilderness areas or Glacier National Park. Many others live in public land areas with more public access and habitat fragmentation than wilderness areas or Glacier National Park. However, the majority of Montana wolf packs live in areas where mountainous terrain, intermountain valleys, and public / private lands are intermixed.

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.

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 2006, the average pack in Montana was approximately 5.5 animals. In 2007, the average pack size in Montana was 5.7 animals. There was no difference in average size of wolf packs in the northern endangered area and the southern experimental area.

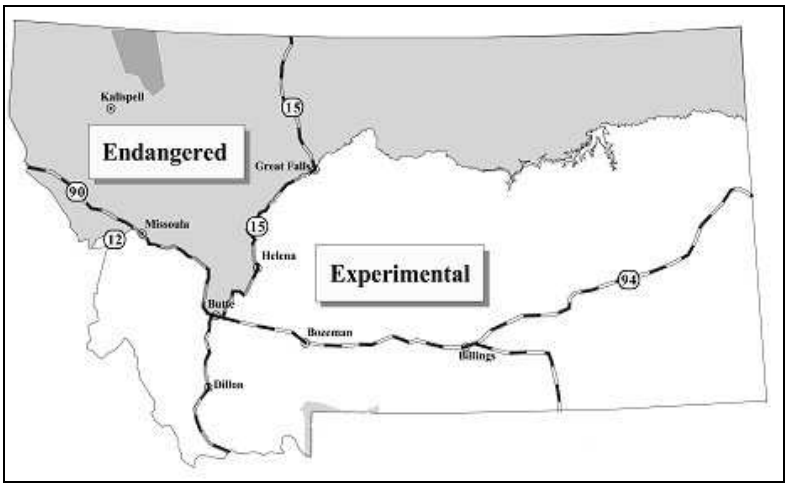


Figure 2. Map of the interim federal wolf management areas showing the endangered area where the 1999 Interim Wolf Control Plan applies and the experimental area where the 10(j) regulations apply. The central Idaho and Greater Yellowstone experimental areas are shown as one since the approved status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

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 less than 2 pups.

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 2007, a total of 18 packs straddled a border between Montana and a different administrative jurisdiction (e.g. the State of Idaho or Canada). In western Montana, a total of 12 packs straddled the Montana / Idaho state line and were tallied in the Montana minimum estimates. Nine of those 12 were in the Bitterroot (Montana portion of the Central Idaho Experimental Area) and 2 were in the lower Clark Fork (Montana portion of the Northwest Montana Endangered Area). An additional 4 also straddled the Montana / Idaho state line, but were tallied in the Idaho population estimate (2 each in the Central Idaho Experimental Area and the Northwest Montana Endangered Area, respectively). Two additional packs straddled the Montana / Canada border but they were not included in the Montana estimate.

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 Tables 1, 2, 3, and 4 for the administrative region in which the animals were counted.

Montana Statewide Wolf Population and Distribution

The Montana wolf population is secure above the 10 Breeding Pair minimum. Wolves and wolf packs themselves, however, are very dynamic on the Montana landscape. Some packs do not persist from year to year for a variety of reasons. The loss of packs in the Montana population could be due to a variety of factors, including mortalities and poor pup production / survival 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 2006 no longer existed by the end of 2007.

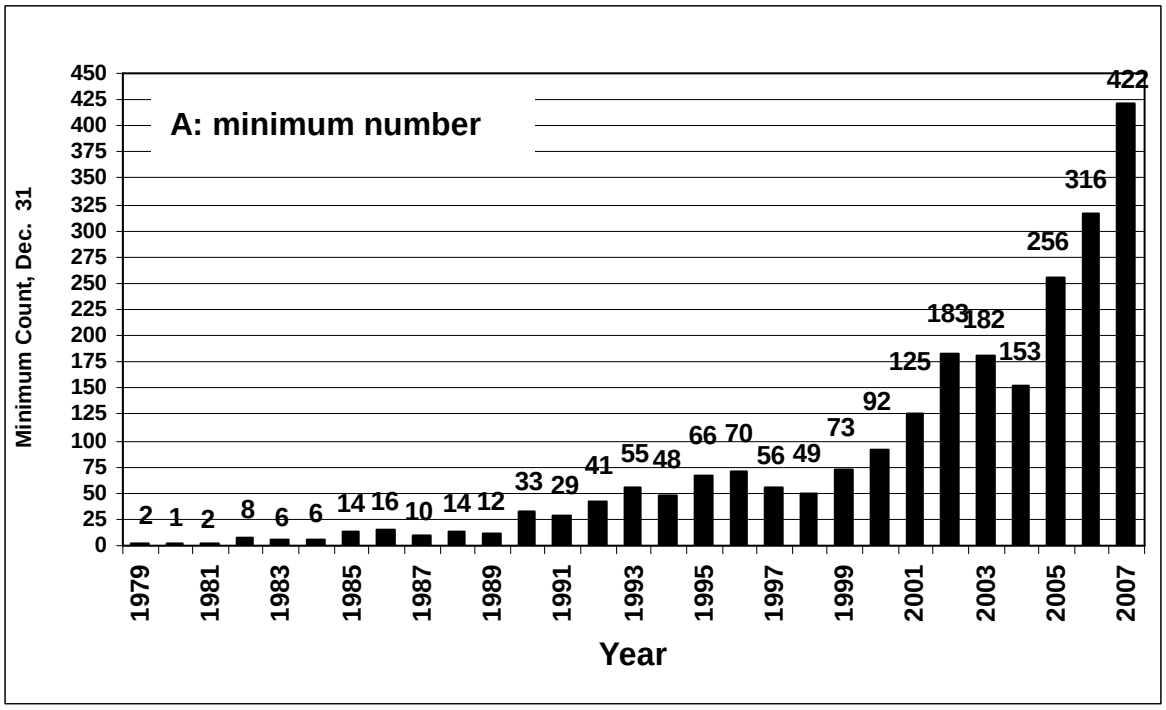
A total of 19 new packs formed between 2006 and 2007. However, 6-8 packs that existed in January 2007 no longer existed by the end of the calendar for a variety of reasons. Mange has been a factor in the Montana portion of the GYA, most notably in the Paradise Valley and eastward towards Big Timber.

The Montana minimum wolf population estimate increased about 34% from 316 wolves in 2006 to 422 in 2007 (minimum increase of 106 wolves) (Figure 3A). The number of Breeding Pairs (by the federal recovery definition) in Montana at the end of 2007 was 39 (Figure 3B). The number of packs statewide (2 or more wolves) increased from 46 in 2005 to 60 to 2006 to 73 in 2007. Packs for which size was known with confidence at the end of the year averaged 5.7 wolves (range 2-15). The larger packs tended to live in remote backcountry areas, wilderness, or Glacier National Park.

The vast majority of the total statewide increase of 106 wolves (or 19 packs of 2 or more wolves) occurred in far western Montana. The increase appeared to be influenced by the geographic proximity of the ID wolf population, a much larger "source" population than YNP. Approximately 87% of the increase in the minimum number of wolves occurred in the NWMT federal recovery area and the Montana portion of CID combined (46 wolves in each area, respectively). However, a greater percentage increase occurred in the Montana portion of the CID (south of Lolo Pass and west of I-15). See Figures 4(A) and 4(B).

In NWMT, the minimum estimate increased from 167 wolves at the end of 2006 to 213 at the end of 2007 (increase of about 28%). Overall wolf distribution in NWMT expanded with the increase in the number of packs. Twenty three of 36 packs met the Breeding Pair criteria. The minimum number of verified packs in NWMT increased from 19 in 2005 to 31 in 2006 to 36 in 2007. Several new packs started from dispersal from within the NWMT area over the last 1-3 years.

In the experimental area across southern Montana at the end of 2007, there were 37 packs, 16 of which met the Breeding Pair criteria. In the Montana portion of the GYA, there was an estimated minimum of 87 wolves in 14 packs, and 7 of the packs met the Breeding Pair criteria. In MTGYA, the population increased by a minimum of 12 wolves (16%) from 2006 to 2007. Seven of the 12 wolves added to the minimum estimate were lone individuals and did not appear to be affiliated with a pack. In the Montana portion of CID at the end of 2007, there was an estimated minimum of 122 wolves in 23 packs, and 9 of the packs met the Breeding Pair criteria. This represents a 61% increase from 2006 to 2007 (76 to 122 wolves, respectively).



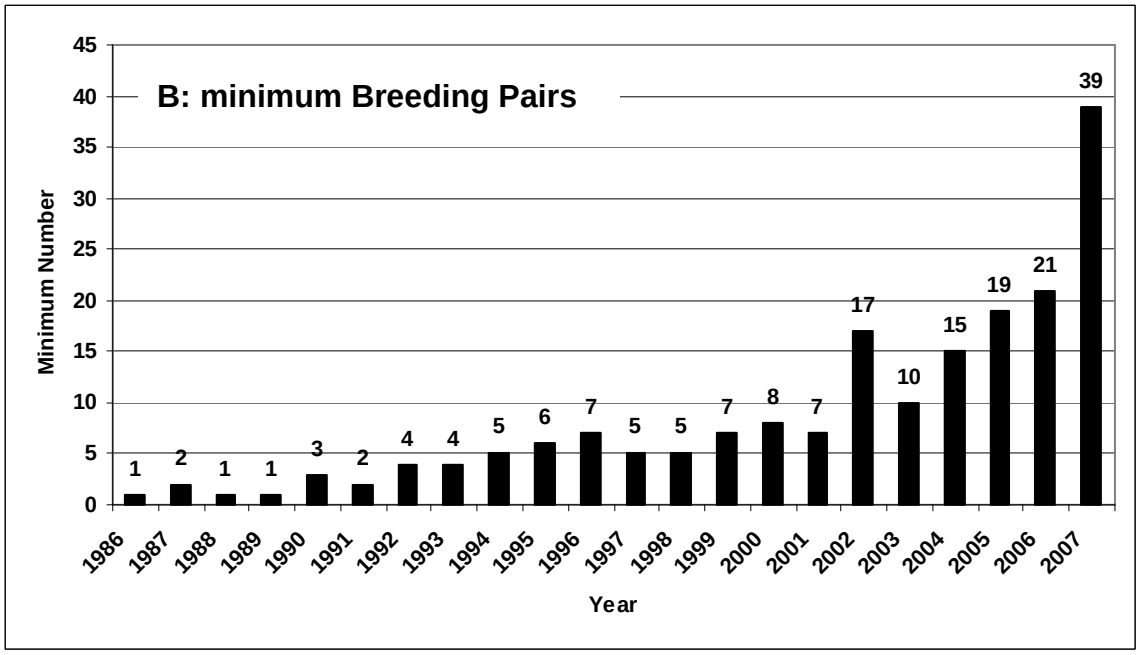


Figure 3. Minimum estimated number of wolves in the State of Montana on December 31, 1979-2007 (A) and (B) minimum estimated number of Breeding Pairs in the State of Montana December 31, 1979 – 2007

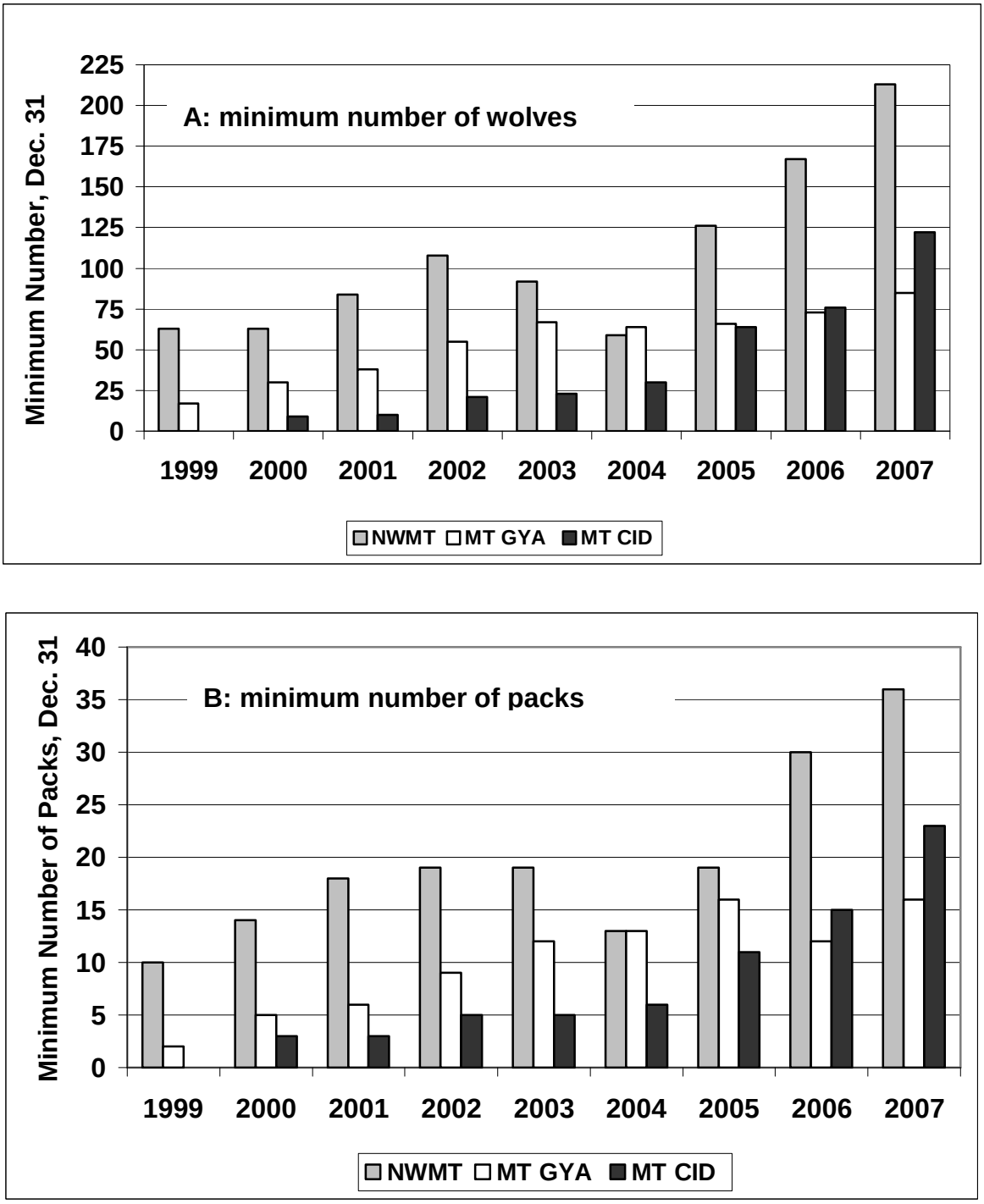


Figure 4. Number trends in the number of wolves (A) and (B) the number of wolf packs (defined as 2 or more wolves traveling together on Dec. 31) in each of the three geographic sub-units of the Montana wolf population: Montana portion of the Northwest Montana Recovery Area (NWMT; endangered), Montana portion of the Greater Yellowstone Recovery (GYA; experimental), and the Montana portion of the Central Idaho Recovery Area (MT CID; experimental), 1999-2007.

Of notable interest for the southern Montana experimental areas was that wolf pack distribution expanded primarily within the area of western Montana s already expected to have wolves (Figure 5). The minimum number of verified packs in the southern Montana experimental area increased from 27 packs in both 2005 and 2006 to 39 packs in 2007.

The number of wolf packs in the Montana portion of CID increased by from 2005 to 2006 and again in 2007 (11, 15, 23, respectively). In contrast, the Montana portion of the GYA decreased by 3 packs from 2005 to 2006, but increased by 4 packs to 14 between 2006 and 2007. These differences are probably due to more numerous successful wolf dispersal events into Montana from Idaho than from the YNP over the last few years. Whereas the wolf population in YNP will always be secure and a source of dispersing wolves into Montana, the YNP wolf population is smaller and nearly all available space within park boundaries has been claimed by a pack. This is in contrast to the larger ID population that continues to increase in both number and geographic distribution in an easterly direction from the original reintroduction sites. Thus the western Montana and the Idaho wolf populations appearing to be merging as new packs form in formerly unoccupied habitats.

The statewide increase from 2006 to 2007 was due to a variety of factors. Some was attributed to a real increase in wolf numbers in 2007, since many new packs formed and produced pups in 2007. MFWP has been documenting dispersal events within Montana's state borders that result in new pairs / packs forming. A total of 19 new packs were verified in 2007; however, some packs that existed on January 1, 2007 did not make it through the year for a variety of reasons, including human-caused mortality and/or disease. Other 2006 packs did not exist at the end of 2007. By the end of 2007, the dynamic nature of wolf packs was such that the number of packs increased by a net total of 19 from 2006 to 2007.

It is also important to note that MFWP's increased efforts to monitor wolves in recent years compared to previous years could partially explain the increases. MFWP re-hired two seasonal conservation technicians and brought on additional volunteers to help with 2007 monitoring efforts. The volunteers contributed about 3000 hours (almost 1.5 FTE) to conduct field surveys to investigate public and agency wolf reports and to trapping operations between May and November. Seasonal technician and volunteer efforts were in addition to volunteers and full time agency personnel.

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. Two or three of the "new" packs verified in 2007 were noted as suspected packs at the end of the year in 2006, but were not confirmed and included in the 2006 population estimate.

In conclusion, the Montana wolf population is split roughly equally between the northern Montana endangered area (NWMT 213 wolves) and the southern Montana experimental area (209 wolves). Packs are also roughly distributed equally between northern and southern Montana (Figure 5).

Several dispersal events were documented in 2007 and described in the Overview sections of the Interim Management Areas below. Of particular note is the southward dispersal of a male wolf wearing a global positioning satellite collar. It left the pack within which it was marked northwest of Lethbridge, Alberta Canada and traveled southwest and is in Idaho near the town of Clarkia (about 260 airline miles away from his natal pack). MFWP personnel were in close communication with a colleague in Pincher Creek Alberta through the period. The wolf was also observed and reported to MFWP by some spring black bear hunters in the Lower Clark Fork River area. Several collared wolves went "missing." These animals either experienced collar failure, were killed and the collar disabled or destroyed, or dispersed from their pack and could turn up elsewhere.

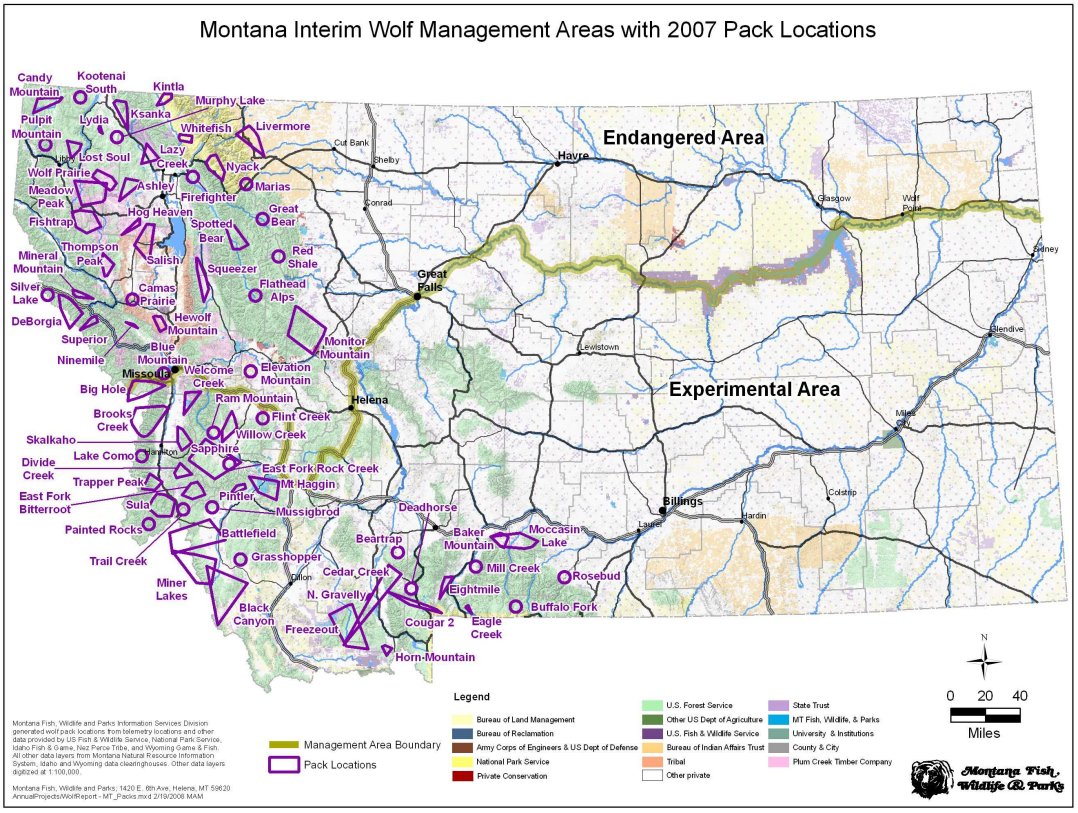


Figure 5. Verified wolf pack distribution in the State of Montana, as of December 31, 2007.

Development of a Public Wolf Hunting / Trapping Season

The U.S. Fish and Wildlife Service (USFWS) is expected to delist gray wolves from the Endangered Species Act in early 2008. Regulated public harvest was first endorsed by the Governor's Wolf Advisory Council in 2000 and eventually included in Montana's wolf conservation and management plan. The 2001 Legislature passed SB 163, reclassifying the wolf as a species in need of management upon federal and state delisting (MCA 87-5-131). The 2007

Legislature created a wolf license (SB 372). Other statutes within MCA enable the FWP Commission to adopt rules and general regulations and specific regulations pertaining to wolf hunting and trapping as a species in need of management.

FWP first began exploring the idea of how to design public hunting and trapping for wolves early in 2007. Ultimately, FWP crafted a proposed season and presented it to the FWP Commission at their meeting in December, 2007. Hunting could only be implemented when wolves are successfully delisted and if there are more than 15 Breeding Pairs of wolves in Montana. Despite awkward appearances, FWP wanted to move forward with the proposal so that adequate time could be devoted to the technical work as well as public comment. In adopting a tentative wolf season proposal in December 2007, the Commission enabled FWP to gather public comment, beginning in January 2008. Final decisions would be made in early 2008.

FWP recommended that wolf hunting and trapping seasons be established in two steps. First, the basic components, such as season dates, management units, means of take etc. would be determined through the regular biennial season setting timeline and process. These are the rules and regulations that outline what's legal and what is not with respect to licensed public harvest as well as other regulations pertaining to gray wolves classified as a species in need of management under Montana Code Annotated. Hunting / trapping season frameworks are adopted in Montana on a two year (biennial) cycle, with the process beginning with presentation of tentative proposals in December every other odd numbered year. The public has an opportunity to comment during the month of January. FWP reviews public comment and may modify the proposal prior to making a final recommendation to the Commission at the first meeting in February of next calendar year. The Commission would then make a final decision, thereby creating rules and regulations for the next two years.

The second step is to determine the actual number of wolves that could be harvested. This is addressed in a separate decision process. FWP is recommending that total wolf harvest be finite and regulated through a quota system. Within that quota system, general licenses would be available for hunting with limited special permits for trapping. The actual quota would be determined through the regular annual quota-setting process at future FWP Commission meetings. At a later time and depending on delisting progress, FWP would recommend tentative quotas and would gather public comment. The FWP Commission would then adopt final quotas in the late summer of each calendar year. Quotas are set on an annual basis.

Incorporating public hunting and trapping into the overall wolf management program will enable the Department to more fully incorporate wolves into Montana's wildlife heritage by enabling sportsmen and women to participate in wolf conservation and management similar to other wildlife species. This will help develop an additional constituency to advocate for its conservation, as has been the case for mountain lions. Wolves would be managed more proactively and in conjunction with natural prey populations and other carnivores in a more ecological manner.

Wolf Health Monitoring and Disease Surveillance

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 guides all wolf capture, physical or chemical immobilization procedures, and animal care and handling procedures. Supplementary training was provided in 2006, 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 submitted in 2007.

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. 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 in recent years, clinical evidence to confirm the cause/s was very difficult to obtain. The 2006 Montana Wolf Conservation and Management Annual Report (Sime et al. 2007) provided an in-depth summary of results to date regarding diseases in Montana wolves.

For the last two years, MFWP has been cooperating in a University of Illinois study examining contaminants and toxins in western gray wolf kidneys. Samples are also being submitted from the Canadian provinces. In 2007, MFWP obtained additional useable kidney samples from Montana wolves. Mid-year, MFWP personnel assisted in shipping and transferring kidney samples obtained in the Canadian provinces and from Montana to the University for analysis. Results are not yet available.

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. The 2006 Montana Wolf Conservation and Management Annual Report (Sime et al. 2007) provided an in-depth summary of results to date for the years 2003 to 2006.

Causes of documented wolf mortality in 2007 are shown in Figure 6. The majority of wolf mortality overall in Montana is related to humans: livestock conflicts, car strikes, train strikes, illegal killing, legal harvest in Canada, and incidental to other activities (e.g. trapping/snaring).

Of the 102 documented mortalities, 72% (n=73 wolves) were killed to address livestock related conflicts. The remaining 28% (n=29 wolves) died due illegal / suspected illegal killing, legal harvest in Canada, incidental trapping/snaring, natural, unknown, car/train, and incidental to management or euthanasia for poor health.

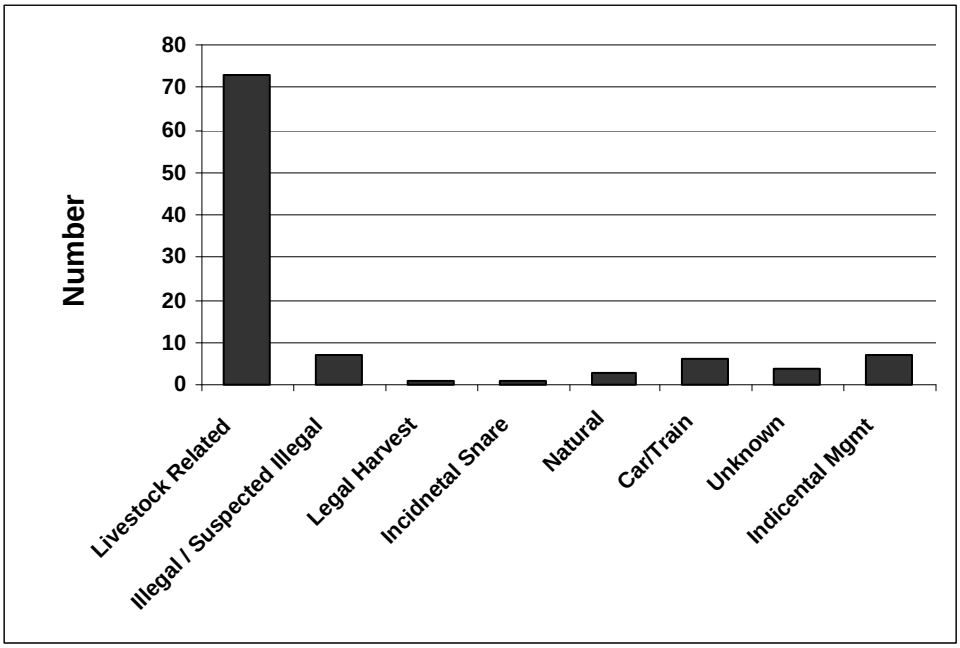


Figure 6. Causes of documented gray wolf mortality in Montana in 2007.

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 MFWP 2006 Monitoring and Assessment Report at http://fwp.mt.gov/wildthings/wolf/game.html.

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 beginning in 2004. 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. Another study showed that elk are not locally "displaced" or shift habitat use when wolves are in an area. Different vegetation patterns may explain why results differed. 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.

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 (2006) on the MFWP website wolf pages under "Wolves – Big Game" for additional information on what MFWP has learned so far. See also the main Northern Rockies bibliography included in this report.

Wolf – Livestock Interactions in Montana: General Overview

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 2007, the vast majority of cattle and sheep 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.

Historically, WS investigated reports of injured or dead livestock or domestic dogs in Montana. Between October 1, 1996 and September 30 2006, WS received approximately 679 complaints of suspected wolf damage. The total number of complaints received on a federal fiscal year basis gradually increased over the last 10 years, but leveled out at around 96 in the last 3 years. In federal fiscal year 2007, however, the number of wolf complaints received by WS increased to 159 from 97 in federal fiscal year 2006. Figure 7 shows the number of complaints received and that about half of all complaints that are verified as wolf.

On average between 1987 and 2006, about 50% of the complaints received were confirmed as wolf damage (injured or dead livestock or domestic animals). About 75% of confirmed injured or dead cattle involved calves (n=213). Of all confirmed injured or dead sheep, ewes comprised about 34% (n=147), lambs accounted for 26% (n=114), and 8% (n=35) were bucks. The remainder was of unknown classification.

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 a 2005 survey conducted by the National Agricultural Statistics Service, Montana cattle producers reported they lost a total of 66,000 cattle and calves to all causes, 3,000 of which were due to predators (4.5%

of total losses). Coyotes were responsible for 54% of calves lost to predation in 2005 (1300 of 2400 total). The remaining 1,100 calves were killed by all other Montana predator species combined, including an unknown number by wolves.

In a 2006 survey, Montana sheep producers reported losing a total of 51,000 sheep (ewes and lambs combined) to all causes, of which 14,100 sheep were killed by predators (28% of total sheep losses). In 2005, coyote predation accounted for 72% of all predator losses (n=10,100) and 20% of all death losses. Wolf predation accounted for 1.4% of total reported predator losses (n=200) (National Agricultural Statistics Service 2007).

However, a restored wolf population in Montana represents a new source of livestock mortality, and it may in fact be significant for some individual livestock producers (see below). Wolf presence may also lead to indirect losses because of missing livestock or poor livestock performance. 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.

Most wolves in Montana routinely encounter livestock, but do not kill livestock at each encounter. On average through the last 10 years, 10-25% of Montana wolf packs were confirmed to have predated on livestock in any given year. One pack has been on the landscape for 18 years and was confirmed to have killed livestock a total of 3 times even though livestock occurred within its territory and within 2 miles of the den site. Other packs depredate once or twice a year, every other year, or at more widely spaced intervals. Still others depredate more frequently, some demonstrating an escalating behavior pattern of actively hunting livestock in the span of a few weeks or months. Packs that have killed livestock repeatedly and within short periods of time, particularly adult-sized livestock, eventually became sources of chronic conflict. In these situations, lethal control occurred more regularly within and across years. In some cases, incremental removal in a stepwise fashion after repeated losses resulted in full pack removal.

From 1987 – 2006, WS confirmed a total of 314 incidents of injured or dead livestock due to wolves, affecting 162 different livestock owners. Of all the affected livestock owners, more experienced a single incident of confirmed wolf damage (n=101 of 162; 63%) than experienced multiple incidents (n=61 of 162; 39%) (Figure 8). Most confirmed incidents of injured or dead livestock in Montana (n=213 of 314; 68%) involved livestock producers who experienced wolf damage 2 or more times. The greatest number of incidents experienced by a single livestock owner in Montana was 16. Two owners experienced 11 incidents, and two others experienced 7 incidents (Figure 9).

Our data demonstrated how variable wolf-livestock conflicts in Montana are within and among years. At a course spatial scale, our data suggested that most conflicts occurred on private land and that some areas are more prone to conflict than others, evidenced by the multiplicity of events experienced by some producers. Still, a majority of affected Montana producers experienced a single incident of confirmed wolf damage (62%). Thus it is difficult to predict exactly when and where wolves will attack livestock within an individual pack territory.

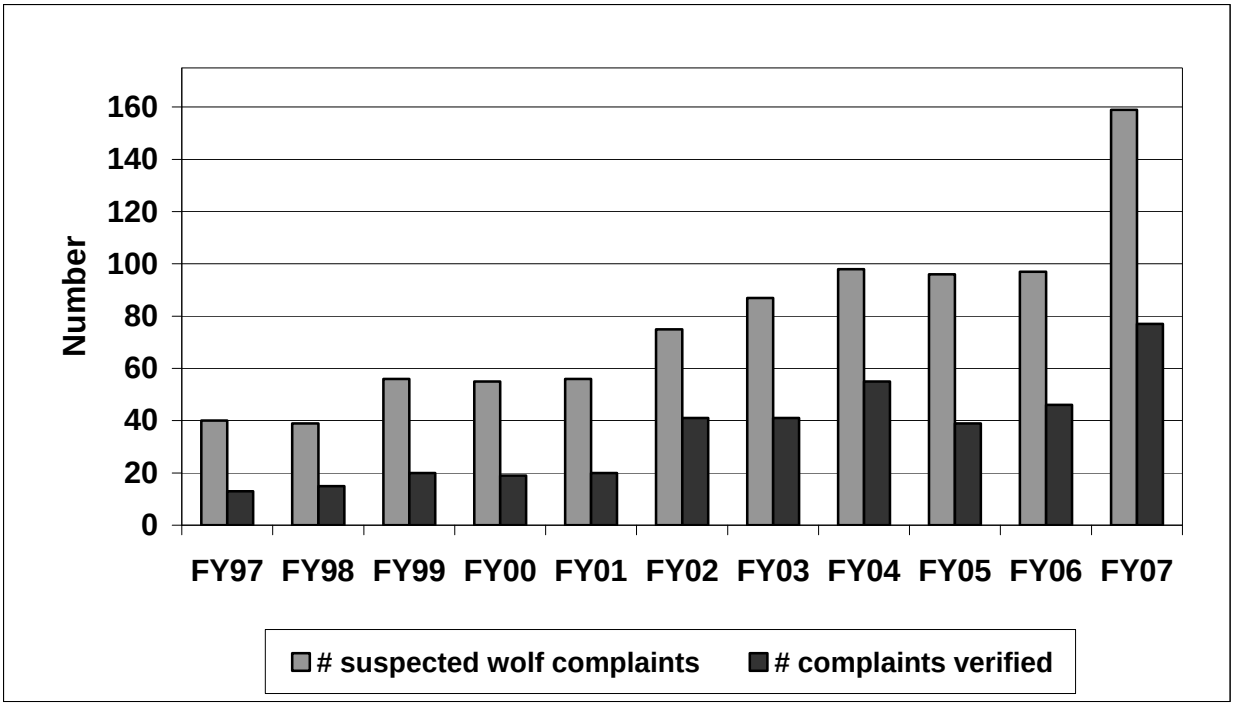


Figure 7. Number of complaints received by USDA Wildlife Services as suspected wolf damage and the percent of complaints verified as wolf damage, federal fiscal years 1992 – 2007. Federal fiscal years from October 1 to September 30.

Occasionally, livestock were confirmed killed by lone dispersing wolves or a pair of wolves passing through, as evidenced by the lack of a resident pack or subsequent instances of injured or dead livestock or wolf sign in the area. In these situations, the wolf usually does not return to the original depredation site. In other instances, livestock are killed by remnants of packs that became fragmented due to lethal control, dispersal or disease-related mortality.

A total of 254 wolves were killed to help resolve conflicts with livestock from 1987-2007 (Figure 10). Despite this level of lethal removal, particularly in the early years, the Montana population still increased in number and distribution, due primarily to immigration from central Idaho and to growth from within the Montana population. YNP is always a source of wolves dispersing into Montana; however, the MT portion of the GYA recovery area population has bee relative stable or slightly increasing / decreasing for the last few years. From 2001-2007, an average of 13.5% of the wolf population per year was killed due to conflicts with livestock (Figure 11). Despite this level of removal due to livestock conflicts, the Montana wolf population continued to increase through the years.

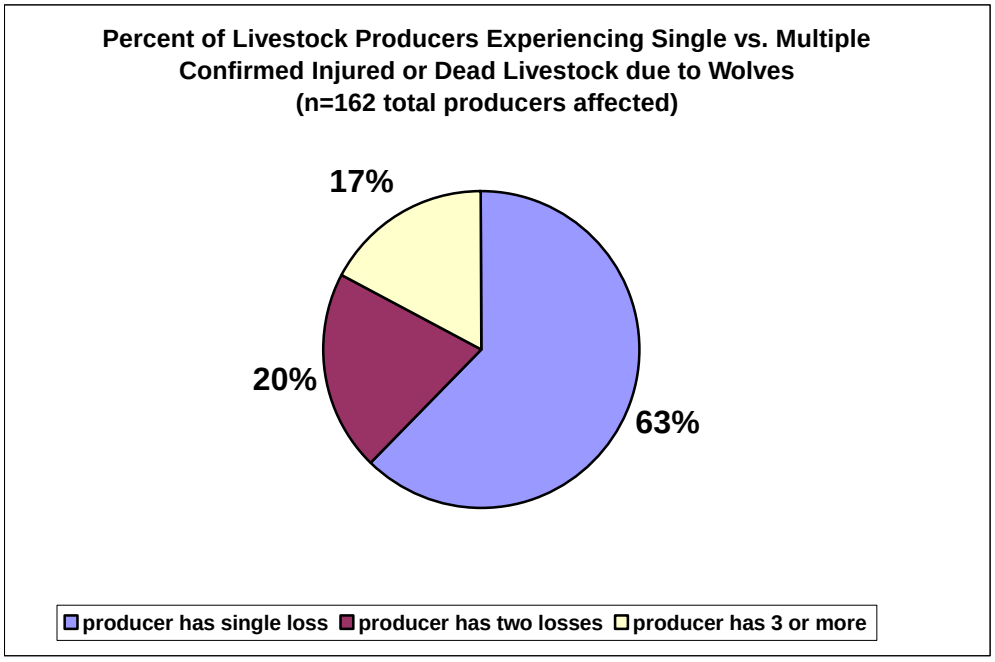


Figure 8. Percent of Montana livestock producers experiencing a single vs. multiple confirmed injured or dead livestock due to wolves, 1987-2006.

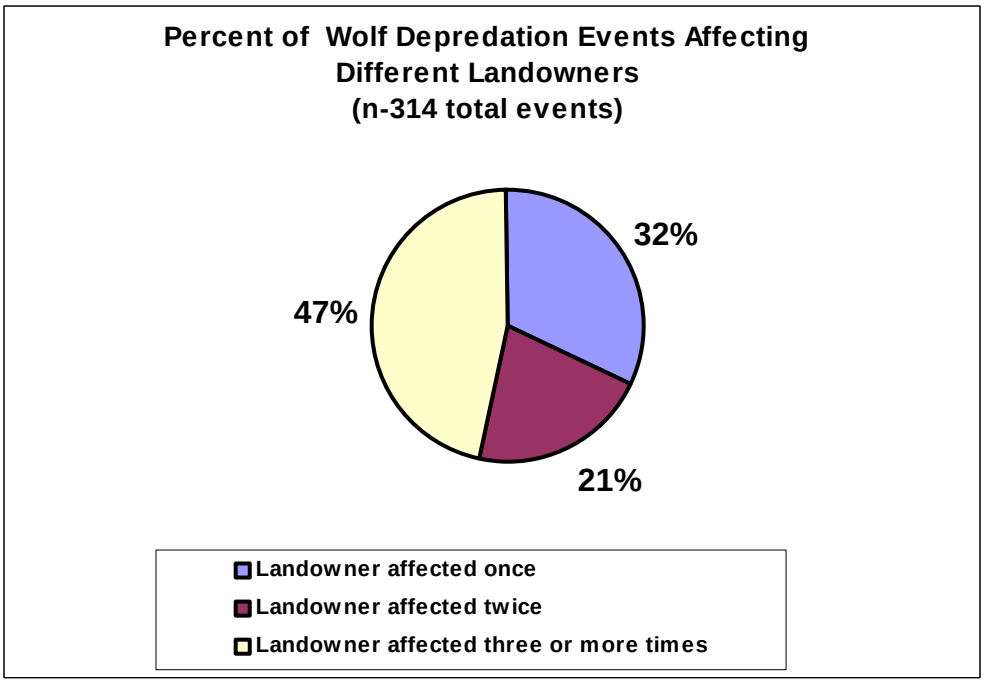


Figure 9. Percent of wolf depredation events of confirmed injured or dead livestock affecting different landowners in Montana, 1987-2006.

Under the more flexible special federal regulations in the southern Montana experimental area, a total of 10 wolves were legally killed by private citizens when discovered in the act of chasing or attacking livestock and 13 wolves were killed under shoot-on-sight permits from 2001-2006. In 2007, 7 wolves were killed while actively chasing livestock and 4 wolves were killed on a special permit. One of the 10j shootings and 1 of the wolves killed under a permit were later found to be in violation of the federal regulations and citations were issued. Those mortalities are still tallied with the others. WS and MFWP received numerous other reports of non-injurious hazing and harassing, but records are not complete enough to report accurately.

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, potential for additional losses, 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 responsively and as directed by the state plan.

Because most confirmed incidents of injured or dead livestock in Montana involve livestock producers who were affected 2 or more times and that most incidents occurred on private lands, we believe the combination of proactive non-lethal deterrents combined with strategic incremental lethal control of problem wolves is the best way to resolve wolf-livestock conflicts.

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 and implemented proactively to decrease the risk of wolf depredations and were considered after confirmed and probable wolf-caused losses. Several different range rider projects were implemented. MFWP also deployed fladry and electrified fladry on private property in several locations in 2007. 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. Fladry, electric night pens, increased human presence, and non-injuriously hazing or harassment were all implemented by both private citizens and agency personnel.

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. In 2005, 7 wolves were killed by private citizens under the 10(j) rule compared to 2 in 2006. In 2007, a total of 7 wolves were killed under the 10j regulation.

Depredation Incidents in 2007

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.

WS confirmed that, statewide, 75 cattle, 27 sheep, 3 domestic dogs and 1 llama were killed by wolves in calendar year 2007 (Figure 10). Approximately 32% of Montana packs had confirmed livestock kills at some point in 2007. Additional investigations were determined to be probable wolf depredations or confirmed injured livestock. 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. Most depredations occurred on private property. Seventy three wolves were killed to reduce the potential for further depredations in 2007. Of the 73, 7 were killed by private citizens on private land under the 2005 10(j) regulations and 4 were killed by private citizens who had been issued a permit in the experimental area of southern Montana. The remaining 62 were killed by WS using either ground or aerial based methods. Three packs were removed entirely due to chronic livestock conflicts (Bearmouth, Fleecer Mountain, and Wedge). Another pack had been slated for complete removal but it was not completed (Hewolf).

In the endangered area across northern Montana, the number of livestock and dogs confirmed killed increased from 2006 levels, as did the number of wolves killed. WS confirmed a total of 26 cattle, 5 sheep, 3 dogs and 1 llama as having been killed by wolves in 2007. A total of 19 wolves were killed in NWMT. The increase in livestock loss and lethal wolf control was due primarily to continued and chronic depredations and removal of wolves from the Hewolf pack. Hewolf pack members first began killing livestock in 2006 and the pattern continued through much of 2007. A total of 12 wolves were removed from this area (63% of the total number of wolves killed in NWMT in 2007). Several livestock producers in the Hewolf pack territory participated in a field trial experiment of electrified fladry. None of the losses occurred within the electrified fladry pastures. A total of 6 of 36 (17%) packs had confirmed depredations. See pack narratives below.

In the Montana portion of the GYA, the number of confirmed livestock losses increased in 2007 from 2006. Incidents in 2007 occurred primarily in 3 counties where livestock conflicts have occurred in the past (Park, Madison, and Beaverhead). WS confirmed a total of 24 cattle, 17 sheep, and 13 goats. A total of 23 wolves were killed (6 of which were killed by private citizens). The increase in total livestock loss and lethal control was apparently due to an increase in the percentage of packs in the GYA that killed livestock. In 2006, 3 of 15 (20%) packs killed livestock whereas in 2007, 9 of 18 packs (50%) killed livestock. Of the 18 packs that existed at some point in 2007, only 14 existed at the end of the year due to the effects of mange, conflicts with livestock, and interactions with other wolves. Lethal control in one of the 18 packs was implemented to remove the entire pack due to chronic depredations on private land (Wedge).

In the Montana portion of the CID, the number of confirmed livestock losses increased in 2007 compared to 2006. WS confirmed a total of 25 cattle and 3 sheep lost to wolves. A total of 31 wolves were killed (5 of which were killed by private citizens when wolves were actively chasing or attacking livestock). In 2006, 6 of 17 (35%) packs killed livestock. Of the 25 packs that existed at some point in 2007, 10 (40%) killed livestock. Two packs were completely removed (Bearmouth and Fleecer Mountain) due to chronic livestock conflicts and did not exist at the end of the year.

Private citizens killed 11 of the 73 (15% of total) wolves removed in the Montana portion of the GYA and CID experimental areas combined in 2007. Seven wolves were killed under the 10(j) regulations and 4 were killed by permit in 2007. All of the wolves killed in Montana by private citizens under the 10j regulation or as authorized by a shoot-on-sight permit were killed on private land.

Between 1987 and 2006, 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, September, and October. Because of their smaller size relative to cattle or other classes of livestock, sheep are vulnerable to wolf predation year round. Similar patterns of peak depredation activity were observed in 2007.

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

In 1987, Defenders of Wildlife (Defenders) 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.

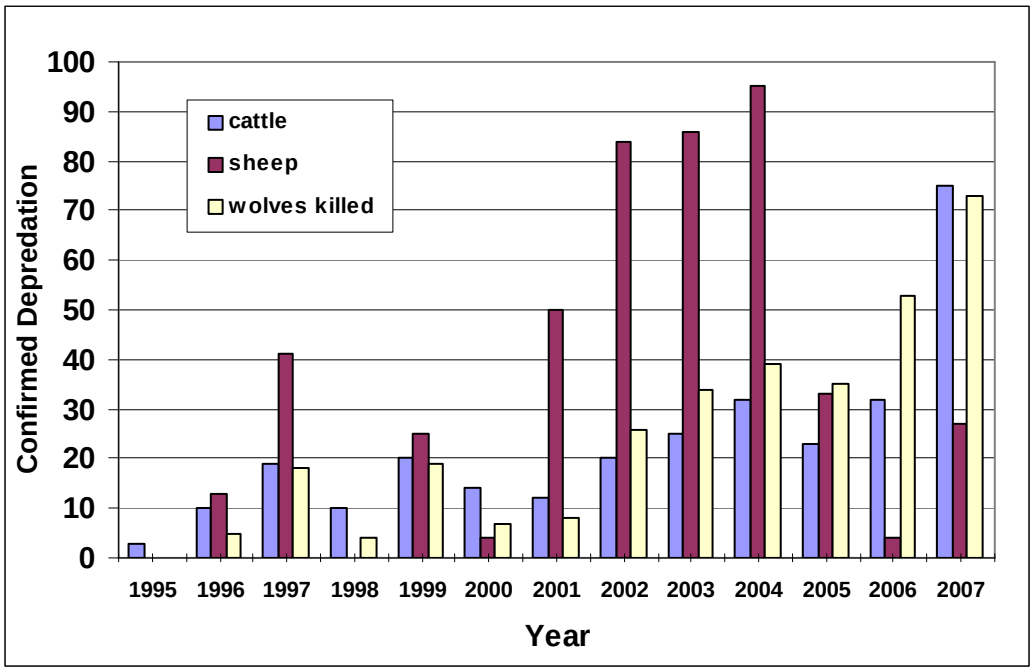


Figure 10. Confirmed cattle and sheep depredation and the number of wolves lethally controlled in the State of Montana based on investigations by USDA Wildlife Services, 1995-2007.

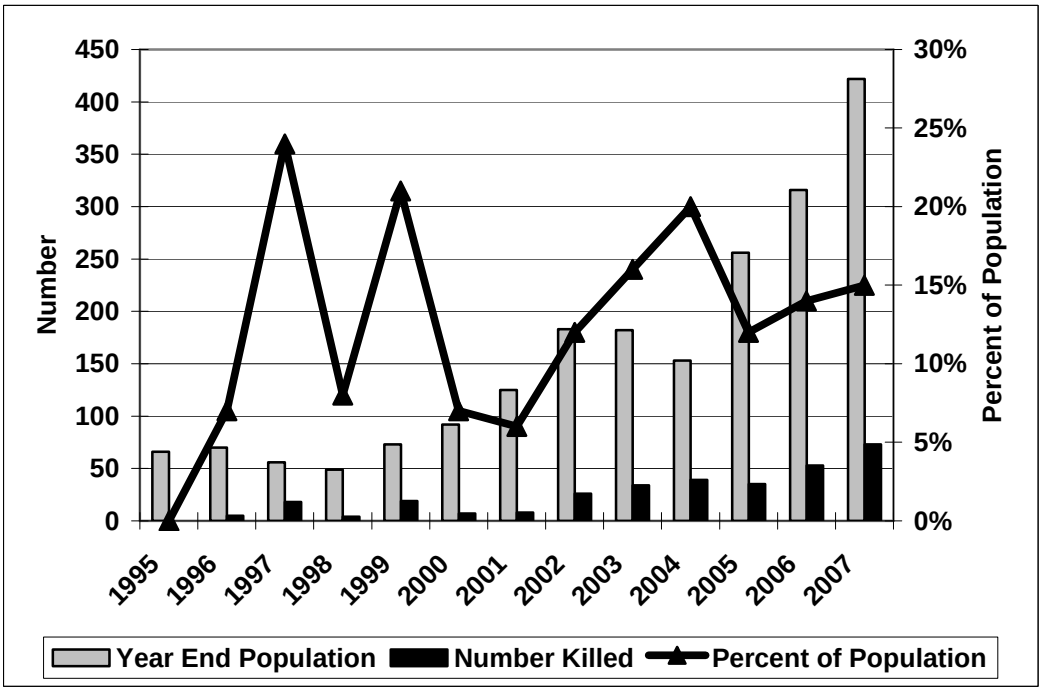


Figure 11. Minimum estimated wolf population, number of wolves killed to resolve livestock conflicts, and percent of the population removed, calendar years, 1995 - 2007.

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. More recently, Defenders increased the cap per animal to $3000 and implemented some criteria that are supposed to be met in order for a claim to be paid. 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 additional information.

Defenders of Wildlife also created the Proactive Carnivore Conservation Fund to prevent conflict between imperiled predators and humans before it occurs. The fund was renamed The Bailey Wildlife Foundation Proactive Carnivore Conservation Fund in recognition for the foundation's gift. If landowners or other entities have repeated predator problems, Defenders will consider funding projects that could help reduce conflict.

If the concept is practical and within the means of the organization, Defenders will share the cost of the project. Projects can also be proposed by government agencies or producers. According to Defenders, the proactive fund has three objectives: to reduce conflicts between predators and humans, to keep predators from being killed by agencies in response to human conflicts, and to increase general tolerance for carnivores across the landscape in an effort to expand the range of predators across the American West by reducing conflict between predators and humans.

From 1987 through December 2007, Defenders of Wildlife paid a total of approximately $298,109 in claims in the State of Montana (Figure 12). From 2000 to 2005 (inclusive), the total amount paid was $158,451 (65% of the total paid in Montana 1987-2005), averaging about $26,408 per year. The amount paid in any one year ranged from $7,935 to $54,757. Increases in total payments from 2005-2007 reflect increasing wolf numbers in Montana.

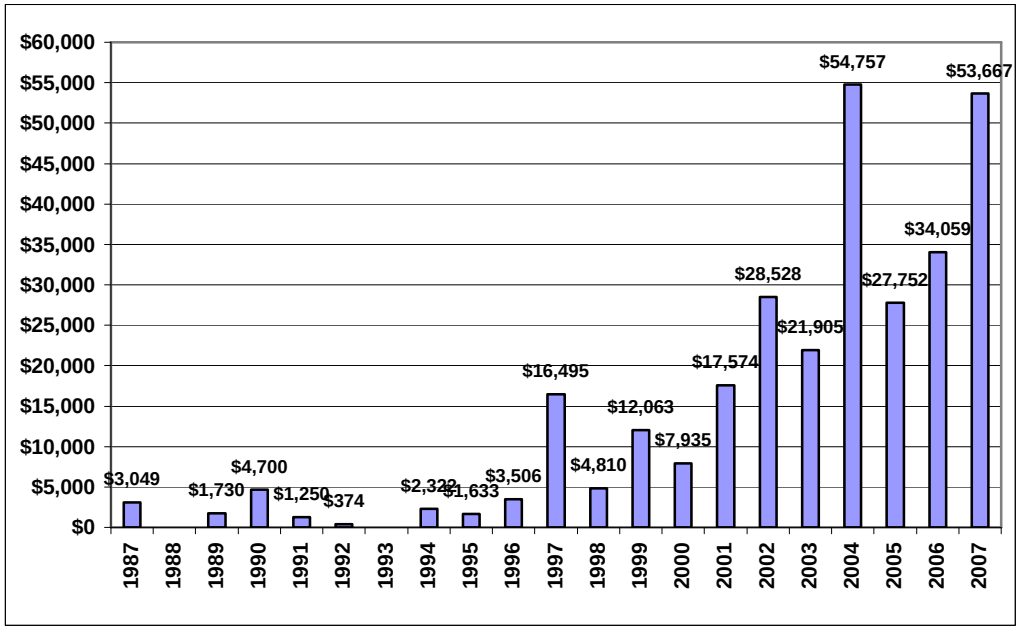


Figure 12. Compensation payments paid in Montana by Defenders of Wildlife, 1987 through December 2007, according to calendar year of payment and parameters set forth by Defenders of Wildlife. Source: http://www.defenders.org/wolfcomp.html.

Montana Livestock Loss Reduction and Mitigation Program: 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. A smaller subcommittee continued to meet in 2006. This group finalized a framework which then became the basis for legislation in the 2007 Montana Legislature.

As a part of the comprehensive wolf program implemented by Montana Fish, Wildlife & Parks (MFWP) and its cooperators, the Montana Livestock Loss Reduction and Mitigation Program (MLLRMP) will address economic losses due to wolf predation and create incentives for producers to take proactive, preventive steps to decrease the risk of loss. The large working group agreed that both government and livestock producers want to take reasonable and cost-effective measures to reduce losses, that it is not possible to prevent all losses, and that livestock producers should not incur disproportionate impacts as a result of recovery of Montana's wolf population.

The purposes of the Montana Livestock Loss Reduction and Mitigation Program are to proactively apply prevention tools and incentives to decrease the risk of wolf-caused losses; minimize the number of livestock killed by wolves through active management of the wolf population and proactive livestock management strategies and defense of property provisions of federal regulations prior to delisting and state laws upon delisting; provide financial reimbursements to producers for losses caused by wolves based on the program criteria.

There are three basic components: a loss reduction element, a loss mitigation element, and the state wolf management plan. MFWP and USDA Wildlife Services (WS) would fulfill their responsibilities and roles outlined in the state management plan. The loss reduction and loss mitigation elements would be administered by an independent quasi-judicial board created by the Montana Legislature.

The Loss Reduction element is intended to minimize losses proactively by reducing risk of loss through prevention tools such as night pens, guarding animals, or increasing human presence with range riders and herders. Active management of the population under the approved Montana Wolf Plan (and the applicable federal regulations for now) should also help decrease the risk of loss.

The Loss Mitigation element would implement a reimbursement payment system for confirmed and probable losses that can be verified by USDA Wildlife Services. Indirect losses and costs are not directly covered, but could be addressed through application of a multiplier for confirmed losses and a system of bonus or incentive payments. Eligible livestock losses are cattle, calves, hogs, pigs, horses, mules, sheep, lambs, goats, and guarding animals. Confirmed and probable death losses would be reimbursed at 100% of fair market value. Veterinary bills for injured livestock that are confirmed due to wolves are covered at 100% of fair market value of the animal.

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. Both the Montana Wolf Advisory Council and the second working group concluded that the MLLRMP would be funded through special state or federal appropriations or private donations. Both groups agreed that MFWP's wolf management dollars, and other MFWP funds (license revenue and federal matching Pittman-Robertson or Dingle Johnson dollars) would not be used to reimburse wolf-caused losses. Private donations will also be sought.

During the 2007 Montana Legislative session, a bill to establish the framework of the working group was introduced and passed (HB364). The legislation created the Livestock Loss Reduction and Mitigation Board to administer programs for the mitigation and reimbursement of livestock losses by wolves. It also established the quasi-judicial board, its purpose, membership, powers and duties, and reporting requirements. The Board is administratively attached to the Montana Department of Livestock, but its role and duties are wholly independent from the Department and the Montana Board of Livestock and vice versa. Late in 2007, the Governor appointed the Board.

The legislation also codified much of the actual draft framework in state law. It directed the Board to establish a program to cost-share with livestock producers who are interested in implementing measures to decrease the risk of wolf predation on livestock. It also directed the Board to establish and administer a program to reimburse livestock producers for losses caused by wolves. While some details of the grant program (loss reduction) and the reimbursement program (loss mitigation) are established in statute, the Board will still need to establish additional details through a rule-making process, which will include public comment opportunities.

HB364 also establishes special state and federal revenue accounts, respectively. The funds may only be used for the purposes of implementing the loss reduction grants program and reimbursing wolf-caused losses. HB 364 also established a trust fund with an intended principal of $5 million dollars. The earned interest of which funds the program. The Legislature did not, however, appropriate dollars for either of the special revenue accounts or the trust fund.

The 2007 Montana Legislature did appropriate "start up" funds in the amount of $60,000 in each year of the biennium to pay for initial operating expenses of the Board. The appropriation also included 1.0 FTE to support the work of an individual who works for the Board and conducts the day to day business of the program. This individual was hired late in 2007 and the initial orientation and coordination has begun.

The first meeting of the Montana Livestock Loss Reduction and Mitigation Board is scheduled for early 2008. Rulemaking is expected in 2008 to finalize outstanding details and establish them in the Administrative Rules of Montana. Fundraising is also expected to get underway in 2008.

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.

PACK SUMMARIES

Northwest Montana Endangered Area

Overview

In 2007, we documented a minimum estimate of 213 wolves in 36 packs in the Montana portion of the NWMT recovery area. This is an increase from 167 wolves in 31 packs at the end of the year in 2006. There were 7 newly identified packs in 2007. Some of these packs are believed to be first year packs, and some are likely to have existed the previous year.

Forty-one radio collared wolves in 29 packs, or 80% of the 36 total packs, were monitored in northwest Montana during 2007. This is up from 58% of 31 total packs in 2006. Two additional radio collared packs, Kootenai North (west of Koocanusa Reservoir) and Spruce Creek (aka Nettie in 2005) (North Fork Flathead), were also monitored, but appear to spend most, or all, of their time in Canada. Radio collared wolves were located from aircraft approximately 1–2 times per month. Radio collared wolves in and around Glacier National Park (GNP) were located more frequently from the ground by GNP staff. Twenty-seven radio collared wolves from 19 packs and 2 dispersers (55% of the 36 total packs and dispersers) were being monitored in northwest Montana by the end of 2007.

MFWP traplines were set in 18 pack territories, and 18 wolves were captured in 2007. Fifteen were radio collared and 3 were too small to collar. USDA Wildlife Services trapped in 6 additional areas and collared 7 wolves. Two of these areas were trapped with the cooperation of both the Blackfeet Tribe and the Salish Kootenai Tribes on their respective reservations. Fur trappers captured 1 non-target wolf. This is down from 5 non-target captures in 2006. That wolf was killed in a lethal coyote snare.

MFWP surveyed a total of 23 areas for wolf presence and pack status. Five of those areas resulted in the verification of new packs. Wolf activity was verified in 2 other areas, but it is unclear whether they are discrete packs or areas used by adjacent packs. These areas will be scheduled for survey again in 2008. Ten of those surveys were conducted to determine pack status in areas of known packs that do not have functioning radio collars. There were 6 areas

where definitive wolf sign could not be determined and will be scheduled for survey again in 2008. Two more new packs were verified one each by personnel of the Salish Kootenai Confederated Tribes and USDA Wildlife Services.

Packs included in the Montana portion of the NWMT recovery area as of December 2007 were Ashley, Blue Mountain, Camas Prairie, Candy Mountain, DeBorgia, Elevation Mountain, Fishtrap, Firefighter, Flathead Alps, Great Bear, Hewolf Mountain, Hog Heaven, Kintla, Kootenai South, Ksanka, Lazy Creek, Livermore, Lost Soul, Lydia, Marias, Meadow Peak, Mineral Mountain, Monitor Mountain, Murphy Lake, Ninemile, Nyack, Pulpit Mountain, Red Shale, Salish, Silver Lake, Spotted Bear, Squeezer, Superior, Thompson Peak, Whitefish, and Wolf Prairie. Newly documented wolf packs in 2007 included the Blue Mountain, Camas Prairie, Firefighter, Mineral Mountain, Monitor Mountain, Salish, and Silver Lake (Table 1a).

Along the Montana/Idaho transboundary area within the NWMT Recovery area, the Calder Mountain and Solomon Mountain packs are believed to den and spend most of their time in Idaho and therefore are counted towards the Idaho wolf population. Along the transboundary area between the NWMT and CID recovery areas, the Bitterroot Range and Fish Creek packs den and spent most of their time in Idaho and are therefore counted towards the Idaho population. Along the US/Canada Border, the Kootenai North and Spruce Creek (aka Nettie in 2006 annual report) packs spend most or all of their time in Canada and are not counted towards the NWMT population.

Reproduction was confirmed in 28 of the 36 packs (Table 1a). Twenty-three of the 28 packs known to reproduce met the criterion to be counted as Breeding Pairs. Breeding pair status could not be documented in some packs either because they were uncollared and therefore more difficult to obtain data, or we were unable to confirm a minimum pup survivorship of 2 at the end of the year. Three packs appeared to not have reproduced.

Thirty-two total wolf mortalities were documented in the Montana portion of the NWMT recovery area population in 2007. All but 5 were attributed to some form of human cause including 19 lethally removed in control actions, 1 illegally killed, 1 legal harvest (Canada), 1 non-target incidental coyote snare, 4 vehicle collisions, and 1 train collision. One wolf died of pneumonia. Four other wolves died of unknown causes.

A total of 6 radio-collared wolves were missing by the end of the year. Missing collars are due to long-range dispersal, collar failure, or other unknown fate.

Three dispersals were recorded. One of these took place in 2005, but was not discovered until this year. Female wolf 326, who had been missing from the Fishtrap pack since October of 2005, was found in the St. Regis River drainage. She is now part of the Mineral Mountain pack. Female wolf NW191F, who has been missing from the Elevation Mountain pack since July 2007, was found on the Rocky Mountain Eastern Front. At this time we do not know if she is associated with other wolves but is suspected to still be alone. Another dispersal was also recorded from the Willow Creek pack in Alberta Canada. Wolf WC7 was captured on 10/31/06 approximately 75 miles northwest of Lethbridge, Alberta, and collared with an ARGOS GPS collar. WC7 began to disperse around 3/23/07, entered the United States in the North Fork

Flathead valley on 3/30, and traveled through NW Montana and entered Idaho in the vicinity of Lookout Pass on I-90 on 5/7. WC7 appears to have settled in an area 260 miles away from his natal pack near Clarkia and Boville, ID.

In NWMT, the number of confirmed livestock and dogs killed was up from 2006 as well as number of wolves lethally controlled. The increase was due primarily to continued depredations and subsequent control of the Hewolf pack. Hewolf depredations began in 2006 and continued through much of 2007. The number of packs or lone wolves involved in livestock depredations also increased in 2007. We documented 35 confirmed livestock and dog kills. There were 26 cattle, 5 sheep, 3 dogs, and 1 llama. An additional 4 calves were ranked as probable kills, 3 calves were probable injured, 4 calves were confirmed injured, 1 llama confirmed injured, and 2 horse/mule (1 each) was probable injured. Six or seven of 36 packs (we were unsure which pack was involved in 2 dead and 1 injured calves) and 4 lone wolves were involved in confirmed killed or injured livestock, and a total of 19 were lethally removed as a result. Twelve wolves were removed from the Hewolf pack. These figures only account for verified losses. It is unavoidably impossible to account for the proportion of unverified losses due to wolves. Unverified losses are losses where the cause of dead or missing livestock is not known. Turbo Fladry (electrified fladry) was used in the Hewolf pack territory as part of research on the efficacy of that tool (see research section below). Regular fladry was used as a preventative measure in 2 different instances across 2 different packs.

Verified Packs (Table 1a in Appendix 3)

Ashley

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

History: Discovered in 2006. Their home range is NW of Kalispell.

2007 Activities: This area was surveyed at different times from May-September. Trapping occurred in August and NW243F was captured on 9/8/07. On 9/18 we documented 9 wolves in this pack, but by the end of the year we could only document 4 wolves including 1 pup. NW243F has been missing since 12/18 and appeared to be by herself and outside the Ashley home range at that time. This pack is no longer collared.

Blue Mountain

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

History: First documented in 2007.

2007 Activities: In early 2007 several residents in the Blue Mountain area, west of Missoula reported seeing a single black wolf. Due to the amount of dog use in this area it was difficult to confirm. Other reports of wolf activity continued to come in later in the spring and FWP personnel found wolf scats up the Blue Mountain road in early summer. Due to the amount

of human use in the area trapping was not attempted. Hunters reported at least 2 black wolves in the area during the fall. In September FWP personnel cut 2 sets of tracks in the Grave Creek area. In December FWP followed up on a report of 4 wolves from a lion hunter in the Albert Creek area and cut 4 sets of tracks.

Camas Prairie

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

History: New in 2007

2007 Activities: The Salish Kootenai Tribe documented this pack in the fall of 2007. There is nothing else known about this pack. Their home range is near Perma, MT. There are no radio collars in this pack.

Candy Mountain

- 4 wolves; not a 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. The Candy Mountain territory is in the Yaak River drainage.

2007 Activities: There were 11 wolves in the Candy Mountain pack in the beginning of 2007. By the end of the year we could only document 2 pups and 2 adults. Wolf 351, the assumed alpha female, has been missing since 10/15. Her collar was 4 years old at that time and possibly expired. Candy Mountain pack is not a breeding pair this year since we could not document the status of the alpha female at the end of the year. In October we surveyed for both the 2005 and 2006 dens. We located and documented the 2005 den, but could not locate the 2006 den. This pack is no longer collared.

DeBorgia

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

History: First suspected in 2005 and confirmed in 2006.

2007 Activities: At the end of 2006, six wolves were believed to be in the DeBorgia Pack. Alpha female NW85F continued to be tracked during 2007. NW85F localized in Montana during April and was believed to have denned. In August, 2 gray pups were seen from the air. Very few other visuals were obtained during the rest of the year. At the end of 2007 at least 2 adults and 2 pups were believed to be in this pack. DeBorgia is a Montana/Idaho border pack but is counted as a Montana pack for 2007 because they denned in Montana and the majority of 2007 aerial telemetry locations were in Montana.

Elevation Mountain

- at least 6 wolves; breeding pair
- 3 injured calves probable

History: First documented in 2006.

2007 Activities: At the end of 2006, five wolves were believed to be in the Elevation Mountain pack. In March three calves were injured and were written up by WS as probable wolf damage. WS attempted to collar and release during this time but no wolves were caught. FWP initiated a trapping effort in May and captured and released a yearling female. This wolf (NW191F) dispersed 2 weeks later and wasn't found again until late November when FWP found her by herself during a monitoring flight west of Choteau on the Rocky Mountain Front. FWP continued trapping efforts on and off throughout the rest of the summer but no other wolves were captured. In July FWP documented 6 pups (5 black, 1gray) and 2 adults (both black) from the ground. At the end of 2007 FWP documented at least 6 wolves were still present through snow tracking.

Fishtrap

- 7 wolves; breeding pair
- no depredations reported

History: The Fishtrap pack was first documented in 2000. Its territory is in and around the Thompson River, McGuiness Creek, and Fishtrap Creek drainages.

2007 Activities: Wolf 270s collar and wolf 266s collar are both old (6 and 5 years respectively) and are due for battery expiration. We conducted a trapline in July to place a new collar in the pack. Wolf NW221F was captured on 7/30. The dispersal of Fishtrap wolf 326 was documented in 2007. Female wolf 326 had been missing from the Fishtrap pack since October 2005 and was observed in October 2007 as part of the Mineral Mountain pack northwest of St. Regis. This is approximately 40 mile dispersal distance. We speculate that she may be the alpha female of the Mineral Mountain pack. There are still 3 functioning radio collars in the Fishtrap pack.

Firefighter

- 8 wolves; breeding pair
- no depredations reported

History: New pack in 2007.

2007 Activities: MFWP bear biologists discovered this pack. Trapping was attempted in September but no wolves were captured. This pack is not collared.

Flathead Alps

- 10 wolves; breeding pair
- no depredations reported

History: Discovered in 2006. The home range is located in the Bob Marshall Wilderness Area in the White and South Fork Flathead River drainages.

2007 Activities: Activity was documented in and around the den area during the denning period. Both the den and pups were discovered by back country recreationists. Forest Service personnel reported a wolf with a radio collar in this pack, but we have not been able to verify a functioning collar in area.

Great Bear

- 4 wolves; breeding pair
- no depredations reported

History: The Great Bear pack was first discovered as a new pair in 2003 after wolf 271 dispersed from the Spotted Bear pack and paired with another wolf of unknown origin. This pack's territory is along the Middle Fork of the Flathead River and tributaries within the Great Bear Wilderness. The radio collar is suspected to have failed in March 2004.

2007 Activities: Reproduction and numbers were documented by MFWP bear biologists working in the area. Forest Service personnel reported two wolves with radio collars in this area, but we have not been able to verify a functioning collar in area.

Hewolf Mountain

- 4 wolves; not a breeding pair
- 7 calves, 2 cows, 1 yearling, 1 llama confirmed killed, 1 calf, 1 llama confirmed injured, 1 calf probable; 12 wolves killed by WS/Tribe

History: First suspected in 2005 and confirmed in 2006.

2007 Activities: Six wolves were suspected in the area at the end of 2006 but eight adults were documented in June 2007. During the winter, CSKT, WS, and FWP collaborated on a turbo-fladry research project with Utah State University. Turbo-fladry was installed at multiple ranches west of Arlee. No depredations were recorded within the fladry lines during this time and the project finished up in the spring. However, depredations persisted and became chronic throughout the rest of the year. In May, two calves and 1 llama were confirmed killed and a second llama was injured. Control actions were initiated. WS and the CSKT tribe collared and released a yearling male (NW180M) at this time. In June, two more calves were confirmed killed and 1 calf was probable. WS/CSKT trapped and killed 1 wolf in early June and trapped and released 1 pup. Another calf was confirmed killed in mid-July. Two wolves were killed in July. At this time, CSKT decided to remove the entire pack. In August, one calf and one cow were confirmed killed. One wolf was killed in early August. In early September 4 wolves were killed (including NW90F and NW180M) and later in the month an additional 4 wolves were killed, including 2 pups. Another calf was confirmed killed in mid-September. A female pup (NW242F) was collared and released in early September. A cow was confirmed killed in November and a yearling was killed in December. In December NW242F was recaptured at the site of the carcass and her collar was refitted. Two wolves that were killed during control efforts during the year were not recovered. Efforts were ongoing at the end of 2007 to remove the remainder of the pack, which was believed to consist of one adult and 3 pups.

Hog Heaven

- 6 wolves, breeding pair
- 1 cow and 2 calves confirmed killed; 1 wolf lethally removed by Wildlife Services.

History: The Hog Heaven pack was first documented as a new pair in 2001, after wolves 278 and 286 from the Parsnip group (a group of wolves translocated in 2001 from the Boulder Creek pack as a management response to cattle depredations), traveled separately to the Hog Heaven/Browns Meadow area and paired.

2007 Activities: The status of this pack was unknown at the beginning of the year and there were no functioning radio collars. This area was surveyed in August and wolf presence was documented. On 8/21 an adult cow was confirmed killed by wolves. Wildlife Service trapped 2 wolves, collared NW231F, and released both on 8/22. On 10/22 2 calves were confirmed killed and Wildlife Services lethally removed 1 wolf on that same day. No further depredations were reported. There is one radio collar in this pack.

Kintla

- 4 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 for additional information). The Kintla pack's home range is in the North Fork Flathead River drainage, and spends most of their time within GNP.

2007 Activities: Wolf 255's collar is 6 years old and due for battery expiration. We conducted a trapline in May to place a new collar in the pack. On 5/15 we captured and collared NW185F. We located and documented the den in May after the pack vacated the den. On 10/16 NW185F was found illegally killed in Canada ½ mile north of the US/Canada border and Glacier National Park. Wolf 255's collar was still functioning at the end of the year.

Kootenai South

- 4 wolves; breeding pair
- no depredations reported

History: Since 2005 the former Kootenai pack now consists of the Kootenai North and Kootenai South packs through either the mechanisms of dispersal or pack splitting. The Kootenai South pack occupies a territory mainly south of the U.S./Canadian border and west of Koocanusa Reservoir, while the Kootenai North pack (collared wolf 329) occupies a territory mainly north of the border and west of Koocanusa Reservoir.

2007 Activities: This pack was uncollared in the beginning of 2007. We surveyed this area in June. On June 28 we captured 2 wolves, collared NW207F, and released a pup that was too small to collar. NW207 was reported by Canadian biologists as legally harvested in Canada approximately 5 miles north of the US/Canada border. This is the second time in as many years that we collared a wolf that would be legally harvested in Canada later that year. This pack is uncollared at the end of the year.

Ksanka

- 6 wolves; breeding pair
- no depredations reported

History: Ksanka was first documented in 2006 with the discovery of dispersing wolf 263 from the Kintla pack. This pack is east and southeast of Eureka.

2007 Activities: The only collar, wolf 263, was missing at the beginning of the year. Public sources reported and even photographed a radioed wolf indicating that likely his collar failed prematurely. Surveys were conducted in this area in June and a subsequent trapline was initiated. NW199M was captured on 6/16. We located and documented the den site in September. This pack has 1 radio collar.

Lazy Creek

- 8 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. Their territory is north of Whitefish Lake.

2007 Activities: In September we documented 14 wolves (including pups) in this pack. By the end of the year we could only document 8 wolves (including 2 pups). The Lazy Creek pack has 2 collars (261 and NW026M).

Livermore

- 10 wolves; breeding pair
- no depredations reported

History: Livermore was first documented in 2005 and its home range is within the Blackfeet Tribe Reservation.

2007 Activities: This pack was uncollared at the beginning of the year. On 3/19 a wolf was documented to have died of natural causes. In June, a calf was injured by wolves from the Livermore pack. Subsequently, the Blackfeet Tribe and Wildlife Services captured and collared NW256M on 6/29 to monitor the pack more closely. Blackfeet Tribe biologists monitor this pack. There is 1 collar in this pack at the end of the year.

Lost Soul

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

History: Lost Soul was first observed in 2006 after following the dispersal of NW036F from the Kootenai South pack. She occupied the area with one other wolf. Their territory is located northeast of Libby.

2007 Activities: NW036F localized during the denning season and was assumed denned. She has been missing since June. We surveyed the potential den area in September and found no wolf sign or anything to indicate there ever was a den in the area. The status of this pair/pack is therefore unknown. We will survey this area during the denning season in 2008. There are no radio collars in this pair/pack.

Lydia

- 8 wolves; breeding pair
- 3 confirmed calves killed, 1 probable, calf killed; 2 wolves lethally removed.

History: This pack was first documented in 2006. Their territory is south of Eureka.

2007 Activities: This pack was not collared in the beginning of the year. We surveyed the area in June, set trapline, and captured and collared NW197F on 6/10. Wildlife Services confirmed a wolf killed calf 1 week later on a Forest Service grazing allotment. FWP initiated daily hazing operations in an attempt to push the pack off the grazing allotment. It is not known if these efforts were successful in the short term. During this time 2 different dens were located and documented. Three calves were confirmed or ranked probable killed by wolves in early August on the same Forest Service grazing allotment. One pup was captured and released during control action operations. Ultimately 2 wolves, including newly collared NW197F were lethally removed. No further depredations were reported. This pack is uncollared.

Marias

- 6 wolves; breeding pair
- no depredations reported

History: This pack was first documented in 2005 and occupies an area around the Marias Pass area.

2007 Activities: This pack has never been collared. We surveyed this area in September, set traps, and captured a pup that was too small to collar on 9/14. Survey efforts also verified minimum numbers of adults and pups. There are no collars in this pack.

Meadow Peak

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

History: This pack was first documented in 2006. Their territory is north of Thompson Chain of Lakes.

2007 Activity: This pack was uncollared in the beginning of the year. In February a female wolf was killed incidentally in a coyote snare within the Meadow Peak home range. It was estimated at that time that it had been a breeding female. In July we surveyed the area, set traps, and subsequently captured and collared NW216F on 7/24. There was never any evidence of reproduction. This pack has one collar.

Mineral Mountain

- 6 wolves; breeding pair
- no depredations reported

History: New in 2007.

2007 Activities: This pack was discovered by MFWP game wardens in the 06/07 winter and was thought to be uncollared in the beginning of the year. This area was surveyed and trapped in both April and August. On 8/18 a pup was captured after the pack moved the pups to a different rendezvous site 2 miles from the previous site. On 8/24 NW233F was captured and collared. She was missing for 4 months after this capture. On 10/24 missing wolf 326 was discovered in the Mineral Mountain territory. Female wolf 326 had been missing from the Fishtrap pack since October 2005. This is approximately a 40 mile dispersal. We speculate that she may be the alpha female of the Mineral Mountain pack. Since then, on 12/18, NW233F has reappeared and both collars have been located together. This pack has 2 collars in it.

Monitor Mountain

- 5 wolves; not a breeding pair
- 4 confirmed calves killed, 2 probable calves killed; 3 wolves lethally removed.

History: New in 2007. Their home range is NE of Lincoln on the Eastern Front and the Scapegoat Wilderness.

2007 Activities: This pack was discovered after a new pair of wolves was confirmed to have killed 2 calves and 2 probable kills on private land in January. In March NW159M was captured and radio collared. The pair denned and produced 6 pups that survived into November. At that time the pack returned to the same ranch and depredated again in November. Wildlife services attempted to helicopter dart and collar an additional wolf during this time, but that operation was unsuccessful. In December the pack killed another calf. Wildlife Services removed 3 wolves from the pack including the alpha female and 2 pups. At the end of the year this pack consisted of only one adult and 4 pups and therefore does not count as a breeding pair in 2007. There is one radio collar in this pack at the end of the year.

Murphy Lake

- 2 wolves; breeding pair
- no depredations reported

History: The Murphy Lake pack was first documented 16 years ago in 1991. This pack had confirmed depredations in only 2 of the last 16 years. Their territory is between Whitefish and Eureka.

2007 Activities: This pack was uncollared in the beginning of the year. We received a report from one of our public sources indicating that the den area may be located. We confirmed pups immediately and began to trap around this location for 5 weeks and were unsuccessful. We located and documented the den after the pack vacated. This pack remains uncollared.

Ninemile

- 6 wolves; breeding pair
- 2 dogs killed

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

2007 Activities: At the end of 2006, six wolves were believed to be in the Ninemile pack: 3 black adults, 2 gray adults, and 1 gray pup. NW61M, who was collared in 2005, disappeared in early 2007 and is believed to have dispersed. NW56F, who was also collared in 2005, was monitored up until April 2007 when her collar was believed to have failed. Numerous residents reported spotting a collared black wolf throughout the year, so she is believed to still be alive. FWP collared an adult gray male in July but the collar slipped two weeks later. Other attempts to collar/release were initiated in the fall with no success. The pack remains uncollared at the end of 2007. The Ninemile pack produced at least 2 pups in 2007. Two dogs were confirmed killed by wolves in the valley, one in May and another in September. At the end of 2007, at least six wolves were believed to be in the Ninemile pack: 4 adults, and at least 2 pups.

Nyack

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

History: This pack was first documented after discovering a dispersing collared wolf from the Halfway pack in 2006.

2007 Activities: In the beginning of the year there were 3 wolves in this pack, but by the end of the year we could only account for 2 wolves. There was never any evidence of reproduction.

Pulpit Mountain

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

History: This pack was first documented in 2006. Their territory is east of Troy and northwest of Libby.

2007 Activity: At the beginning of the year this pack was uncollared. We surveyed the 2006 den and surrounding areas in May and found no sign. We surveyed the estimated home range in October and located what we believe to be the Pulpit Mountain pack and observed 2 adults and 1 pup. Trapping operations were unsuccessful. There are no collars in this pack.

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 US Forest Service.

2007 Activities: There were no collars in this pack at the beginning of the year. Forest Service personnel documented a minimum of 7 wolves including 5 pups. There are no collars in this pack.

Salish

- 5 wolves; not a breeding pair
- 1 yearling and 1 calf confirmed killed; 1 wolf lethally removed.

History: New in 2007. Their territory is in the Salish Mountains west of Flathead Lake.

2007 Activities: This pack was discovered after a confirmed wolf depredation on a calf in early May. A subsequent survey of the area turned up wolf activity in a distant corner of the Hog Heaven pack territory. On 5/23 NW190M was captured and collared in that area. On 6/11 another calf was confirmed killed by wolves. On 7/3 1 wolf was lethally removed from the pack. No further depredations were reported. Three pups were discovered dead of unknown causes at different times and in different areas from September – October. October we documented 9 wolves in this pack but could only account for 5 at the end of the year. The Salish pack is exclusively occupying the southern portion of the old Hog Heaven pack territory. There is one radio collar in this pack.

Silver Lake

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

History: First documented in 2007.

2007 Activities: In April 2007 a black bear hunter reported seeing 5 black wolves in the Silver Creek drainage south of Saltese, close to the Idaho border. FWP followed up 2 days

later and found multiple wolf tracks in the area but there was still too much snow to initiate trapping efforts. FWP personnel scouted the area again in August but only found old wolf sign on the Montana side. Other public reports came in later in the summer on the Idaho side west of Dominion Peak so it is likely the wolves spent the latter half of the summer in Idaho. Silver Lake is a Montana/Idaho border pack but is counted as a Montana pack for 2007 since locations during the denning period were in Montana.

Spotted Bear

- 8 wolves; breeding pair
- no depredations reported

History: A Murphy Lake female wolf dispersed to the Bitterroot Valley and mated with a male wolf of unknown origin forming the Bass Creek pack in 1998. The Bass Creek pack was involved in cattle depredations in June 1999. The entire pack (2 adults and 8 pups) was removed from the wild and held at a facility in McCall, Idaho. The alpha male died in a handling accident while in captivity. Three pups died of canine parvovirus in captivity. The alpha female and surviving pups were translocated to a holding pen in the Spotted Bear area in December 1999. The pen was intended to hold the pack for several days to allow acclimation to the new area, and prevent the pack from splitting and dispersing from the area. The first night in the pen, 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 in the South Fork of the Flathead and became the Spotted Bear pack.

2007 Activities: At the beginning of the year the pack appeared to consist of around 3 animals. Reproduction was confirmed and by the end of the year there were 8 animals including 4 pups. There are 2 radio collars in this pack.

Spotted Dog

- status unknown
- no depredations reported

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 in 2005.

2007 Activities: The collared female became missing in late February 2007 and no further contact with the pack occurred all year. Project personnel made several attempts to locate sign of wolves in the Spotted Dog territory but never found anything. Very few reports were received from landowners or the public. Status of this group is unknown.

Squeezer

- 9 wolves; breeding pair
- no depredations reported

History: This pack was first documented in 2006. Their territory is in the Swan Valley.

2007 Activities: We ran a trapline in early May and captured and collared the alpha female and an adult male. There are 2 radio collars in this pack.

Superior

- 8 wolves; breeding pair
- no confirmed depredations

History: First documented in 2005.

2007 Activities: At the beginning of 2007, little was known about the Superior pack. In early January a landowner in the Superior area reported a dog missing after wolves had passed through the property that night. The dog was never found. FWP hung fladry on their property as well as 2 other properties in the area to help protect horses, goats, and dogs during the winter. Two wolves from the Superior pack were killed in early 2007. One wolf was hit by a train in January and another hit by a vehicle on I-90 in April. FWP initiated trapping efforts in April and collared and released a yearling male. Two weeks later in mid-May, this wolf (NW174M) was hit and killed by a vehicle on I-90. A passing motorist picked up the collar but the carcass was never retrieved. In August, FWP initiated a second trapping effort and collared and released a black adult male, NW224M, who is believed to be the alpha male. FWP documented 4 pups from the ground in mid-August. This pack is a Montana/Idaho border pack but is counted as a Montana pack for 2007 because they denned in Montana and the majority of 2007 aerial locations were in Montana. Eight wolves (4 adults, 4 pups) were seen together at the end of 2007.

Thompson Peak

- 13 wolves; breeding pair
- no depredations reported

History: This pack was first documented in 2006. Their territory is in north of Plains.

2007 Activities: This pack was uncollared in the beginning of the year. We started a trapline for this pack in mid July and on 8/2 we captured and collared NW223F. There is 1 collar in this pack.

Whitefish

- 15 wolves; 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. The Whitefish pack's home range is in the North Fork Flathead River drainage, and spends most of their time within GNP.

2007 Activities: In the beginning of the year there were 8 wolves in this pack. By the end of the year we had documented 15 wolves in this pack. There is 1 radio collar in this pack.

Wolf Prairie

- 3 wolves; not a breeding pair
- 1 confirmed calf injured.

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

2007 Activities: In the beginning of the year there were 3 wolves in this pack and they showed no signs of denning. At the end of the year there were 3 wolves in this pack. This is the second year this pack has not reproduced since the alpha female, 331, was hit and killed by a train at the end of February 2006. The suspected alpha male, wolf 330, has also been missing since that time. There is 1 collar in this pack.

Verified Border Packs Counting in the Idaho Population Estimate (Table 3 in Appendix 3)

Bitterroot Range

- at least 5 wolves; breeding pair
- no depredations reported

History: First documented in 2007.

2007 Activities: There were numerous public reports of a group of wolves in the North Fork of Fish Creek and Goose Creek areas in 2007. FWP personnel backpacked into the area and investigated in September and found this pack's rendezvous site. Three gray adults and 2 gray pups were documented. No collaring attempts were made. Since the rendezvous site was found on the Idaho side this pack counts in Idaho estimates for 2007.

Calder Mountain

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

History: The Calder Mountain Pack was first documented in 2005 through cooperative efforts of MFWP and IDFG. This pack occupies an area west of Troy.

2007 Activities: This pack is thought to den and spend most of their time in Idaho and therefore count towards the Idaho population and mainly monitored by IDFG. There are no radio collars in this pack.

Fish Creek

- 9 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.

2007 Activities: Two radio-collared wolves, B235F and B236M continued to be monitored through 2007. The Fish Creek pack denned in Idaho in 2007 and had a minimum of 4 pups. They are counted as an Idaho pack in 2007 but continue to use parts of the Fish Creek drainage in Montana.

Solomon Mountain

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

History: New in 2007. Their territory is in Montana and Idaho between the Moyie and Yaak rivers.

2007 Activities: This pack was discovered after radio collared Idaho wolf B296 dispersed from the Boundary pack (Idaho panhandle) into this area. Eight wolves were documented in 2007. The collar is believed to have been shed in December. This pack is no longer collared.

Verified Border Packs in Canada that Do Not Count in the Montana Population Estimate

Kootenai North

- ? wolves
- no depredations reported on the U.S. side of the border

History: Kootenai North was formed from the former Kootenai pack and is a product of either splitting (into Kootenai North and Kootenai South) or is a product of dispersal. The former Kootenai pack was a transboundary pack that has denned both in Canada and the US. The Kootenai North pack occupies a territory mainly north of the U.S./Canadian border and west of Koocanusa Reservoir, while the Kootenai South pack (collared wolf 329) occupies a territory mainly south of the border and west of Koocanusa Reservoir.

2007 Activities: Because this pack spends most of it's time in Canada, most of our monitoring is from the US side of the border. This pack was located 1 time in Canada, and signals were detected another 2 times from the US side of the border indicating the pack was near the US/Canada border. Because of infrequent monitoring, we have not collected numbers information in 2007.

Spruce Creek (aka Nettie in 2006 annual report)

- 4 wolves
- no depredations reported on the U.S. side of the border

History: This pack was first documented as a new pack in 1990 and spends most if it's time in Canada. This pack has been monitored irregularly since then because it spends most of its time in Canada. In September 2006 a missing wolf from the Lazy Creek pack was found in this area with other wolves. This newly discovered pack was given the name Nettie. However in April the radio collared animal was found at the traditional Spruce Creek den multiple times. Therefore it is now assumed that this is actually the Spruce Creek pack and the name has therefore reverted back.

2007 Activities: We monitored this pack through the beginning of September when it was discovered that wolf 272 had his collar chewed off by pack mates. Before that we had located the pack less than 2 miles within the US only 2 of 9 locations. The den is 5 miles north of the international border. Reproduction was expected but we were unable to verify pups by the time we lost the radio collar. There are no collars in this pack at the end of the year.

Miscellaneous / Lone Individuals in Northwest Montana

On 3/30, dispersing wolf WC7 from the Willow Creek pack in Alberta entered Montana. He was captured on 10/31/06 approximately 75 miles northwest of Lethbridge, Alberta, and collared with an ARGOS GPS collar. WC7 began to disperse around 3/23/07, traveled approximately 113 miles to the south and entered the United States in the North Fork Flathead valley on 3/30. From there he traveled down the North Fork Flathead to Columbia Falls, followed the Whitefish Range north, crossed Highway 93 near Stryker, headed south through the Salish Range, through Pleasant Valley, down the Thompson River Valley, crossing Highway 200 and the Clark Fork near Weeksville, over the Coeur d'alene Mountains, to I-90 where he traveled east along the interstate where he entered Idaho in the vicinity of Lookout Pass on 5/7. WC7 appears to have settled in an area near Clarkia and Boville, Idaho, which is approximately 260 miles away from his natal pack

On 4/13, a female wolf of unknown origin was killed by vehicle collision near Fort Shaw Montana. Around this time there was an injured horse and mule ranked probable wolf in the general area.

On 4/19, a male wolf of unknown origin was killed by vehicle collision on Highway 93.

Between 5/27 and 6/4 there was a lone wolf that was killing sheep near Dupuyer. There were no further visuals or depredation complaints after 6/4.

On 5/27 and 8/21, there were additional livestock losses that could not be verified against any known packs. These losses include 3 calves killed and 1 calf injured. The depredations seem to be outside of those pack territories and we suspect that there may be a third pack within this area

that is not radio collared. Therefore pack movement and landscape use in adjacent pack territories could not be ascertained.

Wolf activity was verified in 3 other areas, but it is unclear whether they are discrete packs or areas used by adjacent packs. We will continue to monitor these areas. These areas include Wigwam River northeast of Eureka and adjacent to the Ksanka pack (collared), Spar Lake south of Troy and adjacent to the Calder Mountain pack (uncollared), and 2 wolves south of Lubrecht and adjacent to the Elevation Mountain pack (collared).

Suspected Packs in Northwest Montana

Beside those areas mentioned in the 'Miscellaneous/Lone Individuals in Montana' section, there is 1 other suspected pack north of Thompson Falls.

Other Miscellaneous Information in Northwest Montana

Last year the McMillan pack (uncollared) was listed as one of the 2006 packs. It was estimated to exist in an area adjacent to Meadow Peak which was also uncollared. All of our public reports and field reconnaissance seemed to show that these were two discrete packs. In July the Meadow Peak pack was collared and by the end of the year they had also occupied an area previously assumed to be the McMillan pack. It is now believed that the McMillan pack and Meadow peak packs are in fact one in the same and McMillan pack has been dropped from the pack list.

Southern Montana Experimental Area

Montana Portion of the Greater Yellowstone Experimental Area

Overview

Packs in the MT portion of the GYA have been documented from Red Lodge to Dillon. Several packs live on the borders of YNP and WY. Agencies (YNP, MFWP, TESF and WY USFWS) monitor these packs through flights and ground tracking. The location of the den site and the percent area / time in an area determines where that pack will be tallied in the population estimates. See the respective pack summaries below.

In 2007, a minimum estimate of 87 wolves in 14 verified packs existed in the Montana portion of the Greater Yellowstone Experimental Area at the end of the year. Packs that were verified in 2006 and still existed in 2007 are Rosebud, Moccasin Lake, Baker Mountain, Buffalo Fork, Mill Creek, Eagle Creek, Dead Horse, Cougar II, Freezeout and Beartrap. The 4 packs that no longer existed by the of the calendar year were: Wedge, Swan Lake, Chief Joeseph, and Mission. Of the 14 packs left at the end of the year, 7 met the breeding pair criteria. Lethal control on

depredating packs and packs with the mange parasite may attribute to this low success in breeding pairs. Lower wolf numbers inside YNP could also partly explain the difference as fewer animals in the YNP population could result in fewer animals dispersing out of YNP into Montana.

New packs formed in the GYA for 2007 are Eight-Mile, Cedar Creek, Horn Mountain, North Gravelly and a YNP pack, Swan Lake, which shifted its territory to outside of the park boundary and became a full time Montana resident pack. MFWP documented transient wolf activity in several locations throughout the MT portion of the GYA. Project staff documented the dispersal of one wolf from its capture site (SW72F) and is recorded in the lone/misc. section of this report. The Beartooth pack is a Montana/Wyoming border packs that either denned or spent the majority of its time in Wyoming in 2007 and will therefore count in Wyoming estimates.

A total of 16 wolves were caught in 2007, two of which were too small to collar. During 2007, 15 (83%) of 18 packs were monitored using ground and aerial telemetry. By the end of 2007, 14 packs remained. At the end of 2007, 7 of 14 (50%) verified packs were being monitored using ground and aerial telemetry. Ten collared animals were lost due to control actions, natural mortalities or illegal killings. Three collared animals are considered missing. Seven wolves were collared by MFWP and 7 were collared by WS. Radio-collared wolves were located 1-2 times per month by fixed-wing aircraft and ground telemetry.

In 2007**,** 9 of the total of 18 packs that did exist at one time during the year (50%) were confirmed to have killed livestock (Table 1b), resulting in the lethal removal of 23 total wolves (2 of which were illegal under the 10j regulation). Two of the 23 wolves controlled were lone wolves with no pack affiliation. Four of these wolves were removed by landowners utilizing shoot-on-site permits and 2 wolves were killed in the MT portion of the GYA under the 10(j) rule.

Verified Packs (Table 1b in Appendix 3)

Rosebud

- 2 wolves; not a breeding pair
- 12 goats confirmed

History: Pack formed late in 2005.

2007 Activities: Two wolves traveled together throughout spring and summer of 2007. No localized activity was detected during the denning season. In November, twelve goats were confirmed killed by wolves and tracks of two wolves were present. Trapping was not attempted due to cold temperatures and the goats were removed from the property decreasing the risk of further depredations.

Moccasin Lake

- 4 wolves; not a breeding pair
- 1 calf confirmed
- 1 wolf killed on an SOS permit

History: This pack formed in 2004, and its territory is south-southeast of Big Timber. There was no breeding activity in 2005, but in October the Moccasin female 242F was joined by an adult male (473M) that had left the Swan Lake pack in YNP.

2007 Activities: The pack localized during the denning season. Three pups were documented by the end of 2007. The alpha male was found dead in the fall of the year and cause of death is under investigation. A landowner shot one wolf on his private property the day after a calf was confirmed killed by wolves using a shoot on sight permit.
The Boulder Range Rider Project continued for its third year funded by a grant from the Natural Resource Conservation Service (Environmental Quality Incentives Program, EQIP), and contributions from Keystone Conservation (an private non-governmental organization). One depredation was confirmed in early April; unfortunately the riders did not start their season for another month.

In addition, landowners in the area were part of a turbo fladry project measuring the effectiveness of this electrified flagging. The confirmed calf was not in the electrified pasture at the time it was killed. No other depredations were associated with this pack throughout the remainder of the year. The boulder rider project wishes to continue the effort and is looking for funding as the EQIP funding is limited to three years. See the Field Studies and Research section below for more detail on this project.

Mission Creek

- 1 wolf missing; not a breeding pair
- no depredations reported
- pack no longer exists

History: The Mission Creek pack first formed in 2002. Its territory is southeast of Livingston. Pack dynamics appeared to be greatly affected by mange. In October 2005, the alpha male succumbed to mange and died and SW28M (formerly of the Moccasin Lake pack) joined the pack.

2007 Activities: Of the three wolves left documented at the end of 2006, SW028M has been missing since early 2007. 457F was found on mortality in March and the fate of the uncollared gray is unknown. All three members had varying degrees of mange in 2006. The Baker Mountain pack seems to be utilizing some of the Mission Creek territory and no other wolves have been found that are associated with Mission creek. We no longer think there is a Mission Creek pack and attribute this to mange and unknown deaths.

Baker Mountain

- 3 wolves; not a breeding pair
- 9 sheep, 3 calves
- 1 wolf collared, 1 WS removal, 1 killed on an SOS permit, 1 illegal

History: This group was documented in fall 2005 shortly after SW57F was caught and collared near a depredation site. Its territory is in the West Boulder area, and just south of the Mission Creek pack.

2007 Activities: The pack localized during the denning season and produced five pups. By the end of 2007 only two pups were still confirmed alive. Nine sheep were confirmed killed by wolves and Wildlife Services collared and released one adult. One uncollared wolf was killed by the owner of the sheep with a SOS permit near the depredation site. In mid-May two calves were confirmed killed by wolves and the radio collared male was found in the vicinity and lethally removed. During an October telemetry flight the breeding female, SW57, was found on mortality and cause of death is under investigation. The pack no longer has a radio collar but tracks of three wolves were documented by the end of 2007.

Buffalo Fork

- 10 wolves; unknown breeding status
- 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. In 2005, 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 and found sign of wolf activity.

2007 Activities: YNP wolf personnel documented at least ten wolves in the Buffalo Fork territory while visiting outfitter camps in the fall of 2007. No radio collars exist in the pack.

Mill Creek

- 7 wolves; breeding pair
- 1 calf confirmed, 1 cow confirmed, 1 cow injured
- 3 wolves collared

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.

2007 Activities: Three pups were collared and released due to confirmed depredations in August and September. No more depredations were reported after the fall of the year.

Eight-Mile

- 7 wolves, breeding pair
- no depredations reported

History: New pack formed in early 2007 and occupies a territory on the west side of paradise valley.

2007 Activities: An adult male was radio collared on December 11, 2006. An adult female was re-collared December 27, 2007 who turned out to be a missing wolf from the Donohue pack and whose collar was not working. The adults denned and reared five pups, all surviving through December 31, 2007.

Swan Lake

- 1 wolf missing; not a breeding pack
- 3 calves confirmed, 3 calves probable
- 1 wolf collared, 1 recaptured
- 1 WS removal, 1 wolf killed on an SOS permit
- pack no longer exists

History: The Swan Lake pack was originally a YNP group but by winter of 2006 spent their time outside of the park.

2007 Activities: The Swan Lake pack was documented at least three strong going into spring of 2007 and began using part of the Chief Joseph territory. After multiple confirmed depredations, traps were set to remove two individuals. The radio collared male 295 was recaptured and released. A breeding female (SW186F) was collared and released. A third wolf (SW188F) was caught and killed and two days later a landowner shot SW186F as authorized under a shoot-on-site permit. All three wolves had mange. The last known member, 295M has been missing since late summer and the pack seems to have dissolved.

Chief Joseph

- 2 wolves collared; 1 euthanized
- no depredations reported
- pack no longer exists

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 an 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, 2006 and 2007.

2007 Activities: Both collared males, wolf 394 and SW113 had moderate to severe cases of mange. They seemed to travel alone most of the time and continued to use the historical Chief Joseph pack territory. In November of 2007, a MFWP warden received a call of a sick wolf in a dog house. The warden responded and euthanized the sick animal which was wolf

394M. Inspection of the body showed severe mange and a calcified leg from an old break. Wolf SW113M continues to travel around the territory but has not been seen with any other wolves. Two other groups of wolves started to occupy parts of the Chief Joseph territory this year and it is believed that the Chief Joseph pack has all but dissolved.

Eagle Creek

- 4 wolves; breeding status unknown
- no depredations reported

History: This pack replaced the Casey lake pack and comprised of a pair of adults and two pups by the end of 2006. The Eagle Creek pack is four strong, comprised of a pair of adults and two pups at the end of 2007.

2007 Activities: On a July telemetry flight, SW17F was found on mortality and retrieved two days later. The carcass was quite old and cause of death has yet to be determined. Since radio contact with the pack was lost, accurate counts on the group has been limited to tracks and public reports. At least five pups were reported in the spring of 2007 and track counts have been estimated to 4 animals strong.

Beartrap

- 13 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.

2007 Activities: A total of 13 animals were documented at the end of 2007, seven of these are pups of the year. Trapping to collar was attempted but unsuccessful. This pack has been occupying areas that are very visible and has made counting individuals feasible.

Cedar Creek:

- 2 wolves; not a breeding pair
- 1 collar
- 3 confirmed calves killed; 4 wolves removed by WS

History: New pack in 2007. It occupied a territory at the North end of the Madison Range from Jack Creek to Cedar Creek.

2007 Activities: FWP and MT WS started getting reports of 4 wolves in the Cedar Creek area in early January. MT WS saw the group of 4 wolves while doing other work in the area in early February. FWP looked for this group in late February while darting elk with hopes of getting a collar in the group but could not find them that day. MT WS investigated and confirmed a wolf-killed calf on March 3rd, in the Cedar Creek area. A second calf carcass was found on the 4th and was thought to have been killed the same night as the first calf. MT WS was authorized to remove one wolf and collar one wolf. A SOS permit was issued to the landowner. On April 3rd MT WS confirmed a 3rd wolf-killed calf in the Cedar Creek

area. The ranch manager saw 2 grays & 1 black [which they shot at and missed] (all uncollared) running out of the pasture on the 3rd. The ranch manager hazed a gray out of the cattle the previous Saturday and saw a gray at 1:30 in the afternoon thinking that it was quite bold. They had been shooting to harass the wolves away from the cattle.

MT WS set traps and caught and collared a non-lactating gray female wolf (SW166F) on the 10th, and was authorized to remove one wolf from this group. On the morning of April 11th, a 4th calf was confirmed killed by wolves. MFWP then authorized removal of the entire group of 4 wolves. On April 24th WS removed an uncollared gray male (SW 172M) and on the 26th trapped and removed a gray male (SW175M).

On May 5th WS found the den with five newborn pups and set traps in the area. On May 6th WS again checked the den and all pups were dead, as the female did not return to the den. On May 7th WS called and shot a gray male (SW178M) near the den site. On May 23rd WS aerially removed the black breeding female a considerable distance from the den site but could not remove the remaining radio collared wolf (SW166F) because it got into heavy timber. The 45-day control period ended on May 25th and the remaining collared female wolf (SW166F) was not removed. Recent reports and radio monitoring flights have indicated that SW166F in now traveling with an uncollared black wolf.

Cougar 2:

- 7+ wolves; breeding pair
- 2 missing radios
- 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.

2007 Activities: During the months of January and February the Cougar 2 pack was observed and monitored in the Upper Madison Valley. It is suspected that they followed migrating elk from the Upper Gallatin Valley into the Madison Valley. They were observed in and around cattle during this period but were not involved in any reported livestock depredations. They then followed migrating elk back into the Upper Gallatin where they denned. While conducting a routine monitoring flight in May, seven members of the Cougar 2 pack, including the only radio collared member, were observed on a fresh elk kill and were seen packing large chunks of meat to a rocky / forested ridge. It was later determined this was a den site for 2007, this den site was outside of YNP. Project personnel set up a trapline in the proximity of the den site. On May 19th, an adult gray wolf (SW187M) was captured and fitted with a radio collar. This pack ranges in and out of the park throughout the year. It is considered a Montana pack based on the amount of time it spends outside YNP and where it denned in 2007. MFWP conducts nearly all the monitoring for this pack now.

Dead Horse:

- Unknown; not a breeding pair
- no depredations reported

History: New pack in 2005. It occupied a territory at the south end of the Gallatin Mountain range from Big Sky to the Taylor Fork drainage.

2007 Activities: Contact was lost with this pack in the spring of 2006, repeated attempts were made to locate the pack for collaring purposes but not enough sign was ever found to warrant setting up a trapline. Several sightings from the fall hunting season indicate that this pack may still be intact and is still has a territory south of the Big Sky area.

Horn Mountain:

- 7 wolves; breeding pair
- 2 radios
- 1 confirmed calf killed

History: New pack in 2007. It occupied a territory at the south end of the Madison range in the Antelope Basin Area.

2007 Activities: In early July FWP received a report from a coyote hunter that while calling coyotes in the antelope basin area, adult wolves and pups responded by howling.

When the cattle moved into this area of the public land grazing allotment, the Madison Valley Range riders started seeing single adult wolves in the area, they also found the den site and later a rendezvous site with three black pups. Project personnel scouted the area and set up a trap line on July 22 with the help of the Madison Valley Range Riders and personnel from Keystone Conservation. On 7/23 a 38 pound black male pup (SW214M) was captured and released, as it was too small to collar. On 7/24 a 34 pound black female pup (SW215F) was captured and also released again too small to collar. On 7/28 the gray breeding female (SW219F) was captured and collared and on 7/29 the black alpha male (SW220M) was also captured and collared and traps were pulled. This pack was monitored by the Range Riders the rest of the season and was observed in and around cattle without any depredations until after the cattle were shipped. On October 11 a cow calf pair was left behind after shipping the rest of the herd and wolves killed the calf. No control action was initiated since the cows were moved off of the allotment and there was no other livestock in close proximity to the wolves.

North Gravelly:

- 6 wolves; breeding pair
- no radio collars
- 3 calves confirmed, 2 wolves removed by WS

History: New pack in 2007. It occupied the territory on the northwest end of the Madison valley south of Ennis.

2007 Activities: On August 8th, MT WS confirmed a calf killed by wolves in the North end of the Gravelly Mountains. FWP had a couple of credible reports of wolves in this area but did not document any pack activity. WS set traps in the area to collar and release to try and learn what was there. No captures were made and traps were pulled on August 9th. WS confirmed a month old calf that was killed by wolves on the north end of the Gravelly Mountains, in the Warm Springs Creek area, on a FS allotment. The calf was found dead by the livestock producer and brought to the WS agent for investigation. This was the second confirmed depredation in this area in the past month. While moving cattle off allotment in the Warm Springs area of the Gravelly Mountains on October 22nd, riders found a consumed carcass of an adult cow and jumped 5 wolves off of the carcass. The rider thought there were one adult and 4 pups. WS investigated and called it a probable wolf kill. The carcass was freshly dead and totally consumed and the area was littered with wolf sign. This was in the same area that we had 2 confirmed kills earlier this summer. FWP decided to remove two wolves from this area but because of hunting season, MTWS was asked not to conduct any control work until after the general big game season closed November 25th. On December 11th MT WS shot 2 male wolf pups (SW274M & SW275M) on the north end of the Gravelly Mountains. The control action had been temporarily postponed because of the special extended elk-hunting season in that area. A group of eight wolves were seen and all had rope tails due to mange.

Freezeout Pack:

- 5 wolves; not a breeding pair
- 2 confirmed calf killed, 1 wolf removed by WS

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

2007 Activities: On August 25th, MT WS investigated and confirmed a 600-pound calf as being killed by wolves in the Tepee Creek area, north side of the Centennial Valley. This is the same area we had problems last year and removed members of the Freezeout pack. Tepee Creek is near the Freezeout and the new Horn Mountain territories so at that point we did not know which pack was involved. WS did not hear any of the radio-collared wolves in the area during their investigation. Based on increased monitoring by WS, it was determined that it was in the Freezeout territory and a control action with SOS permits was initiated for one wolf. On the September 5th MT WS shot an uncollared gray wolf in the Long Creek area, which was a member of the Freezeout Pack and the breeding female. Two wolves, the one that was shot and the collared member of the Freezeout Pack were in the process of trying to kill a domestic calf. While retrieving the controlled wolf from the ground the calf was euthanized and confirmed as a wolf kill. This ended the control action and no other depredations were reported.

Wedge:

- 0 wolves (pack removed due to chronic depredation); not a breeding pair
- 5 confirmed heifers killed; 1 wolf killed on an SOS permit; 1 wolf killed under 10j regulation; 7 wolves removed by WS.

History: New pack in 2005. It occupied a territory at the south end of the Madison range from Mill Creek to Cabin Creek.

2007 Activities: The Wedge Pack denned in its normal area of past years and had a litter of 5 pups. On July 9th MT WS confirmed that wolves killed a yearling heifer, a control action on the Wedge pack has been initiated and a SOS permit was issued to the landowner for the removal of one adult wolf. On July 11th, ranch personnel reported shooting at and wounding an adult wolf using the issued SOS permit. FWP decided to leave the SOS permit active for one uncollared adult wolf. A male pup (SW208M) was shot on July14th, by ranch personnel, on the SOS permit and a yearling female (SW209F) was killed by MT WS on the 17th. The Wedge pack control was completed. Two wolves were removed on this control action because the first one was a pup on the issued SOS permit and the control action was for one adult wolf as the pups were too young to be involved in the depredations. An employee on the ranch killed the alpha female on July 23rd under the 10j rule. This incident and the shooting of a pup under the SOS permit were investigated by USFWS law enforcement. USFWS law enforcement later concluded that the shooting of the pup under the adult-issued SOS permit and the 10j shooting was not in accordance with federal regulations, respectively. Citations were issued to the ranch and fines were paid.

On July 31st, MT WS investigated a heifer (on the same ranch) that had wounds on and around the rectum and confirmed it as wolf caused, this heifer was euthanized because if its wounds. The wounds were estimated to be several days old. FWP initiated a control action for one wolf assuming there was one adult left. On August 3rd, MT WS investigated a dead heifer in the same area as previous depredations. It too was several days old and was confirmed as a wolf kill. At that point FWP decided to removal the entire Wedge pack, assuming there was 1-2 adults and possibly 5 pups. WS attempted a control action on August 4th with no luck. Early on August 5th, the ranch called and had another injured heifer that had to be euthanized and had seen 2 adult wolves in the area and asked for a SOS permit. A SOS permit for 2 wolves was issued by MFWP to the ranch. As authorized by MFWP, MT WS removed 5 male pups (SW226M-SW230M) from the Wedge pack on August 8th. The remaining radio-collared adult was removed on August 9th. While retrieving the radio-collared wolf WS found and confirmed another heifer in the same area as the earlier depredations. All suspected members of the Wedge pack were removed.

Verified Border Packs Counting in Wyoming Population Estimate (Table 2 in Appendix 3)

The Beartooth pack is a Montana/Wyoming border pack that either denned or spent the majority of its time in Wyoming in 2007. Therefore, it is counted in Wyoming estimates (Table 2) and is displayed on the Greater Yellowstone Recovery Area map (Figure 3).

Miscellaneous / Lone Individuals in Montana GYA

Centennial Valley: One calf confirmed killed by an unknown wolf on May 15.

East of Lima: One lone wolf shot by a landowner under the 10j rule on March 29.

Boulder River (south of Big Timber): Four yearling ewes were confirmed killed by wolves in January of 2007. Tracks of three wolves were found at the depredation site.

SE of Livingston: One lone gray injured a llama in mid September. The llama died of its injuries a week later.

Eastern Montana (Garfield County): Two lambs were confirmed killed by wolves and ten considered probable on two separate ranches in eastern Montana in late August 2007. In this area, WS saw large canids that strongly resembled wolves and was authorized to remove both animals. One wolf was killed at the depredation site a week later. No further depredations have been reported.

SW154M (near Ennis Lake): On Jan.16th, while doing coyote work in the Madison Valley, MT WS darted a lone adult male black wolf near Ennis Lake. Examination determined the wolf had old injuries, apparently by other wolves. It had numerous puncture wounds in the chest, hip and head areas. It was collared and released and the signal was monitored from the ground on the 17th and was not heard in the immediate capture area. On February 2nd, while checking radio signals from the ground, FWP heard a mortality signal from the newly collared wolf SW154M in the Madison Valley. During a routine radio flight on February 10, the collar location was pin pointed. On February 16 the collar and carcass was retrieved and taken to the FWP lab in Bozeman for necropsy. When WS collared this animal on January 16, it appeared that it had been wounded in a fight with other wolves. Upon lab examination it was surmised that the wolf had previous injuries from other wolves and that its death may have resulted from an injury from a bull elk as it had a deep puncture wound in the chest that penetrated into the heart sac. The FWP vet said it could have survived many more days after this type of injury.

SW157F (near Ennis): On Jan 26th a trapper caught an adult female gray wolf in a leg hold trap in the Bear Creek area south of Ennis, MT. FWP personnel responded and collared and release the wolf. It is unknown which pack it is associated with. On September 11 this wolf was found during a radio monitoring flight several miles from the reported site. On September 16 an archery hunter found this wolf dead. FWP and USFWS enforcement retrieved the collar but could not determine the cause of death.

SW237F (north end of Gravelly Mountains): On Sept. 1st, an adult gray female wolf (SW237F; 4-5 years old weighing 90#'s) was captured by project personnel and collared near Morgan Gulch in the northern part of the Gravelly Mountains in SWMT. This wolf was not breeding. The recently radio collared wolf (SW237F) from the north Gravelly Mountains did not appear to be traveling with the North Gravelly pack and has not been relocated in the area during recent monitoring flights.

Wall Creek (south of Ennis): Two wolves were collared near the Wall Creek Management Area in the Madison Valley. Both of these wolves appeared to be dispersers and had not shown pack activity or affiliation. No depredations were reported and they were not considered a resident pack. SW073F was last heard in the area on August 29, 2006 and not found again and SW72F was last heard near the Blacktail Wildlife Management Area and seen with two other uncollared wolves late in December 2007 (see SW072F group in suspected packs in MTGYA).

Suspected Packs in Montana GYA

Trail Creek area: Four to six wolves were reported in the Bullis Creek area of Paradise Valley during the hunting season. A Leopold dispersing collared female from YNP was heard in the area in November. These animals were not included in the final 2007 minimum population estimate because personnel could not verify subsequent reports. We will continue to monitor this area in 2008 to confirm wolf activity.

SW072F group: Three wolves, one of which is the collared Wall Creek disperser SW072F was located around the Blacktail / Sage Creek areas. These three wolves are included in the population estimate as lone/miscellaneous wolves. It is uncertain if this group will stay together, and it will be monitored closely in 2008.

Other Miscellaneous Information in Montana GYA

Project personnel received multiple reports of suspected wolf activity in the northwest end of the Crazy Mountains (vicinity of Lennop, Martinsdale and Sixteenmile Creek). FWP talked with several landowners in the area and will investigate new reports in 2008.

Montana portion of the Central Idaho Experimental Area

Overview

In 2007, we documented a minimum estimate of 122 wolves in 23 packs in the Montana portion of the Central Idaho Experimental Area. This is an increase from 76 wolves in 16 packs at the end of the year in 2006. There were 8 newly identified packs in 2007, one of which was removed for livestock depredations. Some of these packs are believed to be first year packs and some are likely to have existed the previous year.

Previously verified packs that still existed in 2007 were the Battlefield, Big Hole, Black Canyon, Brooks Creek, Divide Creek, East Fork Bitterroot, Lake Como, Miner Lakes, Mt Haggin, Mussigbrod, Painted Rocks, Sapphire, Skalkaho, Sula, Welcome Creek, and Willow Creek packs. Newly documented packs in 2007 included the East Fork Rock Creek, Flint Creek, Grasshopper, Pintler, Ram Mountain, Trail Creek, and Trapper Peak packs. The Fleecer Mountain pack was also a new verified pack for 2007, but the pack was removed before the end of the year because of repeated livestock depredations. The Bearmouth pack, first documented in 2006, was removed in 2007 due tochronic livestock depredations.

The Hughes Creek pack (Idaho/Montana border pack) denned and spent the majority of their time in Idaho in 2007 and will therefore count in the Idaho population estimate. SW64M, a disperser from the Sage Creek pack east of Dillon, also counted in the 2007 Idaho estimate, although he was found in Montana on multiple occasions.

During 2007, 17 (68%) of 25 verified packs were monitored using ground and aerial telemetry at some point during the year. At the end of 2007, 13 (57%) of 23 remaining verified packs were being monitored using ground and aerial telemetry. Eleven wolves in 7 packs were captured and radio collared in the Montana portion of the CID in 2007. Four wolves were radio collared during MFWP trapping efforts and 4 were radio collared by WS. Three wolves were caught by coyote trappers and were collared and released by FWP personnel. In addition, the Nez Perce Tribe collared 4 wolves in the Big Hole pack in Idaho. Radio collared wolves were located 1-2 times per month by fixed-wing aircraft.

Nine of 23 packs monitored in the MT portion of the CID occupied the Montana/ Idaho border: Battlefield, Big Hole, Black Canyon, Brooks Creek, Lake Como, Miner Lakes, Painted Rocks, Sula, and Trapper Peak packs. The Battlefield, Big Hole, Black Canyon, Brooks Creek, and Miner Lakes 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 9 packs denned in Montana, or were known to have spent most of their time in Montana, they were counted as Montana packs for 2007. 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 agencies in both states. The Hughes Creek pack spent most of its time in Idaho and was monitored primarily by IDFG.

Reproduction was confirmed in 14 packs: Big Hole, Black Canyon, Brooks Creek, Divide Creek, East Fork Bitterroot, Miner Lakes, Mussigbrod, Pintler, Sapphire, Skalkaho, Sula, Trail Creek, Trapper Peak, and Willow Creek packs. Although pups were documented in the Mussigbrod, Sapphire, and Trapper Peak packs, their survival either could not be confirmed at the end of 2007 or pups were known to have died for various reasons. For the remaining 11 packs, a minimum of 39 pups were produced and 9 packs (Big Hole, Black Canyon, Brooks Creek, Divide Creek, Pintler, Skalkaho, Sula, Trail Creek, and Willow Creek) met the breeding pair requirement. Reproductive status of the Battlefield, East Fork Rock Creek, Flint Creek, Grasshopper, Lake Como, Painted Rocks, and Ram Mountain packs was unknown.

Two dispersals were documented in 2007. SW47F dispersed from the Battlefield pack east to the Pioneer Mountains. At the end of 2007 she was believed to still be alone and was spending time in both the East and West Pioneers. Black Canyon wolf SW67M, who disappeared in August 2006, was found on the Mt Haggin game range in April 2007. He paired up with a female but did not produce pups in 2007. The pair held a territory in the Mt Haggin area at the end of the year and are called the Mt Haggin pack.

Ten packs were confirmed to have killed livestock: Battlefield, Bearmouth, Brooks Creek, Fleecer Mountain, Miner Lakes, Mt Haggin, Mussigbrod, Pintler, Sapphire and Skalkaho. Twenty-five cattle and 5 sheep were confirmed killed and 5 yearlings and 1 calf were confirmed injured. Thirty-five wolf mortalities were documented in 2007. Thirty-one wolves were killed in response to depredations: five were shot by private citizens [10(j)] and 26 were killed by WS. One wolf was killed illegally, one was hit by a car, one died due to capture stress, and one mortality cause was unknown. Two radio-collared wolves in the Sapphire pack were missing at the end of 2007.

Verified Packs (Table 1c in Appendix 3)

Battlefield

- 3 wolves; not a breeding pair
- 1 calf, 2 yearlings confirmed killed; 5 wolves removed by WS

History: The Battlefield pack formed in 2002.

2007 Activities: Four gray wolves were believed to be in the Battlefield pack in early 2007. A yearling heifer was killed on private land in March and 2 wolves were killed by WS shortly thereafter, including a bred female. A calf and another yearling heifer were killed in early April and 3 more wolves were killed. It is possible that some of these wolves involved in the depredations that were killed were members of the Mussigbrod pack and not the Battlefield pack, because some of the wolves were black. Wolves in the Battlefield pack had been predominantly gray. There were no collars in the Mussigbrod pack and the collared Battlefield female SW47F was not present during these depredations. She had been alone and seemed to be starting to disperse. These depredations occurred in the heart of the Battlefield pack territory however, which makes it more likely to assume Battlefield was involved. The most likely explanation may be that there was a lot of reshuffling going on with wolves in this area in the spring, which is not surprising given that both packs had members removed in 2006 due to livestock depredations. SW47F permanently left the Battlefield pack territory in the summer and has spent the rest of the year in the East and West Pioneers. In early August FWP followed up on reports of wolves in Ruby Creek, which has been traditionally used by the Battlefield pack. Tracks of at least 3 wolves were confirmed. No collaring attempts were made due to fire activity in the area. Reproductive status was unknown.

Bearmouth

- pack removed; not a breeding pair
- 3 calves confirmed killed, 5 yearlings injured; 5 wolves removed by WS; 3 wolves killed under 10j

History: First confirmed in 2006.

2007 Activities: In early 2007, 4 wolves (2 adults, 2 pups) were thought to exist in the Bearmouth pack. In April 2007 they denned and had 6 gray pups. In August five yearlings were confirmed injured and WS found the pack's rendezvous site in the middle of a large number of cattle on public land. WS killed the alpha male and hazed the rest of the pack with the helicopter. FWP followed up and believed they had left the area. In early September a landowner shot 3 wolves (all pups) on private land under the 10j rule. Two other wolves were also shot and hit but were never found and it was unknown if they survived. The wolves had killed 2 calves at this time. FWP believed there was a good chance this event would haze the pack out of the area so no further control work was proposed at that time. However, the following day the pack killed another calf just over the hill from where the shooting and depredations had occurred the day before. FWP authorized WS to remove the rest of the pack, since the wolves appeared to be keyed into the livestock as a primary food source. The remaining 2 adults (including alpha female SW87F) and 3 pups were killed shortly thereafter.

Big Hole

- 5 adults, 5 pups; breeding pair
- no depredations reported

History: The Big Hole pack formed when B7 and B11 (released in 1995 as part of the original reintroduction efforts) pair bonded in 1996. 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.

2007 Activities: The Big Hole pack splits its time between Montana and Idaho but denned in Montana and therefore was officially counted as a Montana pack in 2007. Field work and monitoring flights were conducted by both the NPT and FWP. B7, one of the founding members of the Big Hole pack was found hit by a car near Salmon, Idaho in early January. He was estimated at 13.75 years old. He hardly had any teeth left and was scavenging road kill when he was hit. His collar gave out in 2003 and he was last seen with the Big Hole pack in 2005. B151F, who was monitored in 2006, disappeared in early 2007 and it was likely her collar failed. Efforts were made by both FWP and the NPT in Idaho to re-collar this pack. FWP personnel set traps in Montana in early summer but did not catch any wolves. The Big Hole pack had rendezvous sites in Idaho for the latter part of the summer. NPT personnel trapped in Idaho and caught and collared the presumed alpha male in July. During a monitoring flight less than a week later this male turned up dead. FWP recovered the carcass and because the wolf died within a mile of its capture location and soon after the capture, his death was presumed related to the capture. Around this same time a pup was also caught and was collared with a temporary makeshift collar built with a trap transmitter, as the pup was too small to wear a regular collar. This collar served its purpose of helping the NPT locate the rest of the pack and they collared 2 more wolves in August, a female pup (B347F) and an adult male (B348M). The NPT counted 5 pups during their field efforts. The trap transmitter collar fell off later in the fall and was retrieved. During the summer NPT personnel saw a collared gray adult wolf with a non-functioning radio collar and this wolf was seen again by FWP during a monitoring flight in December. This wolf is likely B151F, whose collar is thought to have failed earlier in the year. At the end of the year FWP counted 10 wolves (5 adults, 5 pups) in this pack from the air.

Black Canyon

- 4 adults, 4 pups; breeding pair
- no depredations reported

History: First confirmed in 2004.

2007 Activities: At the end of 2006 there were thought to be at least 2 wolves left in the Black Canyon pack after control actions had removed 3 wolves earlier that year. SW67M, who was collared in 2006 and disappeared that August, was confirmed to have dispersed and was found in the Mt Haggin area in April 2007 paired with a female. No other collars remained in the Black Canyon pack and there were few public reports until hunting season. There were numerous sightings reported by hunters during the fall in both Montana and Idaho. In November FWP personnel cut tracks of at least 6 wolves in Montana and a Forest

Service biologist counted 8 on the Idaho side, including 4 pups. No collaring attempts were made because it was late in the season.

Brooks Creek

- 3 adults, 4 pups; breeding pair
- 3 calves confirmed killed; 2 wolves removed by WS; 1 wolf killed under 10j

History: The Bass Creek pack initially 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 where they established the Spotted Bear pack (see northwest Montana pack summaries above). The Brooks Creek pack was first documented in 2005.

2007 Activities: The Brooks Creek pack denned in Montana in 2005, in Idaho in 2006, and back in Montana in 2007. SW17M, who was collared in 2005, continued to be tracked through 2007. This pack was confirmed to have killed at least 3 calves in the Bitterroot Valley in June. A landowner shot 1 wolf under the 10j regulations and WS removed 2 other wolves. The pack moved their pups later in June farther from the cattle and problems ceased. Later in the year FWP counted 3 adults and 4 pups during a monitoring flight.

Divide Creek

- 4 adults, 3 pups; not a breeding pair
- no depredations reported

History: First confirmed in 2006.

2007 Activities: After estimating 4 wolves in this pack at the end of 2006, FWP counted 5 during an aerial survey early in 2007. SW118F continued to be monitored throughout 2007 and in October three pups were counted from the air. At the end of 2007, seven wolves were seen traveling together (4 adults, 3 pups).

East Fork Bitterroot

- at least 4 wolves (at least 1 pup); not a breeding pair
- no depredations confirmed

History: First confirmed in 2006.

2007 Activities: In early 2007 there were at least 3 adults and 3 pups in the East Fork Bitterroot pack. The collared alpha female SW115F was tracked all year and localized during denning season. In September, two adults and 3 pups were seen traveling together but by the end of the year only 4 gray wolves were seen consistently together and it could not be determined if this was a breeding pair.

East Fork Rock Creek

- at least 3 wolves; not a breeding pair
- maybe 1 confirmed calf

History: New in 2007.

2007 Activities: Sightings of gray wolves were common in the Middle and East Fork of Rock Creek during 2007. The neighboring pack, the Sapphire pack, was predominantly black and so it was suspected this was a different group. In April a calf was confirmed killed in the Middle Fork of Rock Creek and the collared wolves in the Sapphire pack were not found nearby. It was unknown at the time which wolves were involved. FWP confirmed a minimum of 3 gray wolves in this pack at the end of the year. It's possible this pack winters to the east around Garrity Mountain, as gray wolves were reported in that area later in the year.

Fleecer Mountain

- pack removed; not a breeding pair
- 2 calves confirmed killed; 3 wolves removed by WS

History: New in 2007.

2007 Activities: This pack was first documented when a newborn calf was confirmed killed in August. WS trapped and collared a gray adult female, SW232F. She had an injured right front leg she was unable to use and did not travel far for the first 2 weeks after she was released. She connected back up with 3 other uncollared wolves and another calf was confirmed killed in early September. An uncollared gray wolf was killed by WS shortly thereafter. The landowner was calving at the time and the wolves continued to hang around the ranch. A leasee on an adjacent USFS grazing allotment reported seeing these wolves harassing cattle and FWP personnel caught and chased the wolves out of the cattle on another occasion. The landowner reported one of her calves missing in one of the pastures where one of the earlier calves was killed. FWP decided to remove the remaining 3 members of the pack due to a high potential for further problems and because the wolves were continuing to key into the cattle. WS killed 2 other wolves including SW232F. The fourth wolf may have been killed but was not found.

Flint Creek

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

History: New in 2007.

2007 Activities: A landowner south of Jens reported seeing 3 wolves (1 black, 2 gray) on their property in July. FWP investigated and found some old wolf sign. Traps were set in the area but nothing was caught. Very few reports came in through the rest of year. But at the end of the year, 4 wolves were documented near Flint Creek and were involved in depredations in early January 2008.

Grasshopper

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

History: New in 2007

2007 Activities: This pack was first documented when a coyote trapper in Warm Springs near Jackson caught an adult male wolf in one of his traps in January 2007. The wolf (SW156M) was collared and released by FWP. Further monitoring found him with 2 other gray uncollared wolves. The wolves spent most of their time in the Grasshopper Valley but were also found further north on occasion in the West Pioneers, southeast of Wisdom. In April, SW156M was caught chasing cattle and was shot by a landowner under the 10j regulations. Little was known about the remaining 2 wolves until later in the year. Three wolves were documented using the Grasshopper Valley at the end of the year and are believed to be part of this same original group.

Lake Como

- at least 5 wolves; not a breeding pair
- 2 pygmy goats probable

History: This pack initially produced pups and was documented as a breeding pair with 5 members at the end of 2002. This pack has never been radio collared.

2007 Activities: Very little was known about this pack in early 2007. FWP collared two wolves in the spring southwest of Darby and thought those wolves were members of the Lake Como pack but they turned out to be a different group (see Trapper Peak pack) because tracking throughout the year revealed that they did not use the Lake Como/Lost Horse area. Meanwhile there were reports during the spring and again during the winter in the Lake Como area north to Sawtooth and Blodgett Creek. FWP prioritized this area for snow tracking work in December and consistently cut 5 sets of tracks in the area. In the fall a landowner in the Camas Creek area reported 3 wolves stalking her horses. Later in December two pygmy goats were killed in the same general area and WS thought this was a highly probable wolf depredation but a dog had disturbed the carcasses making it difficult to prove. There have been other reports of 7 wolves in the area but FWP could only confirm 5 at the end of the year. Reproductive status was unknown.

Miner Lakes

- 1 adult, 3 pups; not a breeding pair
- 1 calf confirmed killed, 1 calf probable; 1 wolf removed by WS

History: Confirmed in 2006.

2007 Activities: B191F was a dispersing wolf from the Soldier Mountain pack in Idaho and was found in the Big Hole Valley in July 2006. She paired with a male in 2006 and they denned in the Big Hole Valley in 2007 and had 3 pups. A calf was confirmed killed in July and another calf was probable. Prior to this event landowners in the same general had reported a black wolf harassing cattle on at least 2 other occasions. WS killed the uncollared

alpha male in response in early August. B191F raised the 3 pups through the end of the year and continued to spend time in both Idaho and Montana.

Mt. Haggin

- 2 adults, 0 pups; not a breeding pair
- 1 calf confirmed killed

History: New pair documented in 2007. It is unknown whether the uncollared female is related to the original Mt Haggin pack.

2007 Activities: Wolf activity has been documented in the Mt Haggin area for numerous years but little has been known about these wolves because there were no collars. In April 2007 FWP found missing Black Canyon wolf SW67M on the Mt Haggin Wildlife Management Area. One calf was confirmed killed on the WMA in July and SW67M was found nearby. FWP personnel spent 2 weeks in the area in July tracking this wolf and trying to haze him out of the cattle. He was found paired up with an uncollared female but their movements were not localized and no pups were found. No further depredations occurred and during monitoring flights later in the year FWP saw only the 2 gray adults.

Mussigbrod

- 3 wolves; not a breeding pair
- 4 calves confirmed killed; 3 wolves removed by WS

History: First confirmed in 2006.

2007 Activities: The Mussigbrod pack was believed to consist of at least 6 wolves in early 2007. A calf was confirmed killed in March. At this time there were other depredations in March and April further south in traditional Battlefield territory and wolves were killed in that area in response. Some of these wolves may have been from the Mussigbrod pack (see Battlefield narrative). During the summer there were few reports but in the fall an FWP biologist saw 2 black wolves while bird hunting. Numerous other reports came in during the hunting season but it was too late in the year to trap/collar. In late December three calves were confirmed killed and WS killed 3 wolves two days later, including 1 pup. Three other wolves were seen nearby. Depredations persisted in early January 2008 and FWP authorized WS to remove the rest of the pack.

Painted Rocks

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

History: Wolf activity was initially documented in the Painted Rocks area (West Fork of the Bitterroot River near the Montana/Idaho border) with the location of dispersing Idaho female B67 in this area in 2001. B67 was monitored through 2002, and the pack has not contained a radio-collared individual since.

2007 Activities: At least 4 wolves were thought to comprise the Painted Rocks pack at the beginning of 2007. MFWP personnel scouted the West Fork of the Bitterroot several times during the summer and found old wolf sign, but nothing fresh enough to warrant a capture effort. Through a combination of summer field work and snow tracking FWP could only

confirm that a minimum of 2 wolves were using the area at the end of 2007, though there are likely more.

Pintler

- 3 adults, 3 pups; breeding pair
- 1 calf confirmed killed

History: New pack in 2007 though likely present in 2006.

2007 Activities: There were reports of wolf activity in the Fishtrap and Mud Creek drainages in 2006 though it was uncertain at that time whether or not it was the Mussigbrod pack. FWP trapped in the area in July 2007 and collared an adult gray breeding female. A calf was confirmed killed in the area in late August and the Pintler pack was believed responsible. Landowners reported seeing a collared gray wolf in the area. At the end of the year, FWP counted 3 adults and 3 pups in this pack.

Ram Mountain

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

History: New pack in 2007 though likely present in 2006.

2007 Activities: In fall 2006 wolf activity was reported consistently near the upper main stem of Rock Creek. The Sapphire pack has been known to use part of the main stem of Rock Creek around the Stony Creek area before and the Willow Creek has been know to use an adjacent area as well. However, neither pack was found in this area when the wolf activity was reported and documented by FWP and WS. Reports were scarce in the spring and during the summer most of the area was closed to the public due to fires. In the fall, FWP initiated a trapping effort after a cow was found hung up in a fence and dead. It was unknown whether wolves or something else had chased the cow into the fence but wolf sign was found in the area and traps were set. No wolves were caught and traps had to be pulled at the beginning of rifle season. Five gray wolves were believed to inhabit this area at the end of 2007.

Sapphire

- At least 4 wolves; not a breeding pair
- 2 calves confirmed killed; 5 wolves removed by WS; 1 illegal mortality

History: First confirmed in 2001.

2007 Activities: Fourteen wolves (13 black and 1 gray) were estimated in the Sapphire pack in early 2007, at least four of which were pups. SW45F, collared in 2005, disappeared over the winter and was believed to have dispersed. SW84F, collared in 2006, was likely illegally killed sometime in late winter. Her collar was found cut off in Rock Creek in April. That left one collared wolf, SW83M, in the pack. In May, WS trapped and radio collared 2 more wolves: an adult gray male (SW183M) and a black yearling female (SW184F). SW183M was never found with the rest of the pack during the month he was tracked and he was likely

not associated with the Sapphire pack. His collar slipped in late June. FWP saw 6-7 black pups from the air in mid-June. Around this same time, SW45F reappeared and she was tracked with the rest of the pack until November, when she disappeared again. Defenders of Wildlife funded a range rider program on the affected ranch during the course of the summer (see range rider section under Research and Field Studies). A calf was confirmed killed in late July and one wolf was killed by WS returning to the carcass. In September another calf was confirmed killed and the pack was located nearby. Four wolves were killed by WS including a breeding female and 3 pups. By the end of the year SW184F disappeared and is thought to have dispersed. There should have been at least 3 pups left in the pack and up to 6 adults. However only 4 black wolves were seen consistently traveling together at the end of the year (including SW83M) and it is unknown whether the others are still present.

Skalkaho

- 4 adults, 5 pups; breeding pair
- 1 calf confirmed killed; 1 wolf removed by WS

History: Confirmed in 2005 but likely present in 2004.

2006 Activities: The status of the Skalkaho pack was unknown in early 2007. One collared wolf was illegally killed in late 2006 and 2 other collared wolves had gone missing. Very few sightings were reported over the winter. In the spring, the Skalkaho pack reappeared and killed a calf on private property. WS collared a yearling male (SW196M) and removed the alpha female. The pack moved to higher elevations during the summer and no other conflicts were reported. In July a FWP biologist doing an elk survey incidentally saw the pack from the air and counted 5 pups. In early December, a coyote trapper caught 2 male pups and FWP collared and released them both (SW269M, SW270M). At the end of the year 9 gray wolves were seen traveling together (4 adults and 5 pups).

Sula

- 10 wolves (at least 3 pups); breeding pair
- no depredations reported

History: Confirmed in 2005 but likely present in 2004.

2007 Activities: Seven wolves were believed to comprise the Sula pack at the beginning of 2007. The pack localized during denning season, but no pups were counted until later in the year. We continued to monitor radio-collared wolf SW20M throughout the year and in December saw a minimum of 10 wolves in this pack, including 3 pups.

Trail Creek

- 3 adults, 3 pups; breeding pair
- no depredations reported

History: New pack in 2007 though likely present in 2006.

2007 Activities: A hiker reported accidentally walking into this pack's rendezvous site near the East Fork Bitterroot/Big Hole divide in August. FWP followed up and counted 3 gray adults and 3 gray pups. Trapping efforts were initiated soon thereafter but were thwarted by a fire that broke out very close to the trapline. Traps were pulled without any captures and the wolves moved on. This pack is believed to use the Trail Creek area as well as the southwest part of the East Fork including Tolan Creek.

Trapper Peak

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

History: Wolf activity was documented in this area in 2006 but was not verified as distinct from the Lake Como pack until 2007.

2007 Activities: Wolf activity was confirmed in the Tin Cup Creek area in 2006 but was believed to be the uncollared Lake Como pack. In spring of 2007 wolf sign was again confirmed in the Tin Cup area. A landowner south of Darby reported wolves on their property in April and FWP set traps in the area, near Chaffin Creek. Two wolves were captured and collared, a yearling female (SW170F) and a lactating adult female (SW176F). Wolf sign in the area indicated a pack of at least 5 wolves. This pack localized and 2 black pups were seen from the air in early July. This pack held a small home range throughout the rest of the year, southwest of Darby and it was determined they were distinct from the Lake Como pack. In September several people reported an injured collared black wolf dragging its hind end near Rye Creek. FWP investigated and did not find either collared wolf very close to where this injured wolf was sighted. A week later, SW176F turned up dead during a monitoring flight. Her carcass was recovered and was very emaciated and was likely the wolf reported the week before. SW176F was sent to the lab in Bozeman and is still pending necropsy. At the end of the year only 2 wolves (SW170F and an uncollared gray adult) were seen consistently together. FWP also snow tracked the area and only cut tracks of 2 wolves in December.

Welcome Creek

- 4 adults, 0 pups; not a breeding pair
- no confirmed depredations

History: First confirmed in 2006.

2007 Activities: In early 2007, 4 wolves were thought to exist in the Welcome Creek pack. A rancher grazing his cattle on Plum Creek land in the Woodchuck area thought he may have had a calf killed in July but nothing remained to investigate. At the same time a logger reported consistent wolf tracks nearby on a skid trail he was working. FWP set traps and collared a gray yearling female (SW218F). After the wolf was released FWP spent several days in the area looking for the wolf but she could not be found. At this same time the airspace closed due to fires in the area and so the area could not be flown. When the airspace reopened in the fall, FWP searched for SW218F several times and still could not find her. Finally in November she was located and was tracked for the remainder of the year. Four

gray adult wolves were seen consistently from the air in December but no pups appeared present.

Willow Creek

- 5 adults, 5 pups; breeding pair
- 1 calf confirmed injured

History: First confirmed in 2005 with the dispersal of B142M from the Buffalo Ridge pack near Challis, Idaho. This pack is likely not related to the original Willow Creek pack.

2007 Activities: In early 2007, 5 wolves (4 adults, 1 pup) were thought to exist in the Willow Creek pack. Collared wolves B142M and SW82F continued to be tracked through 2007. The pack's den site and rendezvous sites were on private land near cattle and FWP made numerous efforts during the summer to haze the wolves out of the area. The wolves did not move far but no depredations were confirmed until October when a calf was confirmed injured after it was brought down off the forest. At the end of the year 10 gray wolves were seen from the air: 5 adults (including collared wolves B142M and SW82F) and 5 pups.

Verified Border Packs Counting in Idaho Population Estimate (Table 3 in Appendix 3)

Hughes Creek

History: First documented by IDFG in 2005.

2007 Activities: See 2007 Idaho Annual Report.

Miscellaneous / Lone Individuals in Montana CID

SW64M: This male wolf, originally dispersed from the Sage Creek pack east of Dillon, continued to spend time on the Continental Divide southwest of Dillon in 2007. He was found more often in Idaho than Montana and therefore counts in Idaho population estimates for 2007. At the end of the year, SW64M was paired with an uncollared female. They may have been responsible for some depredations that occurred in the Big Sheep Creek area in 2007, but agency personnel could not confirm which wolves were involved. Three calves and 5 buck sheep were confirmed killed in the area during the year.

Suspected Packs in Montana CID

There are several areas where MFWP suspected or verified wolf activity, but did not have enough information to verify whether new packs were present. These areas will potentially be explored in 2008:

Alder Peak: There were numerous reports of wolf activity around the Alder Peak area in the West Pioneers. A fire in this area during the summer precluded FWP from investigating.

Watchtower Creek: There were a number of reports in the Nez Perce/Watchtower and Boulder Creek drainages and wolf sign was confirmed in these areas. But it is unknown whether this pack is distinct from the Painted Rocks pack.

Roaring Lion: IDFG documented a wolf pack around the Moose Lake area just across the Montana border in Idaho. But it is unknown whether this pack is distinct from Lake Como.

Other Miscellaneous Information in Montana CID

Nothing to report.

OUTREACH AND EDUCATION

MFWP's wolf program outreach and education efforts are varied, but significant. 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 most their outreach efforts and activities in the USFWS Wolf Weekly report.

Other MFWP staff and volunteers are instrumental in accomplishing MFWP's outreach efforts. These include 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 2006 was the redesign of the wolf pages on the MFWP website. In 2007, periodic updates were made. The pages were updated with new information on a variety of subjects with respect to wolf conservation and management in Montana. In February, MFWP launched an application for the public to log on and view flight reports. The wolf report application continued to bring valuable information from the public. Wolf reports help MFWP monitoring existing packs and documenting wolf activity in new areas. See www.fwp.mt.gov/wildthings/wolf.

A wide variety of media requests are received, ranging from daily newspapers, magazines, documentary filmmakers, and authors. Additionally, the MFWP website receives email comments and questions from a wide variety of interested publics. Efforts are made to respond to as many as possible, which to date has been all.

A feature-length documentary was released late in 2007, Wolves in Paradise. This film is one of the first to tell the story of the challenges and opportunities of wolf conservation and management outside national park settings in the northern Rockies. It chronicles a traditional ranching operation in the Paradise Valley and compares it with a non-traditional ranching operation in the Madison Valley. It highlights the common ground and overlapping interests of conservationists and ranchers in protecting open space and finding ways to have livestock and wolves on the Montana landscape. This documentary was a co-production of Homefire Productions (Bill Campbell, Livingston, MT), the Independent Television Service, and KUSM / Montana PBS, with funding provided by the Corporation for Public Broadcasting, Montana Committee for the Humanities, and The Greater Montana Foundation. A community screening of the film in Bozeman was followed by a panel / audience participation event. Attendees gained valuable insights. A benefit of such community events about wolves, wolf recovery and management is that a deeper appreciation of the true challenges and opportunities of integrating wolves into the Montana landscape develops. Additionally, it continues the grassroots conversations among Montanans that started with the original Wolf Advisory Council in 2000.

The most significant outreach occurs on a daily basis when project personnel are meeting people in the field and answering phone calls or email inquiries. This informal outreach is not recorded here. In addition to the field contacts, MFWP wolf staff gave many more formal presentations throughout the year to a variety of groups. A minimum of 47 presentations were given to about 2,100 in 2007. When broken down by category, the majority of presentations were made to other agency/government professionals and landowner / livestock interests. However, no single group or setting dominated our efforts, as shown below.

Outreach Categories:
Civic: Kiwanis Club, Rotary Club, Lions Club, etc.
Teacher/school: K-12, teachers
College/Professional: colleges, conferences, and adult education
Hunting: hunting, check stations, outfitting, road and gun, etc.
Landowner / Livestock: livestock groups, permittees, watershed groups, etc.
Agency/government: Forest Service, BLM, NPS, county, Montana Legislative Committees, etc.

Outreach Categories	# of Programs	Number of public
Civic	7 (15%)	343 (16%)
Teacher/school	3 (6%)	200 (10%)
College/professional	8 (17%)	525 (25%)
Hunting	3 (6%)	160 (7%)
Landowners / Livestock	15 (32%)	477 (23%)
Agency/government	11 (24%)	395 (19%)
Total:	47 (100%)	2100 (100%)

RESEARCH, FIELD STUDIES, AND PROJECT PUBLICATIONS

Gradients of predation risk affect distribution and migration of a large herbivore.

Investigator: Jamin Grigg, Department of Ecology, Montana State University, Bozeman, MT 59717.

Abstract: Few studies have placed wildlife behavioral responses to human disturbance and hunting pressure within the larger ecological context of predator-prey theory. Given that large herbivores respond behaviorally to the presence of wolves and other predators, we should expect similar adaptive behavioral responses when large herbivores are presented with risk in the form of human disturbance and hunting pressure. One index of human access, disturbance, and thus potential predation risk to large herbivores from hunters are road and trail networks bisecting large herbivore ranges. I evaluated the effects of human disturbance and predation pressure in the forms of motorized and total combined access networks on elk (*Cervus elaphus*) summer home range size, timing of fall migration, and movement rates by placing 49 GPS radio-collars on adult female elk on a winter range in the Madison Valley, MT over the course of a two-year study. I found evidence that elk responded to motorized access during the summer by increasing summer home range size. Further, regional variation in predation risk from human hunters resulted in elk subjected to the highest levels of hunting pressure initiating fall migration from summer ranges to winter ranges earlier than elk subjected to lower levels or no hunting pressure. These winter ranges are mostly privately-owned ranchlands that provide relative refuge from hunting pressure. All elk in this study summered on public lands, yet most elk summering in heavily hunted regions were unavailable to public-land hunters for large portions of the hunting seasons due to early fall migration patterns. Movement rate models were ambiguous and I was unable to detect differences associated with motorized and total access levels, though movement rates during the hunting seasons were correlated with varying regional predation risk. This research potentially provides valuable knowledge to biologists across the western United States managing large herbivore populations that summer on public lands and winter in privately-owned agricultural valleys, and provides insight into general predator-prey behavioral relationships.

Recent project publication:

Grigg, J. 2007. Gradients of predation risk affect distribution and migration of a large herbivore. Master's thesis, Montana State University, Bozeman, MT 59717.

Expanding the Use of Time of Death Determination Parameters to Carnivores: A Two Part Project

Investigator: F. Carleen Gonder, University of Montana; Masters of Interdisciplinary Studies: Criminology and Forensic Anthropology (Wildlife Forensics); (406) 244-0007; carleen_montana@yahoo.com.

Sponsor Numerous individuals and organizations have contributed to this project, but primary sponsor is the Association of Midwest Fish and Game Law Enforcement Officers. Material from this project will appear in their field manuals.

Purpose: Law enforcement investigators have long understood the importance of time of death determinations, both short term or during the initial 24 hours postmortem, and long term by understanding the various stages of decomposition. The focus of this project is on decomposition. Eight wolves, four mountain lions, two black bears and a whitetail deer are now in the dry stage of decomposition. Due to their availability, wolves have become a control for documentation of seasonal variation. A time lapse photo essay is being prepared in manual format that will have a corresponding overlay of predominant insects associated with the various decomposition stages which are indicators for time of death. Included in this manual will be insect collection protocols for forensic entomological purposes, specific to wildlife and the intermountain west and mid west regions. Plans are underway to continue this decomposition project over a period of several years to introduce new variables and gather comparable data for several wildlife species.

Project Activities: On 19 June 2006, two wolves were placed for decomposition in an electrified exclosure. Their carcasses remain relatively intact and preserved due to mummification. On 15 Sept. two wolves and a black bear were placed in a second exclosure and they are mummified. A black bear was placed 28 Oct., and three mountain lions and a whitetail deer were placed 22 Nov. Two wolves were placed 1 Dec and another lion on 11 Jan. 2007. Two additional wolves were placed 4 April. All carcasses are at the dry decomposition stage. Though the focus of this project is on carnivores, the addition of the deer sets the stage for long term wildlife decomposition study.

Due to their availability, wolves will provide seasonal variation for one species. Two yearling females were placed mid June (summer). The weather remained hot and dry for most of the summer. Within two weeks of placement their hides were nearly mummified, with little underlying tissue. Two adult females were placed mid September (fall). While temperatures remained warm, there was slightly more precipitation. This resulted in delayed carcass drying. They are now at the dry stage. The summer and fall wolves are well preserved due to mummification. Two adult males were placed early December (winter), and remained static for several months. They are now at the dry stage. Two wolves were placed in April (spring) with increased amounts of moisture in the form of rainfall and higher relative humidity, compared to the other 3 seasons. While the spring wolves are currently in the dry stage, they are exhibiting decomposition characteristics not observed in the wolves placed in the three previous seasons, such as significant amounts of exposed skeleton. This is due to higher overall moisture resulting in delayed carcass drying which promoted an increase in insect activity.

One cub-of-the-year black bear was placed on bare ground on 28 October. The carcass had been frozen but was fully thawed at the time of placement. Last fall it had undergone numerous freeze/thaw cycles, and remained static after snowmelt this spring for well over one month. Three fresh (unfrozen) yearling lions and one whitetail deer were placed on bare ground 22 November during an active snow storm and were fully covered the following day. They

remained snow-covered until spring. The yearling lions were possibly insulated from freezing until after snowmelt. Two frozen adult male wolves were placed on snow 1 December and remained frozen until spring. One frozen adult male lion was placed 11 January on top of snow and it, too, remained frozen until spring. UM graduate student Laura Wagster has conducted an analysis of freeze-thaw affects on the summer and fall wolf carcasses in an attempt to determine a relationship to human remains.

A time lapse photo essay is being prepared in field manual format that will have a corresponding overlay of predominant insects associated with the various decomposition stages which are indicators for time of death. Included will be insect collection protocols for forensic entomological purposes, specific to wildlife and the intermountain west and mid west regions. This material will be published in the Wildlife Forensic Field Manual. A forensic entomology analysis is being conducted by Gregory Johnson, Ph.D (Montana State University) of the insects collected by C. Gonder from the summer and spring wolves.

Range Rider Projects 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, Keystone Conservation, 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 and Keystone Conservation.

Range Rider projects were implemented in 2004, 2005, 2006, and 2007 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 continued in 2007.

The fourth field season of the Range Riders project in the Madison occurred in 2007. This year was the third field season in the Boulder. There were a total of 4 riders (2 in Boulder drainage, and 2 in Madison drainage). The riders in the Madison were out from June 15 - October 15, and the riders in the Boulder were out from June 1 - October 30th. They were each paid $2,000 a month – Keystone Conservation covered all costs in the Madison, and put in $5,000 for riders in the Boulder.

There was one confirmed depredation in the Madison Valley, after livestock were removed from the project site in the fall of 2007. There were no confirmed or probable depredations in the Boulder Valley. No missing livestock were reported and attributed to wolf kills in either project area. In the Madison, the riders reported seeing the Horn Mountain pack numerous times on the public grazing allotment, and assisted FWP in collaring and tracking the pack. The Madison Valley riders chased wolves away from cattle on horseback, but did not use less than lethal munitions.

In the Boulder, the riders encountered six individual wolves that they associated with either the Baker Mountain pack or Moccasin Lake pack. They did not have the opportunity to use any less-than-lethal munitions. The Boulder project was primarily on private land this year because forest fires in 2006 closed livestock grazing allotments in the Gallatin National Forest. The riders encountered a lot of sign and tracks of wolves, as well as both black and grizzly bears.

FWP collaborated on another Ranger Rider project with Defenders of Wildlife and a livestock producer in the Rock Creek drainage east of Missoula. This producer experienced missing livestock in 2006, and FWP monitoring efforts suggested that the Sapphire pack was large (14 wolves at the end of 2006). The rider started in May, 2007 and spent time both on private land and the affiliated public grazing allotment through September. No 10j hazing or take in the act was reported by the rider, but there were two calves were killed on private land during 2007 (one in July and another in September). Due to repeated visitation of members of this pack to private lands (this ranch and others) in close proximity to livestock, 5 wolves were removed from the pack and 1 wolf was killed illegally. At least four wolves remained in the pack at the end of 2007. The producer registered satisfaction with the Range Rider project and is expected to participate again in during 2008.

Estimation of Successful Breeding Pairs for Wolves in the Northern Rocky Mountains, USA

Investigators: Dr. Michael Mitchell, U. S. Geological Survey, Montana Cooperative Wildlife Research Unit; David E. Ausband, Montana Cooperative Wildlife Research Unit; Carolyn A. Sime, Montana Fish, Wildlife & Parks; Edward E. Bangs, U.S. Fish and Wildlife Service; Justin A. Gude, Montana Fish, Wildlife & Parks; Michael D. Jimenez, U.S. Fish and Wildlife Service; Curt M. Mack, Wolf Recovery Project, Nez Perce Tribe; Tomas J. Meier, National Park Service; M. Steven Nadeau, Idaho Department of Fish and Game; and Douglas W. Smith, National Park Service.

Abstract accepted for publication: Under the Endangered Species Act, documenting recovery and federally mandated population levels wolves (Canis lupus) in the northern Rocky Mountains (NRM) requires monitoring wolf packs that successfully recruit young. United States Fish and Wildlife Service (USFWS) regulations define successful breeding pairs as packs estimated to contain an adult male and female, accompanied by ?2 pups on 31 December of a given year. Monitoring successful breeding pairs will become more difficult following proposed delisting of NRM wolves; alternatives to historically intensive methods, appropriate to the different ecological and regulatory context following delisting, are required. Because pack size is easier to monitor than pack composition, we estimated probability a pack would contain a successful breeding pair based on its size for wolf populations inhabiting 6 areas in the NRM. We also evaluated the extent to which differences in demography of wolves and levels of human-caused mortality among the areas influenced probability packs of different sizes would contain successful breeding pairs. Probability curves differed among analysis areas, depending primarily on levels of human-caused mortality, secondarily on annual population growth rate, and little on annual population density. Probabilities packs contained successful breeding pairs were more uniformly distributed across pack sizes in areas with low levels of human mortality and stable populations. Large packs in areas with high levels of human-caused mortality and high annual growth rates had relatively high probabilities of containing breeding pairs whereas those for small packs were relatively low. Our approach can be used by managers to estimate number of successful breeding pairs in a population where number of packs and their sizes are known. Following delisting of NRM wolves, human-caused mortality is likely to increase, resulting in more small packs with low probabilities of containing breeding pairs. Differing contributions of packs to wolf population growth based on their size suggests monitoring successful breeding pairs will provide more accurate insights into population dynamics of wolves than will monitoring number of packs or individuals only.

Internal Validation of Predictive Logistic Regression Models for Decision-making in wildlife management.

Investigators: Justin A. Gude, Montana Fish, Wildlife & Parks; Michael Mitchell, U.S. Geological Survey, Montana Cooperative Wildlife Research Unit; David E. Ausband, Montana Cooperative Wildlife Research Unit; Carolyn A. Sime, Montana Fish, Wildlife & Parks; Edward E. Bangs, U.S. Fish and Wildlife Service.

Abstract submitted for publication: Predictive logistic regression models are commonly used to inform decisions related to wildlife management and conservation. Examples include predicting favorable wildlife habitat for land conservation objectives and predicting vital rates for use in population models. Often such models are developed for use in the same population from which sample data were obtained; they are intended for "internal" use. Before using a logistic regression model for this purpose, the predictive ability of the model should be validated. We describe a process for conducting an internal validation. We start by defining the major components of accuracy for binary predictions as calibration and discrimination, and we describe methods for assessing the calibration and discrimination abilities of a logistic regression model. We also describe methods for correcting problems of calibration in a logistic regression model. We then show how the bootstrap can be used to obtain honest estimates of predictive accuracy in the population underlying the sample data. We also show how the bootstrap can be used to assess coverage rates and re-calibrate the endpoints of confidence intervals for predictions from a logistic regression model in order to achieve nominal coverage rates. We illustrate the process of internal validation using logistic regression models for predicting the number of successfully breeding wolf packs in the northern Rocky Mountains. Managers need to know the number of successfully breeding wolf packs in order to document the recovery and population status of wolves in the region, as dictated by federal and state management plans. Therefore the example has direct management applications, and we validate that logistic regression predictions will be reliable in this situation. The validation methods we present, while useful for logistic regression, can also be applied to any prediction method that is based on data, either directly or with modification. We believe that predictive accuracy should be validated before any model is used to inform wildlife management and conservation decisions, regardless of how the model was selected or developed. This will increase the odds that management decisions will achieve management goals.

Dog Lice (Trichodectes canis) on wolves in Montana and Idaho.

Investigators: Michael D. Jimenez, U.S. Fish and Wildlife Service; Edward E. Bangs, U.S. Fish and Wildlife Service; Mark Drew, Idaho Wildlife Health Laboratory; Steven Nadeau, Idaho Fish and Game; Val J. Asher, Turner Endangered Species Fund; Carolyn Sime, Montana Fish, Wildlife and Parks.

Abstract submitted for publication: We found dog lice (*Trichodectes canis*) on 5 wolves (5 pups) in 1 wolf pack in Montana in 2005 and 2006, and on 9 wolves (5 adults, 3 yearlings, and 1 pup) in 8 different packs from Idaho in 2006 and 2007. Lice were not detected on all members of the pack once a pack member was diagnosed with lice. Lice infestation may have contributed to higher morbidity in individual wolves, but was not a significant cause of wolf mortality.

Sarcoptic mange found in wolves in the Rocky Mountains in western United States

Investigators: Michael D. Jimenez and Edward E. Bangs, U.S. Fish and Wildlife Service; Carolyn Sime, Montana Fish, Wildlife, & Parks; Valpa J. Asher, Turner Endangered Species Fund.

Abstract submitted for publication: We documented sarcoptic mange (*Sarcoptes scabiei*) in wolves (*Canis lupus*) in the Northern Rocky Mountain (NRM) states of Montana (MT) and Wyoming (WY), from 1995 through summer 2007. Mange was identified in wolves from MT and WY, primarily east of the Continental Divide. Statewide in MT, we recorded mange in: 3% of 33 packs in 2003, 12% of 33 packs in 2004, 31% of 35 packs in 2005, 7% of 60 packs in 2006, and 4% of 71 packs in 2007**,** but all infected packs were in southwest Montana (SWMT) north of Yellowstone National Park (YNP). In addition, one wolf in northwest MT (NWMT) was confirmed to have mange in 1995 and another in 2005. In WY (including YNP), mange-infected wolves were found in: 5% of 22 packs in 2002, 8% of 26 packs in 2003, 12% of 26 packs in 2004, 3% of 29 packs in 2005, 9% of 40 packs in 2006, and 15% of 33 packs in 2007. Mange was first documented in YNP in 2006 and in Grand Teton National Park (GTNP) in 2007. We did not detect mange in all members of every pack once a pack member was found with mange. No mange was documented in Idaho. We documented individual wolves that recovered from infestations. We predict that sarcoptic mange infestation in the NRM will progress as it has in other parts of North America by affecting local wolf packs in episodic fashion and will not threaten regional wolf population viability. Since 1995, numerous individual wolves have died or were euthanized due to mange-related conditions and some wolf packs in specific areas have been affected. But the overall wolf population in the NRM was not negatively impacted by mange, and the population continued to increase 10-20% annually to an estimated 1300 wolves in September 2007. If the NRM wolf population was dramatically reduced, mange epizootics may play a more significant role in wolf population status in the future when combined with other mortality factors.

Gray Wolves and Livestock in Montana: a Recent History of Damage Management

Investigators: Carolyn A. Sime, Montana Fish, Wildlife & Parks; Edward E. Bangs, U.S. Fish and Wildlife Service; Elizabeth Bradley, Montana Fish, Wildlife & Parks; John E. Steuber, Kraig Glazier, and Paul J. Hoover, USDA Wildlife Services; Val Asher, Turner Endangered Species Fund; Kent Laudon, Mike Ross, and Jon Trapp, Montana Fish, Wildlife & Parks.

Abstract to be published in conference proceedings: The Montana gray wolf population grew from 2 wolves in 1979 to a minimum of 316 by late 2006. Resolving conflicts, both perceived and real, between wolves and livestock was a dominant social issue for the federal recovery program, and it remains so today. The U.S. Fish and Wildlife Service and now Montana Fish, Wildlife & Parks work with USDA-APHIS-Wildlife Services to reduce depredation risks and address wolf-related conflicts through a combination of non-lethal and lethal management tools. The number of wolf complaints investigated from 1987-2006 increased as the population increased and expanded its distribution into Montana after reintroduction into Yellowstone National Park and central Idaho in 1995/96. Montana wolf packs routinely encountered livestock, though wolf depredation was a relatively rare cause of livestock death and difficult to predict or prevent. Cattle and sheep were killed most often from March to October, although losses were confirmed each month. From 1987-2006, wolves killed 230 cattle and 436 sheep. However, confirmed losses probably represent a fraction of actual wolf losses. Few other types of livestock classes were killed. Conflicts are addressed on a case-by-case basis, striving to

connect the agency response to the damage in space and time and to decrease the potential for future losses. Lethal control is implemented incrementally after predation was verified, and 254 wolves were killed from 1987–2006. Only complete removal of either wolves or livestock eliminates the potential for wolf depredation. The continued presence of a viable wolf population requires that a wide variety of non-lethal and lethal tools be investigated and implemented. That combination will also be required to maintain local public tolerance of wolves where the two overlap and to foster broad public acceptance of techniques used to minimize conflicts. Resolving wolf-livestock conflicts at a local scale is but one component of a larger state wolf conservation and management program. Upon delisting, regulated public harvest will allow us to more proactively manage the population.

Application of Electrified-Fladry to Decrease Risk of Livestock Depredation by Wolves in Montana.

Investigators: Carolyn A. Sime, Montana Fish, Wildlife & Parks; Nathan Lance, Utah State University and USDA Wildlife Services Research Section; John Shivik and Stewart Breck, USDA Wildlife Services Research Section; John Steuber, USDA Wildlife Services Montana State Office; Stacy Courville, Confederated Salish and Kootenai Tribes.

Abstract: Wolf (*Canis lupus*) predation on livestock can cause economic hardships for livestock producers, resulting in increased animosity towards wolves and complicating the balance between wolf conservation and human interests. Because gray wolves are given special federal and state protection, regulations limit the ability of livestock owners and wildlife managers to address wolf depredation on livestock. More tools are needed that prevent conflict, thus the objective of this project was to further develop and test a deterrent tool to reduce livestock depredation by wolves. Electrified-fladry is an electrified rope barrier with suspended flagging that shows particular promise as an effective tool for keeping wolves out of smaller size pastures. We completed a pen study that demonstrated the effectiveness of electrified-fladry in preventing captive wolves from accessing food resources. To learn more about the applicability of this tool in a field setting and the efficacy in reducing wolf use of pastures and preventing depredations, we performed a field test of electrified-fladry in Montana. We identified twelve cattle pastures on nine ranches with a history of wolf depredations. Six pastures received electrified-fladry to protect 40-160 acre calving pastures, and six did not. Electrified-fladry was installed during critical calving times (February-June) when calves are vulnerable to predation. All ranches and pastures were monitored for cattle depredation and wolf activity using track plots and radio-telemetry. In addition, we studied the willingness and interest of livestock producers for integrating electrified-fladry into their operations. We recorded information about installation and maintenance time and costs and surveyed all project participants to learn about their experiences, beliefs and attitudes regarding the usefulness of electrified-fladry. Electrified-fladry was implemented and surveys were distributed in 2007. Data collection was completed in 2008. Analysis and publications will be completed in 2008.

Other Project Collaborators and Principals: U.S. Forest Service, Gallatin National Forest, Big Timber; Boulder Watershed Group; participating landowners in both project areas; Mike Lewis

and Joe Weigand, Montana Fish, Wildlife & Parks, and field specialists from both USDA Wildlife Services and Montana Fish, Wildlife & Parks.
Note: The field portion of this study was funded through a Conservation Innovation Grant provided by the Montana Office of the USDA Natural Resources Conservation Services. It is part of a Master's Degree program for Nathan Lance through Utah State University.

Contrasting wolf-ungulate interactions in the Greater Yellowstone Ecosystem.

Investigators: Ken Hamlin[1], Bob Garrott[3], P.J. White[4], and J. A. Fuller[1].
[1]Montana Fish, Wildlife & Parks, 1400 S. 19th, Bozeman, MT 59718
[2]Montana State University, Department of Ecology, Bozeman, MT 59717
[3]National Park Service, Yellowstone National Park, Mammoth, WY

Summary: We documented the effects of wolf restoration on elk populations in the greater Yellowstone area, which varied considerably with variations in ecological and landscape factors. We found no correlation between wolf:elk ratios and the proportion of adult cows pregnant. Pregnancy rates were uniformly high for all herds, approaching the maximal levels that could be expected for this species. Thus, reduced pregnancy was unlikely to have contributed to low indices of recruitment (i.e., ratios of calves per 100 adult females) observed in some herds after wolf establishment. We found a strong negative correlation between the ratio of predators to prey and indices of calf recruitment and attribute this relationship to additive predation effects that reduced calf mortality below levels that would have been experienced in the absence of predators. There was some evidence the survival of adult female elk decreased at high numbers of wolves relative to elk, and that a portion of this increased mortality was likely additive to other causes. Elk populations decreased in areas where combined high numbers of wolves and grizzly bears occurred in relation to numbers of elk. However, elk populations remained stable or increased where consistently low numbers of wolves and/or grizzly bears coexisted with elk and moderate levels of hunter harvest occurred. The effects of wolves on elk populations varied depending on the predominant land use. Wolves reached high numbers relative to elk populations where preservation was the main land use (e.g., Yellowstone National Park) and/or there were few conflicts with agricultural activities (e.g., Gallatin Canyon). However, in areas where agriculture was the predominant land use, consistent depredations by wolves resulted in control actions that maintained low wolf to elk ratios.

Recent Project Publications: Hamlin, K. L., R. A. Garrott, P. J. White, and J. A. Fuller. 2008 (*in press)*. Contrasting wolf-ungulate interactions in the Greater Yellowstone Ecosystem. Chapter 25 *in* R. A. Garrott and P. J. White, editors, Large mammal ecology in central Yellowstone: A synthesis of 16 years of integrated field studies. Elsevier – Academic Press.

Trophic Cascades Involving Humans, Wolves, Elk, and Aspen in the Crown of the Continent Ecosystem.

Graduate Student: Cristina Eisenberg; *Committee Chair*: Dr. William J. Ripple, Oregon State University, Corvallis

Collaborators: Shell Canada, Alberta Fish and Wildlife Division, Montana Fish Wildlife and Parks, Waterton Lakes National Park, Glacier National Park, the University of Alberta, the University of Calgary, and Oregon State University.

Project Summary: Predation by wolves may be critical for maintaining biodiversity and sustaining aspen communities. Currently in decline in portions of the West, aspen provides key habitat for songbirds and beaver, among other species. One of the major controversies in ecology in the past century concerns whether food has a stronger influence on herbivore population regulation than predation. Predation can drive strong lethal and non-lethal effects throughout food webs, referred to as trophic cascades. I am studying trophic cascades involving human land use, wolves, elk, and aspen in the Crown of the Continent Ecosystem. My objective is to investigate how an apex predator affects aspen communities by influencing abundance and behavior of large herbivore prey. This work will contribute to our knowledge of food webs, via a gradient analysis of the magnitude of trophic cascades and investigation of temporal and spatial trophic interactions in a geographic location where they have not been studied previously. It is part of the *Southern Alberta Montane Elk Study*, an interagency, transboundary collaboration in which we are working with 98 elk fitted with GPS collars, and 7 radio-collared wolf packs.

Project Activity in 2007: Coursework, development of research questions, first year of field research.

Anticipated Completion Date: 2010

Policy Issues Related to Wolves in the Northern Rocky Mountains

Investigators: Christian A. Smith and Carolyn A. Sime, Montana Fish, Wildlife and Parks.

Abstract for publication in conference proceedings: Wolves were extirpated from the northern Rocky Mountains (NRM) in the 1930s, but returned to the region through natural recolonization of northern Montana in the 1980s and reintroduction to central Idaho and Yellowstone National Park in the 1990s. Wolf numbers increased rapidly after 1996 and now number about 1300. The impacts of wolves on wild ungulate management, hunter harvest, livestock, public safety and agency funding are subjects of significant public speculation and political rhetoric, but scientific data needed for informed decisions are limited. Legal and administrative issues have precluded delisting, even though wolves achieved the biological recovery threshold in 2002. Agency managers and policy makers will face many challenges as they integrate wolves into existing programs and political environments. A commitment to open, inclusive decision-making processes based on sound science and respect for diverse perspectives will provide the best model for addressing issues related to wolves in the NRM.

LAW ENFORCEMENT

The USFWS Office of Law Enforcement remained the lead agency investigating wolf deaths in Montana in 2007. MFWP representatives collaborated and provided assistance on request. Several documented wolf mortalities were suspected to be due to illegal activity and cases are still under investigation. Two citations were issued for violations of the experimental 10j rule and fines were paid.

FWP Game Wardens, by nature of their positions make valuable contributions with respect to outreach about wolves, their management, and the Montana program. In addition, wardens have assisted with various field activities such as retrieving road-killed wolves or responding to wolves caught incidentally by recreational trappers. Wardens have also passed along wolf reports to project personnel and contributed to monitoring efforts. FWP federal wolf funding helps support their activities.

FUNDING

MFWP's core wolf program is funded through 2 separate federal sources. Approximately half is obtained through a direct annual Congressional line-item appropriation and half is obtained directly from USFWS as a part of the agency base budget. These sources are identified in the state-federal wolf cooperative agreement and are transferred on a federal fiscal year cycle which is offset from the state fiscal year cycle by six months. 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 sometimes resulted in Congressional recessions (across the board percentage cuts). Therefore, Montana received about $607,000 in federal fiscal year 2005. In 2006, Montana received about $641,000. In federal fischal year 2007, Montana again received about $641,000 in federal funds. 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.

In federal fiscal years 2005 and 2006, Montana USDA WS was funded through the regular Congressional budgeting process for federal agencies and did not receive USFWS-direct funding. Historically and beginning in the early 1990s, USFWS provided funding to USDA WS western region to assist in wolf recovery and management in the tri-state area. By 2001, about

$100,000 per year was being transferred from USFWS to USDA WS across the tri state area for field assistance. At that same time, USDA WS also began receiving direct annual appropriations through the USDA Congressional budget process in recognition of the increased workload in the northern Rockies. USFWS continued to fund USDA WS until 2005 through a direct Congressional appropriation and USDA WS western region continued to receive special Congressional directives.

However, in federal fiscal year 2005, Congress deleted the federal appropriation that had been given to USFWS and subsequently transferred to USDA WS for their work in the tri state area. In it's place, other special Congressional directives had been incorporated into the USDA WS western region budgets to address funding needs as a result of increased workloads beginning in federal fiscal year 2001. These special directives have been maintained each year since. Both MFWP and MT WS have concerns that Congressional earmarks and/or special directives will be cut or eliminated at the Congressional level. That would have important implications for the two agencies and their ability to fulfill their respective agency responsibilities and the commitments made in the Montana Wolf Plan.

There has been confusion over the coincidental timing of elimination of USFWS funding received by MT WS and MFWP taking on wolf management responsibilities. In federal fiscal year 2005, the USFWS Congressional appropriation that had been provided to the western region of USDA WS was eliminated. In the same federal fiscal year, an interagency cooperative agreement was completed between MFWP and USFWS. As a condition of MFWP signing the agreement, USFWS agency base funding was transferred to MFWP since MFWP was now doing the field program with state personnel. The loss of USFWS funding for tri-state USDA WS gray wolf field activities had nothing to do with a different, independent Congressional earmark appropriation and USFWS base funding for to MFWP to implement work outlined in an MFWP-USFWS interagency cooperative agreement to manage wolves in Montana.

In federal fiscal year 2007, WS spent an estimated $183,924 responding to wolf complaints and assisting FWP with depredation management responses such as radio collaring or killing problem wolves. This is an increase above the estimated $152,000 spent in federal fiscal year 2006.

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. Therefore, efforts to garner national financial support to fully implement the state's program are ongoing.

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 of 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/Missoula, and Jon Trapp in Red Lodge. Jon Trapp resigned from MFWP in mid-summer 2007 to accept a position with the Red Lodge Fire Department. His position remained vacant for the rest of the calendar year, although Jon did contribute to this year's annual report, and we thank him for his extra time.

But the wolf team is part of a much bigger team of tremendously dedicated agency professionals that make up Montana Fish, Wildlife & Parks. In particular, Dr. Mark Atkinson (MFWP's former wildlife veterinarian) over saw our animal handling protocols welfare guidelines, in addition to being the MFWP lead for wolf disease surveillance and necropsy work. Additional staff at the MFWP Wildlife Research Laboratory also provide significant logistical support and services for the wolf program, including Neil Anderson (Lab Supervisor). Salish Kootenai Confederated Tribes biologist Stacey Courville and Blackfeet Tribe biologist Dan Carney captured and monitored wolves in and around their respective tribal reservations. We thank them for sharing information contained in this report and the close coordination throughout the year.

In 2007, the Montana wolf management program benefited from the contributions from our seasonal technicians Ty Smucker, Kris Boyd, and Kari Holder, all of whom excelled at their jobs and contributed enormously. The Montana wolf management volunteer program was very fortunate to be served by volunteers: Stefanie Bergh, Kari Holder, Emily Schock, Laura Cerruti, Quinn Harrison, Sarah Bassing, Gana Wingard, Samantha Dwinnell, Shannon Kachel, Carly Levell, Natasha Meier, Nick Mitrovich, Trina Wade, and Adia Sovie, and Nathan Stone who worked enthusiastically and with good humor and dedication through long days and weeks. Arlie Burke, Eureka area logger and houndsman, lent his time unselfishly to help with fieldwork, local information, and to pass on old tried and true "woodsmanship" to the next generation of biologists in our volunteer program. We also want to thank the Swan Ecosystem Center and Northwest Connections for their avid interest and help in documenting wolf presence and outreach in the Swan River Valley.

We also thank the private citizens who served on the working group to develop the framework for a Montana Livestock Loss Reduction and Mitigation Program. We also thank the members of the Montana Wolf Management Advisory Council for their ongoing contributions. Their participation on these working groups, respectively, provides valuable guidance from a diversity of perspectives. Their continued collaboration, along with many other Montanans, continues to be the foundation of the program's success to date.

MFWP's wolf program is supported 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. We appreciate the MFWP Helena staff from all the Divisions who contributed their expertise and time. We thank Caryn Amacher, Denise Dawson, 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. We appreciate the work and dedication of the MFWP Website Team. Jay Lightbody and Don Bartsch at the Print shop prepared and printed outreach materials. Mike Lewis and Joe Weigand contributed their time, funding, and expertise during the electric fladry field trials experiments and data analysis. 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 throughout the year.

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.

USDA WS investigates suspected wolf damage and carries out wolf control activities in Montana. We thank them for contributing their expertise to the state's 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 2007 included State Director John Steuber, eastern district supervisor Paul J. Hoover, western district supervisor Kraig Glazier, wildlife specialists Dennis Biggs, John Bouchard, Owen Murnion, Rick Glover, 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, and Eric Waldorf.

The Montana Wolf Management program field operations also benefited in a multitude of ways from the continued cooperation and collaboration of other state and federal agencies and private interests such as the 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, Wyoming Game and Fish, Nez Perce Tribe, Canadian Provincial wildlife professionals, Defenders of Wildlife, Keystone Conservation, 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 (Hoerner Aviation Inc., Kalispell), Steve Davidson (Selway Aviation, Hamilton), Doug Chapman (Montana Aircraft, Bozeman), Roger Stradley (Gallatin Flying Service, Belgrade), Steve Ard (Tracker Aviation Inc., Belgrade), and 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.

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.

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APPENDIX 1

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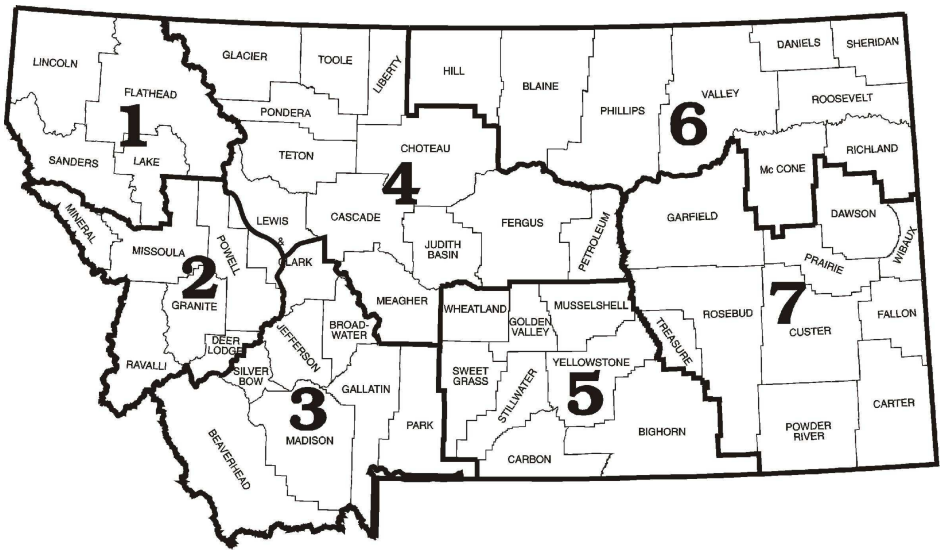
MONTANA FISH WILDLIFE & PARKS ADMINISTRATIVE REGIONS



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TO REPORT A DEAD WOLF OR POSSIBLE ILLEGAL ACTIVITY:

U.S.Fish and Wildlife Service

- Special Agent, Missoula MT: (406) 329-3000
- 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; 1st pups are born 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 MT, ID, and WY 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.

2006

- Montana implements as much of approved state plan as possible and within federal guidelines.
- Funding from U.S. Fish and Widllfie Service and special Congressional appropriations continue.
- Montana Fish, Wildlife & Parks and USDA Montana Wildlife Services update an existing interagency cooperative agreement to include gray wolves
- Montana Livestock Loss Reduction and Mititgation Program draft framework completed and draft legislation is prepared for the 2007 Montana Legislature.
- An estimated 316 wolves in 21 breeding pairs are counted in Montana. Distribution continues to be the western one-third of Montana.

2007

- Montana implements as much of approved state plan as possible and within federal guidelines.
- Funding from U.S. Fish and Wildlife Service and sepcial Congressional appropriations continue.
- HB 364 passed the 2007 Montana Legislature, creating the Montana Livestock Loss Reduction and Mitigation Program; Oversight Board is appointed by the Governor and administrative officer of the Board is hired. First Board meeting, fundraising, and rule-making to begin early in 2008.
- MFWP proposes a tentative wolf hunting/trapping season structure proposal which is approved by the MFWP Commission, enabling the agency to gather public comment. (decision timeline is occurs in 2008).
- U.S. Fish and Wildlife Service proposes modification of the Experimental Rules (10j) to provide additional flexibility to northern Rockies states with approved plans that applies to the experimental areas of those states, respectively.
- U.S. Fish and Wildlife Service approves Wyoming's wolf management plan and state laws.
- U.S. Fish and Wildlife Service proposes a Northern Rockies Distinct Population Segment and to delist wolves in the northern Rockies in states with approved plans.
- An estimated minimum of 422 wolves in 39 breeding pairs are counted in Montana. Distribution continues to be the western one-third of Montana

APPENDIX 3

NORTHERN ROCKIES WOLF PACK TABLES

Table 1a: Montana Wolf Packs and Population Data for Montana's Portion of the Northwest Montana Recovery Area, 2007.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007			DOCUMENTED MORTALITIES			KNOWN		CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	DISPERSED	MISSING [4]	CONTROL [5]	CATTLE	SHEEP	DOGS	OTHER
1	Ashley	NWMT	MT	3	1	4					1					
2	Blue Mountain	NWMT	MT	4	?	4										
3	Camas Prairie	NWMT	MT	3	?	3										
4	Candy Mountain	NWMT	MT	2	2	4					1					
5	DeBorgia #	NWMT	MT	2	2	4										
6	Elevation Mountain	NWMT	MT	2	4	6				1						
7	Fishtrap	NWMT	MT	4	3	7										
8	Firefighter	NWMT	MT	2	6	8										
9	Flathead Alps	NWMT	MT	6	4	10										
10	Great Bear	NWMT	MT	2	2	4										
11	Hewolf Mountain	NWMT	MT	1	3	4						12	10			1
12	Hog Heaven	NWMT	MT	3	3	6						1	3		1	
13	Kintla	NWMT	MT	2	2	4		1								
14	Kootenai South	NWMT	MT	2	2	4		1								
15	Ksanka	NWMT	MT	4	2	6					1					
16	Lazy Creek	NWMT	MT	6	2	8										
17	Livermore	NWMT	MT	6	4	10	1									
18	Lost Soul	NWMT	MT	?	?	?					1					
19	Lydia	NWMT	MT	3	5	8						2	3			
20	Marias	NWMT	MT	3	3	6										
21	Meadow Peak	NWMT	MT	3	0	3		1								
22	Mineral Mountain	NWMT	MT	4	2	6										
23	Monitor Mountain	NWMT	MT	1	4	5						3	4			
24	Murphy Lake	NWMT	MT	2	2	4										
25	Ninemile	NWMT	MT	4	2	6					1				2	
26	Nyack	NWMT	MT	2	0	2										
27	Pulpit Mountain	NWMT	MT	2	1	3										
28	Red Shale	NWMT	MT	2	5	7										
29	Salish	NWMT	MT	4	1	5			3			1	2			
30	Silver Lake #	NWMT	MT	2	?	2										

Table 1a: Montana Wolf Packs and Population Data for Montana's Portion of the Northwest Montana Recovery Area, 2007.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN [2]	UNKN [3]	KNOWN DISPERSED	MISSING [4]	CONTROL [5]	CONFIRMED LOSSES [6] CATTLE	SHEEP	DOGS	OTHER
31	Spotted Bear	NWMT	MT	4	4	8										
	~~Spotted Dog~~ [7]	NWMT	MT	?	?	?					1					
32	Squeezer	NWMT	MT	3	6	9										
33	Superior #	NWMT	MT	4	4	8		3								
34	Thompson Peak	NWMT	MT	6	7	13										
35	Whitefish	NWMT	MT	7	8	15										
36	Wolf Prairie	NWMT	MT	3	0	3										
	Misc/Lone			4		4		2	1				4	5		
	MT Total in NWMT			117	96	213	1	8	4	1	6	19	26	5	3	1

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 2007.

5 Agency lethal control (10j regulation does not apply to the endangered area).

6 Includes only domestic animals confirmed killed by wolves.

7 Pack did not exist on Dec. 31 2007 and is not displayed on the map; see pack narrative.

Border pack shared with the State of Idaho; dens in Montana.

Table 1b: Montana Wolf Packs and Population Data for Montana's Portion of the Greater Yellowstone Experimental Area, 2007.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007			DOCUMENTED MORTALITIES			KNOWN			CONFIRMED LOSSES 6			
				ADULT	PUP	TOT	NATURAL	HUMAN 2	UNKN 3	DISPERSED	MISSING 4	CONTROL 5	CATTLE	SHEEP	DOGS	OTHER
37	Rosebud	GYA	MT	2	0	2										12
38	Moccasin Lake	GYA	MT	1	3	4		1				1	1			
	~~Mission Creek~~ [7]	GYA	MT	0	0	0		1			1					
39	Baker Mountain	GYA	MT	?	?	3		1				2	3	9		
40	Buffalo Fork	GYA	MT	?	?	10										
41	Mill Creek	GYA	MT	3	5	8							2			
42	Eightmile	GYA	MT	2	5	7										
	~~Swan Lake~~ [7]	GYA	MT	0	0	0					1	2	3			
	~~Chief Joe~~ [7]	GYA	MT	0	0	0		1								
43	Eagle creek	GYA	MT	4	0	4		1								
44	Beartrap	GYA	MT	6	7	13										
45	Cedar Creek	GYA	MT	2	0	2		5				4	3			
46	Cougar 2	GYA	MT	7	?	7+										
47	Deadhorse [8]	GYA	MT	?	?	2+										
48	Horn Mtn	GYA	MT	2	5	7							1			
49	N. Gravelly	GYA	MT	2	?	6						2	3			
50	Freezeout	GYA	MT	2	3	5						1	2			
	~~Wedge~~	GYA	MT	0	0	0						9	5			
	Misc/Lone	GYA	MT	7	0	7	2				1	2	1	8		1
	MT Total in GYA			40	28	87	2	10	0	0	3	23	24	17	0	13

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 2007.

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, 2007 and is not displayed on the map; see pack narrative.

8 See narrative text for explanation.

Table 1c: Montana Portion of the Central Idaho Experimental Area (Montana statewide totals): wolf packs and population data 2007

Montana portion of Central Idaho Experimental Area

REF.		RECOV		PACK SIZE DEC 2007			MORTALITIES			KNOWN		CONTROL	CONFIRMED LOSSES6			
#	WOLF PACK1	AREA	STATE	ADULT	PUP	TOT	NAT	HUMAN2	UNKN3	DISPERSED	MISSING4	KILLED 5	CATTLE	SHEEP	DOGS	OTHER
51	Brooks Creek #	CID	MT	3	4	7						3	3			
52	Painted Rocks #	CID	MT	2	?	2										
53	Lake Como #	CID	MT	5	?	5										
54	Trapper Peak #	CID	MT	2	0	2			1							
55	Sula #	CID	MT	7	3	10										
56	East Fork Bitterroot	CID	MT	3	1	4										
57	Divide Creek	CID	MT	4	3	7										
58	Skalkaho	CID	MT	4	5	9						1	1			
59	Welcome Creek	CID	MT	4	0	4										
60	Big Hole #	CID	MT	5	5	10		2								
61	Ram Mtn	CID	MT	5	?	5										
62	Sapphire	CID	MT	4	?	4		1			2	5	2			
63	Willow Creek	CID	MT	5	5	10										
	~~Bearmouth~~[7]	CID	MT	0	0	0						9	3			
64	Flint Creek	CID	MT	4	?	4										
65	East Fork Rock Creek	CID	MT	3	?	3										
66	Mt Haggin	CID	MT	2	0	2							1			
67	Battlefield #	CID	MT	3	?	3						5	3			
68	Mussigbrod	CID	MT	3	0	3						3	4			
69	Trail Creek	CID	MT	3	3	6										
70	Pintler	CID	MT	3	3	6							1			
71	Miner Lakes #	CID	MT	1	3	4						1	1			
	~~Fleecer Mtn~~[7]	CID	MT	0	0	0						3	2			
72	Black Canyon #	CID	MT	4	4	8										

Table 1c: Montana Portion of the Central Idaho Experimental Area (Montana statewide totals): wolf packs and population data 2007

Montana portion of Central Idaho Experimental Area

REF.		RECOV		PACK SIZE DEC 2007			MORTALITIES			KNOWN		CONTROL	CONFIRMED LOSSES6			
#	WOLF PACK1	AREA	STATE	ADULT	PUP	TOT	NAT	HUMAN2	UNKN3	DISPERSED	MISSING4	KILLED 5	CATTLE	SHEEP	DOGS	OTHER
73	Grasshopper	CID	MT	3	?	3						1				
	Misc/Lone	CID	MT	1	0	1							4	5		
	MT Total in CID	CID	MT	83	39	122	0	3	1	0	2	31	25	5	0	0
	MT in NWMT total (Table 1a)	NWMT	MT	117	96	213	1	8	4	1	6	19	26	5	3	1
	MT in GYA total (Table 1b)	GYA	MT	40	28	87	2	10	0	0	3	23	24	17	0	13
	MT in CID total (Table 1c)	CID	MT	83	39	122	0	3	1	0	2	31	25	5	0	0
	MT STATE TOTAL			**240**	**163**	**422**	**3**	**21**	**5**	**1**	**11**	**73**	**75**	**27**	**3**	**14**

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 2007.

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, 2007 and is not displayed on the map; see pack narrative.

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

Table 2a: Wyoming Wolf Packs (Outside of Yellowstone National Park) and Population Data for Wyoming's Portion of the Greater Yellowstone Recovery Area, 2007.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL 5	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
	Wyoming Outside Yellowstone National Park															
74	Beartooth	GYA	WY	4	4	8					1	3	4	0		
75	Sunlight	GYA	WY	7	4	11	1		1		2	3	1	0		
76	Absaroka	GYA	WY	2	0	2			2	1		4	8	0		
77	Pahaska	GYA	WY	>2	?	>2						0	0	0		
78	South Fork	GYA	WY	6	4	10			1			1	1	0		
79	Greybull River	GYA	WY	4	4	8						8	2	0		
80	Gooseberry	GYA	WY	1	5	6						2	7	0		
81	East Fork	GYA	WY	4	4	8			1		1	5	6	0		
82	Washakie	GYA	WY	5	6	11					2	2	6	0		
83	Togwotee	GYA	WY	6	4	10			1			0	0	0		
84	Gros Ventre	GYA	WY	5	8	13					1	0	0	0		
85	Pacific Creek	GYA	WY	9	4	13			1			0	0	0		
86	Snake River	GYA	WY	5	6	11						0	0	0		
87	Huckleberry	GYA	WY	3	2	5					2	0	0	0		
88	Buffalo	GYA	WY	7	6	13	1	1		1	3	0	0	0	1	
89	Teton	GYA	WY	3	5	8						0	0	0		
90	Pinnacle Peak	GYA	WY	6	?	6						0	0	0		
91	Daniel	GYA	WY	4	0	4						3	1	0	1	
92	Green River	GYA	WY	4	2	6						6	12	0		
93	Black Butte	GYA	WY	2	?	2						0	1	0		
94	Soda Lake	GYA	WY	5	?	5						0	0	0		
95	Big Piney	GYA	WY	>2	?	>2						0	0	0		
96	La Barge	GYA	WY	>2	?	>2		1				0	0	12		
97	Prospect	GYA	WY	>3	?	>3						0	0	0		
98	Kemmerer	GYA	WY	>3	?	>3						0	0	0		
	Sub-total:			104	68	172	2	2	7	2	12	37	49	12	2	
	Misc. wolves															
	~~Carter Mtn~~ [7]	GYA	WY	1	0	1						19	2			
	~~Owl Creek~~ [7]	GYA	WY	0	0	0						7	1			
	Misc./Lone wolves	GYA	WY	>7	?	15		1					3	4		
	WY Total (outside YNP)			120	68	188	2	3	7	2	12	63	55	16	2	0

Table 2b: Yellowstone National Park (YNP) Wolf Packs and Population Data for YNP's Portion of the Greater Yellowstone Experimental Area, 2007.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL 5	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
	Yellowstone National Park Northern Range															
99	Leopold	GYA	MT/WY	13	3	16				1						
100	Oxbow	GYA	MT/WY	8	8	16				1						
101	Agate	GYA	MT/WY	8	9	17	1			1	1					
102	Slough	GYA	MT/WY	7	9	16	3	1			1					
103	Druid	GYA	MT/WY	9	7	16										
	Misc/Lone	GYA	MT/WY	12	1	13	1									
	Yellowstone National Park Non-Northern Range															
104	Mollie's	GYA	WY	9	5	14		1			1					
105	Yellowstone Delta	GYA	WY	16	6	22					2					
106	Bechler	GYA	WY/ID	8	3	11				2	3					
107	Cougar Creek	GYA	MT/WY	3	4	7			1							
108	Gibbon Meadows	GYA	WY	11	6	17					1					
109	Hayden Valley	GYA	WY	1	3	4	3									
	Misc./Lone	GYA	WY	2		2		2								
	YNP Total in WY	GYA	WY	107	64	171	8	4	1	5	9	0	0	0	0	0
	WY Total (outside YNP)			120	68	188	2	3	7	2	12	63	55	16	2	0
	WY STATE TOTAL			227	132	359	10	7	8	7	21	63	55	16	2	0

Table 2c: Wolf Population Data for the Greater Yellowstone Recovery Area, 2007.

WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL 5	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
WY in GYA (Table 2b)	GYA	WY	227	132	359	10	7	8	7	21	63	55	16	2	0
MT in GYA (Table 1b)	GYA	MT	40	28	87	2	10	0	0	3	23	24	17	0	13
ID in GYA (Table 3c)	GYA	ID	?	?	7	0	0	0	0	0	1	0	2	1	0
GYA TOTAL	GYA	WY/MT/ID	267	160	453	12	17	8	7	24	87	79	35	3	13

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 2007.
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, 2007 and is not displayed on the map; see pack narrative.

Table 3a: Idaho Wolf Packs and Population Data for Idaho's Portion of the Central Idaho Recovery Area, 2007.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007 % ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL 5	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
110	Aparejo	CID	ID	?	?	13										
111	Applejack	CID	ID	?	?	5								4		
112	Archie Mountain	CID	ID	2	5	7										
113	Avery	CID	ID	4	1	5		1	1							
114	Basin Butte	CID	ID	8	5	13		1								
115	Battle Ridge	CID	ID	2	2	4										
116	Bear Pete	CID	ID	2	6	8										
117	Bear Valley	CID	ID	10	4	14										
118	Big Buck	CID	ID	2	2	4										
119	Bimerick Meadow	CID	ID	3	4	7					1					
120	Bitterroot Range #	CID	ID	3	2	5										
121	Blue Bunch	CID	ID	4	3	7								3	3	
122	Buffalo Ridge	CID	ID	?	?	6				1		2	3			
123	Calderwood	CID	ID	3	1	4										
124	Carey Dome	CID	ID	1	4	5		1				2		7		
	~~Castle Peak/East Pass~~	CID	ID	0	0	0										
125	Chamberlain Basin	CID	ID	5	6	11										
126	Chesimia	CID	ID	?	?	?										
127	Cold Springs	CID	ID	2	0	2										
128	Coolwater Ridge	CID	ID	4	2	6										
129	Copper Basin	CID	ID	3	0	3			1			6	5			
130	Deception	CID	ID	1	4	5			1							
131	Doublespring	CID	ID	7	1	8										
132	Eagle Mountain	CID	ID	5	3	8										
133	Earthquake Basin	CID	ID	2	8	10		1								
134	Eldorado Creek	CID	ID	2	4	6										
135	Fish Creek #	CID	ID	5	4	9										
136	Fishhook	CID	ID	6	2	8										
137	Five Lakes Butte	CID	ID	?	?	?			1	1						

Table 3a: Idaho Wolf Packs and Population Data for Idaho's Portion of the Central Idaho Recovery Area, 2007.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007 % ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL 5	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
138	Florence	CID	ID	3	7	10		2								
139	Galena	CID	ID	?	?	12					2	1		2		
140	Giant Cedar	CID	ID	?	?	6	1									
141	Golden Creek	CID	ID	3	4	7										
142	Gospel Hump	CID	ID	?	?	?										
143	Hard Butte	CID	ID	2	3	5						1	1	8	1	
	~~Hazard Lake~~	CID	ID	0	0	0										
144	Hemlock Ridge	CID	ID	5	2	7										
145	High Prairie	CID	ID	2	1	3						2	1	8		
146	Hoodoo	CID	ID	?	?	13										
147	Hughes Creek #	CID	ID	9	2	11		1								
148	Hyndman	CID	ID	?	?	?										
149	Indian Creek	CID	ID	2	0	2	1									
150	Jungle Creek	CID	ID	4	0	4						4		41		
151	Jureano Mountain	CID	ID	?	?	?		1			1	3	5			
152	Kelly Creek	CID	ID	4	1	5			1							
153	Landmark	CID	ID	?	?	?										
154	Lemhi	CID	ID	?	?	2		1				2		9		
155	Lick Creek	CID	ID	2	6	8								1		
156	Lochsa	CID	ID	2	4	6					1					
	~~Magruder~~	CID	ID	0	0	0										
157	Marble Mountain	CID	ID	4	1	5										
158	Monumental Creek	CID	ID	7	8	15										
159	Moores Flat	CID	ID	1	1	2						9	4	27	1	
160	Morgan Creek	CID	ID	3	2	5						3	2			
161	Moyer Basin	CID	ID	5	5	10					1		1			
162	No Man	CID	ID	2	1	3										
163	O'Hara Point	CID	ID	?	?	3										
164	Orphan	CID	ID	?	?	?										
165	Owl Creek	CID	ID	?	?	?										

Table 3a: Idaho Wolf Packs and Population Data for Idaho's Portion of the Central Idaho Recovery Area, 2007.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007 % ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL 5	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
166	Packer John	CID	ID	?	?	3		1				1		21		
	~~Partridge Creek~~	CID	ID	0	0	0										
167	Pass Creek	CID	ID	5	3	8		1								
168	Pettitbone	CID	ID	2	2	4										
169	Phantom Hill	CID	ID	2	3	5								14	2	
170	Pilot Rock	CID	ID	2	4	6						1	1			
171	Pot Mountain	CID	ID	?	?	?										
172	Red River	CID	ID	2	3	5										
173	Scott Mountain	CID	ID	2	2	4										
174	Selway	CID	ID	8	7	15										
175	Sleepy Hollow	CID	ID	2	0	2										
176	Soldier Mountain	CID	ID	2	0	2					1					
177	Spirit Ridge	CID	ID	3	4	7										
178	Steel Mountain	CID	ID	7	2	9				1		2		9		
179	Stolle Meadows	CID	ID	4	0	4										
180	Tangle Creek	CID	ID	2	0	2		1								
181	Thorn Creek	CID	ID	8	4	12										
182	Thunder Mountain	CID	ID	?	?	?										
183	Timberline	CID	ID	9	2	11					2			9		
184	Warm Springs	CID	ID	4	1	5				1						
185	White Bird Creek	CID	ID	4	0	4			1			1				
186	Wolf Fang	CID	ID	5	0	5										
187	Yankee Fork	CID	ID	?	?	11										
	Lone/Paired	CID	ID	12	0	12		2			2	5	20			
	Idaho minimum count	CID	ID	231	158	463										
	Unknown wolves [8]	CID	ID	?	?	245		3	2			4	10	5		
	ID Total in CID			231	158	708	2	17	8	4	11	49	53	168	7	0

Table 3b: Idaho Wolf Packs and Population Data for Idaho's Portion of the Northwest Montana Recovery Area, 2007.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL 5	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
188	Boundary	NWMT	ID	5	0	5				1						
189	Calder Mountain #	NWMT	ID	3	1	4										
190	Solomon Mountain #	NWMT	ID	?	?	8										
	ID Total in NWMT			8	1	17	0	0	0	1	0	0	0	0	0	0

Table 3c: Idaho Wolf Packs and Population Data for Idaho's Portion of Greater Yellowstoen Experimental Area and Idaho Statewide totals, 2007.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL 5	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
191	Biscuit Basin	GYA	ID	3	2	5										
192	Falls Creek	GYA	ID	2	0	2						1		2	1	
	ID Total in GYA	GYA	ID	5	2	7	0	0	0	0	0	1	0	2	1	0
	ID Total in NWMT	NWMT	ID	8	1	17	0	0	0	1	0	0	0	0	0	0
	ID Total in CID	CID	ID	231	158	708	2	17	8	4	11	49	53	168	7	0
	ID STATE TOTAL	GYA/NWMT/CID	IC	244	161	732	2	17	8	5	11	50	53	170	8	0

Table 3d: Wolf Population Data for the Central Idaho Experimental Area, 2007.

WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2007 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN 2	UNKN 3	KNOWN DISPERSED	MISSING 4	CONTROL 5	CONFIRMED LOSSES 6 CATTLE	SHEEP	DOGS	OTHER
MT in CID (Table 1c)	CID	MT	83	39	122	0	3	1	0	2	31	25	5	0	0
ID in CID (Table 3a)	CID	ID	231	158	708	2	17	8	4	11	49	53	168	7	0
CID TOTAL	CID	ID/MT	83	39	830	2	20	9	4	13	80	78	173	7	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 became missing in 2007.

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, 2007 and is not displayed on the map; see pack narrative.

8 See narrative for more information.

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

% Pack composition figures are extrapoplations of data collected during summer, where number of adults is calcuated by subtracting verified pup production from year-end pack size estimates; these estimates do not account for undocumented pup mortalities, and therefore may underestimate the number of adults in a pack.

Table 4a: Northern Rocky Mountain minimum fall wolf population and breeding pairs* 1979-2007, 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	06	07
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	126	171	230
GYA																	21	40	86	112	118	177	218	271	301	335	325	390	453
CID																	14	42	71	114	156	196	261	284	368	452	565	739	830
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	1016	1300	1513

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	06	07
Recovery Area																													
NWMT								1	2	1	1	3	2	4	4	5	6	7	5	5	6	6	7	12	4	6	11	12	23
GYA																	2	4	9	6	8	14	13	23	21	31	20	31	33
CID																		3	6	10	10	10	14	14	26	29	40	43	51
TOTAL								1	2	1	1	3	2	4	4	5	8	14	20	21	24	30	34	49	51	66	71	86	107

* 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.

2007 BP by REC AREA Tab;e 4a & Figure 5.xls

Table 4b: Northern Rocky Mountain minimum fall wolf population and breeding pairs* 1979-2007, 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	06	07
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	316	422
WY																	21	40	86	112	107	153	189	217	234	272	252	311	359
ID																	14	42	71	114	156	187	251	263	345	422	512	673	732
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	1300	1513

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	06	07
State																													
MT								1	2	1	1	3	2	4	4	5	6	7	5	5	7	8	7	17	10	15	19	21	39
WY																	2	4	9	6	7	12	13	18	16	25	16	25	25
ID																		3	6	10	10	10	14	14	25	26	36	40	43
TOTAL								1	2	1	1	3	2	4	4	5	8	14	20	21	24	30	34	49	51	66	71	86	107

* 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.

Table 5a: Northern Rocky Mountain States confirmed wolf depredation[1], 1987-2007, by recovery area.

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	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	6	26	153
sheep	10	0	0	0	2	0	0	0	0	0	30	0	19	2	5	13	3	1	1	1	5	92
other 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	1	0	2	1	13
dogs	0	0	0	1	0	0	0	0	3	1	0	0	2	3	1	4	0	0	0	1	3	19
wolves moved	0	0	4	0	3	0	0	2	2	10	7	0	4	0	5	0	0	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	15	19	104
Greater Yellowstone Recovery Area:																						
cattle									0	0	5	3	4	7	22	33	45	100	61	135	79	494
sheep									0	13	67	7	13	39	117	71	90	99	53	41	35	645
other 3									0	0	0	0	1	0	0	0	10	4	0	1	13	29
dogs									1	0	0	4	7	8	4	1	0	6	2	0	3	36
wolves moved									6	8	14	0	0	6	8	0	0	0	0	0	0	42
wolves killed									0	1	6	3	9	6	9	23	38	55	61	56	87	354
Central Idaho Recovery Area:																						
cattle									0	2	1	9	16	15	10	10	13	24	27	43	78	248
sheep									0	24	29	5	57	39	16	15	118	170	190	205	173	1041
other 3									0	0	0	0	0	0	0	0	0	0	2	0	0	2
dogs									0	1	4	1	6	0	1	4	6	3	9	7	7	49
wolves moved									0	5	0	3	15	10	5	0	0	0	0	0	0	38
wolves killed									0	1	1	0	5	10	7	14	7	30	41	71	80	267
Total, 3 Recovery Areas:																						
cattle	6	0	3	5	2	1	0	6	3	11	22	21	33	32	40	52	64	130	97	184	183	895
sheep	10	0	0	0	2	0	0	0	0	37	126	12	89	80	138	99	211	270	244	247	213	1778
other 3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	5	10	5	2	3	14	44
dogs	0	0	0	1	0	0	0	0	4	2	4	5	15	11	6	9	6	9	11	8	13	104
wolves moved	0	0	4	0	3	0	0	2	8	23	21	3	19	16	18	0	0	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	142	186	724

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 2007 are 13 llamas, 24 goats and 7 horses.

From 1987 to December 2007, Defenders of Wildlife has paid $984,474 for wolf damage to livestock and guard dogs. Information is available at http://defenders.org/wolfcomp/html.

Table 5b: Northern Rocky Mountain confirmed wolf depredation[1], 1987-2007, by state.

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	TOTAL
Montana																						
cattle	6	0	3	5	2	1	0	6	3	10	19	10	20	14	12	20	24	36	23	32	75	321
sheep	10	0	0	0	2	0	0	0	0	13	41	0	25	7	50	84	86	91	33	4	27	473
other 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	3	2	2	14	30
dogs	0	0	0	1	0	0	0	0	4	1	0	1	2	5	2	5	1	4	1	4	3	34
wolves moved	0	0	4	0	3	0	0	2	8	22	20	0	14	6	17	0	0	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	53	73	328
Wyoming																						
cattle									0	0	2	2	2	3	18	23	34	75	54	123	55	391
sheep									0	0	56	7	0	25	34	0	7	18	27	38	16	228
other 3									0	0	0	0	1	0	0	0	10	2	0	1	0	14
dogs									0	0	0	3	6	6	2	0	0	2	1	0	2	22
wolves moved									0	0	1	0	0	0	0	0	0	0	0	0	0	1
wolves killed									0	0	2	3	1	2	4	6	18	29	41	44	63	213
Idaho																						
cattle									0	1	1	9	11	15	10	9	6	19	20	29	53	183
sheep									0	24	29	5	64	48	54	15	118	161	184	205	170	1077
other 3									0	0	0	0	0	0	0	0	0	0	0	0	0	0
dogs									0	1	4	1	7	0	2	4	5	3	9	4	8	48
wolves moved									0	1	0	3	5	10	1	0	0	0	0	0	0	20
wolves killed									0	1	1	0	3	11	7	14	7	17	27	45	50	183
Total, 3 States																						
cattle	6	0	3	5	2	1	0	6	3	11	22	21	33	32	40	52	64	130	97	184	183	895
sheep	10	0	0	0	2	0	0	0	0	37	126	12	89	80	138	99	211	270	244	247	213	1778
other 3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	5	10	5	2	3	14	44
dogs	0	0	0	1	0	0	0	0	4	2	4	5	15	11	6	9	6	9	11	8	10	101
wolves moved	0	0	4	0	3	0	0	2	8	23	21	3	19	16	18	0	0	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	142	186	724

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 2007 are 13 llamas, 24 goats and 7 horses.

From 1987 to December 2007, Defenders of Wildlife has paid $984,474 for wolf damage to livestock and guard dogs. Information on the compensation program is available at http://www.defenders.org/wolfcomp.html.

2007 DEP by STATE Table 5b.xls

APPENDIX 4

NORTHERN ROCKIES PACK DISTRIBUTION MAPS 2007

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

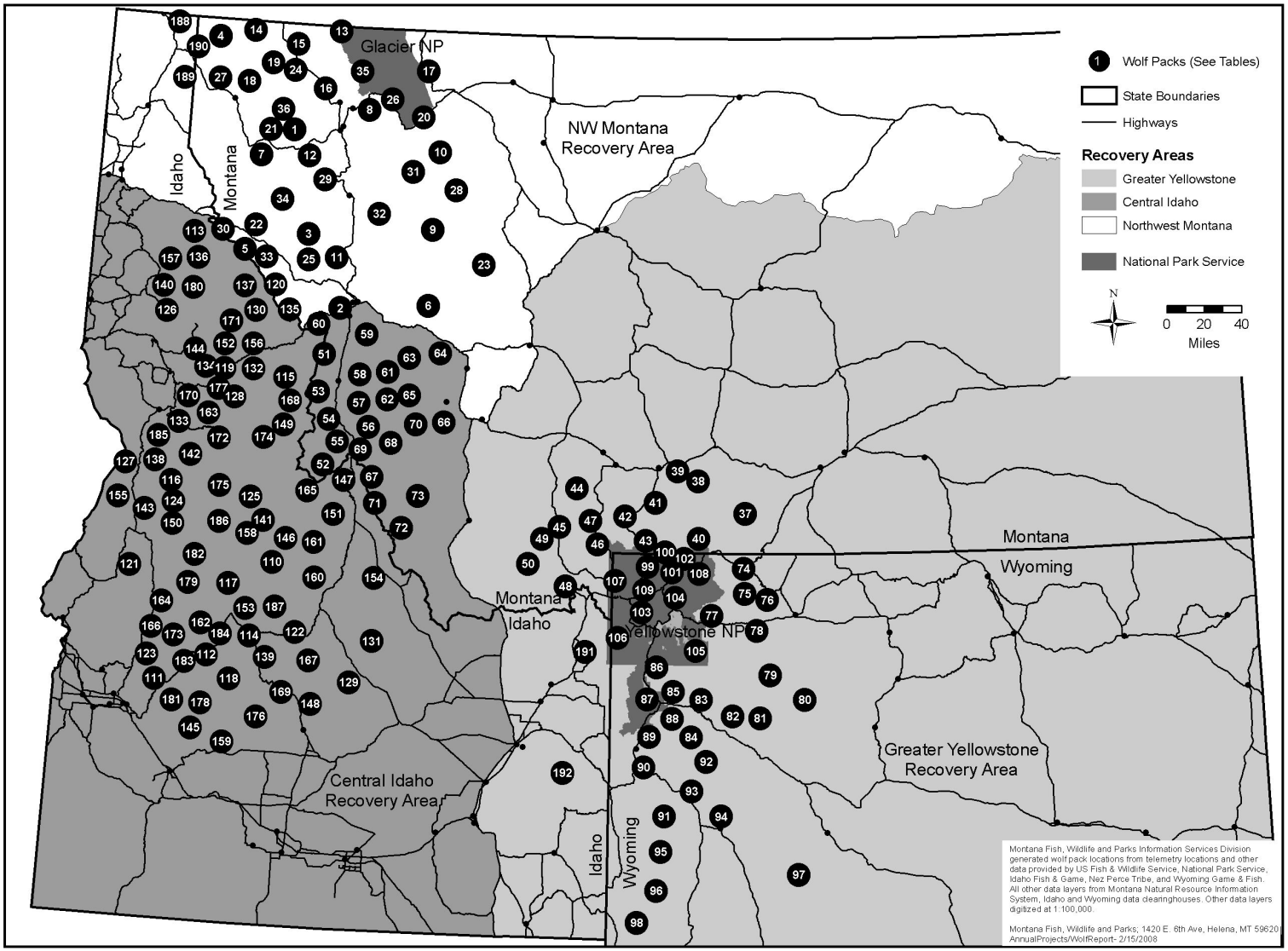


Figure 2. Northwest Montana Wolf Recovery Area

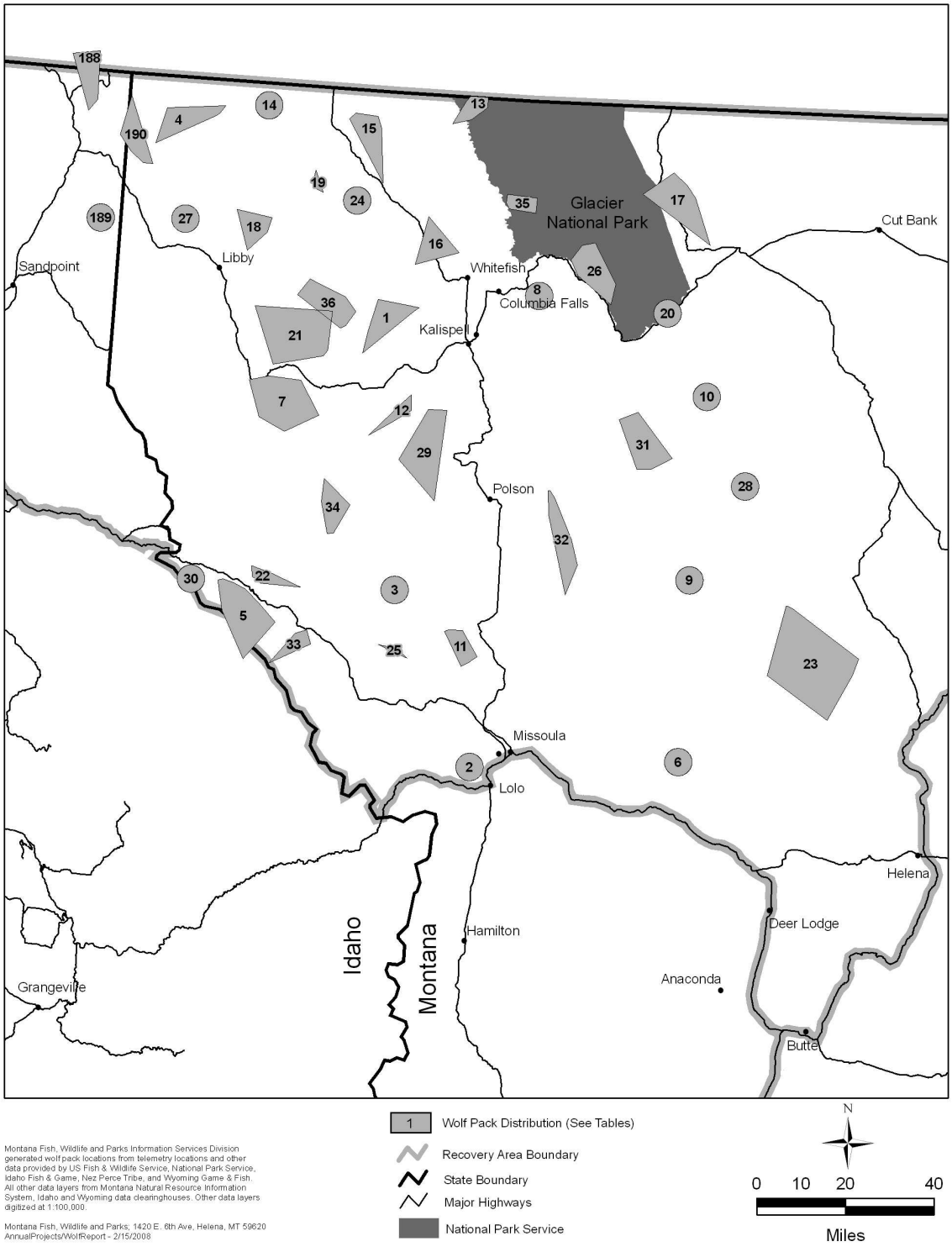


Figure 3. Greater Yellowstone Wolf Recovery Area

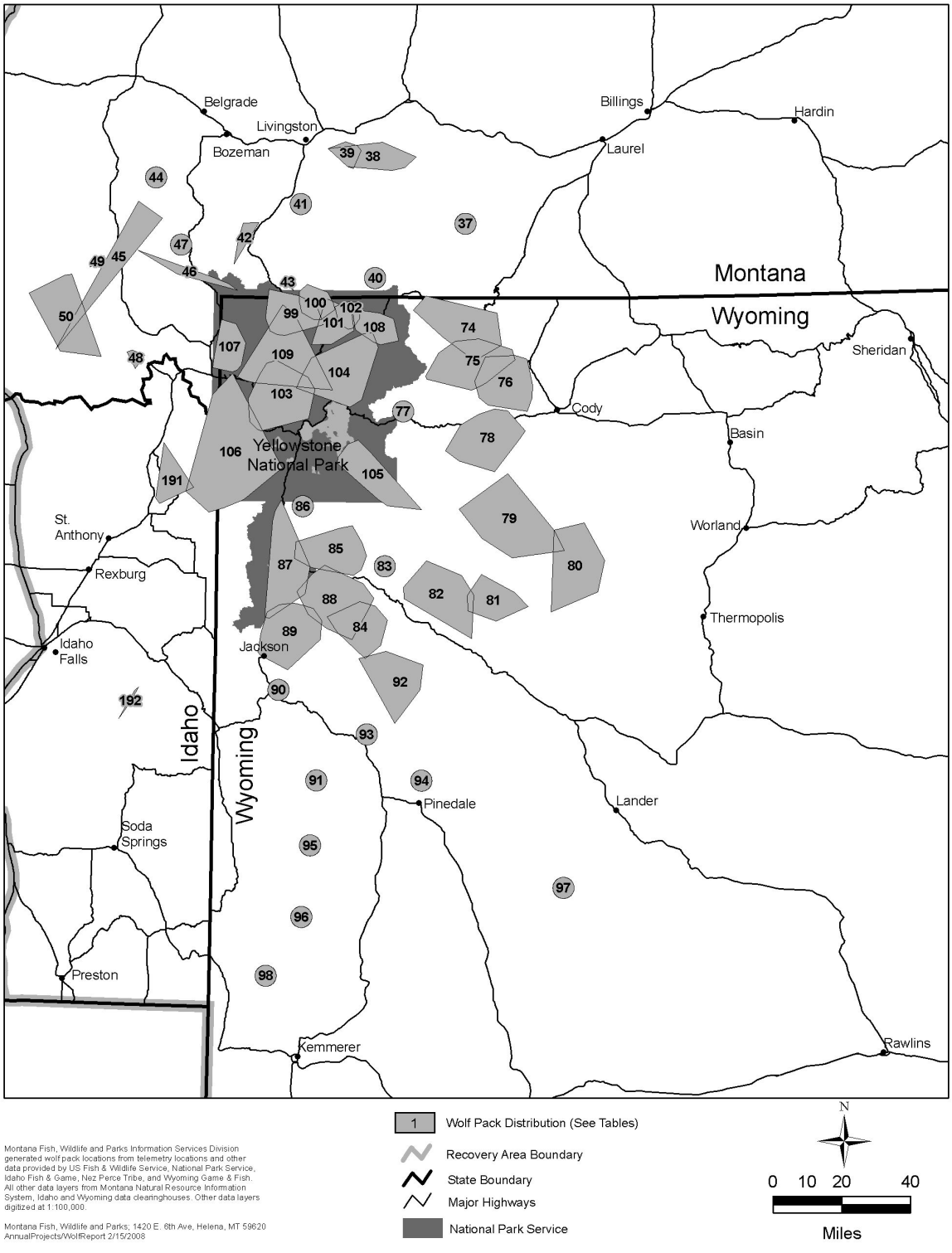
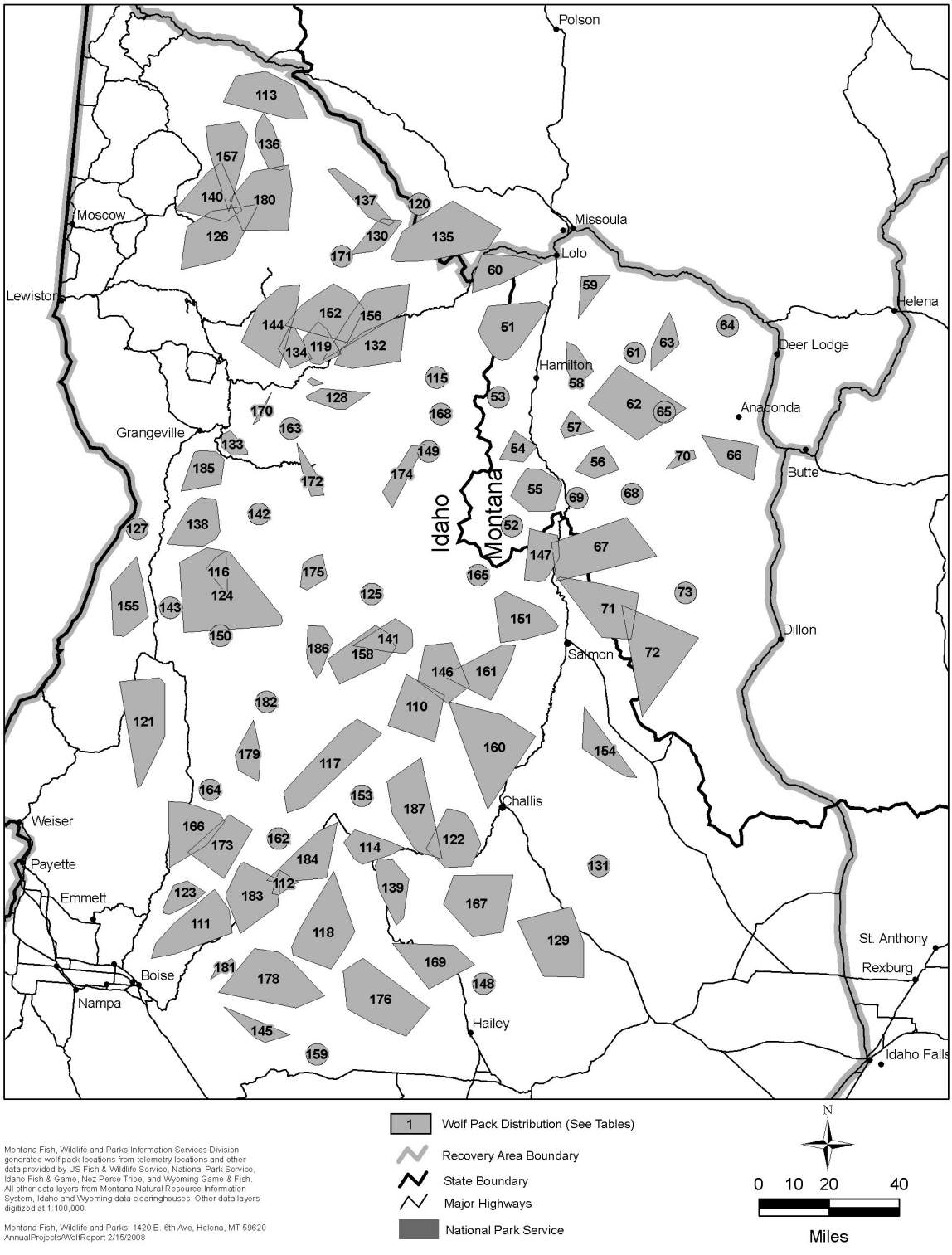


Figure 4. Central Idaho Wolf Recovery Area



APPENDIX 5

NORTHERN ROCKIES WOLF POPULATION GRAPHS

Figure 5. Northern Rocky Mountain wolf population trends 1979-2007, by recovery area.

Figure 6.Northern Rocky Mountain wolf population trends 1979-2007, by state.

Figure 5. Northern Rocky Mountain Wolf Population Trends by Recovery Area, 1979-2007

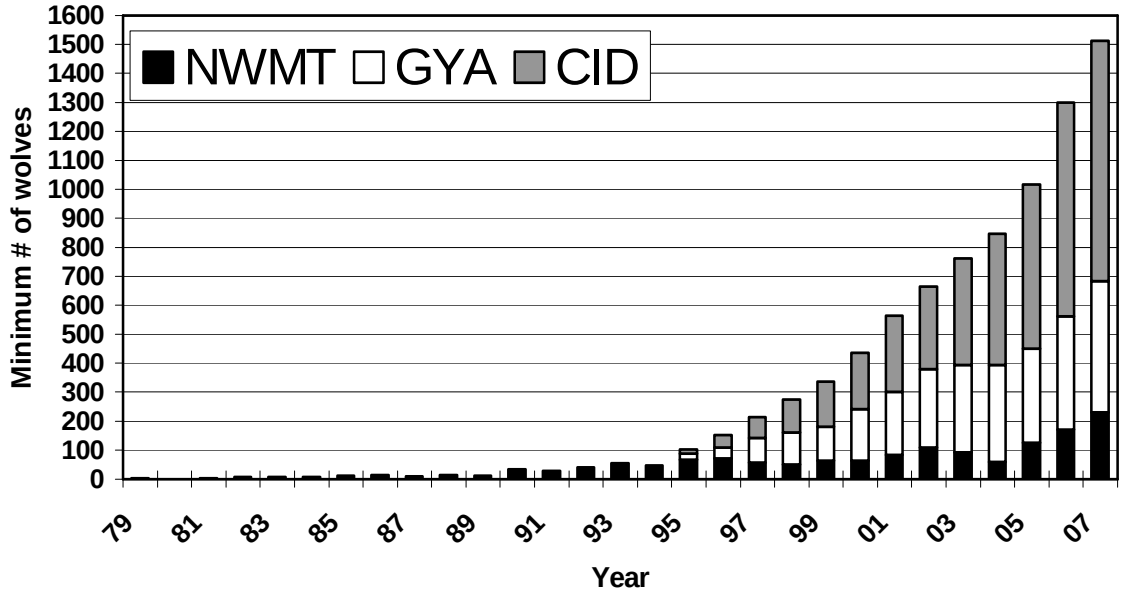


Figure 6. Northern Rocky Mountain Wolf Population Trends by State, 1979-2007