Montana Gray Wolf
Conservation and Management
2010 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 by photo Liz Bradley

This report presents information on the status, distribution, and management of wolves in the State of Montana, from January 1, 2010 to December 31, 2010.

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 statewide under an interagency cooperative agreement. The agreement allowed 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 wolf program coordinator was based in Helena until late 2010.

The Montana wolf population increased about 8% from 2009 to 2010. The population in each of three overall management units (corresponding to the 3 federal recovery areas and the MFWP 2009 wolf management units) increased slightly from 2009 levels. The most suitable habitats that are least prone to conflicts with livestock are already occupied. As wolves attempt to colonize less suitable habitats, conflicts with livestock occur and wolves are killed. This dynamic produces more of a turnover effect at local scales than a net increase in the number of wolves on the landscape. Western and southwest Montana wolf populations may be showing evidence of this by fluctuating between about 110-130 wolves for the last several years.

In contrast, the wolf population in northwestern Montana is still apparently increasing. One factor is that livestock availably varies widely among packs in NWMT. Thus, the majority of packs have no or low levels of livestock present within pack territories. Lethal control may occur in specific areas where livestock do occur (e.g. East Front, Flathead Reservation), but is generally at lower levels relative to western or southwestern Montana.

A total of 108 verified packs of 2 or more wolves yielded a minimum count of 566 wolves in Montana. Thirty-five packs qualified as a breeding pair according to the federal recovery definition (an adult male and female with two surviving pups on December 31). In NWMT, there were at least 326 wolves in 68 packs, 21 of which were breeding pairs. In western Montana, there were at least 122 wolves in 21 packs, 8 of which were breeding pairs. In southwest Montana, there were at least 118 wolves in 19 packs, 6 of which were breeding pairs.

USDA Montana Wildlife Services (WS) confirmed that 87 cattle, 64 sheep, 2 dogs, 3 llamas, and 2 domestic goats, 1 horse, and 4 miniature horses were killed by wolves in calendar year 2010. Additional losses (both injured and dead livestock) most certainly occurred, but could not be confirmed. Most depredations occurred on private property. The Montana Livestock Loss

Reduction and Mitigation Board paid $96,077 for 163 head of livestock that were verified by WS as either a confirmed or probable death loss due to wolves in 2010. One hundred forty one wolves were killed to reduce the potential for further depredations. Of the 141, 128 were killed by WS, 13 were killed by private citizens under either state or federal regulations that allowed citizens to kill wolves seen chasing, killing, or threatening to kill livestock.

Wolves in Montana prey primarily on elk, deer, and moose. Numerous research projects that investigated wolf-ungulate relationships are winding down. Many reports and publications are available. Earlier in 2009, MFWP completed the final report summarizing efforts to monitor and assess wolf-ungulate interactions and population trends within the Greater Yellowstone Area, southwestern Montana, and Montana statewide. It is on the MFWP website and available in hard copy. In October, MFWP submitted a 10j proposal to remove wolves in the West Fork of the Bitterroot due to concerns about predation on elk populations.

In February 2008, the USFWS delisted the gray wolf in the northern Rocky Mountain Distinct Population Segment (all of Montana, Idaho, Wyoming, eastern Oregon, eastern Washington, and a small part of Utah). That decision was challenged in court in April. In July, a preliminary injunction was granted and wolves were back under the federal regulations and considered endangered or experimental in Montana. For about four months in 2008, wolves were officially delisted and wolves were managed wholly under Montana's regulatory framework. The USFWS withdrew its 2008 delisting decision by fall 2008 so that it could be re-evaluated in light of the court order granting the preliminary injunction. USFWS re-evaluated its delisting decision and took public comment on the issues raised during the 2008 delisting litigation and the court's injunction ruling.

In April 2009, USFWS published a new delisting decision that took effect May 4, 2009. The wolf was delisted in all of Montana and Idaho, eastern Oregon, eastern Washington, and a small part of Utah. In Wyoming, the wolf remained listed as experimental / non-essential under the federal Endangered Species Act. Upon delisting, the wolf was automatically reclassified as a state species in need of management statewide under Montana law. Montana's laws, administrative rules, and the state management plan took full effect. The first fair chase wolf hunting season occurred in fall 2009.

MFWP managed the wolf as a resident wildlife species in need of management from May 4 2009 until August 5, 2010 when a federal court order put wolves in Montana and throughout the northern Rocky Mountain Distinct Population segment back under the protection of the Endangered Species Act. For Montana, wolves across the northern half were reclassified as federally-endangered and wolves across the southern half were reclassified as experimental, non-essential.

This annual report presents information on the status, distribution, and management of wolves in the State of Montana from January 1 to December 31, 2010. The report and other information about wolves and their management in Montana program are available at http://fwp.mt.gov/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 and temporal 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.

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 was 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 wolf was relisted on August 5, 2010 and federal laws and regulations replaced state laws. For the remainder of 2010, MFWP and USFWS reactivated the terms of the 2005-2010 cooperative agreement while the renewal process was initiated.

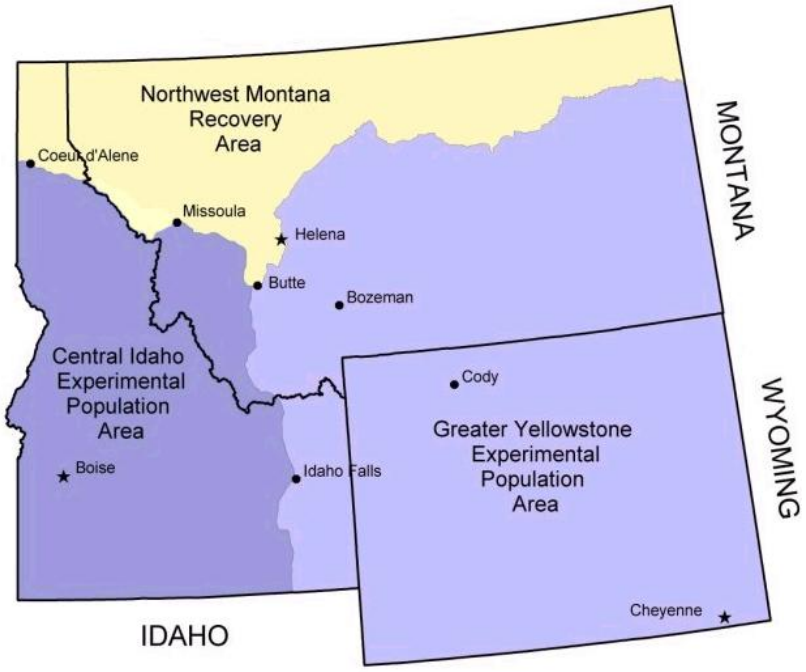


Figure 1. Northern Rockies gray wolf federal recovery area comprised of the states of Montana, Idaho, and Wyoming

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.

In July 2007, USFWS proposed changes to the federal regulation pertaining to the 10j experimental area across southern Montana. USFWS proposed that the 2005 10(j) nonessential experimental population regulation be modified (72 FR 36942) to modify the standard by which states and tribes with USFWS-approved plans to develop science-based proposals to lethally remove wolves shown to be negatively affecting ungulate herds. The modification from 'primary cause' to 'one of the major causes' allowed a high but reasonable standard. In addition it would allow anyone on private land or public land to shoot a wolf that was attacking their dog or stock animals. The proposed rule change received over 262,000 public comments. The rule was published on January 28, 2008 (73 FR 4720) and became effective 30 days later on February 27, 2008.

Delisting Efforts and Other Litigation in 2007 - 2010

Delisting

On February 8, 2007, USFWS proposed to identify the Distinct Population Segment (DPS) of the gray wolf in the NRM and to delist it. Two options were presented, depending on whether the regulatory framework in Wyoming (WY) could be approved. The USFWS proposed to delist wolves in Montana, Idaho, and Wyoming, and parts of Washington, Oregon, and Utah. The

proposal noted that the ESA's protections would be retained in significant portions of the range in Wyoming if adequate regulatory mechanisms were not developed to conserve Wyoming's portion of a recovered wolf population into the foreseeable future. Under this alternative scenario, wolves in portions of Wyoming would stay listed under ESA as a non-essential, experimental populations and managed according to the 1994 federal regulations.

On July 6, 2007, the USFWS extended the comment period on the February 8, 2007 proposal in order to consider a 2007 revised Wyoming wolf management plan and state law. The delisting proposal was open for public comment for a total of 90 days and 8 public hearings were held. The proposed delisting rule received over 283,000 public comments. In December of 2007, the USFWS Director determined Wyoming's regulatory mechanisms met the requirements of the ESA, contingent on some final steps to be taken by Wyoming. On February 27, 2008, USFWS issued a final rule recognizing the NRM DPS and removing all of this DPS from the List of Endangered and Threatened Wildlife (73 FR 10514) and stated that Wyoming's 2007 regulatory mechanisms were adequate.

On March 28, 2008, wolves in Montana and throughout the NRM were officially delisted. The Montana state plan and state laws took full effect. On April 28, 2008, 12 parties filed a lawsuit challenging the identification and delisting of the NRM DPS. The plaintiffs also requested a preliminarily injunction to block the delisting decision from taking effect. The State of Montana sought and was granted intervener status to participate fully during the litigation. Many other interveners were permitted to participate in the litigation in support of the USFWS delisting decision, including the states of Idaho and Wyoming. In May, during a court hearing on the injunction request, MFWP argued that Montana's regulatory framework was adequate and that the court had the flexibility to enjoin some states, but not others – essentially suggesting that the federal judge could split Montana out from Idaho and Wyoming at the injunction state and put Montana under the court's supervision.

The NRM DPS wolf population was officially delisted from March 28 to July 18, 2008. During that time, the Montana regulatory framework was in effect. Wolves were protected under Montana state law and by MFWP Commission rule as a species in need of management statewide. Montana's defense of property law allowed private citizens to haze, harass or kill wolves that were seen killing or threatening to livestock. One wolf was killed in that circumstance during the four month period in MFWP Administrative Region 2 where wolf-livestock conflicts have occurred in the past. The incident was reported and investigated by MFWP law enforcement. It was determined to be lawful and fulfilled the requirements of Montana law. MFWP's use of lethal control was guided by Interim Depredation Guidelines previously adopted by the MFWP Commission. The Interim Guidelines were applied statewide as the formal administrative rulemaking process was not yet completed. The Guidelines and the rules formally adopted by the MFWP Commission in September mirror the federal 2008 10j regulations. Thus, MFWP was not more aggressive in its application of lethal control, nor was there an accelerated rate of killings by non-agency personnel. Other aspects of the program (e.g. monitoring, outreach, research) also transitioned smoothly as MFWP has been managing the wolf population since 2004.

On July 18, 2008, the U.S. District Court for the District of Montana granted the plaintiffs' motion for a preliminary injunction and enjoined the USFWS implementation of the final delisting rule for the NRM DPS of the gray wolf. The three main issues identified were the regulatory framework in Wyoming, connectivity, and defense of property laws. The Court's preliminary injunction order concluded that the Plaintiffs were likely to prevail on the merits of their claims. The judge stated that he was inclined to rule against the federal government on two of the three issues during the main part of the lawsuit.

The NRM DPS wolf population was officially delisted from March 28 to July 18, 2008. This corresponded to the time lag between when the delisting decision took effect and when a federal district judge granted a request for a preliminary injunction (see below). During this period of time, state and Tribal management plans and state laws were fully in effect. The Court's preliminary injunction reinstated ESA protections for the gray wolf and reinstituted federal regulations throughout the NRM DPS, effective July 18.

On September 22, 2008, USFWS asked the Court to vacate the final rule and remand it back to the agency. This would allow the agency to withdraw the rule for further consideration and review. On October 14, 2008, the Court vacated the final delisting rule and remanded it back to the USFWS.

On October 28, 2008, USFWS reopened the comment period on the February 2007, proposed delisting rule that presented two different scenarios for delisting the NRM DPS. Specifically, USFWS sought information, data, and comments from the public regarding the 2007 proposal, with an emphasis on new information relevant to this action, the issues raised by the Montana District Court, and the issues raised by the September 29, 2008, ruling of the U.S. District Court for the District of Columbia with respect to the Western Great Lakes gray wolf DPS. The notice also asked for public comment on the WY regulatory framework. About 240,000 comments were received during that public comment period.

Based on the Court's ruling and a more thorough review, the USFWS determined and notified Wyoming in early January 2009 that its state plan and regulatory framework were not adequate and no longer "approved." Wolf management in all of Wyoming [except the Wind River Tribal Lands because the Tribe had a Service-approved plan] transitioned immediately to the 1994 experimental rules, which are less flexible and more restrictive than the 2005 or 2008 regulations.

In December 2008, USFWS revised the NRM delisting rule originally proposed in February 2007. On January 14, 2009, USFWS announced its decision to delist wolves throughout the NRM except the State of Wyoming, due to the lack of an accepted plan. The publication of the decision (final rule) in the Federal Register (official record of federal government's decisions) was delayed by an Executive Order on January 20, 2009. This is a standard practice as new federal administrations take office. The outcome of review by the administration could be: 1) publish as they were drafted; 2) revise through additional work and public comment and then modify/publish, or 3) not publish and withdraw to develop a different approach.

In February 2009, the Court awarded Earthjustice (the law firm representing 12 groups which filed the lawsuit challenging delisting) about $263,000 in legal fees as reimbursement for their efforts at litigating the final delisting rule.

Upon further review by the new federal administration in early 2009, the USFWS delisting decision ultimately was published in the Federal Register and took effect in May, 2009. Wolves were delisted throughout the Northern Rocky Mountain Distinct Population Segment in the states of Montana, Idaho, eastern Oregon, eastern Washington, and a small part of Utah. The wolf remained a federally listed species in Wyoming due to the lack of an approved state plan and state laws. For the delisted states, the mandatory 5-year post delisting oversight period began in May.

Litigation over the 2009 delisting decision was again initiated in federal court in Missoula by the same coalition of organizations. Montana was again granted intervenor status. An injunction was requested, based on arguments presented by the plaintiffs that the hunting seasons planned for Idaho and Montana would harm the regional wolf population. The injunction request was denied and each state implemented a hunting season. Written legal briefings were filed with the court by the all parties, and the last briefs were filed in January 2010. A hearing for oral arguments took place in June.

On August 5, 2010, the District Court ruled that delisting within the NRM DPS could not occur without Wyoming and vacated the delisting of the entire DPS. Wolves throughout the entire NRM DPS were relisted (except Wyoming, which was not delisted in the 2009 delisting effort) under ESA. Montana laws and regulations were superseded by federal laws and regulations. In Montana, as of the August 5 ruling, wolves across the northern half were reclassified as endangered and experimental / non-essential across the southern half.

The Nonessential Experimental Population Rules

Gray wolves were reintroduced in parts of the NRM as nonessential experimental populations under the ESA in January 1995 and 1996. In 1994, just prior to wolves being reintroduced to central ID and YNP, special nonessential experimental population regulations under 17.84 (i) ESA Sec. 10(j) were promulgated (59 FR 60252). Those regulations allowed extra flexibility to Federal agencies, states, tribes, and private individuals to manage wolves to protect private property and other wildlife populations.

The USFWS' updated January 6, 2005 10(j) (70 FR 1286) regulation expanded the authority of states and Native American tribes with USFWS-approved post-delisting wolf management plans to manage gray wolves in the experimental population areas of CID and GYA. This designation allowed federal, state and tribal agencies and private citizens more flexibility in managing wolves and to protect domestic animals than the 1994 regulations. The rule also intended to allow the states and tribes with USFWS-approved post-delisting wolf management plans to lethally remove wolves that were the 'primary' cause of significant negative impacts to big game herds and for states and tribes to lead wolf management in their state or reservation. Analysis of a March 2006 proposal by the state of ID to remove up to 43 wolves in a small area of central ID to reduce the rate of wolf predation on ungulates for up to 5 years revealed that the 'primary'

requirement in the 2005 rule was an unobtainable standard, as wolf predation is never the 'primary' cause of ungulate herd status.

On July 6, 2007 the USFWS proposed that the 2005 10(j) nonessential experimental population regulation be modified (72 FR 36942). The modification from 'primary cause' to 'one of the major causes' allowed a high, but reasonable standard for states and tribes with USFWS-approved post-delisting wolf management plans to develop science-based proposals to lethally remove wolves shown to be negatively affecting ungulate herds. In addition, it would allow anyone on private or public land to shoot a wolf that was attacking his or her dog or stock animals. The proposed rule change received over 262,000 public comments. The rule was published on January 28, 2008 (73 FR 4720) and became effective 30 days later on February 27, 2008. A couple of wolves that were seen attacking domestic dogs or horses have been legally shot by private citizens, but no wolves have been removed to address concerns about wild ungulate populations. In 2010, ID and MT gave the USFWS proposals to reduce wolves for 5 yrs. in 2 small areas. Idaho would remove about 40-60 in the Lolo/Clearwater area of ID and MT would remove about 12 wolves from the Bitterroot area of MT. Both of those proposals are under evaluation by the USFWS. Environmental Assessments, as legally required by the National Environmental Policy Act (NEPA), are being prepared for public review and comment. No wolves can be removed before the legal process in the 2008 rule has been completed and the USFWS has determined such removals are science-based and would not jeopardize wolf recovery.

The January 28, 2008 modification to the 2005 10(j) nonessential experimental population rule is currently being litigated in Montana Federal District Court. The modified 10(j) rule allowed anyone to legally shoot a wolf that was attacking his or her dog or his or her stock animal [horses, mules, donkeys, llamas, and goats]. It also provided a science-based process for the states and tribes to propose that the Service approve localized reductions in wolves where wolf predation was proven to be a major cause of ungulate herds being below state and tribal management objectives. That rule remains in effect while the case is being litigated. The case was stayed until there was a decision regarding the 2009 delisting. A few wolves that were attacking domestic dogs or horses were legally shot by private citizens, but no wolves have been removed to address concerns about wild ungulate populations.

The case became active again when wolves were relisted in 2010 and the claims have now been fully briefed. On January 28, 2011, the court ordered the parties to show cause why the case should not be dismissed as moot because the court stated that there may be information so that the experimental wolves no longer met the ESA's requirements for an experimental population designation. Briefs are to be filed on February 22, 2011. A hearing on a portion of that case (whether the 10(j) litigation is moot) is scheduled for March 24, 2011. Montana did not intervene in this litigation, instead focusing efforts on delisting litigation.

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 were still listed until May 2009, some elements of Montana's plan could be implemented. Prior to delisting in May, the legal classification and federal regulations put wolves into 2 separate categories in Montana – endangered in northern Montana and experimental non-essential across southern Montana (Figure 2). Wolf-livestock conflicts were 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 provided less flexibility to agencies and livestock owners. In contrast, more flexibility was provided through the revised 10(j) regulations (revised in February 2008).

Beginning with delisting in May, the wolf was reclassified as a species in need of management statewide (Figure 3). Montana's laws, administrative rules, and state plan replaced the federal framework. The 2009 delisting decision was challenged in federal court in Missoula. No ruling had been issued by the end of the calendar year, thus the wolf was conserved and managed as a resident wildlife species for the remainder of the year, with all taking regulated either by Montana laws or the MFWP Commission.

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) investigated injured and dead livestock, and MFWP worked 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 or solely on public lands. Of the 108 packs in Montana, 10 (about 9% of all Montana packs) reside most of the year in wilderness areas or in Glacier National Park. Many others live in very remote backcountry areas in rugged terrain along the Montana / Idaho border. The rest live in public land areas with more public access and habitat fragmentation than wilderness areas or Glacier National Park (GNP). 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, 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

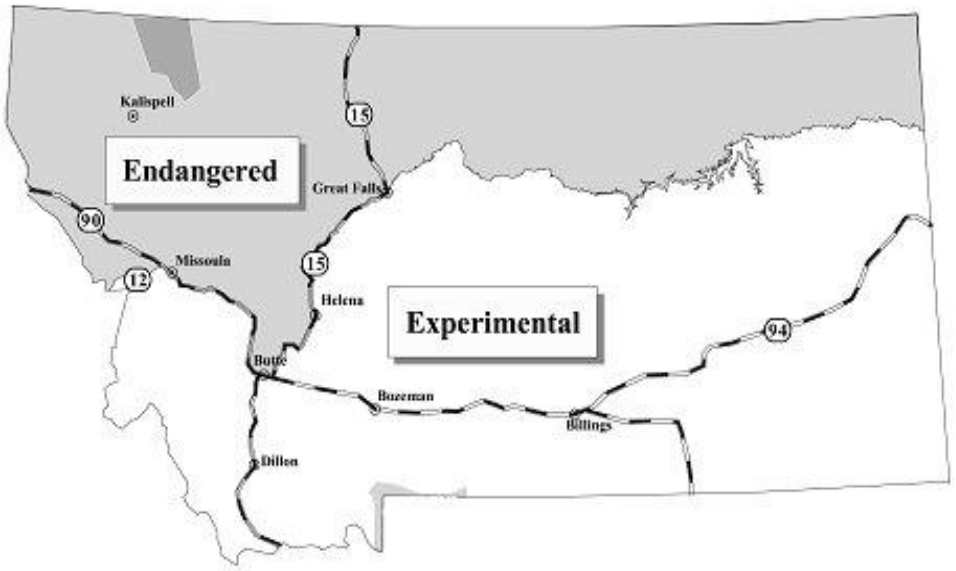


Figure 2. Map of the interim federal wolf management areas showing the endangered area where the 1999 Interim Wolf Control Plan applied and the experimental area where the 10(j) regulations applied prior to delisting in May, 2009 and after the court-ordered relisting in August 2010. The central Idaho and Greater Yellowstone experimental areas are shown as one since the approved status of Montana's state wolf plan allowed the special 10(j) regulations to apply equally in each area.

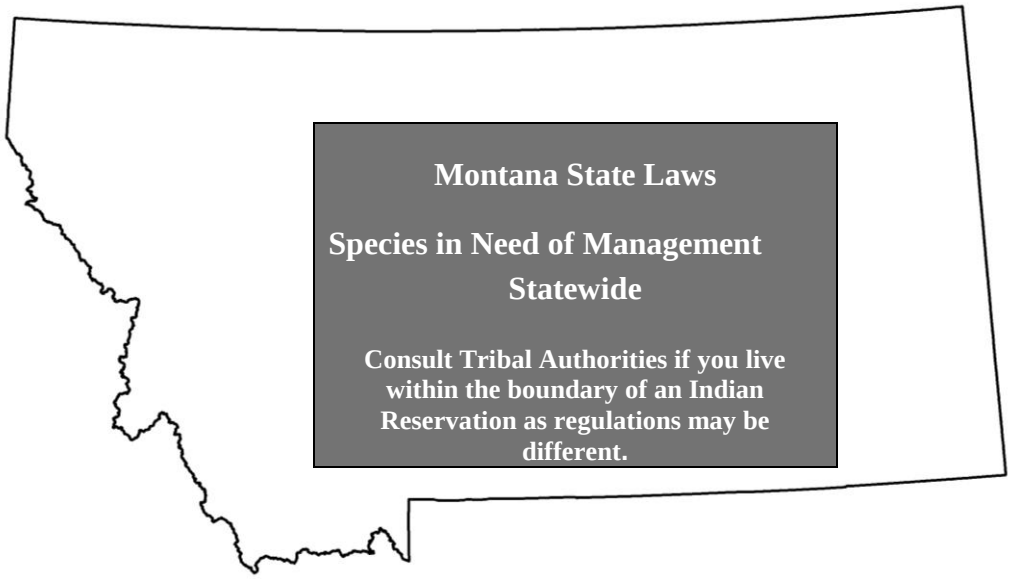


Figure 3. Map of legal classification of wolves statewide as species in need of management. Different laws and regulations may apply on Indian Reservations.

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. The size of the average wolf pack in Montana is between 5-6 wolves. The largest wolf pack documented in Montana in recent years has been 20-22 animals. Packs this large are very rare. There was no significant difference in the average size of wolf packs across all 3 areas (NWMT, CID, GYA).

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

Montana wolf packs are monitored year round. Common wolf monitoring techniques include direct observational counts, howling and track surveys, and public wolf reports. FWP seeks to document pack size and breeding pair status of known packs, to verify wolf activity in new areas that can result in new packs forming, to document dispersal to the extent possible to demonstrate connectivity, to determine pack territories and identify affected private landowners. As importantly, FWP must demonstrate to USFWS that Montana is maintaining a secure, recovered wolf population and ESA-protections are no longer necessary. The statewide minimum Montana wolf population was estimated on a calendar year basis (January to December), based upon the best available information.

Wolf monitoring is conducted using a variety of tools and techniques in combination, as is the case for other wildlife species. Common wolf monitoring tools 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 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, on average 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 and ground surveys. 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 its 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.

The statewide minimum wolf population is estimated by adding up the number of observed wolves in verified packs + known lone animals as of December 31 each year. This is a minimum count and has been reported as such since wolf first began recolonizing northwest Montana in the mid 1980s. Suspected wolf packs are those that could not be verified with confidence and often consist of a new pair that has just formed. They are not included in the final minimum estimated count, but are acknowledged and discussed in the annual report narrative. Suspected packs may or may not persist. Subsequent field work and public reports ultimately reveal whether they did or not and minimum population estimates reflect that accordingly.

MFWP wolf monitoring data, while not a precise accounting of the number of wolves in Montana, are adequate to make decisions to address wolf-livestock conflicts, to set wolf hunting and trapping regulations, and to set harvest quotas because MFWP is confident there are at least the minimum number of wolves observed in the Montana population. These minimum data are also accurate enough to demonstrate maintenance of a recovered population and that relisting is not warranted.

In anticipation of an increased work load and declining federal funding, MFWP first began considering alternative approaches to monitoring the wolf population in 2007. The capacity for MFWP personnel to monitor a growing wolf population has been declining given robust wolf population growth since about 2006. The traditional field-based methods yield minimum counts that are increasing conservative and inevitably below the "true" numbers. Preliminary work focused on developing a more reliable method to estimate the number of breeding pairs based on the size of a wolf pack using logistic regression models (Mitchell et al. 2008). Subsequent work focused on finding ways to utilize wolf observations by hunters in a more systematic way. A collaborative research effort with the University of Montana Wildlife Cooperative Research Unit was initiated in 2008. The primary objectives were to find alternative approaches to wolf monitoring that would yield statistically reliable estimates of the number of wolves, the number of wolf packs, and the number of breeding pairs. See the Research section.

Border Packs

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. In rare cases, a pack may have a den site on one side of an administrative boundary, but spend the majority of its time on the other side. In such cases,

a discretionary decision is made as to where the pack will be tallied. 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. The pack will also be displayed on the appropriate map.

At the end of 2010, a total of 24 packs straddled the Montana / Idaho border. Of those, 18 counted in the Montana population and 6 counted in the Idaho population. Two additional packs straddled the Montana / Canada border but they were not included in the Montana estimate or reflected on maps.

In western Montana in the Bitterroot and Big Hole Valley area, 10 border packs are shared with Idaho but were counted in the Montana minimum population estimate for 2010. See Table 1c, Appendix 3. In NWMT, 8 border packs ranged from the lower Clark Fork north to the Montana / Idaho/Canada border (Table 1a, Table 1b in Appendix 3).

At the end of 2010, a total of 6 packs were shared between Montana and Wyoming / YNP. Four were counted in the Montana population in 2010 (Table 1b, Appendix 3). Two packs were counted in the Wyoming population (Table 2 in Appendix 3).

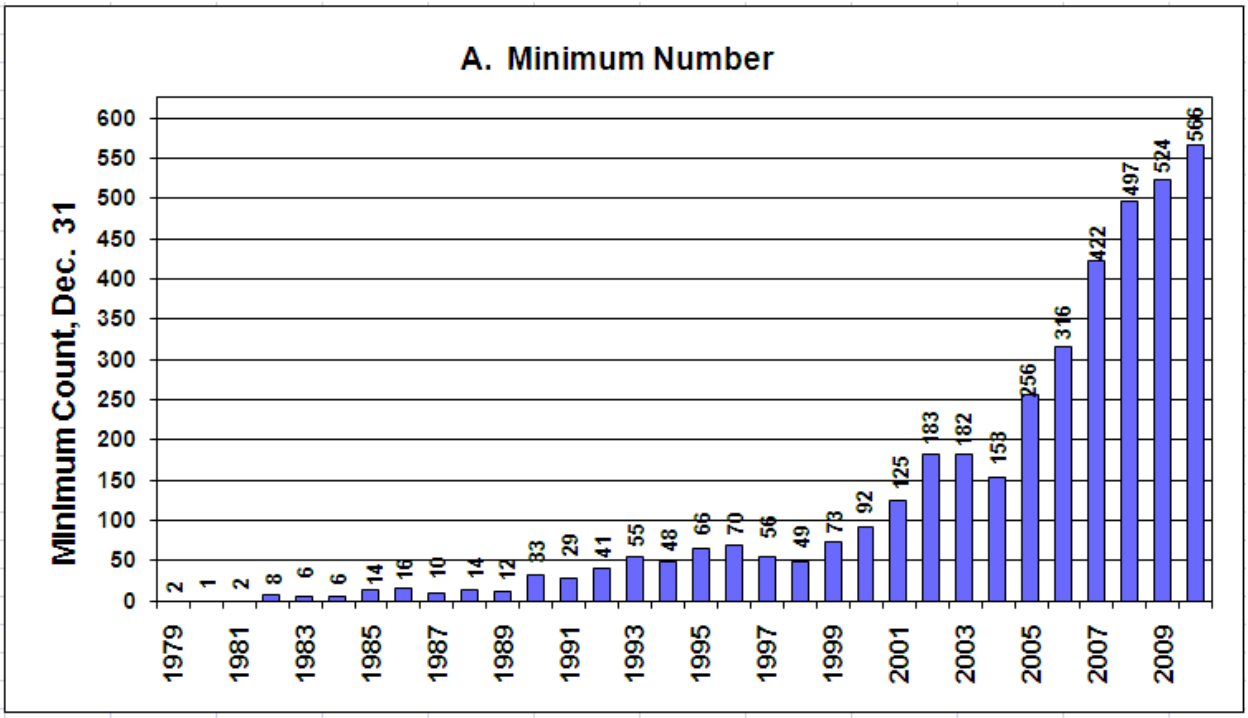
Montana Statewide Wolf Population and Distribution

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 2009 no longer existed by the end of 2010.

A total of 21 new packs formed between 2009 and 2010, about the same as the previous year. The Montana minimum wolf population count increased by about 8%, from a minimum count of 524 in 2009 to a minimum count of 566 in 2010. This is a minimum increase of 42 wolves (Figure 4A). A minimum of 140 pups were documented as of December 31, 2010.

The minimum number of breeding pairs (by the federal recovery definition) in Montana at the end of 2010 was 35 (Figure 4B). The minimum number of packs statewide (2 or more wolves) increased from 46 in 2005, to 60 to 2006, to 73 in 2007, to 84 in 2008, to 101 in 2009, and to 108 in 2010. Packs for which size was known with confidence at the end of the year averaged about 6.0 wolves (range 2-18).

As the wolf population has increased and field effort has remained constant for the last several years, it becomes increasingly difficult to obtain pack counts and to determine the breeding pair status of known packs. It has also become increasing difficult to verity new packs based on MFWP field efforts and public / landowner reports as the workload exceeds agency capacity to accomplish all the field work necessary to make such determinations with certainty. Thus,



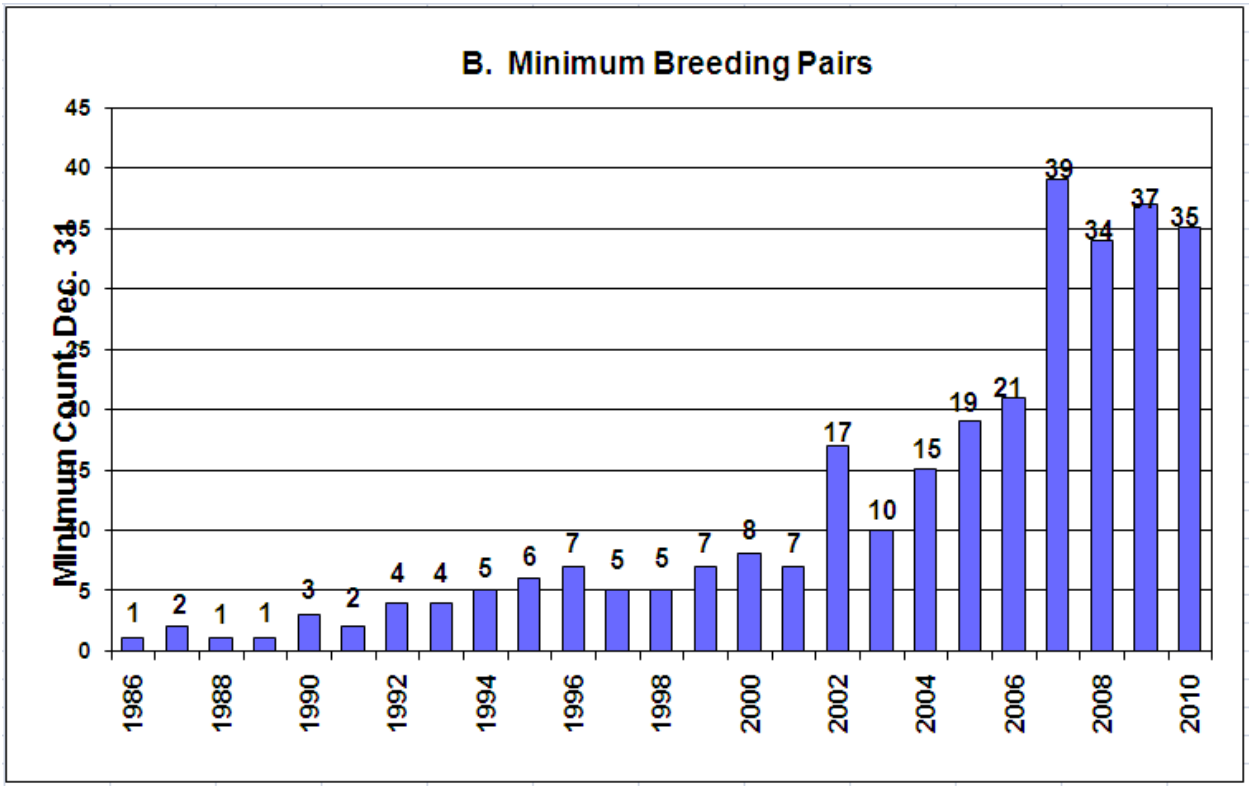


Figure 4. Minimum estimated number of wolves in the State of Montana on December 31, 1979-2010 (A) and (B) minimum estimated number of Breeding Pairs in the State of Montana December 31, 1986 – 2010.

complete pack counts are often not available, as evidenced by the "?" symbol in Tables 1-3. Nonetheless, the minimum counts reported by MFWP indicate that at least that many wolves are present, thus representing a conservative estimated minimum total.

The vast majority of the total statewide increase in the minimum wolf count and number of packs continues to be in NWMT. One and 5 wolf packs occurred on the Blackfeet and Flathead Indian reservations, respectively. The increase appeared to be influenced by the geographic proximity of the robust Idaho wolf population which is a much larger "source" population than YNP. Dispersal from within Montana also accounts for a portion of the increase given most wolves disperse about 60 miles. See Figures 5(A) and 5(B).

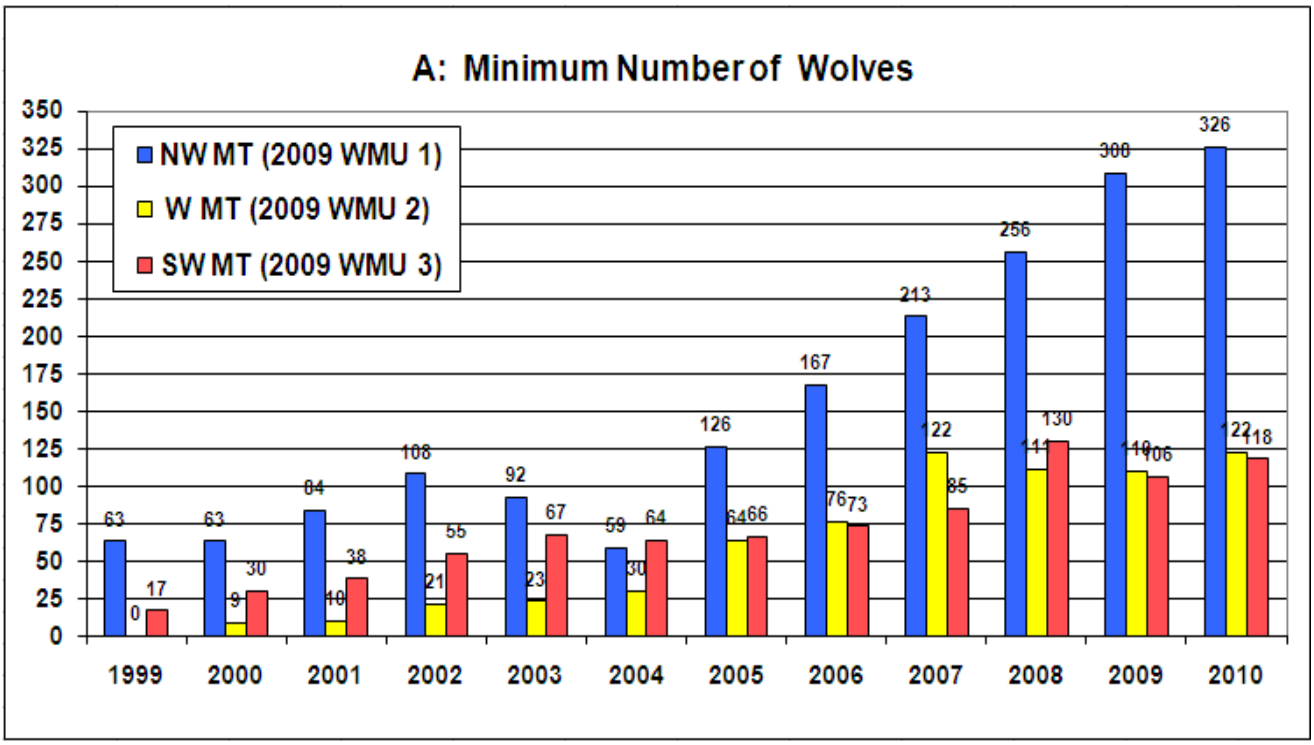
In NWMT, the minimum count increased from 308 in 2009 to 326 in 2010. Twenty one of 68 packs were documented to have met the breeding pair criteria. However, breeding pair status could not be confirmed in many verified packs due to increasing workload and the challenge of obtaining repeated observations on each pack. The number of packs increased to 68 in 2010.

In Western Montana, a minimum of 21 packs were verified, 8 or which met the breeding pair criteria, for a minimum of 122 wolves (a slight increase over 110 in 2009). Total wolf numbers in the unit appear to be fluctuating around 115 wolves over the last several years after several years of strong population growth even though high densities of wolves may occur at local scales where fewer livestock are present. There continues to high turnover in the population in parts of western Montana (e.g. Big Hole Valley) due to livestock conflicts and agency control. Wolves appear to recolonize some areas quite rapidly along the Montana-Idaho border.

In southwest Montana at the end of 2010, a minimum of 19 packs were verified, 6 of which met the breeding pair criteria, for a minimum count of 118 wolves. This is an increase from 106 total wolves at the end of 2009. The population in southwest Montana appears to be fluctuating around an average of about 115 wolves over the last 2-3 years as well, suggesting that suitable habitat is filled. Levels of lethal control and decreased immigration from YNP may explain the leveling off.

At the statewide level, wolves were distributed primarily in the western third of the state. A small pack was documented in the Snowies near the end of the year. The Lebo pack still exists at the north end of the Crazy Mountains. Most of Montana's wolf packs live outside of national parks are remote backcountry wilderness areas (Figure 6).

MFWP has been documenting dispersal events within Montana's state borders that result in new pairs / packs forming. A total of 21 new packs were verified in 2010. However, some packs that had existed at some point in 2010 did not make through to the end of the year for a variety of reasons, including human-caused mortality or disease. Given the dynamic nature of wolf packs, the minimum number of wolf packs increased by a net total of 19 from 2006 to 2007, from 73 in 2007 to 84 in 2008, from 84 to 101 in 2009, and from 101 to 108 in 2010.



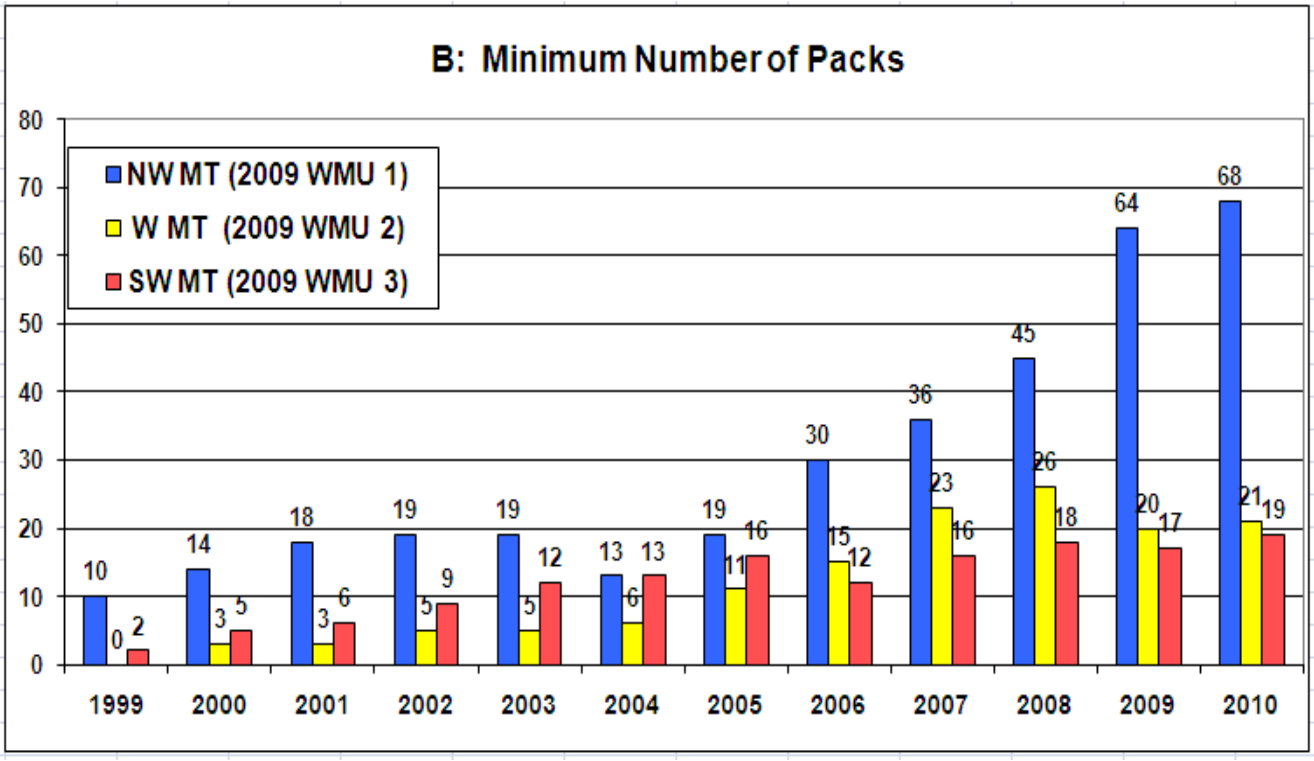


Figure 5. Number trends in the number of wolves (A) and (B) the number of wolf packs (defined as 2 or more wolves traveling together on Dec. 31) in each of three areas (Northwest Montana, western Montana CID, southwest Montana GYA), 1999-2010.

MFWP maintained a similar amount of field effort in 2010, but increased wolf numbers increased the workload. MFWP hired two experienced seasonal field technicians and brought on additional volunteers to help with 2010 monitoring efforts. However, recent increases in the wolf population over the last few years has meant that MFWP has to verify more new packs, the status of previously verified packs, and determine breeding pair status for as many as possible. Inevitably, some packs are suspected, but not verified and MFWP conservatively notes those packs in the narrative, but those suspected packs are not included in the minimum estimate. Similarly, if the breeding pair status is not known with confidence, it is recorded as "not" a breeding pair or "breeding status unknown." Thus the number of breeding pairs is a minimum known and others certainly exist, but could not be verified using field-based methods without increased effort.

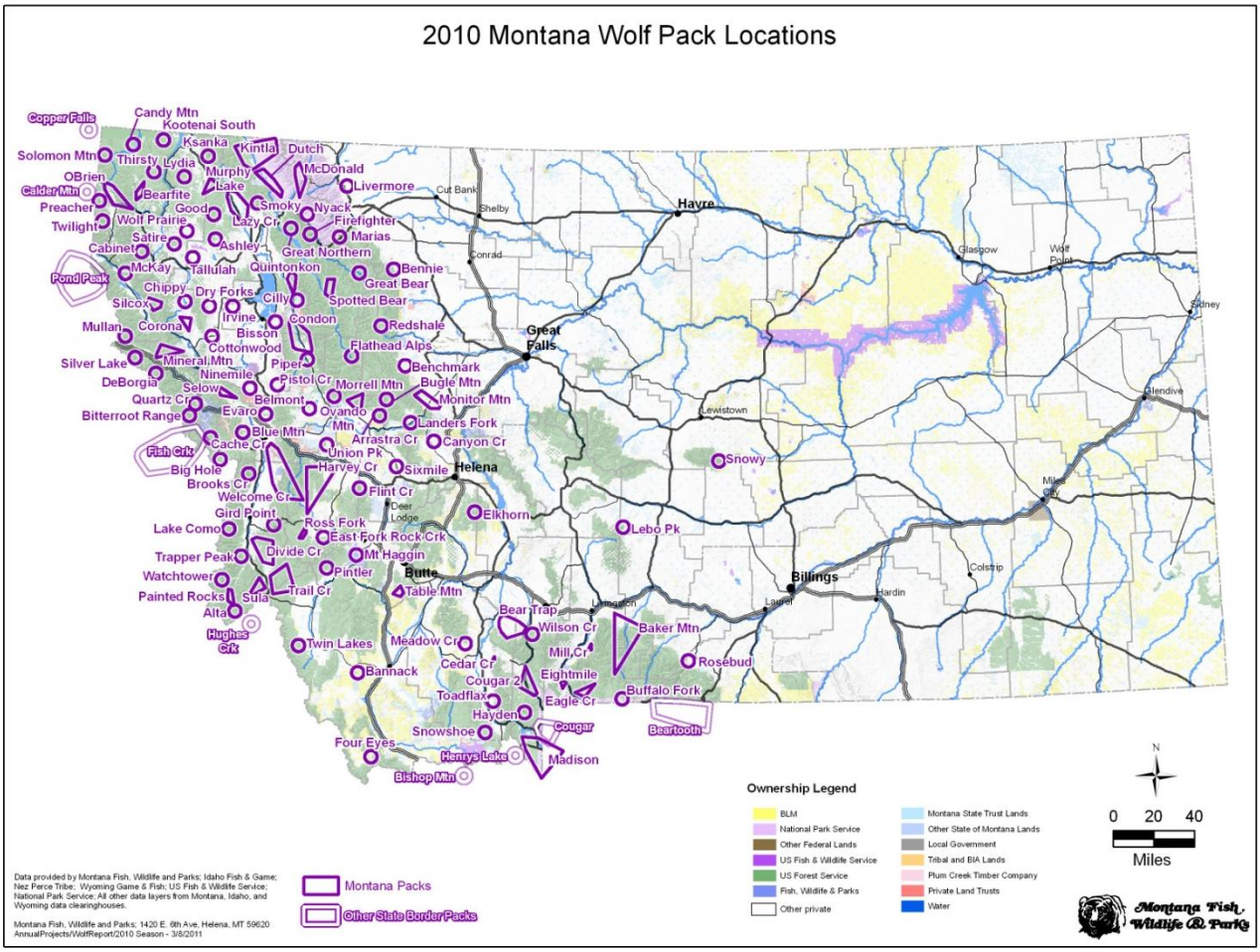


Figure 6. Verified wolf pack distribution in the State of Montana, as of December 31, 2010.

Fair Chase, Regulated Public Hunting

Regulated public harvest of wolves, endorsed by the Governor's Wolf Advisory Council in 2000, was included in Montana's wolf conservation and management plan. In 2001, the Montana Legislature authorized the MFWP Commission to reclassify wolves under state law from an endangered species to a species in need of management upon federal delisting. MFWP first began exploring the idea of how to design regulated public hunting and trapping for wolves early in 2007, in anticipation of delisting in 2008. The 2007 Legislature created a wolf hunting license for residents and nonresidents (SB 372). Other statutes within MCA enable the MFWP Commission to adopt rules and general regulations and specific regulations pertaining to wolf hunting and trapping as a species in need of management upon delisting. Hunting could only be implemented when wolves are successfully delisted and if there are more than 15 breeding pairs of wolves in Montana the previous year.

The wolf was first delisted in 2008. However, 2008 season wasn't realized due to a preliminary injunction followed by the wolf's relisting. The second USFWS decision to delist the gray wolf in Montana from the federal Endangered Species List was effective May 4, 2009. Litigation challenging the federal delisting decision was ongoing at the time, but a preliminary injunction that would have blocked a fall 2009 season was denied. An intentionally conservative quota of 75 wolves was adopted for the 2009 season. Hunting closed on Nov. 16, 2009 with a legal harvest of 72 animals. The minimum count of wolves increased from 497 in 2008 to 524 in 2009. Harvest mortality in addition to depredation removals appeared to help dampen the rate of population growth. See Sime et al. 2010 for a summary of the 2009 hunting season.

MFWP preparations for the 2010 wolf hunting season included an internal procedural step of utilizing a formal structured decision making process (SDM) to identify and refine wolf management units (WMUs). SDM consists of 5 steps arranged in an iterative sequence: define the Problem, identify Objectives that would characterize successful resolution of the problem, develop management Alternatives to meeting those objectives, identify Consequences for each of the alternatives, and evaluate Trade-offs among the alternatives. This two-day effort included regional and Helena staff across multiple positions and bureaus and culminated in the development of a specific problem statement specific to the 2010 season setting process, a list of prioritized objectives and fourteen (14) different wolf management units.

For developing a proposed 2010 harvest quota, MFWP completed the following process. In addition to maintaining the statewide harvest simulation modeling effort as an important input to quota setting, MFWP assigned regional staff the task of assembling regional inputs to season structure and quotas based upon regional circumstances to include wolf biology and relationships with livestock and prey. This was done to enhance the sensitivity to and opportunity for local inputs in a manner that best fosters ground-based conservation support for the wolf itself. In this light, regional inputs called for a general reduction in wolf numbers reasonably within the flexibility of the species biology and recovery requirements.

Ultimately, the MFWP Commission approved a final 2010 wolf quota of 186 wolves, distributed across 14 WMUs. In response to growing wolf numbers, impacts to livestock and prey populations (deer/elk/moose) and associated growing concern among some public constituents, MFWP

proposed and the Commission approved a higher wolf quota for 2010, with the intent to cap and reverse wolf population growth by an estimated 13 – 20%. None of the harvest simulations predicted the wolf population would drop below the 15 BP threshold. The 2010 wolf hunting season was precluded due to a federal court order which relisted the wolf as of August 5, 2010.

MFWP Wildlife Lab Surveillance of Wolf Mortality and Disease, 2007-2010

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. From 2007 – 2010, necropsies were performed less frequently as baseline information has increasingly become established. Instead, necropsies were increasingly performed only for those wolves for which cause of death was unknown.

Typical information collected includes cause of death, body weight, evidence of ectoparasites, etc. Various biological data were also collected. 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.

This following summary was contributed by: Andrew Puls, Dr. Jennifer Ramsey, and Neil Anderson: Montana Fish, Wildlife and Parks, Wildlife Research Laboratory, 1400 South 19th Ave., Bozeman, MT.

Introduction

From January 1, 2007 to December 31, 2010, the Montana Fish, Wildlife and Parks (FWP) Wildlife Research Laboratory (Wildlife Lab) received carcasses and tissue samples from 507 wolf mortality and capture events. A total of 72 wolf carcasses were necropsied to assess overall fitness, identify disease agents and parasites, and determine cause of death. Tissue, hair, and blood samples from control/management mortalities, captures, hunter harvest, and other wolf mortalities were collected, inventoried, and banked for future analysis. Of the 507 wolf samples received by the lab, 130 came from wolves that were collared and released in order to monitor the movements of their packs. Blood was collected from 111 of these released animals and tested for exposure to various pathogens.

This report is a summary of the cause of death, serology, and parasitology results from those samples received by the Wildlife Lab. Results are divided into two wolf populations: the southwestern (SW) experimental population and northwestern (NW) endangered population.

Mortality Data

Between January 1, 2007 and December 31, 2010, the Wildlife Lab received 377 carcasses and samples from Montana wolf mortalities (Figure 7). One-hundred ninety of these came from the

SW population, 181 from the NW population, and location was unknown for six. Control / management removals accounted for the largest percentage of wolf mortalities in both the SW (62%) and NW (41%) populations. Hunter harvest from 2009 accounted for the second largest cause of death (17% SW and 19% NW), while illegal harvest made up 4% of SW and 15% of NW mortalities. Road and train kills were responsible for 7% of SW and 12% of NW wolf mortalities. Three SW and four NW wolves were incidental takes in snares and traps. Natural deaths likely occurred in 13 SW and two NW wolves. Cause of death can be difficult to confirm through necropsy, especially when the carcass is not fresh, in an advanced state of autolysis, or incomplete. These mortalities are classified as an unknown cause of death, which is the case with 10 SW and 17 NW individuals. It is important to recognize that these counts do not represent the total wolf mortality from 2007-2010, only those samples and carcasses received by the Wildlife Lab.

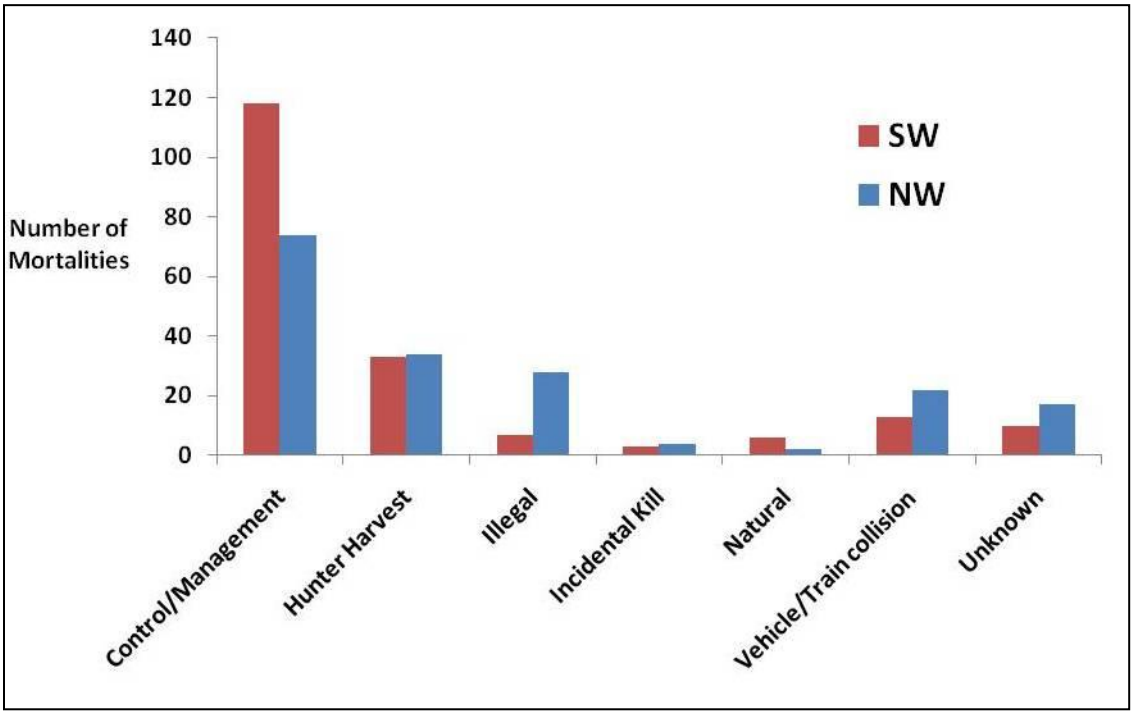


Figure 7. Cause of death of wolves received by the FWP Wildlife Research Laboratory between 2007 and 2010. Mortalities are divided into the northwest (NW) and southwest (SW) populations.

Serology Results

Between 2007 and 2010, serologic testing was conducted on 56 SW and 64 NW wolves. Serum was tested to determine if animals had been exposed to canine distemper virus (CDV), canine parvovirus (CPV), canine adenovirus (CAV), canine herpesvirus (CHV), neosporosis, and leptospirosis (Figure 8), as well as *Brucella abortus* and *B. canis*. Testing for leptospirosis, *B. abortus*, and *B. canis* was conducted by the Montana Department of Livestock Diagnostic Laboratory. All other tests were conducted by the Cornell University Animal Health Diagnostic Laboratory.

Serologic testing does not yield a definitive positive or negative result for disease. Instead, results are based on serial dilutions and reported as a titer, which is a measure of the amount of antibodies in the blood against a particular pathogen. Titers falling within a normal range (based on sampling in domestic dogs) are considered seropositive and are evidence of exposure to that pathogen. Very low titer values that are below the normal range are difficult to interpret due to limitations in test effectiveness and sample toxicity. The following titer ranges were used to define the normal range of each pathogen: CDV 32 - 1024, CPV 80 - 2560, CAV 16 - 512, CHV < 1, neospirosis < 200, leptospirosis < 1. For the purposes of this report, all wolves with titers below the normal range for a particular pathogen are considered seronegative. Serologic results have therefore been divided into two categories: 1) seronegative (no detectable antibodies or titers below the normal range), and 2) seropositive (indicates exposure to a pathogen). Titer values exceeding normal ranges can indicate clinical disease and these cases are described. The serologic results are used to determine seroprevalence, which is the percentage of individuals sampled that show evidence of exposure to a particular pathogen.

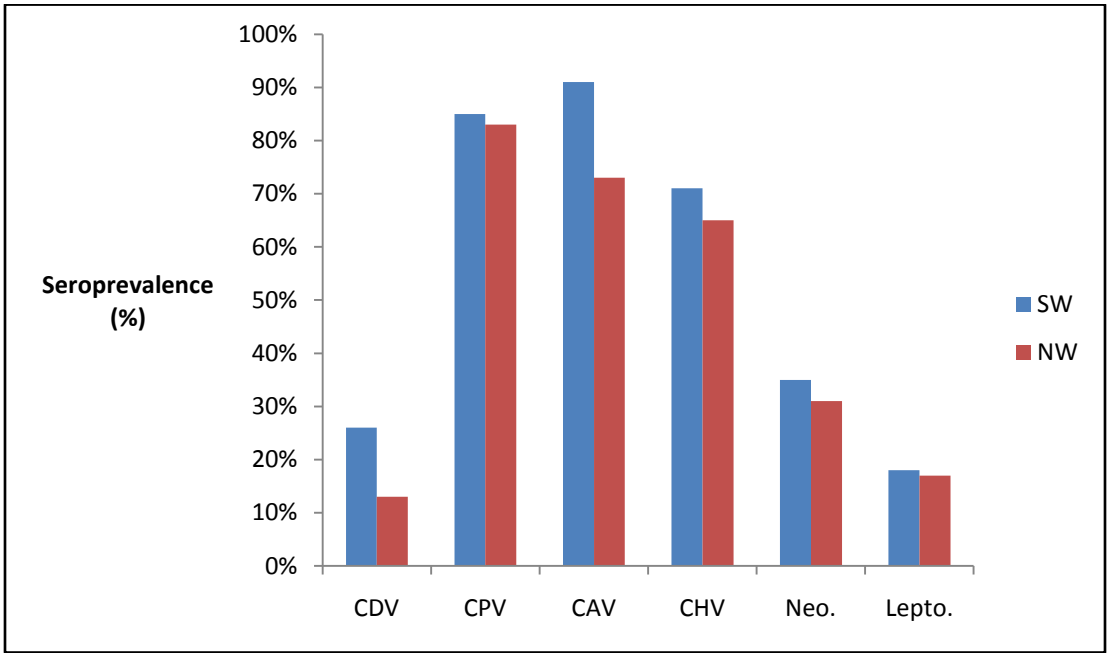


Figure 8. Disease seroprevalence in wolves received by the FWP Wildlife Research Laboratory between 2007 and 2010. Results are divided into northwest (NW) and southwest (SW) populations. (CDV = canine distemper virus, CPV = canine parvovirus, CAV = canine adenovirus, CHV = canine herpesvirus, Neo. = neosporosis, and Lepto. = leptospirosis).

It is important to note that these results likely do not reflect the rates of disease exposure in Montana's wolf population. Exposed animals could be either more or less likely to be sampled than unexposed individuals, thereby introducing sampling bias to the research. Also, sample size is likely not sufficient to yield accurate extrapolative results or detect low rates of exposure.

1. **Canine Distemper Virus**

   CDV is a highly contagious disease affecting carnivores, including domestic and wild canids, raccoons, and mustelids. Because CDV is cold resistant, most cases observed in canids occur during the fall and winter. The virus is typically inhaled and affects the skin, eye membranes, intestinal tract, and occasionally the footpads, teeth, and brain. Fever, loss of appetite, and discharge from the eyes and nose are initial symptoms, which can be followed by diarrhea, seizures, and death.

   From 2007 through 2010, 53 SW and 64 NW wolves were tested for CDV. Twenty-six percent of SW and 13% of NW animals were seropositive for CDV exposure. Titer levels exceeding the normal range of exposure were observed in one SW and three NW individuals. These high titers are not of major concern because although CDV has been attributed to pup mortality in northwestern Montana and Yellowstone National Park, clinical disease appears to be relatively rare in wild wolves and it is likely difficult to document a clinically ill wolf due to CDV.

2. **Canine Parvovirus**

   CPV is an infectious disease which causes dehydration through diarrhea and vomiting. It affects many species, including canids, felids, and raccoons, and appears to be present in a very high proportion of Montana's wolves.

   In his 2006 report on wolf disease surveillance, Atkinson found that 100% of Montana wolves sampled showed evidence of exposure to CPV. Seroprevalence was also high in wolves sampled from 2007 to 2010, with 85% of SW and 83% of NW wolves testing positive for exposure. One wolf from each population had a high antibody titer that could have been indicative of clinical disease or recent exposure. In spite of high exposure rates to the virus, no evidence suggests that CPV is a significant cause of wolf mortality in Montana.

3. **Canine Adenovirus**

   A cause of hepatitis in domestic dogs, CAV also infects other carnivore species including bears and wild canids. Because the virus is transmitted through the ingestion of saliva, feces, and urine and can remain stable in the environment for long periods, direct contact with an infected animal is not necessary for transmission.

   Exposure to CAV appears widespread in Montana's wolves. Of the 53 SW and 64 NW wolves tested for CAV, seropositive titers were found in 91% of SW and 73% of NW wolves. A high percentage of wolves (51% of SW and 42% of NW) had titer levels exceeding the normal range. Unlike domestic dogs, however, clinical CAV in wolves has not been described; therefore these high titer levels do not necessarily represent diseased individuals.

4. **Canine Herpesvirus**

   CHV affects the reproductive and respiratory tracts of adult dogs. The disease can be transmitted through sexual or other physical contact as well as the birthing process. Exposure of pups to the virus can be fatal.

Testing for CHV in Montana's wolves did not begin until 2009, therefore sample sizes are lower (7 SW and 23 NW) than for other pathogen tests. The majority of SW (71%) and NW (65%) wolves were seropositive for CHV.

5. Neosporosis

The protozoal parasite *Neospora caninum* causes neosporosis, a disease that can manifest in abortions, premature births, and impaired calves in cattle. The disease is linked to dogs, which contract the parasite by eating infected tissue and then release eggs into the environment in their feces.

The majority of the 55 SW and 64 NW wolves examined were seronegative for Neospora antibodies (65% and 69% respectively). Of the 35% of SW and 31% of NW wolves that were seropositive, one SW and three NW individuals had abnormally high titer levels.

6. Leptospirosis

Leptospirosis is a widespread, bacterial disease that infects numerous mammal species. There are at least three species of *Leptospira*, one of which, *L. interrogans*, is known to infect domestic and wild canids. Of the more than 200 known serovars of *L. interrogans*, Montana wolves are tested for eight which are most commonly associated with wild and domestic canids as well as cattle: Icterohemorrhagiae (ICT), Canicola (CAN), Grippotyphosa (GRP), Pomona (POM), Bratislava (BRAT), Hardjo (HAR), Autumnalis (AUT), and Tarassovi (TAR).

The majority of *Leptospira* serovars infect the kidneys, with bacteria being expelled during urination. Expelled bacteria are capable of surviving months in moist conditions. Transmission occurs through ingestion of infected prey or contact between contaminated soil and mucous membranes or open skin lesions. Fever and depression are common symptoms of leptospirosis, which can also lead to death through chronic kidney infections, hepatitis, or abortion.

A relatively small percentage of Montana wolves showed evidence of exposure to the 8 *Leptospira* serovars that were tested for (Figure 9). Of 55 SW and 65 NW wolves tested, 10 and 11 respectively were seropositive for at least one serovar. Three wolves from each of the NW and SW populations appeared to have been exposed to multiple serovars. Of the eight serovars, AUT, GRP, and ICT had the highest exposure rates in both the SW and NW populations. HAR, CAN and TAR were not found in wolves from either population.

7. Brucellosis

Brucellosis, a disease caused by the bacteria *Brucella abortus,* can cause abortion, arthritis, and lameness in bovids and cervids. Wolves and other canids can become "spillover" hosts of *B. abortus* by ingesting infected prey. A second species, *B. canis*, also infects wild and domestic dog species.

Brucellosis appears to be uncommon in Montana's wolves. *B. canis* has not been detected in wolves tested from Montana (MFWP unpublished data). Of 52 SW and 63 NW wolves tested

for *B. abortus* between Jan. 2007 and Dec. 2010, three individuals were considered reactors on standard serology. Western blot tests suggest, however, that a cross-reaction may have occurred with another bacteria, Yersinia, resulting in a false serologic positive for two of the three reactors. Western blot results are pending for the third reactor.

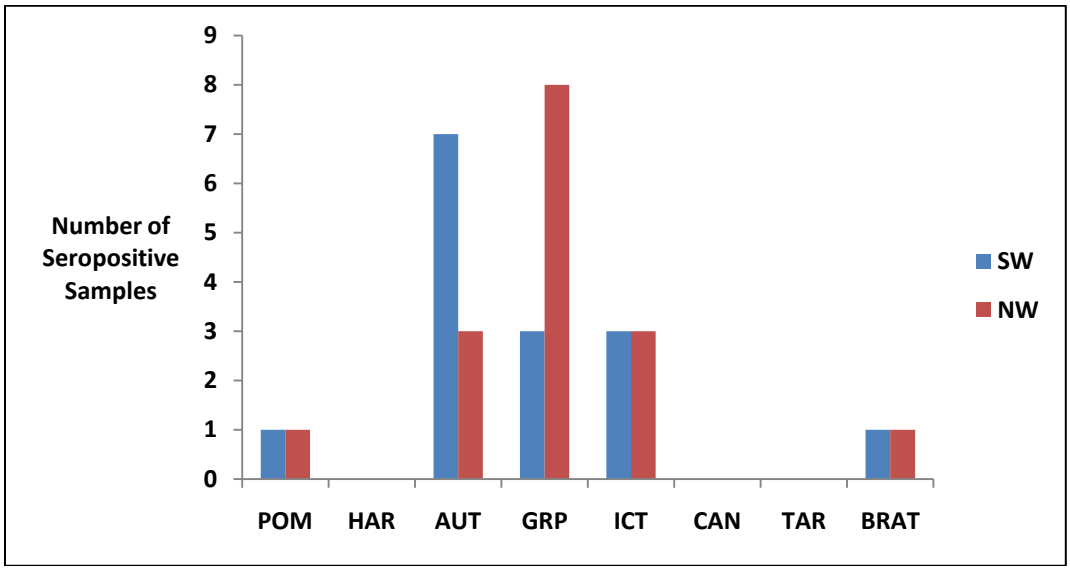


Figure 9. Number of wolves from southwest (SW,n = 55) and northwest (NW, n = 65) populations that were seropositive for each of eight *Leptospira* serovars. (POM = Pomona, HAR = Hardjo, AUT = Autumnalis, GRP = Grippotyphosa, ICT = Icterohemorrhagiae, CAN = Canicola, TAR = Tarassovi, BRAT = Bratislava).

Parasitology Results

1. Ectoparasites

Mange is a mammalian skin disease caused by tissue-burrowing mites. *Sarcoptes scabiei* has been identified as the mite species causing the disease in Montana's wolves, coyotes and foxes. Of the 72 wolves necropsied by the Wildlife Lab between 2007 and 2010, 14 (19%) showed evidence of mange through either hypotrichosis (change in hair type), alopecia (loss of hair), or skin crust and lesions. Of these 14, only one was from the NW population. *S. scabiei* was identified by Veterinary Parasitology Services in Bozeman, Montana on two of these individuals, both from the SW population. Mange does not appear to exert a negative influence at the population level (Jimenez et al. 2010a).

Lice were found on two necropsied wolves. Lice appear to be more commonly found on Idaho's wolves, and the one SW wolf infested with *Trichodectes canis* came from the Bitterroot Valley. The second case was a severe infestation on a NW wolf, although the louse species was not identified. Lice does not appear to exert a negative influence at the population level (Jimenez et al. 2010b).

2. Echinococcus

Echinococcus granulosus, a species of tapeworm, is a two-host parasite that inhabits the small intestine of its definitive host, which include wild and domestic canids. Eggs are released in the feces of infected canids and accidentally ingested by an intermediate host, such as elk, usually through grazing. The eggs hatch in the small intestine of the intermediate host, penetrate the intestinal wall, move through the circulatory system, and eventually form cysts in organs, most commonly the lungs or liver. Definitive hosts are infected through ingestion of encysted tissue, which can remain infective in carrion for weeks.

Intestinal contents of 47 wolf carcasses received by the Wildlife Lab in 2007 and 2008 were examined for the presence of *E. granulosus* by the Washington State University Department of Veterinary Microbiology and Pathology in Pullman, WA. Echinococcus was present in five out of 12 NW wolves (42%) and 24 out of 35 SW wolves (69%).

In its brucellosis surveillance efforts from 2008 to 2010, FWP also collected data on the prevalence of echinococcus in elk lung tissue. Lungs of 179 hunter-harvested elk in HD's 313, 314, 317, 360, and 362 were palpated for the presence of cysts. Any cysts were collected and subsequently examined by Veterinary Parasitology Services in Bozeman, Montana. Elk were considered positive for echinococcus if cysts contained *E. granulosus* protoscolices (larvae) and suspect if they had the morphological structure unique to echinococcus cysts. Thirty-nine elk (22%) had cysts that contained protoscolices while 10 individuals (6%) had sterile cysts with the characteristic morphology of *E. granulosus* infection.

Discussion

Subjectively, percentages of different causes of death did not differ markedly between Atkinson's 2005-2006 report and 2007-2010 mortalities. Control/management actions were the most common source of mortality in both periods. Percentages of vehicle collisions, natural deaths, illegal take, and incidental harvests were also similar between reporting periods. One obvious difference between time periods was the 2009 wolf hunt, which accounted for 72 wolf mortalities, 65 of which were received as samples by the Wildlife Lab and are thus represented in this report.

Atkinson (2006) reported that 91% of wolves tested in Montana between 2003 and 2006 showed serologic evidence of being exposed to CDV, which is much higher than the 19% statewide seroprevalence found from 2007 through 2010. Although not discussed, it is likely that Atkinson considered titers below the cut-offs defined for this report as evidence of exposure. Also, Zarnke et al. (2004) found that in Alaskan wolf populations, CDV was cyclical in nature, with years of high seroprevalence followed by years of low seroprevalence. The possibility therefore exists that CDV in Montana wolf populations follows a similar cycle.

While neospora is present in Montana's wolves, it is likely that they do not play a large role in the natural cycle of the disease (Atkinson 2006). While research has shown that coyotes can spread Neospora through feces, evidence of wolves doing so is less conclusive (Atkinson 2006,

Gondim et al. 2004). More common and widespread species, such as coyotes, dogs, raccoons, and deer carry and shed *N. canium* into the environment and their significance in the spread of the disease is likely much greater than wolves (Gondim 2006; Lindsay et al. 2001).

Similar to neospora, wolves are unlikely to play an important role in maintaining or spreading leptospirosis in Montana. Evidence suggests that seroprevalence of leptospirosis is low in Montana's wolves and that species like raccoons, skunks, and various rodents are also carriers and more common sources of infection . In Montana, the most common *Leptospira* serovars to infect cattle are ICT, CAN, GRP, POM, and HAR (Rankin 2010). Of these, CAN, and the most common serovar infecting cattle, HAR, were not detected in wolves from Montana sampled between 2007 and 2010.

Brucellosis has been documented in bison and elk in and around Yellowstone National Park. Wolves may serve as "spillover" hosts to the disease. Transmission from infected wolves to cattle or other wildlife, however, is very unlikely. Research indicates that while infected wolves do sporadically shed very small numbers of brucellae into the environment, they are far below the infective doses for cattle (Tessaro and Forbes 2004). This research, coupled with the fact that brucellosis has not been verified in a Montana wolf, suggests that wolves are not important in maintaining or spreading brucellosis.

E. granulosus has been documented in Montana wolves (Foreyt et al. 2009). It is unknown whether wolves released into Yellowstone National Park and Idaho introduced the parasite or if it was already established in the region's carnivore populations (Foreyt et al. 2009). Released wolves were administered drugs to eliminate *E. granulosus* from their intestinal tracts (Johnson 2001), but it is uncertain whether this was 100% effective. Records do indicate that two NW wolves tested positive for *E. granulosus* prior to wolf reintroduction in 1996 (MFWP unpublished data). Although *E. granulosus* has been found in wolf populations and intermediate hosts, such as elk, it is not believed to have a significant effect on ungulate populations or human health in Montana. For more information on *E. granulosus*, please refer to FWP's Echinococcus Fact Sheet, which can be found online at: http://fwpiis.mt.gov/content/getItem.aspx?id=41860.

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2010 Documented Statewide Wolf Mortalities

MFWP documented a total of 179 mortalities in 2010 statewide due to all causes. Undoubtedly, additional mortalities occurred but were not detected. The majority of wolf mortality overall in Montana is related to humans: livestock conflicts, regulated public harvest, car strikes, train strikes, illegal killing, legal harvest in Canada, and incidental to other activities (e.g. trapping/snaring). That pattern is similar across the northern Rocky Mountains, except inside national parks where the majority of wolf mortality is to due intraspecific strife (wolf on wolf aggression) or other natural causes.

Documented total wolf mortality in 2010 was lower than the total documented in 2009 (255 in 2009, 75 of which was attributed to public harvest). With the exception of public harvest in 2009, mortality levels were similar in both years and higher than 2008. Since 2005, total mortality attributed to livestock conflicts has increased commensurate with increased wolf numbers and wolf distribution in Montana. See Figure 10

Of the 179 mortalities documented in Montana during 2010, 79% (n=141) were killed to address livestock related conflicts. This is similar to the number killed to address livestock conflicts in 2009 (145). Of the 141 wolves killed in 2010, 128 were killed through agency control and 13 were killed by private citizens under the federal 10j regulations or a Montana state law known as the Defense of Property statute (DOP).

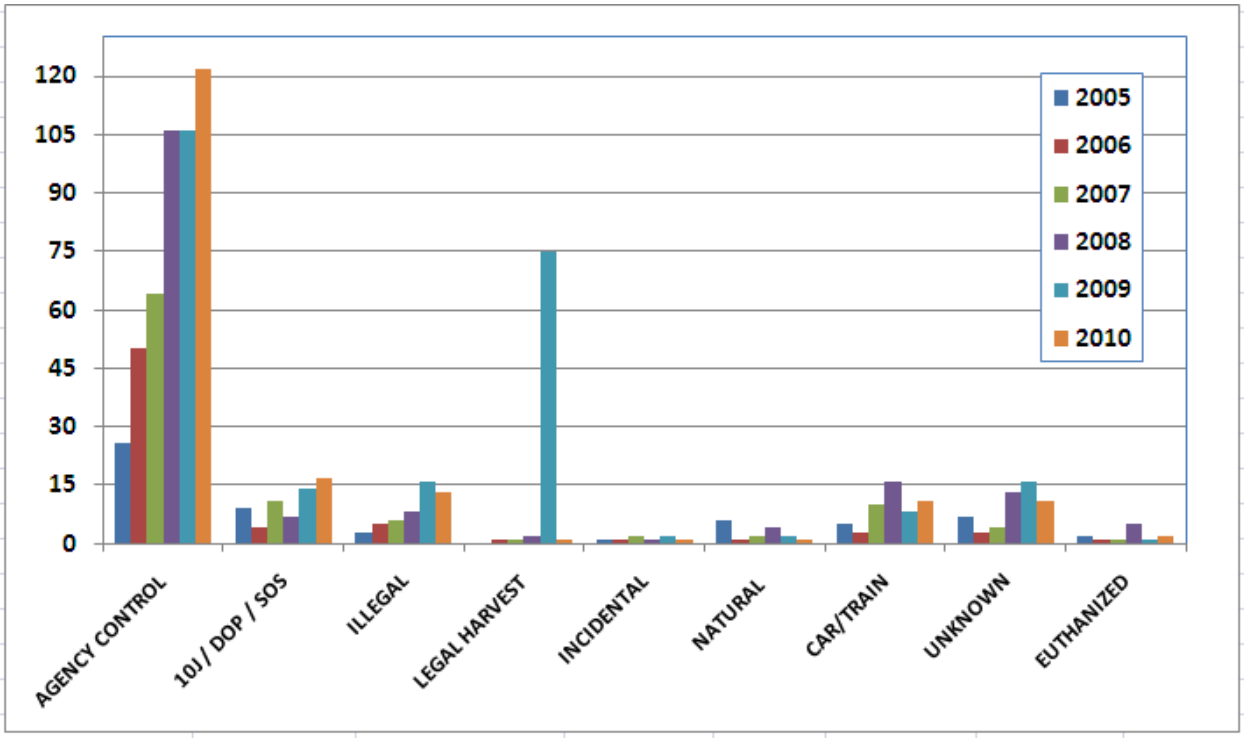

Figure 10. Minimum number of wolf mortalities documented by cause for gray wolves in 2005-2010. Total number of documented wolf mortalities in 2007 was 102, 161 in 2008 (which includes 3 wolves which died in Idaho and 3 wolves which died in Canada), 255 in 2009 and 179 in 2010.

In NWMT, livestock related mortality (61 wolves, 19 of which were killed on the Flathead Reservation) accounted for 69% of the total mortality documented (89 total). In western Montana (MT-CID), livestock related mortality (33 wolves) accounted for 94% of the total mortality documented (35 total). The majority of livestock related mortality in western Montana occurred in the Big Hole Valley and along the Montana-Idaho (19 of 33). In southwest Montana, livestock related mortality (47 wolves) accounted for 85% of the total documented mortality (55 total). The majority of livestock related wolf mortality in southwest Montana occurred in the Madison Valley and the Gravelly Mountains (30 of 47).

At the statewide level, the remaining documented 38 mortalities were: 13 died due to illegal killing (7%), 11 car/train strikes (6%),9 died of unknown causes (5%), 1 self-defense, 1 euthanized due to a gunshot wound, 2 incidental, and 1 wolf was lawfully harvested in Canada (0.5%).

Mange continues to be documented primarily in southwest Montana and the East Front of the Rockies. Mange has not been documented in west of the continental divide northwest Montana or in far western Montana. It does not appear to have a detrimental effect on Montana's wolf population as a whole (see Jimenez et al. 2010a).

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 2009, the vast majority of cattle and sheep wolf depredation incidents confirmed by WS occurred on private lands. Losses on public lands increased in 2010, notably in the Gravelly Mountains. 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.

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. In more recent years, an average of 35% of packs has confirmed depredations. One pack has been on the landscape for 19 years and was confirmed to have killed livestock a total of 5-6 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.

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.

USDA Wildlife Service's workload has increased over the last 10 years as the wolf population increased and distribution expanded. The number of suspected wolf complaints received by WS increased steadily from federal fiscal year 1997 to 2009 (Figure 11). The number of complaints received declined in federal fiscal year 2009 from 233 to 191 in 2010. About 50% of the complaints received by WS are verified as wolf-caused.

A total of 582 wolves were killed to help resolve conflicts with livestock from 1987-2010 in Montana (Figure 12). Despite this level of lethal removal, particularly in the early years, the Montana population still increased in number and distribution, due to immigration from central Idaho, YNP, and through growth from within the Montana population via dispersal and new pack formation. From 2004-2008, an average of 15.8% of the wolf population per year was killed due to conflicts with livestock (Figure 13). In 2009, about 22% of the population was removed to resolve wolf-livestock conflicts. The percent killed has increased as the size of the wolf population has increased and wolf pack distribution has expended into areas where conflicts with

livestock are more likely. Similar trends are evident in the NRM and the Western Great Lakes States in that regard. In 2010, about 20% of the total wolf population was killed to address wolf-livestock conflicts. Despite this level of removal, the Montana wolf population continued to increase through the years.

More flexible federal regulations in the southern Montana experimental area and upon delisting the state framework allowed a private citizen to kill as wolf seen in act of attacking, killing, or threatening to kill livestock. In 2009, 14 wolves were taken by private citizens in defense of livestock when a wolf / wolves were seen chasing or attacking livestock or under a kill permit . In 2010, 17 were taken by private citizens under either the federal 10j provision, the state DOP provision, or under a kill permit.

Because wolves were listed under ESA for the last few months of 2010, wolf-livestock conflict resolution was guided by a combination of the approved state plan, administrative rules of Montana, and federal regulations. Upon relisting in August 2010, the federal regulations took effect once again.

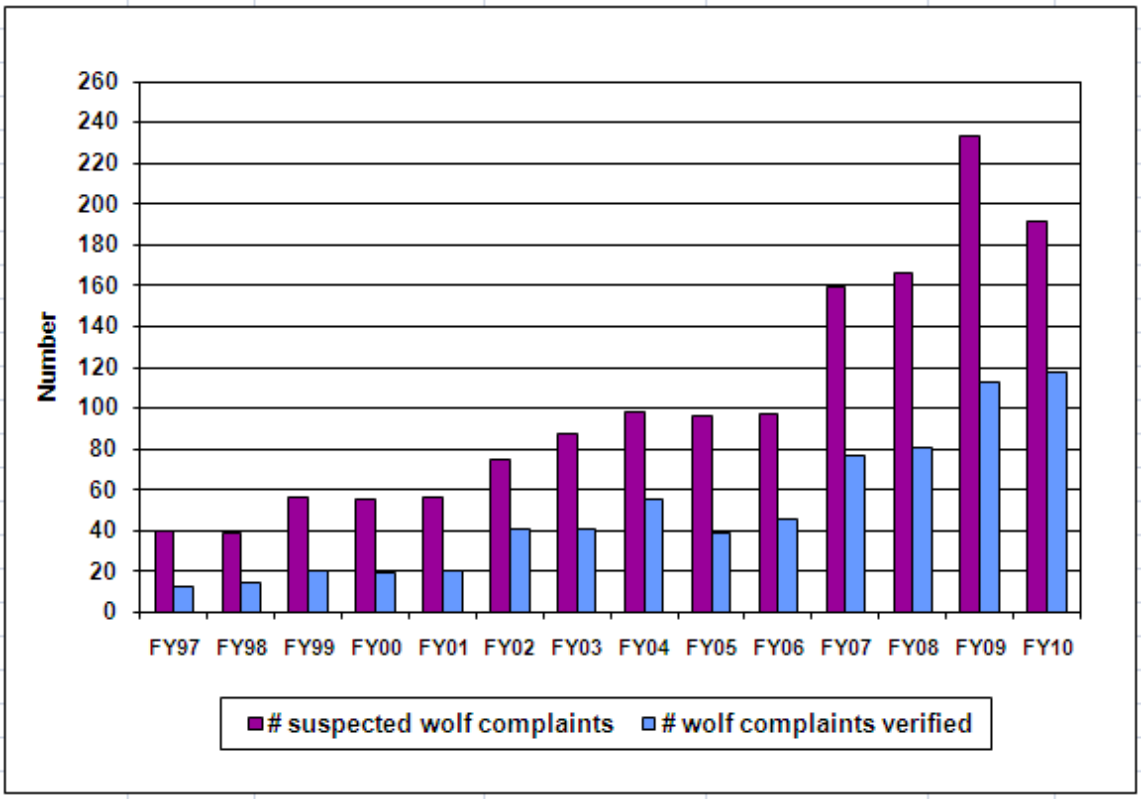

Figure 11. Number of complaints received by USDA Wildlife Services as suspected wolf damage and the percent of complaints verified as wolf damage, federal fiscal years 1997 – 2010. Federal fiscal years from October 1 to September 30.

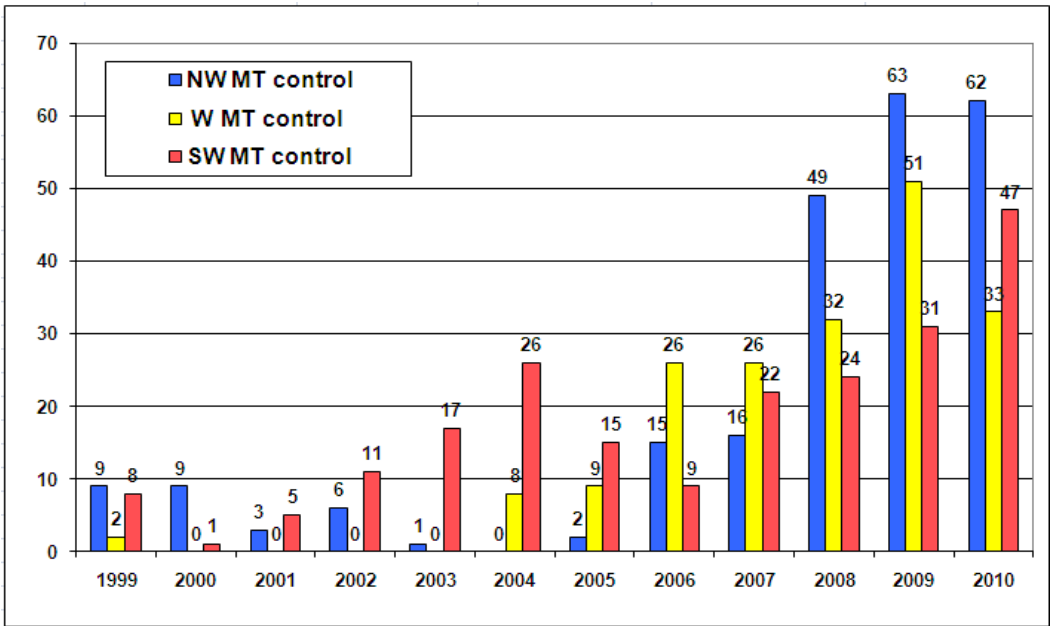

Figure 12. Number of wolves removed through agency control and take by private citizens under either the federal 10j regulation or the state defense of property law in northwest Montana (2009 WMU1, NWMT), western Montana (2009 WMU 2, MT-CID), and southwest Montana (2009 WMU 3, MT-GYA), 1999-2010.

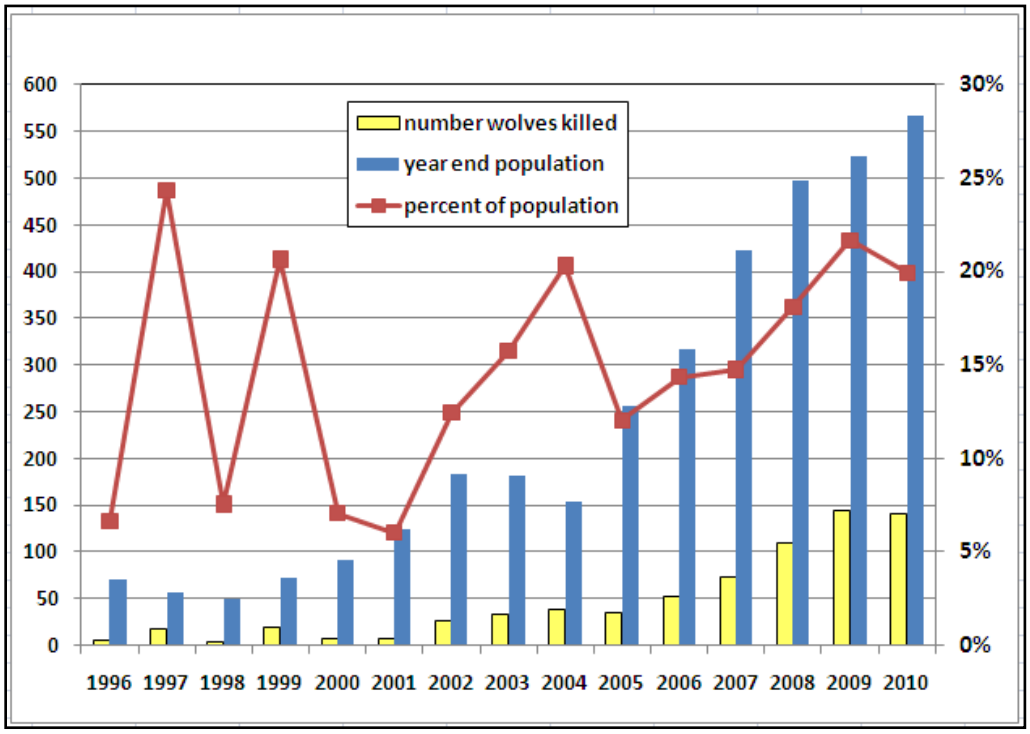

Figure 13. Minimum estimated wolf population (left axis), number of wolves killed to resolve livestock conflicts (left axis), and percent of the population removed (right axis) during calendar years 1996 - 2010.

Depredation Incidents in 2010

The majority of wolf-livestock interactions took place in NWMT and southwest Montana. WS confirmed that, statewide, 87 cattle, 64 sheep, 2 domestic dogs, 3 goats, 3 llamas, 1 horse, and 4 miniature horses were killed by wolves in calendar year 2010 (Figure 14). The first part calendar year 2010 saw higher confirmed death losses compared to the same period in 2009. The "pace" of death losses confirmed during second half of 2010 slowed down considerably so that total cattle death loss in 2010 is lower than 2009. Sheep losses in 2010 are down considerably from 2009 levels. The overall level of agency control remained about the same between the two years.

Approximately 31% of Montana packs had confirmed livestock kills at some point during 2010. Additional investigations were determined to be probable wolf depredations or confirmed injured livestock. Furthermore, many 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.

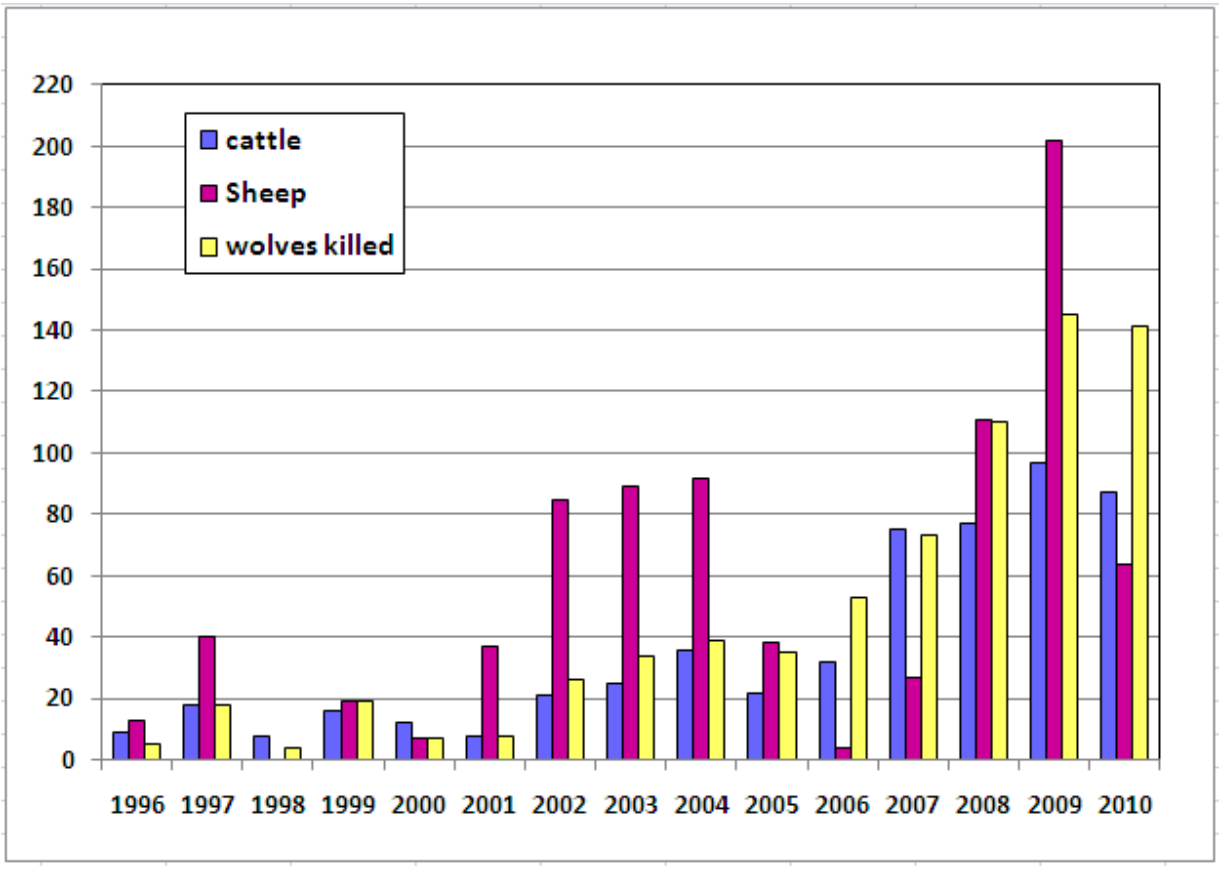

Figure 14. Confirmed cattle and sheep death losses confirmed as wolf-related and the number of wolves lethally controlled in the State of Montana based on investigations by USDA Wildlife Services, 1996-2010.

To address livestock conflicts and to further reduce the potential for further depredations, 141 wolves were killed. Thirteen of the 141 were killed by private citizens when the wolf was seen chasing, killing, or threatening to kill livestock. The others were taken by WS using either ground or aerial based methods. Twelve were removed entirely due to chronic livestock conflicts (Camas Prairie, Elevation Mountain, Fishtrap, Mitchell Mountain, Superior, Horn Mountain, Horse Creek, Rock Creek, Bender, Miner Lakes, Ruby Creek, Horse Prairie).

These 12 packs accounted for 50% of the total number of wolves killed to resolve livestock conflicts. All combined, these packs accounted for 57% of the total confirmed cattle killed and 19% of the total confirmed sheep killed. In some cases, these packs occupied primarily private lands and/or also had some level of failure of nonlethal tools.

In 2010 in NWMT, WS confirmed a total of 26 cattle, 13 sheep, 3 goats, 1 horse, 4 miniature horses and 3 llamas as killed by wolves. Wolf-livestock conflicts also occurred on the Flathead Reservation. A total of 61 wolves were killed through agency control and take in the act by private citizens in NWMT. Five packs were eliminated (Camas Prairie, Elevation Mountain, Fishtrap, Mitchell Mountain, and Superior) due to ongoing conflicts and a very high potential for additional losses.

In 2010 in western Montana, WS confirmed a total of 33 cattle, 1 sheep, and 1 dog as killed by wolves. Of the cattle losses in western Montana, the vast majority were killed in the Big Hole Valley (27 out of 33). Thirty three wolves were killed and several packs were eliminated (Bender, Miner Lakes, Ruby Creek, and Horse Prairie).

In 2010 in southwest Montana, WS confirmed a total of 28 cattle, 50 sheep, and 1 domestic dog. Most of the cattle were lost due to 2 packs (Horn Mountain and Horse Creek), which were both removed. These two large packs accounted for 64% of the cattle lost in this part of Montana. Miscellaneous lone wolves killed 36 sheep in this area, which is about 56% of the total sheep lost statewide. A total of 47 wolves were killed through agency control or by private citizens.

Private citizens killed a total of 13 wolves caught in the act of chasing, attacking or killing livestock (about 9% of the total livestock related mortality).

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.

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.

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 MFWP and its cooperators, the Montana Livestock Loss Reduction and Mitigation Program (MLLRMP) addresses economic losses due to wolf predation and creates 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.

There are three basic components: a loss reduction element, a loss mitigation element, and the state wolf management plan. MFWP and USDA WS would fulfill their responsibilities and roles outlined in the state management plan. The loss reduction and loss mitigation elements are administered by an independent quasi-judicial board that is administratively attached to the Montana Department of Livestock.

Of particular concern to all participants was the need to secure funding for <u>both</u> 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 first Board.

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 proactive livestock management

strategies, and provide financial reimbursements to producers for losses caused by wolves based on the program criteria.

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 wolf population by MFWP 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 implements a reimbursement payment system for confirmed and probable losses that can be verified by USDA WS. Indirect losses and costs are not directly covered, but eventually 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, llamas, and guarding animals. Confirmed and probable death losses are reimbursed at 100% of fair market value. Veterinary bills for injured livestock that are confirmed due to wolves may be covered ~~at~~ up to 100% of fair market value of the animal when funding becomes available.

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. Rulemaking is expected in 2010 to finalize and establish other program implementation details in the Administrative Rules of Montana.

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

The 2007 Montana Legislature appropriated “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 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 got underway. Fundraising efforts began in 2008.

The Montana Livestock Loss Reduction and Mitigation Board (LLRMP) met three times in 2010. With the 2010 funding available, the Livestock Loss Reduction and Mitigation Board prioritized payments for animals that were attacked by wolves and died, as verified (probable or confirmed) by USDA WS. Claims were paid on a first-come, first-served basis. Federal appropriations provided some of LLRMP’s available funding for 2010. Donations were received from the Montana Cattlemen’s Association and Montana Farmers Union for a logo/license plate

contest. The board received 80 logos and awarded a $750 prize to the winner. Natural Resource Defense Council and Defenders of wildlife provided $3,000 of the $4,000 needed to begin the process for a specialty license plate. A specialty license plate will be issued by the board in 2011 for fundraising purposes.

A total of $87,318 was paid to livestock owners for 238 dead animals between April 15 and December 31, 2008. A total of $144,996 was paid to livestock owners for 370 dead animals in 2009 (Table 1). The board continued to receive 2009 claims for livestock losses during early 2010. Preliminary totals for 2010 are $96,077 paid to livestock owners on 163 head of livestock (Table 2). 2010 cattle losses are comparable to 2009 totals. Sheep losses decreased and horse losses increased. Individual animal values have increased for both cattle and sheep.

Federal legislation introduced by Montana Senator Jon Tester has been signed by the President. This legislation provides for $1,000,000 for wolf loss prevention efforts and loss payments in all states. Montana received $140,000 of this appropriation in July of 2010. Future federal funding to continue supporting LLRMB is uncertain pending additional federal appropriations within the federal budget.

Payments for injured animals or funds for cost-share grants to implement proactive tools intended to decrease risk were unavailable in 2010. The board intends to begin a grant process for prevention in 2011. Lack of sufficient funding has limited the board's ability to expand loss and prevention activities. This board and program are primarily funded via private donations and governmental appropriations. Donations are fully tax deductible

If a livestock producer suspects a wolf-related livestock injury or death, USDA WS should be contacted to request an investigation. If the loss is related to wolves, USDA WS will mail a copy of the WS investigation report and the board's livestock loss claim form to the livestock owner. The livestock owner should complete the claim form and mail it (along with the copy of the USDA WS investigation report) to the Coordinator. The Coordinator will determine the market value of the loss based on USDA market reports from Billings each week. Claims for unique or higher value livestock should be accompanied by documentation of value. Claims are typically submitted about one month after the WS investigation is completed. If forms are complete and no unusual circumstances present themselves, claims are processed and payment is made within 2-3 weeks.

Table 1. Payments for confirmed and probable livestock death losses by the Montana Livestock Loss Reduction and Mitigation Board, 2009. Asterisk shows updated figures once all 2009 claims were received and paid.

County	Cattle	Sheep	Goat	Horse	Guard Dog	Llama	Total	Payments
Beaverhead	28*****	184					212*****	$75,448.63*****
Cascade		10					10	$1,295.00
Flathead	2						2	$1,361.00
Glacier	14			1			15	$8,809.42
Granite	5				1*****		6*****	$5,742.41*****
Jefferson	2						2	$1,118.25
Lake	7						7	$5,152.77
Lewis & Clark	12	7			2		21	$11,153.58*****
Lincoln	4	1					5	$2,861.00
Madison	12	14					26	$10,979.41
Meagher		24					24	$3,690.00
Missoula	1						1	$684.00
Park	2						2	$2,525.00
Pondera	1						1	$707.06
Ravalli	1						1	$732.88
Powell	9	1					10	$5,437.58
Sanders	5						5	$3,566.53
Stillwater		2	1				3	$375.00
Sweet Grass		1	2				3	$300.00
Teton	2						2	$1,316.25
Wheatland		12					12	$1,740.00
Total	107*****	256	3	1	3*	0	370*****	$144,995.77*****

[1] Confirmed, defined in MCA 2-15-3112 [as determined by USDA Wildlife Services]: reasonable physical evidence that livestock was actually attacked or killed by a wolf, including but not limited to the presence of bite marks indicative of the spacing of canine tooth punctures of wolves and associated subcutaneous hemorrhaging and tissue damage indicating that the attack occurred while the animal was alive, feeding patterns on the carcass, fresh tracks, scat, hair rubbed off on fences or brush, eyewitness accounts, or other physical evidence that allows a reasonable inference of wolf predation on an animal that has been largely consumed.

[2] Probable, defined in MCA 2-15-3112 [as determined by USDA Wildlife Services]: the presence of some evidence to suggest possible predation but a lack of sufficient evidence to clearly confirm predation by a particular species. A kill may be classified as probable depending on factors including but not limited to recent confirmed predation by the suspected depredating species in the same or a nearby area, recent observation of the livestock by the owner or the owner's employees, and telemetry monitoring data, sightings, howling, or fresh tracks suggesting that the suspected depredating species may have been in the area when the depredation occurred.

Table 2. Payments for confirmed and probable livestock death losses by the Montana Livestock Loss Reduction and Mitigation Board, 2010. (Note: 2010 loss claims will continue to be received by the board beyond the date this report is published.)

County	Cattle	Sheep	Goat	Horse	Guard Dog	Llama	Total	Payments
Beaverhead	29	15					44	$22,725.74
Carbon	1						1	$696.95
Cascade		18					18	$5,550.00
Deer Lodge	1						1	$754.00
Jefferson	2						2	$1,390.59
Lake	1						1	$704.00
Lewis & Clark	3	12	2				17	$5,145.31
Lincoln	8						8	$8,459.07
Madison	25	10					35	$20,633.40
Mineral				4			4	$5,250.00
Missoula	3	1					4	$2,324.03
Park	5	2					7	$4,106.05
Powell	5			1			6	$6,339.78
Ravalli	2						2	$1,509.63
Sanders	11						11	$9,144.43
Silver Bow	2						2	$1,344.00
Total	98	58	2	5	0	0	163	$96,076.98

[1] Confirmed, defined in MCA 2-15-3112 [as determined by USDA Wildlife Services]: reasonable physical evidence that livestock was actually attacked or killed by a wolf, including but not limited to the presence of bite marks indicative of the spacing of canine tooth punctures of wolves and associated subcutaneous hemorrhaging and tissue damage indicating that the attack occurred while the animal was alive, feeding patterns on the carcass, fresh tracks, scat, hair rubbed off on fences or brush, eyewitness accounts, or other physical evidence that allows a reasonable inference of wolf predation on an animal that has been largely consumed.

[2] Probable, defined in MCA 2-15-3112 [as determined by USDA Wildlife Services]: the presence of some evidence to suggest possible predation but a lack of sufficient evidence to clearly confirm predation by a particular species. A kill may be classified as probable depending on factors including but not limited to recent confirmed predation by the suspected depredating species in the same or a nearby area, recent observation of the livestock by the owner or the owner's employees, and telemetry monitoring data, sightings, howling, or fresh tracks suggesting that the suspected depredating species may have been in the area when the depredation occurred.

PACK SUMMARIES

Northwest Montana
Montana Portion of the Northwest Montana Endangered Area (NWMT)

Overview

In 2010, we documented a minimum estimate of 326 wolves in 68 packs in the Montana portion of the NWMT recovery area. That is an increase from 308 wolves in 64 packs at the end of the year in 2009. There were 9 newly identified packs in 2010. Some of these packs are believed to be first year packs, and some are likely to have existed the previous year. Five packs were removed from the population as a consequence of chronic livestock depredation.

Forty-six radio collared wolves in 29 packs, or 43% of the 68 total packs, were monitored in northwest Montana during at least some portion of 2010. This is down from 47% of 64 total packs in 2009. An additional 2 radio collared wolves that had dispersed were monitored at some point during the year and 1 of those was still known to be alive at the end of the year. One additional radio collared dispersed wolf was also monitored, but spent all of its time in British Columbia, Canada. That wolf has been missing since spring. 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 Oregon State University research project personnel. Twenty collared wolves from 16 packs (24% of the 68 total packs) were monitored by the end of the year. Two collars are ARGOS GPS collars. One was for Patch Occupancy Population Modeling research in cooperation with the University of Montana Wildlife Cooperative Research Unit (this collar ceased functioning in Sept), and the other was furnished by Flathead Valley Community College in a cooperative venture as an educational tool for natural resource students. An additional collar is a store on board GPS collar for research conducted by Oregon State University.

MFWP traplines were set in 14 pack territories, and 16 wolves were captured and 11 were collared in 2010. Four were too small and released without radio collars. One had to be euthanized as a result of a trapping accident. USDA Wildlife Services trapped in 10 additional areas and collared 5 wolves. One of these areas was trapped with the cooperation of the Salish Kootenai Tribes on their respective reservations.

MFWP surveyed a total of 44 areas for wolf presence and pack status. Seven of those areas resulted in the verification of new packs. Wolf activity was verified in 5 other areas, but it was unclear whether it is a discrete pack or an area used by an adjacent pack. Twenty-nine 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 may be surveyed again in 2011. One new pack was verified by USDA Wildlife Services.

The 68 packs included in the Montana portion of the NWMT recovery area as of December 2010 are listed in Table 1a. Along the Montana/Idaho transboundary area within the NWMT Recovery area, the Calder Mountain, Deception, and Fish Creek packs are believed to den and spend most of their time in Idaho and therefore are counted towards the Idaho wolf population.

Along the US/Canada Border, the Kootenai North and Spruce Creek packs spend most or all of their time in Canada and are not counted towards the NWMT population.

We were able to confirm reproduction in 25 of the 68 packs (Table 1a). Twenty of those packs met the criterion 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 or adult survivorship of 2 each at the end of the year.

Eighty-nine wolf mortalities were documented in the Montana portion of the NWMT recovery area population in 2010. All but 7 were attributed to some form of human cause including 61 lethally removed in control actions, 10 illegally killed, 7 vehicle collisions, 1 incidentally killed in a coyote snare, 1 incidental trapping injury, and 1 claimed self defense. 1 wolf was legally harvested in Canada. Seven other wolves died of unknown causes. All control action and legally harvested mortalities are precise numbers, while the number of mortalities from all other causes is a minimum observed. Because of this the minimum population count cannot be used to derive percent mortality.

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. NW374F dispersed from the Candy Mountain pack, 25 miles to the SE, and is thought to have started the O'Brien pack east of Troy. 619F dispersed from near Cody, WY, 221 miles to the NW and is thought to have started the Canyon Creek pack. 619F was later removed in a control action following livestock depredations. NW736F dispersed from the Evaro pack, 40 miles to the NE, and appears to have joined the Condon pack (formerly Cilly) in the Swan.

In NWMT, the number of confirmed livestock was down from 2009. Livestock availability varies widely among packs in NWMT, and the majority of packs have no or low levels of livestock present within pack home ranges. The number of confirmed packs in 2010 increased 4%, but the number of packs involved in livestock depredations stayed about the same. Seventeen of 68 packs were involved in some level of livestock depredations in 2010. A three year low in the whitetail deer population throughout much of NWMT is believed to increase the risk of livestock losses due to wolves. We documented 50 confirmed livestock kills. There were 26 cattle, 13 sheep, 4 miniature horses, 3 llamas, 1 horse, and 3 goats. An additional 4 calves and 4 sheep were ranked as probable kills. 10 calves, 2 yearlings, 1 Dexter cow, 2 cows and 2 sheep were confirmed injured. The number of wolves lethally controlled decreased from 63 in 2009 to 56 in 2010. Five entire packs were removed. These figures only account for verified losses. It is not possible to document unverified losses due to wolves. Unverified losses are losses where the cause of dead or missing livestock is not known. Nonlethal measures ranging from range riders to aversive tools such as Radio Activated Guard Boxes and fladry are routinely deployed where applicable and as available. A range rider was utilized in Elevation Mountain, Ovando Mountain, and Arrastra Creek packs. Fladry was used on the Belmont, Ovando Mountain, Morrell Mountain, Fishtrap, Superior packs, and on the Eastern Front.

Verified Packs (Table 1a in Appendix 3)

Arrastra Creek

- at least 8 wolves; breeding pair
- 1 cow confirmed killed; 1 calf probable; 1 wolf removed by WS

History: First documented in 2008. Its territory is in the upper Blackfoot River drainage.

2010 Activities: In early 2010, we estimated 5 wolves in the Arrastra Creek pack based on snow tracking. They denned in the spring and had at least 3 pups. The pack was one of primary focus of the Blackfoot Challenge's range rider project (see research section) due to their proximity to livestock. In June, a cow was confirmed killed on private land and a calf was considered a probable kill. One wolf was killed as a result. Several trapping attempts were initiated to try to deploy a radio-collar. MFWP caught a pup in August but it was too small to collar. No other wolves were captured and the pack remained uncollared at the end of the year. We estimated 5 adults and 3 pups at the end of the year.

Ashley

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

History: First documented in 2006. Its territory is northwest of Kalispell.

2010 Activities: A calf was injured in August. Because of increased workloads, we were not able to survey this area. Reports of wolves continue in this area, and wolf presence is documented. There are at least 2 wolves in this pack actual numbers and reproduction remain unknown at the end of the year. This pack has not been collared since 2007.

Bearfite

- 6 wolves; breeding pair
- no confirmed depredations

History: First documented in 2008. Its territory is north of Libby.

2010 Activities: A female wolf was captured and collared and is the only radio collared member. Trail cameras placed in the area during field operations document a three legged wolf in this pack.

Belmont

- 9 wolves; breeding pair
- no depredations reported

History: First documented in 2008. Its territory is in the Blackfoot Valley west of Placid Lake.

2010 Activities: The Belmont pack was believed to consist of 5 wolves in early 2010. MFWP initiated trapping/radio-collaring efforts in May and June and 6 pups were documented during this time. An adult male was caught in June and severely broke its leg in

the trap and had to be euthanized. No other wolves were captured. At the end of the year we estimated 3 adults and 6 pups.

Benchmark

- 7 wolves; breeding status unknown
- 1 calf confirmed killed, 1 calf probable kill

History: First documented in 2008. This pack occupies a territory west of Augusta.

2010 Activities: At the end of 2009 this pack remained uncollared despite efforts by WS and MFWP. In early May, 1 calf was confirmed killed by a wolf and 1 calf was determined to be a probable wolf kill. A collar was placed in the pack. This wolf was located out of the normal territory shortly after collaring and was never located again in 2010. No other depredations were reported. New wolf activity may have started occurring in part of the Benchmark territory in the late fall. This could possibly be a new pack. Alternatively, it could be due to a shift in territory areas as this area is on the border or the Monitor Mountain, Red Shale, and Flathead Alps home ranges. In early winter 2011, wolf activity was not found in this area.

Bennie

- 2 wolves; breeding status unknown
- no reported depredations

History: First documented in 2008. Its territory is west of Choteau near the Blackleaf Wildlife Management Area.

2010 Activities: No depredations were reported in the year. Wolf activity was noted throughout the year by landowners and hunters. Attempts to place a collar were unsuccessful and will continue into 2011.

Bisson

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

History: First documented in 2009. Transboundary with the Flathead Reservation and located on the northern end of the Mission Range.

2010 Activities: There are no radio collars in this pack.

Bitterroot Range

- at least 7 wolves; not a breeding pair
- no depredations reported
- border pack shared with ID; counted in MT in 2010

History: First documented in 2007. Its territory is in a remote area west of Missoula in the Fish Creek area.

2010 Activities: Getting an accurate estimate on this pack has been difficult because it seems to spend most of its time in the backcountry in a heavily timbered area. Public reports were

consistent in the West Fork and North Fork of Fish Creek during the year. At the end of the year 7 wolves including at least 1 pup could be confirmed through snow tracking.

Blue Mountain

- at least 7 wolves; breeding pair
- no depredations reported

History: First documented in 2007. Its territory is southwest of Missoula.

2010 Activities: At the end of 2009 there were thought to be at least 4 wolves in the Blue Mountain pack. This pack is believed to use the O'Brien Creek/Blue Mountain and Graves Creek areas. At least 5 adults and 2 pups were confirmed in the fall and winter.

Bugle Mountain

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

History: New pack in 2010. Its territory is in the Scapegoat Wilderness in the Upper Blackfoot watershed.

2010 Activities: Numerous early season backcountry hunters reported seeing this pack in early fall 2010 in the Scapegoat Wilderness. Forest Service personnel confirmed at least 9 wolves present. This pack is believed to be the same wolves located during a snow tracking survey near Cooper's Lake and Huckleberry Pass in early 2011.

Cabinet

- 7 wolves; breeding pair
- no confirmed depredations

History: First documented in 2009. Its territory is south of Libby

2010 Activities: Two male wolves were captured and collared in early August. Both wolves have been missing since September. This pack is no longer collared.

Cache Creek

- at least 4 wolves; not a breeding pair
- no depredations reported
- border pack shared with ID; counted in MT in 2010

History: First documented in 2009. Its territory is west of Missoula in the Fish Creek area.

2010 Activities: A previously collared male and an uncollared female established this pack in 2009. The male disappeared in fall 2009 and radio contact with the pack was lost. MFWP surveyed the area in August 2010 and documented reproduction. A female pup was captured and collared but was found dead several days after capture. Upon her retrieval MFWP personnel found another dead uncollared pup. Both pups were sent to the lab for necropsy but cause of death could not be determined. Snow tracking surveys were conducted in Fish Creek in December and at least 4 wolves were present.

Camas Prairie

- 0 wolves; pack no longer present
- 2 calves confirmed killed; 1 calf confirmed injured; 7 wolves removed by WS

History: First documented in 2008. Its territory includes the Flathead Reservation (border pack) between Plains and Hot Springs.

2010 Activities: In early February, 2 calves were confirmed killed. A male was captured and radio collared not long afterward. Later in March, another calf was injured. The entire pack was removed by late April.

Candy Mountain

- 4 wolves; breeding pair
- 1 cow confirmed killed directly and 2 cows killed incidentally in that same event; 1 wolf removed by WS

History: First documented in 2003. Its territory is in the Yaak River drainage.

2010 Activities: Around the beginning of the year, wolf NW374F dispersed from the Candy Mountain pack, 25 miles to the SE, and is thought to have started the O'Brien pack east of Troy. In mid-February, wolves apparently ran three cows into a deep hole in a creek, resulting in all 3 dying. Around that time the Candy Mountain pack had regular presence on that ranch. In late February, 1 wolf was killed. This pack is no longer radio collared.

Canyon Creek

- 3 wolves; not a breeding pair
- 13 sheep confirmed killed; 3 goats confirmed killed; 4 wolves removed by WS

History: First documented in 2010. Its territory is north of Helena.

2010 Activities: During May through September WS confirmed 13 sheep being killed on several different properties during 3 different incidents. In addition during this time period 3 goats were killed during 2 separate incidents. A wolf was collared during early July. During control action disperser 619f (originally captured near Cody Wyoming) was killed. At the time, it was unknown that this wolf was even in the area. No other depredations were reported during the rest of the year. Hunters reported sightings of the wolves in the fall.

Chippy

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

History: First documented in 2009. Its territory in the Thompson River drainage.

2010 Activities: Because of increased workloads, we were not able to survey this area. Reports of wolves continue in this area, but numbers and reproduction remain unknown at the end of the year. This pack has never been radio collared.

Cilly

- at least 2 wolves; not a breeding pair

- no confirmed depredations

History: First documented in 2008. Its territory is in the Swan Valley.

2010 Activities: Another pack (now called Corona) is believed to have been incorrectly identified as Cilly in 2009. Other than its verification in 2008 and that a collared wolf that soon dispersed from the Cilly pack, not much is known about this pack. Because of increased workloads, we were not able to survey this area. Reports of wolves continue, but numbers and reproduction remain unknown at the end of the year. This pack has not been radio collared since 2008.

Condon (thought to be Cilly in 2009)

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

History: First documented in 2009, but originally mistaken for Cilly pack. Its territory is in the Swan Valley.

2010 Activities: In early 2010, 2 radio collared wolves and 1 non-radio collared wolf were traveling together. In late May, a breeding female was killed by a car. Necropsy indicated that she whelped 4 pups. In early June, a male wolf was seen with 4 pups. Those pups were never seen again after that. At the end of the year, the collared male was located with NW736F which had dispersed 40 miles northeasterly from the Evaro pack.

Cottonwood

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

History: New pack in 2010. Its territory includes the Flathead Reservation (border pack) in the Camas Prairie/Hot Springs area.

2010 Activities: There are no radio collars in this pack.

Corona

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

History: First documented in 2006. Its territory is north of Plains.

2010 Activities: In March, 2 wolves were found illegally snared. MFWP game wardens were able to investigate and make a case on a suspect who was later convicted. In early August, a female was found dead of unknown causes. Because of increased workloads, we were not able to survey this area. Reports of wolves continue in this area, but numbers and reproduction remain unknown at the end of the year. This pack is no longer radio collared.

DeBorgia

- at least 6 wolves; not a breeding pair
- no depredations reported
- border pack shared with ID; counted in MT in 2010

History: First documented in 2006. This pack's territory has shifted to the east over the last couple of years and is currently south St Regis.

2010 Activities: Six wolves were believed to be in the DeBorgia pack in early 2010. One pup was hit and killed on I-90 in early January. At least 6 wolves were believed to still be in the pack at the end of the year. Reproductive status for 2010 was unknown.

Dry Forks

- 5 wolves; not a breeding pair
- 3 llamas confirmed killed; 1 calf probable killed; 3 wolves removed by WS

History: First documented in 2009. Its territory is west of Niarada

2010 Activities: There are no radio collars in this pack.

Dutch

- 11 wolves; breeding pair
- no confirmed depredations

History: First documented in 2001, when members of the Whitefish pack crossed the Whitefish Range, and displaced the South Camas pack in the North Fork Flathead River drainage. Its territory is in North Fork Flathead River drainage, and it spends most of its time within Glacier National Park.

2010 Activities: In early June, 2 female wolves were captured and collared. In early November, an adult female wolf was illegally shot and the matter is under investigation. Up to $2,500 is offered as a reward by USFWS. One wolf has been wearing the same radio collar for 6.5 years. The collar is not expected to function much longer.

Elevation Mountain

- 0 wolves; pack no longer present
- 1 calf confirmed killed; 1 calf probable; 1 wolf killed under state DOP law; pack removed

History: First documented in 2006. Its territory in the Garnet Mountains west of Helmville.

2010 Activities: At the end of 2009, the Elevation Mountain pack was authorized for removal after killing livestock. The control action was not completed however and 3 wolves remained in the pack in early 2010. In May, a yearling female wolf was shot by a livestock owner when it was caught harassing cattle. That same day a calf was confirmed killed at a neighboring property and another calf was found and considered a probable kill shortly thereafter. The pack was again authorized for removal and this time all 3 wolves were removed by WS.

Evaro

- at least 3 wolves; not a breeding pair
- no depredations reported; 1 wolf killed by a private citizen under the state DOP law

History: First suspected in 2009; confirmed in 2010. Its territory is northwest of Missoula.

2010 Activities: In 2009 MFWP received multiple reports of wolves around the Evaro Hill area. In April a landowner reported 2 gray wolves trying to attack his dog close to his residence. He shot one of the wolves; a 2 year old gray male. MFWP surveyed the area after this incident and found sign of multiple wolves. Traps were set and a yearling female wolf was caught and collared. She dispersed shortly thereafter and at the end of 2010 was paired with a collared male in the Swan Valley.

Ferry Basin

- 0 wolves; pack no longer present
- no confirmed depredations

History: First documented in 2009. Its territory was on the Flathead Reservation.

2010 Activities: In 2009, the first year this pack was reported, there were 3 wolves. Since then reports of multiple wolves have dropped off for this pack and multiple wolves could no longer be verified. Ferry Basin is no longer considered a pack.

Fishtrap

- 0 wolves; pack no longer present
- 1 Dexter cow confirmed killed; 1 calf confirmed injured; 1 Dexter cow confirmed injured; pack removed

History: First documented in 2000. Its territory included the Thompson, McGuiness, and Fishtrap drainages.

2010 Activities: In early January, a Dexter cow was confirmed killed. In late January, wolves were harassing calves in a pasture. In early February, turbo fladry was installed on 20 acres to protect calves that were harassed in January. A couple days after fladry was installed, 2-3 wolves were reported to have entered the turbo fladry while it was still hot and functioning, and injured a calf. In mid-March, wolves injured a Dexter cow. Lethal control efforts began in mid-February and full pack removal was completed in mid-April. This pack no longer exists.

Firefighter

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

History: First documented in 2008. Its territory is on the east side of Hungry Horse Reservoir.

2010 Activities: Because of increased workloads, we were not able to conduct more than a few days of field work in this area and presence was verified. . In late October, a wolf was shot by hunters who claimed self defense. The hunters were on a return trip from the previous day to retrieve one of the hunter's harvested elk. Wolves were in the area the next day and vocalizing and spooking horses. The hunters were concerned for their safety and shot into the wolves. One wolf was found dead the next day. This pack has never been collared.

Flathead Alps

- 4 wolves; breeding pair
- no confirmed depredations

History: First documented in 2006. Its territory includes the White and South Fork Flathead river drainages (Bob Marshall Wilderness Area)

2010 Activities: Because of increased workloads, we were not able to conduct any survey work in this area. Reports of wolves continue in this area, and wolf presence is documented by the Forest Service. This pack has never been collared.

Good

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

History: New pack in 2010. Its territory is northwest of Whitefish.

2010 Activities: Because of increased workloads, we were not able to conduct more than a few days of field work in this area and presence was verified. In early November, an adult male wolf was shot illegally. Up to $2,500 reward is offered by USFWS for information in this case. This pack is not collared.

Great Bear

- 4 wolves; breeding pair
- no confirmed depredations

History: First documented in 2003 after wolf 271 dispersed from the Spotted Bear pack and paired with another wolf of unknown origin. Its territory is in the Middle Fork Flathead drainage (Great Bear Wilderness Area).

2010 Activities: Because of increased workloads, we were not able to conduct any survey work in this area. Reports of wolves continue in this area, and wolf presence is documented by the Forest Service. This pack has not been collared since 2004.

Great Northern

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

History: First documented in 2009. Its territory is on the west side of the Middle Fork Flathead drainage.

2010 Activities: A wolf was captured in this pack in June but was able to pullout of the trap while technicians were moving in to restrain it. This pack is not collared.

Irvine

- 5 wolves; breeding pair
- 1 calf killed; 2 wolves removed by WS

History: First discovered in 2009. Its territory includes the Flathead Reservation (border pack) west of Flathead Lake.

2010 Activities: In May, a female wolf was captured and collared. She has been missing since mid-September. This pack is no longer collared.

Kintla

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

History: First documented in 2000 in the former 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 Dutch pack summary for additional information). Its territory is in the North Fork Flathead drainage, and it spends most of its time within Glacier National Park.

2010 Activities: In mid-March, a wolf was found dead and the matter is under investigation. In mid-May, a research animal from the Oregon State University study dropped the GPS store onboard collar as scheduled. MFWP attempted to trap to collar the Kintla pack in spring and fall with no success. The Kintla pack did not use any traditional dens in 2010 and may have not reproduced. This pack is no longer collared.

Kootenai South

- at least 2 wolves; breeding pair
- no confirmed depredations

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. Its territory is mainly south of the U.S./Canadian border and west of Koocanusa Reservoir.

2010 Activities: In mid-August, a cow was killed by wolves. The next day, WS captured and collared a male. Since then MFWP has been unable to locate this wolf with fixed wing aircraft. This pack has not been collared since 2007.

Ksanka

- 5 wolves; breeding pair
- no confirmed depredations

History: First documented in 2006 with the discovery of dispersing wolf 263 from the Kintla pack. Its territory is east and southeast of Eureka.

2010 Activities: Because of increased workloads, we were not able to conduct survey work in this area. In mid-September, a debilitated wolf pup was euthanized by a MFWP biologist. That pup had apparently sustained a broken pelvis injury. This pack has not been collared since 2007.

Landers Fork

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

History: First documented in 2009. Its territory is east of Lincoln.

2010 Activities: The Landers Fork pack was first documented at the end of 2009. Five gray wolves were located via snow tracking and visual observation at that time. During the summer and fall there were numerous wolf sightings around the Stemple Pass and Granite Butte area, which were believed to be this same pack. Five to 7 wolves were reported in that area. At the end of the year 5 wolves were located via snow tracking. Reproductive status for 2010 is unknown.

Lazy Creek

- 10 wolves; breeding pair
- no confirmed depredations

History: First discovered in 2001. This pack filled the vacant territory left by the Whitefish pack when it crossed the Whitefish range, displaced the South Camas pack, and became the Dutch pack in 2001. Its territory is north of Whitefish Lake.

2010 Activities: All monitoring activities were conducted during routine telemetry flights. One radio collar is believed to have ceased functioning in January. A second radio collar in the pack was still functioning at the end of 2010 after 8 years, but it is expected to fail soon.

Livermore

- 3 wolves; breeding status unknown
- no depredations

History: First documented in 2005 and its home range is within the Blackfeet Reservation.

2010 Activities: A minimum of 3 are known to exist, and biologists are monitoring through the winter.

Lydia

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

History: First documented in 2006. Its territory is south of Eureka.

2010 Activities: Because of increased workloads, we were not able to conduct survey work in this area. In late July, 2 pups were found dead and the matter is under investigation. This pack has not been collared since 2009.

Marias

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

History: First documented in 2005. Its territory is in the Marias Pass area.

2010 Activities: Because of increased workloads, we were not able to conduct any specific survey work in this area. Reports of wolves continue in this area, and wolf presence is documented. This pack has never been collared.

McDonald

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

History: First documented in 2009. Its territory is in the McDonald Creek drainage within Glacier National Park.

2010 Activities: All monitoring activities were conducted during routine telemetry flights. The collared female localized during the denning season. During a September monitoring flight a possible pup was observed, but no pups could be confirmed at the end of the year.

McKay

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

History: First documented in 2008. Its territory is east of Noxon.

2010 Activities: Because of increased workloads, we were not able to conduct more than a few days of field work in this area. This pack has never been radio collared.

Mineral Mountain

- at least 9 wolves; not a breeding pair
- no depredations reported

History: First documented in 2007. Its territory is in the Lower Clark Fork north of St Regis.

2010 Activities: In early 2010, there were an estimated 11 wolves documented. Nine were reported in the 2009 annual report but 2 additional wolves were documented shortly thereafter. The pack appeared to have denned in 2010 but no pups were ever confirmed due to the loss of both radio-collars in the fall. The collar on one wolf was very old and is believed to have failed. The fate of the other radio collared wolf is unknown.

Mitchell Mountain

- 0 wolves; pack no longer present
- no reported depredations, 2 wolves killed by a private citizen under state defense of property law

History: First documented in 2008. Its territory is northwest of Helena.

2010 Activities: No depredations were reported in early 2010. In May of 2010, 1 wolf was hit by a vehicle and the second wolf was lawfully shot under the state DOP law. There was no evidence this pair had bred or produced pups in 2010.

Monitor Mountain

- 4 wolves; breeding pair
- one calf confirmed killed; 4 wolves removed by WS

History: First documented in 2007. Its territory is northeast of Lincoln on the East Front and in the Scapegoat Wilderness Area.

2010 Activities: This pack was documented as having denned and had pups in the spring. In August, WS confirmed a dead calf. Four wolves were removed and no further depredations were reported.

Morrell Mountain

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

History: New pack in 2010. Its territory is northwest of Ovando in the Blackfoot Valley.

2010 Activities: Three wolves were documented on and around the Blackfoot-Clearwater Wildlife Management Area in 2009. At that time it was unknown whether these wolves were holding a territory. In 2010 this group was confirmed as a resident pack in the area throughout the year. Two trapping efforts were initiated but no wolves were caught. At the end of the year five wolves were estimated in the pack via snowtracking.

Mullan

- 7 wolves; breeding pair
- no confirmed depredations
- border pack shared with ID; counted in MT in 2010

History: First documented in 2008. Mullan is a border pack between Montana and Idaho. Its territory is north of I-90 along the Montana/Idaho border.

2010 Activities: In late July, a male was captured and collared. In early November, a wolf was found dead and the matter is under investigation.

Murphy Lake

- 6 wolves; breeding pair
- 3 calves confirmed killed; 2 cows confirmed injured; 2 calves confirmed injured; 5 wolves removed by WS

History: First documented in 1991. Its territory is between Whitefish and Eureka.

2010 Activities: In early January, a calf was confirmed killed. In early August, another calf was killed, and lethal control efforts were initiated. In late August, 2 adult cows and 1 calf were injured, and in early September, another calf was killed. A second calf was also injured. Five wolves were removed by early October when control efforts were completed.

Ninemile

- at least 8 wolves; breeding pair

- 3 calves killed; 1 calf injured; 4 wolves removed by WS

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

2010 Activities: Ten wolves were in the Ninemile pack in early 2010. In March a calf was killed on private land and another was found injured. Two wolves were killed in response. In May, another calf was confirmed killed and 2 more wolves were killed including the collared male who was caught at the depredation site. Another calf was injured later in May and had to be put down, but no further wolves were captured and no further conflicts were reported. The pack had at least 2 pups in 2010 and there were believed to be at least 8 wolves in the pack at the end of the year.

Nyack

- 10 wolves; not a breeding pair
- no confirmed depredations

History: First documented in 2006 after wolf 505 was discovered to have dispersed from the Avon area. Its territory is in the Middle Fork Flathead River drainage and includes Glacier National Park.

2010 Activities: Because of increased workloads, we were not able to conduct surveys in this area. In late July, an adult male wolf was found dead and the matter is under investigation. This pack has not been radio collared since 2008.

Ovando Mtn

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

History: First documented in 2009. Its territory is north of Ovando in the Blackfoot Valley.

2010 Activities: In early 2010 there were 6 wolves in the Ovando Mtn pack. MFWP initiated a trapping effort in the spring and radio-collared two yearling males. This pack was one of primary focus of the Blackfoot Challenge's range rider project (see research section) due to their proximity to livestock. In September a calf was confirmed killed and 3 wolves were killed as a result. At the end 2010, 5 wolves were present including only 1 pup. One of the collared males was missing and may have dispersed.

Piper

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

History: First documented in 2006. Its territory is in the Swan Valley.

2010 Activities: Because of increased workloads, we were not able to conduct surveys in this area. Reports of wolves continue in this area, and wolf presence is documented. This pack has not been collared since 2009.

Pistol Creek

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

History: First discovered in 2009. Its territory is on the Flathead Reservation southwest of Ravalli.

2010 Activities: This pack has never been collared.

Pulpit Mountain

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

History: First documented in 2006. Its territory is east of Troy and northwest of Libby.
2010 Activity: Because of increased workloads, we were not able to conduct more than a few days of surveys in this area. Reports of wolves continue in this area, and wolf presence is documented. This pack has never been radio collared.

Quartz Creek

- at least 3 wolves; not a breeding pair
- no depredations reported
- border pack shared with ID; counted in MT in 2010

History: First documented in 2009. Its territory is in the Lower Clark Fork near Lozeau.

2010 Activities: Three wolves were estimated in this pack in early 2010. Less activity was reported in this area in 2010 than in 2009 but at least 3 wolves were still believed to be in the area at the end of the year.

Quintonkon

- 7 wolves; breeding pair
- no confirmed depredations

History: First documented in 2009 after a female wolf dispersed from the Spotted Bear pack (18 miles) and mated with a male wolf of unknown origins. Its territory is east of Swan Lake.

2010 Activities: All monitoring activities were conducted during routine telemetry flights which provided good information and allowed crews to prioritize ground-based field work elsewhere. This pack has a large territory.

Red Shale

- 4 wolves; breeding status unknown
- 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 continuous tenure in the North Fork of the Sun River (east side of the Bob Marshall wilderness) ever since.

2010 Activities: As in previous years, consistent hunter reports of wolf activity in the North Fork of the Sun River were received in the fall. Due to the backcountry nature of this pack, MFWP was not able to conduct any surveys in 2010.

Satire

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

History: First documented in 2006. Its territory is north of Thompson Chain of Lakes (west of Kalispell).

2010 Activity: In late December, a female wolf was captured incidentally by a coyote trapper. She was collared and released.

Selow

- 2 wolves; breeding pair
- 2 calves confirmed killed; 3 cows confirmed killed; 7 wolves removed

History: First documented in 2008. Its territory is southwest of Ravalli.

2010 Activities: From mid to late May, 2 calves and 3 cows were confirmed killed. During 2010, a total of 7 wolves were removed. Two are thought to remain and the pack is no longer collared.

Silcox

- 5 wolves; breeding pair
- 2 calves confirmed killed; 3 wolves removed by WS

History: First documented in 2009. Its territory is north and northwest of Thompson Falls.

2010 Activities: Early in the year 2 calves were killed. WS removed 3 wolves and radio-collared a male.

Silver Lake

- at least 7 wolves; not a breeding pair
- no depredations reported
- border pack shared with ID; counted in MT in 2010

History: First documented in 2007. Its territory straddles the MT/ID border near Haugan, west of DeBorgia.

2010 Activities: In early 2010 there was 1 radio-collar in the Silver Lake pack and the pack size was estimated at 13 wolves. The radio-collared female disappeared early in the year so no further flights could be conducted. MFWP surveyed the area in September and found a lot of wolf sign in areas that were known to have been used the previous year. Trapping was initiated but no wolves were captured. A rendezvous site was found that had been used earlier in the summer. MFWP staff found the remains of 3 dead wolf pups at the site but the carcasses were very decomposed. Samples were sent to the MFWP Lab but cause of death

could not be determined. As a result this pack is not believed to be a breeding pair in 2010. At least 7 wolves were believed present at the end of the year.

Sixmile

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

History: First documented in 2009. Its territory is north of Avon.

2010 Activities: There were 5 wolves estimated in the Sixmile pack in early 2010. Very few reports were received in the area during the spring and summer. In the fall a hunter photographed 7 gray wolves near Nevada Mountain.

Smoky

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

History: First documented in 2009. Its territory is north of Columbia Falls.

2010 Activities: Because of increased workloads, we were only able to spend a few days conducting surveys in this area. Reports of wolves continue in this area, and wolf presence is documented. This pack has never been collared.

Solomon Mountain

- at least 2 wolves; not a breeding pair
- no confirmed depredations
- border pack shared with ID; counted in MT in 2010

History: First documented in 2007 after Idaho wolf B296 dispersed from the Boundary pack (Idaho panhandle) to this area. Transboundary pack with Idaho between the Moyie and Yaak Rivers.

2010 Activities: Because of increased workloads, we were not able to conduct surveys in this area. Reports of wolves continue in this area, and wolf presence is documented. This has not been collared since 2008.

Spotted Bear

- 6 wolves; breeding pair
- no confirmed depredations

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, male wolf 117 from the Pleasant Valley Pack, translocated to the same area a year previous, was found 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.

2010 Activities: All monitoring activities were conducted during routine telemetry flights which provided good information and allowed crews to prioritize ground-based field work elsewhere.

Superior

- 0 wolves; pack no longer present
- 4 miniature horses killed; pack removed by WS

History: First documented in 2005. Its territory was in the Lower Clark Fork south of Superior.

2010 Activities: In early 2010, 6 wolves were estimated in the Superior pack. In March, 4 miniature horses were confirmed killed by the pack and MFWP authorized the removal of the pack. Six wolves were killed including the collared alpha male and alpha female.

Tallulah

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

History: First discovered in 2008. Its territory is north of the Lost Prairie and Pleasant Valley areas.

2010 Activities: In late July, a calf was injured, but the pack was located in 2010. It has not been radio collared since 2009.

Thirsty

- 6 wolves; breeding pair
- no confirmed depredations

History: First documented in 2009. Its territory is west of Koocanusa Reservoir.

2010 Activities: Because of increased workloads, we were not able to conduct more than a few days of survey in this area. In mid-July, a USFWS grizzly bear biologists documented 4 pups. This pack has never been radio collared.

Twilight

- 5 wolves; breeding pair
- no confirmed depredations
- border pack shared with ID; counted in MT in 2010

History: First documented in 2008. Transboundary with Idaho and south of Troy.

2010 Activities: Because of increased workloads, we were not able to conduct more than a few days of survey in this area. This pack has never been collared.

Union Peak

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

History: New pack in 2010. Its territory is in the Potomac Valley and Garnet Range east of Missoula.

2010 Activities: A pack was suspected in this area since early 2009 but could not be confirmed until the end of 2010. This pack is believed to cross the Potomac Valley into the Morrison Peak area but likely primarily resides in the Garnets on the south side of the valley.

Wolf Prairie

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

History: First documented in 2004. Its territory is northwest of Pleasant Valley (west of Kalispell).

2010 Activities: Because of increased workloads, we were unable to survey this area. There are reports of wolves in the area and wolf sign is present. This pack is no longer radio collared.

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

Fish Creek

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

2010 Activities: The Fish Creek pack has almost entirely shifted its territory into Idaho but still uses parts of the Fish Creek drainage in Montana from time to time. See Idaho 2010 annual report for more information on this pack.

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

Kootenai North, British Columbia

- at least 2 wolves
- no confirmed depredations on the U.S. side of the border

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. Mainly north of the U.S./Canadian border and west of Koocanusa Reservoir.

2010 Activities: Because of increased workloads, we were unable to survey this area. There are reports of wolves in the area and wolf sign is present. This pack has not been collared since 2008.

Lodgepole Creek, British Columbia

- ? wolves

History: NW389F dispersed from the Bearfite pack (north of Libby) in 2008 and was discovered 62 miles to the northeast in 2009. This pair has been monitored irregularly because it spends all of its time in Canada. Its territory includes Lodgepole Creek near the North Fork Flathead River in Canada.

2010 Activities: NW389F was known to be traveling with another wolf through 2009/2010 winter. She has been missing since 4/22/10.

Spruce Creek, British Columbia

- at least 2 wolves
- no confirmed depredations on the U.S. side of the border

History: First documented in 1990 and spends most if it's time in the North Fork River drainage, Canada. This pack has been monitored irregularly and opportunistically because it spends most of its time in Canada.

2010 Activities: Because this pack is no longer collared and increased workloads, we were unable to survey this area.

Miscellaneous / Lone Individuals in Northwest Montana

NW420M: The Blackfeet Tribe is monitoring this wolf in the Heart Butte area and determined the wolf is still active but it is unknown if it is associated with other wolves.

NW526M: This wolf dispersed from the Lydia pack near Trego/Eureka on 11/17/2009. It traveled south to the Thompson Falls area, then north through the Idaho Panhandle, and 51 miles north into Canada. He headed back south again and into Idaho on 1/11, back to Montana on 1/15-16, and back into Idaho on 1/17. He was shot in Idaho on 1/19/10 under the Idaho defense of property provision to protect a domestic dog.

NW034M: This wolf dispersed from the Kootenai South pack west of Koocanusa after 6/5/2006 and had been missing until 2010. On 1/14/2010, it was trapped and harvested in Canada near Kimberly, BC. This is about 70 miles from the capture location and 45 miles north of the US/Canada border.

Two lone uncollared wolves were documented separately in the Seeley Lake area at the end of the year.

One lone uncollared wolf was documented west of Helmville in the old Elevation Mountain pack territory at the end of the year.

An uncollared male with no known pack affiliation was killed with an SOS permit on private land west of Helmville in May. It was associated with one other wolf, which may be the same one still located in this vicinity at the end of the year.

Three wolves of unknown origin were documented killed by vehicles in separate incidents on I-90 in 2010: one female on Lookout Pass, one adult male near Superior, and one adult male near Alberton.

Suspected Packs in Northwest Montana

Chief Mountain Area (Blackfoot Reservation): Wolves were reported as being seen on the Blackfoot Reservation. No depredations were reported in the area. The wolves are thought to possibly be denning and spending the majority of the time in Canada.

Ear Mountain Wildlife Management Area northwest of Choteau: Wolf activity was reported between the MFWP Sun River and Ear Mountain wildlife management areas, but no wolf packs could be identified before the end of the year.

Highwoods: Public reports indicated 1-2 wolves in the Highwoods area. Upon investigation it could not be determined if there was a resident wolf pack or wolves passing through the area. Investigations will continue in the next year.

Rimini area: M FWP still receives public reports of wolves and wolf sign in the Rimini area southwest of Helena. Some additional reports have been coming from the Little Blackfoot River and Clancy areas that could be related. Efforts to verify a resident pack will continue in 2011.

South Fork of the Sun River/Benchmark (East Front): Wolves were reported in the South Fork of the Sun River and the upper Benchmark area. It is still unclear whether this is a new pack or activity from the Monitor Mountain, Red Shale, Flathead Alps, or Benchmark packs. Efforts will continue to identify wolf activity.

Youngs Creek (Bob Marshall Wilderness): Wolf activity was reported in the South Fork of the Flathead in the Youngs Creek drainage in the fall. Other reports were received around the Pyramid Pass area and in the winter in the Dunham Creek area. Further work will be needed to determine whether these observations are the Morrell Mountain wolves or a different pack.

Petty Mountain (west of Missoula): There have been several reports of wolves in the Petty Mountain area (west of Missoula) in the fall. In the winter, at least 3 wolves were reported in the Albert Creek drainage. Further work is needed to determine if these wolves are part of the Blue Mountain pack or a different pack.

Northwest Peak (northwest Montana): This area is in the northwest corner of Montana along the Idaho and Canada borders. Wolves use this area, but it is not known yet if this is a discrete pack or the Copper Falls pack in Idaho.

There are several other areas of interest in NWMT where we get reports or have documented sign, but information may not be significant enough to suspect actual pack activity or resident wolves. These areas remain of interest and will be scheduled for survey in the 2011 field season. Some of these areas include: the lower Cark Fork River, Bull River, upper Little Bitterroot

River, Wigwam River, Danaher Creek, and portions of the Middle Fork Flathead in Glacier National Park.

Western Montana
Montana portion of the Central Idaho Experimental Area (CID)

Overview

At the end 2010, we documented a minimum of 122 wolves and 21 packs in the Montana portion of the Central Idaho Experimental Area. This is a slight increase from the 110 wolves and 20 packs at the end of 2009. There were 7 newly identified packs in 2010. 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 2010 were the Bender, Big Hole, Brooks Creek, Divide Creek, East Fork Rock Creek, Flint Creek, Gird Point, Lake Como, Painted Rocks, Pintler, Miner Lakes, Mt. Haggin, Horse Prairie, Sula, Trail Creek, Trapper Peak, Watchtower, and Welcome Creek packs. Newly documented packs in 2010 included the Alta, Bannack, Four Eyes, Harvey Creek, Ross' Fork, and Ruby Creek packs. The Bender, Miner Lakes, Ruby Creek, and Horse Prairie packs were removed in 2010 due to livestock depredations. The Ram Mountain pack is believed to no longer exist; two other packs used that area in 2010.

The Beaverhead and Hughes Creek packs (Idaho/Montana border packs) denned and spent the majority of their time in Idaho in 2010 and will therefore count in the Idaho population estimate.

At some point during 2010, 14 (52%) of 27 verified packs in this area in the Montana CID were monitored using ground and aerial telemetry. As of December 31, 7 (33%) of 21 Montana verified packs were being monitored using ground and aerial telemetry. Nine wolves in 7 packs were captured and radio collared in this area in 2010. Four wolves were radio collared during MFWP trapping efforts and 5 were radio collared by WS. Radio collared wolves were located 1-2 times per month by fixed-wing aircraft when possible.

Fourteen of 27 total packs monitored during 2010 in MT CID occupied the Montana/ Idaho border: Alta, Bender, Big Hole, Brooks Creek, Four Eyes, Horse Prairie, Lake Como, Miner Lakes, Painted Rocks, Ruby Creek, Sula, Trail Creek, Twin Lakes, and Watchtower. Four were eliminated due to conflicts with livestock by December (Bender, Horse Prairie, Miner Lakes, Ruby Creek). In 2010, the Big Hole and Trail Creek packs were verified to spend time in Idaho. The others may spend time in Idaho, based on proximity of sightings or telemetry locations to the Montana/Idaho border. Because these 14 packs denned in Montana, or were known to have spent most of their time in Montana, they were counted as Montana packs for 2010.

MFWP conducts most of the monitoring of these packs in close coordination with IDFG and the NPT. The Beaverhead and Hughes Creek packs spent most of their time in Idaho and were monitored primarily by IDFG or NPT. These 2 packs are included in the ID population.

Reproduction was confirmed in 11 packs: Big Hole, Divide Creek, Harvey Creek, Lake Como, Painted Rocks, Ross' Fork, Sula, Trail Creek, Trapper Peak, Twin Lakes, and Welcome Creek packs. Of these 11 packs, a minimum of 35 pups were produced and 8 packs Big Hole, Lake Como, Painted Rocks, Sula, Trail Creek, Divide Creek, Welcome Creek, and Ross' Fork met the breeding pair requirement. Reproductive status of the Alta, Brooks Creek, East Fork Rock Creek, Flint Creek, Gird Point, Mt Haggin, Pintler, Ruby Creek, Four Eyes, and Watchtower packs was unknown.

One dispersal was documented in 2010. SW184F dispersed from the old Sapphire pack and was killed legally under federal 10j regulations south of Butte. One wolf was missing at the end of the year and it is unknown whether it dispersed, the collar failed, or it was killed illegally: SW497 (Welcome Creek pack).

Eight packs were confirmed to have killed livestock or dogs: Bender, Harvey Creek, Horse Prairie, Miner Lakes, Ruby Creek, Trail Creek, Trapper Peak, and Twin Lakes. Single or unknown wolves were responsible for killing 1 calf, 1 lamb, and 1 dog. In total, 33 cattle, 1 lamb, and 1 dog were confirmed killed. Twelve cattle were confirmed injured and 3 calves were documented as probable wolf kills. Thirty-five wolf mortalities were documented in 2010. Thirty-three wolves were killed in response to depredations: 4 were shot by private citizens under federal state 10j statutes, 2 were shot by a private citizen under state Defense of Property statutes, 1 by WS under federal 10j regulations, and 26 were killed by WS in management actions. Two wolves were killed illegally.

Verified Packs (Table 1c in Appendix 3)

Alta

- at least 4 wolves; not a breeding pair
- no depredations reported
- border pack shared with ID; counted in MT in 2010

History: This pack was first documented in 2010 in the West Fork of the Bitterroot but has likely been present for a longer, but unknown duration.

2010 Activities: In July, MFWP conducted field work in the West Fork of the Bitterroot and put 2 collars in the Painted Rocks pack. The Painted Rocks pack was previously believed to use most of the upper West Fork. MFWP conducted extensive surveys and through monitoring work on the collared pack it was determined that a second pack was using part of the upper West Fork. The most recent visual was of 4 wolves.

Bannack

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

History: This new pack formed in 2010. Its territory is north of Grant (south of Dillon).

2010 Activities: There were a couple of public reports and wolves were verified by the end of 2010. Part of this area may have been in the old Horse Prairie territory (which was

removed earlier in 2010) and the Bannock pack may be back filling a vacant territory. There were no reports of depredations in 2010.

Bender

- 0 wolves; pack no longer present
- 7 calves confirmed killed; 5 wolves removed by WS

History: This pack formed in 2009 when one wolf dispersed from the Trail Creek pack and found another wolf that had dispersed from the Sapphire pack. Both wolves were radio collared. Its territory was north of Wisdom.

2010 Activities: The pack at the start of 2010 consisted of three wolves. The pack was implicated in depredations at the end of 2009. In the start of 2010 they were implicated in depredations again in January and incremental lethal control was authorized and successfully completed. Shortly after the first lethal control was completed, additional livestock losses were confirmed. Full pack was authorized and completed.

Big Hole

- at least 6 wolves; breeding pair
- no depredations reported
- border pack with ID; counted in MT in 2010

History: The Big Hole pack formed when B7 and B11 (released in 1995 as part of the original reintroduction efforts) paired up 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 since 1997, although its founders are no longer thought to be alive.

2010 Activities: Five wolves were believed to be in the Big Hole pack in early 2010. There were no radio-collars in the pack during 2010 therefore information was limited to field observations and snow tracking. Nez Perce tribe personnel surveyed the area in the summer and documented at least 4 pups. An adult male wolf was found illegally killed in the fall and is under investigation. At the end of the year there were 6 wolves (2 adults, 4 pups) estimated in the pack.

Brooks Creek

- at least 3 wolves; not a breeding pair
- no depredations reported
- border pack with ID; counted in MT in 2010

History: This pack was first documented in 2005 and holds a territory in the Bitterroot Mountains west of Florence.

2010 Activities: In early 2010, there were thought to be 3 wolves in the Brooks Creek pack. There were no depredations reported in this pack's territory in 2010 but the pack still seemed to be using its same territory west of Florence. Reproductive status of this pack was unknown. We estimated a minimum of 3 wolves in this pack at the end of the year.

Divide Creek

- 13 wolves; breeding pair
- no depredations reported

History: This pack was first confirmed in 2006 and holds a territory in the Sapphire Mountains east of Darby between Skalkaho Creek and the East Fork of the Bitterroot River.

2010 Activities: Seven wolves were believed to be in the Divide Creek pack in early 2010. The pack denned in 2010 and 4 pups were documented from the air in June. The alpha female has been radio-collared since 2006. At the end of the year there were 13 wolves documented in the pack (9 adults, 4 pups).

East Fork Rock Creek

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

History: This pack was first documented in 2007 and holds a territory in the upper East Fork of Rock Creek.

2010 Activities: In early 2010, this pack was believed to consist of about 4 wolves. There were very few reports of this pack until winter. Five gray wolves were documented near Mount Garrity in early winter and were believed to be members of this pack.

Flint Creek

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

History: This pack was first documented in 2007 and holds a territory at the north end of the Flint Creek range.

2010 Activities: Very little new information was learned about this pack in 2010. There were sightings reported throughout the year from the prison ranch area west of Deer Lodge through Gold Creek and Douglas Creek. At least two wolves were believed to be in the pack at the end of the year but there are likely more.

Four Eyes

- at least 6 wolves; no radio collar; not a breeding pair
- no depredations reported
- border pack shared with ID; counted in MT in 2010

History: Newly documented in 2010. Its territory is west of Dell (south of Dillon).

2010 Activities: This area was previously reported as having suspected wolf activity in 2009. Wolf activity was again reported by the public in the Big Sheep Creek area and was verified in 2010. No depredations were reported.

Gird Point

- at least 4 wolves; not a breeding pair

- no depredations reported

History: This pack was first documented in 2009 and holds a territory east of Hamilton between the Welcome Creek and Divide Creek packs.

2010 Activities: At the end of 2009 there were 4 wolves estimated in the Gird Point pack. Very little new information was learned about this pack in 2010 but at least 4 wolves were still present at the end of the year.

Harvey Creek

- 4 wolves; not a breeding pair
- 1 cow confirmed killed; 1 wolf removed by WS

History: SW462F and an uncollared male were together in 2009 but did not establish a territory west of Hall (south of Drummond) until 2010.

2010 Activities: Female SW462F was collared in 2009 and was documented traveling widely with an uncollared male during that year. In 2010 they denned on private property close to livestock west of Hall. Due to concerns from local ranchers, MFWP signed up a volunteer range rider to help with monitoring cattle and wolves. No problems were detected until September when a cow was confirmed killed by the pack. Three pups were documented at that same time. The adult male was killed and the rest of the pack disappeared until later in the fall. At the end of the year the female and 3 pups remained together.

Horse Prairie

- 0 wolves; pack no longer present
- 4 calves confirmed killed; 5 wolves removed by WS

History: First documented in 2008. It was a border pack with ID and the territory was southwest of Dillon.

2010 Activities: In December 2009, WS confirmed that a calf was killed by wolves. One wolf was killed at the end of 2009 and removal efforts continued into 2010. In January 2010, additional livestock losses were confirmed and WS killed 2 more wolves. In late spring 2010, WS again confirmed calves killed by the Horse Prairie pack and full pack removal was authorized and successfully completed. The Horse Prairie pack did not have pups in 2010.

Lake Como

- at least 6 wolves; breeding pair
- no depredations reported
- border pack with ID; counted in MT in 2010

History: This pack was first documented in 2002 and holds a territory in the Bitterroot Mountains southwest of Hamilton.

2010 Activities: This pack's activity is centered between Lake Como and Sawtooth drainages. MFWP conducted field work in the area and documented a minimum of 4 adults and 2 pups at the end of the year.

Miner Lakes

- 0 wolves; pack no longer present
- 14 cattle confirmed killed; 10 cattle confirmed injured; 4 wolves removed by WS; 1 wolf lawfully killed by a livestock owner under the federal 10j regulation.

History: First documented in 2006. It was a border pack shared with ID, and its territory is west of Jackson (Big Hole Valley).

2010 Activities: Miner Lakes had previous depredations in 2009 and were again implicated in depredations in January 2010, at which time full pack removal was authorized. At the beginning of 2010 the Miner Lakes pack had one collar and then a lone wolf (SW587) joined the Miner Lakes pack in early 2010. During a control action, collared wolf B191 was removed and at a later date SW587 collar was chewed off. From May-June, there were 9 incidents of confirmed depredations. WS had been authorized to remove the pack throughout the time period, lack of a radio collar hampered efforts. In October, additional cattle losses were confirmed. The Miner Lakes pack was lethally removed by the end of November.

Mt. Haggin

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

History: First documented in 2007. Its territory is south of Anaconda, mainly on the MFWP Mount Haggin and Fleecer wildlife management areas.

2010 Activities: Hunters reported visuals or tracks of 6 wolves. This pack did not show signs of denning for several years. An increase in a total count this year may be explained by denning or dispersal into the area. Attempts to place a collar in this pack were unsuccessful. The timing and composition of public reports in this area suggest that the pack territory borders of Mt. Haggin and the neighboring Pintler pack may be shifting slightly. Attempts to verify as a breeding pair were unsuccessful.

Painted Rocks

- 6 wolves; breeding pair
- no depredations reported
- border pack with ID; counted in MT in 2010

History: First documented in 2001. Its territory straddles the MT/ID border in the upper West Fork of the Bitterroot.

2010 Activities: At the end of 2009 there were 7 wolves estimated in this pack. MFWP initiated a trapping effort in July and collared 2 wolves, an adult male and a yearling female. Both collared animals were still with the pack at the end of the year and 6 wolves total were present: 4 adults and 2 pups.

Pintler

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

History: First documented in 2007. Its territory is on the south side of the Anaconda-Pintler Wilderness Area.

2010 Activities: Collared wolf SW217 was believed to be in the Pintler pack at the end of 2008 and has not been detected in 2009 or 2010. MFWP trapping efforts to replace the collar were unsuccessful. MFWP field surveys and hunter reports in the fall and winter consist of visuals or tracks of 8 wolves. Pintler and Mt. Haggin pack territories may be shifting slightly based on visual observations of the public. Attempts to verify as a breeding pair were unsuccessful.

Ram Mountain

- 0 wolves; pack no longer present
- no depredations reported

History: This pack was first documented in 2007 and held a territory west of Philipsburg in the Rock Creek drainage.

2010 Activities: This pack is believed to no longer exist in 2010. Two packs (Welcome Creek and Harvey Creek) used parts of this territory in 2010. The fate of the Ram Mountain pack is unknown.

Ross' Fork

- 6 wolves; breeding pair
- no depredations reported

History: This is a newly documented pack in 2010 that holds a territory southwest of Philipsburg in the Sapphire Mountains in and around the Ross' Fork of Rock Creek.

2010 Activities: Two wolves were documented in the Ross' Fork area at the end of 2009 but it was unknown at that time if they were holding a territory. In March, WS opportunistically darted and collared an adult male wolf while doing coyote work in the area. MFWP tracked the collar during the summer but was not able to get any visual observations. The collar could no longer be found during the fall and was believed to have failed. Hunter reports indicated a larger group was likely present. MFWP snowtracked in the Ross' Fork in the winter and documented 6 wolves (2 adults, 4 pups).

Ruby Creek

- no longer exist
- 2 calves confirmed killed; 4 wolves removed by WS

History: First documented in 2010. Its territory is west of Wisdom.

2010 Activities: The Ruby Creek pack back filled the old Battlefield territory. This same area was also used by the Miner Lakes and Bender packs. Depredations were difficult to assign to packs given changing wolf activity in the area and only one radio collar in the area. Two calves confirmed killed by wolves were attributed to the new Ruby Creek pack based on number of tracks compared to Miner Lakes and Bender pack locations and numbers at the time. The Ruby Creek pack very easily could have been involved with previous depredations

assigned to neighboring packs as it was unknown they may have been in the area as a new pack. At the end of 2010, no wolves were thought to be in the area.

Sula

- 9 wolves; breeding pair
- no depredations reported
- border pack shared with ID; counted in MT in 2010

History: This pack was first documented in 2005 and holds a territory west of Sula.

2010 Activities: At the end of 2009 there were 5 wolves estimated in the Sula pack. MFWP conducted filed work in the area in late June/early July and confirmed reproduction. A trapping effort was initiated and a yearling female was caught and collared. Nine wolves were documented in the pack in the fall (5 adults, 3 pups).

Trail Creek

- 7 wolves; breeding pair
- 1 calf confirmed killed; 2 wolves removed by WS; 1 wolf killed by a livestock owner under federal 10j federal regulations
- border pack with ID; counted in MT in 2010

History: This pack was first documented in 2007 and holds a territory between the East Fork of the Bitterroot and the Big Hole Valley.

2010 Activities: In early 2009, the Trail Creek pack was believed to consist of at least 6 wolves. In May, a calf was confirmed killed by this pack on private land. Two wolves were killed shortly after. The alpha female was wearing a GPS collar (see research section) and was recollared with a VHF collar and the alpha male was trapped and collared. No further losses were reported. Four pups were documented in early summer. In the fall, a black wolf from this pack was shot by a livestock owner in the North Fork of the Big Hole when he caught the pack in his cattle. At the end of the year there were 3 adults and 4 pups in this pack.

Trapper Peak

- 5 wolves; not a breeding pair
- 1 calf confirmed killed; 3 wolves removed by WS; 1 wolf killed livestock owner under state Defense of Property law

History: This pack was first documented in 2007 and holds a territory in the Bitterroot Mountains southwest of Darby.

2010 Activities: In early 2010, 6 wolves were estimated in the Trapper Peak pack. In early April a livestock owner legally shot a yearling female wolf that was harassing horses. Later that same month, collared yearling male SW556M was found illegally killed. This case remains under investigation. In May a calf was confirmed killed and MFWP authorized the removal of the remaining members of the pack. WS collared a yearling male and killed 3 wolves, including the collared yearling and an adult male that likely had recently joined the pack sometime earlier in the year. Reports later in the year confirmed the breeding female

was likely still present with at least 4 pups. At the end of the year 5 wolves were estimated in the pack.

Twin Lakes

- 4 wolves; breeding pair status unknown
- 2 cows confirmed killed
- border pack shared with ID; counted in MT in 2010

History: First documented in 2010. Its territory is west of Jackson (Big Hole Valley).

2010 Activities: The first public reports were received in late spring and early summer. A coyote trapper in the fall incidentally captured a pup and MFWP placed a collar on the wolf. The Twin Lakes pack backfilled into the old Miner Lakes territory. The pack was involved in the confirmed depredation of cattle on two separate incidents the end of December and lethal control efforts extended into 2011.

Watchtower

- at least 6 adults; not a breeding pair
- no depredations reported
- border pack shared with ID; counted in MT in 2010

History: This pack was first documented in 2008 and holds a territory in the Nez Perce drainage up the West Fork of the Bitterroot.

2010 Activities: The Watchtower pack was still active in its usual territory through 2010. Reproductive status of this pack was unknown. We estimated 6 wolves in this pack at the end of the year.

Welcome Creek

- 6 wolves; breeding pair
- 1 calf confirmed injured; 2 wolves removed by WS; 1 wolf lawfully killed by a livestock owner under federal 10j federal regulations

History: This pack was first documented in 2006 and holds a territory at the north end of the Sapphire Mountains east of Florence.

2010 Activities: At the end of 2009, 8 wolves were estimated in the Welcome Creek pack including 3 radio-collared females. The pack denned and had 3 pups. Livestock owners in the area were very concerned due to the wolves' proximity to cattle and there were reports of wolves harassing cattle and one report of a cow and calf dying after being run into a barn. MFWP initiated a volunteer range rider program in the area to help step up monitoring. In September a calf was confirmed injured and the same producer reported missing several other calves. Two adult male wolves were killed. There appeared to be some turnover within the pack during the summer. One of the collared females, SW497F disappeared and may have dispersed. Another collared female, SW531F starting travelling north of the pack with an uncollared male from unknown origin and it was suspected that the pack territory was starting to split. In October a landowner saw 2 wolves attacking his sheep in the Miller Creek drainage south of Missoula and shot a black adult male. This wolf was believed to be

the one paired with SW531F. She spent the remainder of the year still coming and going from the main pack but was with the pack at the end of the year. Alpha female SW496F was wearing a GPS collar at the end of the year (see research section) with a functioning VHF signal but the GPS part had failed. Six wolves were estimated in the pack at the end of the year including the 3 pups.

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

Beaverhead: See 2010 Idaho Annual Report. Historically this pack has spent time in Montana and was detected in the fall and winter of 2010 in Montana south of Jackson.

Hughes Creek: See 2010 Idaho Annual Report. This pack occasionally uses the West Fork of the Bitterroot.

Miscellaneous / Lone Individuals in Western Montana

Southeast of the Jackson area, Big Hole Valley: A landowner legally killed a wolf under the federal 10j regulations when it was seen chasing cattle on private land.

West of Feely area, south of Butte: A landowner legally shot dispersing wolf SW184 under the state Defense of Property law when it was seen chasing cattle on private land. This wolf was originally from the Sapphire pack.

West of Wisdom area, Big Hole Valley: WS legally killed a wolf seen chasing cattle from an airplane under the federal 10j regulations.

Hall area: There are at least 2 wolves southwest of Hall in the John Long Mountains but it is unknown if they're holding a territory.

Miller Creek area, south of Missoula: A black male wolf of unknown origin was shot by a landowner in the Miller Creek drainage south of Missoula when it was caught attacking a lamb with another wolf. The black wolf was likely associated with Welcome Creek wolf SW531F (see Welcome Creek pack above) but not with the pack itself. The lamb was injured and had to be euthanized.

Davis Creek, east of Florence: A single unknown wolf killed a dog in the Davis Creek area east of Florence. Although this is the Welcome Creek pack's territory, the pack was known to be elsewhere at the time of this attack.

Suspected Packs in Western Montana

East/ West Pioneers: Hunters reported seeing mostly single wolves in both the east and west Pioneer Mountains north of Dillon. Reports of 2-4 wolves were reported in the NE Pioneers. It could not be determined if this was new wolf activity or activity from the Table Mountain or Mt. Haggin packs. Monitoring will continue into 2011.

Black Pine: At least 2 wolves have been documented using an area southwest of Hall in the Black Pine area. Further work is needed to determine whether they're holding a territory.

Miller Creek/Davis Creek area: During the summer MFWP suspected that the Welcome Creek pack was splitting and that a new pack was forming at the north end of their historical territory. MFWP continues to receive reports of single wolves in the Miller Creek and Davis Creek area and it is unknown whether these wolves are associated with the Welcome Creek pack. Further work will be needed in 2011 to sort this out.

Upper East Fork Bitterroot: In the early summer MFWP received reports in the Upper East Fork of the Bitterroot that were suspected to be a new pack. The area was surveyed and abundant wolf sign was found however a trapping operation could not be initiated at that time. MFWP returned later in the summer but less fresh sign was found. Traps were set but nothing was caught. A single lone black pup was found traveling alone in the Cameron Creek area, which was unusual. No adult sign could be found in that area until the Divide Creek pack showed up nearby several days later but they were thought to have their four pups further north. This area will need further work in 2011 to better determine the extent of the Divide Creek pack's territory and whether another pack exists in that area.

Mormon Creek area: MFWP received several reports of 1 to 2 wolves southwest of Lolo. Further work is needed to determine whether a new pack is establishing in the area or if dispersers were passing through. The Big Hole pack has been found in Mormon Creek before but their main territory is higher up from the South Fork of Lolo Creek up to Lolo Pass and into Idaho.

Other Miscellaneous Information in Western Montana

East of Wisdom: A calf was confirmed as injured by wolves in May and was euthanized later. A collar and release was authorized to learn more about wolf activity in the area. No wolves were caught in 2010.

Southwest Montana
Montana portion of the Greater Yellowstone Experimental Area (MT-GYA)

Overview

Packs in the Montana portion of the GYA were documented from Red Lodge to Dillon. Several packs live on the borders of YNP. Agencies (YNP, MFWP), primarily 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 2010, a minimum estimate of 118 wolves in 19 verified packs, 6 of which qualified as a breeding pair. This represents an increase over the 106 wolves / 17 packs in 2009, but the

number of breeding pairs in 2010 was slightly down from the 9 pairs documented in 2009. The 2010 minimum counts were still slightly less than the 2008 counts.

Six new packs were documented in 2010. They were: Showshoe, Wilson, Meadow Creek, Elkhorn, Snowy, and Madison. Packs that were verified in 2009 and still existed in 2010 were: Rosebud, Buffalo Fork, Baker Mountain, Mill Creek, Eagle Creek, Eightmile, Lebo Peak, Beartrap, Cedar Creek, Toadflax, Cougar 2, Heyden, and Table Mountain. Of the 19 packs left at the end of the year, 6 met the breeding pair criteria.

One border pack shared with Idaho and YNP (Madison) and counted in the 2010 MT population. This pack originally denned within YNP, but by mid-year was not found within YNP again and it's previously used territory was occupied by different wolf packs. Three other border packs are shared with YNP (Buffalo Fork, Cougar2 and Heyden) and are counted in the MT population. Two packs (Cougar and Beartooth) may spend a little time in MT, but are counted in the WY population.

Four packs were eliminated in 2010 due to conflicts with livestock. They are: Horn Mountain, Horse Creek, Black Mountain, and Rock Creek. Of the total sheep death loss confirmed statewide in 2010 (64 total sheep), about 56% of the death loss was attributed to miscellaneous lone wolves in MT GYA (36 sheep). In 2010, 4 packs were eliminated due to chronic livestock conflicts, where as 3 were eliminated in both 2009 and 2008.

The number of collared wolves and the number of wolf packs with at least 1 member radio collared varies throughout the year as new wolves are collared. Additionally, the total number changes as collared wolves die, radio collars malfunction, or collared wolves disperse and are not relocated. At the end of 2010, 8 of 19 (42%) of verified packs were being monitored using ground and aerial telemetry. Radio-collared wolves were located 1-2 times per month by fixed-wing aircraft and ground telemetry.

In 2010, 9 of the total 23 packs that did exist at one time during the year (39%) were confirmed to have killed livestock (Table 1b), resulting in the lethal removal of 47 total wolves [5 of which were killed by private citizens in defense of property either under the applicable federal experimental rule (10j) or the state defense of property law after delisting]. Four packs (Horn Mountain, Horse Creek, Black Mountain, and Rock Creek) due to chronic conflicts. Four of the 47 wolves controlled was a lone wolf with no pack affiliation. No wolves were killed under shoot on sight permits issued to livestock producers.

Fifty five total mortalities were documented. Forty seven wolves were killed to resolve livestock conflicts, 51% of which was attributed to two packs which were removed entirely (Horn Mountain and Horse Creek). Two died of unknown causes. One wolf was euthanized by WS due to an older gun shot wound injury. Four were killed by vehicles, and 1 wolf was killed illegally. All wolves killed in agency control actions or legally harvested are precise numbers, while the number of mortalities from all other causes is a minimum that MFWP documented. The actual number is unknown. Further, these numbers can only be applied to an overall population count that is also known to be a minimum estimate.

Verified Packs (Table 1b in Appendix 3)

Cougar Creek 2

- 9 wolves; breeding pair
- no depredations reported
- border pack with YNP; counted in MT in 2010

History: The Cougar Creek 2 pack formed in 2006. Three members of the Cougar Creek pack split off and formed this new pack. The original Cougar Creek pack's home range was mostly inside YNP, and NPS personnel did all the monitoring. The Cougar 2 pack is a border pack and spends most of the winter outside of YNP and MFWP does most of the monitoring.

2010 Activities: On two separate incidents in July and August two yearling wolves were hit by motor vehicles on HWY 191 near or within the border of YNP. This area is known to be in close proximity to previous rendezvous sites. Cougar 2 spent the winter in the Gallatin drainage and was not found in the Madison Valley during 2010 as it had been in previous years.

Hayden

- 6 wolves; breeding pair
- no depredations reported
- border pack with YNP; counted in MT in 2010

History: This pack has historically been an YNP pack. But due to pack/territory disputes within YNP, it began spending more time in Montana beginning in 2008.

2010 Activities: The lone remaining radio collar was never heard in 2010 during routine monitoring flights. It is unknown if the radio collar quit working or if something happened to the collared wolf. MFWP, on several occasions, did verify wolf activity in the Teepee and Cabin Creek areas of this territory but did not attempt to set out a trapline due to high grizzly bear activity. There are no active grazing allotments in this territory.

Beartrap

- 18 wolves; breeding pair
- no depredations reported; 1 wolf killed by a private citizen under federal 10j regulations

History: The Bear Trap pack formed in 2002. It occupies a territory at the north end of the Gallatin Mountain Range near the Spanish Peaks.

2010 Activities: In April, MFWP darted and collared 2 adult male wolves on a local ranch while collaring elk for an anthrax research project. In late October, a livestock owner producer shot a black wolf that was chasing his cows within the Bear Trap Pack territory. A total of 18 animals were documented at the end of 2010, at least 7 of these are pups of the year. This pack seems to spend the majority of its time on private land.

Wilson

- 6 wolves; breeding pair
- no depredations reported

History: New Pack formed in 2010. It occupies a territory on the north end of the Gallatin Range south of Bozeman from Little Bear Creek to Squaw Creek.

2010 Activities: In January 2010, wolves were observed from a local rural subdivision making kills on wintering deer and elk. As the big game dispersed to summer range so did the wolves. MFWP found the wolves in late August, high in the forest and documented pup survival. MFWP attempted to set traps, but high big game hunting activity moved the wolves and they were not located again. No known depredations occurred in this territory.

Horn Mountain

- 0 wolves; pack no longer present
- 6 calves confirmed killed; 1 calf confirmed injured; 1 calf probable killed; 13 wolves removed by WS; 1 wolf killed by a private citizen under the state DOP law

History: New pack in 2008. It occupied a territory at the south end of the Madison Range in the Antelope Basin area.

2010 Activities: In 2010, pack activity and denning shifted to the West Fork of the Madison River. In a total of 7 separate incidents, 6 calves were killed, 1calf was injured and 1 calf was a probable kill by wolves on the West Fork Madison grazing allotment from July through September. Three wolves total were killed in early July by WS and 1 wolf was killed by a livestock owner in August under the state DOP law just before relisting. These removals did not stop or slow down the depredations so MFWP authorized WS to remove the rest of the pack in late September. Ten more were killed.

Snowshoe

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

History: New Pack in 2010. It occupies a territory in the Gravelly Mountains from Horse Creek to the West Fork of the Madison River.

2010 Activities: A radio collared member of the Gibbon pack (YNP) was found during a routine monitoring flight in the West Fork of the Madison in late October. It has been seen traveling with another uncollared gray that has a severely injured front leg.

Horse Creek

- pack no longer exists
- 12 calves confirmed killed; 1 calf confirmed injured; 1 calf probable killed; 9 wolves removed by WS; 1wolf euthanized due to a prior injury; 1 wolf killed by a private citizen under the state DOP law

History: New pack in 2008. It occupied a territory in the Gravelly Mountains from Wigwam Creek to Standard Creek, including MFWP's Wall Creek Wildlife Management Area.

2010 Activities: In 2010 pack activity and denning shifted from the Wall Creek WMA north to private land in the Morgan Gulch area. In early February, WS darted a lone wolf found in cattle on a private ranch. Prior to collaring the wolf it was noted that the wolf had a broken

hind leg with a draining open wound. Due to its poor body condition the wolf was euthanized. A necropsy revealed that the wolf had an old bullet wound, with the bullet lodged in the leg joint. In late June, a local landowner shot a wolf under the state DOP law. In a total of eight separate incidents, 12 calves were killed, 1calf injured and 1 calf called a probable kill by wolves on the Morgan Gulch area of the Madison grazing allotment and private land in July and August. Two wolves were killed in early July by WS. MFWP authorized the removal of the rest of the pack in mid-August.

Rock Creek

- 0 wolves; pack no longer present
- 4 sheep confirmed killed; 1 sheep confirmed injured; 3 wolves removed by WS

*History***:** New in 2010. Its territory was south of Dillon.

2010 Activities: In 2 separate incidents in mid-October, WS confirmed a total of 4 ewes killed and 1 ewe confirmed injured on private property. A week later, WS was flying in the area and found 3 black wolves in the same pasture with sheep and killed the wolves. No further depredations and no further wolf reports were received from this area.

Toadflax:

- 9 wolves; breeding pair
- no depredations reported

*History***:** Pack formed in 2008 when 3 wolves showed up in vacant Wedge pack territory (Wedge was removed in 2007). The Toadflax pack occupied a territory at the south end of the Madison Range from Beaver Creek north to Indian Creek.

2010 Activities: In 2009 the Toadflax pack numbered 10 wolves and included 2 radio-collared yearling males. Disruptions in the pack caused both of the radioed males to disappear. One (SW386M dispersed to Idaho where it was killed by WS in a control action in late March. The other has not been heard since December 2009. Due to unknown reasons, the Toadflax Pack went from the ten members down to a breeding pair and pups in 2010. MFWP picked up a gray male wolf from the Ennis Department of Transportation personnel in early February that was hit by a motor vehicle on Hwy 287 near the junction to Reynolds Pass. It appeared to be a pup from last year. There are currently no radio collars in the pack, but there are very visible and seen during routine monitoring flights. In 2010 the Toadflax pack used traditional den and rendezvous sites that had been used in 2009 and by the previous Wedge pack.

Black Mountain

- 0 wolves; pack no longer present
- no confirmed depredations

History: New pack in 2008. It occupied a territory in the Madison Range from Bear Creek to Indian Creek.

2010 Activities: Most members of the pack had severe mange by the end of 2009 and it is suspected that they died in early 2010.

Cedar Creek

- 4 wolves, not a breeding pair
- 1 calf confirmed killed; 10 sheep confirmed killed; 6 wolves removed by WS

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

2010 Activities: In early March WS darted and collared 2 members of the Cedar Creek pack (thought to be 10 wolves at the time). In late April WS confirmed a calf as being killed by wolves in the Cedar Creek territory. In early May, WS removed 5 wolves, including one of the radio collared males. In late May, WS confirmed that 10 ewes were killed by a wolf on private land in a pasture near a house and corrals near Jeffers (just outside of Ennis). WS set traps near the carcasses and captured the radio collared male wolf of the Cedar Creek pack. That wolf was killed at the depredation site and no depredations were confirmed in the territory during the rest of 2010. The status of the Cedar Creek pack was somewhat uncertain at the end of 2010, but 4 wolves are still thought to be present.

Meadow Creek

- 6 wolves; not a breeding pair
- 1 probable calf killed

History: New pack in 2010. It occupies the south end of the Tobacco Root Mountains from North Meadow Creek to Granite Creek.

2010 Activities: A calf was determined to be a probable wolf kill in late September. The incident occurred in the same pasture as WS confirmed a calf as being killed by wolves in 2009. Efforts to put out a collar out in 2009 were unsuccessful and there were no further depredations in 2009 or confirmed sightings. The livestock owner reported seeing up to 6 wolves in 2010. Various additional sightings of 6 wolves in the south end of the Tobacco Root Mountains were received in October. MFWP tried to locate the pack, but could not find enough consistent sign to set out traps without conflicting with big game hunters.

Madison Pack

- 5 wolves; not a breeding pair
- no depredations reported
- border pack with ID and YNP; counted in MT in 2010

History: The Madison pack formed in 2010. Its territory is in the area of the MT/ID border and Henry's Lake.

2010 Activities: This pack denned just inside the park in 2010. After the denning period, it left the park and spent time near the ID/MT border. Towards the end of 2010, it became clear that this pack had permanently abandoned the YNP part of its territory as those areas were being used by other YNP packs. No pups could verified at the end of 2010 although the pack was seen during a routine monitoring flight.

Rosebud

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

History: Pack formed late in 2005. Its territory is from Red Lodge to the Fishtail/Nye area.

2010 Activities: In late April, WS confirmed a calf as being killed by wolves south and east of Red Lodge in the territory of the Rosebud pack. WS called on the carcass with no response from the wolves. Efforts to place a collar were unsuccessful, and no more depredations occurred. MFWP estimates that there are 3 wolves in pack.

Baker Mountain

- 4 wolves; breeding pair
- 1 calf confirmed killed; 1 stock dog confirmed killed; 2 wolves removed by WS

History: This group was documented in fall 2005 shortly after a female wolf was caught and collared near a depredation site. Its territory is in the West Boulder area, south of Big Timber.

2010 Activities: One calf was confirmed killed by a single wolf, possibly a member of the Baker Mountain pack in September. One stock dog was confirmed as killed in December and 2 adult wolves were removed by WS 6 days later. Earlier in the year, 5 pups were documented, but only two survived to the end of the year.

Buffalo Fork

- 5 wolves; breeding status unknown
- no depredations reported
- border pack with YNP; counted in MT in 2010

History: The Buffalo Fork pack formed in 2003, north of YNP in MT in the Buffalo Fork drainage. 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. In 2005, numerous public reports were received from backcountry recreationists. In July 2005, MFWP personnel backpacked through the historic Buffalo Fork territory in the Absaroka- Beartooth Wilderness and found sign of wolf activity. It was believed to still exist from 2005-2009.

2010 Activities: Not very much is known about the Buffalo Fork pack in 2010. Sightings consisted of 5-6 wolves, with a lactating female seen in summer 2010 although pups were not documented by the end of December. This pack is thought to exist primarily outside of YNP, at times using the upper Slough Creek drainage inside YNP.

Mill Creek

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

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, near Emigrant.

2010 Activities: The pack localized during denning season and seemed to stay on Forest Service land for most of the year. However, WS confirmed a calf killed in mid May and had been authorized to remove 2 wolves. No wolves were taken during the 45 day control period. In mid October WS confirmed another calf as injured by wolves, and it was later euthanized. WS removed 2 wolves by late November.

Eightmile

- 6 wolves; not a breeding pair
- 2 calves confirmed killed; 1 calf confirmed injured

History: New pack formed in early 2007. It occupies a territory on the west side of Paradise Valley, south of Livingston.

2010 Activities: In early June, MFWP trapped and collared a black adult male in the Tom Miner Basin area. WS confirmed a calf as being killed by wolves in mid July on a grazing allotment in the Tom Miner area. While moving cows off the grazing allotment in mid September, 2 wolves were found feeding on a dead calf (which WS later confirmed). Due to the cows being moved off of the allotment and the owner not wanting lethal removal, there was no lethal control. In late September WS confirmed a calf as being injured by wolves, the injuries were not life threatening and no control actions were initiated.

Eagle Creek

- 8 wolves; breeding status unknown
- no depredations reported

History: This pack replaced the Casey Lake pack. Its territory is on the east side of the Yellowstone River north of Gardiner.

2010 Activities: The pack seemed to be expanding its range north from Jardine to Dome Mountain during 2010. The female's radio collar was found on mortality mode during an early January 2011 flight and had not been retrieved as of publication due to heavy snow cover. It is unknown whether or not it was a shed collar or the wolf was dead. Pups were suspected but could not be verified in 2010.

Lebo Peak

- 3 wolves; no radio collar; not a breeding pair
- no depredations reported; 1 wolf killed by a private citizen under state DOP law

History: New pack in 2008. Its territory is on the northeast end of the Crazy Mountains.

2010 Activities: Almost 2 miles of fladry were strung around a calving pasture as a preventative measure. This is the second year the fladry has been applied as the landowner reported wolves travelling through the property. The pack remained uncollared in 2010 and landowners reported 1-3 wolves. No depredations were reported in 2010. Under the state DOP law, one collared wolf was shot in early April in the Lebo Peak territory while harassing livestock. This animal was a disperser and was originally collared in 2009 in Paradise Valley. It was last located near Cutler Lake (near Corwin Springs) in March of 2010.

Elkhorn

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

History: This new pack formed in 2010. Its territory is west of Townsend.

2010 Activities: There were a couple of public reports during the summer and a handful of hunter reports in the fall. The pack was verified in late 2010.

Table Mountain

- 7 wolves; breeding pair
- 1 calf confirmed killed; 1 calf probable killed; 3 wolves removed by WS; 1 wolf illegally killed; 1 wolf killed by a private citizen under state DOP law

History: New Pack in 2009. Its territory is at the south end of the Highlands, south of Butte.

2010 Activities: A radio collar was placed in the Table Mountain pack in early 2010. In March, a wolf was illegally killed. In April, wolf 690f was legally killed by a landowner under the state DOP law. The wolf had dispersed from YNP, and it was unknown if she had joined the Table pack or was just moving through the territory. She showed signs of mange. In May, WS confirmed that wolves killed 1 calf and 1 calf was a probable wolf kill. WS removed 3wolves.

Snowy

- 3 wolves; not a breeding pair
- 2 yearling cattle confirmed injured

History: This new pack formed in 2010. Its territory is south of Lewistown.

2010 Activities: Two yearlings were confirmed injured by wolves near the end of 2010. A ranch employee chased 3 wolves out of the cattle herd. Attempts to place a radio collar where unsuccessful and will continue into 2011.

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

There were 2 border packs shared between MT and WY during 2010 (Cougar Creek, and Beartooth) that were counted in the WY population. See Appendix 3 Table 2 and the USFWS's Wyoming Annual Report (Jimenez et al. 2011).

Miscellaneous / Lone Individuals in Southwest Montana

Blacktail Area (South of Dillon): In mid June 5 ewes and 5 lambs were confirmed killed by wolves by WS on a private pasture south and east of Dillon. Traps were set in the area and no wolves were caught. There has occasional wolf activity in the area the last couple of years. No more depredations occurred in this area.

South of Ulm area: At the end of year wolves were confirmed to have killed a total of 23 sheep, 1 sheep was confirmed injured and 4 sheep were probable wolf kills on two different ranches during several different incidences. The affected landowners and WS initially thought that domestic dogs were responsible, and no initial action was taken. After more sheep had been killed, WS determined wolves were responsible. Tracks of 2 wolves were detected in the area and both where authorized to be removed. One wolf was killed before the end of the year. Efforts to remove the other wolf continued into 2011.

Suspected Packs in Southwest Montana

Bracket Creek area: One black pup was hit by a vehicle in September near the Bridger Mountains. Pack affiliation is unknown. A pack could not be verified by the end of 2010.

South of Cascade: A couple of hunters reported seeing a lone wolf during the fall and WS confirmed sheep kills in early summer. It is unknown whether this activity is related to the wolf activity south of Ulm. A hunter reported seeing a lone wolf at the end of 2010. Monitoring and collaring attempts will continue into 2011.

Trail Creek area (south of Livingston, west side of Yellowstone River): Reports continue of 1-3 wolves in the Trail Creek area. Two ewes and 1 calf were confirmed killed by wolves and could be attributed to this new group. Efforts will be made to get a radio collar on the group in 2011.

Slip n Slide:
This pack formed when a wolf collared in the Eight Mile area (south of Livingston) moved to the Dome Mountain area with two other wolves in January 2009. This is the northern most end of the Eagle Creek pack territory. The Slip n Slide collared female became missing in August of 2009 and contact with the pack has since been lost. Numerous reports of wolves from landowners in the Slip n Slide territory were received in the fall, although the Eagle Creek pack had also been found in the Slip n Slide territory in 2010. It is unknown if members of Slip n Slide still exist and field work in 2011 will be necessary to clarify the pack's status.

Ruby Creek area (Southwest of Belfry, close to/overlapping WY border): Reports of 1-3 wolves in this area came in throughout the fall, and continued into 2011. Groundwork to investigate reports will continue in 2011.

East Shore Canyon Ferry/Big Belts: Reports have been received of wolves occupying the Big Belts/ east shore Canyon Ferry area. Efforts to follow up in this area will continue in 2011.

Elk Park/Bernice/Whitetail: Hunters reported wolf sightings and tracks of 1-3 wolves. WS confirmed two calves killed in the Pipestone area that could be associated with these sightings. It is unknown if wolves have established a territory in this area or were moving through. Attempts to collar a wolf a further document wolf activity were unsuccessful.
Attempts to locate wolf activity will be made in 2011 if activity persists.

Northwest of White Sulphur Springs area: A landowner shot one wolf in June of 2008. Hunters and ranchers continue to submit reports of wolf sightings and tracks from nearby areas in 2010 wolf pack could not be verified by the end of 2010.

West of Utica: A few reports of wolf activity were reported in the east end of the Little Belts. However, attempts to locate an established pack were unsuccessful and will continue in 2011.

Other Miscellaneous Information in Southwest Montana

Northwest of Twin Bridges: A calf was confirmed as killed by wolves. This area is new for wolf activity. A collar and release was authorized to learn more about what wolf activity was occurring in the area. No wolves were captured and no further depredations were reported.

Gravelly Mountains: In late July WS confirmed a calf as being killed by wolves in the Top of the Gravelly Mtns. It could not be determined if it was in the Horse Creek or Horn Mountain territories so is listed as a miscellaneous kill. In late September WS confirmed a calf as being killed by wolves in the Warmsprings area of the Gravelly Mountains. This was in the territory of the Horse Creek Pack but the depredation occurred after the full pack removal of the Horse Creek pack.

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 Montana 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 increasingly important aspect of outreach is the Internet. In 2010, the MFWP website hosted 316 pages with wolf program content. These pages were viewed a total of 117,623 times in 2010, a 7.3% increase from 2009. There were 91,164 unique page views in 2010, an increase of 11.4% from 2009. During 2010, wolf pages were visited between 14 and 728 times a day, or an average of 322 times per day. See http://fwp.mt.gov/wolf.

According to diagnostic statistics, the 5 most popular wolf pages are: the opening pages (i.e. information about listing status, latest news etc), the wolf hunt planner, the wolf weekly, wolf management, and wolf population (i.e. information about the size and distribution of Montana's wolf population). These 5 pages accounted for about 51% of the total visits to all of the wolf program web pages. Diagnostic statistics also suggest that the public visitors spend more time on the wolf pages (one minute, 44 seconds) compared to the average of other MFWP web page visits.
The "Report a Wolf" application continued to bring valuable information so the public can help MFWP with monitoring efforts for existing packs and documenting wolf activity in new areas. Several hundred reports were received through the website. Countless more were received via postal mail on a pre-printed card and over the phone.

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. A wide variety of media requests are also received, ranging from daily newspapers, magazines, documentary filmmakers, and authors.

Most wolf program staff spend 1-5 days at hunter check stations each hunting season in MFWP Regions 1-4 to talk with hunters about wolves, wolf management, and their hunting experiences. Hundreds of conversations are held. MFWP wolf staff also receive invitations for presentations from a wide variety of groups every year. Staff try to accommodate as many as possible given other work priorities and the time of year.

Presentation Outreach Categories:
Civic: Kiwanis Club, Rotary Club, Lions Club, church groups, etc.
Teacher/school: K-12, teachers
College/Professional: colleges, conferences, and adult education
Hunting: non-profit hunting and sportsperson related, check stations, outfitting, rod and gun, etc.
Landowner / Livestock: livestock groups, permittees, watershed groups, etc.
Agency/government: Forest Service, BLM, NPS, county, Montana Legislative Committees, etc.
Wildlife Advocacy / Conservation: non-profit wolf advocacy or non-consumptive group

Outreach Categories	# of Programs (% of total programs)	Number of attendees (% of total attendees)
Civic	6 (12%)	176 (5%)
Teacher/school	5 (10%)	760 (23%)
College/professional	6 (12%)	511 (16%)
Hunting	12 (24%)	857 (26%)
Landowners / Livestock	9 (18%)	385 (12%)
Agency/government	10 (20%)	550 (17%)
Wildlife Advocacy	1 (2%)	26 (1%)
Total:	49 (100%)	3265 (100%)

RESEARCH, FIELD STUDIES, AND PROJECT PUBLICATIONS

Each year in Montana, there are a variety of research projects and field studies in varying degrees of development, implementation, or completion related. These efforts range from wolf ecology, predator-prey relationships, wolf-livestock relationships, policy, or wolf management. Additionally, the findings of some completed projects get published. The 2009 efforts are summarized below.

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

Graduate Student: Cristina Eisenberg, Boone and Crockett Club Fellow

Committee Chair: Dr. William J. Ripple, Oregon State University, Corvallis

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. We are studying trophic cascades involving human land use, wolves, elk, and aspen in the Crown of the Continent Ecosystem. Our 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 in areas of high, medium, and low wolf density, 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 8 radio-collared wolf packs. Project partners include 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, Oregon State University, and the Boone and Crockett Club.

Project Activity in 2010: During this third and final year of field research, no further GPS collars were deployed on our project. Most of our activity consisted of radio-tracking currently collared wolves in the North Fork, and analysis of wildlife (elk, wolf, vegetation, songbird) data, with a focus on the fire ecology in our North Fork study area and on the interaction of bottom up and top-down effects in this and all study areas.

Preliminary Results: Wolf presence has direct and indirect effects on multiple levels of the food web, within a classic three-part trophic cascades framework (predators-prey-vegetation), with these effects mediated by bottom-up effects (fire, climate, human land-use), and wolf and prey populations. In our study area (two national parks) elk represent the dominant herbivore in elk winter range, as measured by pellet transects. Changes in elk herbivory due to wolf predation may be creating richer songbird habitat, thereby increasing biodiversity, however bottom-up effects have a powerful role in shaping aspen community ecology.

Cadmium, Copper, Iron, and Zinc Concentrations in Kidneys of Grey Wolves, Canis lupus, from Alaska, Idaho, Montana (USA) and the Northwest Territories (Canada)

Co-Authors: S. R. Hoffmann, S. A. Blunck, K. N. Petersen, E. M. Jones, J. C. Koval, R. Misek, J. A. Frick, H. D. Cluff, C. A. Sime, M. McNay, K. B. Beckman, M. W. Atkinson, M. Drew, M. D. Collinge, E. E. Bangs, R. G. Harper.

Abstract: Cadmium, copper, iron, and zinc levels were measured in the kidneys of 115 grey wolves (Canis lupus) from Idaho, Montana and Alaska (United States), and from the Northwest Territories (Canada). No significant differences in the levels of iron or copper were observed between locations, but wolf kidneys from more northern locations had significantly higher cadmium levels (Alaska[Northwest Territories [Montana & Idaho), and wolves from Alaska showed significantly higher zinc than other locations. Additionally, female wolves in Alaska had higher iron levels than males, and adult wolves in Montana had higher copper levels than subadults.

Citation: S. R. Hoffmann, S. A. Blunck, K. N. Petersen, E. M. Jones, J. C. Koval, R. Misek, J. A. Frick, H. D. Cluff, C. A. Sime, M. McNay, K. B. Beckman, M. W. Atkinson, M. Drew, M. D. Collinge, E. E. Bangs, R. G. Harper. 2010. Bulletin of Environmental Contamination and Toxicology 85:481-485.

Scat and stable isotope analysis of summer wolf diet

Graduate Student: Jonathan J. Derbridge, University of Montana

Committee Chair: Dr. Paul Krausman, University of Montana

Collaborators: Chris Darimont, Department of Environmental Studies, University of California, Santa Cruz

Wolf (*Canis lupus*) diet can be estimated from undigested remains of prey in scats or through stable isotope analysis (SIA) of wolf hair when distinct δ13C and δ15N values of potential diet sources are known. Our objectives were to compare diet analysis methods, to estimate intra-population diet variability, and to determine proportions of prey consumed by wolves. We collected scats of 4 wolf packs in northwestern Montana from June to August 2008, and guard hairs of 45 wolves from 12 packs, May to August 2009. We calculated percent biomass consumed of deer (*Odocoileus* spp.), elk (*Cervus canadensis*), moose (*Alces alces*), and other items from scats, and used Pearson's chi-squared tests of proportions to measure differences among packs. We used hierarchical Bayesian stable isotope mixing models to determine diet and scales of diet variation from δ13C and δ15N values of wolves and prey. We used bootstrapped scat data, and Markov Chain Monte Carlo simulation data from stable isotopes to estimate confidence intervals of difference between results from each technique for 4 packs with matched samples. Diet results were not consistent between techniques. Deer was the most common prey item based on scats, and moose the most common based on SIA. Wolf diet was significantly different among packs based on scats, and differences among packs explained most variability in diet based on stable isotopes. We sampled 3 times as many packs for less than half the cost with SIA compared to scat analysis. Stable isotope analysis of wolf tissue has the potential to be a more efficient and accurate technique for estimating diet than scat analysis.

Blackfoot Range Rider Program Update

Investigators: Seth M. Wilson and Peter Brown, Blackfoot Challenge and University of Montana

Collaborators: Blackfoot Challenge; Blackfoot area ranchers, landowners and managers; Montana Fish, Wildlife & Parks; U.S. Fish and Wildlife Service; U.S. Forest Service; Bureau of Land Management; Montana Department of Natural Resources and Conservation; The Nature Conservancy; University of Montana.

The Blackfoot Challenge has been actively working to reduce the risk of livestock losses to wolves in the Blackfoot watershed since 2007. In addition to livestock carcass removal and electric fencing of calving areas, the Blackfoot Challenge has hired several seasonal range riders to help monitor wolf and livestock activity and to provide non-lethal tools to help reduce the chances of livestock depredations by wolves. These efforts have been carried out in close partnership with MT Fish, Wildlife and Parks. The following summary reviews the 2010 season. Additionally, we provide a summary of our overall range rider effort.

2010 Range Rider Field Season Summary:

The 2010 range rider season in the Blackfoot Watershed focused on increasing human presence in livestock herds that were adjacent to concentrations of wolf activity. This was accomplished through the addition of two paid assistants and increased effort on the part of livestock producers grazing in those areas. This was the second official year of livestock and wolf monitoring efforts carried out by the Blackfoot Challenge.

Our cattle monitoring efforts also helped producers track overall herd health. In 2010 livestock producers removed three calves, two cows, and two bulls from grazing allotments when they were found to have injuries or health conditions that we assumed made them at higher risk of depredation. We also noticed that cattle grazing in wet or sub-irrigated grazing allotment had a higher risk of foot rot and injury especially in areas that had been previously logged or had excessive blown down timber. Immunity boosters and hoof health supplements can be added to mineral lick, thus supporting the cumulative herd health by reducing debilitating injuries and subsequent susceptibility to predation attempts.

We focused our monitoring on the Ovando Mountain and Arrastra Creek Packs. The Ovando Mt. Pack had two radio collars placed in the pack in 2010 and facilitated intensive monitoring which resulted in locating members of this pack within 0.5 m of cattle 51 of 74 monitoring days. Members of this pack of wolves were sighted in a pasture with cattle on eleven occasions. One calf depredation occurred on the 89th day of grazing in that pasture. Subsequently three individuals were lethally removal from this pack and the cattle were moved out of this pasture. There were no more reported incidents between cattle and wolves in this area through the remainder of the fall grazing season. The Arrastra Creek pack does not have a collar placed in the pack, making intensive monitoring of this pack's exact location difficult. One depredation early in the grazing season resulted in the removal of one adult male wolf from this pack. Intensive cattle monitoring in this area as well as trapping activity by U.S. Department of Agriculture Wildlife Service agents and Montana Department of Fish, Wildlife and Parks resulted in a significant increase in human presence in the core use area of this pack, which

overlaps with summer grazing allotments on public and private lands. No other conflicts with cattle were detected in this area for the remainder of the 2010 grazing season.

Field Season Statistics:

- Completed 6 month field season to monitor livestock and 4 wolf packs
- Successfully monitored 650-800 cow/calf pairs per week across 45,000 acres
- Documented 22 rider/wolf encounters for the season (5/1/10-10/31/10).
- Radio telemetry monitoring of Ovando Mt. Pack documented presence of wolves within 0.80 km (0.5 mi) of livestock on 51 of 74 monitoring days during grazing season on BCCA.
- Range rider, two assistants, and 5 ranchers collectively averaged 100 hours of 168 possible hours in vigilance/presence for livestock herd monitoring per week on 5 herds for the season.
- 2 cows, 3 calves, and 2 bulls that had health issues/injuries were removed from high risk areas.
- 4 confirmed livestock losses (2 calves; 1 cow; 1 horse) during the season
- 8 wolves removed for livestock depredations during the season
- Deployed fladry on two ranches for approximately 30 days preventative tool.

Social Tolerance / Communication Statistics:

- Successfully maintained trust and credibility with 8 ranchers from the previous field season and cultivated relationships with two additional ranchers whose herds were at greatest risk.
- Maintained regular communication with an additional 40-50 landowners and ranchers who were at moderate risk of depredations by wolves throughout the project area.
- Maintained regular communication through list-serve and BC website with 121 people.
- Made 200-250 telephone and e-mail contacts regularly from 5/1/10 – 10/31/10
- Produced 10 bi-weekly *Wolf Activity Reports* community and project partners
- Maintained weekly contact with MT Fish, Wildlife and Parks and partners.
- Made 6 public presentations on wolf issues to approximately 140 people.

Preliminary Results:

Wolf Pack Establishment in the Blackfoot 2006-2008

Prior to the establishment of our official Range Rider project that commenced in 2009, wolf activity was first documented in the defined project area in late 2006. By early 2007, MT Department of Fish, Wildlife and Parks officially confirmed the Elevation Mt. pack with 7 known individuals.

By mid-April 2008, there were 2 confirmed livestock depredations (Elevation Mt. pack) in the project area and during early June, 2 additional, confirmed depredations occurred by the Elevation Mt. pack. Subsequently there was an incremental, lethal control action by Wildlife Services (USDA) that resulted in 3 wolves being killed from this pack. Despite monitoring efforts an additional calf was killed by the pack in 2009, resulting in two additional wolf removals. By May of 2010 an additional calf was killed and Wildlife Services removed the remaining three wolves of the Elevation MT. pack. It should be noted that the ranch on which several calf depredations occurred has a late calving season beginning in May. Additionally this

ranch has an "open" pasturing approach calving where cow/calf pairs are widely dispersed across sagebrush pastures increasing predation risk. Throughout 2009 wolves continued to reestablish themselves in the Blackfoot watershed resulting in population growth.

2009
Livestock and wolf monitoring begins April 1, 2009. Four additional wolf packs are documented in the project area (Ovando Mt., Arrastra Creek, Belmont, and Lander's Fork packs) and several wolves are documented using the Blackfoot Clearwater Game Range ("Game Range Wolves") area in early 2010 bringing the total number of wolves in the general Blackfoot Valley to approximately 25-35 animals including pups. Two orphaned calves are confirmed losses to wolves (likely the Ovando Mt. pack) in mid-September, 2009.

2010
As summarized above, repeated livestock depredations by the Elevation Mt. pack resulted in full pack removal by May, 2010. Additionally, 1 cow was confirmed killed by wolves (Arrastra Creek pack) and 1 wolf was removed and no additional livestock losses were reported. Despite intensive monitoring of the Ovando Mt. pack and consistent livestock supervision on the BCCA, 1 calf depredation occurred 2 days prior to all cattle being removed from those pastures. Subsequently, 3 adult (non-collared) wolves were killed by Wildlife Services.

Pre-Range Rider Baseline 2007-2008:
- 4 confirmed calf losses
- 1 confirmed wolf pack (7 individuals)
- 4 wolves removed

Range Rider Outcomes 2009:
- 2 confirmed calf losses
- 3 confirmed wolf packs (est. 25-35 animals including pups)
- 2 wolves removed

Range Rider Outcomes 2010:
- 4 confirmed livestock losses (2 calves, 1 cow, 1 horse)
- 5 confirmed wolf packs (est. 34 animals including pups)
- 8 wolves removed

Discussion: The use of intensive herd monitoring or range riding is an important tool that may be helping to decrease the risk of livestock depredation by wolves in the project area. However, the beneficial effects observed in the 2009 field season should be tempered by the fact that subsequent livestock losses to wolves occurred in 2010 despite concerted herd supervision on the BCCA. Earlier removal of livestock from those pastures may help reduce future livestock losses to wolves. Our herd supervision efforts may have helped prevent potential losses to wolves when injured or sick individuals were removed from high risk areas. This occurred 7 times during the field season. Regular monitoring of wolves and extensive communication networks that have been developed in the project area with the help of ranchers, residents, and our agency partners has been of great benefit. Cultivating trust within the ranching community is essential for documenting actual estimated wolf numbers/packs, understanding wolf pack behavior, and ultimately for developing the willingness by landowners to engage in proactive efforts that reduce livestock depredation risk to both grizzly bears and wolves.

We are hopeful that the combination of livestock carcass removal, electric fences that serve as safe havens for livestock from to both bears and wolves, and our range rider project are having a cumulative, positive effect that helps people and wolves coexist in an agricultural landscape.

An assessment of territory size and the use of hunter surveys for monitoring wolves in Montana.

Graduate Student: Lindsey Rich, University of Montana

Committee Chair: Dr. Michael Mitchell, University of Montana, Montana Cooperative Wildlife Research Unit

Collaborators: Montana Fish, Wildlife & Parks, U. S. Fish and Wildlife Service

Reliable knowledge of the status and trend of carnivore populations is critical to their conservation. Direct and indirect methods of monitoring carnivores, however, are time consuming and expensive to conduct across large spatial scales. In the Northern Rocky Mountains, wildlife managers need a time- and cost-efficient method for monitoring the growing population of gray wolves (*Canis lupus*). I evaluated if a multi-season patch occupancy model (POM) could be used to accurately estimate the abundance and distribution of wolf packs in Montana from 2007 to 2009. I evaluated hunter sightings of wolves as an index of occupancy and assessed model accuracy by comparing POM estimates to Montana Fish, Wildlife, and Parks minimum wolf pack counts (N_{min}). To develop a POM robust to variation in territory size, I investigated how territory sizes of wolf packs were affected by ecological factors. In the future, when territory sizes cannot be estimated directly, these ecological factors can be used to predict and monitor changes in territory sizes. I estimated territories for 38 wolf packs in Montana using 90% adaptive kernels, created generalized linear models (GLM) representing combinations of ecological factors hypothesized to effect territory size, and evaluated the top GLM's predictive power using a jack-knife approach. The POM estimated there were 82 (SE = 31; N_{min} = 82), 124 (SE = 28; N_{min} = 102), and145 (SE = 28; N_{min} = 118) wolf packs in Montana in 2007, 2008, and 2009, respectively. I found territory size was positively related to terrain ruggedness, control actions, and human density and negatively related to pack density. The top GLM had good model fit (R^2 = 0.68, P < 0.0005, df = 37) and successfully predicted territory sizes (β_1 = 0.88, SE = 0.14, P < 0.0005). Patch occupancy models, using hunter surveys as the sampling method, combined with an understanding of territory size offer promise as a method for accurately monitoring elusive carnivores at state-wide scales in a time- and cost-efficient manner.

Using Hunter Surveys to Monitor Wolf Pack Abundance and Distribution in Montana

Graduate Student: Lindsey Rich, University of Montana

Committee Chair: Dr. Michael Mitchell, University of Montana, Montana Cooperative Wildlife Research Unit

Collaborators: Montana Fish, Wildlife & Parks, U. S. Fish and Wildlife Service

Reliable knowledge of the status and trend of carnivore populations is critical to their conservation. Direct and indirect methods of monitoring carnivores, however, are time consuming and expensive to conduct across large spatial scales. In the Northern Rocky Mountains, wildlife managers need a time- and cost-efficient method for monitoring the large,

growing population of gray wolves (*Canis lupus*). I developed a patch occupancy model (POM) to estimate the abundance and distribution of wolf packs in Montana from 2007 to 2009. I evaluated hunter sightings of wolves as an index of occupancy (ψ) and how ecological factors influenced a wolf pack's probability of ψ, colonization (γ), extinction (ε), and detection (p). I ran multi-season POMs, used the top model selected with Akaike's Information Criterion to generate patch-specific estimates of ψ, γ, ε, and p, and assessed model accuracy by comparing POM estimates to Montana Fish, Wildlife, and Parks minimum wolf pack counts (N_{min}). In the top model, ψ was positively related to forest cover, rural road density, and elevation, γ was positively related to forest cover, bull elk harvest, and the mean number of wolves seen, ε was negatively related to the mean number of wolves seen, and p was positively related to hunter effort and forest cover. The POM estimated there were 82 (SE = 31; N_{min} = 82), 124 (SE = 28; N_{min} = 102), and145 (SE = 28; N_{min} = 118) wolf packs in Montana in 2007, 2008, and 2009, respectively. Patch occupancy models using hunter surveys offer promise as a method for accurately monitoring elusive carnivores at state-wide scales in a time- and cost-efficient manner.

Estimating Numbers of Wolves, Wolf Packs, and Breeding Pairs in Montana Using Hunter Survey Data in a Patch Occupancy Model Framework

Graduate student and Post Doctoral Researcher: Lindsey Rich and Betsy Glenn, University of Montana, Montana Cooperative Wildlife Research Unit

Committee chair and Principle Investigator: Dr. Michael Mitchell, University of Montana, Montana Cooperative Wildlife Research Unit

Collaborators: Robin Russell, U.S. Geological Survey; Justin Gude, and Carolyn Sime, Montana Fish, Wildlife & Parks

Reliable knowledge of the status and trend of carnivore populations is critical to their conservation. Direct and indirect methods of monitoring carnivores, however, are time consuming and expensive to conduct across large spatial scales. In the Northern Rocky Mountains, wildlife managers need a time- and cost-efficient method for monitoring the large, growing population of gray wolves (*Canis lupus*) at state-wide scales. Each year, Montana Fish, Wildlife and Parks (MFWP) conducts annual telephone surveys of >50,000 hunters providing a large number of potential observers of wolves in every part of Montana. We explored how survey data on hunter's sightings of wolves could be incorporated into multi-year patch occupancy models to estimate the abundance and distribution of wolf packs, wolves, and breeding pairs in Montana for 2007- 2009. We used hunter observations of wolves to estimate the probability that 600-km^2 patches within a uniform grid overlaid on Montana were occupied by a wolf pack. Our occupancy modeling framework also allowed us to examine how geographic and ecological factors influenced a wolf pack's probability of occupancy, colonization, extinction, and detection. To generate estimates of numbers of wolves, we used occupancy model output in combination with the mean number of wolves seen by hunters. To generate estimates of numbers of breeding pairs, we used occupancy model output in combination with data on the distribution of pack sizes. We assessed model accuracy by comparing our estimates of numbers of wolf packs, wolves, and breeding pairs to MFWP minimum known number of wolf packs, wolves, and breeding pairs. In the top occupancy model, occupancy was positively related to forest cover, rural road density, and elevation,

colonization was positively related to forest cover, bull elk harvest, and the mean number of wolves seen, extinction was negatively related to the mean number of wolves seen, and detection was positively related to hunter effort and forest cover. Our models provided estimates of number of wolf packs, wolves, and breeding pairs that were accurate, generally exceeding of MFWP minimum counts for 2007-2009 by ≤ 20% (i.e., accounting for wolves undetected by current monitoring). Lastly, we developed a modeling framework that will enable MFWP to evaluate alternative harvest and management strategies. The patch occupancy model we developed for harvest modeling will allow MFWP to explore how harvest influences wolf population dynamics in the state. Patch occupancy models based on hunter surveys provide accurate estimates number of wolves and breeding pairs at state-wide scales in a time- and cost-efficient manner. For these models to remain accurate in the future, complementary field monitoring of pack sizes and distributions will be required to ensure hunter sightings remain calibrated to wolf population dynamics. The harvest models we present offer the opportunity to evaluate effects of alternative harvest scenarios when setting wolf quotas, and to evaluate actual effects of implemented quotas on the Montana wolf population through an adaptive management framework.

LAW ENFORCEMENT

All wolf mortalities that are not the result of authorized agency lethal control, of a shoot on sight permit, or obviously related to a vehicle / train strike, are reported to law enforcement personnel. All other wolf mortalities are under investigation until a full determination is made regarding cause of death and any potential of criminal activity.

The USFWS Office of Law Enforcement was the lead agency to investigate wolf deaths until delisting in May 2009. Upon delisting, MFWP personnel led law enforcement efforts for state-based laws, rules, and MFWP Commission regulations (including the 2009 wolf hunting season) until August 5, 2010 when the wolf was relisted through court order. For the remainder of 2010, MFWP personnel collaborated and provided assistance to federal law enforcement on request.

MFWP 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 also responded and made initial assessments in incidents where a livestock owner killed a wolf seen in the act of chasing or killing livestock. Wardens have also passed along wolf reports to project personnel and contributed to monitoring efforts.

When illegal activity is suspected, some time is required before a situation is ultimately resolved and the process runs its course. Back in October 2009 during the fall hunting season, MFWP R1 Warden Captain Anderson and Sgt. Obst investigated 2 black wolves shot and killed in the Whale Creek drainage of North Fork Flathead. Anderson cited an individual for shooting and killing the two wolves during a closed season. The individual pled guilty to the charge in Flathead County Justice Court.

Another charge was brought against an individual in the Plains area for illegally snaring wolves. Two wolves were killed. The case went to court in 2010 and the individual was fined. The incidents took place during a period when the wolf was delisted.

FUNDING

Montana Fish, Wildlife & Parks

Historically, MFWP's core wolf program has been funded through 2 separate federal sources. Approximately half was obtained through a direct annual Congressional line-item appropriation and half was obtained directly from USFWS as a part of the agency base budget. These sources were identified in the state-federal wolf cooperative agreement which outlines the scope of MFWP's work and how the money can be spent. Funds are transferred on a federal fiscal year cycle which is offset from the state fiscal year cycle by six months. Federal funds could be spent anywhere in Montana for the wolf management and conservation activities specified in the cooperative agreement. Federal budget constraints have sometimes resulted in Congressional recessions (across the board percentage cuts typically of 2-3%) and slightly lower funding levels ultimately made available.

A cooperative agreement covering the five-year period through June 30, 2010 expired. MFWP and USFWS will begin work in 2011 to develop a new cooperative agreement that outlines responsibilities and funding for the next 5-year period that began July 1, 2010. The dynamic legal nature of the listing status of wolves in the NRM DPS has been a complicating factor. The new cooperative agreement will be flexible enough to accommodate future changes. Ultimately, a cooperative agreement is a necessary part of MFWP being able to access federal funding, whether wolves are listed and MFWP is the lead agency as the designated agent of USFWS or whether wolves are delisted and managed as resident wildlife during the 5-year post-delisting monitoring period required by USFWS. Until a new agreement is finalized, USFWS and MFWP consider the existing agreement still in effect until replaced or rescinded. That agreement is consistent with a "listed" legal framework. In July 2010, a funding agreement (about $508,938, which accounts for overhead) was finalized for state fiscal year 2011 so that federal dollars continue to fund MFWP's wolf program in the interim.

MFWP has utilized a small amount of its federal wolf funding on recovery coordination. However, the vast majority has been spent for on-the-ground implementation of Montana's wolf program. This funding has paid for wolf monitoring, radio collaring, data management, depredation response, research, and public outreach – all of which both directly and indirectly support the work of USDA WS and MLLRMB. The field-based program also directly supports the work and decisions made by MFWP and the MFWP Commission for wolf management (e.g. harvest) and demonstrates to the USFWS that Montana is maintaining a recovered population.

Other MFWP staff make significant contributions to the program above and beyond the work done by staff whose primary responsibilities are wolf-related. Examples include administration, biologist support, law enforcement, public outreach, and legal support. Exact figures have not been quantified.

USDA Wildlife Services

USDA WS is the federal agency assisting MFWP with wolf depredation management. WS personnel conduct investigations of injured or dead livestock to determine if it was a predation event and, if so, what predator species was responsible for the damage. Verification (either as confirmed or probable) by WS that damage is due to a wolf is an important aspect of the managing the wolf-livestock interface. Livestock owners may be eligible to receive reimbursement through the Montana Livestock Loss Reduction and Mitigation Program. MFWP determines what, if any, is an appropriate response of wolves were responsible for the damage.

As a federal agency, USDA WS is funded through the regular Congressional al budgeting process, particularly with respect to wolf-related work due to the wolf's federally listed status. WS also receives money from other sources in Montana for other agency activities, including the state per capita fee and county livestock assessments.

In FFY 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 FFY 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 its 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 FFY 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 FFY 2005, the USFWS Congressional appropriation that had been provided to the western region of USDA WS was eliminated. In the same FFY, 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 FFY 2008, WS maintained a $100,000 Congressional directive for responding to complaints of wolf damage as well as a $1,000,000 directive (reduced from $1,300,000 in FFY 2007) for Montana, Idaho, and Wyoming to investigate and address predator damage, including that by wolves. This was also maintained in FFY2009. In FFY2010, Congress again provided $926,000 to WS in MT, ID, and WY to investigate and address predator damage, including wolf damage.

In FFY 2007, WS spent an estimated $183,924 responding to wolf complaints and assisting MFWP 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 FFY 2008, Montana WS expended approximately $227,437. This is an increase of about $43,500 over the previous year. In FFY 2009, WS expenditures increased another $187,133 to $414,567 in FFY 2009. In FFY2010, WS expenditures increased to $442,283. Administrative time is not reflected in the total.

The increase in expenditures is due in part to increases in fixed costs (e.g. aircraft fuel, vehicles, cell phones, computer fees, or personnel). It is also due in part to the increasing number of investigation requests received by WS, and more frequent management responses required. This would be expected as the wolf population has increased from the 66 in Montana in 1995 at the time of reintroduction to today's level.

Beginning in calendar year 2008, MFWP and WS modified the Cooperative Agreement and the work plan to redirect $110,000 of MFWP license dollars towards toward assistance with wolf depredation management. WS management activities include capture and incremental control of wolves, reporting, as well as proactive actions to help reduce or minimize potential for wolf predation on livestock. MFWP and WS renewed the work plan in 2009 and again in 2010. WS has expended the full amount each year.

PERSONNEL AND ACKNOWLEDGEMENTS

By now, literally hundreds of people have assisted with wolf recovery and management 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 2010 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 Nathan Lance in Butte. Abigail Nelson was hired in the fall and is based in Livingston. The wolf coordinator position was eliminated and Carolyn Sime was reassigned to other MFWP projects in late October. She continued to assist with wolf reports and publications. Val Asher left the state program to resume her duties for Turner Endangered Species Fund full time. 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. Jennifer Ramsey (MFWP's 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) and Kevin Hughes. Salish Kootenai

Confederated Tribal biologist Stacey Courville and Blackfeet Tribal 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.

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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. Federal law enforcement agents investigated wolf mortalities throughout Montana and provided important guidance about the federal regulations when wolves were relisted in August 2010.

USDA APHIS WS investigates suspected wolf damage and carries out wolf damage management activities in Montana. We thank them for contributing their expertise to the state's wolf program and for their willingness to complete investigations and carry-out lethal control

and radio-collaring activities in a timely fashion, 7 days a week. WS personnel involved in wolf management in Montana in 2010 included state director John Steuber; eastern district supervisor Mike Foster; western district supervisor Kraig Glazier; western assistant district supervisor Chad Hoover; eastern assistant district supervisor Alan Brown; wildlife disease biologist Jerry Wiscomb; wildlife specialists Denny Biggs, John Bouchard, Owen Murnion, Jordan Brinkerhoff, Rick Glover, Steve Demers, Mike Hoggan, Danny Thomason, Brian Noftsker, Mike Thomas, Dick Martin, Graeme McDougal, Ted North, Jim Rost, Pat Sinclair, John Maetzold, Joe Carpenter, Bart Smith, and Jim Stevens; and pilots Stan Colton, Tim Graff, Eric Waldorf, and Guy Terril.

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APPENDIX 1

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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, Great Falls MT (406) 761-2286
- Special Agent, Cody WY (307) 527-7604

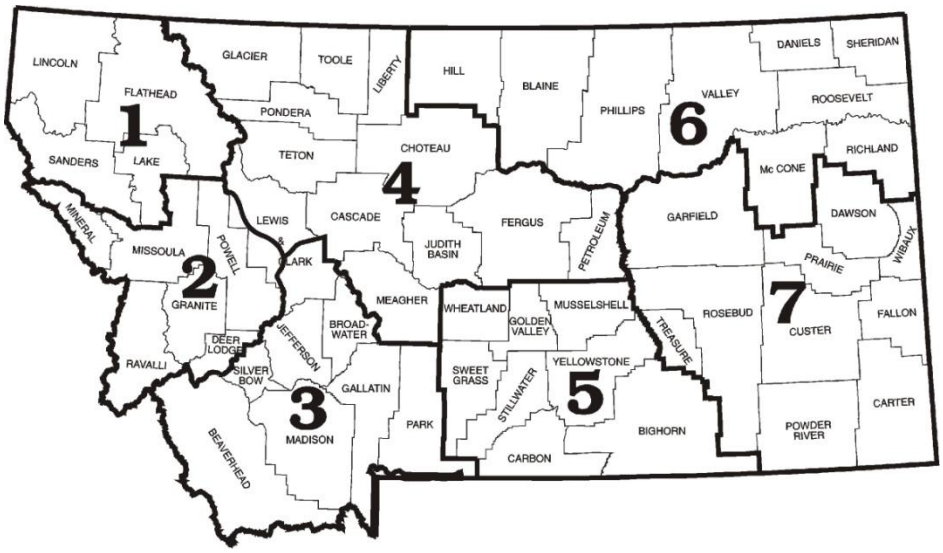
Montana Fish, Wildlife & Parks

- Dial 1-800-TIP-MONT (1-800-847-6668)

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

- http://fwp.mt.gov/wolf

MONTANA FISH WILDLIFE & PARKS ADMINISTRATIVE REGIONS



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APPENDIX 2

Gray Wolf Chronology in Montana

1800

- Wolves are common throughout Montana.

1884

- Wolf-bounty law initiates Montana's 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 dispersed 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 pairs 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 environmental 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 recovery area reclassified as "endangered" by court order.

- U.S. Fish and Wildlife Service adopts more flexible 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 responsibility 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 Wildlife 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 Mitigation 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 special 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 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 in February (2-8-07). Two options are presented (with and without Wyoming)
- USFWS extended the comment period on the delisting proposal on 7-6-07.
- An estimated minimum of 422 wolves in 39 breeding pairs are counted in Montana. Distribution continues to be the western one-third of Montana.

2008

- Montana implements as much of approved state plan as possible and within federal guidelines.
- Funding from U.S. Fish and Wildlife Service and special Congressional appropriations continue.
- The proposed U.S. Fish and Wildlife Service 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 is published in the Federal Register in January and took effect late February. Became moot from March to July when wolves officially delisted.

Took effect again in mid-July when the delisting decision was enjoined. This federal regulation is challenged in court and litigation was still ongoing at the end of the year.

- MFWP proposes a tentative wolf hunting/trapping season structure proposal (in December 2007), gathers public comment. MFWP Commission approves 2008/2009 biennial wolf hunting season in February.
- In June, MFWP proposed a tentative wolf quota for the possible 2008 wolf season and received public comment in July.
- In June, MFWP also initiated formal rulemaking to adopt rules relating to how the agency will implement lethal control under Montana's wolf plan and to reclassify the gray wolf as a species in need of management upon delisting.
- Formal rules adopted by the MFWP Commission in September. New rules are effective as of October, but will not be applied (i.e. take effect) until the wolf is delisted.
- Montana Livestock Loss Reduction and Mitigation Board met twice. The program receives a $50,000 grant from Defenders of Wildlife and donations from the Greater Yellowstone Coalition, the Montana Cattlemen's Association, and others. Combined funding allows payments to begin in April with the first claim. Approximately $83,000 is paid in claims for livestock that are verified by USDA Wildlife Services as having been killed by wolves.
- On February 27, USFWS publishes the final delisting rule, recognizing the NRM DPS and removing it from the List of Endangered and Threatened Wildlife; USFWS had determined Wyoming's 2007 regulatory mechanisms were adequate.
- Delisting decision took effect March 28.
- Twelve parties filed a lawsuit challenging the identification and delisting of the NRM DPS on April 28. The plaintiffs also moved to preliminarily enjoin the delisting.
- Oral arguments are heard in May.
- On July 18, the U.S. District Court granted the plaintiff's motion for a preliminary injunction. The ruling placed the gray wolf back under the ESA; the 1999 Interim Wolf Control Plan and the 2005/2008 10j regulations reinstated... The NRM DPS wolf population was officially delisted from March 28 to July 18; FWP suspects preparations for a 2008 wolf hunting season.
- In September, USFWS asked the Court to vacate the delisting rule and remand it back to the agency for further consideration.
- The Court agreed on October 14. On October 28, USFWS re-opens a 30-day public comment period on the February 2007 delisting proposal specific to issues raised in the preliminary injunction and contemplates delisting without WY after having rejected the WY plan upon reconsideration.
- USFWS analyzed public comments and was expected to make a decision by the end of 2008.
- Blackfeet Nation finalizes a wolf management plan for the Blackfeet Reservation.
- An estimated minimum of 497 wolves in 34 breeding pairs are counted in Montana. Distribution continues to be the western one-third of Montana.

2009

- On January 15, USFWS notified WY Governor that WY plan no longer approved. Wolves in WY managed by USFWS and regulations adopted in the 1994 EIS are reinstated due to the lack of an approved WY plan.
- April 2, USFWS publishes the final delisting rule which designated the NRM distinct population segment and delists the gray wolf throughout the DPS except WY.
- May 4, the final delisting rule takes effect. Wolves in MT are classified as a species in need of management statewide under Montana law; state rules and the state management plan take full effect.
- MFWP Commission adopts tentative wolf quotas for public comment in May. A statewide quota was proposed and broken down into three wolf management units. Public comment taken

during June. Commission adopts the final 2009 wolf quotas in July. The final statewide quota approved by the MFWP Commission is 75.

- On June 2, same coalition of groups file a lawsuit challenging the federal delisting decision; suit filed in Missoula MT. MT granted intervenor status in July and files legal briefs according to schedule approved by the court..
- In July, WY initiated litigation in the WY Federal District Court (Cheyenne). WY argued the USFWS should have approved WY's wolf management plan and delisted wolves in WY in 2009 at the same time as ID and MT.
- Confederated Salish and Kootenai Tribes complete a wolf management plan for the Flathead Reservation.
- On August 20, plaintiffs request preliminary injunction. Hearing on August 30.
- MFWP begins selling wolf hunting licenses on August 31.
- Injunction request is denied on September 8.
- The wolf hunting season opens in the Absaroka-Beartooth Wilderness and the west side of the Bob Marshall complex on September 15.
- On October 9 (half hour after sunset) the Absaroka-Beartooth backcountry season was closed after a total of 9 wolves were harvested.
- General deer / elk season opened on October 25. Wolf hunting season opened statewide except in the Absoraka-Beartooth area.
- WMU 3 (southwest MT) closed on October 26, with a total of 13 wolves harvested. The WMU 3 quota of 12 was exceeded by 1 wolf.
- On November 10, the N. Fork Flathead subunit was closed to harvest after the prescribed number of 2 wolves were reported harvested.
- On November 16, the wolf season closed statewide. A total of 72 wolves were harvested out of the total statewide quota of 75. Thirty-eight of the quota of 41 wolves had been taken in WMU 1 and 21 of 22 in WMU 2. WMU 3 was closed on October 26 2009, the quota of 12 wolves was exceeded by 1.
- An estimated minimum of 524 wolves in 37 breeding pairs are counted in Montana. Distribution continues to be the western one-third of Montana.

2010

- In July, MFWP and the MFWP Commission finalized the 2010 wolf hunting season structure and final statewide quota of 186. The season was canceled when the wolf was relisted on August 5. The regulations had not yet been printed and no licenses had been sold.
- In July, MFWP and USFWS signed a funding agreement that funds Montana's wolf program for 2011. Work begins on renewing the overall cooperative agreement.
- In August, with the relisting of the wolf under the 2005/2008 experimental rules across southern Montana and most of Idaho, a prior legal challenge to the 2008 modification of the experimental 10j rule was reactivated and resumed in Missoula District Court. This litigation continued into 2011.
- In August, MFWP Commission passed resolutions that urged MFWP and the federal government to appeal the district court ruling; second resolution urged MFWP to pursue efforts in support of regaining state management authority and implementing a hunting season as soon as possible.
- In September, MFWP submitted a permit application to take wolves through a statewide conservation hunt. The USFWS denied the state's application in October.
- In October, MFWP filed its appeal with the U.S. Court of Appeals for the Ninth Circuit Court, seeking to overturn the August 5 Missoula District ruling.
- In October, MFWP completed and the MFWP Commission approved a 10j proposal to control wolves in the West Fork of the Bitterroot due to concerns about the elk population. It was

submitted to the USFWS by late October. No decision had been made by the end of 2010. Litigation over the modified 2008 10j rule still ongoing.

- In October, the USFWS rejected MFWP's request for a Cooperative Agreement under Section 6 of the federal Endangered Species Act to implement the Montana wolf plan in its entirety, including regulated public harvest.
- In October, the State of Idaho withdrew from its designated agent status and all wolf monitoring and management responsibilities were assumed by USFWS and the Nez Perce Tribe.
- In October, the Montana Congressional Delegation and other parties began pursuing federal legislation (as a standalone bill or as a rider amended to budget bills) that would delist the wolf. Nothing had passed Congress by the end of 2010.
- In October, USFWS approved the Confederated Salish and Kootenai Tribe's wolf plan.
- In November, a Wyoming Federal District court ruled that the USFWS failed to adequately explain why Wyoming's predator and trophy game areas were inadequate. The Wyoming Court did not approve Wyoming's approach but it did require the USFWS to reevaluate if WY's regulatory framework might be adequate to maintain recovery levels and promote genetic connectivity. The court remanded the 2009 delisting rule back to the USFWS for further consideration. The 2009 delisting rule had already been vacated in August by the Montana District Court ruling. Since the USFWS did not reject Wyoming's plan solely because trophy game status was not state-wide, it is unlikely Wyoming's current approach could be approved. But, since delisting was vacated no further action has been taken to reevaluate Wyoming's regulatory framework.
- An estimated minimum of 566 wolves in 35 breeding pairs are counted in Montana. Distribution continues to be the western one-third of Montana, but a small pack is verified in the Snowies.

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, 2010.

Table 1b. Montana wolf packs and population data for Montana's portion of the Greater Yellowstone Experimental Recovery Area, 2010.

Table 1c. Montana portion of the Central Idaho Experimental Recovery Area (Montana statewide totals): wolf packs and population data, 2010.

Table 2a Wyoming wolf packs (outside of Yellowstone National Park) and population data for Wyoming's portion of the Greater Yellowstone Experimental Recovery Area, 2010.

Table 2b. Yellowstone National Park (YNP) wolf packs and population data for YNP's portion of the Greater Yellowstone Experimental Recovery Area, 2010.

Table 2c. Wolf Population Data for the Greater Yellowstone Experimental Recovery Area, 2010.

Table 3a. Idaho wolf packs and population data for Idaho's portion of the Central Idaho Experimental Recovery Area, 2010.

Table 3b. Idaho wolf packs and population data for Idaho's portion of the Northwest Montana Recovery Area, 2010.

Table 3c. Idaho wolf packs and population data for the Greater Yellowstone Experimental Recovery Area, 2010.

Table 3d. Idaho population data for the Central Idaho Experimental Recovery Area, 2010.

Table 4a. Northern Rocky Mountains minimum fall wolf population and breeding pairs 1979-2010 by recovery area.

Table 4b. Northern Rocky Mountains minimum fall wolf population and breeding pairs 1980-2010 by state.

Table 5a. Northern Rocky Mountain states: confirmed wolf depredation and wolf management by recovery area, 1980-2010.

Table 5b. Northern Rocky Mountain states: confirmed wolf depredation and wolf management, by state, 1987-2010.

Table 5c. Confirmed wolf depredation elsewhere, Northern Rocky Mountain Distinct Population Segment, 2010.

Table 6. Wolf Packs and Population Data for Oregon and Washington inside the Northern Rocky Mountain Distinct Population Segment, 2010.

Table 7. Wolf Packs and Population Data for Washington Outside the Northern Rocky Mountain Distinct Population Segment, 2010.

Table 1a: Montana Wolf Packs and Population Data for Montana's Portion of the Northwest Montana Recovery Area, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN		CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]	DISPERSED	MISSING [4]	CATTLE	SHEEP	DOGS	OTHER
1	Arrastra Creek	NWMT	MT	5	3	8					1			1			
2	Ashley	NWMT	MT	?	?	2											
3	Bearfite	NWMT	MT	3	3	6											
4	Belmont	NWMT	MT	3	6	9		1									
5	Benchmark	NWMT	MT	?	?	7								1			
6	Bennie	NWMT	MT	?	?	5											
7	Bisson (CSKT)	NWMT	MT	3	?	3											
8	Bitterroot Range #	NWMT	MT	6	1	7											
9	Blue Mountain	NWMT	MT	5	2	7											
10	Bugle Mountain	NWMT	MT	9	?	9											
11	Cabinet	NWMT	MT	2	5	7							2				
12	Cache Creek #	NWMT	MT	4	?	4			2								
	~~Camas Pr. (CSKT)~~ [7]	NWMT	MT	0	0	0					7			2			
13	Canyon Creek	NWMT	MT	?	3	3			1		4				13		3
14	Candy Mountain	NWMT	MT	2	2	4					1	1		3			
15	Chippy	NWMT	MT	?	?	2											
16	Cilly	NWMT	MT	?	?	2											
17	Condon^	NWMT	MT	2	?	2		1									
18	Cottonwood (CSKT)	NWMT	MT	3	?	3											
19	Corona	NWMT	MT	?	?	2		2	1								
20	DeBorgia #	NWMT	MT	6	?	6		1									
21	Dry Forks (CSKT)	NWMT	MT	5	?	5					3						3
22	Dutch	NWMT	MT	8	3	11		1									
	~~Elevation Mountain~~ [7]	NWMT	MT	0	0	0					3			1			
23	Evaro	NWMT	MT	2	?	3					1	1					
	~~Ferry Basin (CSKT)~~ [7]	NWMT	MT	0	0	0											
24	Firefighter	NWMT	MT	?	?	2		1									
	~~Fishtrap~~	NWMT	MT	0	0	0					4			1			
25	Flathead Alps	NWMT	MT	2	2	4											
26	Good	NWMT	MT	3	1	4		1									
27	Great Bear	NWMT	MT	2	2	4											
28	Great Northern	NWMT	MT	?	?	2											
29	Irvine (CSKT)	NWMT	MT	2	3	5					2		1	1			
30	Kintla	NWMT	MT	?	?	6		1									
31	Kootenai South	NWMT	MT	?	?	2							1	1			

Table 1a: Montana Wolf Packs and Population Data for Montana's Portion of the Northwest Montana Recovery Area, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER
32	Ksanka	NWMT	MT	2	3	5		1									
33	Landers Fork	NWMT	MT	5	?	5											
34	Lazy Creek	NWMT	MT	4	6	10											
35	Livermore (BFN)	NWMT	MT	?	?	3											
36	Lydia	NWMT	MT	?	?	2		2									
37	Marias	NWMT	MT	?	?	6											
38	McDonald	NWMT	MT	2	?	2											
39	McKay	NWMT	MT	?	?	2											
40	Mineral Mountain	NWMT	MT	9	?	9							1				
	~~Mitchell Mountain~~ [7]	NWMT	MT	0	0	0					2						
41	Monitor Mountain	NWMT	MT	2	2	4					4			1			
42	Morrell Mountain	NWMT	MT	5	?	5											
43	Mullan #	NWMT	MT	3	4	7		1									
44	Murphy Lake	NWMT	MT	2	4	6					5			3			
45	Ninemile	NWMT	MT	6	2+	8					4			3			
46	Nyack	NWMT	MT	?	?	10		1									
47	O'Brien	NWMT	MT	1	3	4		1									
48	Ovando Mountain	NWMT	MT	4	1	5					3			1			
49	Piper	NWMT	MT	?	?	2											
50	Pistol Creek (CSKT)	NWMT	MT	4	?	4											
51	Preacher	NWMT	MT	2	5	7											
52	Pulpit Mountain	NWMT	MT	?	?	2											
53	Quartz Creek #	NWMT	MT	3	?	3											
54	Quintonkon	NWMT	MT	3	4	7											
55	Red Shale	NWMT	MT	?	?	2											
56	Satire	NWMT	MT	6	?	6		1									
57	Selow (CSKT)	NWMT	MT	2	?	2					7			5			
58	Silcox	NWMT	MT	5	?	5		1			3			2			
59	Silver Lake #	NWMT	MT	7	?	7			3				1				
60	Sixmile	NWMT	MT	7	?	7											
61	Smoky	NWMT	MT	?	?	2											
62	Solomon Mountain#	NWMT	MT	?	?	2											
63	Spotted Bear	NWMT	MT	3	3	6											
	~~Superior #~~ [7]	NWMT	MT	0	0	0					6						4

Table 1a: Montana Wolf Packs and Population Data for Montana's Portion of the Northwest Montana Recovery Area, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER
64	Tallulah	NWMT	MT	?	?	2											
65	Thirsty	NWMT	MT	2	4	6											
66	Twilight #	NWMT	MT	3	2	5											
67	Union Peak	NWMT	MT	4	?	4											
68	Wolf Prairie	NWMT	MT	?	?	2		1									
	Misc/Lone	NWMT	MT	4	0	4		3			1						1
MT in NWMT (Table 1a)		NWMT	MT	177	79	326	0	21	7	0	61	2	6	26	13	0	11
ID in NWNMT (Table 3b)		NWMT	ID	?	12	48	0	2	0	0	1	0	0	0	0	0	0
NWMT RECOVERY AREA		NWMT	MT/ID	177	91	374	0	23	7	0	62	2	6	26	13	0	11

1 Underlined packs are counted as breeding pairs toward recovery goals.CSKT = Flathead Indian Reservation; BFN = Blackfeet Indian Reservation.

2 Excludes wolves killed in control actions to address livestock depredation and lawful public harvest.

3 Does not include pups that disappeared before winter.

4 Collared wolves that became missing in 2010.

5 Agency lethal control whether under state or federal regulations. Includes wolves killed by private citizens to defend livestock or under terms of a kill permit.

6 Includes only domestic animals confirmed killed by wolves.

7 Pack did not exist on Dec. 31 2010 and is not displayed on the map; see pack narrative.

8 No regulated public harvest occurred in 2010.

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

^ Pack names were changed to better characterize geographic home place. Condon pack was misindentified as the Cilly pack in 2009.

FINAL_Table 1a_MT_NWMT_03-02-11_csime.xls

Table 1b: Montana Wolf Packs and Population Data for Montana's Portion of the Greater Yellowstone Experimental Area, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER
69	Rosebud	GYA	MT	?	?	3								1			
70	Baker Mountain	GYA	MT	2	2	4					2			1		1	
71	Buffalo Fork*	GYA	MT	?	?	5											
72	Mill Creek	GYA	MT	4	1	5					2			2			
73	Eightmile	GYA	MT	5	1	6			1					2			
74	Eagle Creek	GYA	MT	?	?	8			1								
75	Lebo Peak	GYA	MT	?	?	3					1						
76	Beartrap	GYA	MT	11	7	18					1						
77	Cougar 2 *	GYA	MT	4	5	9		2									
78	Hayden *	GYA	MT	?	?	6											
	~~Horn Mountain~~ [7]	GYA	MT	0	0	0					14			6			
	~~Horse Cr~~ [7]	GYA	MT	0	0	0		1			10			12			
79	Toadflax	GYA	MT	2	7	9		1			1						
80	Snowshoe	GYA	MT	2	0	2											
	~~Black Mtn~~ [7]	GYA	MT	0	0	0											
	~~Rock Creek~~ [7]	GYA	MT	0	0	0					3				4		
81	Cedar Creek	GYA	MT	?	?	4					6			1	10		
82	Wilson	GYA	MT	?	?	6											
83	Meadow Creek	GYA	MT	?	?	6											
84	Elkhorn	GYA	MT	?	?	3											
85	Table Mountain	GYA	MT	4	3	7		1			3			1			
86	Snowy	GYA	MT	?	?	3											
87	Madison #	GYA	MT/ID/WY	2	?	5											
	Misc/Lone	GYA	MT	6	0	6		1			4			2	36		
MT in GYA (Table 1b)		GYA	MT	42	26	118	0	6	2	0	47	0	0	28	50	1	0

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

2 Excludes wolves killed in control actions to address livestock depredation and lawful public harvest.

3 Does not include pups that disappeared before winter.

4 Collared wolves that became missing in 2010.

5 Agency lethal control whether under state or federal regulations. Includes wolves killed by private citizens to defend livestock or under terms of a kill permit.

6 Includes only domestic animals confirmed killed by wolves.

7 Pack did not exist on Dec. 31 2010 and is not displayed on the map; see pack narrative.

8 No regulated public harvested occurred in 2010.

* Border pack shared with YNP; dens in MT.

Border pack shared between MT/ID/YNP; denned inside YNP; pack displaced from YNP mid-year and is now a MT/ID pack.

Table 1c: Montana Portion of the Central Idaho Experimental Area (Montana statewide totals): wolf packs and population data 2010.

REF. #	WOLF PACK[1]	RECOV AREA	STATE	PACK SIZE DEC 2010 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NAT	HUMAN[2]	UNKN[3]	HARVEST[8]	CONTROL[5]	KNOWN DISPERSED	MISSING[4]	CONFIRMED LOSSES[6] CATTLE	SHEEP	DOGS	OTHER
88	Big Hole #	CID	MT	2	4	6		1									
89	Brooks Creek #	CID	MT	3	?	3											
90	Lake Como #	CID	MT	4	2	6											
91	Trapper Peak	CID	MT	1	4	5		1			4			1			
92	Watchtower #	CID	MT	6	?	6											
93	Painted Rocks #	CID	MT	4	2	6											
94	Alta #	CID	MT	2	?	4											
95	Sula #	CID	MT	6	3	9											
96	Trail Creek #	CID	MT	3	4	7					3			1			
97	Divide Creek	CID	MT	9	4	13											
98	Gird Point	CID	MT	4	?	4											
99	Welcome Creek	CID	MT	3	3	6					2		1				
	~~Ram Mtn~~ [7]	CID	MT	0	0	0											
100	East Fork Rock Creek	CID	MT	5	?	5											
101	Flint Creek	CID	MT	2	?	2											
102	Ross' Fork	CID	MT	2	4	6											
103	Harvey Creek	CID	MT	1	3	4					1			1			
	~~Bender #~~ [7]	CID	MT	0	0	0					5			7			
104	Mt. Haggin	CID	MT	?	?	6											
105	Pintler	CID	MT	?	?	8											
	~~Miner Lakes #~~ [7]	CID	MT	0	0	0					5			14			
	~~Ruby Creek #~~ [7]	CID	MT	0	0	0					4			2			
	~~Horse Prairie #~~ [7]	CID	MT	0	0	0					5			4			
106	Twin Lakes #	CID	MT	?	2	5								2			
107	Four Eyes #	CID	MT	?	?	6											
108	Bannack	CID	MT	?	?	3											
	Misc/Lone	CID	MT	2	0	2					4			1	1	1	
	MT Total in CID	CID	MT	59	35	122	0	2	0	0	33	0	1	33	1	1	0
MT in NWMT total (Table 1a)		NWMT	MT	177	79	326	0	21	7	0	61	2	6	26	13	0	11
MT in GYA total (Table 1b)		GYA	MT	46	26	118	0	6	2	0	47	0	0	28	50	1	0
MT in CID total (Table 1c)		CID	MT	59	35	122	0	2	0	0	33	0	1	33	1	1	0
	MT STATE TOTAL		**MT**	**282**	**140**	**566**	**0**	**29**	**9**	**0**	**141**	**2**	**7**	**87**	**64**	**2**	**11**

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

2 Excludes wolves killed in control actions.

Table 1c, Continued.

4 Collared wolves that ceased transmitting in 2010.

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, 2010 and is not displayed on the map; see pack narrative.

8 No regulated public harvest occurred in 2010.

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

FINAL_Table_1c_MT_CID_03-02-11_csime.xls

Table 2a: Wyoming Wolf Packs (Outside YNP) and Population Data for Wyoming's Portion of the Greater Yellowstone Experimental Area, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP [3]	TOT	NATURAL	HUMAN [2]	UNKN	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER [9]
	Wyoming Outside Yellowstone National Park																
109	Absaroka	GYA	WY	4	2	6			1		4			4			
110	Antelope	GYA	WY	4	0	4						1					
111	Beartooth *	GYA	WY	7	5	12											
112	Big Piney	GYA	WY	4	?	4											
113	Black Butte	GYA	WY	2	0	2					3			4			1
114	Bold Mtn.	GYA	WY	3	0	3											
115	Buffalo	GYA	WY	14	0	14		2	2			3					
116	Butte Creek	GYA	WY	5	4	9											
117	Carter Mtn.	GYA	WY	3	0	3											
118	Chagrin River #	GYA	WY	4	4	8											
119	Clark	GYA	WY	3	0	3					8			3			
120	Daniel	GYA	WY	4	?	4											
121	Dog Creek	GYA	WY	5	5	10									4		
122	East Fork	GYA	WY	3	3	6					2			3			
123	Elk Fork Creek	GYA	WY	3	4	7											
124	Gooseberry	GYA	WY	4	3	7											
125	Green River	GYA	WY	3	5	8					5			7			
126	Greybull River	GYA	WY	5	5	10											
127	Hoodoo	GYA	WY	6	4	10			2		2			1			
128	Huckleberry	GYA	WY	9	?	9											
129	Lava Mtn.	GYA	WY	5	5	10											
130	New Fork	GYA	WY	3	0	3											
131	Pacific Creek	GYA	WY	7	5	12						1					
132	Pahaska	GYA	WY	7	?	7											
133	Phantom Springs	GYA	WY	6	3	9	2		1			3					
134	Pinnacle Peak	GYA	WY	6	5	11			4			2					
135	Popo Agie	GYA	WY	2	0	2											
136	Prospect	GYA	WY	2	0	2											
137	Rim	GYA	WY	4	0	4											
138	South Fork	GYA	WY	4	4	8											
139	Sunlight	GYA	WY	3	5	8			1		5			3			
140	Washakie	GYA	WY	4	4	8											
141	Whiskey Basin	GYA	WY	3	0	3											

Table 2a: Wyoming Wolf Packs (Outside YNP) and Population Data for Wyoming's Portion of the Greater Yellowstone Experimental Area, 2010.

REF #	WOLF PACK[1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING[4]	CONFIRMED LOSSES[6]			
				ADULT	PUP[3]	TOT	NATURAL	HUMAN[2]	UNKN	HARVEST[8]	CONTROL[5]			CATTLE	SHEEP	DOGS	OTHER[9]
142	Wiggins Fork	GYA	WY	2	2	4					3						
	Sub-total	GYA	WY	153	77	230	2	2	11	0	32	10	0	25	4	0	1
	Misc. wolves																
	~~Casper~~	GYA	WY	1	0	1			1								
	~~Dempsey Creek~~	GYA	WY	0	0	0					8				4		
	Misc/Lone wolves[9]	GYA	WY	15	0	15		1	1					1	25		
	Sub-total	GYA	WY	16	0	16	0	1	2	0	8	0	0	1	29	0	0
	WY Total (outside YNP)		WY	169	77	246	2	3	13	0	40	10	0	26	33	0	1

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

2 Excludes wolves killed in control actions and lawful harvest.

3 Does not include pups that disappeared before winter.

4 Collared wolves that became missing in 2010.

5 Includes agency lethal control under federal regulations. Includes wolves killed by private citizens to defend livestock or under terms of lethal take permit.

6 Includes only domestic animals confirmed killed by wolves.

7 Strikethough packs did not exist on Dec. 31 2010 and are not displayed on the map; see pack narrative.

8 No regulated public harvest occurred in 2010.

9 See narrative text for explanation.

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

* Border pack shared with Montana; dens in Wyoming.

FINAL_Table_2a_WY_GYA_03-02-11_csime.xls

Table 2b: Yellowstone National Park (YNP) Wolf Packs and Population Data for YNP's Portion of the Greater Yellowstone Experimental Area, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]	KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6] CATTLE	SHEEP	DOGS	OTHER
	Yellowstone National Park Northern Range																
143	Agate	GYA	WY	4	4	8	1										
144	Blacktail	GYA	WY	8	6	14						1					
145	Lamar Canyon	GYA	WY	3	4	7											
	~~Druid~~ [7]	GYA	WY	0	0	0	4					2					
146	Quadrant Mountain	GYA	WY	7	0	7											
	~~Silver~~ [7]	GYA	WY	0	0	0	2										
	Misc/Lone wolves	GYA	WY	2	0	2	2					1	3				
	Northern Range Total			24	14	38	9	0	0	0	0	4	3	0	0	0	0
	Yellowstone National Park Non-Northern Range																
147	Bechler %	GYA	WY/ID	4	7	11											
148	Canyon	GYA	WY	3	3	6							1				
149	Cougar Creek	GYA	WY	4	0	4						1					
	~~Gibbon Meadows~~ [7]	GYA	MT/WY	0	0	0	1					3					
150	Grayling	GYA	WY	3	0	3											
151	Mary Mountain	GYA	WY	4	2	6											
152	Mollie's	GYA	WY	9	7	16						3	1				
153	Yellowstone Delta	GYA	WY	4	5	9											
	Misc/Lone wolves	GYA	WY	4	0	4	1						3				
	Non-Northern Range Total			35	24	59	2	0	0	0	0	7	5	0	0	0	0
	YNP Total in WY	GYA	WY	59	38	97	11	0	0	0	0	11	8	0	0	0	0
WY Total (Table 2a outside YNP)		GYA	WY	169	77	246	2	3	13	0	40	10	0	26	33	0	1
WY STATE TOTAL		**GYA**	**WY**	**228**	**115**	**343**	**13**	**3**	**13**	**0**	**40**	**21**	**8**	**26**	**33**	**0**	**1**

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

2 Excludes wolves killed in control actions and lawful harvest.

3 Does not include pups that disappeared before winter.

4 Collared wolves that became missing in 2010.

5 Includes agency lethal control under federal regulations. Includes wolves killed by private citizens to defend livestock or under terms of a lethal take permit.

6 Includes only domestic animals confirmed killed by wolves.

7 Pack did not exist on Dec. 31 2010 and is not displayed on the map; see pack narrative

8 No regulated public harvest occurred in 2010.

9 See narrative text for explanation.

Border pack shared with Montana; dens in Wyoming.

% Border pack shared with Idaho; dens in Wyoming.

FINAL_Table 2b_2c_YNP_GYA_03-02-11_csime.xls

Table 2c: Wolf Population Data for the Greater Yellowstone Recovery Area, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER
WY in GYA (Table 2b)		GYA	WY	228	115	343	13	3	13	0	40	21	8	26	33	0	1
MT in GYA (Table 1b)		GYA	MT	46	26	118	0	6	2	0	47	0	0	28	50	1	0
ID in GYA (Table 3c)		GYA	ID	0	12	40	0	0	0	0	2	0	0	0	0	0	0
GYA RECOVERY AREA		**WY/MT/ID**		**274**	**153**	**501**	**13**	**9**	**15**	**0**	**89**	**21**	**8**	**54**	**83**	**1**	**1**

FINAL_Table 2b_2c_YNP_GYA_03-02-11_csime.xls

Table 3a: Idaho Wolf Packs and Population Data for Idaho's Portion of the Central Idaho Recovery Area, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER
154	Aparejo	CID	ID	?	?	5											
155	Archie Mountain	CID	ID	2	0	2			1	2							
156	Avery	CID	ID	2	4	10											
157	Baldy Mountain	CID	ID	?	?	7					2			4			
	~~Battle Ridge~~ [7]	CID	ID	0	0	0											
158	Bear Pete	CID	ID	?	4	6			1								
159	Bear Valley	CID	ID	?	2	?											
160	Bear Wallow	CID	ID	4	?	4									10		
161	Beaverhead	CID	ID	?	?	4											
162	Big Buck	CID	ID	?	2	?											
163	Bimerick Meadow	CID	ID	?	3	5											
	~~Black Canyon #~~ [7]	CID	ID	0	0	0					2						
164	Blue Bunch	CID	ID	?	6	?					7			1			
165	Buffalo Ridge	CID	ID	?	2	7				1				2			
166	Calderwood	CID	ID	3	?	3											
167	Casner Creek	CID	ID	?	2	5											
	~~Chamberlain Basin~~ [7]	CID	ID	0	0	0											
168	Chesimia	CID	ID	?	1	5											
169	Coolwater Ridge	CID	ID	?	1	?											
170	Deception	CID	ID	?	5	?											
171	Doublespring	CID	ID	?	?	?								6	5		
	~~Eagle Mountain~~ [7]	CID	ID	0	0	0											
172	Earthquake Basin	CID	ID	?	7	9											
173	Eldorado Creek	CID	ID	?	6	?			1								
174	Fish Creek #	CID	ID	?	?	?											
	~~Fishhook~~ [7]	CID	ID	0	0	0				1							
	~~Florence~~ [7]	CID	ID	0	0	0											
175	Galena	CID	ID	2	2	4					2			1	1		
176	Giant Cedar	CID	ID	?	3	7											
177	Golden Creek	CID	ID	?	?	?			1								
178	Grandad	CID	ID	?	4	5											
179	Hard Butte	CID	ID	?	?	?					3				10		
180	Hemlock Ridge	CID	ID	?	3	?											
181	Honey Jones	CID	ID	2	2	4	1	1									
182	Hoodoo	CID	ID	?	2	?											
183	Hornet Ck	CID	ID	?	4	?											

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]	KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6] CATTLE	SHEEP	DOGS	OTHER
184	Horsethief	CID	ID	?	?	?								7			
185	Hughes Creek #	CID	ID	?	5	?				3							
	~~Indian Creek~~ [7]	CID	ID	0	0	0											
186	Iron Creek	CID	ID	?	?	?											
187	Jersey Creek	CID	ID	?	2	?		1		1							
188	Jungle Creek	CID	ID	?	?	?									3		
189	Jureano Mountain	CID	ID	?	2	10					4			1			
190	Kelly Creek	CID	ID	?	2	?			1	2							
191	Kootenai Peak	CID	ID	?	4	10											
192	Landmark	CID	ID	?	5	?											
193	Lemhi	CID	ID	?	?	?					2			7			1
194	Lick Creek	CID	ID	?	5	?											
195	Little Anderson	CID	ID	?	?	?											
196	Little Wood River	CID	ID	?	?	?					2				3		
197	Lochsa	CID	ID	?	6	15											
198	Long Meadow	CID	ID	?	1	?					4			2			
199	Magruder	CID	ID	?	?	?											
200	Mahoney	CID	ID	?	?	8											
201	Marble Mountain	CID	ID	?	5	7											
202	Monumental Creek	CID	ID	?	?	?											
203	Morgan Creek	CID	ID	?	?	?								1			
204	Moyer Basin	CID	ID	?	9	12					1			4			
205	Musselshell	CID	ID	?	2	5											
206	Nakarna Mtn	CID	ID	?	4	?											
	~~Owl Creek~~ [7]	CID	ID	0	0	0											
207	Pen Basin	CID	ID	?	2	?											
	~~Pettibone Creek~~ [7]	CID	ID	0	0	0											
208	Phantom Hill	CID	ID	?	?	?											
209	Pilot Rock	CID	ID	?	1	?											
210	Pot Mountain	CID	ID	?	?	7				1							
211	Red River	CID	ID	?	4	?											
212	Scott Mountain	CID	ID	?	?	2											
	~~Selway~~ [7]	CID	ID	0	0	0											
213	Seven Devils	CID	ID	2	4	6											
214	Sleepy Hollow	CID	ID	?	?	?											
	~~Snake River~~ [7]	CID	ID	0	0	0			1		1						
215	Soldier Mountain	CID	ID	2	2	4									1		

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010 ADULT	PUP	TOT	DOCUMENTED MORTALITIES NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]	KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6] CATTLE	SHEEP	DOGS	OTHER
216	Spirit Ridge	CID	ID	?	4	?											
217	Steel Mountain	CID	ID	?	3	?					2				38		
218	Stolle Meadows	CID	ID	?	?	?											
	~~Sweet Ola~~ [7]	CID	ID	0	0	0					9			4			
219	Tangle Creek	CID	ID	?	?	8											
220	Thorn Creek	CID	ID	?	5	7					1				1		
221	Thunder Mountain	CID	ID	?	3	?											
222	Timberline	CID	ID	?	5	10				1							
223	Van	CID	ID	?	?	?											
224	Wapiti	CID	ID	?	4	11											
225	White Bird Creek	CID	ID	?	0	?					2			5			2
226	Wolf Fang	CID	ID	?	?	?											
227	Woodhead	CID	ID	?	4	?											
228	Yankee Fork	CID	ID	?	?	?				1							
229	Yuba River	CID	ID	?	?	?					2				20		
	Misc. / Lone Wolves	CID	ID			9	1	1	5	35	29			30	56		
	minimum count	CID	ID	19	158	223	2	3	11	48	75	0	0	75	148	0	3
	Diff. from pop. est. [9]	CID	ID			394											
	ID in CID (Table 3a)		ID	19	158	617	2	3	11	48	75	0	0	75	148	0	3

Table 3b: Idaho Wolf Packs and Population Data for Idaho's Portion of the Northwest Montana Recovery Area, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER
	~~Boundary~~ # [7]	NWMT	ID	0	0	0											
230	Bumblebee	NWMT	ID	?	?	?											
231	Calder Mtn #	NWMT	ID	?	?	?											
232	Copper Falls #	NWMT	ID	?	5	?											
233	Cutoff Peak #	NWMT	ID	?	4	?											
234	Pond Peak #	NWMT	ID	?	?	?											
235	R1-1	NWMT	ID	?	3	?											
	~~Snowy Top~~ # [7]	NWMT	ID	0	0	0											
	Misc/Lone	NWMT	ID	0	0	0		2			1						
	minimum count	NWMT	ID	0	12	0	0	2	0	0	1	0	0	0	0	0	0
	Diff. from pop. est. [9]					48											
ID in NWMT (Table 3b)		NWMT	ID	0	12	48	0	2	0	0	1	0	0	0	0	0	0

Table 3c: Idaho Wolf Packs and Population Data for Idaho's Portion of Greater Yellowstone Experimental Area and Idaho Statewide totals, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER
236	Biscuit Basin	GYA	ID	?	2	2											
237	Bishop Mountain #	GYA	ID	?	3	4					1						
238	Bitch Creek #	GYA	ID	?	5	?											
239	Fogg Butte	GYA	ID	?	?	?					1						
240	Henrys Lake #	GYA	ID	?	2	?											
	Misc / Lone	GYA	ID	0	0	0											
	minimum count	GYA		0	12	6	0	0	0	0	2	0	0	0	0	0	0
	Diff. from pop. est. [9]					34											
ID in GYA (Table 3c)		GYA	ID	0	12	40	0	0	0	0	2	0	0	0	0	0	0
ID in CID (Table 3a)		CID	ID	19	158	617	2	3	11	48	75	0	0	75	148	0	3
ID in NWMT (Table 3b)		NWMT	ID	0	12	48	0	2	0	0	1	0	0	0	0	0	0
ID in GYA (Table 3c)		GYA	ID	0	12	40	0	0	0	0	2	0	0	0	0	0	0
ID STATE TOTAL		**GYA/NWMT/CID**		**19**	**182**	**705**	**2**	**5**	**11**	**48**	**78**	**0**	**0**	**75**	**148**	**0**	**3**

Table 3d: Wolf Population Data for the Central Idaho Experimental Area, 2010.

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER
MT in CID (Table 1c)		CID	MT	59	35	122	0	2	0	0	33	0	1	33	1	1	0
ID in CID (Table 3a)		CID	ID	19	158	617	2	3	11	48	75	0	0	75	148	0	3
CID RECOVERY AREA		**CID**	**ID/MT**	**78**	**193**	**739**	**2**	**5**	**11**	**48**	**108**	**0**	**1**	**108**	**149**	**1**	**3**

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

2 Excludes wolves killed in control actions to address livestock depredation and lawful public harvest.

3 Does not include pups that disappeared before winter.

4 Collared wolves that became missing in 2010.

5 Agency lethal control whether under state or federal regulations. Includes wolves killed by private citizens to defend livestock or under terms of a kill permit.

6 Includes only domestic animals confirmed killed by wolves.

7 Pack did not exist on Dec. 31 2010 and is not displayed on the map; see pack narrative.

8 IDFG-authorized take by the public during an extension of the 2009 wolf-hunting season or during the 2010 spring black bear harvest season in the Lolo Elk Zone.

Border pack shared with adjacent state or province; dens in Idaho.

9 reflects the number of wolves in documented Idaho packs listed in Tables 3a, 3b, and 3c that were not observed or included in the Total column, plus additional wolves above and beyond those reported in Misc./Lone Wolves category that could not be acounted for as a result of mortality and/or depredations that occurred outside of territories of documented packs.

FINAL_Table_3a_3b_3c_3d_ID_03-02-11_csime.xls

Table 4a: Northern Rocky Mountain minimum fall wolf population and breeding pairs* 1980-2010, by Federal Recovery Area

(Includes only Montana, Idaho, and Wyoming within the Northern Rocky Mountain Distinct Population Segment. See Figures 2-4.)

Minimum Fall Wolf Population by Recovery Area:

Year	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	08	09	10
Recovery Area																															
NWMT	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	282	319	374
GYA																21	40	86	112	118	177	218	271	301	335	325	390	453	449	455	501
CID																14	42	71	114	156	196	261	284	368	452	565	739	830	924	913	739
TOTAL	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	1655	1687	1614

Breeding Pairs by Recovery Area:

Year	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	08	09	10
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	18	26	24
GYA																2	4	9	6	8	14	13	23	21	31	20	31	33	35	38	37
CID																	3	6	10	10	10	15	14	30	29	40	43	51	42	49	47
TOTAL							1	2	1	1	3	2	4	4	5	8	14	20	21	24	30	35	49	55	66	71	86	107	95	113	108

* 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.

FINAL_2010_BP_by_REC_AREA_Table_4a_&_Figure_5_03-02-11_csime.xls

Table 4b: Northern Rocky Mountain minimum fall wolf population and breeding pairs* 1980-2010, by State.

(Includes only those within the Northern Rocky Mountain Distinct Population Segment. See Figure 1.)

Minimum Fall Wolf Population by State:

Year	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	08	09	10
State																															
MT	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	497	524	566
WY																21	40	86	112	107	153	189	217	234	272	252	311	359	302	320	343
ID																14	42	71	114	156	187	251	263	345	422	512	673	732	856	870	705
OR																														14	21
WA																														5	16
UT																															0
TOTAL	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	1655	1733	1651

Breeding Pairs by State:

Year	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	08	09	10
State																															
MT							1	2	1	1	3	2	4	4	5	6	7	5	5	7	8	7	17	10	15	19	21	39	34	37	35
WY																2	4	9	6	7	12	13	18	16	25	16	25	25	22	27	27
ID																	3	6	10	10	10	14	13	28	26	36	41	43	39	49	46
OR																														1	2
WA																														1	1
UT																															0
TOTAL							1	2	1	1	3	2	4	4	5	8	14	20	21	24	30	34	48	54	66	71	87	107	95	115	111

* 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.

FINAL_2010_BP_by_STATE_Table_4b_&_Figure_6_03-02-11_csime.xls

Table 5a: Northern Rocky Mountain States Confirmed Wolf Depredation[1], 1987-2010, by Recovery Area.

(Within the NRM Federal Recovery Area only; does not include Oregon, Washington, or Utah. See Table 5c.)

YEAR	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	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	37	40	26	256
sheep	10	0	0	0	2	0	0	0	0	0	30	0	19	2	5	13	3	1	1	1	5	0	9	13	114
other [3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	1	0	2	1	9	5	11	38
dogs	0	0	0	1	0	0	0	0	3	1	0	0	2	3	1	4	0	0	0	1	3	2	1	0	22
wolves moved	0	0	4	0	3	0	0	2	2	10	7	0	4	0	5	0	0	0	0	0	0	0	0	0	37
wolves killed[2]	4	0	1	1	0	0	0	0	0	4	14	4	9	4	3	9	14	1	2	15	19	50	63	62	279
Greater Yellowstone Recovery Area:																									
cattle									0	0	5	3	4	7	22	33	45	100	61	135	79	60	37	54	645
sheep									0	13	67	7	13	39	117	71	90	99	53	41	35	111	477	83	1316
other [3]									0	0	0	0	1	0	0	0	10	4	0	1	13	5	2	1	37
dogs									1	0	0	4	7	8	4	1	0	6	2	0	3	1	13	1	51
wolves moved									6	8	14	0	0	6	8	0	0	0	0	0	0	0	0	0	42
wolves killed[2]									0	1	6	3	9	6	9	23	38	55	60	56	87	83	69	89	594
Central Idaho Recovery Area:																									
cattle									0	2	1	9	16	15	10	10	13	24	27	43	78	117	115	108	588
sheep									0	24	29	5	57	39	16	15	118	170	190	205	173	244	235	149	1669
other [3]									0	0	0	0	0	0	0	0	0	0	2	0	0	3	0	3	8
dogs									0	1	4	1	6	0	1	4	6	3	9	7	7	11	10	1	71
wolves moved									0	5	0	3	15	10	5	0	0	0	0	0	0	0	0	0	38
wolves killed[2]									0	1	1	0	5	10	7	14	7	30	41	71	80	131	138	108	644
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	214	192	188	1489
sheep	10	0	0	0	2	0	0	0	0	37	126	12	89	80	138	99	211	270	244	247	213	355	721	245	3099
other [3]	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	5	10	5	2	3	14	17	7	15	83
dogs	0	0	0	1	0	0	0	0	4	2	4	5	15	11	6	9	6	9	11	8	13	14	24	2	144
wolves moved	0	0	4	0	3	0	0	2	8	23	21	3	19	16	18	0	0	0	0	0	0	0	0	0	117
wolves killed[2]	4	0	1	1	0	0	0	0	0	6	21	7	23	20	19	46	59	86	103	142	186	264	270	259	1517

1 Numbers of animals confirmed killed by wolves in calendar year. Excludes Oregon and Washington. See Table 5c.

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

3 Total livestock other than cattle and sheep confirmed killed by wolves 1987 - 2010: 27 llamas, 37 goats, 14 horses, 4 miniature horses, 1 domestic bison

FINAL_2010_DEP_by_REC_AREA_Table_5a_03-02-11_csime.xls

Table 5b: Northern Rocky Mountain Confirmed Wolf Depredation[1], 1987-2010, by State.

(Within the NRM Federal Recovery Area only; does not include Oregon, Washington, or Utah. See Table 5c.)

YEAR	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	TOTAL
Montana																									
cattle	6	0	3	5	2	1	0	6	3	10	19	10	20	14	12	20	24	36	23	32	75	77	97	87	582
sheep	10	0	0	0	2	0	0	0	0	13	41	0	25	7	50	84	86	91	33	4	27	111	202	64	850
other [3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	3	2	2	14	16	6	11	63
dogs	0	0	0	1	0	0	0	0	4	1	0	1	2	5	2	5	1	4	1	4	3	2	4	2	42
wolves moved	0	0	4	0	3	0	0	2	8	22	20	0	14	6	17	0	0	0	0	0	0	0	0	0	96
wolves killed[2]	4	0	1	1	0	0	0	0	0	5	18	4	19	7	8	26	34	40	35	53	73	110	145	141	724
Wyoming																									
cattle									0	0	2	2	2	3	18	23	34	75	54	123	55	41	20	26	478
sheep									0	0	56	7	0	25	34	0	7	18	27	38	16	26	195	33	482
other [3]									0	0	0	0	1	0	0	0	10	2	0	1	0	0	0	1	15
dogs									0	0	0	3	6	6	2	0	0	2	1	0	2	0	7	0	29
wolves moved									0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
wolves killed[2]									0	0	2	3	1	2	4	6	18	29	41	44	63	46	32	40	331
Idaho																									
cattle									0	1	1	9	11	15	10	9	6	19	20	29	53	96	75	75	429
sheep									0	24	29	5	64	48	54	15	118	161	184	205	170	218	324	148	1767
other [3]									0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	5
dogs									0	1	4	1	7	0	2	4	5	3	9	4	8	12	13	0	73
wolves moved									0	1	0	3	5	10	1	0	0	0	0	0	0	0	0	0	20
wolves killed[2]									0	1	1	0	3	11	7	14	7	17	27	45	50	108	93	78	462
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	214	192	188	1489
sheep	10	0	0	0	2	0	0	0	0	37	126	12	89	80	138	99	211	270	244	247	213	355	721	245	3099
other [3]	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	5	10	5	2	3	14	17	7	15	83
dogs	0	0	0	1	0	0	0	0	4	2	4	5	15	11	6	9	6	9	11	8	13	14	24	2	144
wolves moved	0	0	4	0	3	0	0	2	8	23	21	3	19	16	18	0	0	0	0	0	0	0	0	0	117
wolves killed[2]	4	0	1	1	0	0	0	0	0	6	21	7	23	20	19	46	59	86	103	142	186	264	270	259	1517

1 Numbers of animals confirmed killed by wolves in calendar year. Excludes Oregon and Washington. See Table 5c.

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

3 Total livestock other than cattle and sheep confirmed killed by wolves between 1987 and 2010: are 27 llamas, 37 goats, 14 horses, 4 miniature horses, 1 domestic bison.

See Interagency Report narrative for compensation paid in each state.

FINAL_2010_DEP_by_STATE_Table_5b_&_5c_03-02-11_csime.xls

Table 5c: Confirmed Wolf Depredation[1] Elsewhere, Northern Rocky Mountain Distinct Population Segment, 2010.

(Includes only portions of Oregon, Washingtonm Utah within the NRM Distinct Population Segment. See Figure 1.)

YEAR	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	TOTAL
Oregon																									
cattle																							1	8	9
sheep																							28	0	28
other [3]																							1	0	1
dogs																							0	0	0
wolves moved																							0	0	0
wolves killed[2]																							2	0	2
Washington																									
cattle																							0	0	0
sheep																							0	0	0
other [3]																							0	0	0
dogs																							0	0	0
wolves moved																							0	0	0
wolves killed[2]																							0	0	0
Utah																									
cattle																							0	3	3
sheep																							0	4	4
other [3]																							0	0	0
dogs																							0	0	0
wolves moved																							0	0	0
wolves killed[2]																							0	1	1
Total, 3 States																									
cattle																							1	11	12
sheep																							28	4	32
other [3]																							1	0	1
dogs																							0	0	0
wolves moved																							0	0	0
wolves killed[2]																							2	1	3

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

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

3 Total livestock other than cattle and sheep confirmed killed by wolves 2009-2010: 1 goat.

See Interagency Report narrative for compensation paid in each state.

FINAL_2010_DEP_by_STATE_Table_5b_&_5c_03-02-11_csime.xls

Table 6: Wolf Packs and Population Data for Oregon, Washington, and Utah Inside the Northern Rocky Mountain Distinct Population Segment, 2010. (See Figures 1 and 7)

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2010			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER
241	Imnaha		OR	9	6	15						1		8			
242	Wenaha		OR	3	3	6		1									
243	Diamond #		WA/ID	6	6	12											
244	Salmo		WA	3	1	4											
	Misc./Lone		UT	0	0	0					1			3	4		
OR/WA Total inside NRM DPS (Table 6)				21	16	37	0	1	0	0	1	1	0	11	4	0	0

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

2 Excludes wolves killed in control actions to address livestock depredation and lawful public harvest.

3 Does not include pups that disappeared before winter.

4 Collared wolves that became missing in 2010.

5 Agency lethal control whether under state or federal regulations. Includes wolves killed by private citizens to defend livestock or under terms of a kill permit.

6 Includes only domestic animals confirmed killed by wolves.

7 Pack did not exist on Dec. 31 2010 and is not displayed on the map; see pack narrative.

8 No regulated public harvest in 2010.

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

FINAL_Table_6_Table_7_OR_WA_UT_03-02-11_csime.xls

Table 7: Wolf Packs and Population Data for Washintgon Outside the Northern Rocky Mountain Distinct Population Segment, 2010. (See Figure 7)

REF #	WOLF PACK [1]	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2009			DOCUMENTED MORTALITIES					KNOWN DISPERSED	MISSING [4]	CONFIRMED LOSSES [6]			
				ADULT	PUP	TOT	NATURAL	HUMAN [2]	UNKN [3]	HARVEST [8]	CONTROL [5]			CATTLE	SHEEP	DOGS	OTHER
	Lookout		WA	3	0	3			1								
WA Total outside NRM DPS (Table 7)				3	0	3	0	0	1	0	0	0	0	0	0	0	0

FINAL_Table_6_Table_7_OR_WA_UT_03-02-11_csime.xls

APPENDIX 4

NORTHERN ROCKIES PACK DISTRIBUTION MAPS 2010

Figure 1. (map) Central Idaho, Northwest Montana and Greater Yellowstone wolf recovery areas (Key: Tables 1 - 3).

Figure 2. (map) Northwest Montana Wolf Recovery Area (Key: Table 1a).

Figure 3. (map) Greater Yellowstone Wolf Recovery Area (Key: Tables 1b, 2).

Figure 4. (map) Central Idaho Wolf Recovery Area (Key: Tables 1c, 3 a, b, c, d).

Figure 7. (map) Oregon Washington Wolf Pack Locations (Key: Tables 6 and 7).

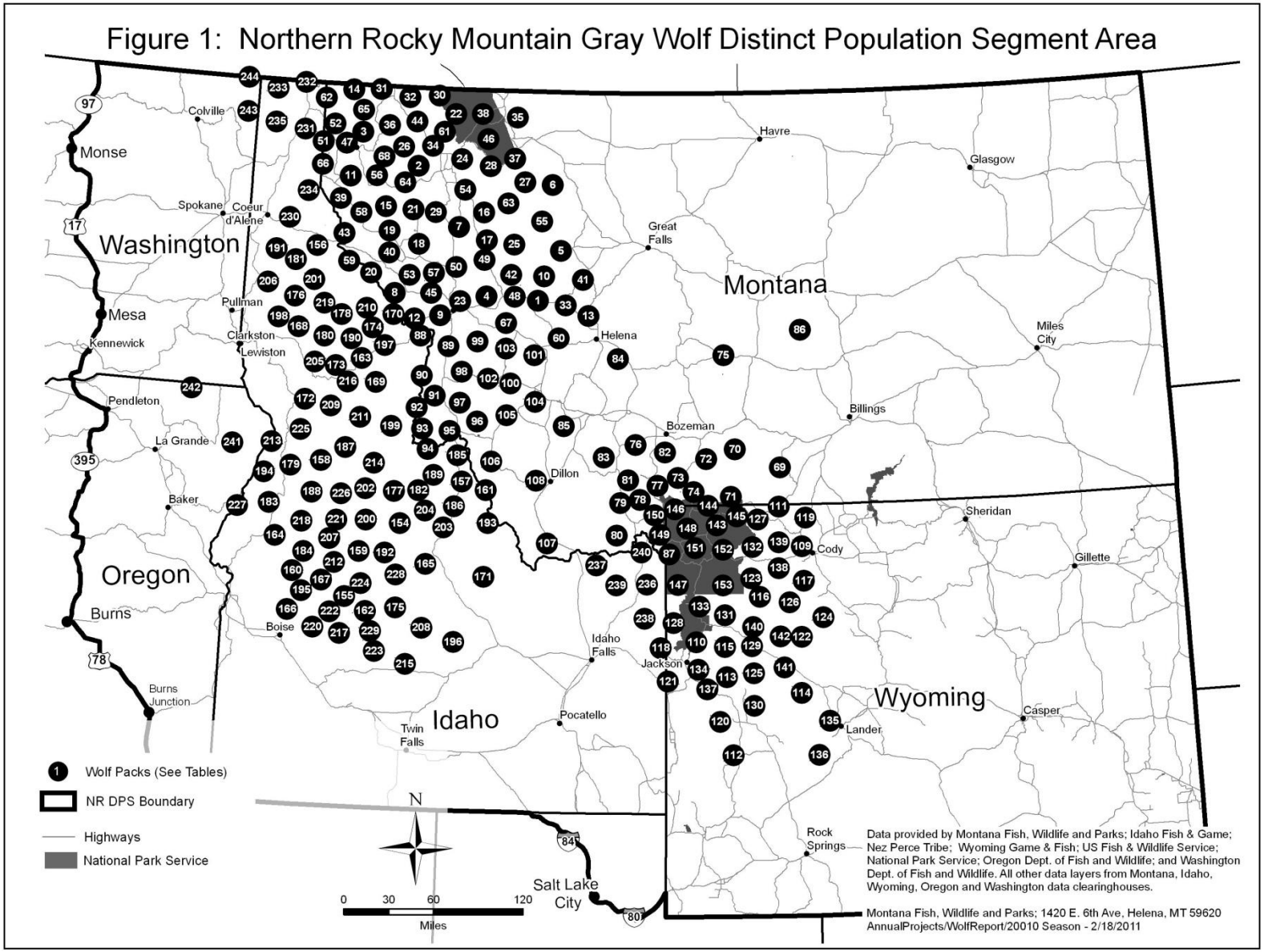


Figure 1: Northern Rocky Mountain Gray Wolf Distinct Population Segment Area
Washington
Oregon
Idaho
Montana
Wyoming
Colville
Spokane
Coeur d'Alene
Pullman
Clarkston
Lewiston
Kennewick
Pendleton
La Grande
Baker
Burns
Burns Junction
Boise
Twin Falls
Pocatello
Idaho Falls
Jackson
Monse
Mesa
Havre
Glasgow
Great Falls
Helena
Miles City
Billings
Bozeman
Dillon
Sheridan
Cody
Gillette
Casper
Lander
Rock Springs
Salt Lake City
97
17
395
78
84
80
1 Wolf Packs (See Tables)
NR DPS Boundary
Highways
National Park Service
N
0 30 60 120
Miles
Data provided by Montana Fish, Wildlife and Parks; Idaho Fish & Game; Nez Perce Tribe; Wyoming Game & Fish; US Fish & Wildlife Service; National Park Service; Oregon Dept. of Fish and Wildlife; and Washington Dept. of Fish and Wildlife. All other data layers from Montana, Idaho, Wyoming, Oregon and Washington data clearinghouses.
Montana Fish, Wildlife and Parks; 1420 E. 6th Ave, Helena, MT 59620
AnnualProjects/WolfReport/20010 Season - 2/18/2011

Figure 2. Northwest Montana Wolf Recovery Area

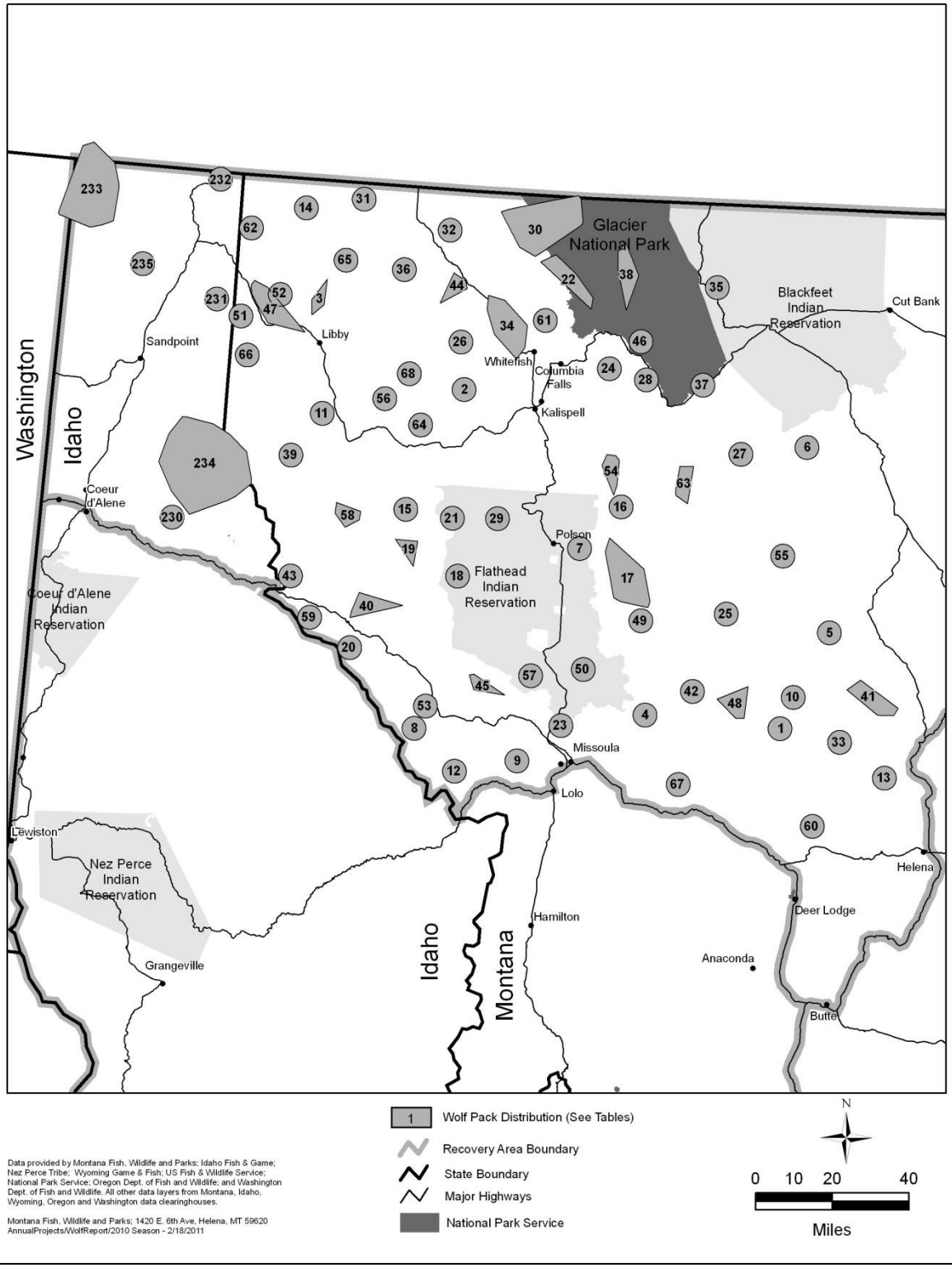


Figure 3. Greater Yellowstone Wolf Recovery Area

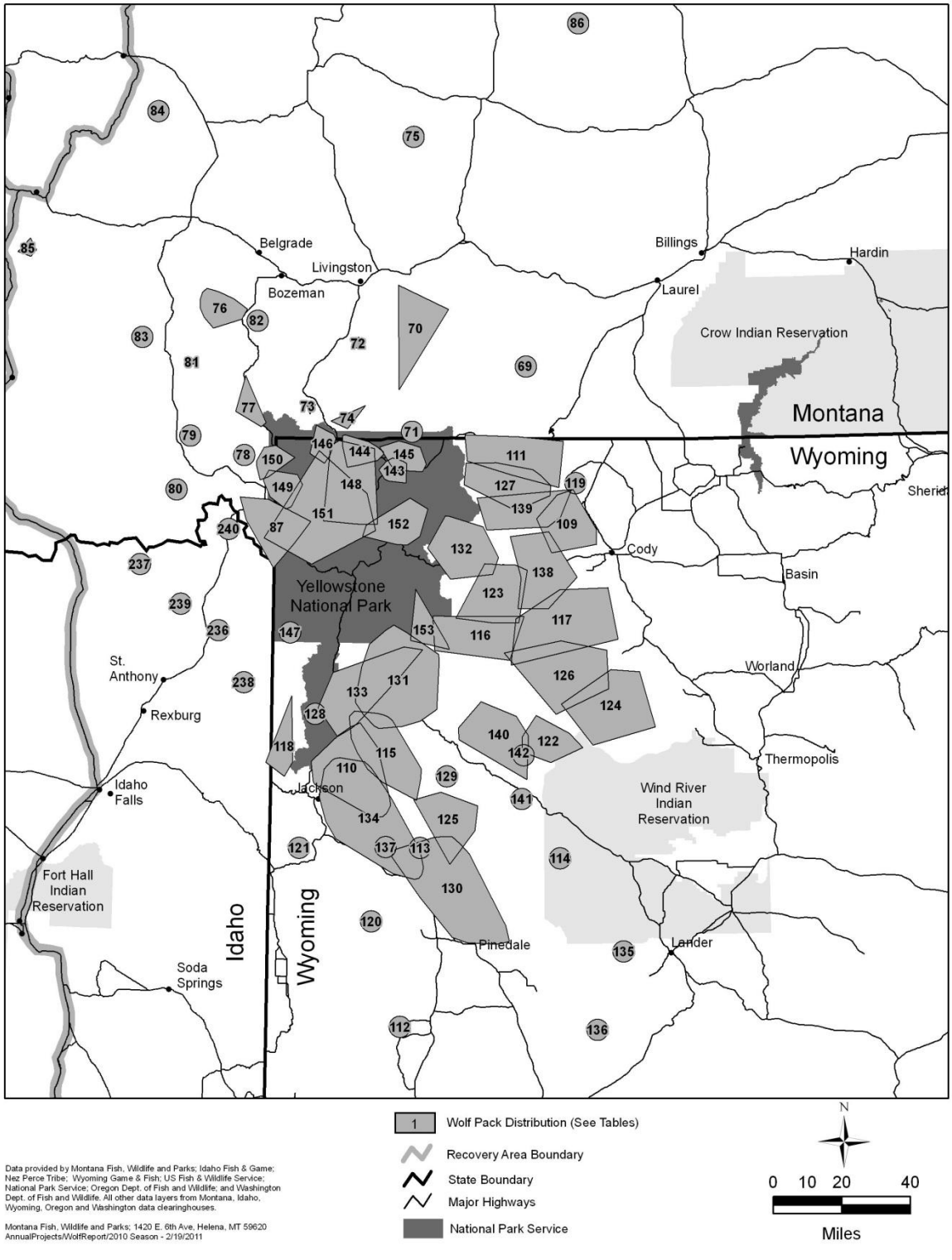


Figure 4. Central Idaho Wolf Recovery Area

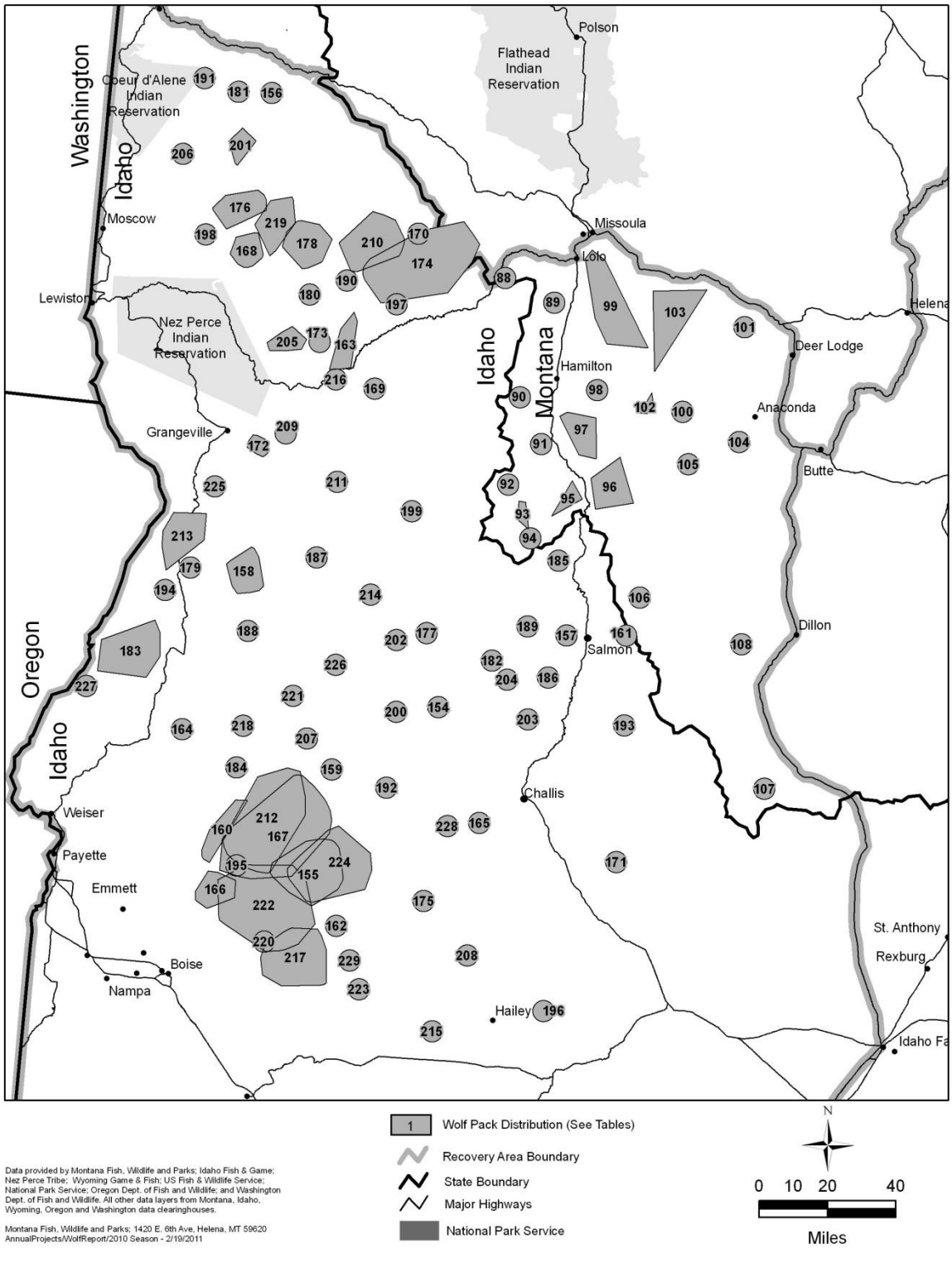
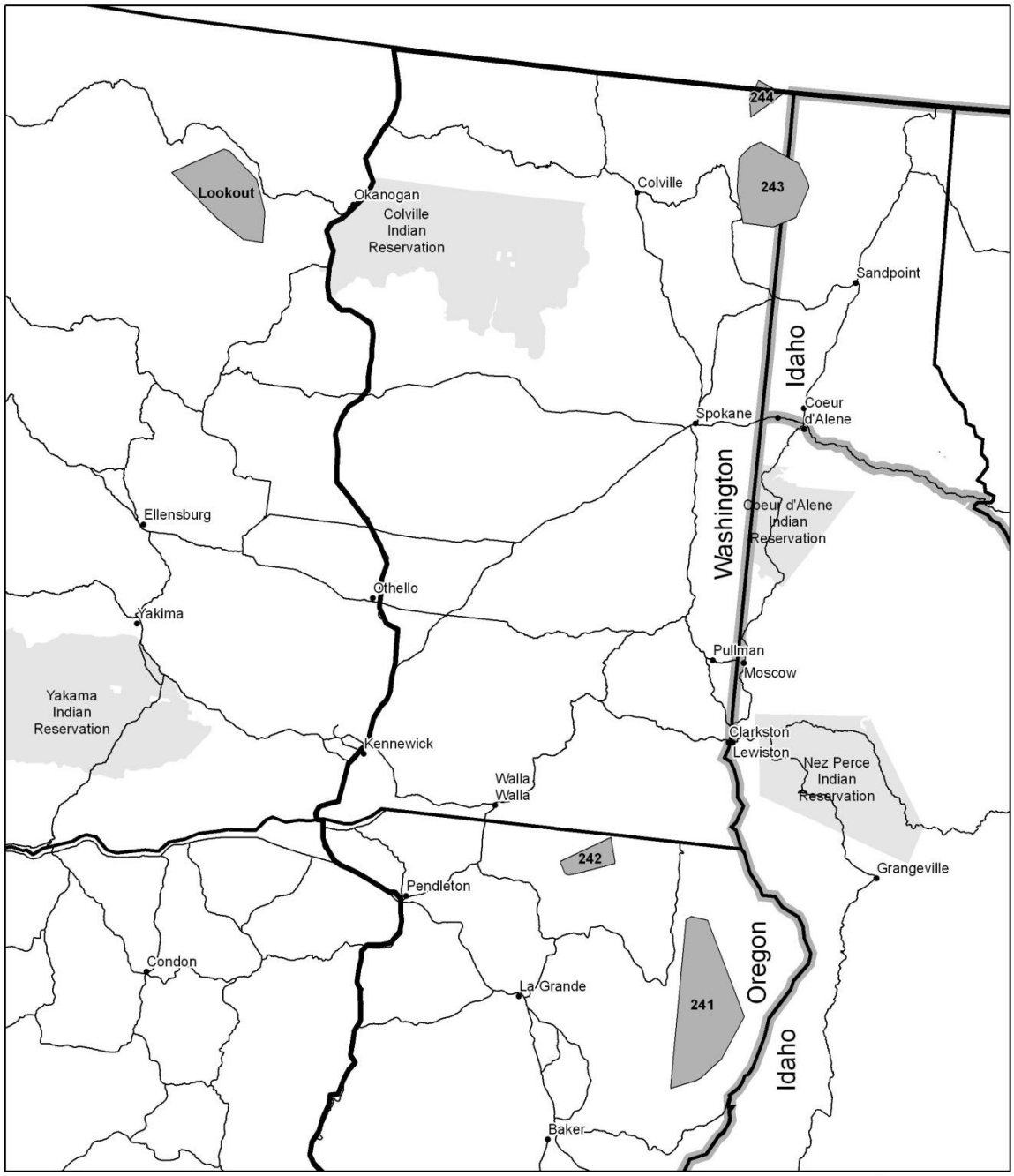


Figure 7. Oregon / Washington Wolf Pack Locations



APPENDIX 5

NORTHERN ROCKIES WOLF POPULATION GRAPHS

Figure 5. Northern Rocky Mountain wolf population trends 1980-2010, by recovery area.

Figure 6.Northern Rocky Mountain wolf population trends 1980-2010, by state.

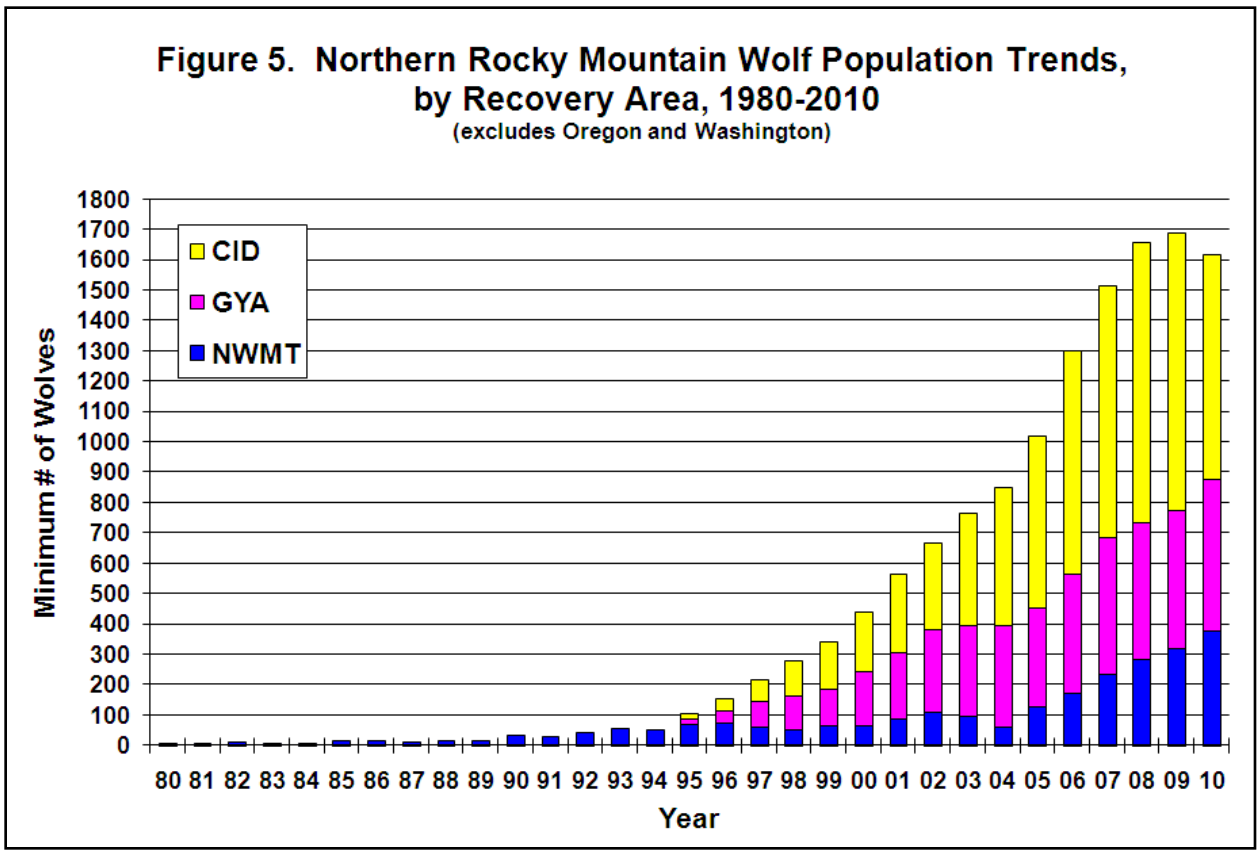


Figure 5. Northern Rocky Mountain Wolf Population Trends, by Recovery Area, 1980-2010
(excludes Oregon and Washington)
Minimum # of Wolves
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
CID
GYA
NWMT
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10
Year

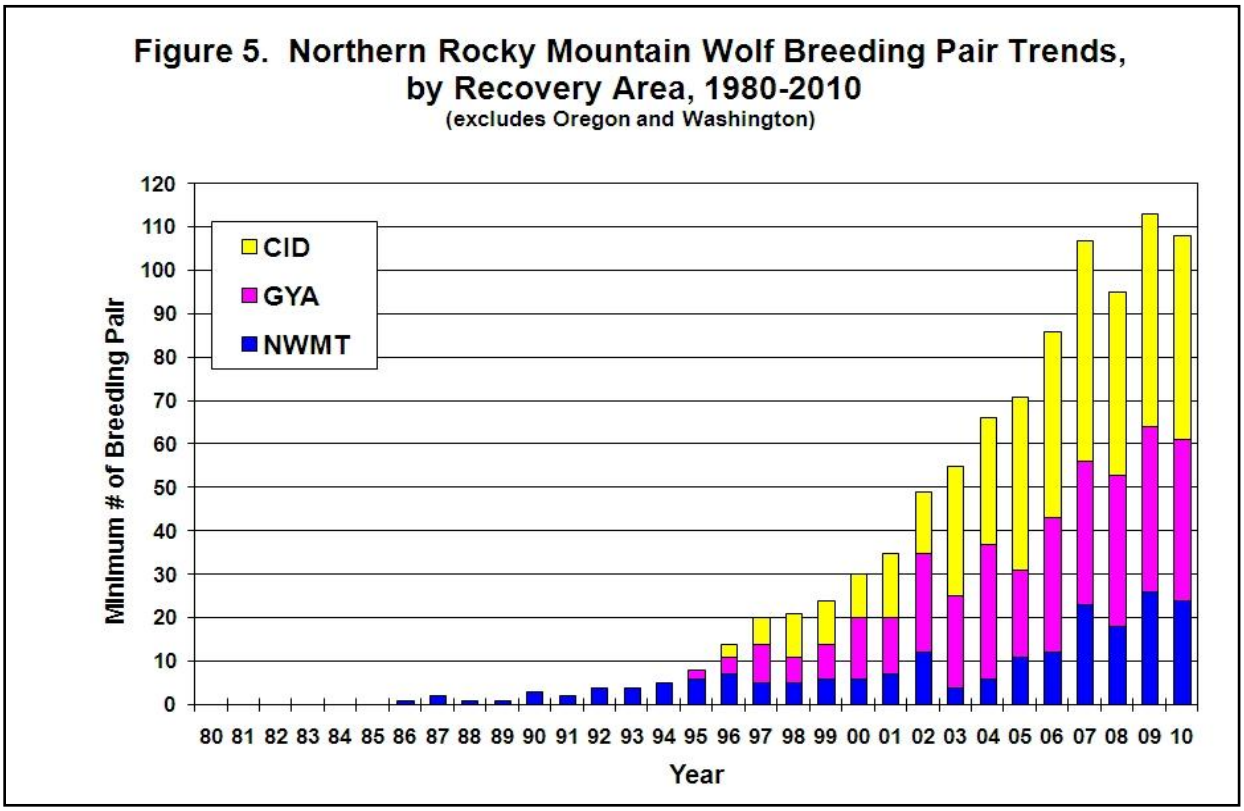


Figure 5. Northern Rocky Mountain Wolf Breeding Pair Trends, by Recovery Area, 1980-2010
(excludes Oregon and Washington)
Minimum # of Breeding Pair
120
110
100
90
80
70
60
50
40
30
20
10
0
CID
GYA
NWMT
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10
Year

Figure 6. Northern Rocky Mountain Wolf Population Trends in Montana, Idaho and Wyoming: 1980-2010

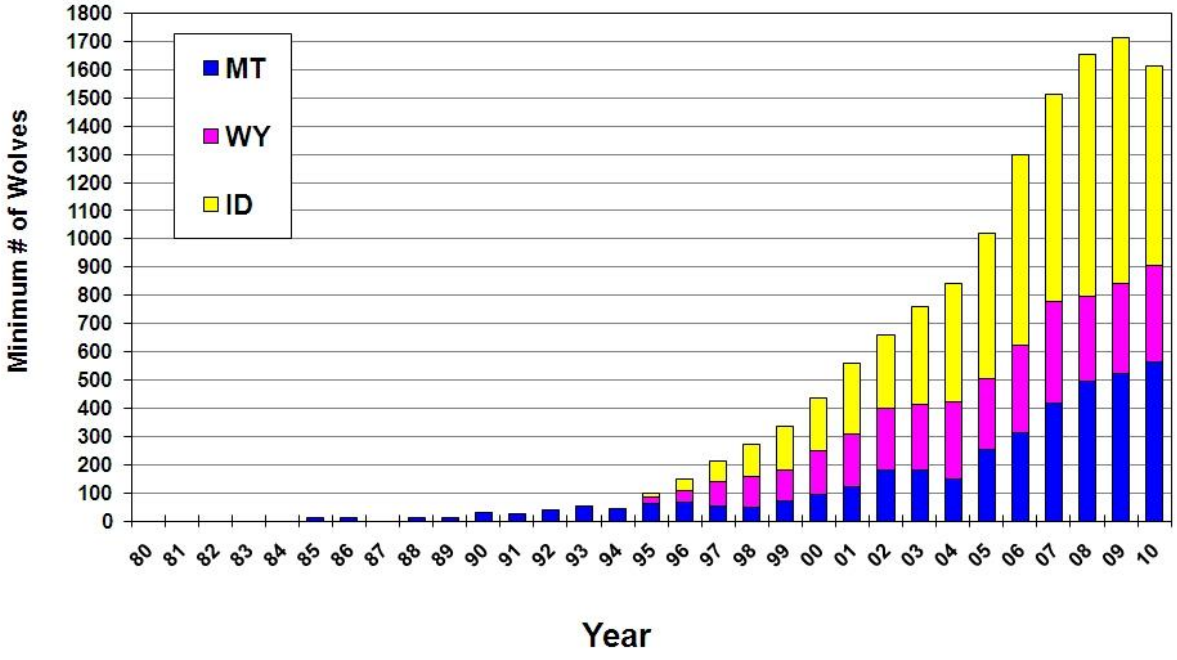


Figure 6. Northern Rocky Mountain Breeding Pair Trends in Montana, Idaho and Wyoming: 1980-2010