Rocky Mountain Wolf Recovery
2004 Annual Report

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

NPS photo by D. Smith

This cooperative annual report presents information on the status, distribution and management of the Northern Rocky Mountain wolf population from January 1, 2004 to December 31, 2004. It is also available at http://westerngraywolf.fws.gov/annualreports.htm

This report may be copied and distributed as needed.

Suggested citation: U.S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, Montana Fish, Wildlife and Parks, Idaho Fish and Game, and USDA Wildlife Services. 2005. Rocky Mountain Wolf Recovery 2004 Annual Report. D. Boyd, ed. USFWS, Ecological Services, 100 N Park, Suite 320, Helena MT. 72 pp.

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SUMMARY

The gray wolf *(Canis lupus)* population in the Northern Rocky Mountain (NRM) states (Idaho, Montana, and Wyoming) continued to increase in distribution and numbers (Figure 1, Tables 4a, 4b). Estimates of wolf numbers at the end of 2004 were 452 wolves in the Central Idaho Recovery Area (CID), 324 in the Greater Yellowstone Recovery Area (GYA), and 59 in the Northwest Montana Recovery Area (NWMT) for a total of 835 wolves (Figure 1, Table 4a). By state boundaries, there were an estimated 422 wolves in the state of Idaho, 260 in Wyoming and 153 in Montana (Table 4b). Of approximately 110 packs (groups of 2 or more wolves), 66 packs met the definition of "breeding pair," defined as an adult male and female raising 2 or more pups until December 31 (Tables 4a, 4b). This made 2004 the fifth year in which 30 or more breeding pairs were documented within the 3-state area. Recovery criteria have been met for removing NRM wolves from the Endangered Species list.

Wolves in the area subsisted mainly on elk, white-tailed deer, mule deer, moose, and bison. Livestock depredations in 2004 included 128 cattle, 270 sheep, and 9 dogs that were confirmed as killed by wolves (Tables 5a, 5b). Approximately 39 of 110 known wolf packs were involved in confirmed livestock depredations. In response, 85 wolves were lethally removed within the 3-state area. No wolves were translocated in 2004. As new packs form between the original core recovery/release areas, the 3 populations increasingly resemble and function as a single, large population (Figure 1). Numerous research projects are underway, examining wolf population dynamics, predator-prey interactions and livestock depredation.

BACKGROUND

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

The NRM wolf population contains 3 recovery areas: the NWMT (Figs. 1, 2) includes northern Montana and the northern Idaho panhandle; the GYA (Figs. 1, 3) includes Wyoming and adjacent parts of Idaho and Montana; the CID (Figs. 1, 4) includes central Idaho and adjacent parts of southwest Montana. Wolves in the 3 recovery areas are managed under different guidelines, depending upon their designated status under the ESA. In 2003, NWMT wolves were reclassified from endangered, the most protected classification under the ESA, to threatened, a less restrictive classification. However, in January 2005, a federal court ordered wolves to be listed again as endangered in the northern U.S. including NWMT. The GYA and CID wolves are classified as nonessential experimental populations and managed with more flexible options than an endangered or threatened population. The U.S. Fish and Wildlife Service (USFWS), responsible for administering the ESA, believes that 30 or more breeding pairs of wolves, with an equitable distribution among the 3 states for 3 successive years,

constitutes a viable and recovered wolf population. That criterion was met at the end of 2002. If other provisions required for delisting are met, primarily adequate regulatory mechanisms in the form of state laws and wolf management plans that would reasonably assure that the gray wolf would not become threatened or endangered again, the USFWS will propose delisting (removal from protection under the ESA).

NORTHWEST MONTANA WOLF RECOVERY AREA

Personnel

Wolves in Montana (including the NWMT recovery area and parts of the GYA and CID recovery areas) were monitored in western Montana by USFWS biologists Joe Fontaine, Diane Boyd, Jack Bucklin, and Paul Frame. Tom Meier, formerly the USFWS biologist in Kalispell, left Montana and took a job as wildlife biologist for Denali National Park and Preserve in Alaska. Montana Fish, Wildlife and Parks completed a cooperative agreement with USFWS, becoming the FWS's designated agent in May 2004 (see Montana Wolf Management). Carolyn Sime became the FWP Wolf Program Coordinator in Helena, and FWP Wolf Management Specialist Kent Laudon, Kalispell, monitored wolves in NWMT. Therese Hartman was a USFWS volunteer who monitored wolves in northwest Montana. Amy Edmonds, Glacier National Park (GNP), monitored the Kintla and Whitefish Packs. Other USFWS personnel in Montana included wolf recovery coordinator Ed Bangs (Helena), and law enforcement agents Roger Parker (Agent-In-Charge, Billings), Rick Branzell (Special Agent, Missoula), and Doug Goessman (Special Agent, Bozeman). In the portions of Montana that lie within the GYA and CID recovery areas, wolves were monitored cooperatively with the Turner Endangered Species Fund (TESF), National Park Service (NPS) and Nez Perce Tribe (NPT) (see GYA and CID Personnel). Carita Bergman, Alberta Fish and Wildlife Division, monitored movement of a dispersing Global Positioning System (GPS) radiocollared wolf that established a home range in Montana. Many other individuals, organizations and agencies contributed toward wolf monitoring and management.

Wolf control activities in all recovery areas were carried out by USDA/APHIS/Wildlife Services (WS). Wildlife Service personnel involved in wolf management in Montana in 2004 included state director Larry Handegard, eastern district supervisor Paul J. Hoover, western district supervisor Kraig Glazier, wildlife specialists Dennis Biggs, John Bouchard, Steve Demers, Michael Hoggan, Chad Hoover, R.R. Martin, Graeme McDougal, Theodore North, James Rost, Bart Smith, and James Stevens, and pilots Stan Colton, Tim Graff and Eric Waldorf. The Montana WS operation covered parts of the NWMT, GYA, and CID wolf recovery areas.

Monitoring

Eleven wolves were captured and radiocollared in NWMT in 2004. Seven were radiocollared during USFWS trapping efforts, and 2 were radiocollared by WS in response to a depredation. Two additional wolves were incidentally captured by fur trappers who contacted the USFWS and WS, and the trappers and federal personnel collaboratively radiocollared and released the

wolves. At the end of 2004, 18 radiocollared wolves (31% of the population) from 11 packs or pairs were being monitored in NWMT. These packs, together with uncollared packs that were documented, totaled 16 packs containing 59 wolves in the NWMT recovery area (Figs 1, 2; Tables 1a, 4a). Radiocollared wolves were located from aircraft approximately 1 - 2 times per month. Radiocollared wolves in and around GNP were located more frequently from the ground by GNP staff.

Packs included in NWMT as of December 2004 were Kintla, Murphy Lake, Ninemile, Whitefish, Spotted Bear, Fishtrap, Candy Mountain, Lazy Creek, Hog Heaven, Halfway, Wolf Prairie, Red Shale, Fish Creek, Great Bear, Lonepine, and Kootenai packs. There were no reports in 2004 from the Castle Rock, Green Mountain, Great Divide, or the Holland Lake areas so those packs are no longer counted. A new pack of wolves, the Wolf Prairie Pack, was radiocollared and reproduction confirmed in the Wolf Creek drainage. The Kootenai Pack is a transboundary pack spanning Montana and British Columbia. This pack denned in NWMT for the first time since the beginning of monitoring them in 2001, and was counted as a NWMT pack in 2004. Sporadic wolf activity was reported in the Grave Creek, Blanchard Creek, and Chief Mountain areas and these areas will continue to be monitored. It is not known which side of the U.S./Alberta border the Chief Mountain wolves spent the majority of their time. Along the transboundary area between the NWMT and CID recovery areas, the Fish Creek Pack was counted in the NWMT population, and the Big Hole Pack was counted in the CID population. All locations in 2004 indicated that the Fish Creek Pack apparently moved south and occupied the former Lupine Creek Pack's home range in CID. A male, adult GPS radiocollared wolf, #78M, dispersed from Pincher Creek, Alberta, south to Montana. Wolf #78 traveled south along the Rocky Mountain front ending up in the Halfway Pack's territory north of Avon, Montana. He remained in this area with radiocollared female #302F in the Great Divide Pack until his radiocollar dropped off, as expected, in December 2004.

Reproduction was confirmed in the Kintla, Murphy Lake, Ninemile, Whitefish, Spotted Bear, Fishtrap, Lazy Creek, Wolf Prairie and Kootenai packs. Six of these packs met the criterion to be counted as breeding pairs. The Hog Heaven Pack did not den because the alpha female died before denning season. The breeding status of the Red Shale, Fish Creek, and Great Bear packs was unknown due to the loss of radiocollared wolves. The Murphy Lake and Ninemile packs each had only 1 confirmed pup surviving to the end of the year. There was not enough data on the Kootenai Pack to confirm survival of at least 2 pups by year end.

Six wolf mortalities were documented in the NWMT population in 2004. The causes of death included 2 illegal kills, 1 vehicle collision, 1 lethally removed in a control action, 1 from natural causes, and 1 from unknown causes. A total of 6 radiocollared wolves ceased transmitting in 2004: Murphy Lake #253, Kootenai #133, Lazy Creek #265, Hog Heaven #328, Red Shale #300, and Great Bear #271. They are missing and may have dispersed or experienced radiocollar failure.

Research

An evaluation of wolf-livestock conflicts and management in the northwestern U.S.

Investigators: Elizabeth H. Bradley and Daniel H. Pletscher, Wildlife Biology Program, Department of Ecosystem and Conservation Sciences, University of Montana (UM), Missoula.

Cooperators: USFWS, TESF, YNP, NPT, Defenders of Wildlife (DOW), National Fish and Wildlife Foundation

Effects of wolf removal on livestock depredation in Montana, Idaho, and Wyoming

Bradley, E. H., D. H. Pletscher, E. E. Bangs, K. E. Kunkel, D. W. Smith, C. M. Mack, J. A. Fontaine, C. C. Niemeyer, T. J. Meier, and M. D. Jimenez.

Abstract: Reducing wolf predation on livestock is a central component of wolf recovery efforts in Montana, Idaho, and Wyoming. To mitigate conflicts, wolves are often killed or translocated away from predation sites. We examined the effects of complete and partial removal of wolf packs on recurrence of livestock predation in areas of removal from 1987-2002. On average, 30% of packs with livestock in their territory preyed on livestock annually. Of these, 63% underwent removal of ≥1 individual. Rate of recolonization of territories where entire packs were removed (n = 10) was high (70%) and most recolonizations (86%) occurred within a year of removal. Most recolonized packs depredated (86%) and most depredations involved ≥1 previously affected livestock producer. Intervals between the last depredation of the removed pack and first depredation of the recolonized pack averaged 276 days. Most packs (68%) depredated again within a year of partial removal. Intervals between depredations after partial pack removal were similar to complete removal, averaging 324 days. Depredation intervals increased an average of 270 days after partial pack removal. Removing alpha individuals appeared no more effective than removing non-alphas in reducing depredations within the year. Packs that were partially removed contributed fewer breeding pairs (defined as an adult male and female with ≥ 2 pups on 31 December) to wolf recovery goals (36%) than non-depredating packs (58%), but both were similar to depredating packs that did not undergo removal (48%).

Evaluating wolf translocation as a non-lethal method to reduce livestock conflicts in the northwestern United States

Bradley, E. H., D. H. Pletscher, E. E. Bangs, K. E. Kunkel, D. W. Smith, C. M. Mack, T. J. Meier, J. A. Fontaine, C. C. Niemeyer, and M. D. Jimenez.

Abstract: Successful nonlethal management of livestock predation is important for conserving carnivores that are rare or endangered. In the northwestern U.S., wolves have been translocated away from livestock with the objective of mitigating conflicts while promoting wolf restoration. We assessed predation on livestock, pack establishment, survival, and homing behavior of 88 translocated wolves with radio telemetry to determine the effectiveness of translocation in our region and consider how it may be improved. More than 25% of translocated wolves preyed on livestock after release. Most translocated wolves (67%) never established or joined a pack, although 8 new packs resulted from translocations. Translocated wolves had lower annual survival (0.60) than other radiocollared wolves (0.73), with government removal the primary source of mortality. In northwest Montana, where most wolves have settled in human-populated

areas with livestock, survival of translocated wolves was lowest (0.41) and more wolves proportionally failed to establish packs (83%) after release. Annual survival of translocated wolves was highest in CID (0.71) and more wolves proportionally established packs (44%) than in the other 2 recovery areas. Translocated wolves showed a strong homing tendency; most of those that failed to home still showed directional movement toward capture sites. Wolves that successfully returned to capture sites were more likely to be adults, hard (immediately) rather than soft (temporarily held in enclosure) released, and translocated shorter distances than other wolves that did not return home. Success of translocations varied and was most affected by the area in which wolves were released. We suggest managers translocating wolves or other large carnivores consider soft releasing individuals (in family groups, if social) when feasible because this may decrease homing behavior and increase release-site fidelity.

Assessing factors related to wolf depredation of cattle in fenced pastures in Montana and Idaho

Elizabeth H. Bradley and Daniel H. Pletscher

Abstract: Managing wolf depredation on livestock is expensive and controversial, therefore managers seek to improve and develop new methods to mitigate conflicts. Determining which factors put ranches at higher risk to wolf depredation may provide ideas for ways to reduce livestock and wolf losses. We sampled cattle pastures in Montana and Idaho that experienced confirmed wolf depredations (n = 34) from 1994-2002 and compared landscape and selected animal husbandry factors with cattle pastures on nearby ranches where depredations did not occur (n = 62). Pastures where depredations occurred were more likely to have elk present, were larger in size, had more cattle, and grazed cattle further from residences than pastures without depredations. Using classification tree analysis, we found that a higher percentage of vegetation cover was also associated with depredated pastures in combination with the variables above. We found no relationship between depredations and carcass disposal methods, calving locations, calving times, breed of cattle, or the distance cattle were grazed from the forest edge. Most pastures where depredations occurred during the wolf denning season (April 15 – June 15) were located closer to wolf dens than nearby cattle pastures without depredations. Physical vulnerability, especially of calves, may also increase risk of depredation.

Outreach

Program personnel presented informational talks and status reports throughout the year to various federal and state agencies, public and private institutions, special interest groups, rural communities, and visitors to Montana. During 2004, project personnel gave public presentations to more than 3000 people on wolf biology, the federal recovery effort, and the increased participation by the state of Montana in wolf monitoring, management, and conservation. Montana Fish, Wildlife and Parks responded to inquiries and public comments received through the FWP website. Numerous local and national radio, television, and newspaper interviews were conducted, featuring project personnel, wolf recovery, federal regulatory changes, and increased state participation.

Livestock Depredation and Management

With the reclassification of wolves in NWMT from endangered to threatened in April of 2003, the rules governing wolf management across the NRM states became nearly uniform across the 3 recovery areas. In NWMT, the use of less-than-lethal munitions (by permit) and harassment by private citizens was allowed, and livestock owners could legally kill wolves caught in the act of physically attacking livestock on private lands. In chronic depredation situations, livestock owners could obtain shoot-on-sight (SOS) permits on public or private lands. All reports of wolf depredation on livestock were investigated by WS, who implemented control after consultation with USFWS and FWP. Nonlethal control methods included trapping and harassment of packs to move them away from livestock, less-than-lethal munitions, fladry, guard animals and Radio Activated Guard (RAG) boxes. No wolves were legally killed by the public in NWMT in 2004 under that expanded management flexibility.

Four of the 16 known wolf packs in NWMT were involved in livestock depredations in 2004. Confirmed losses in 2004 included 6 cattle, 1 lamb, and 1 colt killed by wolves. Another 3 cattle and a llama were confirmed injured. Four cattle were classified as probable wolf kills. In wooded and/or mountainous country, livestock carcasses may not be found promptly, if ever. It can be difficult or impossible to confirm wolf depredation when livestock carcasses are eaten or decomposed. Therefore, confirmed losses represent only a portion of actual losses. Whether this is a large or small portion of such losses is the subject of much controversy and research. Depredation control efforts in NWMT resulted in the death of 1 wolf.

Halfway Pack: One lamb was confirmed killed in Halfway Pack territory in July 2004. One wolf was trapped and radiocollared on site and has since disappeared. In October, 1 calf was confirmed injured on summer pasture near Avon, Montana.

Hog Heaven Pack: One newborn colt was confirmed killed in Hog Heaven territory on the Flathead Reservation in July 2004. Attempts were made to trap, radiocollar, and release wolves but none were captured.

Lonepine Pack: Two cattle were confirmed killed and another confirmed injured in Lonepine Pack territory in February 2004. Wildlife Services lethally removed a gray female pup.

Ninemile Pack: In February 2004, a llama was confirmed injured in the Ninemile Valley by a single gray wolf. The landowner attempted to legally shoot the wolf as it was attacking the llama but missed. A 45-day SOS permit was issued to the landowner because of chronic past problems in this same area but no wolves were taken.

Wolf Prairie Pack: Two cattle were confirmed killed and 4 were classified as probable wolf kills in Wolf Prairie Pack territory in July and August 2004. In July, 2 wolves were radiocollared and released on site. No further losses were reported by that producer and no further depredations were confirmed in the area by WS.

Miscellaneous/Lone: In May 2004, a calf was confirmed killed by a single black wolf near Helmville, Montana. The rider had videotaped the wolf returning to the partially consumed carcass and was observed carrying the calf carcass away. Efforts were made to trap and

radiocollar this wolf but it pulled out of one of the traps and did not return. In early October a cow was confirmed injured by wolves near Eureka, Montana. Cows were being brought off the state leased land so no control was conducted. Later in October, a calf was confirmed injured by wolves and had to be euthanized north of Babb, Montana near the Canadian border. The rancher saw 5 wolves attacking the calf. Cattle were removed from the area and no trapping or radiocollaring was conducted because of muddy conditions.

GREATER YELLOWSTONE WOLF RECOVERY AREA

Personnel

Three full-time employees worked for the Yellowstone Wolf Project in 2004: Project Leader Douglas Smith, Project Biologist Dan Stahler, and Biological Science Technician Debra Guernsey. Rick McIntyre worked as a seasonal employee on the Druid Peak Pack Road Management Project. Emily Almberg also worked on the Druid Road Management Project, through the Yellowstone Park Foundation (YPF). Matt Metz and Janice Stroud worked during the winter and summer months as biological technicians, and were joined by Katie Yale for the summer as a third biological technician. All 3 were paid through YPF. Other volunteers (see Acknowledgments) staffed the 2 early (November-December) and late (March) winter study periods. Bob Wayne, Blaire Van Valkenburgh, and John Vucetich were visiting scholars to the Wolf Project in 2004. Linda Thurston, DOW, helped monitor wolves in the Paradise Valley. Volunteers in YNP included Emily Almberg, Jessica Auer, Jack Bean, Hillary Billman, Paul Brown, Stephanie Farris, Brent Fenty, Chris Geremia, Tim Hudson, Jennifer Jones, Scott Laursen, Matt Metz, James Napoli, Abby Nelson, Nichole Patrick, Janice Stroud, John Vucetich, Lea Vucetich, Chris Wilmers, and Michael Wolcott.

Wolves in Wyoming outside YNP were monitored by Project Leader Mike Jimenez (USFWS), and Liz Bradley and Jon Trapp (Bradley and Trapp were USFWS biologists in the summer, and became FWP biologists in the fall in Montana). Turner Endangered Species Fund biologist Val Asher in Bozeman, and FWP biologist Mike Ross monitored wolves in the southwest Montana portion of the GYA. U.S. Fish and Wildlife Service law enforcement agents in Wyoming were Dominic Domenici (Agent-In-Charge, Casper), Tim Eicher (Special Agent, Cody), and Roy Brown (Special Agent, Lander).

Wyoming employees of WS who were involved with wolf control or management in 2004 included state director Rod Krischke, assistant director Sam Crowe, district supervisors Craig Acres and Merrill Nelson, specialists James Pehringer, Rod Merrell, Arnold DeBock, Tracy Frye, Stephen Moyles, Michael Peterson, Jed Edwards, William Ross, Casey Hunter, Matt Lumley, Andy McKinney, and pilot Ted Jensen. Idaho Wildlife Specialists Jon Farr and Lee Czapenski responded to a wolf depredation in the Idaho portion of the GYA.

Monitoring

Yellowstone National Park

Population status: At the end of December 2004, at least 171 wolves in 16 packs occupied YNP. This represented no gain of wolves from 2003, marking only the second year since reintroduction that the wolf population did not increase (1999 was the other year). Four new packs formed (Specimen Ridge, Hayden Valley, Gibbon Meadows and Biscuit Basin) and 2 packs were lost through emigration. The Rose Creek and Buffalo Fork Packs which historically used YNP, moved north onto Gallatin National Forest and were no longer counted as YNP packs. In the Madison-Firehole area a dispersing wolf from the Nez Perce Pack had pups and created the Biscuit Basin Pack in the Old Faithful area. Another dispersing wolf from the Cougar Creek Pack was one of the founders of the Gibbon Meadows Pack in the Gibbon Meadows/River area. The Hayden Valley Pack probably formed from a dispersing Nez Perce wolf, but it is an uncollared pack so genetic samples are unavailable to determine the origin of this pack. The Specimen Ridge Pack formed from dispersing Mollie's and Druid Peak Pack wolves, but the Mollie's wolf died, so the remaining wolves are not regularly tracked due to a lack of radiocollared wolves. Of these 16 packs, all counted toward the breeding pair objective for the GYA.

Seven of these packs (84 wolves) used the northern range and 9 packs (87 wolves) used the rest of YNP. Pack size ranged from 4 (Bechler) to 23 (Leopold) and averaged 12.4, the largest average pack size for any year so far. Pack size was slightly larger on the northern range (mean = 14.5) than elsewhere in YNP (mean = 10.8). Interestingly, the largest pack on the northern range in 2004 was the Leopold Pack, a pack that for most of its existence was of moderate size (10-15 wolves).

Wolf distribution was largely unchanged from 2003. Occupied wolf range continues to be the northern range, Pelican Valley, north of the Madison River, and the Madison-Firehole, Thorofare, and Bechler areas. One of the new packs, the Biscuit Basin Pack, sandwiched itself into occupied territory in the Madison-Firehole and, perhaps because of this high wolf density, is in very poor condition. Another new pack, the Gibbon Meadows Pack, established itself in the Gibbon Meadows-Norris area. The uncollared Hayden Valley Pack formed in Hayden Valley, an area of past wolf use by the Nez Perce pack. This new pack appears to have made Hayden Valley its core territory. The Specimen Ridge Pack formed on the northern range, an area of high wolf density, but their area of use focused on the edge of the primary wolf range.

Reproduction: At least 86 pups were born and 59 survived through autumn in 16 packs. The Druid Peak, Leopold, and Geode Creek Packs each had 2 litters of pups. Average number of pups per litter was 5.1, and ranged from 1 to 9. Despite 2 litters for the Druid Peak Pack only 2 pups survived. The Bechler Pack also had poor pup survival. All of the Leopold, Biscuit Basin and Cougar Creek pups survived. Overall pup survival was 69%. Den sites were again visited and scats picked up for summer food habits studies. Seven (58%) of 12 den sites were reused among packs that had denned previously.

Mortalities: Twenty-four wolves [5 old adults (>6 years old)), 12 adults (2 -5 yrs), 3 yearlings, 3 pups, and 1 of unknown age] died in or originated from YNP during 2004, including 11 males, 11 females and 2 of unknown sex. Four wolves (17%) died due to intraspecific strife, 7 (29%) to

natural causes, 11 to human causes (46%), and 2 (8%) to unknown causes. Of the wolves dying from human causes, 4 (36%) died from vehicle strikes, 4 (36%) to control actions (when wolves traveled outside YNP and killed livestock), and 3 (27%) to other human causes. The mortality rate for radiocollared wolves from 2004 to 2005 was 12.6%. Mortality has ranged from a low of 9% in 1998 to a high of 43% in 1997.

Mange was reported for the first time inside YNP. A Chief Joseph wolf was sighted near YNP's border in Daly Creek with hair loss. This was the only location in YNP where mange has been observed and so far no mortalities in YNP have been attributed to mange. Mange was common on all sides of YNP, except to the south where it has not been observed.

Long-range dispersal: Wolf #293F dispersed from the Swan Lake Pack in YNP sometime after January 15, 2004. On June 6, 2004 she was found dead beside the road 30 miles west of Denver, Colorado, and had apparently been struck by a vehicle. The incident was reported to Colorado Department of Natural Resources personnel Gary Skibe. An in-depth necropsy was performed to determine cause of death. Wolf #293 dispersed a straight-line distance of 718 km (446 miles).

Status of original reintroduced wolves: None of the 31 wolves that were originally reintroduced to YNP were alive by the end of 2004. The last 2 surviving wolves from the original reintroduction died 2 weeks apart in 2004. Wolf #41, originally of the Druid Peak Pack, was lethally removed in a control action east of YNP. She had a severe case of mange at the time of death. Her sister, number #42, with Druid Peak Pack, was killed by wolves from Mollie's Pack in late January 2004. All wolves alive in the population are thought to be descendents of reintroduced wolves.

Monitoring: Wyoming outside YNP

Population status: We combined 3 census techniques to estimate the total number of wolves in Wyoming outside YNP: 1) direct observations of wolves, 2) winter track counts of wolves traveling in snow, and 3) reports of repetitive wolf sightings from other agencies and the general public. We counted the number of wolves in packs containing radiocollared wolves using visual observations from the ground and aerial telemetry flights. We maintained 22 radiocollars in 9 packs (25 % of the population). We tracked wolves in winter and counted the different sets of wolf tracks in snow. In packs where local residents repeatedly saw and counted wolves, we incorporated those observations into our estimates. We averaged the high and low population estimates to calculate other statistics used to describe the wolf population in Wyoming.

We estimated that at least 89 wolves inhabited western Wyoming outside YNP in 2004. Nine packs, totaling 72 wolves, produced pups. However, due to the loss of the alpha male from the Carter Mountain Pack, only 8 packs met recovery goal criteria (Tables 4a and 4b). Pack size ranged from 3 to 13 and averaged 8.0 wolves. Another 17 wolves were located throughout the western portion of the state, but no other known litters were produced. Since 2003 the wolf population increased 9%, from 82 wolves in 2003 to 89 wolves in 2004. However, the rate of population growth decreased in 2004.

Reproduction: Nine wolf packs produced 9 litters with at least 44 pups. Mean litter size was 4.9 pups. Eight of the 9 packs producing pups in 2004 met the breeding pair criteria: Teton, Washakie, Sunlight Basin, Absaroka, Beartooth, Greybull River, Owl Creek, and Daniel Packs (Table 2).

Mortalities: In 2004, a total of 36 wolves (29% of the total population) were known to have died in Wyoming outside of YNP. Humans caused 86% of all mortalities: 17 males and 12 females were lethally removal in control actions, 1 male was illegally killed, 1 male was incidentally taken, and 6 other miscellaneous mortalities were documented. Of the 44 pups observed at den and rendezvous sites, 36 pups survived until December 31, 2004 for a survival rate of 82%. This was only an estimate of maximum survival rate because pups were not usually seen until mid-summer when some pup mortality had already occurred.

Population movement and dispersals in Wyoming: Wolves dispersed south and east of YNP and recolonized new areas in western Wyoming. Many dispersing wolves attempted to recolonize areas where thousands of livestock grazed. Wolves were lethally removed when they chronically killed livestock. Wolf #072M from the Nez Perce Pack and wolf #332F from the Sheep Mountain Pack dispersed to the upper Green River drainage. Wolf #214M from the Nez Perce Pack in YNP and #278F and #279F from the Teton Pack dispersed to the Pinedale/Cora area. All 5 dispersing wolves were lethally removed after repeatedly killing livestock. Wolf #215M dispersed from the Nez Perce Pack but was illegally killed in southwest Wyoming. Wolf #239M was radiocollared in the Dunoir Valley as a pup from the Washakie Pack in 2001. In 2004, wolf #239M was trapped and recollared in CID.

Monitoring: Montana portion of GYA

Seventeen packs were monitored in the Montana portion of the GYA: Red Rock, Freezeout, Bear Creek, Bear Trap, Lone Bear, Mill Creek, Casey Lake, Mission Creek, Moccasin Lake, Phantom Lake, Red Lodge pair, Sheep Mountain, Taylor Peak, Sentinel, Ennis Lake, and the Dillon pair. The Chief Joseph Pack, though classified as a YNP pack, spent considerable time outside of the YNP and expanded their home range into the Taylor Fork and Madison drainages. The Rose Creek II Pack also traveled outside of YNP into Montana. In 2004, 19 wolves were caught, of which 11 were radiocollared. Three pups were caught but were too small to radiocollar, 1 pup was euthanized due to mange, 1 pup with severe mange died from capture myopathy, and 4 were trapped and lethally removed due to control actions. Packs were monitored throughout the year by USFWS, FWP TESF, NPS, WS, Montana State University (MSU), Utah State University (USU), DOW, and Predator Conservation Alliance (PCA) via radio telemetry, visual observation and snow tracking. Six packs were confirmed as breeding pairs by the end of 2004. Nonlethal techniques implemented by project personnel, PCA and DOW consisted of fladry, RAG boxes, less-than-lethal munitions, cracker shells, permanent and temporary predator-proof fencing, range riders and loaning telemetry receiver to landowners. Project personnel participated in numerous consultations with private landowners and cooperating agencies on wolf behavior, pack territories, potential grazing allotment rotations, and regulations for the experimental gray wolf population

Research

Collaborative Research for All Three Wolf Recovery Areas

Survival: Analysis of wolf survival data continued in 2004. The decision was made to add radiocollared wolves from 2003 and 2004 to the database extending the period of analysis from 1982 through 2004 and involving 716 wolves. Objectives were to determine if survival of wolves was different between the recovery areas, land use and ownership, year, and other attributes that pertained to habitat quality, wolf demographics and behavior.

Population Genetics: A three-recovery area genotyping of all captured wolves is progressing, where genetic samples were available (>500 wolves). Objectives of the study were to: 1) determine genetic interchange (not the same as dispersal of radiocollared wolves between recovery areas) between the recovery areas to test the hypothesis that Yellowstone is more isolated than the other 2 recovery areas, 2) establish settlement patterns and relatedness between packs (GYA only), and 3) determine maternity and paternity in cases where more than 1 wolf bred in a pack (YNP only). Preliminary results were promising in that CID, NWMT, and GYA wolves separated out and could be distinguished from each other genetically. It was unknown if this distinction was possible because the source populations for CID, GYA, and NWMT were the same and potentially indistinguishable. Final results will be available sometime in 2005. This project was collaborative and involved the University of California, Los Angeles and the USFWS lab in Ashland, Oregon.

Research in Yellowstone National Park

*Wolf-prey relationships***:** Wolf–prey relationships were documented by observing wolf predation directly and by recording the characteristics of wolf prey at kill sites. Wolf packs were monitored during 2 winter-study sessions (30-day periods in March and November–December) during which wolves were intensively radiotracked. The Leopold, Geode Creek, and Druid Peak Packs were monitored by 2-person teams from the ground and from aircraft; the Swan Lake, Agate Creek, Slough Creek, Mollie's, Gibbon Meadows, Biscuit Basin, Nez Perce, Cougar Creek, Bechler, and Yellowstone Delta Packs were monitored from aircraft only. Yellowstone National Park staff recorded behavioral interactions between wolves and prey, predation rates, the total time wolves fed on their kills, percent consumption of kills by wolves and scavengers, characteristics of wolf prey (e.g., nutritional condition), and characteristics of kill sites. In addition, similar data were collected opportunistically throughout the year during weekly monitoring flights and ground observations. The abundance and sex-age composition of elk within wolf pack territories were also estimated from the ground.

Composition of Wolf Kills: Project staff detected 295 kills (definite, probable, and possible combined) made by wolves in 2004, including 240 elk (81 %), 19 bison (6 %), 1 moose (< 1%), 4 deer (1 %), 4 pronghorn (1%), 1 badger (< 1%), 2 cougar (1%), 6 coyotes (2 %), 1 golden eagle (< 1%), 2 grizzly bears cubs (1%), 1 raven (< 1%), 3 wolves (1 %), and 11 unknown prey (4 %). The composition of elk kills was 18 % calves (0–12 months), 16 % cows (1-9 years old), 16 % old cows (≥ 10 years old), 38 % bulls, and 12 % elk of unknown sex and/or age. Bison

kills included 4 calves (unknown sex), 8 cows, 5 bulls, and 2 unknown sex and age. Kill rates for the period of 1995-2000 showed that wolves residing on the northern range killed an average of 1.8 elk/wolf/30-day study period during the winter. Using the same method for calculating kill rates as previously, wolves on the northern range killed an average of 1.1 elk/wolf/30-day study for the period of 2001-2004. This decrease of 40% suggested that ecological conditions were changing for wolves in this part of YNP.

Winter Studies: During the 2004 March Winter Study (30 days), wolves were observed for 379 hours from the ground. The number of days wolf packs were located from the air ranged from 1 (Yellowstone Delta and Bechler) to 21 (Leopold, Geode, Druid Peak, and Slough Creek). Sixty-six definite or probable wolf kills were detected, including 56 elk, 6 bison, 2 mule deer, and 2 unknown species. Among elk, 9 (16%) were calves, 14 (25%) were cows, 25 (45%) were bulls, 5 (9%) were adults of unknown sex adult, and 2 (4%) were of unknown sex and age. During the 2004 November–December Winter Study (30 days), wolves were observed for 300 hours from the ground. The number of days wolf packs were located from the air ranged from 0 (Rose Creek) to 15 (Leopold, Druid Peak, Geode Creek, Agate Creek). Fifty definite, probable or possible wolf kills were detected during the November-December 2004 Winter Study, including 45 elk, 2 bison, 1 coyote, 1 cougar, and 1 badger. Among elk, 7 (16%) of the kills were calves, 18 (40%) were cows, 19 (42%) were bulls, and 1 (2%) kill was an adult elk of unknown sex.

Summer Studies:
Summer Predation - In the summer of 2004, project staff continued efforts to document summer predation patterns by wolves. Documenting the predatory habits of wolves in summer is problematic due to the lack of snow for tracking, increased nighttime activity of wolves, lack of pack cohesiveness, and smaller prey packages leading to quick consumption and loss of evidence. Traditionally, the best data concerning wolf summer food habits have come from analysis of scat contents collected at den and rendezvous sites. Although this effort on scat collection continued in 2004, downloadable GPS radiocollars have opened a new door to studying summer wolf predation.

The Wolf Project deployed 5 GPS radiocollars in the 2004 capture season to enhance understanding of 1) seasonal predation patterns; 2) spatial and temporal interactions with other wolf packs and other carnivores; 3) movements with respect to dens during pup rearing season; and 4) territory size, use, and overlap. Because GPS radiocollars provided more accurate and numerous data compared to traditional telemetry radiocollars and reduce the reliance on aerial monitoring, we expanded the GPS radiocollar program. Using GPS radiocollars with downloadable data acquisition technology, data gathered weekly during summer 2004 yielded greater information on wolf summer predation patterns. Radiocollars programmed to collect location data every 30 minutes for the summer season have given researchers a high resolution of wolf movements and allowed wolf kills to be found, including smaller kills such as newborn elk calves. The GPS radiocollar technology allowed researchers to find fresh kill sites to collect scavenger data. For example, researchers found where a wolf pack displaced a cougar from a cow elk killed by the cougar, which the wolves then appropriated and scavenged.

A GPS radiocollar on Geode wolf #392M performed extremely well and allowed staff to document 14 kills made by members of the Geode Pack from May 3rd until June 21st. Of these 14 kills, 5 were neonate elk calves, 3 were adult bull elk, 3 were adult cow elk, and 3 were yearlings. In addition, GPS points allowed documentation of 5 carcasses scavenged, 1 belonging to a GPS radiocollared cougar in the Hellroaring study area.

Summer Scavenging - An important aspect of trophic cascade research as it relates to wolf restoration is the effect of wolves on scavenger guilds in the Yellowstone ecosystem. Research on wolf and scavenger interactions has been conducted since 1998 through support from Canon and Yellowstone Center for Resources (YCR). This research, largely done in the winter, monitored how wolves influence the abundance and distribution of carrion, both spatially and temporally, as well as how they facilitate food acquisition by other carnivores. Although we have learned a great deal about the magnitude and relative importance of wolf-kills to the winter scavenger communities, we know little about the impact on summer scavengers, both vertebrate and invertebrate communities. By focusing on summer scavenging, we hope to complete our understanding of the ecological relationship between wolves and scavengers as it relates to seasonal variation, abundance, and diversity.

In summer 2004, project staff increased monitoring efforts on summer carcasses to document scavenger utilization and behavioral interactions between wolves and scavengers. At the end of the Summer Study period, scavenging data were collected on 3 bison and 4 elk carcasses. Most carcasses were observed from their early stages of consumption until they were reduced to bone and hide. Every carcass was visited by wolves, grizzly bears, coyotes, bald eagles, golden eagles, ravens, and magpies. A black bear fed on 1 carcass. Overall, vertebrate scavenger numbers were lower at summer carcasses than at winter carcasses. The highest count for ravens at a summer carcass in the study area was 47, compared to raven counts exceeding 100 individuals observed at winter carcasses in the same study area. Preliminary data suggests that bears (both grizzly and black) benefit more from wolf kills in summer than in winter, and in general, vertebrate scavenger densities were lower at each carcass in summer.

Feeding patterns of wolves in summer were different from those seen in winter, largely due to the necessity of bringing food from a carcass back to a den site to feed growing pups, sometimes requiring adult wolves to travel miles with food in their mouth and stomachs. This allowed other vertebrate scavengers to feed on carcasses in the wolves' absence, in contrast to winter when wolves would more aggressively defend their food source from scavengers and the entire pack was typically assembled together. Another difference in wolf foraging strategies during summer related to the presence of newborn ungulates on the landscape. This food source was small and easy to consume in a shorter period, and allowed wolves to reap most of the benefit almost exclusively of their hunting success, leaving little for scavengers.

Collaborative Research

The wolf project and the Yellowstone Park Foundation provided direct and indirect support for collaborative research with scientists at other institutions, primarily universities. Most of the studies represent pioneering work on wolves within the topic of interest.

Wolf Project Students – Direct Assistance

Graduate Student: Shaney Evans (Master of Science candidate)
Committee Chair: Dr. L. David Mech, University of Minnesota, St. Paul
Title: Adult cow elk (*Cervus elaphus*) seasonal distribution and mortality post-wolf (*Canis lupus*) reintroduction in YNP, Wyoming.
Project Narrative: As part of a 3-tiered study, "Multi-trophic level ecology of wolves, elk, and vegetation in YNP, Wyoming," seasonal distributions and movements of elk were examined to evaluate the behavioral effects of wolves on elk and establish baseline data for future analyses. Individual elk radio-locations were paired with wolf radio-locations to establish the proximity of elk to wolves. Comparisons of individual differences in cow elk distribution were investigated with respect to several variables including: age, presence of calf, pregnancy status, nutritional condition, group size, spatial and temporal factors, and wolf density. In addition, a survival analysis provided information on relative factors influencing mortality of cow elk in YNP's Northern Range herd.
Project Activity in 2004: completed mortality report for NPS, thesis writing.
Anticipated Completion Date: May 2005

Graduate Student: Daniel MacNulty (Ph.D. Candidate)
Committee Chair: Dr. Craig Packer, University of Minnesota
Title: A behavioral analysis of the effect of predator and prey densities on wolf predation.
Project Narrative: The mathematical expression for a predator's "kill rate" (i.e. kills per predator per time) is fundamental to analyses of predator-prey dynamics. Predictions of dynamics vary widely according to how kill rate models assume that kill rate changes with predator and prey densities. Little is known, however, about the behavioral processes generating the relationship between kill rate and predator-prey densities, especially in natural environments. This is an important knowledge gap because it hinders progress in predator-prey theory and confounds predictions of predator-prey dynamics. This study examined the behavioral mechanisms that cause wolf kill rate to vary with elk, bison and wolf densities in YNP. The analyses were based on direct observations of wolves and ungulates recorded during 8 intensive 30-day study periods from 1995 to 2003. Individual-level analyses of wolf kill rate and its behavioral parameters (i.e. attack rate, handling time, search time) were completed with general linear and non-linear mixed models to account for correlation among repeated measurements of individual wolves. The results were expected to clarify the basic biology underlying models of wolf kill rate, and thereby strengthen attempts to anticipate the effects of wolf predation on ungulate populations.
Project Activity in 2004: Data analysis and thesis writing.
Anticipated Completion Date: September 2005

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

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

Research in Wyoming outside Yellowstone National Park

<u>2004 Progress Report</u>: Wolf/elk interactions on state-managed feed grounds and adjacent national forests in Wyoming
Principal Investigator: Mike Jimenez , USFWS

Cooperators: Bridger-Teton National Forest, National Elk Refuge, GTNP, and Wyoming Game and Fish Department (WYGF).

We monitored wolves during winters 2000-2004 to determine the distribution of wolf packs, describe prey selection of wolves, and document the behavioral response of elk to the presence of wolves on 3 elk feed grounds and adjacent national forest in Wyoming. We used radiotelemetry to locate wolves, estimate home ranges and locate carcasses of elk killed or scavenged by wolves. Radiocollared elk were followed to describe how elk responded to wolves hunting on the feed grounds. In 2000 and 2001, 2 wolf packs recolonized the area and their home ranges overlapped in 2 feed grounds. From 2002 through 2004, only 1 wolf pack inhabited the drainage. We located 188 kills made by wolves on all 3 feed grounds and the adjacent national forest. Forty-eight percent of the elk killed were cows, 8% bulls, and 44% calves. The mean age of adult elk killed was 9.2 years and the oldest elk killed was 23 years old. Mean consumption of elk carcasses by wolves was 81%. Calf/cow ratios increased in 2004 to 24 calves/100 cows. In 2004, 1 moose (10 years old) and 1 bison (6 years old) were recorded as possible wolf kills. Wolves killed at least 2 coyotes and fed on 2 cattle carcasses. Wolves did not displace elk from the Gros Ventre drainage. Elk responded to wolves hunting on the feed grounds by: 1) remaining on the feed ground even when wolves killed elk; 2) leaving the area but returning within days; and 3) leaving the feed ground where wolves killed elk and gathering in larger herds on adjacent feed grounds. Displaced elk gathering on private property and elk crowding on specific feed grounds became very controversial as state game managers were forced to adjust their winter feeding programs.

Research in the Montana portion of the Greater Yellowstone Recovery Area

Lower Madison Valley Wolf-Ungulate Research Project:

Investigators: Julie Fuller and Robert Garrott, MSU

This project focused on measuring the following questions:

1) Are wolf-related changes in elk behavior and distribution evidenced in browse plants, such as aspen and willow?
2) What do wolves eat during the summer months when most elk leave the Madison Valley?

Unfortunately, this research project was terminated at the end of winter 2004, when the Madison Valley wolves were eliminated due to cattle and sheep depredation. Currently, FWP and MSU are exploring means to continue this research.

Factors affecting wolf-elk interactions in the GYA:

Investigators: Scott Creel, David Christianson (Department of Ecology, MSU), and Ken Hamlin, FWP.

This project focused on measuring behavioral responses of elk to the risk of predation by wolves, and determined the consequences of behavioral responses for elk physiology, demography and population dynamics. These data showed that elk behaved differently on days that wolves were present within their drainage, but they did not demonstrate that these behavioral responses carry costs. We were less advanced in analyses of the cost of antipredator responses, but we recorded reduced rates of pregnancy (61-85% for a low predation site and 21% for a high predation site) for herds exposed to wolf activity. Additional data are needed. Trends in population size (by aerial total count) and recruitment (from ground and aerial classification counts) suggested that

predation (both direct and indirect effects) may be altering elk demography and dynamics. Recruitment in early winter was at or below 20 calves per 100 cows in 5 of 6 winters with data since colonization by wolves, compared to 1 of 13 winters prior to wolf colonization (Fisher's exact test, P=0.12). Similarly, population size was below 1500 elk in 6 of 7 winters since wolf colonization, compared to 16 of 41 winters prior to wolves (Fisher's exact test, P=0.17). Factors other than wolves may contribute to these patterns.

Range rider pilot study

As a collaborative effort headed by the PCA and the Madison Valley Ranchlands Group, 2 riders were hired to work on several U.S. Forest Service (USFS) grazing allotments in the Madison Valley to learn more about the potential effectiveness of human presence as a non-lethal management technique for reducing livestock losses caused by wolves. Riders were placed on the allotments from June through November of 2004. The riders were equipped with telemetry receivers, wolf frequencies and less-than-lethal munitions. Riders were required to ride daily and record tracks, scat, and visual observations/behavior of predators, ungulates and cattle in the area. On 3 separate occasions the riders harassed 1-2 uncollared wolves seen on the allotments. The riders also documented a dispersing radiocollared female #290F from YNP's Leopold Pack traveling through the area. No confirmed or probable wolf depredations were reported on the cooperating allotments or neighboring allotments near cattle. A questionnaire was filled out by permittees who participated in the pilot study and by adjacent permittees who did not have access to the riders, to better understand local sentiment about the program. A summary of these efforts should be completed by spring of 2005. Other collaborators on the project include TESF, MFP, USFWS and USFS.

Relative contributions of prey physical condition and habitat structure to predation by cougars and wolves in southwest Montana

Investigators: Todd C. Atwood, Eric M. Gese, and Kyran Kunkel, Department of Forest, Range, and Wildlife Sciences, Utah State University, Logan.

Vulnerability to predation resulting from direct or indirect effects of physical condition is allegedly a widespread phenomenon in predator-prey systems, yet there is a paucity of empirical support for the putative linkage between predator detection and avoidance behaviors and relative or absolute body condition. We examined patterns of prey selection by sympatric cougars and wolves to determine (i) if prey killed by wolves were in poorer absolute physical condition relative to prey killed by cougars and (ii) if declining relative physical condition resulted in prey becoming risk-insensitive, thus making them more vulnerable to predation. Additionally, we assessed the role of vegetative structure in facilitating predation. Since 2003, we have documented prey characteristics and kill site attributes in the northern Madison range of southwest Montana. Mule deer were the primary prey for cougars, whereas elk were the primary prey for wolves. Wolves selected prey in relatively poor absolute physical condition compared to prey selected by cougars. However, declining relative condition in mule deer may have contributed to vulnerability to predation by cougars. Wolf kills occurred in habitat that was more reflective of the study area than cougar kills. These disparities suggest patterns in species-specific hunting behavior and prey selection differ considerably, and prey that are likely to forage in a risk-prone manner as physical condition declines.

Outreach

Yellowstone National Park wolf project staff Doug Smith, Dan Stahler, and Deb Guernsey gave approximately 50 formal presentations to approximately 2500 people throughout the year. Additionally, project staff Rick McIntyre and Emily Almberg gave 226 informal talks and discussions with visitors in the field to an estimated 2,260 visitors and made 9,450 contacts during roving interpretation in the field. Wolf recovery personnel also participated in television interviews, and magazine and newspaper feature stories.

Livestock Depredation and Management

Wyoming portion of Greater Yellowstone Area

Potential livestock depredations in Wyoming were investigated by WS and USFWS. Depredations were classified as confirmed, probable, or other, based on specific criteria agreed upon by the USFWS and WS. Nine of 10 wolf packs in Wyoming outside YNP were involved in at least 1 depredation and were responsible for at least 122 livestock and 2 dogs depredated by wolves (including 94 confirmed and 30 probable depredations). Confirmed depredations included 74 cattle, 16 sheep, 2 dogs, and 2 horses. One horse died directly from injuries sustained during a wolf attack and 1 horse was injured by wolves and later euthanized (Tables 2, 5a, and 5b). Probable depredations included 7 cattle and 23 sheep. One dog and 2 horses were injured by wolves, but survived the attacks. The total number of depredations in 2004 increased approximately 42% from 2003 when 86 livestock were lost to wolves (51 confirmed and 35 probable depredations). Wildlife Services documented 58% (n = 71) of all depredations on public grazing allotments and 42% (n = 51) on private property. Defenders of Wildlife compensated livestock growers for confirmed and probable livestock losses from wolves.

Control actions in response to confirmed livestock depredations included trapping and radiocollaring 8 wolves; intensive monitoring; increasing riders on grazing allotments; harassing wolves with rubber bullets, lights, and cracker shells; moving livestock to different pastures; lethally removing wolves; and issuing 6 SOS permits. Nonlethal control was routinely considered but was often not applicable in many areas in Wyoming due to 1) specific wolf packs chronically killed livestock year after year, 2) unpredictable travel patterns and movements by wolves, and 3) very large wolf home ranges that covered vast areas where cattle grazed on public grazing allotments. When nonlethal control methods were not effective, wolves were lethally removed in an attempt to prevent further livestock depredations. Six SOS permits were issued and livestock producers killed 2 wolves on private property. In 2004, 29 wolves (approximately 23% of the wolf population in Wyoming outside YNP) were lethally removed in control actions. A total of 36 wolves were killed (control actions, illegal mortalities, incidental take, and unknown), and these 36 mortalities represent 25% of the wolf population in Wyoming outside YNP. The following is a brief summary of confirmed wolf depredations that occurred in 2004 and the subsequent lethal control responses:

Washakie Pack: Over the last several years, the Washakie Pack repeatedly killed livestock on public and private land. Despite increased riders and daily livestock tending, Washakie wolves killed at least 8 cattle on private and public land in 2004. Three wolves were trapped, radiocollared, and released on site. Six wolves were lethally removed in control actions.

Teton Pack: The Teton Pack killed 1 calf in GTNP and 2 cattle on other public and private property in 2004. Two additional depredations were reported as probable. Five wolves were trapped, radiocollared, and released on site. Their traditional home range included a small corner of GTNP and the Gros Ventre River drainage. In December 2004, the pack consisted of 13 wolves. Radiocollared wolves from the Teton Pack have dispersed south of GTNP, but all have been lethally removed in control actions due to chronic livestock conflicts.

Pinedale/Cora area: No known breeding packs formed in the Pinedale/Cora areas in 2004. However, dispersing wolves continued to travel south through the Pinedale/Cora/Big Piney areas and killed several calves in 2002 and late December 2003, and 2 additional calves in January 2004. Four dispersing wolves were lethally removed in control actions (2 wolves from the Teton Pack and 2 wolves from the Nez Perce Pack).

Green River Pack: At least 20 cattle and 2 herding dogs were killed by wolves in the upper Green River drainage in 2004. One herding dog was attacked by wolves but survived. Seven wolves were lethally removed in control actions.

Daniel Pack: Four wolves in the Daniel Pack were radiocollared in 2003, but none survived through spring 2004. The home range of the Daniel Pack overlapped large tracts of private land and vast public grazing allotments containing thousands of sheep and cattle. Livestock depredations have been an ongoing conflict. Daniel Pack wolves killed at least 13 cattle during summer and fall 2004. Five wolves were lethally removed in control actions in an attempt to prevent further depredations.

Southwest Wyoming: In 2004, there were no known wolf packs in southwest Wyoming, but wolves dispersing from YNP and other parts of Wyoming killed at least 12 sheep and 6 cattle in Lincoln County, Wyoming. Control efforts were attempted on several occasions, but no wolves were removed.

Sunlight Basin Pack: One old wolf with severe mange was lethally removed in a control action after Sunlight Basin wolves killed a calf on private property. No further depredations occurred in 2004.

Absaroka Pack: Wolves from the Absaroka Pack killed at least 7 cattle on public and private land in 2004. Two wolves were lethally removed in control actions.

Owl Creek Pack: Three adult wolves formed the Owl Creek Pack and produced a litter of 5 pups in 2004. In January 2004, the pack killed an adult cow on private property. No control actions were taken until the pack later killed another calf in June. The 2 alpha wolves were left in the pack, but the third nonbreeding wolf was lethally removed in attempt to prevent further

depredations. In November, 2 more cows were killed and 2 pups were lethally removed. The pack killed a fifth cow in December and the situation was closely monitored. When the pack killed an adult horse, 2 more pups were lethally removed. The remainder of the pack (4 wolves) will be killed if further depredations continue.

Greybull River Pack: Wolves from the Greybull River Pack killed at least 4 cattle on private land. Control actions were attempted but no wolves were killed.

Carter Mountain Pack: The alpha male wolf was lethally removed from the Carter Mountain Pack, when the pack killed 4 adult cows. No further depredations from this pack were reported in 2004.

Big Horn Mountains: At least 4 sheep and 2 cattle were killed in Johnson County, Wyoming, and recorded as confirmed wolf kills. Trapping and radiocollaring efforts were attempted but no wolves were captured.

Montana portion of Greater Yellowstone Area

In the Montana portion of the GYA (Figures 1, 3), 9 of the 17 known wolf packs were involved in confirmed depredations on livestock or guard dogs in 2004 (Table 1b). Cattle and sheep depredations continued to be a significant problem in this area. A variety of nonlethal techniques were used to help reduce depredation, in addition to the lethal removal of 25 wolves in 2004 by WS or by private landowners with SOS permits. Confirmed losses in 2004 included 24 cattle, 81 sheep, 2 goats and 4 herding or guard dogs. Six packs were confirmed as breeding pairs by the end of 2004. Of the 32 known wolf mortalities, 4 died of mange-related causes, 2 died of natural causes, 3 were legally shot by landowners with SOS permits, 22 were lethally removed by WS in control actions and 1 was euthanized after being illegally wounded. By December 31, 2004, the Sheep Mountain, Lone Bear, Ennis Lake, Taylor Peak, and Sentinel packs and the Dillon pair no longer existed as packs due to mange or control actions.

Freezeout Pack: In June project personnel recaptured the Freezeout radiocollared alpha female #115F and fitted her with a new radiocollar. On August 30, 2 guard dogs and a herding dog were confirmed killed by wolves in the Gravelly Mountains. It was believed to be the Freezeout Pack but #115F was not located in the vicinity. Traps were set to radiocollar and release more wolves but none were caught. Project personnel trapped and radiocollared a male pup, #452M, and a 3-year-old male, #454M, in October. Wolf #452 immediately returned to the rendezvous site and his radiocollar was chewed off by littermates 2 days later. No other livestock depredations were confirmed in this pack. Two radiocollared wolves remain in this pack.

Bear Creek Pack: On April 7 a newborn calf was confirmed as a probable wolf kill in the Bear Creek area near Cameron, Montana. Traps were set in the area and on April 19 WS caught and radiocollared a black, 2-year-old male wolf, #423M. The Bear Creek Pack was believed to be the remaining 2 members of the Sentinel Pack. This group was seen numerous times during monitoring flights and contained only 2 members, #423M and a gray companion.

Chief Joseph Pack: In February, personnel from FWP and TESF aerially darted and radiocollared 2 adult male wolves, #393M and #394M, from this pack. Wolf #393M had severe mange and was found dead the day after his capture. His death was likely caused by the stress of capture combined with his poor condition. Wolves harassed cattle in the Tom Miner Basin in March, and in the Taylor Fork drainage in August. Project personnel erected a fladry line around the calving pasture in the Tom Miner area during calving time. The landowners were trained in nonlethal techniques and given less-than-lethal munitions to harass wolves. There were no more problems during the 2 months the cattle remained in the pasture, although wolves were seen in the area. In the Taylor Fork area, wolves harassed cattle on a USFS allotment. The rider was issued cracker shells and successfully harassed wolves on several occasions. The radiocollared alpha female, #327F, and 5 other pack members were observed with severe mange. On November 19, an adult ewe was confirmed killed by wolves in the Tom Miner area and the Chief Joseph Pack was implicated. No control actions were initiated. Two radiocollared wolves remained in this pack.

Bear Trap Pack: This pack consisted of 3 uncollared wolves, one of which was reportedly a pup. There is speculation that this group may have been the Ennis Lake Pack that was involved in depredations and lethally removed in the Madison Valley in March 2004.

Lone Bear Pack: On July 2, project personnel trapped and radiocollared a yearling male, #425M, in the Lone Bear Pack in Paradise Valley. On July 3 a pup was incidentally trapped but too small to radiocollar. On July 21 a calf was injured by the Lone Bear Pack and SOS permits were issued to 3 landowners. On September 4, WS confirmed 3 ewes and 1 lamb killed by wolves and on September 11, 2 ewes were killed and 1 ewe injured that had to be euthanized. Control was initiated for 2 wolves, and fladry was strung by DOW and project personnel the same day. In addition the landowner was provided with a telemetry receiver, and a RAG box was set up on the property. On September 17, 3 ewes were confirmed as wolf kills and 1 lamb was wounded by wolves. On September 17, radiocollared wolf #425M and 1 uncollared adult male, #450M, were lethally removed. On October 6, wolf #334M from the Sheep Mountain Pack was found with #283F and remained in the Lone Bear Pack. On October 8, WS lethally removed an uncollared gray wolf in the pack but it was not retrieved. On November 3, both #283F and #334M were in the vicinity of 2 dead goats that were confirmed as wolf kills. Defenders of Wildlife provided 2 adjacent landowners with predator-proof night pens. No further depredations occurred and control is ongoing. Two functioning radiocollars remained in this pack.

Mill Creek Pack: On September 13, 3 ewes were confirmed as wolf kills and traps were set to radiocollar wolves, but none were caught. The landowner was issued an SOS permit for 2 wolves, and on October 12 the landowner shot an uncollared female pup, #459F. On November 15, project personnel euthanized male pup #462 due to severe mange. In December WS confirmed 2 calves as wolf kills. Shoot-on-sight permits were issued to 2 landowners for up to 3 wolves, and on December 29, one of the permitted landowners shot a female pup. This pup had a severe case of mange and the landowner said that the other 4 pups with it were also in poor condition. The breeding female, #271F, is the only radiocollared animal in this pack.

Moccasin Lake: Two dead calves were confirmed as wolf kills on April 20 and on September 24. Wildlife Services trapped and lethally removed an uncollared male, #424M, on April 21. On September 30, #326F and an uncollared female pup, #458F, were lethally removed by WS. One radiocollared wolf remained in the pack. An uncollared male pup, #463M, was incidentally snared and killed by a bobcat trapper in the Boulder River area south of Big Timber, Montana, in December. No law enforcement action was undertaken with the incidental take.

Phantom Lake Pack: This uncollared pack had confirmed depredations of 13 calves and 49 sheep from March through December 2004. Traps were set by WS to radiocollar and release wolves in March. The first SOS permit was issued to landowners on March 29 and reissued on several occasions throughout the year to multiple landowners. On July 28 a landowner/employee with an SOS permit shot a black pup on private land. On August 26, project personnel radiocollared a gray female pup, #447F. On November 11, WS lethally removed an uncollared breeding female. By December 31 there appeared to be 1 adult and 3 pups remaining in the Phantom Lake Pack and control was ongoing. One radiocollared wolf remained in this pack.

Sheep Mountain Pack: Wildlife Services confirmed a dead cow as a wolf kill on private land on May 30. On July 3, a calf was confirmed as killed by wolves. On July 26, WS lethally removed 2 uncollared wolves, a 3-year-old male, #428M, and a 2-year-old female, #429F. On August 27 a calf was confirmed killed by wolves and 2 other calves as possible wolf kills. On August 31, WS lethally removed the breeding female #323F. She had been missing from the Sheep Mountain Pack since March of 2004 and was killed in Green River, Wyoming. On September 21, a calf was confirmed killed by the Sheep Mountain pack. An October 6 the Sheep Mountain #334M was located in the Lone Bear Pack territory with Lone Bear #283F and he remained there through December 31. He is scheduled for removal because of continuing depredations. Wolf #283F was located in the Sheep Mountain territory in November and December. The Sheep Mountain Pack is no longer considered an intact pack, and any new wolves occupying this territory in the future will be renamed.

Sentinel Pack: On February 26, a newborn calf was confirmed as a wolf kill by WS in the Bear Creek area outside of Cameron, Montana. A cow was confirmed as a wolf kill by WS on March 1 in the Bear Creek area. At this point there were no radiocollared wolves in this pack. On March 2, WS darted and radiocollared a female pup, #412F. On March 4 a stock dog was confirmed as a wolf kill by WS in the Bear Creek area, and the entire pack was then targeted for lethal removal. During a control action on March 5 it was discovered that someone had illegally shot and wounded #412. Law enforcement was contacted. Due to the lack of a radiocollar in this pack, SOS permits were issued to 3 of the effected landowners. On March 11, WS personnel lethally removed 5 members of this pack: #413M, #414M, #415F, #416F, and #417F. Radiocollared wolf #412F was monitored closely to see if she would find the remaining 2 members and assess the extent of her injury. Project personnel determined that she was scavenging from deer carcasses, not using a hind leg and traveling alone. Wolf #412F was lethally removed on March 16. No members remained in the Sentinel Pack.

Ennis Lake Pack: This pack is believed to be the group of 6 wolves that were seen regularly on the Flying D ranch during most of 2003. On February 28, 2 newborn calves were confirmed as

wolf kills near Ennis Lake. On the night of March 1, the rancher successfully harassed wolves from near calving barns on the Cedar Creek Ranch. The next day the landowner was trained in less-than-lethal munitions by project personnel. Two yearling steers were confirmed as wolf kills on March 9. At this point it was decided to lethally remove the entire pack. On March 12, WS lethally removed 5 wolves near Ennis Lake: #418F, #419M, #420M, #421, and an uncollared wolf. One of these wolves was a radiocollared male from the Nez Perce Pack in YNP, #249. The Ennis Lake Pack no longer exists.

Dillon Pair: A pair of uncollared wolves (an adult black male and a gray yearling female) killed 7 rams in the Blacktail area west of the Snowcrest Mountains on October 31 and November 16. Efforts were made to lethally remove the pair but they could not be found.

Miscellaneous/Lone: On May 2, WS confirmed a calf killed by wolves in the Whitehall area. Traps were set but the wolves did not return. On June 13 project personnel ground tracked Lone Bear disperser #284F to the upper Ruby River in the Snowcrest Mountains. On July 22, dispersed #284F killed 7 rams in the Blacktail area west of the Snowcrest Mountains. WS lethally removed #284F the same day.

Idaho portion of the Greater Yellowstone Area

A calf was confirmed killed by wolves on August 13 in the Idaho portion of the GYA near Conant Creek, Wyoming. Wildlife Services set traps for 5 days but no wolves were captured. It is unknown which pack of wolves was responsible for the depredation.

CENTRAL IDAHO WOLF RECOVERY AREA

Personnel

The NPT Wolf Recovery Program, headed in 2004 by Project Leader Curt Mack and biologists Isaac Babcock, Adam Gall, Jim Holyan, Kent Laudon, and Anthony Novack, conducted wolf management and monitoring of the CID. Volunteers Mishca Connine, Jonathan Derbridge, Jennifer Donovan, Janeen Hetzler, Tyler Hollow, Anastacia Kampe, an Doug Noel assisted during the field season. Consuelo Blake, office assistant, left the Recovery Program at the end of the year. Jon Trapp, a graduate student affiliated with Prescott College, concluded his thesis research on den-site characteristics. Barbara Trapp developed a database for the Program. Mike Schlegel helped during helicopter capture.

The USFWS was represented in Idaho by recovery coordinator Carter Niemeyer, and in Montana by biologists Joseph Fontaine, Diane Boyd, Paul Frame, and Jack Bucklin. Law enforcement agents in the Boise USFWS field office are Senior Agent Craig Tabor and Special Agent Scott Kabasa. Special Agent Scott Bragonier is headquartered in Twin Falls. USFWS Special Agent Rick Branzell covers that portion of southwest Montana that is part of the CID.

The Idaho Department of Fish and Game (IDFG) began wolf management and coordination during 2003. Personnel involved include State Coordinator Steve Nadeau (Boise) and 2 regional wildlife biologists hired in 2004 to address wolf management and monitoring, Jason Husseman (Salmon) and Michael Lucid (Nampa). In addition, IDFG personnel assisted throughout Idaho.

Wildlife Services personnel involved in wolf control and management in 2004 included State Director Mark Collinge, Assistant State Director George Graves, District Supervisors Charles Carpenter, Craig Maycock and Todd Grimm, Wildlife Specialists Jeff Ashmead, Doug Hansen, Doug Hunsaker, Gary Looney, Justin Mann, Kelly Parker, Shane Robinson, Eric Simonson, Dave Thomas, Wolf Specialist Rick Williamson, and pilots Joe Dory and Sam Kocherhans.

Monitoring

Radiocollared wolves were located approximately once per month by airplane, and more frequently during spring denning, livestock grazing season, and fall hunting seasons. Seventy wolves were captured made during the 2004 field season, 27 by helicopter darting and/or helicopter net-gunning and 42 by trapping. Additionally, 1 wolf was ground-darted, the second known instance this method has been successfully employed on wolves. Fifty-six wolves were radiocollared for the first time, 3 wolves were recollared, 9 were not radiocollared, and 2 were lethally removed at the time of capture. At the end of 2004, approximately 64 wolves (14% of the estimated population) were being monitored in 40 documented groups or as lone/dispersing wolves. Contact with 5 other groups was terminated by the loss of radiocollared wolves in them. These packs, along with 15 areas of suspected wolf activity, accounted for about 452 wolves in the CID. Approximately 422 wolves live in the state of Idaho (Table 3) and 30 in the Montana portion the CID (Table 1b). The CID population estimate is developed by adding the current year's known pups and immigrant wolves to the previous year's population estimate, and then subtracting the current year's documented mortalities and emigrants. This method tries to account for wolves not observed by field personnel, specifically those in the areas of suspected wolf activity (as those theoretically originated from known packs in the CID and were previously counted as members of their natal packs). Therefore the "Unknown wolves" line in Table 3 should not be interpreted to mean that the NPT program knows of 149 wolves affiliated with undocumented packs in the CID. Inclusion of this line is simply a way to reconcile the Program's CID population estimate with other data presented in Table 3.

Forty-four packs were documented in the Idaho portion of the CID including: Bear Valley, Bennett Mountain, Big Hole, Buffalo Ridge, Calderwood, Castle Peak (no radiocollars), Chamberlain Basin (no radiocollars), Chesimia, Cold Springs, Cook (extirpated for chronic depredations), Coolwater Ridge, Copper Basin, Eagle Mountain, Eldorado (no radiocollars), Five Lakes Butte, Florence, Galena, Gold Fork, Golden Creek, Gospel Hump, Hazard Lake, Hemlock Ridge, Jureano Mountain, Kelly Creek, Landmark (no radiocollars), Lupine (no radiocollars), Magruder, Marble Mountain, Monumental (no radiocollars), Morgan Creek, Moyer Basin, O'Hara Point, Orphan, Packer John, Partridge Creek, Red River, Scott Mountain, Selway (no radiocollars), Soldier Mountain, Steel Mountain, Thunder Mountain (no radiocollars), Timberline, Twin Peaks (no radiocollars), and Warm Springs Packs (Table 3, Figures 1, 4).

Also, 14 areas of suspected wolf activity in the Idaho portion of the CID were identified: Avery, Bovill/Deary, Carey Dome/Marshall Mountain, Grangeville, Lemhi, Lower Mores Creek, Lower Selway, North Fork of the Salmon, Pikes Fork, Postoffice Creek, Stolle Meadows/Warm Lake, Upper Selway, Willow Creek Summit, and Wolf Fang.

In addition, at least 7 packs inhabited the Montana portion of the CID: Battlefield Pack in the Big Hole Valley, Black Canyon Pack in the Horse Creek drainage, Painted Rocks Pack in the West Fork of the Bitterroot River drainage, Sapphire Pack in the East Fork of the Bitterroot River drainage, at least a pair of wolves in the Willow territory, and at least a pair of wolves in the Grassy Top territory. The Fox Creek Pack was lethally removed during 2004 (Table 1b, Figure 4). Of the packs known to live in the Montana portion of the CID, only the Battlefield Pack was radiocollared. Additionally, Mount Haggin was considered an area of suspected wolf activity. None of the wolves in this area were radiocollared or monitored in 2004.

Reproduction was confirmed in 37 packs (34 in Idaho and 3 in Montana), producing a minimum of 123 pups (112 in Idaho and 11 in Montana). Thirty (27 in Idaho and 3 in Montana) of the 37 reproductive packs met the recovery standards of a breeding pair (Tables 1b, 3). Fifty-three wolves were known to have died in 2004: 47 of human-related causes [thirty removed in control actions (17 in Idaho and 13 in Montana), 11 illegally killed, 6 from other human causes], and 6 of unknown causes. The fates of 6 radiocollared wolves that dispersed from their home ranges were ascertained in 2004. Seven radiocollared wolves ceased transmitting in 2004.

Eight new wolf packs were documented in 2004: Black Canyon (unknown origin), Calderwood (dispersed female B141 from Scott Mountain and unknown male), Chesimia (unknown origin), Cold Springs (unknown origin), Coolwater Ridge (dispersed female B163 from O'Hara Point and unknown male), Packer John (unknown origin), Partridge Creek (unknown origin), and Warm Springs (dispersed female B109 from Wolf Fang and unknown male). Five packs were retroactively added as 2003 packs based on information obtained in 2004. Those were Battlefield, Bear Valley, Bennett Mountain, Copper Basin, and Golden Creek.

As noted above, several packs were documented that contained no functioning radiocollars. Field biologists verified these packs through follow-up investigations of reports of wolves or wolf sign received from other agencies or the public, or based on previous project knowledge. Evidence was obtained from howling/track/scat surveys and/or visual observations. For most of these groups, capture efforts were undertaken to equip wolves with radiocollars, but were not successful. Radiocollars were transmitting in the Castle Peak, Cook, Gospel Hump, Lupine, and Selway Packs, in 2004, but were lost for a variety of reasons.

Status of Original Reintroduced Wolves: The last 2 wolves being monitored from the original 35 reintroduced in 1995 and 1996 died during 2004. Male B2, the alpha male of the Castle Peak Pack, was estimated at 14 years of age when he died in February. Male B5, one-time alpha of the Selway Pack, died in October at approximately 12.5 years of age. At least 2 wolves from the 1995 release, male B7 and female B11 (both of the Big Hole Pack), were alive in 2004, although they were not monitored because their radiocollars ceased transmitting in 2003. The fates of 13

other wolves translocated from Canada were not known due to loss of radiocollar signals over time.

Research

The wolf recovery program supported research that provided sound scientific data leading to wolf conservation and management.

Wolf den site selection in the Northern Rocky Mountains.

Graduate student: Jon R. Trapp. Thesis, Prescott College, Prescott, Arizona, USA.
Investigators: Paul Beier (Northern Arizona University), Curt Mack (NPT), David Parsons (Prescott College), and Paul Paquet (University of Calgary).
Cooperators: NPT, USFWS, USFS, GNP, Banff National Park, Wolf Education and Research Center, Sun Ranch, Plum Creek Timber Company, YNP, and the Geographic Data Service Center.

Reproductive success is key to survival and persistence in any species. Gaining a better understanding of wolf den site selection and characteristics can help in the future management of wolves in the NRM of the U.S. and elsewhere. This study investigated fine-scale denning habitat selection by comparing field-measured characteristics of 22 dens in Idaho, Montana, and Canada to paired random contrast sites within the pack home range. In order of importance, wolves denned in areas that had greater canopy cover, hiding cover, herbaceous ground cover, and woody debris, and were closer to water than paired random sites. Logistic regression models using these as candidate variables identified proximity to water, canopy cover, herbaceous ground cover, and small woody debris as the most important variables, and successfully categorized >81% of dens and >86 % of paired contrast sites. At a coarse-scale (using GIS data layers), 35 wolf dens did not differ from 35 paired random contrast sites in Idaho, Montana, and YNP with respect to elevation, slope, coniferous forest cover, solar radiation, land ownership, distance to water, and distance to roads. However, a GIS model based on the Mahalanobis distance (with slope, elevation, coniferous forest cover, and solar radiation as habitat variables) suggests that >85% of dens will occur in potential denning habitat that occupies <12% in the NRM.

Literature review of worldwide wolf monitoring techniques

Principal Investigators: Curt Mack (NPT), Kyran Kunkel (MSU), and Wayne Melquist (University of Idaho).
Cooperators: IDFG and USFWS.
The investigators worked to synthesize the current worldwide state of knowledge regarding wolf monitoring techniques. This effort included a complete published and grey literature search, as well as a questionnaire survey designed to collect unpublished information from current wolf managers. Results of the literature searches and questionnaire are being analyzed. This was the initial stage of, and will provide the foundation for, a proposed research study to develop post-delisting monitoring protocols for wolves in Idaho. Results of this study will also be useful to

other states developing wolf survey and monitoring protocols.

Developing monitoring protocols for the long term conservation and management of gray wolves in Idaho

Principal Investigators: Curt Mack (NPT)
Cooperators: IDFG and USFWS.

As part of USFWS efforts to restore endangered populations of gray wolves, an imperiled species, to the NRM of the conterminous U.S., 35 wolves were reintroduced into Idaho between 1995 and 1996. The NPT has supported wolf recovery efforts, in part, because of the cultural and religious significance of this species. The NPT, working through a cooperative agreement with USFWS, has been charged with the responsibility of monitoring and documenting the status of the recovering wolf population in Idaho. Wolves in the NRM have recovered more rapidly than anticipated and USFWS is intending to initiate the delisting process in the near future.

To date, wolf population estimation has relied on time-intensive and expensive radiotelemetry techniques. Although this approach worked well with initial small population sizes, these techniques are no longer appropriate or cost-effective given the current, much larger recovered population size and near-statewide distribution. The NPT, USFWS, and the State of Idaho are interested in a collaborative partnership effort to develop a less intensive and more cost-effective approach for estimating wolf population numbers across the varied landscapes of Idaho. They propose to initiate a 3.5-year research effort to develop standardized protocols for estimating wolf population parameters appropriate for meeting post-delisting monitoring and management needs.

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

Ungulate Ecology

During 2005, IDFG will begin research on elk and deer, specifically looking at ecological factors and impacts that help predict ungulate population performance. Included in the research will be the impacts of large carnivores, including wolves, on the performance of elk and deer populations within several study areas across the state. Other variables analyzed will include habitat, ecological region, weather events, and hunting. Research will be conducted over several years to monitor changes in populations, variables, and impacts.

Outreach

Program personnel presented informational talks and status reports throughout the year to various federal and state agencies, public and private institutions, special interest groups, and

rural communities. Additionally, scores of informal presentations to small groups or individuals were conducted during this time.

Livestock Depredation and Management

Of the 51 documented packs of wolves in the CID (7 in the Montana portion of CID and 44 in Idaho state), 18 groups (packs, pairs, or individuals) were involved in confirmed or probable livestock depredations in 2004. WS investigated all reports of livestock depredation and then took appropriate actions as authorized by the USFWS. For the CID recovery area, losses were; 22 cattle confirmed as wolf kills, 2 calves recorded as probable wolf kills, 170 sheep confirmed as wolf kills, 12 sheep as probable wolf kills, and 3 dogs were confirmed killed by wolves. Thirty wolves were lethally controlled in 2004 in the CID, which was larger than the total for the years 2001-2003 combined (28).

Idaho Portion of CID

Wildlife Services responded to 82 complaints and determined that a total of 17 cattle, 161 sheep, and 3 dogs were confirmed killed by wolves in the Idaho part of the CID in 2004. Another calf and 12 sheep were classified as probable wolf kills. The number of investigations conducted in the Idaho portion of the CID in 2004 increased approximately 84% over 2003, with confirmed livestock losses rising 38%. Seventeen wolves were lethally removed during government depredation control and none were translocated. Another 6 wolves were captured and released on site in these operations. Together, the Cook (85 confirmed sheep kills plus 2 sheep probable) and Partridge Creek (31 confirmed sheep kills) packs were responsible for the majority of confirmed sheep losses (72%).

Bennett Mountain Pack: Nine depredation events, from late February to mid-May, resulted in the confirmed losses of 6 cattle and 8 sheep. Three wolves were lethally removed. Female B199 was trapped and radiocollared after control actions. Aerial observations indicated she remained alone until late 2004 when another wolf was observed with B199 within the Bennett Mountain Pack's territory.

Castle Peak Pack: Two calves, 1 confirmed and 1 probable, were killed by this pack in late April. Traps were set, but no wolves were captured. No additional depredations were reported. Contact with this pack was lost in February when 1 of the radiocollared wolves went ceased transmitting and the other died.

Chesimia Pack: This pack was discovered due to their initial depredation on an adult cow in August. A pup was trapped and radiocollared during the control action. This pup led biologists to the pack's rendezvous site, where a second pup was ground darted and radiocollared. In all, 2 cows were confirmed killed by the Chesimia Pack during 2004.

Cook Pack: Four members of this pack were radiocollared in January. Observers on a subsequent monitoring flight observed 13 wolves in the pack. Depredations began very soon after sheep entered this pack's territory during the summer grazing season. Seventy-one sheep

were confirmed killed during a single incident in July. A total of 5 depredation events were attributed to this pack, which resulted in the lethal removal of all (nine) wolves. Sheep losses attributed to this pack represented a minimum of 61% of total sheep confirmed lost to wolves in the CID.

Copper Basin Pack: Beginning in late August, this pack was implicated in 5 depredations that resulted in 4 cattle confirmed killed by wolves and 2 more calves confirmed injured. During control actions the alpha male and a pup were captured and radiocollared.

Florence Pack: In early December this pack was involved in the death of 4 sheep. One livestock-guarding dog was missing as well. No control action was implemented, and no further depredations were reported.

Galena Pack: This pack was responsible for killing 1 sheep herding dog in late September. Several instances of wolves from this pack interacting with dogs were reported earlier in the year. Wolves from this pack injured a guard dog in late September.

Gold Fork Pack: In August, 6 sheep were confirmed killed by wolves and 14 were injured within the pack territory. WS initiated a control action, but no wolves were captured. No further depredations were reported.

Hazard Lake Pack: In August, this pack was implicated in 2 attacks on sheep that resulted in 6 confirmed and 7 probable sheep deaths. Control actions conducted following the second depredation resulted in the lethal removal of 3 wolves, including alpha male B105. In mid-October, 2 sheep herding dogs were confirmed killed in this pack's home range.

Jureano Mountain Pack: The Jureano Mountain Pack was involved in 1 confirmed calf depredation incident in mid-August. A female pup was captured, radiocollared, and released.

Moyer Basin Pack: One calf was confirmed killed in this pack's territory during 2004. No control action was undertaken as cattle were in the process of being removed from the allotment.

Partridge Creek Pack: Three depredation events attributed to this pack resulted in the confirmed loss of 31 sheep. Two wolves, a subadult male and subadult female, were lethally removed in late July after the second depredation.

Steel Mountain Pack: This second year pack was confirmed to have killed 4 sheep and injured 1 guard dog in August. During a control action late in the month a pup was captured and released, though it was too small to radiocollar.

Miscellaneous/Lone Wolves: Two instances of known lone/paired wolves attacking livestock were investigated by WS. The first involved male B196, the second female B45 and/or male Y239. Wolf B196, a dispersing wolf from the Morgan Creek Pack, killed 1 domestic calf in 2004. Ten sheep were confirmed killed by wolves in the territory formerly occupied by B45, although her radiocollar had been dead since August 2002. During the control action B45 was

recaptured but not given a new radiocollar. Eight days later Y239, from the Washakie Pack in Wyoming, was captured at the same trap site as B45. He was given a new radiocollar, but subsequently left this area. Unknown wolves were implicated in the confirmed loss of 1 cattle and 7 sheep during 6 instances of depredation.

Montana Portion of the Central Idaho Recovery Area

Five cattle and 9 sheep were confirmed killed by wolves in the Montana part of the CID recovery area. One calf was categorized as a probable wolf kill. Thirteen wolves were lethally removed here during 2004.

Battlefield Pack: Three calves were confirmed killed by wolves, and another was classified as probable, in the Battlefield Pack territory in the Big Hole Valley. Three wolves were lethally removed in September, and 2 more were lethally removed in October.

Fox Creek Pack: Two calves were confirmed killed by wolves in the southern Big Hole Valley early in 2004, following a series of depredations in 2003. The Fox Creek Pack, 8 members, was lethally removed during control actions in early 2004.

Miscellaneous/Lone Wolves: Unknown wolves were confirmed to have killed 9 sheep near Hall, Montana in 2004.

PLANNING AND LEGAL ISSUES

Reclassification and Delisting of the Gray Wolf

Wolves, once common throughout North America, became protected under the ESA because human persecution nearly eliminated them from the contiguous United States. By 1974, there were no wolves left in the NRM. The ESA prohibited people from harming wolves and mandated that all federal actions seek to conserve and not jeopardize wolves. Ultimately, 3 distinct wolf recovery programs, Midwest, NRM, and Southwest, were initiated. In the NRM, 2005 marked the fifth consecutive year that 30 or more breeding pairs of wolves were documented. The population of 835 wolves has achieved biological recovery objectives.

The USFWS can propose delisting of the NRM wolf population when it determines that the population has recovered and it is reasonably assured that wolves would not become threatened again if the ESA protections were removed. The ESA contains several checks and balances to ensure that any decision to delist a species is scientifically sound and will not result in a species being relisted. The ESA requires that all decisions be based on the best scientific data available. The USFWS is mandated to examine all of the factors that may have caused a species to become threatened and to determine that they are not likely to cause the species to become threatened again. Regulating the level of human-caused mortality is the primary factor that must be resolved before delisting could be proposed. The ESA requires that USFWS determine that regulations, other than the ESA, will prevent unchecked human-caused mortality from once

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

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

In early January 2004, the Director determined that Montana's state wolf management plan was an outstanding professional effort and deserved special recognition. Montana's wolf management plan was clearly adequate as a regulatory mechanism to maintain and conserve a recovered wolf population. Idaho's state wolf management plan, when examined by itself, appeared to contain some conflicting and confusing statements regarding whether adequate regulatory mechanisms would be in place to protect gray wolves. However, passage of Idaho House Bill 294 in 2003 resolved those concerns. Idaho's wolf management plan was adequate as a regulatory mechanism to maintain a recovered wolf population, assuming step-down planning followed through on their plan's overall policy commitments. The Wyoming state wolf plan called for wolves to be considered "trophy game" in the national park and wilderness areas of the state and considered as "predators" throughout the remainder of the state (and as trophy game in a larger area of Northwest Wyoming if less than 8 packs were outside the national narks). The combination of large areas and the uncertainty of monitoring wolf mortality under predatory animal status, the alternation between "predatory animal" and "trophy game" status in certain areas and the potentially limited area in which human-caused mortality of wolves could be regulated were major concerns. Wyoming's unique and complex proposed regulatory framework and the vague direction provided by Wyoming law, did not assure the USFWS that Wyoming's plan will conserve wolves at or above a recovered level in Wyoming. The Director determined that Wyoming must designate wolves as trophy game statewide so the WYGF has legal authority to manage them, and Wyoming must clearly commit to managing for 15 or more well distributed packs. These changes will require modifications in Wyoming state law that cannot be made until 2005 at the earliest. The USFWS will not propose that the wolf population be delisted until Wyoming state laws and their state plan can assure that Wyoming's portion of the NRM wolf population will remain secure without the ESA protections.

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

Nationwide wolf reclassification:

The reclassification of wolves nationwide was completed on April 1, 2003. The rule created a new Western Distinct Population Segment (DPS) for wolves, consisting of Wyoming, Montana, Idaho, Washington, Oregon, California, Nevada and the northern halves of Utah and Colorado. This proposal did not change the status of wolves in the experimental nonessential population areas (CID and GYA) but changed the status of wolves in the rest of the Western DPS from endangered to threatened. Wolves were also reclassified to threatened in 22 north-central and northeastern states (Eastern DPS), and delisted in all or part of 14 southeastern states. The reclassification and accompanying special rule [4d] allowed wolves to be managed under virtually the same rules throughout the northwestern U.S. Activities that are allowed under threatened status include the use of less-than-lethal munitions to harass wolves away from livestock and the ability for livestock owners to legally kill a wolf caught in the act of attacking livestock, herding or guarding animals, or dogs on private property. The activities of government agencies in managing depredating wolves are not significantly different under the threatened status. Although wolf reclassification is still being litigated, it is a separate administrative procedure from a potential delisting proposal (see *Litigation*).

The Experimental Population Rule

The USFWS's new 10j regulation expanded the authority of States and Native American Tribes with USFWS-approved wolf management plans to manage gray wolves in the experimental population areas of CID and GYA. Gray wolves were reintroduced in the Northern Rockies as nonessential experimental populations under the ESA in 1995 and 1996. This designation allowed Federal, State and Tribal agencies and private citizens more flexibility in managing wolves within the experimental population areas. The new rule applies to states and tribes within the experimental population areas of Idaho, Montana, and Wyoming that have USFWS-approved wolf management plans. Only 2 States, Montana and Idaho, where there are about 575 wolves, presently fit that category. At this time, this regulation does not apply to the state of Wyoming because it does not have a USFWS-approved wolf management plan.

The new rule was proposed in March 2004 and was available for public comment for 60 days. Two public hearing were held, 1 in Helena, Montana and another in Boise, Idaho. Nearly 23,000 people commented on the new rule. Those comments were analyzed and the final (and revised) 10j rule became effective on February 7, 2005. Among other things, it provided that in the wolf experimental population areas of Montana (south of the Montana/Idaho border to Hwy 12, south of I-90 to Butte and east of I-15 and south of the Missouri River) and Idaho (south of I-90):

- Anyone may harass a wolf in a noninjurious and opportunistic manner (scaring it and running it off in a way that doesn't hurt the wolf) at any time. Such harassment must be reported within 7 days.

- Wolves seen attacking livestock, livestock herding and guarding animals, and dogs on private land can be shot by the landowners without prior written authorization. It must be reported within 24 hours and there must be physical evidence of a wolf attack. Evidence of a wolf attack would include injured or dead livestock, broken fences, trampled vegetation, and mixed wolf and livestock sign.

- Wolves attacking livestock and livestock herding and guarding animals on public federal lands can be shot by grazing or guide/outfitter permittees on their active allotments, and on ceded lands by tribal members, without prior written authorization. It must be reported within 24 hours and there must be physical evidence of a wolf attack.

- Under some circumstances landowners and public land grazing and guide/outfitting permittees maybe issued written authorization to use rubber bullets to harass wolves, or SOS permits to kill wolves.

- Wolves determined to be causing unacceptable impacts to wildlife populations, such as herds of deer and elk, can be killed by state or tribal agencies. This is allowed only after the States or Tribes complete science-based documents that underwent public and peer review and were approved by the USFWS.

- States or tribes with approved wolf management plans can lead gray wolf conservation and management in the experimental areas within their states' or reservations' boundaries.

Litigation

Western Watersheds Project vs. Sawtooth National Forest, United States Court of Appeals, Ninth Circuit. No 03-35478, late 2003. This case involved a complaint against the USFS and their alleged failure to properly complete National Environmental Policy Act (NEPA) analysis regarding allowing livestock grazing in the Sawtooth National Recreation Area and the agency wolf control that might result because of livestock depredation. The court ordered the USFWS to withhold all lethal wolf control pending resolution of the issues. The case was resolved and the injunction against the USFWS expired.

State of Wyoming, et al. vs. United States Department of the Interior, et al., United States District Court for the district of Wyoming, Civil Action No. 04CV01123J. This case involved the USFWS not approving the Wyoming state wolf management plan. The case was expanded by interveners to include alleged failure to properly manage wolves in Wyoming and failure to conduct additional NEPA compliance. A related legal issue between Wyoming and the Department of the Interior also involves Freedom of Information Act issues about the USFWS's withholding of certain documents because they were related to internal deliberations and attorney-client privilege. Oral arguments for the Wyoming state wolf plan case was heard in Wyoming District Court on February 4, 2005.

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

National Wildlife Federation et al. vs. Gale Norton et al., United States District Court of Vermont, Civil No. 1:03-CV-340. This case involved the April 2003 reclassification of the gray wolf to threatened status and the USFWS's establishment and listing of 3 gray wolf DPS (Eastern, Western and Southwestern). This litigation is ongoing but primary involves the Eastern DPS, and claims the USFWS should have established a fourth DPS for the northeastern U.S.

Defenders of Wildlife et al. vs. Gale Norton et al., United States District Court of Oregon, Civil No. 03-1348 JO. This case also involved the April 2003 reclassification of the gray wolf, the USFWS's establishment and listing of 3 gray wolf DPS (Eastern, Western and Southwestern), the special 4(d) rules within the Western and Eastern DPS. This litigation primarily involved the Western DPS. Oral argument was heard in Portland, Oregon on January 19th, 2005. On January 31, 2005, the U.S. District Court in Portland, Oregon, issued a decision that apparently reversed the USFWS's April 2003 reclassification of the gray wolf to threatened status throughout the northern United States and eliminated all 3 DPS's and both the 4(d) rules that authorized problem wolf management. Under that ruling wolves outside the experimental nonessential areas are now considered endangered and will be managed according to the authorities and rules in place prior to April 2003. The ruling also voided the cooperative agreement between Montana and the USFWS. This court order eliminated the special 4(d) rule that allowed landowners outside of the experimental nonessential areas in the northwestern U.S. to legally kill or harass wolves that were seen physically attacking their livestock and dogs on their private land. No wolves had been taken under those provisions in the nearly 2 years they had been in effect. As a result of the court order, wolf control outside the experimental population areas can only be implemented by the USFWS or its designated agents. Outside the experimental population areas private citizens cannot harm or kill wolves. The USFWS is consulting with Department of Justice attorneys analyze the court's order and its legal options and potential remedies.

Funding of Wolf Recovery and Management, FY04 for 2004 annual report.

Wolf recovery in the NRM from 1973 through 2004 cost approximately $18,944,618 (with no adjustments for inflation). If recovery continues at the current rate and management costs remain within predictions, additional cost to federal taxpayers of $2,159,618 will be incurred annually each year wolves remain listed. Unless Wyoming's wolf management plan can be approved by the USFWS, the wolf population will not be proposed to be delisted and will remain under the protections of the federal ESA.

In FY 2004 (October 1, 2003 to September 30, 2004) total USFWS funding for wolf recovery and management issues in the northwestern U.S. (nearly all funding was spent in Montana, Idaho, and Wyoming) was about $2,090,000. The majority of that funding was directly allocated by Congress in federal appropriations language in the federal budget. It was allocated as follows:

In FY04, funding for wolf recovery was increased by Congress over FY03 levels. Region 6 of the USFWS (which includes Montana and Wyoming) received about $1,114,654. Of that, FY04 congressional allocations of $508,654 were designed to help with the transition to state wolf management. Montana, Fish Wildlife and Parks was allocated $305,193 and $203,461 was allocated to WYGF. A base USFWS budget of about $506,000 was used to conduct the usual monitoring, management, control, and information program in Montana and Wyoming, begin coordination of a delisting proposal, propose and finalize a new nonessential experimental population rule for states/tribes with approved wolf management plans (finalized January 6, 2005), and coordinate wolf management issues in the northwestern U.S. Region 6 is also the lead for supporting the Department of Justice on litigation issues related to wolf recovery involving the northwestern U.S. (see Litigation). In addition, as the result of its two-thirds share of a Congressional earmark of $300,000 for increased wolf monitoring in the Frank Church-River of No Return Wilderness (Frank Church), Idaho, and Yellowstone, Montana/Wyoming areas, $100,000 was used to support WS's assistance with investigations of reported wolf damage. The remaining $97,535 was used to support increased wolf management activities in Wyoming and Montana and is included in the total Region 6 base budget of $506,000 mentioned above. The remaining $98,000 of that Frank Church funding went to assist in wolf management in Idaho. In FY05, that entire congressional earmark was eliminated.

Funding levels for USFWS in Region 1 for FY04 was also increased by Congress. Region 1 (which includes Idaho) received **$**1,044,964 in Congressional earmarks which were used to fund the NPT ($393,096), the Idaho Governor's Office of Species Conservation ($454,332**;** $90,000 of which was distributed to livestock producers for missing livestock in CID), and the USFWS Idaho wolf recovery program ($197,536). In FY05, the congressional funding allocation to the USFWS in Idaho was reduced to $99,000.

In addition WS maintained a $100,000 Congressional directive for responding to complaints of wolf damage as well as a $1,300,000 directive for Montana, Idaho, and Wyoming for investigating and addressing predator damage, including predation by wolves. This directive recognized and helped fund the increased costs of conducting coyote control in the presence of wolves. Yellowstone National Park maintained their NPS-funded wolf monitoring and research program at about the $210,000 level in FY04.

In addition to federal funding, the private TESF funded the salary of an experienced wolf field biologist in Bozeman, Montana. That biologist is a USFWS volunteer, whose logistic and field support and direct supervision was provided by the USFWS (costing about $20,000/yr). That employee monitored wolves and assisted in resolving conflicts between wolves and private landowners in southwest Montana. Defenders of Wildlife provided a compensation program for livestock killed by wolves, with expenditures of more than $395,000 from 1987 through December 2004. In 2004, DOW paid $95,000 in compensation to livestock producers in Montana, Idaho, and Wyoming for confirmed and probable wolf-caused damage to livestock and livestock herding and guarding animals. Universities in Idaho, Montana and Wyoming also provided substantial funding and support for their graduate students conducting wolf research.

In FY2005 Congress directed funding increases in Idaho but reduced or eliminated earmarks to the USFWS and Wyoming (see table below).

Funding Sources for Livestock Depredation Control for FY2004 and FY2005

Fiscal Year	2004	2005
USFWS-Region 6	$506K	$711K
MT	$305K	$316K
WY	$203K	$ 0K
FC/YNP	$100K	$ 0K
SUBTOTAL	$1,114K	$1,027K
USFWS-Region 1	$99K	$99K
ID-OSC	$454K	$720K
Nez Perce	$393K	$343K
FC/YNP	$99K	$ 0K
SUBTOTAL	$1,045K	$1,162 K
TOTAL	**$2,159K**	**$ 2,189**

Law Enforcement

USFWS Law Enforcement--Montana

As wolf numbers increase so do the chances of the illegal killing of wolves. Special Agents continue to find wolves shot near public roads and highways. The offering of rewards and the interview of potential witnesses have not proven effective in solving illegal wolf kills. The USFWS is continuing to use traditional law enforcement techniques to identify the persons who have illegally killed wolves in Montana. For reasons not completely understood, witnesses seldom come forward with information regarding the illegal killing of wolves. While continuing traditional law enforcement measures, USFWS Special Agents are also relying on outreach and education to prevent the killing of wolves.

USFWS Law Enforcement--Wyoming

Increasing wolf numbers have also resulted in some increased illegal take of wolves in Wyoming. The exact number of illegally killed wolves cannot be determined. As wolves expand their range and the number of uncollared wolves increases, timely discovery of dead wolves is more difficult. As in Montana, information from witnesses is seldom obtained. In one case however, local Law Enforcement Officers identified a witness to the illegal shooting of a wolf in 1992. The witness was discovered during an investigation regarding the illegal manufacturing of methamphetamine. The USFWS Agents then located the carcass of the illegally killed wolf and successfully prosecuted the 2 persons who killed the wolf. Both defendants paid, fines and restitution and were incarcerated for the crime.

USFWS Law Enforcement--Idaho

What follows is a list of known wolf mortalities occurring in Idaho during calendar year 2004 that were investigated by USFWS Law Enforcement Special Agents:

The radiocollar of Wolf B79, Lupine Pack, was heard on mortality mode in late January. A USFWS Law Enforcement agent was unable to detect the signal from the ground during his investigation. In June this wolf's carcass was recovered; the remains were mostly intact and there was no obvious sign of cause of death. The body was sent to the National Fish and Wildlife Forensics Laboratory for necropsy. An open investigation is underway.

USFWS Law Enforcement personnel recovered an uncollared gray wolf near Fenn Ranger Station on the Selway River wolf in February. An open investigation is underway.

Red River Pack male B165 was illegally shot near the Red River Wildlife Management Area, south of Elk City, Idaho in April. An open investigation is underway.

An uncollared wolf was found dead on the north side of the Salmon River, approximately 25 miles east of Riggins, Idaho, in April. Due to high water conditions the carcass could not be recovered until July. A necropsy indicated that the wolf had been illegally shot. An open investigation is underway.

A ranch hand illegally took the alpha male of the Orphan Pack, B116, in May near Cascade, Idaho. The ranch hand and the ranch owner were fined $750 each.

Moyer Basin Pack wolf B140, a 2-year-old female, was illegally shot in this pack's territory outside of Salmon, Idaho. An open investigation is underway.

Subadult wolf B179, a male of the Scott Mountain Pack, was shot during the big game hunting season. The perpetrator, claiming self-defense, reported his action to the proper authorities. Prosecutors are determining whether to bring charges against this individual.

USFWS Law Enforcement agents investigated the illegal killing of female B139 of the Gospel Hump Pack. She was shot during the big game hunting season in October. The hunter paid a fine and the case is closed.

Wolf B127, a male suspected to be alone, was illegally shot during the big game hunting season southwest of Tamarack, Idaho. An open investigation is underway.

The alpha male of the Partridge Creek Pack, B211, was illegally shot during the big game hunting season. An open investigation is underway.

The alpha male of the Bear Valley Pack, B214, was illegally shot during the big game hunting season. An open investigation is underway.

An uncollared pup, probably of the Timberline Pack, was found illegally shot along Highway 21 south of Lowman, Idaho during the big game hunting season. An open investigation is underway.

USFWS Law Enforcement agents continued, when able, to conduct pro-active wolf protective patrols in areas where there were documented concentrations of illegal mortalities. USFWS Law Enforcement agents in Idaho are coordinating with IDFG Conservation Officers to assist them in investigating potential cases of illegal take of wolves.

Idaho Wolf Management

State of Idaho

The Idaho State Legislature passed, and the Governor signed, HB294 in April 2003. The bill allowed the IDFG to become reinvolved in wolf management, coordinate with all entities involved to assist in delisting wolves, and then to implement the State Wolf Plan. The IDFG Commission also passed a wolf policy that allows the Department to do what is necessary to begin managing wolves. The IDFG Commission also classified wolves as a big game animal, to take effect after delisting. The IDFG, along with the Governor's Office of Species Conservation, continued to negotiate with the NPT to develop a memorandum of understanding that defines a role for the NPT once wolves are delisted. A field work plan for 2004 was developed as a process to coordinate monitoring and management efforts between the State and the NPT. The

IDFG conducted training sessions, hired personnel, defined roles and responsibilities, purchased equipment, enhanced ungulate monitoring efforts, coordinated among agencies, and otherwise began to manage wolves. The State is prepared to be the primary wolf manager in Idaho as soon as it is feasible and legal under the new 10(j) rules. The USFWS has determined that the State Wolf Plan is adequate to fulfill state requirements for delisting. The IDFG is defining and developing many of the management strategies that will be used for managing wolves under the Plan. The Governor's Office and IDFG will be developing a memorandum of understanding with the USFWS to be the designated agent for Idaho under the new 10(j) rule, and will be discussing which authorities will be requested and granted. Additionally, Idaho is working with Montana and Wyoming to develop a monitoring and coordination plan that will be included in any future delisting package.

Nez Perce Tribe

The NPT and the State of Idaho share a mutual interest in the long-term conservation and management of wolves in Idaho. During 2003, the State of Idaho and the NPT began negotiations to develop a Memorandum of Agreement that, if adopted, would commit both governments to work cooperatively towards the conservation and management of wolves, provide agreement and understanding on shared roles and responsibilities across the state, outline joint efforts for securing needed funding, and provide guidelines for managing future harvest of wolves. This Memorandum of Agreement would take affect upon adoption, prior to delisting, and remain in affect after delisting. Completion of this Memorandum of Agreement is anticipated in 2005.

Montana Wolf Management

Montana completed its wolf planning effort and accompanying environmental impact statement (EIS) in September 2003. The FWP Director and the FWP Commission selected the Updated Council alternative in the final EIS, which then became Montana's official wolf plan. This conservation and management plan scheduled to take effect upon delisting, in conjunction with Montana state statutes. In January 2004, USFWS notified Montana that delisting was delayed due to the lack of adequate regulatory mechanisms in Wyoming. Shortly thereafter, FWP and USFWS began informal discussions to explore options by which Montana could increase its role in day-to-day wolf recovery and management. But prior to any involvement, FWP had to revisit its decision notice and select the Contingency Alternative to assure compliance with the Montana Environmental Policy Act. The Contingency Alternative states that if delisting were delayed for any reason, FWP would implement the Updated Council Alternative to the extent allowed by federal regulations.

In northwest Montana, Tom Meier's departure from the program created a vacancy in Kalispell which needed to be addressed. In southwest Montana, new wolf packs increased personnel demands that were not being met with existing staff. Additionally, federal funding for Montana became available through the Congressional budget in fiscal year 2004 and from the USFWS wolf program directly. These three factors contributed to the context in which the FWP-USFWS discussions took place.

In northwest Montana, the 4(d) regulations provided an avenue by which Montana could become a "designated agent" of USFWS. That would allow FWP to lead the field aspects of the program and be the lead decision maker by implementing the 4(d) regulations finalized in April 2003, in conjunction with portions of the state plan. In southwest Montana, the 1994 10(j) regulation was still in effect, and it provided an avenue by which Montana became a "cooperator" or a "designated agent" in the Montana portions of the Central Idaho and Greater Yellowstone experimental areas. A "cooperator" role would only increase state participation in day-to-day aspects of the field program.

In May, FWP and the FWP Commission amended the previous Record of Decision, selecting the Contingency Alternative and paving the way for FWP to increase its role under state laws. In northwest Montana, an existing FWP-USFWS agreement was amended to allow FWP to serve as USFWS's designated agent. In the experimental areas across southern Montana, a previously existing agreement was amended to allow FWP to become a "cooperator", similar to other program cooperators. USFWS remained the lead decision maker in the experimental areas, but FWP participated in the discussions. Both agreements were finalized in mid-May and remained in effect through the end of the year.

With clear agreements in place and federal funding to support the work, FWP hired a Wolf Program Coordinator in August and 3 field specialists in September 2004. Beginning in October, FWP employees became the primary field contacts in Montana outside of national parks and reservations. Additional information can be found at http://www.fwp.state.mt.us/wildthings/wolf/wolfmanagement.asp

Wyoming Wolf Management

The WYGF completed a final management plan in August 2003. The plan was crafted to conform with HB 229, which the Wyoming Legislature passed in February 2003 to define the management of wolves in Wyoming. It called for dual status of wolves in Wyoming, trophy game in a portion of northwest Wyoming and predator status in the remaining portion of the state. The plan committed to managing for 15 packs statewide, including National Park Service lands, with at least 7 packs outside National Park Service lands. The state plan was peer reviewed by 11 wolf management and research professionals. Ten of the 11 reviewers, with some reservations, generally thought the plan would provide enough support to the 3 state efforts to support a long-term, viable population in the NRM. Following peer review, the USFWS responded to Wyoming that the plan was not satisfactory to proceed with delisting. The state of Wyoming subsequently filed a lawsuit contesting the USFWS decision. Oral arguments on the case were held in Federal District Court in Cheyenne, Wyoming, on February 4, 2005.

ABBREVIATIONS AND ACRONYMS

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

CONTACTS

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

U.S. Fish and Wildlife Service, Helena MT:	(406) 449-5225
U.S. Fish and Wildlife Service, Jackson, WY:	(307) 330-5620
U.S. Fish and Wildlife Service, Boise ID:	(208) 378-5639
Yellowstone Center for Resources, YNP WY:	(307) 344-2243
Montana Fish, Wildlife and Parks, Helena, MT:	(406) 841-4016
Montana Fish, Wildlife and Parks, Kalispell, MT:	(406) 751-4586
Montana Fish, Wildlife and Parks, Dillon, MT:	(406) 683-2287
Montana Fish, Wildlife and Parks, Red Lodge, MT:	(406) 446-0106
Montana Fish, Wildlife and Parks, Bozeman, MT:	(406) 994-6371
Turner Endangered Species Fund	(406) 556-8514
Nez Perce Tribal Wolf Program, McCall ID:	(208) 634-1061
Idaho Fish and Game, Boise, ID	(208) 334-2920
Idaho Fish and Game, Salmon, ID	(208) 756-2271
Idaho Fish and Game, Nampa, ID	(208) 465-8465

To report livestock depredations:

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

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

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

WEBSITES:

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

ACKNOWLEDGMENTS

Hundreds of people have assisted with wolf recovery efforts in a wide variety of ways and we are indebted to them all. It would be impossible to individually recognize them all in this report. We especially want to acknowledge the support and understanding from our families and friends. Major contributions to wolf recovery efforts were provided by Dave Skates and Laurie Connell (USFWS Lander, WY), Jim Williams (FWP, Kalispell, MT), Mark Wilson, Robyn Barkley, Brent Esmoil, and Heidi Van Duyn (USFWS/ES, Helena MT), Tom Hoffman (WS, Denver CO), Mark Collinge and Todd Grimm (WS, Idaho), Dave Renwald (Bureau of Indian Affairs), and Mike Phillips and Kyran Kunkel (TESF). Numerous agencies have contributed to the recovery program and we thank the USFS, Bridger-Teton National Forest, Shoshone National Forest, Kootenai National Forest, Flathead National Forest, Lewis and Clark National Forest, GNP, YNP, GTNP, National Elk Refuge, Lost Trail National Wildlife Refuge, U.S. Bureau of Indian Affairs, Confederated Salish-Kootenai Tribes, the Blackfeet Tribe, WYGF, FWP, and IDFG. Laboratory work was performed by the Montana FWP laboratory in Bozeman MT, the USFWS Forensics Laboratory in Ashland, OR, Matson's Laboratory in Milltown, MT, and Gary Haas of Big Sky Beetle Works in Hamilton, MT. Veterinarians providing services and advice to wolf recovery programs included Drs. Clarence Binninger, Charlene Esch, and David Hunter. We thank our legal advisors Margot Zallen and Michael Johnson, (DOI), and Kristen Gustufson, Jimmy Rodriguez, and David Gayer (DOJ) for their hard work and advice.

Portions of this report were authored by Diane Boyd, Ed Bangs, Jill Parker, Joe Fontaine, Mike Jimenez, Roger Parker, Craig Tabor, Dominic Domenici (USFWS), Mark Collinge, Todd Grimm (USDA/WS), Doug Smith, Deb Guernsey and Dan Stahler (NPS), Stewart Breck (National Wildlife Research Center), Curt Mack and Jim Holyan (NPT), Scott Creel and Robert Garrott (MSU), Carolyn Sime, Liz Bradley, Kent Laudon, and Jon Trapp (FWP), Kim Berger (Utah State University), Steve Nadeau (IDFG), Steve Moody and John Emmerich (WYGF), and Val Asher (TESF). Special thanks to Steve Carson (FWP) for preparing maps for this report, and to Jim Renne (USFWS) for producing the website.

We thank our pilots: Dave Hoerner of Red Eagle Aviation, Lowell Hanson of Piedmont Air Services, Tim Graff and Eric Waldorf of WS, Bob Hawkins and Gary Brennan of Hawkins and Powers Aviation, Roger Stradley of Gallatin Flying Service, Gary Lusk of Mountain Air Research, Jerry Hyatt and Claude Tyrrel of Sky Aviation, Pat and Mike Dorris, Rod Nielson, Glen Gemeli, Jason Reinke, and Travis Christiansen of McCall Aviation, Steve and Michelle Wolters, and Wendy Beye of North Star Aviation, Bob Danner and Dia Terese of SESS/Stanley Air, Ray Arnold of Arnold Aviation, Pete Wilson of Middle Fork Aviation, Gene Mussler of Sawtooth Flying, Leroy Brown Idaho Helicopters; Pat and Mike Dorris, Rod Nielson of McCall Aviation, Steve and Michelle Wolters, Wendy Beye of North Star Aviation, Bob Danner and Dia Terese of SESS/Stanley Air, Ray Arnold of Arnold Aviation, Leroy Brown and Jack Fulton of Idaho Helicopters, Steve and Lisa Robertson, and Doug Chapman of Montana Aircraft. Their skill and cooperation greatly contributed to wolf recovery efforts.

Amy Edmonds, Scott Emmerich, Reggie Altop, John Waller and Steve Gniadek helped monitor wolves in GNP. Volunteers in YNP included Emily Almberg, Paul Brown, Mitch Eaton, Shaney Evans, Francesco Fonseca, Chris Geremia, Tim Hudson, Daniel MacNulty, Rick McIntyre, Matt Metz, Guy Miller, Gus Mills, Kylie Paul, Derek Schlickeisen, Heather Sterling, John Sterling, Janice Stroud, Lisa Turner, Grant Weigert, Elena West, Aaron Wunderlin, Katie Yale, and Judy York. Assisting in monitoring wolves in Wyoming were Susannah Phillips, Leah Samberg, Lindsay Reynolds, and Miguel Licona. The NPT thanks Mike Schlegel for his contributions in Idaho. The IDFG especially thanks Martha Waterbury and Laurie Hanauska-Brown for their

assistance.

Many private organizations have lent their support to the program including DOW, National Fish and Wildlife Foundation, Wolf Education and Research Center, DeVlieg Foundation, Rocky Mountain Elk Foundation, Snowdon Wildlife Sanctuary, Twin Spruce Foundation, Yellowstone Park Foundation, and Plum Creek Timber Company. The efforts of many individuals who have contacted us to report wolf sightings are greatly appreciated. The dozens of ranchers and other private landowners whose property is occasionally used by wolves, sometimes at great cost to the owner, deserve our thanks and gratitude.

ROCKY MOUNTAIN WOLF PUBLICATIONS 1998-2004 (2004 publications in bold)

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Table 1a: Northwest Montana wolf recovery area: Wolf packs and population data 2004

REF.		MINIMUM ESTIMATED DOCUMENTED AND SUSPECTED RECOV PACK SIZE DEC 2004					MORTALITIES			KNOWN		CONTROL		CONFIRMED LOSSES5			
#	WOLF PACK1	AREA	STATE	ADULT	PUP	TOT	NAT	HUMAN2	UNKN3	DISPERSED	MISSING4	KILLED	MOVED	CATTLE	SHEEP	DOGS	OTHER
1	Kintla	NWMT	MT	3	2	5											
2	Murphy Lake	NWMT	MT	1	1	2					1						
3	Ninemile	NWMT	MT	2	1	3											
4	Whitefish	NWMT	MT	2	5	7		1									
5	Spotted Bear	NWMT	MT	2	3	5			1								
6	Fishtrap	NWMT	MT	3	2	5		1									
7	Candy Mtn	NWMT	MT	3	0	3											
8	Lazy Creek	NWMT	MT	3	2	5					1						
9	Hog Heaven	NWMT	MT	3	0	3	1				1						1
10	Halfway	NWMT	MT	2	0	2					1				1		
11	Wolf Prairie	NWMT	MT	2	2	4								2			
12	Red Shale*	NWMT	MT	7	0	7											
13	Fish Creek*	NWMT	MT	?	?	?		1									
14	Great Bear*	NWMT	MT	?	?	7					1						
15	Lonepine*	NWMT	MT	?	?	?						1		2			
16	Kootenai*	NWMT	M	?	?	1											
	Misc/Lone	NWMT	MT	0	0	0								2			
	Total	NWMT	MT/ID	33	18	59	1	3	1	0	5	1	0	6	1	0	1

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

2 Excludes wolves killed in control actions.

3 Does not include pups that disappeared before winter.

4 Collared wolves that ceased transmitting in 2004.

5 Includes only domestic animals confirmed killed by wolves.

* No collars; numerous reliable sightings.

Table 1b: Montana outside of NWMT recovery area (and statewide totals): Wolf packs and population data 2004

		MINIMUM ESTIMATED DOCUMENTED AND SUSPECTED																
		RECOV		PACK SIZE DEC 2004			MORTALITIES			KNOWN		CONTROL		CONFIRMED LOSSES5			
REF	WOLF PACK 1	AREA	STATE	ADULT	PUP	TOT	NATURAL	HUMAN2	UNKN3	DISPERSED	MISSING4	KILLED	MOVED	CATTLE	SHEEP	DOGS	OTHER
#	SWMT																
17	Red Rock	GYA	MT	2	?	2											
18	Freezeout	GYA	MT	7	7	14					1					3	
19	Bear Creek	GYA	MT	2	?	2											
20	Bear Trap	GYA	MT	2	1	3											
21	Lone Bear	GYA	MT	3	2	5				1		3			11		2
22	Mill Creek	GYA	MT	3	5	8		1				2		2	3		
23	Casey Lake	GYA	MT	2	3	5	1										
24	Mission Creek	GYA	MT	2	4	6		1									
25	Moccasin Lake	GYA	MT	2	3	5		1				3		2			
26	Phantom Lake	GYA	MT	1	3	4						2		9	53		
27	Red Lodge	GYA	MT	2	?	2											
28	Rose Creek II	GYA	MT	4	?	4					1						
29	Sheep Mtn	GYA	MT	0	0	0	1			1		3		4			
30	Taylor Peak	GYA	MT	0	0	0	1	1									
31	Sentinel	GYA	MT	0	0	0						6		2		1	
32	Ennis Lake	GYA	MT	0	0	0						5		4			
33	Dillon Pair	GYA	MT	2	0	2									7		
	Misc/Lone	GYA	MT	2	0	2						1		1	7		
	total in GYA (MT)	GYA	MT	36	28	64	3	4	0	2	2	25	0	24	81	4	2
	CID																
34	Sapphire	CID	MT	5	3	8											
35	Painted Rocks	CID	MT	2	4	6											
36	Battlefield	CID	MT	4	4	8						5		3			
37	Willow*	CID	MT	2	0	2		1									
38	Fox Creek*	CID	MT	0	0	0						8		2			
39	Grassy Top*	CID	MT	2	0	2											
40	Black Canyon*	CID	MT	4	0	4											
	Misc/Lone	CID	MT	0	0	0		1							9		
	total in CID (MT)	CID	MT	19	11	30	0	2	0	0	0	13	0	5	9	0	0
	NWMT (Table 1a)	NWMT	MT	33	18	59	1	3	1	0	5	1	0	6	1	0	1

MT TOTAL	ALL	MT	88	57	153	4	9	1	2	7	0	39	0	0	35	91	4	3

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

2 Excludes wolves killed in control actions.

3 Does not include pups that disappeared before winter.

4 Collared wolves that ceased transmitting in 2004.

5 Includes only domestic animals confirmed killed by wolves.

* No active radiocollars present; wolf sign repeatedly observed in area in 2004 but may not have year-end counts.

Table 2: Wyoming wolf packs and population data 2004, and totals for Greater Yellowstone Recovery Area.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED DOCUMENTED AND SUSPECTED PACK SIZE DEC 2004 ADULT	PUP	TOT	MORTALITIES NATURAL	HUMAN2	UNKN3	KNOWN DISPERSED	MISSING4	CONTROL KILLED	MOVED	CONFIRMED LOSSES 5 CATTLE	SHEEP	DOGS	OTHER
41	Druid Peak	GYA	WY	7	2	9	4			3	4						
42	Leopold	GYA	WY	12	11	23				2	2						
43	Swan Lake	GYA	WY	7	2	9	1			2	1			1			
44	Mollie's	GYA	WY	4	2	6			1								
45	Nez Perce	GYA	WY	12	2	14	2			5	2						
46	Cougar Creek	GYA	WY	7	5	12		1		3	3						
47	Yellowstone Delta	GYA	WY	15	4	19				1	3						
48	Agate Creek	GYA	WY	9	2	11				1							
49	Bechler	GYA	WY	2	2	4											
50	Geode Creek	GYA	WY	7	5	12				2							
51	Slough Creek	GYA	WY	7	8	15	2			2							
52	Specimen Ridge	GYA	WY	3	2	5	1										
53	Gibbon Meadows	GYA	WY	6	2	8		1									
54	Biscuit Basin	GYA	WY	5	6	11											
55	Hayden Valley*	GYA	WY	2	2	4											
56	Chief Joseph	GYA	WY	7	2	9		1							1		
	Misc/Lone in YNP	GYA	WY				2	8		2							
	Total in YNP	GYA	WY	112	59	171	12	11	1	23	15	0	0	1	1	0	0
57	Teton	GYA	WY	5	8	13						2		3			
58	Washakie	GYA	WY	4	3	7			1			6		8			
59	Sunlight Basin	GYA	WY	4	3	7						1		1			
60	Absaroka	GYA	WY	5	4	9						2		7			
61	Beartooth	GYA	WY	4	4	8											
62	Greybull River	GYA	WY	4	4	8								3			
63	Green River	GYA	WY	3	0	3						7		20		2	
64	Owl Creek	GYA	WY	2	2	4						3		5			1
65	Daniel	GYA	WY	4	4	8		1	3			5		13			
66	Carter Mtn	GYA	WY	1	4	5						1		4			
	Misc outside YNP	GYA	WY	17	0	17		1	1			2		10	16		1
	Total outside YNP	GYA	WY	53	36	89		2	5	0	0	29	0	74	16	2	2
	WYOMING TOTAL	GYA	WY	165	95	260	12	13	6	23	15	29	0	75	17	2	2
	MT part of GYA	GYA	MT	36	28	64	3	4	0	2	2	25	0	24	81	4	2
	ID part of GYA	GYA	ID	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	GYA total	GYA	ALL	201	123	324	15	17	6	25	0 17 0	54	0 0	100	98	6	4

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

2 Excludes wolves killed in control actions.

3 Does not include pups that disappeared before winter.

4 Collared wolves that ceased transmitting in 2004.

5 Includes only domestic animals confirmed killed by wolves.

* No collars; numerous reliable sightings.

Note: the cattle and sheep depredation by Swan Lake and Chief Joseph occurred in SW MT and are counted in the MT part of GYA.

Table 3: Idaho wolf packs and population data 2004, and totals for Central Idaho recovery area.

REF #	WOLF PACK 1	RECOV AREA	STATE	MINIMUM ESTIMATED PACK SIZE DEC 2004 ADULT	PUP	TOT	DOCUMENTED AND SUSPECTED MORTALITIES NATURAL	HUMAN2	UNKN3	KNOWN DISPERSED	MISSING4	CONTROL KILLED	MOVED	CONFIRMED LOSSES5 CATTLE	SHEEP	DOGS	OTHER
67	Bear Valley	CID	ID	5	5	10		1									
68	Bennett Mountain	CID	ID	1	0	1		3				3		6	8		
69	Big Hole	CID	ID	8	2	10											
70	Buffalo Ridge	CID	ID	5	2	7											
71	Calderwood	CID	ID	2	3	5											
72	Castle Peak	CID	ID	5	0	5			1		1			1			
73	Chamberlain Basin	CID	ID	?	?	?											
74	Chesimia	CID	ID	2	4	6								2			
75	Cold Springs	CID	ID	2	4	6											
76	Cook	CID	ID	0	0	0		9				9			85		
77	Coolwater Ridge	CID	ID	2	3	5											
78	Copper Basin	CID	ID	7	2	9								4			
79	Eagle Mountain	CID	ID	4	3	7											
80	Eldorado	CID	ID	?	?	?											
81	Five Lakes Butte	CID	ID	7	3	10											
82	Florence	CID	ID	8	7	15		1							4		
83	Galena	CID	ID	6	3	9		1								1	
84	Gold Fork	CID	ID	2	3	5									6		
85	Golden Creek	CID	ID	5	2	7											
86	Gospel Hump	CID	ID	1	4	5		1									
87	Hazard Lake	CID	ID	4	3	7		3			1	3			6	2	
88	Hemlock Ridge	CID	ID	5	3	8											
89	Jureano Mountain	CID	ID	5	3	8				1				1			
90	Kelly Creek	CID	ID	2	2	4			1								
91	Landmark	CID	ID	?	?	?											
92	Lupine	CID	ID/MT	?	?	?			1								
93	Magruder	CID	ID	5	5	10					1						
94	Marble Mountain	CID	ID	2	2	4											
95	Monumental	CID	ID	3	3	6											
96	Morgan Creek	CID	ID	9	2	11				1							
97	Moyer Basin	CID	ID	6	3	9		1						1			
98	O'Hara Point	CID	ID	2	4	6			1	1							
99	Orphan	CID	ID	3	4	7		1			1						

100	Packer John	CID	ID	2	5	7													
101	Partridge Creek	CID	ID	2	6	8		3		1		1		2				31	
102	Red River	CID	ID	3	0	3		1	1			1							
103	Scott Mountain	CID	ID	4	4	8		1		1		1							
104	Selway	CID	ID	1	0	1			1										
105	Soldier Mountain	CID	ID	4	5	9													
106	Steel Mountain	CID	ID	10	3	13												4	
107	Thunder Mountain	CID	ID	?	?	?													
108	Timberline	CID	ID	2	1	3		1											
109	Twin Peaks	CID	ID	2	1	3													
110	Warm Springs	CID	ID	3	3	6													
	Misc./Lone	CID	ID	8	0	8		1									1	10	
	Unknown wolves6	CID	ID	151		151		4		1							1	7	
	IDAHO TOTAL	ALL	ID	310	112	422	0	32	6	6		7	0	17	0	0	17	161	3	0

	ID part of GYA																1			
	MT part of CID	CID	MT	19	11	30	0	2	0	0		0		13	0		5	9	0	0
	CID total	CID	ID/MT	329	123	452	0	34	6	6	0	7	0	30	0	0	23	170	3	0

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

2 Excludes wolves killed in control actions.

3 Does not include pups that disappeared before winter.

4 Collared wolves that ceased transmitting in 2004.

5 Includes only domestic animals confirmed killed by wolves.

6 See text page 27

Table 4a: Northern Rocky Mountain minimum fall wolf population and breeding pairs* 1979-2004, by recovery area

Minimum fall wolf population by recovery area:

Year	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04
Recovery Area																										
NWMT	2	1	2	8	6	6	13	15	10	14	12	33	29	41	55	48	66	70	56	49	63	64	84	108	92	59
GYA																	21	40	86	112	118	177	218	271	301	324
CID																	14	42	71	114	156	196	261	284	368	452
TOTAL	2	1	2	8	6	6	13	15	10	14	12	33	29	41	55	48	101	152	213	275	337	437	563	663	761	835

Breeding pairs by recovery area:

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

* 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 totals, so breeding pairs in previous annual reports are updated in current annual reports.

Table 4b: Northern Rocky Mountain minimum fall wolf population and breeding pairs* 1979-2004, by state

Minimum fall wolf population by state:

Year	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04
State																										
MT	2	1	2	8	6	6	13	15	10	14	12	33	29	41	55	48	66	70	56	49	74	97	123	183	182	153
WY																	21	40	86	112	107	153	189	217	234	260
ID																	14	42	71	114	156	187	251	263	345	422
TOTAL	2	1	2	8	6	6	13	15	10	14	12	33	29	41	55	48	101	152	213	275	337	437	563	663	761	835

Breeding pairs by state:

Year	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04
State																										
MT								1	2	1	1	3	2	4	4	5	6	7	5	5	7	8	7	17	10	15
WY																	2	4	9	6	7	12	13	18	16	24
ID																		3	6	10	10	10	14	14	25	27
TOTAL								1	2	1	1	3	2	4	4	5	8	14	20	21	24	30	34	49	51	66

* 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 totals, so breeding pairs in previous annual reports are updated in current annual reports.

Table 5a: Northern Rocky Mountain States confirmed wolf depredation1 and wolf management, 1987-2004 by recovery area.

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	TOTAL
Northwest Montana Recovery Area:																			
cattle	6	0	3	5	2	1	0	6	3	9	16	9	13	10	8	9	6	6	112
sheep	10	0	0	0	2	0	0	0	0	0	30	0	19	2	5	13	3	1	85
other 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	1	10
dogs	0	0	0	1	0	0	0	0	3	1	0	0	2	3	1	4	0	0	15
wolves moved	0	0	4	0	3	0	0	2	2	10	7	0	4	0	5	0	0	0	37
wolves killed	4	0	1	1	0	0	0	0	0	4	14	4	9	4	3	9	14	1	68
Greater Yellowstone Recovery Area:																			
cattle									0	0	5	3	4	7	22	33	45	100	219
sheep									0	13	67	7	13	39	117	71	90	99	516
other 3									0	0	0	0	1	0	0	0	10	4	15
dogs									1	0	0	4	7	8	4	1	0	6	31
wolves moved									6	8	14	0	0	6	8	0	0	0	42
wolves killed									0	1	6	3	9	6	9	23	38	54	149
Central Idaho Recovery Area:																			
cattle									0	2	1	9	16	15	10	10	13	22	98
sheep									0	24	29	5	57	39	16	15	118	170	473
other 3									0	0	0	0	0	0	0	0	0	0	0
dogs									0	1	4	1	6	0	1	4	6	3	26
wolves moved									0	5	0	3	15	10	5	0	0	0	38
wolves killed									0	1	1	0	5	10	7	14	7	30	75
Total, 3 Recovery Areas:																			
cattle	6	0	3	5	2	1	0	6	3	11	22	21	33	32	40	52	64	128	429
sheep	10	0	0	0	2	0	0	0	0	37	126	12	89	80	138	99	211	270	1074
other 3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	5	10	5	25
dogs	0	0	0	1	0	0	0	0	4	2	4	5	15	11	6	9	6	9	72
wolves moved	0	0	4	0	3	0	0	2	8	23	21	3	19	16	18	0	0	0	117
wolves killed2	4	0	1	1	0	0	0	0	0	6	21	7	23	20	19	46	59	85	292

1 Numbers of animals confirmed killed by wolves in calendar year.
2 Includes wolves legally shot by ranchers. Others killed in government control efforts.
3 Total livestock other than cattle and sheep confirmed killed by wolves between 1987 and 2004 are 9 llamas, 12 goats and 4 horses.

Since 1987, Defenders of Wildlife has made compensation payments totalling more than $395,000 for wolf damage to livestock and guard dogs. Information on the compensation program is available at http://www.defenders.org/wolfcomp.html

Table 5b: Northern Rocky Mountain confirmed wolf depredation1 and wolf management, 1987-2004 (by state)

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	TOTAL
Montana																			
cattle	6	0	3	5	2	1	0	6	3	10	19	10	20	14	12	20	24	35	190
sheep	10	0	0	0	2	0	0	0	0	13	41	0	25	7	50	84	86	91	409
other 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	3	12
dogs	0	0	0	1	0	0	0	0	4	1	0	1	2	5	2	5	1	4	26
wolves moved	0	0	4	0	3	0	0	2	8	22	20	0	14	6	17	0	0	0	96
wolves killed	4	0	1	1	0	0	0	0	0	5	18	4	19	7	8	26	34	39	166
Wyoming																			
cattle									0	0	2	2	2	3	18	23	34	75	159
sheep									0	0	56	7	0	25	34	0	7	18	147
other 3									0	0	0	0	1	0	0	0	10	2	13
dogs									0	0	0	3	6	6	2	0	0	2	19
wolves moved									0	0	1	0	0	0	0	0	0	0	1
wolves killed									0	0	2	3	1	2	4	6	18	29	65
Idaho																			
cattle									0	1	1	9	11	15	10	9	6	18	80
sheep									0	24	29	5	64	48	54	15	118	161	518
other 3									0	0	0	0	0	0	0	0	0	0	0
dogs									0	1	4	1	7	0	2	4	5	3	27
wolves moved									0	1	0	3	5	10	1	0	0	0	20
wolves killed									0	1	1	0	3	11	7	14	7	17	61
Total, 3 States																			
cattle	6	0	3	5	2	1	0	6	3	11	22	21	33	32	40	52	64	128	429
sheep	10	0	0	0	2	0	0	0	0	37	126	12	89	80	138	99	211	270	1074
other 3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	5	10	5	25
dogs	0	0	0	1	0	0	0	0	4	2	4	5	15	11	6	9	6	9	72
wolves moved	0	0	4	0	3	0	0	2	8	23	21	3	19	16	18	0	0	0	117
wolves killed2	4	0	1	1	0	0	0	0	0	6	21	7	23	20	19	46	59	85	292

1 Numbers of animals confirmed killed by wolves in calendar year.
2 Includes wolves legally shot by ranchers. Others killed in government control efforts.
3 Total livestock other than cattle and sheep confirmed killed by wolves between 1987 and 2004 are 9 llamas, 12 goats and 4 horses.

Since 1987, Defenders of Wildlife has made compensation payments totalling more than $395,000 for wolf damage to livestock and guard dogs. Information on the compensation program is available at http://www.defenders.org/wolfcomp.html

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

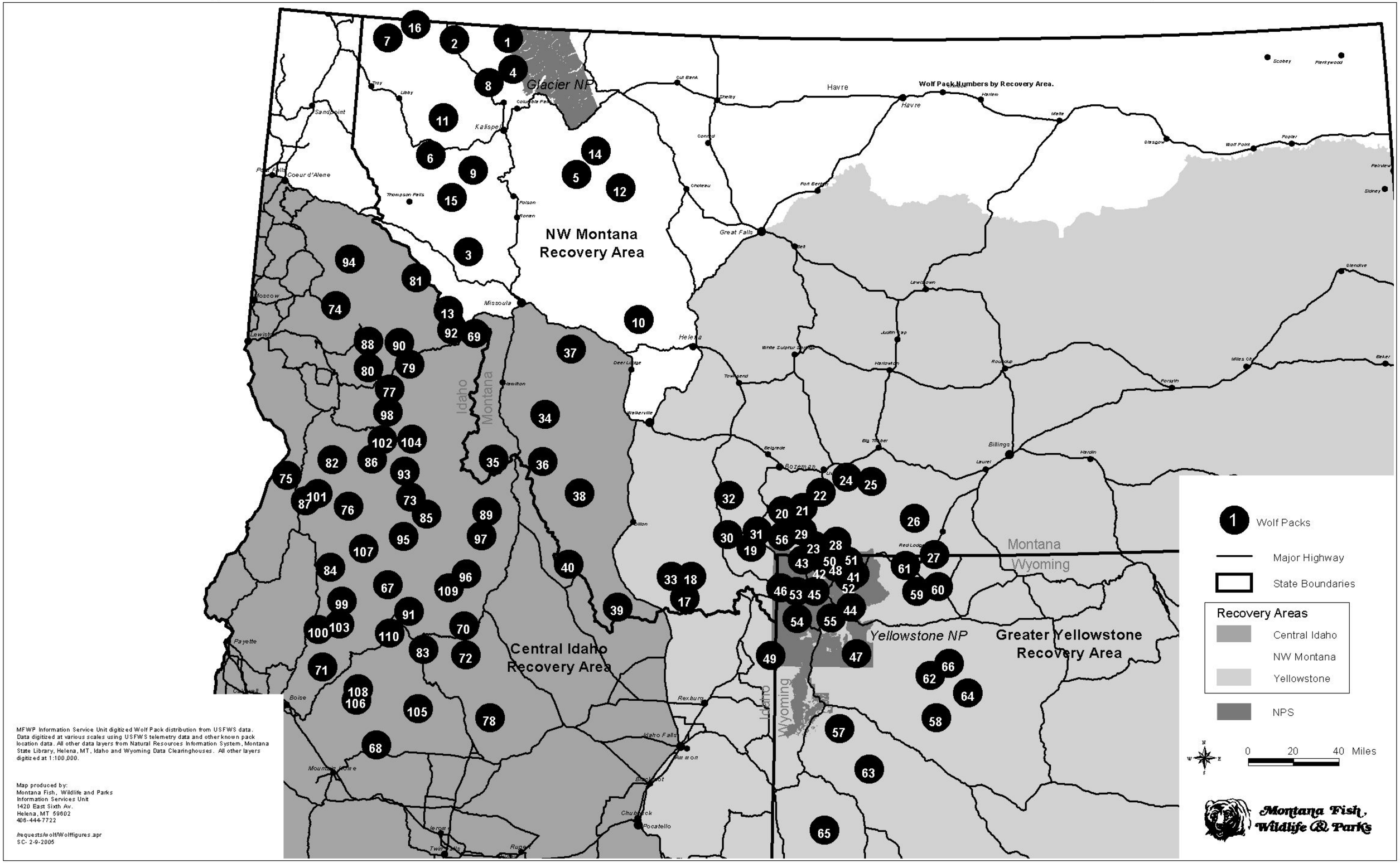
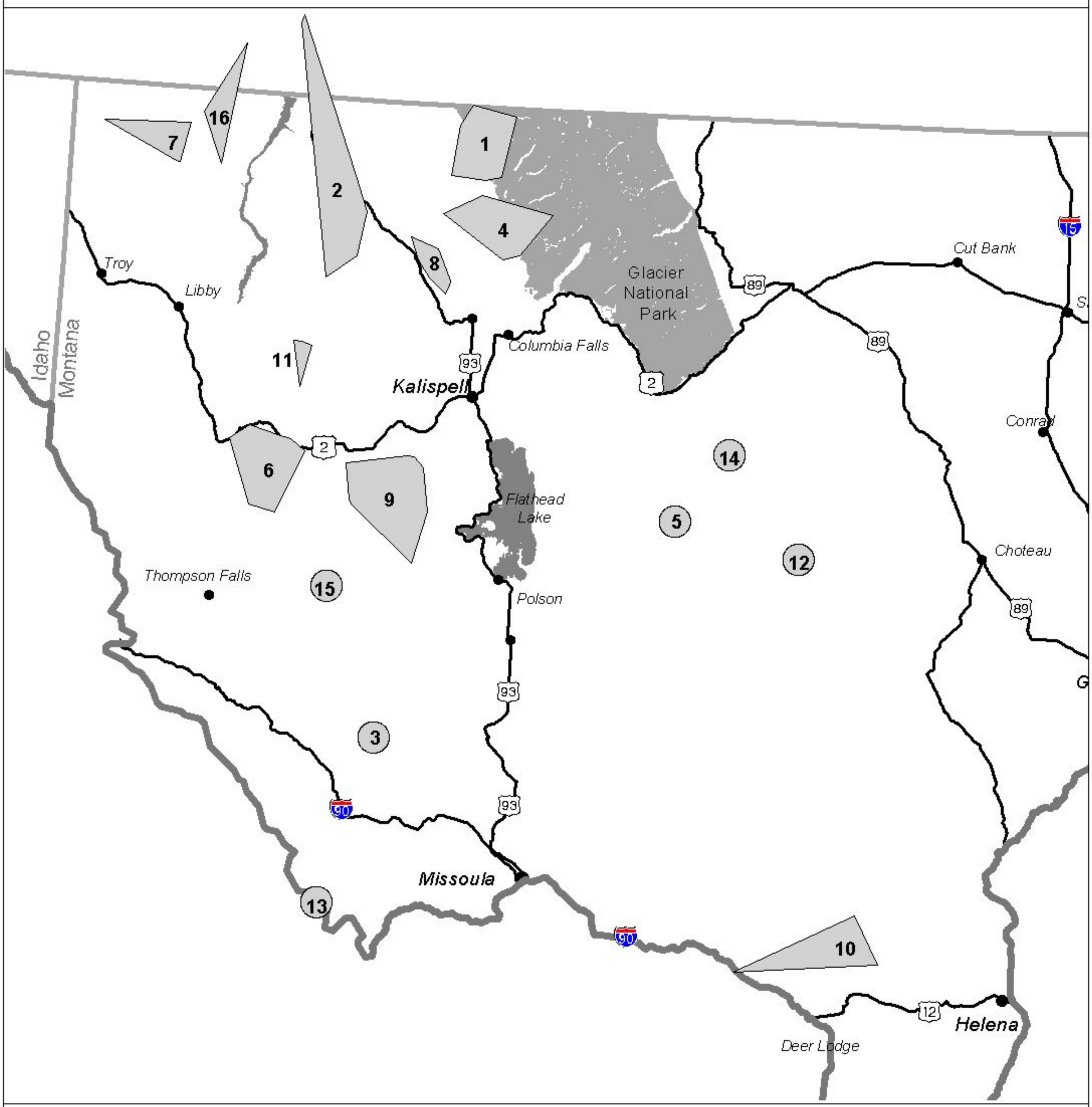


Figure 2. NW Montana Wolf Recovery Area



MFWP Information Service Unit digitized Wolf Pack distribution from USFWS data. Data digitized at various scales using USFWS telemetry data and other known pack location data. All other data layers from Natural Resources Information System, Montana State Library, Helena, MT, Idaho and Wyoming Data Clearinghouses. All other layers digitized at 1:100,000.

Wolf Pack Distribution
Wolf Recovery Area Boundary
State Boundary

N W E S

0 10 20 Miles

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Montana Fish, Wildlife and Parks
Information Services Unit
1420 East Sixth Av.
Helena, MT 59602
406-444-7722

/requests/wolf/WolfFigures.apr
SC- 2-8-05

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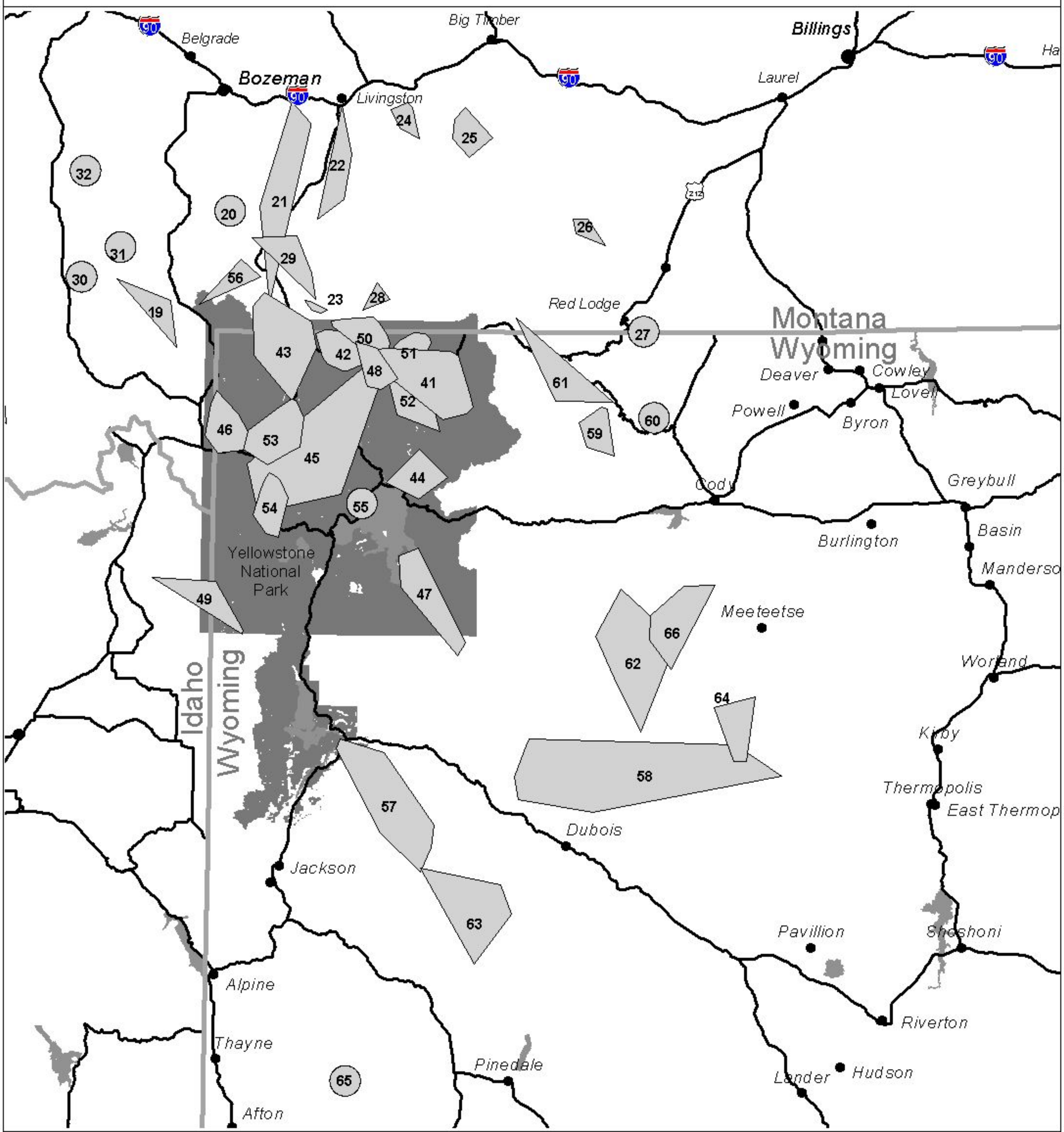
Figure 3. Greater Yellowstone Wolf Recovery Area



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Wolf Pack Distribution
Wolf Recovery Area Boundary
State Boundary

N
W E
S

0 6 12 Miles

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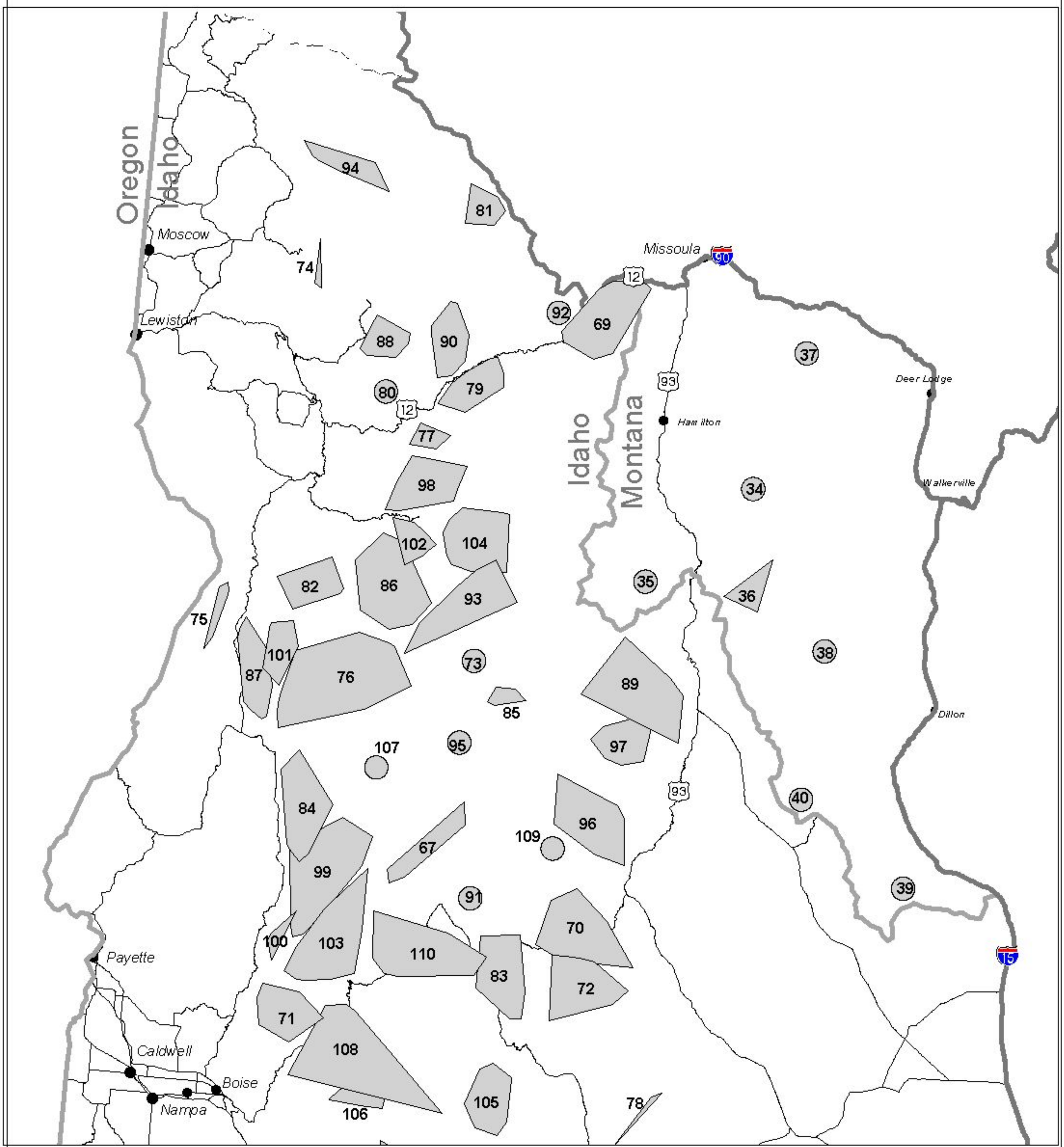
Figure 4. Central Idaho Wolf Recovery Area



MFWP Information Service Unit digitized Wolf Pack distribution from USFWS data. Data digitized at various scales using USFWS telemetry data and other known pack location data. All other data layers from Natural Resources Information System, Montana State Library, Helena, MT, Idaho and Wyoming Data Clearinghouses. All other layers digitized at 1:100,000.

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N
W E
S

0 10 20 Miles

Wolf Pack Distribution
Wolf Recovery Area Boundary
State Boundary

Montana Fish, Wildlife & Parks

Figure 5. Northern Rocky Mountain Wolf Population Trends 1979-2004, by Recovery Area

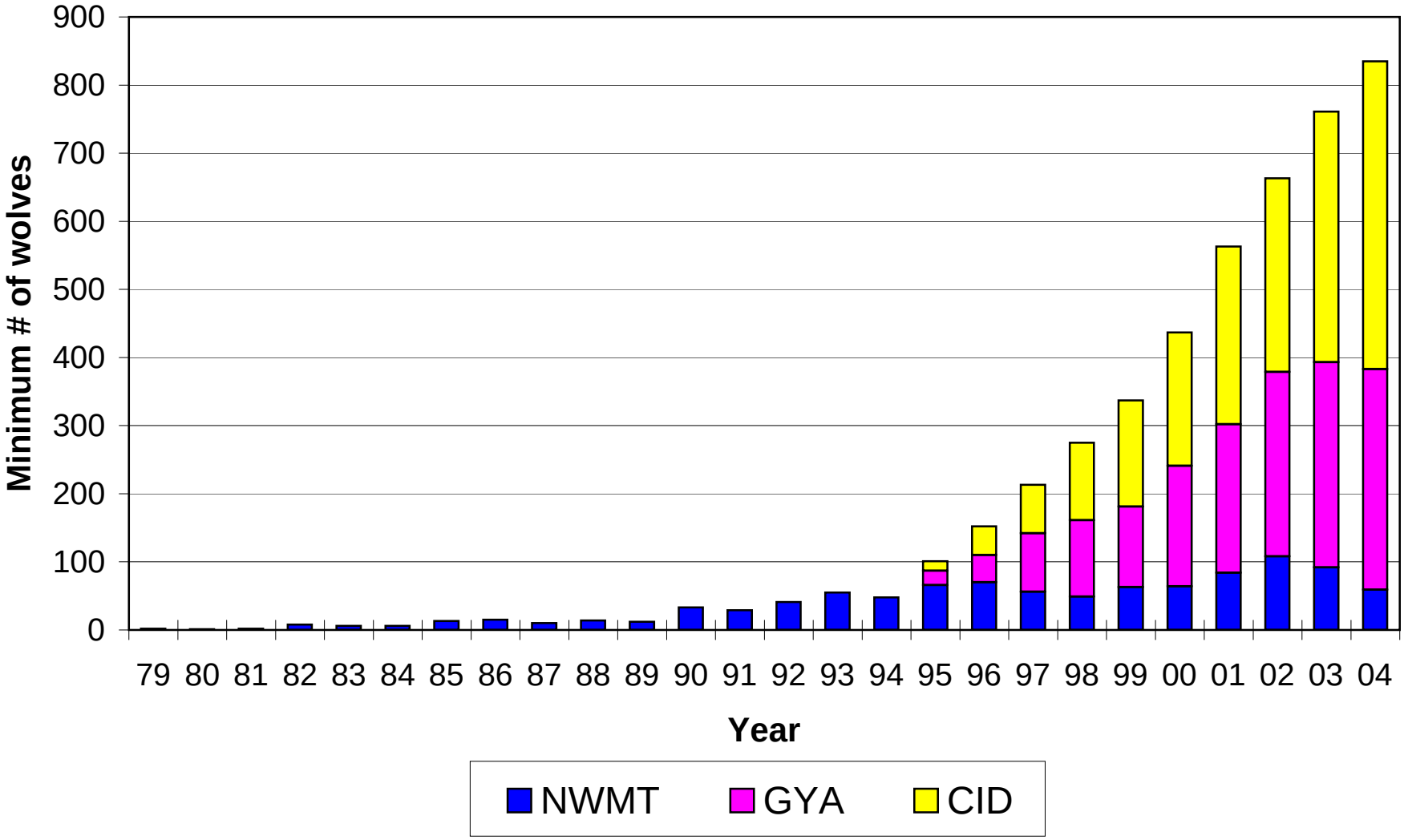
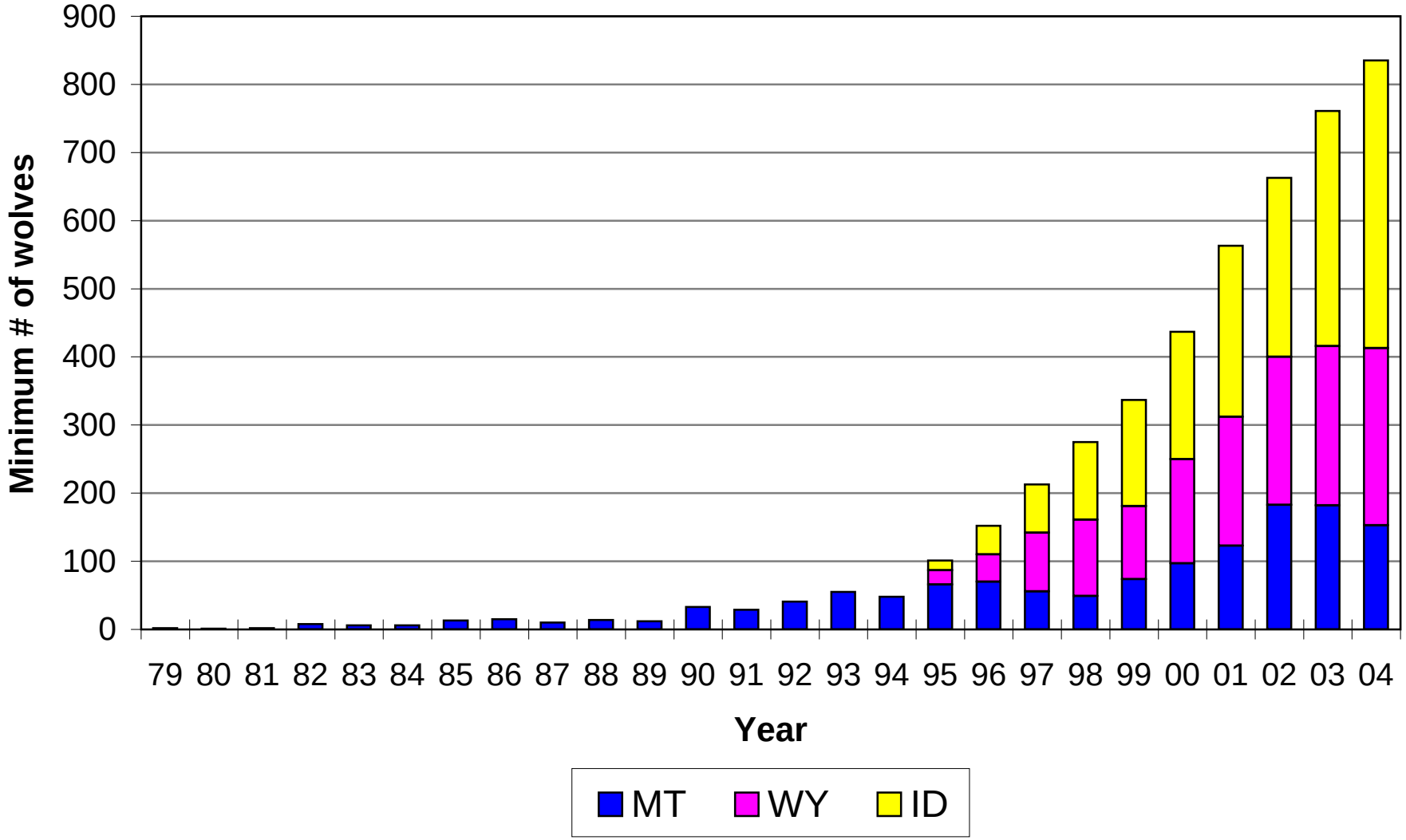
Figure 6. Northern Rocky Mountain Wolf Population Trends 1979-2004, by State