

IDAHO WOLF RECOVERY PROGRAM

RESTORATION AND MANAGEMENT OF GRAY WOLVES
IN CENTRAL IDAHO

THREE YEAR
PROGRESS REPORT

1999 - 2001

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EXECUTIVE SUMMARY

The U.S. Fish and Wildlife Service is restoring endangered gray wolves to the northern Rocky Mountains including ongoing efforts in three restoration areas: northwest Montana, the greater Yellowstone area, and central Idaho. Gray wolves are naturally recolonizing northwest Montana and are listed as fully endangered under the Endangered Species Act (ESA). Nonessential experimental population areas were established for central Idaho and the greater Yellowstone area where wolves were actively reintroduced as nonessential experimental populations under the ESA. This special designation allows for management flexibility to address public concerns such as wolf-livestock conflicts.

At the end of 2001, the Central Idaho Experimental Population Area (CIEPA) was home to an estimated 261 wolves including 17 known wolf packs. Sixteen of those produced litters in 2001, 14 of which met the recovery requirement for a breeding pair - an adult male and an adult female wolf that have successfully raised at least 2 pups to December 31 of their birth year. The recovery goal for wolf restoration in the northern Rocky Mountains is to maintain 30 breeding pairs equitably distributed across the 3 restoration areas for 3 years. The Northern Rocky Mountain Restoration Region (NRMRR) has maintained 30 breeding pairs in 2000 and 2001. If current trends continue, wolves in the NRMRR could reach recovery levels in December of 2002.

Wolves were well distributed across 22,759 square miles (58,945 square km) of central Idaho by the end of 2001. Territories of all known packs and pairs were completely or predominately within National Forest lands, eight of which included federally designated wilderness areas.

The Idaho wolf population continued to expand from 1999 to 2001, the three year period covered by this report. Ten new packs were documented and a minimum of 214 wolf pups (71.3 per year) was produced. Estimated minimum average litter size was 4.9 pups per litter.

Wolf dispersal was documented within and between the NRMRR indicating interchange between recovering wolf populations. Between 1999 and 2001, 21 radio-collared wolves dispersed from their natal territories in the CIEPA. Five of these dispersed across restoration area boundaries.

Documented wolf mortalities during 1999-2001 increased over previous years, primarily as a result of increased agency lethal control of wolves. Of 56 wolf mortalities documented during this time period 21 (38%) were lethally controlled by wolf recovery agencies in response to conflicts with livestock.

Capture and radio-collaring wolves remains a project priority. During 1999-2001, 77 (25.7 per year) were captured. Although additional wolves are captured every year, the proportion of radio-collared individuals in the population decreases with expanding numbers of wolves, increasing the challenge of documenting new packs.

Thirteen wolf pack territories overlapped livestock grazing allotments during 1999-2001. Confirmed wolf-caused livestock losses during this period accounted for 41 cattle (13.7 per year) and 150 sheep (50.0 per year). As a result of agency control actions 21 wolves were lethally controlled and 20 relocated.

Continued conflicts between wolves and livestock and perceived effects of wolves on big game populations remain key management issues challenging the Idaho Wolf Recovery Program (Recovery Program). In response, the Recovery Program continues participation in on-going research addressing these challenges. Scientific information collected through these efforts will foster a better understanding of wolf-livestock and wolf-big game relationships, and effective wolf conservation and management.

As the wolf population increases and expands its range, the Recovery Program will continue to address the interests of livestock producers, outfitters and guides, outdoor recreationists, wolf supporters, and other interested or affected publics. With the prospect of recovery and delisting on the horizon, it is important that the Recovery Program maintains and enhances its working relationships with federal, state, and local governments; livestock associations; sportsmen's groups; and the environmental community. Ultimately, wolf recovery will be determined by Idahoans' willingness to allow wolves to remain a part of the state's diverse fauna.

ACKNOWLEDGMENTS

The U.S. Fish and Wildlife Service (USFWS) provided principal funding for the Idaho Wolf Recovery Program (Recovery Program). In addition, we gratefully acknowledge the Bureau of Indian Affairs, the Defenders of Wildlife, the Idaho Cattle Association, Lemhi County Horse and Cattle Growers' Association, the National Fish and Wildlife Foundation, the National Wildlife Federation, the U.S. Forest Service, the Wolf Education and Research Center, and all of the many individuals who generously contributed financial support.

Effective coordination and willing assistance at all levels has been paramount to the success of the Recovery Program. We commend this spirit of cooperation among all involved agencies and organizations. We acknowledge the leadership, guidance, and policy direction provided by the Nez Perce Tribal Executive Committee and Wildlife Program Director Keith Lawrence of the Nez Perce Tribe; and Robert Ruesink, Roy Heberger, Carter Niemeyer, Ed Bangs, and participating staff of the USFWS. The cooperation and assistance received from Mark Collinge, George Graves, all of the district supervisors, and dedicated field agents for USDA Wildlife Services has resulted in a constructive working relationship and an effective wolf control program in Idaho. We extend a special thanks to Wildlife Service's Rick Williamson and Jeff Ashmead, who continually go above and beyond the call of duty. In addition to funding assistance, the U.S. Forest Service generously provided housing, office support, information, forest access, and field equipment. We are especially grateful to Bill LeVere and Deb Cooper of the Sawtooth National Forest; and Becky Nourse, Bob Gill, and the rest of the Stanley Ranger Station staff. Our appreciation to George Matejko, Terry Hershey, Dick Wenger, Gary Mills, Judy Ulvestad, and the Salmon Ranger District staff. The USFWS Law Enforcement have been crucial to recovery efforts. We would like to recognize Senior Agents Rich McDonald and Craig Taber; Special Agents Rick Branzell, Steve Magone, and Paul Weyland; and the staff at the USFWS National Fish and Wildlife Forensics Lab for their assistance.

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We are indebted for the services and dedication of Recovery Program Veterinarian Dr. Clarence Binninger and local veterinarian Dr. Kelly Chamberlain. We give special recognition to Holly and Jim Akenson, Hank Fisher, the Griswold family, Suzanne Laverty, Gary Power, and Mitch Silvers for the help and cooperation that they have provided. We would also like to recognize the contributions of Linda and Doug Holden, along with the Board of Directors of Snowdon Wildlife Sanctuary for their support of recovery efforts by housing and caring for wolves in captivity.

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Finally, we acknowledge the contributions of all those who live close to wolves and whose lives are most affected by them. Wolf recovery could not proceed without the continued patience and tolerance afforded wolves by the Idaho public.

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INTRODUCTION

Gray wolves (*Canis lupus*) were distributed throughout North America prior to the arrival of European settlers. As civilization moved westward wolves were systematically eliminated because they were seen as destructive predators of big game and livestock. By the 1930's only Minnesota retained a viable wolf population.

Wolves gained endangered status in 1974 with their listing under the Endangered Species Act (ESA). In 1987 the U. S. Fish and Wildlife Service (USFWS) completed the revised Northern Rocky Mountain Wolf Recovery Plan. Four years later Congress instigated the Environmental Impact Statement (EIS) process for wolf reintroductions into Yellowstone National Park and central Idaho. Extensive public input showed overwhelming support for wolf recovery, and the Secretary of Interior approved the Final EIS, making reintroductions a reality. In 1995 and 1996, 66 wolves were captured in Alberta and British Columbia, Canada; 35 were released in central Idaho, and 31 were reintroduced into Yellowstone National Park.

The ultimate goal of the northern Rocky Mountain wolf restoration effort is to establish self-sustaining populations on gray wolves and remove the gray wolf from the Endangered Species List. The numeric recovery goal for the Northern Rocky Mountain Restoration Region (NRMRR) is to maintain 30 breeding pairs equitably distributed across the 3 restoration areas of northwest Montana, greater Yellowstone, and central Idaho for 3 years. The Final EIS designated nonessential experimental population areas for the greater Yellowstone and central Idaho restoration areas (Figure 1), in which all wolves (released and naturally occurring) were classified as nonessential experimental animals. The USFWS developed a Final Rule that governs how wolves are managed within the nonessential experimental population areas. This Rule allows for management flexibility to meet public concerns and minimize conflicts regarding the presence of wolves, including effects on wild ungulate populations and livestock.

The USFWS, the Nez Perce Tribe (Tribe), and USDA Wildlife Services (Wildlife Services) comprise the Idaho Wolf Recovery Program (Recovery Program) sharing legal responsibility for recovering wolves in Idaho. The Recovery Program has adopted a collaborative approach working closely with other government and private entities to balance the biological needs of wolves with the social concerns of Idahoans.

THE CENTRAL IDAHO RESTORATION AREA

Central Idaho, vast, mountainous, and remote, is one of the largest remaining undeveloped blocks of public land in the conterminous United States. The Central Idaho Restoration Area covers all of central Idaho, and a small portion along the eastern slope of the Bitterroot Divide in Montana. The Central Idaho Restoration Area encompasses over 13 million acres (over 5.2 million ha) of contiguous National Forest lands administered by 9 different National Forests in Idaho and northwest Montana. These include all or parts of the Bitterroot, Boise, Clearwater,

Lolo, Nez Perce, Panhandle, Payette, Salmon, Challis, and Sawtooth National Forests. The core of the Central Idaho Restoration Area includes 3 contiguous wilderness areas, the Selway-Bitterroot, Frank Church-River of No Return, and Gospel Hump, encompassing almost 4 million acres (1.6 million ha).

Three major mountain ranges (Salmon River, Clearwater, and Bitterroot) and 2 large river systems (Salmon and Clearwater) define the landscape. Most of central Idaho is characterized by deeply incised river canyons and abrupt mountain ranges. The terrain is steep and rugged with extreme elevational gradients. Elevations range from about 1,500 feet (457 m) at the bottom of the deepest river canyons to just over 12,000 feet (3,657 m) along the crest of the highest mountains. Annual precipitation varies from less than 8 inches (20 cm) at lower elevations to nearly 100 inches (254 cm) at higher elevations. Central Idaho is also influenced by a climatic gradient, with moister maritime climates supporting western red cedar (*Thuja plicata*)-western hemlock (*Tsuga heterophylla*) habitat types in the Clearwater drainage to the north, grading into dryer continental climates supporting Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) habitat types in the Salmon River drainage to the south.

Because of the combination of extreme elevational gradients, complex topography, and variable climate, the Central Idaho Restoration Area supports a diversity of habitats and wildlife species. Approximately 400 species of mammals, birds, amphibians, and reptiles inhabit the region. Common ungulates include elk (*Cervus elaphus*), white-tailed (*Odocoileus virginianus*) and mule deer (*O. hemionus*), moose (*Alces alces*), mountain goats (*Oreamnos americana*), and bighorn sheep (*Ovis canadensis*). Mountain lions (*Felis concolor*), bobcats (*Lynx rufus*), black bears (*Ursus americanus*), coyotes (*Canis latrans*), and marten (*Martes americana*) are common terrestrial predators. Central Idaho also supports populations of rare forest carnivores including lynx (*Lynx lynx*), fisher (*Martes pennanti*), and wolverine (*Gulo gulo*).

Central Idaho is encompassed within a 10-county area and is sparsely populated, with an average population density of about 3 people per square mile (2.59 square km). Nearly 80% of the land base is public land. Primary land uses include grazing, logging, mining, and recreation. Over 380,000 cattle and 100,000 domestic sheep winter on approximately 3.4 million acres (1.3 million ha) of private land surrounding public lands. Over 80,000 cattle and 220,000 sheep summer on approximately 4.4 million acres (1.7 million ha) of public allotments distributed along the edges of the southern half of the Central Idaho Restoration Area.

STATUS OF IDAHO WOLVES

The Idaho wolf population has continued to grow since initial reintroductions (Figure 2). Minimum fall population estimates have increased annually from the original 35 translocated wolves to 261 wolves in 17 documented packs well distributed across central Idaho (Table 1). In general, pup production has increased annually, as has overall wolf mortality. Pack sizes seemed stable, balanced by the addition of new pups every spring, subadult dispersal, and mortality.

The NRMRR supported a minimum of 30 breeding pairs in 2000 and 2001. If current trends continue, recovery levels could be attained in December 2002.

Distribution

Wolves were well distributed throughout 22,759 square miles (58,945 square km) of the Central Idaho Experimental Population Area (CIEPA; Figure 3). Marble Mountain, the northern-most documented pack, maintained a territory within the St. Joe River drainage, while Big Smoky, the southern-most documented pack, established a home range north of Fairfield, Idaho. Home ranges of all established packs were predominately or wholly within National Forest lands within the Central Idaho Restoration Area. Eight Idaho packs (Big Hole, Chamberlain Basin, Gospel Hump, Landmark, Selway, Thunder Mountain, Twin Peaks, and Wolf Fang) used significant portions of federally designated wilderness areas (Wilderness Areas).

Pack Formation and Reproduction

Since initial releases in 1995 and 1996, the wolf population has continued to grow in number and expand in range with the formation of new packs (Table 1). Ten new packs were documented during 1999-2001. As the proportion of radio-collared wolves in the population decreases (see *Capture and Collaring*), it will be more difficult to document the formation of new packs. Most first year packs discovered had at least 1 radio-collared member. Remaining instances involved uncollared wolves depredate on livestock, which allowed biologists to target those areas to verify new packs.

A minimum of 214 wolf pups was produced during 1999-2001 for a minimum mean litter size of 4.9 pups. In 2001, 16 litters were documented including a minimum of 82 pups, and 14 breeding pairs. A Breeding Pair is defined as an adult male and an adult female wolf that have successfully raised at least 2 pups to December 31 of their birth year. Two packs that produced pups in 2001 failed to meet the requirements of a breeding pair. The Orphan pack produced only one pup, and the alpha male of the Twin Peaks pack died.

Numbers of pups produced increased through 2001 (Table 2). Most packs reproduced annually. Minimum annual pup production ranged from 11 in 1996, the first year of documented reproduction, to 82 in 2001. Litter sizes ranged from 1 to 9 pups. Average minimum litter sizes of known packs ranged from 3.7 in 1996 (3 litters) to 5.7 in 1999 (12 litters), with a 6-year average of 4.9 pups per litter. These were conservative estimates because some pup mortality likely occurred prior to counts and some counts were incomplete. The Chamberlain Basin pack produced two litters in 2000. The Chamberlain Basin pack has been the only pack documented to have produced more than a single litter per year since 1995.

Dispersal

Movements of wolves between restoration areas are important from a genetic standpoint, and emphasize the importance of examining the entire NRMRR as an interconnected ecosystem.

In the CIEPA, 21 radio-collared wolves dispersed from their natal territories during 1999-2001 (Figure 4). Twelve were males and 9 were females. Of these dispersers, 14 were between the

ages of 18 and 30 months (wolves reach sexual maturity at 22 months of age). Four were over 30 months and 3 were younger than 18 months.

Dispersal movements ranged from short distances where dispersing wolves established territories adjacent to their natal pack territories, to long distances where dispersers moved entirely across the CIEPA, or even out of it. Perhaps most notable was B45, an 18-month-old female, which dispersed over 245 miles (393 km) and ultimately settled around John Day, Oregon. She was the first wolf documented to disperse outside of the NRMRR. At least two additional wolves from Idaho made dispersal movements outside of the NRMRR. In the spring of 2000, a dispersing 2-year-old male was killed while crossing Interstate 84 near Baker, Oregon. In addition, an uncollared wolf was recovered dead in Oregon. These dispersal movements exemplify the potential for wolves to recolonize areas outside of the Restoration Area.

As the wolf population continues to increase, dispersing wolves will settle into new areas. Many of these areas will be in less acceptable habitat, socially and politically. In such places, increased conflict with humans can be expected.

Emigration and immigration of wolves has taken place within the CIEPA. Six naturally immigrating wolves were documented, 2 from the greater Yellowstone area and 4 from northwest Montana. In addition, 6 naturally emigrating wolves were documented, 3 to northwest Montana and 3 to Oregon.

Mortality

Although known wolf mortalities generally increased each year since 1995, known mortality rate remained fairly low, between 3 and 11% of the yearly estimated population size (Table 3). Documented wolf mortalities during 1999-2001 increased over previous years, primarily as a result of increased lethal control of wolves. Of 56 wolf mortalities documented during this time period 21 (38%) were lethally controlled.

Of the 35 wolves originally released in 1995 and 1996, 8 (23%) are known to be alive and the fates of 9 (26%) were unknown. Since 1995, 71 mortalities were documented and 6 suspected. The predominant known cause of death for documented mortalities was related to human factors ($n=49$; 89%) including lethal control, ($n=22$; 45%), illegal take ($n=16$; 33%), other causes ($n=9$; 18%), and legal take ($n=2$; 4%). Percentage estimates for illegal take are undoubtedly underestimated in comparison to lethal control because not all incidences of illegal take are documented. Causes of natural mortality ($n=6$, 11%) were starvation, intraspecific strife, drowning, mountain lion predation, and head injuries inflicted by an ungulate. The cause of death for 16 (23%) wolves was unknown. Considering known and suspected mortalities, more deaths were documented among males ($n=31$) than females ($n=24$). The sex of 22 wolves was not ascertained at the time of their deaths. The decline in known wolf mortalities in 2001 was predominantly attributed to decreased lethal control and illegal take. As the wolf population expands, conflicts with livestock may escalate, leading to increased wolf mortality through lethal control. This situation emphasizes the importance of continuing information, education, and outreach efforts.

WOLF MANAGEMENT

Capture and Collaring

Radio-collaring wolves remains a key priority. The Recovery Program strives to maintain radio-contact with each documented pack. In addition, efforts are made to radio-collar members of uncollared packs. Maintaining radio-collars on wolves is crucial to determine population status, maintain effective wolf management, and achievement of recovery goals. During 1999-2001, 77 (25.7 per year) wolves were captured. At the end of 2001, 54 radio-collared wolves were being monitored, approximately 20% of the estimated population.

Wolf capture is accomplished through trapping and helicopter darting. During the spring and summer, field crews concentrate on trapping efforts. Helicopter darting is used during winter months when adequate snow pack enhances detection of wolves and hinders wolf mobility.

Spring and summer trapping consistently produced wolf captures, however required substantial time and effort. A successful trap line typically required a minimum 7-day effort. In addition, rugged terrain and limited access increased logistical challenges. In USDA Forest Service Wilderness areas and regions of thick timber trapping was the only option. Full-scale trapping efforts began in 1998. Trapping averaged 24 wolf captures per year between 1998 and 1999, but dropped to 14.5 captures per year between 2000 and 2001 (Table 4). The decline in annual captures can be attributed to decreased trapping efforts per pack resulting from increasing project workloads, expanding wolf numbers, and greater efforts documenting uncollared packs.

Relative to ground trapping, in some situations, helicopter darting can be a more productive and selective means of capturing multiple wolves. Helicopter operations captured more wolves in a shorter period and allowed specific individuals, such as alpha wolves, to be targeted. In the CIEPA, helicopter darting was an excellent tool where wolves occupied open terrain, however, was infeasible where thick timber and or very steep terrain provided escape cover for wolves and posed safety concerns for helicopter operations. Access restrictions prohibited helicopter operations within Wilderness Areas. Increased funding in February of 2001 enabled the Recovery Program to implement its first full scale helicopter capture effort in which 8 animals were collared from 5 packs.

Despite yearly fluctuations in success for different capture methods, total wolf captures remained fairly consistent. However, the proportion of radio-collared wolves in the population decreased because population growth exceeded the number of wolves captured, and radio-collared individuals were lost through mortality.

Livestock Depredations

Since 1999, 41 cattle (13.7 per year) and 150 sheep (50.0 per year) were confirmed lost to wolf depredation in the CIEPA. In addition, 16 cattle (5.3 per year) and 13 sheep (4.3 per year) were classified as probable wolf kills in that insufficient evidence prevented confirmation (Figure 5). Livestock loss figures were minimums as they only included verified losses (see RESEARCH).

Since 1996, livestock losses to wolves have gradually increased, but at a disproportionately lower rate than wolf population growth (Figure 6).

Since 1995, the majority of confirmed wolf depredations on cattle occurred on private land (63%), while the majority involving sheep occurred on public land (81%; Figure 7). Summer territories of 13 wolf packs contained livestock. Members of these packs were frequently in close proximity to cattle and sheep throughout the grazing season.

Idaho Agricultural Statistics Service data indicated that predators accounted for 34% of all sheep deaths in Idaho during 2000. Wolves were responsible for 0.4% of sheep lost to predation (Figure 8). Similarly, National Agricultural Statistics Service data indicated that predator loss represented 3% of all cattle deaths in Idaho during 2000. Wolves accounted for 0.6% of cattle lost to predation (Figure 9). Although wolf-caused losses to livestock are minimal statewide, they may impose an economic burden to individual livestock operations. Wolf-livestock conflicts remain an important social and political issue in Idaho.

Livestock Conflict Resolution

Wildlife Services, under a cooperative agreement with the USFWS, holds the primary responsibility to investigate and verify reports of suspected wolf depredation, and implement wolf control actions. Since 1999, 21 wolves were lethally controlled (7.0 per year) and 20 relocated (7.6 per year) in response to agency control actions.

The Tribe and Wildlife Services work cooperatively with livestock producers to minimize losses. Management for resolving confirmed depredations is addressed on a case-by-case basis. Control strategies vary widely, ranging from non-injurious harassment to lethal removal. Implementation of control actions emphasizes minimizing livestock losses while promoting wolf recovery.

The Recovery Program continues to seek proactive measures to minimize wolf-livestock interactions. Radio-activated guard (RAG) units, a frightening device, were developed to deter wolves from livestock areas. RAG units have been installed both before and after depredations, and in some instances appear to have prevented further losses. Other proactive measures included using guard dogs, fencing livestock, employing additional range riders, purchasing hay or alternate pastures to separate wolves and livestock, modifying grazing patterns, and coordinating volunteers to help haze wolves away from livestock.

The Defenders of Wildlife, a private conservation organization, established and administers a wolf compensation trust, to reimburse ranchers for verified losses to wolves. This program has promoted tolerance for wolf recovery. Defenders of Wildlife has also worked cooperatively with the Recovery Program and provided financial assistance for resolving wolf-livestock conflicts. Between 1995 and October of 2001, this program has paid over \$ 57,000 to livestock producers in Idaho for confirmed and suspected wolf-caused losses.

Wolf Relocations

Wolves were relocated within and between restoration areas to reduce conflicts with livestock and enhance opportunities for relocated wolves to contribute toward recovery. Twenty-six wolves (14 males and 12 females) originating or residing within the CIEPA were relocated since 1999, for a total of 28 relocations (2 wolves were relocated twice). Twenty wolf relocations were in response to livestock depredations, and 8 were preemptive measures. Twenty-one wolves were relocated within the CIEPA, 6 wolves were relocated to northwest Montana outside of the CIEPA, and one wolf was relocated back into the CIEPA after dispersing to Oregon.

Since 1995, wolf relocation has been a valuable management tool in Idaho. Of all wolves relocated ($n=32$), only two were implicated in subsequent depredations. Additionally, at least 6 relocated wolves successfully reproduced and two others joined established packs. In the future, wolf relocation as a management tool may become less effective. As the wolf population expands throughout Idaho there is less justification to employ this relatively expensive tool and social tolerance for relocating wolves diminishes. In addition, with increased wolf pack distribution, fewer high quality and unoccupied release sites are available to release wolves into.

Future Perspective

Effectively addressing wolf-livestock conflict is one of the defining social challenges of wolf recovery. Wolf-caused livestock depredation is of some economic, and a paramount socio-political concern in Idaho. Under the Final Rule, wolves may be harassed, relocated, or lethally controlled in response to confirmed depredations on livestock. In addition, the Defenders of Wildlife provides monetary compensation to livestock producers for verified losses to wolves. Despite agency control and monetary compensation, livestock depredations and resulting control of wolves remain highly emotional and politically charged. Although the number of livestock killed by wolves has been minimal compared to other causes of livestock mortality across the state, wolf depredations can place economic burdens on individual livestock producers operating in occupied wolf range. Continued losses of livestock to wolves, regardless of extent, bolster opposition for wolves and wolf conservation. Conversely, lethal control of wolves has eroded support for wolf management and delisting among wolf advocacy groups. The socio-political nature of this issue polarizes wolf opponents and proponents, fueling discontent for the recovery program and eroding public support for recovery and delisting – which may ultimately delay or derail efforts to remove the wolf from the Endangered Species List.

Overlap between livestock and occupied wolf range is concentrated in the southeastern portion of the Restoration Area. Chronic wolf-livestock conflicts have occurred within the upper Salmon River drainage and surrounding country extending from the town of Stanley, Idaho, north about 150 miles to the town of Salmon, Idaho. During 1999-2001, 5-6 wolf packs held established territories in this area. All but one of these packs have been involved in confirmed livestock depredations, and depredations on livestock have occurred every year. Seventy-three percent of all verified incidents of wolf-caused livestock depredations within the CIEPA occurred in this area. The concentration of wolf-livestock conflicts in a definable geographic area enhances management potential for conflict resolution. Developing long-term solutions to resolve conflicts in this area is key to timely recovery and delisting of wolves in Idaho.

RESEARCH

Continued conflicts between wolves and livestock and potential effects of wolves on big game populations remain key management issues. The Recovery Program continues participation in on-going research to help address these challenges. Scientific information collected through these efforts will foster a better understanding of wolf-livestock and wolf-big game relationships, and more effective wolf conservation and management.

Three research projects have been initiated since 1999. Two address predator-ungulate relationships and the other deals with wolf-livestock interactions.

Winter Predation and Interactions of Wolves and Cougars on Panther Creek in Central Idaho

Investigators: Dennis Murray and Jason Husseman, University of Idaho; Gary Power, Lemhi County; and Dick Wenger, U. S. Forest Service.

Cooperators: Nez Perce Tribe, USFWS, Bureau of Land Management, Rocky Mountain Elk Foundation, Wolf Education and Research Center, Hornocker Wildlife Institute.

This study was initiated to investigate wolf-cougar interactions and predation on wintering ungulate populations, primarily elk and deer. The study area was located within GMU 28 west of Salmon, Idaho and encompassed the Panther Creek drainage and surrounding areas. Two wolf packs, Jureano Mountain and Moyer Basin had established territories within the study area. In addition, 4-6 cougars were radio collared and monitored within the study area.

The 2000 field season was the second year of this multi-year project. Samples of wolf and cougar-killed prey indicated that elk and deer comprised the bulk of their winter diets. In wolf diets, elk were represented in greater proportions relative to deer during both years. In addition, elk calves, followed by elk cows, were favored. Crude kill rates were estimated to be between 3.5 and 5.0 days per kill for both wolf packs over the 2 field seasons. These figures are thought to underestimate the true kill rate as researchers often lost track of wolves for varying lengths of time, and were unable to search all the areas where wolves had traveled due to terrain and time constraints.

Cougar diets were similar to wolf diets in both species and composition. During both winters, elk were represented in greater proportion relative to deer in samples of cougar-killed prey. Likewise, elk calves, followed by elk cows, were represented in highest proportions in samples of cougar-killed elk. Predation of elk bulls by cougars may have been under-represented because a majority of cougars collared were female, which may focus on smaller prey relative to male cougars.

Wolves and cougars tended to kill prey in different habitats, with wolves killing prey in higher elevation areas with low to moderate slopes. A majority of kills occurred in riparian areas. Cougars also tended to kill prey in higher elevations, but kills occurred on significantly steeper slopes with less snow cover.

Predation and Interactions of Wolves and Cougars on Big Creek in Central Idaho

Investigators: Jim and Holly Akenson

Cooperators: Nez Perce Tribe, University of Idaho, Charles Devlieg Foundation, Idaho Department of Fish and Game, Hornocker Wildlife Institute-Wildlife Conservation Society.

This study was initiated to investigate the wolf-cougar interactions and predation on wintering ungulate populations, primarily elk and deer. The study area is located within the Big Creek drainage in the Frank Church-River of No Return Wilderness. The study area encompasses part of the wintering area of the Chamberlain Basin pack. In addition, 5 cougars were radio-collared and monitored within the study area.

The 2001 field season was the third year of this multi-year project. Samples of wolf and cougar-killed prey indicated that elk and deer comprised the bulk of wolf and cougar winter diets. In wolf diets, elk were represented in greater proportions relative to deer during 1999 and 2000, and these prey species were taken in proportion to their relative abundance in the study area.

In cougar diets, like wolf diets, elk and mule deer were taken in similar proportion to their relative abundance in 1999. In 2000, however, cougars disproportionately selected deer as prey over elk. This difference between years was attributed to a mild winter and resulting change in distribution of elk and deer relative to cougars within the study area during 2000.

Elk calves were taken in greater proportion to their availability in both wolf and cougar diets. Older adult cows were the predominant age and sex class of ungulate carcasses found in the study area during all years. Median age of adult elk carcasses was 15 years in 1999 and 10 years in 2000. Birth years were calculated based on tooth aging by cementum annuli for Big Creek cow elk that died in 1999 and 2000 during winter or from hunter harvest. Only 2 of 36 cows were born after 1993. This lack of young cow elk reflects poor calf production or survival. Many people were concerned that wolves were directly responsible for lower elk recruitment. These data suggest that this elk population had started to decline prior to wolf presence. Wolves and cougars did not favor mule deer fawns in 2 of 3 years. Mule deer killed by wolves and cougars were also primarily older adults, with a median adult age of 7 years in 2000.

Wolves visited cougar kill sites, but researchers did not document cougars visiting wolf kill sites. Researchers felt wolf presence in cougar home ranges affected cougar movements.

A large-scale forest fire burned much of the Big Creek winter range in August 2000. This resulted in a shift to an adjacent winter range by some elk and the wolf pack in winter 2000-2001, whereas cougars remained in the drainage and diversified their diets. Mortality from wolf and cougar predation could be partially compensatory if this elk population is at carrying capacity.

Preliminary Assessment of Wolf Predation on Livestock on the Diamond Moose Allotment in Central Idaho.

Investigators: Dennis Murray and John Oakleaf, University of Idaho; Curt Mack, Nez Perce Tribe; Rick Williamson, Wildlife Services.

Cooperators: U. S. Fish and Wildlife Service, Salmon Challis National Forests, Lemhi County Cattle Association, Diamond Moose Association, Lemhi County, Defenders of Wildlife, Wolf Education and Research Center, National Wildlife Federation, Idaho Cattle Association.

This research examined interactions of the Jureano Mountain wolf pack and cattle on a U.S. Forest Service allotment near Salmon, Idaho in an attempt to evaluate effects of wolves on calf survival. The Diamond Moose Association (DMA) calf losses increased over historic levels following wolf establishment. Despite this increase, few calf mortalities were conclusively documented as being the result of wolf depredation. During the 1999 and 2000 grazing seasons, one third of the total calf population (N=1368) was radio-marked. Overall, calf survival was high (greater than 95%), with relatively few mortalities ($n=9$, $n=4$) among the marked population. Natural calf mortality (pneumonia, unknown causes), and wolf-caused calf mortalities represented 46% and 31% of deaths ($n=13$), respectively during the 2 grazing seasons. The Jureano Mountain wolf pack was deemed responsible for 2 of 4 unmarked calf deaths on the DMA. An additional 6 mortalities (2 in 1999 and 4 in 2000) attributed to wolves were discovered on a neighboring pasture. The fate of 34 missing calves on the DMA was unknown at the conclusion of the study.

Detection rates for all causes of mortalities (marked and unmarked calves) were low within the DMA (1 of 3.1 mortalities) and similar to detection rates for wolf-caused calf mortality (1 of 2.7). Detection rates of wolf-caused mortality dropped considerably (1 of 8.0) when marked calves were removed from this estimate. Calves selected by wolves were significantly younger than average ($p < 0.05$), indicating that ranchers should consider altering calving periods to favor older calves in areas with wolves. Movement patterns and herd size of calf locations did not vary with wolf use levels. Calf vulnerability to predation appeared to be correlated with spatial proximity to wolf home ranges and rendezvous sites. Wolf control actions coupled with natural and illegal mortality apparently reduced the rate of wolf-caused calf mortality.

FUTURE OUTLOOK

Recovery and Delisting

Wolf recovery is quickly becoming a reality. As the wolf population continues to expand, it is clear that wolves have successfully recolonized once-vacant habitats in Idaho. This recognition brings new and different challenges, as the Recovery Program focuses more attention on the delisting process to help insure timely removal of wolves from the Endangered Species List.

Delisting is beneficial to wolf proponents and opponents alike. It will not occur until the wolf population has reached recovery levels, and at recovery levels additional management opportunities (such as regulated public harvest) will be available to address social concerns without jeopardizing wolf population viability. The USFWS can initiate the delisting process when two prerequisites have been met: 1) achievement of the numerical recovery goal of 30

breeding pairs that are distributed throughout Montana, Idaho, and Wyoming for 3 years, and 2) establishment of coordinated wolf management plans developed by the states of Montana, Idaho, and Wyoming. The numerical recovery requirement will almost certainly be met in 2002. State management plans which must be submitted to and approved by the USFWS and insure the long-term management and conservation of wolves, are in various stages of completion. At the end of 2001, Idaho had developed a draft wolf conservation and management plan, Montana was in the initial stages of drafting a plan, but Wyoming had not initiated the development of a plan. It is possible that wolves will reach recovered levels prior to completion of the required state management plans. To insure timely delisting, it is important for the three states to continue to actively engage in developing sound wolf management plans.

Upcoming Challenges

Although wolves are recovering more quickly in Idaho than projected, the ultimate success of the recovery program will hinge on social tolerance for wolves and broad public support for recovery and delisting. The consistent growth of the wolf population is due, in large degree, to the expansive, contiguous block of mostly undeveloped public lands in central Idaho. Although Idaho has sufficient habitat to accommodate several hundred wolves, the citizens of Idaho, not habitat, will ultimately determine the number of wolves that will persist in the state. This social carrying capacity for wolves will undoubtedly be below the biological carrying capacity as wolves are managed in concert with other wildlife values, livestock concerns, and other management objectives. As the wolf population continues to make progress towards recovery, the greatest challenge to the Recovery Program is to effectively balance social concerns surrounding wolf recovery and reduce wolf-human conflicts.

To meet this challenge, the Recovery Program will continue a strong monitoring program emphasizing capturing and radio-collaring additional wolves and documenting new uncollared packs. The Recovery Program will address wolf-livestock conflicts through continued responsive and effective wolf management and control; develop constructive working relationships with new communities affected by the expanding wolf population; develop proactive, non-lethal techniques to deter wolf-livestock interactions; and seek long-term solutions to resolve wolf-livestock conflicts in chronic problem areas. Concerns of recreational hunters and outfitters and guides will be addressed through continued outreach and research. The Recovery Program will engage in cooperative efforts with the State of Idaho to develop an effective wolf management plan that will provide for long-term conservation of wolves and address the varied interests and concerns of Idahoans. Through these efforts, the Recovery Program strives to reduce conflict, increase tolerance, and promote public support for removing the wolf from the Endangered Species List.

IDAHO WOLF PACKS AND PAIRS

B45 and a wolf of unknown origin maintained a territory north of McCall, Idaho in the French Creek, Secesh River, and the North Fork of the Payette River drainages. B45, an offspring of the Jureano Mountain pack's 1997 litter, dispersed in February of 1999 to John Day, Oregon. Her dispersal became the center of media attention, as she was the first wolf documented crossing outside of the NRMRR. She was recaptured and returned to Idaho. This pair's territory overlaps with many domestic sheep allotments on National Forest land. They have not been involved in any confirmed depredations. Curiously, B45 and her mate did not produce pups in 2000 or 2001.

Bass Creek

This pack, originally found in their namesake drainage near Stevensville, Montana (within the CIEPA), was responsible for a livestock depredation that led to their removal from the wild. The entire pack, consisting of the alpha pair (B87 male and MT57 female) and their 8 pups were captured and placed into captivity at the Snowdon Wildlife Sanctuary in McCall, Idaho. The alpha male (handling mishap) and 3 pups (disease) died while at the facility. In December a temporary enclosure was erected near the Spotted Bear Guard Station, northwestern Montana, where the alpha female and remaining pups were to acclimate before being released. During the first night, a radio-collared lone male visited the Bass Creek wolves. When his presence was discovered it was decided that the release should occur immediately. The pen was opened and the Bass Creek pack had a new alpha male, home range, and name (Spotted Bear). Since then an additional 3 pups of the initial litter have died. The alpha female and her new mate produced a litter of 3 pups in 2000 and a litter of 5 in 2001. They are now part of the Northwestern Montana Restoration Area, and an example of how well relocation can work.

Big Hole

The Big Hole pack has maintained an established territory since 1997 along the Bitterroot Divide south of Lolo Pass, consisting of predominately public lands. The alpha male, B07, and female, B11, produced a litter of 3 pups in 1999. Two female wolves from their 1998 litter have been radio-collared, B62 and B67. B62 has remained with the pack. B67 dispersed in the winter of 2000 and was observed with another wolf near Painted Rocks Reservoir, Montana (this potential pair did not produce in 2001). Field investigations indicated the Big Hole pack did not produce pups in 2000. Further evidence supported this when the pack made 2 extended forays outside of their home range, along the Bitterroot Mountains. These movements covered country that pups would not have been likely to traverse. In 2001 the Big Hole pack produced a litter of 6 pups and an additional radio-collared wolf was documented with the pack. Its origin and identity remain unknown. The Big Hole pack was a breeding pair for the 1999 and 2001 seasons, and was a non-breeding pair for 2000.

Big Smoky

The Big Smoky pack was discovered north of Fairfield, Idaho in the summer of 2000 following confirmed wolf depredations on sheep. Cooperative efforts between the Tribe and Wildlife Services resulted in the capture of B96, the suspected alpha male, and B57, a 2-year-old dispersing male from the Thunder Mountain pack. Following their capture a series of

rendezvous sites was found, where 6 pups were detected. Also observed was a second gray adult, the alpha female (she was seen nursing the pups). No further depredations occurred that summer. In late November and early December of 2000, the collars of both wolves went into mortality mode. B96, who had an injured leg prior to his initial capture, was illegally poisoned with Compound 1080. The necropsy showed that the leg wound was the result of a gunshot. B57's death is under investigation. This pack was not considered a breeding pair for 2000 due to the loss of the alpha male. The origin and status of this pack was unknown. The remains of a wolf were found in this pack's territory in the fall of 2001, suggesting that there may still be wolf activity in this area.

Chamberlain Basin

Alpha pair B09 (male) and B16 (female) has occupied an established territory in Chamberlain Basin within the Payette National Forest since pairing in 1995. Their territory was wholly contained within the Frank Church-River of No Return Wilderness. This pack was one of 3 packs that first produced pups in Idaho in 1996, and the only pack to have successfully produced pups for 6 consecutive years. In 1999 they produced 5 pups. During 2000, 6 pups were produced. A 2-3-year-old female wolf (B88) was captured and collared from the primary Chamberlain Basin pack during May 2000, and was found to be lactating. Telemetry indicated that the traditional alpha female, B16, was still the most attentive to the pups, however, B88 was associated with them as well. It was uncertain whether some of the 6 pups were born to B88, or if she had an additional litter which did not survive. In August of 2000, B88 was discovered dead (under investigation). Also in 2000, B50, a subordinate wolf, produced a second litter of at least 2 pups within this pack's home range. This was the first documented occurrence of multiple litters for an Idaho wolf pack. Although B09, the Chamberlain Basin alpha male, associated with B50 at her den and rendezvous sites, it remained unclear as to whether her litter was sired by him. During winter of 2000, B50 split off, forming the Gospel Hump pack, and now occupies a territory on the north side of the Salmon River, adjacent to the Chamberlain Basin pack's territory. In 2001 the Chamberlain Basin pack produced 4 pups. They were considered a breeding pair in 1999, 2000 and 2001.

Gold Fork

The Gold Fork pack was confirmed in late summer of 2001 when 2 wolves were captured and radio-collared during a control action resulting from a depredation on livestock, east of Donnelly, Idaho. The pack was composed of suspected alpha male B117, yearling male B116, and at least 5 additional wolves. At least 2 yearlings were observed, allowing them to be counted as a breeding pair for 2000, retroactively, and the 30th breeding pair overall for the NRMRR (see Future Outlook, Recovery and Delisting). Limited data on this pack's home range has been gathered, but the area used during the summer of 2001 contained a large number of cattle and sheep. This pack was implicated in a second depredation shortly after B116 and B117 were captured. They were also suspected of having attacked sheep in this general area in 2000. This pack faces an uncertain future should livestock depredations continue. This pack produced a minimum of 2 pups in 2000 and 2001 and was considered a breeding pair.

Gospel Hump

The Gospel Hump pack originated when B50 (female) budded from the Chamberlain Basin pack in 2000. She mated with an unknown male and whelped at least 2 pups within the Chamberlain Basin pack's territory. The fate of B50's 2000 pups was unknown. Only 1 wolf was seen with her during aerial surveys that winter. In 2001 she crossed the Salmon River, separated completely from the Chamberlain Basin pack, and denned in the southeast portion of the Gospel Hump Wilderness. Seven pups were recorded, making this a first year breeding pair for 2001. The identity of the alpha male was never determined.

Jureano Mountain

Established in 1996 when alpha pair B32 (male) and B25 (female) bonded, this pack has had a dynamic history. B32 and B25 both died in 1999, the former euthanized after this pack repeatedly depredated on cattle in their home range west of Salmon, Idaho, and the latter illegally shot. Before their deaths this pair bore 3 litters, consisting of 6, 4, and 9 (though only 2 from this litter survived) pups, respectively, from 1997-1999. Many of these offspring have been captured and monitored because of management concerns surrounding interactions with cattle grazing on 2 Forest Service allotments that fall within their territory. Since 1998 the Jureano Mountain pack has been involved in 9 agency control actions resulting from confirmed depredations on livestock. Control actions have led to 3 wolves euthanized, 4 wolves relocated, and several wolves (mainly pups) collared and released on site. By the fall of 1999 this pack was reduced to just 2 pups. Both were later captured and relocated. In response to the on-going nature of livestock depredations, the Tribe, University of Idaho, and many other cooperators, implemented a study in 1999 to better assess wolf-livestock interactions (see RESEARCH section). In January of 2000, following the deaths of B32 and B25, a dispersed female from Jureano Mountain pack's initial 1997 litter (B46) reoccupied this pack's traditional home range. She paired with a male of unknown origin, and whelped a minimum of 6 pups. Helicopter darting in February of 2001 captured the alpha male, B106. They produced 3 pups in 2001. This revised Jureano Mountain pack has been implicated in 4 confirmed or probable depredations, with control actions resulting in 3 wolves radio-collared and released on site and 1 wolf euthanized in 2001. Because of their proximity to cattle, the Jureano Mountain pack continued to be a management priority for the Recovery Program. They were a non-breeding pair in 1999 and a breeding pair for 2000 and 2001.

Kelly Creek

The Kelly Creek pack was composed of alpha pair 90-13 (male) and B15 (female). Wolf 90-13 was originally radio-collared in Glacier National Park, Montana, in 1990 before dispersing into Idaho in 1992. He died probably of natural causes associated with old age during the spring of 2001 at a minimum estimated age of 13 years. He was the oldest known wolf in the NRMRR. His union with B15 was the first documented case of a translocated wolf pairing with a naturally occurring wolf. During winter of 2000-2001, 90-13 was often located apart from his radio-collared pack mates. Because of his advanced age he may have been deposed as alpha male. Wolf 90-13 contributed substantially to recovery in the northern Rockies. Four of his

descendants were radio-collared, B42, B48, B78, and B79. B42, now 4-years old, still resides with the pack while the others dispersed and founded packs of their own. The Kelly Creek pack produced a litter of 4 pups in 1999 and 2 pups in 2000. No evidence of reproduction was documented in 2001. They were a breeding pair in 1999 and 2000 but not in 2001.

Landmark

After the death of the original alpha pair (B06 and B08) the fate of the Landmark pack was uncertain. During the 1999 denning season, B33, a lone male from the 1996 reintroduction, was frequently located at the historic Landmark den site. Further groundwork documented a litter of 5 pups. The alpha female (B91) was captured and radio-collared the following spring. She was assumed to be offspring from the original Landmark pack. Successive litters have included 8 and 6 pups, for 2000 and 2001, respectively. These wolves inhabit the southern portion of the Frank Church-River of No Return Wilderness. In 2001 they used Forest Service lands to the south where there was an active sheep allotment. This pack was in close proximity to sheep on numerous occasions, but did not depredate. Proactive management strategies (hazing, electronic alarms, electric fencing, etc.) were employed to help deter these wolves from interacting with domestic animals. This pack was a breeding pair for 1999, 2000, and 2001.

Marble Mountain

The Marble Mountain pack was discovered in April of 2000 when B48, a 3-year-old dispersing male wolf from the Kelly Creek pack, localized in an area within the St. Joe National Forest. Further groundwork verified that at least 2 pups were produced. In 2001 this pack produced a minimum of 3 pups. Extremely dense vegetation around the den and rendezvous sites has precluded more accurate enumeration of pups. This pack was a breeding pair for 2000 and 2001.

Moyer Basin

Since establishment in 1996 this pack has undergone tremendous change. The founding alpha pair, B29 (male) and B37 (female), was illegally poisoned with Compound 1080 between 1999 and 2000. At least 2 other wolves were poisoned, and 1 additional mortality is under investigation. Despite these setbacks the Moyer Basin pack persisted; B29 produced a litter with B37 in 1999 before his death. By June of 1999 male wolf B49 joined the group, dispersing from the Stanley Basin pack. Presumably B49 bred with B37 in 2000 and they produced 5 pups. B49 has not been located since early January of 2001- his fate is currently unknown. After his disappearance only 1 radio-collared wolf remained in the Moyer Basin pack's territory. Two pups were radio-collared during helicopter-capture efforts in February of 2001. In the spring of 2001 the radio-collared wolves made an extraterritorial foray to the southwest, where they spent several weeks north of Clayton, Idaho. In early June inspection of the traditional den site revealed 5 pups. The alpha pair is unknown. This pack was implicated in a single depredation event in 1998. Like their neighbors to the north, the Jureano Mountain wolves, this pack continues to be a management concern because of 3 Forest Service, public grazing allotments that overlap their home range.

Orphan

The Orphan pack originated when B28 (male) and B61 (female) paired permanently in October of 1999. These wolves associated in the fall and winter of 1998-1999. Prior to his union with B61, B28 had been a member of the Bear Valley trio (with B19 and B30). Upon the dispersal of B19 and the death of B30, he became a lone wolf. B61 was a 2-year-old female originating from the Stanley Basin pack that was “orphaned” as a 14-week-old pup when her pack moved to a new rendezvous site and left her behind. She was a well-watched item in Lower Stanley, as she hunted for mice in the fields within plain view of the highway. In September biologists captured and fitted her with a radio-collar. Remarkably, she lived through the winter as a lone pup. During denning season of 2000, this pair localized around the upper stretches of the South Fork of the Salmon River. This pack produced a single pup in both 2000 and 2001. The Orphan pack was not a breeding pair.

Scott Mountain

The Scott Mountain pack formed in 2001 when B115 (male) and B78 (female) produced 4 gray pups northeast of Garden Valley, Idaho. The alpha female originated from the Kelly Creek pack. In 2000 she dispersed and was located near the Big Hole pack, before continuing to her present home range. B115 was trapped and radio-collared in August 2001- his origin was unknown. Insufficient data has been collected to define this pack’s territory, though the Deadwood River drainage was used extensively during the summer of 2001.

Selway

This pack, which inhabited the Selway-Bitterroot Wilderness between the Main Salmon and Selway Rivers, has been in existence since 1996. Alphas B05 (male) and B10 (female) produced a litter of 2 pups in 1996. Efforts to document additional offspring were unsuccessful until 1999 when a minimum of 2 pups was found. A pup, female B70, was killed shortly after being radio-collared in 1999. Necropsy results showed that other wolves had killed her, possibly indicating a second, unconfirmed pack in this region. B99 was collared in 2000, and alpha male B05 was re-collared in 2001. Litters of 4 and 3 pups were determined for 2000 and 2001, respectively, qualifying this pack as a breeding pair for those years.

Snow Peak

The Snow Peak pack used areas of the Clearwater and Idaho Panhandle National Forests, consisting primarily of roadless, remote, and undeveloped mountainous country. The alpha male’s (B31) radio-collar ceased to transmit in early 1999. His collar was malfunctioning so his exact fate is unknown. The pack was soon joined by R-132, a Yellowstone wolf that had been involved in sheep depredations near Leadore, Idaho, and was relocated to the north. No evidence of pup production was found in 1999. During the winter of 1999-2000 both R-132 and the alpha female (B20) were found dead. Causes of death are under investigation. Since these were the

only functioning radio-collars within the Snow Peak pack, their current status and location is unknown. The Snow Peak pack was considered a non-breeding pair in 1999, 2000, and 2001.

Stanley Basin

The Stanley Basin pack represented one of the greatest management challenges faced by the Recovery Project. They began depredating in 1999, after avoiding conflicts with livestock for their initial 2 years. A great deal of time, effort, and expense was devoted to preventing this pack from interacting with sheep and cattle in the Sawtooth Valley, south of Stanley, Idaho. Three wolves were lethally controlled (B23, B55, and B69) and 3 were relocated (B27, B68, and B98) to help alleviate the conflicts. Following the alpha male's (B27) relocation to northern Idaho in September of 2000, the remainder of the pack fragmented and began to travel into areas outside their usual home range. During the 2000-2001 winter, several members frequented an area southwest of Mackay, Idaho, where alpha female B23 killed a domestic calf and was lethally controlled. B27 was found dead near Weippe, Idaho, approximately 80 miles (129 km) from his release site. Remaining pack members B95, B97, B100, and B105 dispersed effectively ending this pack.

From 1996-2000 B23 and B27 produced a minimum of 26 pups and were probably the most visible and noteworthy pack in the state. They generated considerable interest and support among wolf advocates whenever control actions were underway. Though this pack disbanded, its genetic heritage is still well represented. The Orphan, Wolf Fang, and Wildhorse packs were founded from descendants of B23 and B27. In addition, B100 (female) has potentially paired with male B63 in the Big Hole, Montana, and B105 (male) has been seen with 2 wolves in the Long Valley/Round Valley area south of Donnelly, Idaho. The vacated Stanley Basin pack's territory was reoccupied by the Whitehawk Mountain pack. The Stanley Basin pack was a breeding pair in 1999.

Thunder Mountain

The Thunder Mountain pack was composed of female wolf, B22, a male of unknown origin, and their offspring. Their territory lay within the boundaries of the South Fork of the Salmon River on the west, and the Middle Fork of the Salmon River in the east. It encompassed both Wilderness and non-Wilderness areas of the Boise and Payette National Forests. They have denned at different locations within the Frank Church-River of No Return Wilderness in most years. They produced a litter of 7 pups in 1999, 3 pups in 2000, and 9 pups in 2001. This group was a breeding pair since 1998.

The Thunder Mountain pack had 3 radio-collared male wolves undertake notable dispersals. B58 was last located between Ketchum and Arco, Idaho in the Copper Basin country, approximately 112 miles (179 km) from his birth territory. B57 moved approximately 95 miles (152 km) from his natal range to join the Big Smoky pack. B59 ended up at least 50 miles (80 km) from his birthplace, where he became the alpha male of the Twin Peaks pack.

Twin Peaks

The Twin Peaks pack territory was situated within the Challis National Forest and the Frank Church-River of No Return Wilderness, west of Challis, Idaho. In 1999 they produced a litter of 4 young. During the fall of 1999 they were joined by B68, a Stanley Basin wolf that had been relocated to the Selway-Bitterroot Wilderness as a result of livestock depredations. During the livestock calving season of 2000, the Twin Peaks pack spent time along the main Salmon River, near the town of Clayton. Before long they were involved in a series of depredations. As a result, 4 wolves were lethally controlled, including B68, and the alpha pair (B18 and B35) was relocated to the Selway River drainage. The only remaining wolf with a radio-collar (B83) dispersed to Oregon, near the town of Baker, where he was killed by an automobile on Interstate 84. The alpha pair left the Selway drainage shortly after relocation and were last located south of Anaconda, Montana. Despite ground efforts, pups were never documented in 2000. In the fall of 2000 radio-contact was lost with both wolves. Their current status and location is unknown. In February of 2001, B59, a 3-year-old male disperser from the Thunder Mountain pack, was observed with uncollared wolves in the original Twin Peaks pack's territory. In April, his locations focused around the traditional Twin Peaks' den site. His restricted movements suggested that he was attending a female that had denned. In June an uncollared lactating female and 7 pups were observed with B59. It is suspected that the female was a remnant offspring of the original Twin Peaks pack. This pack was a breeding pair in 1999, but did not meet the criteria in 2000 or 2001.

White Cloud

The White Cloud pack's territory was situated in the Boulder and White Cloud Mountains along the upper reaches of the East Fork of the Salmon River. The valley floor of the East Fork is primarily private ground and is composed of numerous cattle ranches. The surrounding foothills are public lands with ungulate winter range, and active Forest Service summer grazing allotments. In the spring of 1999, 2 yearling White Cloud wolves were relocated in response to a cattle depredation on private land. B36 (alpha female) produced a litter of 7 pups in 1999. This pack was involved in an additional depredation in March of 2000, and as a result 4 wolves were relocated to the Selway-Bitterroot Wilderness, including the alpha female and her mate, B85, a native Idaho wolf. Depredations continued and control actions resumed, resulting in the lethal control of 5 wolves, including the alpha male, who had returned to his home territory in less than 15 days, covering a minimum distance of 175 miles (282 km). The alpha female settled in the Gibbonsville, Idaho area and was documented to have at least 2 pups. In August she moved east into the Big Hole country of Montana where she was joined by B86, a relocated yearling from her 1999 litter. She spent the fall and winter moving in and out of the Big Hole area. Radio-contact was lost in February of 2001, near Jackson, Montana. She and B86 are unaccounted for. This pack was a breeding pair in 1999.

Whitehawk Mountain

The Whitehawk Mountain pack was formed when B40 and B47 dispersed from the Moyer Basin pack in March of 1999 and joined with 3 wolves of unknown origins in the Bear Valley area.

They wintered near Grandjean at the head of the South Fork of the Payette River. In 2000 they produced 1 pup in the Bear Valley area. After the Stanley Basin pack disbanded in September of 2000, the Whitehawk Mountain pack moved into the Sawtooth Valley. As the winter progressed they covered a broad range of country, including the vacated territory of the defunct White Cloud pack along the East Fork of the Salmon River. In February of 2001, B101 (assumed alpha male) and B102 (subordinate male) were captured and radio-collared. In March, B102 was legally killed by a rancher while in the act of depredating on private property along the East Fork. During the denning season, the Whitehawk Mountain pack settled into the Sawtooth Valley and produced a litter of 9 pups. In June B101 and B40 were lethally controlled for depredating on sheep and a calf. The alpha female remained uncollared and her origins were unknown. Extensive efforts were undertaken during the summer of 2001 to dissuade the remaining wolves from interacting with livestock, principally sheep, in their home range. These measures appear to have been effective, as no further depredations occurred. This pack was a breeding pair in 2001.

Wildhorse

The Wildhorse pack roamed an area between Ketchum and Mackay, Idaho. Their territory included the Copper Basin and the upper reaches of the Big Lost River. This pack formed when B66, a 2-year-old dispersing female from the Stanley Basin pack, paired with B02. B02 was released in 1995 as a 4-year-old adult. After the 1995 release, his whereabouts were unknown. He was not located until the winter of 1998 around Ketchum. He remained in that area until the winter of 1999, when contact was lost again. He reappeared in the same general area with B66. They produced a litter of 2 pups in 2000 and 5 in 2001. During the summer, this pack's territory overlaps 3 active livestock allotments on the Challis National Forest. Members of this pack interacted with cattle on a daily basis throughout the grazing season and were implicated in their first depredation in August of 2001. One yearling member of this pack was captured and relocated to the Selway-Bitterroot Wilderness to mitigate further livestock losses. They were a breeding pair in 2000 and 2001.

Wolf Fang

The Wolf Fang pack formed in January of 2000 when B38, a female from the Stanley Basin pack's 1997 litter, dispersed and paired with a male wolf of unknown origin along the lower South Fork of the Salmon River. In 2000 she whelped 5-7 pups and in 2001 produced a litter of 8-9 pups. Their territory encompassed parts of the Boise and Payette National Forests and the Frank Church-River of No Return Wilderness. A yearling female, B109 was captured and radio-collared in the spring of 2001. The origin of the alpha male remained unknown. This pack was a breeding pair since their inception.