IDAHO WOLF RECOVERY PROGRAM

RESTORATION AND MANAGEMENT OF GRAY WOLVES IN CENTRAL IDAHO

PROGRESS REPORT

1995 - 1998

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EXECUTIVE SUMMARY

In January of 1995 and 1996, 35 gray wolves from Canada were released into central Idaho as part of the restoration of wolves to the northern Rocky Mountains. After an initial exploratory period of about six months, wolves began to reduce their movements, pair, and establish pack territories. By fall of 1998, less than four years after the initial release, all available females translocated to central Idaho had pair bonded and formed packs. The first pups were produced in 1996. The number of packs steadily increased, from three in 1996 to ten in 1998. The minimum number of pups produced also increased, from 11 in 1996 to 52 in 1998.

Territories of all packs and pairs were completely or predominately within National Forest lands, and more than half of the pack ranges were located primarily or partially within wilderness areas. Six of these territories corresponded to active grazing allotments on public lands. Twelve of 34 total reported livestock depredations during 1995-98 were confirmed to be caused by wolves. Confirmed and possible wolf caused livestock losses since 1995 included 90 sheep, 31 cattle, and possibly one horse. In most cases, control actions involving the relocation of six wolves were successful at curtailing depredations.

As of December 1998, 24 of the original 35 wolves were known to be alive and were still being monitored. Including these wolves, their offspring, and wild or dispersed wolves from neighboring states, the estimated population in central Idaho is 115 wolves. The population has grown faster than anticipated, and 1998 was the first year that one component of recovery --10 breeding pairs --was attained. Wolves in the northern Rocky Mountains will reach recovery levels when 10 breeding pairs have been maintained for three consecutive years in each of the three restoration areas.

Increased interactions between wolves and livestock and potential effects of wolves on big game populations and hunter opportunities are two key management issues for the Recovery Program. The geographic distribution of wolves in relation to livestock and big game herds, the ability of the Recovery Program to continue to be responsive to the concerns of livestock producers and outfitters, and the tolerance afforded wolves by Idahoans, will ultimately determine the long term recovery of wolves in Idaho.

ACKNOWLEDGMENTS

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Finally, we acknowledge the contributions of sportsmen and women, outfitters and guides, livestock producers and 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

Historical Background

The Gray wolf, one of the most widespread of all land mammals, once ranged across nearly all of the North American continent. As with most large predators, wolves were persecuted by European settlers during colonization of North America. As settlers expanded westward, wolves were viewed as an obstruction to progress and were systematically shot, trapped, and poisoned. Effective government eradication programs continued the extermination of wolves in the West, including Idaho. By the 1930's wolves were extirpated from all of the contiguous 48 states except Minnesota.

Wolves were federally listed as endangered under the Endangered Species Act in 1974, initiating one of the most politically controversial and emotionally charged conservation issue of this century. After nearly two decades of debate over recovery of wolves in the northern Rocky Mountains of the West, the U.S. Congress in 1991 directed the U. S. Fish and Wildlife Service (USFWS) to consult with the National Park Service and USDA Forest Service and prepare an Environmental Impact Statement (EIS) for the reintroduction of wolves to Yellowstone National Park and central Idaho. Because of the controversial nature of wolf recovery, developing the EIS became one of the most extensive public involvement efforts ever, receiving over 160,000 comments from the public across the United States as well as 40 foreign countries. The EIS clearly defined the controversial roots of the issue: 1) overwhelming support for wolf recovery in the northern Rockies by the general public throughout the States, and 2) strong local opposition voiced by those with concerns about increased government regulations and the effects of wolves on livestock and big game populations. Public comments were analyzed and incorporated into the Final EIS, which was completed and approved by the Secretary of Interior, Bruce Babbitt, in 1994. Responding to public comments and identified concerns, the Final EIS outlined a strategy to provide for recovery of wolves while mitigating conflicts and economic impacts.

The Northern Rocky Mountain Wolf Recovery Strategy

The U.S. Fish and Wildlife Service's efforts to restore viable populations of wolves to the northern Rocky Mountains incorporates three different approaches in three restoration areas: 1) natural recolonization of wolves in northwest Montana, 2) reintroduction of wolves using "soft" release techniques in the Greater Yellowstone Area (GYA), and 3) reintroduction of wolves using "hard" release techniques in central Idaho. Naturally recolonizing wolves in northwestern Montana are fully protected as endangered species, while reintroduced wolves in the GYA and central Idaho are designated as nonessential experimental populations.

Under this special designation, nonessential experimental population areas were created for the GYA and central Idaho restoration areas (Figure 1), in which all wolves (released and naturally-occurring) were designated nonessential experimental animals. The USFWS developed a Final Rule that governs how wolves are managed within the two nonessential experimental population areas. This rule allows for more management flexibility to meet public concerns and minimize

conflicts regarding the presence of wolves including effects on wild ungulate populations and livestock, and other potentially conflicting land uses.

The recovery goal for the northern Rocky Mountains is to maintain 10 breeding pairs of wolves for three consecutive years in each of the three restoration areas. Once this recovery goal is achieved, the USFWS will initiate a delisting process to remove wolves in the northern Rocky Mountains from the Endangered Species List. When delisting occurs, wolf management will revert to the respective state and/or tribal authorities.

The Idaho Wolf Recovery Program

The U. S. Fish and Wildlife Service's recovery strategy intended that states and/or tribes would have the primary responsibility for implementing wolf recovery and for monitoring and managing wolf populations through the recovery process. In Idaho, both the State Department of Fish and Game and the Nez Perce Tribe (Tribe) were involved in developing the Final EIS, but the state declined to participate in the implementation of the wolf recovery program. In 1995, the USFWS and the Tribe entered into a cooperative agreement to recover and manage wolves in Idaho. The Tribe completed, and the USFWS approved, the Nez Perce Tribal Gray Wolf Recovery and Management Plan for Idaho. This plan operates within the broad guidelines set forth in the Final EIS and Final Rule, and is the umbrella document that directs recovery activities in Idaho.

The overall goal of the Idaho Wolf Recovery Program is to restore a self-sustaining population of gray wolves to Idaho by maintaining a minimum of 10 breeding pairs for three consecutive years, thereby contributing to the delisting of wolves throughout the northern Rocky Mountains. The Idaho Recovery Program adopts an innovative partnership approach which focuses on collaborative efforts to balance the biological needs of wolves and the social concerns of Idahoans. By integrating four key program elements (monitoring, management and control, information and education, and research), wolf recovery in Idaho employs an effective team approach among the Nez Perce Tribe, federal and state agencies, regional universities, local governments, private organizations, and individuals working together toward a common goal.

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 of contiguous National Forest lands administered by nine 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 three contiguous wilderness areas, the Selway Bitterroot, Frank Church River-of-No-Return, and Gospel Hump, encompassing almost four million acres.

Three major mountain ranges (Salmon River, Clearwater, and Bitterroot) and two 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 at the bottom of the deepest river canyons to just over 12,000 feet along the crest of the highest mountains. Annual precipitation varies from less than 8 inches at lower elevations to nearly 100 inches at higher elevations. Central Idaho is also influenced by a climatic gradient, with moister maritime climates supporting western red cedar-western hemlock habitat types in the Clearwater drainage to the north, grading into dryer continental climates supporting Douglas-fir and ponderosa pine habitat types in the Salmon 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, white-tailed and mule deer, moose, mountain goats, and bighorn sheep. Mountain lions, bobcats, black bears, coyotes, and marten are common terrestrial predators. Central Idaho also supports populations of rare forest carnivores including lynx, fishers, and wolverines.

Central Idaho is encompassed within a 10-county area and is sparsely populated, with an average population density of about three people for every square mile. Nearly 80% of the land base contained within the 10 counties is public land. Primary land uses include grazing, logging, mining, and recreation. During winter, over 380,000 cattle and 100,000 domestic sheep are maintained on approximately 3.4 million acres of private land surrounding national forest lands. During the summer, over 80,000 cattle and 220,000 sheep graze on approximately 4.4 million acres of public national forest allotments distributed along the western, eastern, and southern edges of the southern half of the Central Idaho Restoration Area.

WOLF TRANSLOCATIONS

Sources of Wolves

Wolves released in Central Idaho were translocated from western Canada, concurrent with translocation of wolves to Yellowstone National Park. Canadian capture sites were selected because of the similarity of habitats and wolf prey to the Central Idaho and GYA restoration areas. Wolves in the selected capture areas were also disease-free and had seldom encountered humans or livestock**.** Wild Canadian wolves were captured by darting them with a tranquilizer from helicopters. During January of 1995 and 1996, 64 wolves were captured, radio collared, and transported for release in central Idaho and Yellowstone National Park. Thirty-five of these animals were released in Idaho.

Idaho Releases

Potential Idaho release sites were selected primarily for proximity to wilderness areas. Due to limited accessibility in winter, all wolves were released in or adjacent to the Frank Church

River-of-No-Return Wilderness Area. A "hard" release technique was used in Idaho, whereby individuals from many different packs were set free together immediately upon arrival at their release sites. This differed from the "soft" release technique used in Yellowstone National Park, where mostly related wolves belonging to the same pack were held in acclimation pens for about 10 weeks before being released to the wild. The soft release technique was used in hopes of reducing post-release movements and to increase the likelihood that the released wolves would remain within the GYA. Hard releases were selected in Idaho because the remoteness of the release sites precluded construction and maintenance of acclimation pens, and because this technique minimized holding and handling time and was less expensive.

During January 1995, 15 wolves (seven males and eight females; nine adults and six subadults) from seven different packs were captured in west-central Alberta, Canada, and released at three different sites in Idaho (Table 1). Wolves arrived from Alberta in three shipments and were released in Thomas Creek and Indian Creek along the Middle Fork of the Salmon River, and Corn Creek along the Main Salmon River. During January of 1996, an additional 20 wolves (11 males and nine females; 14 adults, three subadults, and three pups) from eight different packs in east-central British Columbia, Canada, were released at Dagger Falls along the headwaters of the Middle Fork of the Salmon River (Table 1). All wolves released in Idaho were equipped with radio collars so that biologists could monitor the status of the recolonizing population.

The Final EIS called for the release of 15 wolves per year for three to five years in the Central Idaho Restoration Area. However, wolves recolonized so successfully after the first two releases that additional translocations were deemed unnecessary by the USFWS.

Initial Post-Release Movements

Initial post-release movements were assessed in two ways: 1) an index of the rate of movement between consecutive locations, expressed as miles traveled per day, and 2) the average distance that wolves collectively moved from their release sites over time. The first measure is an index. It does not represent the actual miles moved per day, but rather the straight-line distance between consecutive locations related to the number of days elapsed between locations. Actual daily movements between locations were not known and were probably much greater than indicated by the index. In both release years, wolves exhibited a post-release exploratory period that lasted about six months. Wolves moved at the greatest rate during the first three months after release. For example, in 1995 the mean index of movement was 3.2 miles/day during February and March, then decreased by almost half to 1.4 miles/day for the April-May period (Figure 2).

Movements away from release sites generally continued beyond the initial three months, albeit at a slower rate. For wolves released in 1996, average distance moved from release site increased substantially from the February-March period to April-May, and then decreased and stabilized within six months (Figure 3). Although the exploratory period was relatively short in duration, wolves collectively investigated much of central Idaho before localizing their movements. Localization occurred after wolves paired and/or established territories.

STATUS OF IDAHO WOLVES

Movements and Distribution

The locations of released wolves have been monitored from fixed-wing aircraft about once every two weeks since January of 1995. A total of 2,914 locations were recorded from early 1995 through the fall of 1998. In general, wolves moved over relatively large regions, and lone wolves traversed much larger areas than paired wolves. Although on average lone males tended to range over larger areas (4,588 mi^2, 11,883 km^2) than did lone females (3,546 mi^2, 9,184 km^2), this difference was not significant. For males and females combined, lone wolves on average ranged over 4,000 square miles (10,360 km^2) annually. Movements of lone wolves were unpredictable throughout the year. For several individuals, annual movements encompassed much of the Central Idaho Restoration Area. Once paired, however, wolves used significantly smaller geographic areas and movements became more predictable within identified home ranges (Figure 4). Wolf pack home ranges varied from 204-695 square miles (528-1,800 km^2) and averaged 359 square miles (930 km^2) in size. Wolf pairs established pack home ranges as close as 17 miles (27 km) and as far as 159 miles (256 km) from their release sites. On average, wolves settled 57 miles (92 km) from release sites.

With few exceptions, wolves remained on public lands within the Central Idaho Restoration Area during 1995-98. Most exceptions occurred during the exploratory periods in 1995 and 1996 when most wolves were either lone or associated with non-breeding pairs. Four wolves have traveled outside of the Central Idaho Restoration Area. Lone wolf B04, a female released in 1995, traveled approximately 90 miles (145 km) to the Rock Creek drainage in northwestern Montana, where she was killed in 1996 during an encounter with a mountain lion. Male wolf B07 and female wolf B11, released in 1995, paired in early 1996 and established their initial home range in the Big Hole country of northwestern Montana. They were successfully relocated back to central Idaho after being implicated in a livestock depredation on private property. Lastly, lone male wolf B14, released in 1995, traveled to Montana in 1998 and joined a wolf pack near Deer Lodge, approximately 160 miles (258 km) from his Idaho release site. This is the farthest documented distance traveled from a release site of any Idaho wolf. Prior to leaving the Central Idaho Restoration Area, B14 had used an average annual range of over 7,000 square miles (18,130 km^2).

Movements of wolves have become more limited since animals have paired and established pack territories. As of fall of 1998, all but one (B14) of the 24 original released wolves that were still being monitored were located within public lands of central Idaho. Territories of all established packs and pairs were wholly or predominately within National Forest lands (Figure 5). Six Idaho wolf packs (Selway, Chamberlain, Thunder Mountain, Landmark, Stanley, and Twin Peaks) and the Bear Valley pair have established territories wholly or partially within federally-designated wilderness areas (Figure 5).

Pair Bonding

Wolves released in central Idaho successfully formed pair bonds relatively quickly after release (Table 2). Seventeen female wolves were released during the winters of 1995 and 1996. Most available female wolves of breeding age paired within their release year (three of six females (50%) during 1995, and six of seven (86%) during 1996. Two of eight female wolves released in 1995 did not have the opportunity to pair. B13 was shot near Salmon, Idaho, within one month of release, and contact with B03 was lost a few months after her release. All remaining six female wolves paired by March of 1996, one year following release. Two of the nine female wolves released in 1996 were pups and too young to pair. All but one of the remaining seven adults and subadults paired during their release year. By the fall of 1998, less than four years after the initial release, all of the available females translocated to central Idaho had pair bonded and formed packs.

Because wolves paired so soon after release, all pair bonds were established between wolves released during the same year. Interestingly, although some males and females released together had come from the same packs in Canada (Table 1), none of these animals paired with a 'familiar' wolf. This may have been due to the fact that most of the wolves released in Idaho were young adults of dispersal age. Of the currently-established pairs and packs, none is comprised of animals affiliated with the same source pack in Canada.

Reproduction and Pack Formation

The first litters of pups from wolves released in Idaho were produced in 1996. This marked the first known wolves born in the wilds of Idaho in over 60 years. Wolf pairs usually (82%) produced their first litter during the first full breeding season following pairing. On average, wolves produced their first litter 11 months after their first paired observation. Except for the Selway and Landmark packs, all wolf packs have successfully produced pups in successive years. Both the number of packs and number of pups produced have increased annually from 1996 to 1998 (Table 3). As of 1998, there were 12 known wolf packs in central Idaho, including 10 reproductive packs and two (Selway and Landmark) non-reproductive packs (Table 4). One additional pair, Bear Valley, has not produced pups since establishing their territory in 1996.

Minimum estimated mean litter sizes increased slightly from 1996 (3.7) to 1998 (5.2), but over the three-year period averaged 4.8 pups/pack, which was within the normal range for wolves. Three wolf packs, Chamberlain Basin, Landmark, and Selway, produced a total of 11 pups in 1996, the first year in which pups were born (Table 3). The Chamberlain Basin and Landmark packs produced pups again in 1997, as did four additional new packs, including Jureano Mountain, Kelly Creek, Moyer Basin, and Stanley Basin. These 6 packs produced a minimum of 32 wolf pups in 1997. The Selway pack did not produce in 1997 and as of 1998, had not produced pups since their initial litter of two in 1996. Except for the Landmark pack, all packs that produced pups in 1997 also produced pups in 1998. In addition, five new packs (Big Hole, Snow Peak, Thunder Mountain, Twin Peaks, and White Cloud) produced pups in 1998. The

Landmark pack alpha pair was found dead near their den site during April of 1997, before the female had given birth to her third litter. A total of 10 packs produced a minimum of 52 pups in 1998. The Chamberlain Basin pack is the only one to produce pups in all three years. This pair has produced a minimum total of 12 pups (Table 3).

Mortality

Known mortality among Idaho wolves has been lower than expected. Of the original 35 wolves released during 1995 and 1996, 24 (69%) are still alive and being monitored, 4 (11%) are unaccounted for, and only 7 (20%) deaths have been confirmed (Table 5). One additional wolf, B30 is suspected to have died when her collar went on mortality mode in December of 1998. However, at the time of this report, mortality was not confirmed and the incident was still under investigation. Considering all wolves, 15 mortalities have been documented and an additional two mortalities suspected within the Idaho Experimental Population Area since 1995. Of these, one was euthanized in captivity before release, 13 were related to released wolves and their offspring, and three were of animals relocated or dispersed on their own from Montana and Wyoming. (An additional three wolf pups relocated from a Montana pack died in captivity before release. These animals are not included in the mortality analysis because they were not part of the central Idaho population.) Numbers of deaths remained low through 1997, and a marked increase was noted in 1998. Mortalities have been evenly divided between sex and age groups. The majority (82%) of known wolf mortalities were human caused (Table 5). Illegal killing of wolves accounted for 56% of all human-caused deaths and 46% of all known wolf mortalities. The increase in overall wolf mortalities and illegal take during 1998 indicates an increasing number of human interactions with an expanding wolf population. This situation emphasizes the importance of continuing information, education, and outreach efforts.

Population Status

The Idaho wolf population has grown faster than initially anticipated. Minimum fall population estimates have increased annually from the original 35 released animals to 115 wolves and 12 packs well distributed across central Idaho (Figure 6). The number of reproductive packs and pups produced has increased each year since 1996, and the number of wolf mortalities has remained low (Table 6). The establishment of 10 breeding pairs in 1998 marked an important benchmark in the recovery process. Wolves in the northern Rocky Mountains will reach recovery levels and be considered for delisting when 10 breeding pairs have been maintained for three consecutive years in each of the three restoration areas.

In general, newly establishing packs have remained in cohesive family units. However, because of high reproductive success over the past two years, a large proportion (67%) of the population is comprised of pups and yearlings. We anticipate that many of these young wolves will leave their natal packs and disperse throughout central Idaho in the next few years.

FOOD HABITS

Summer diets of wolves were assessed by identifying hair samples in 533 wolf scats collected from the six established wolf packs in 1997. Scats were mostly collected at den and rendezvous sites from June through September. Results are presented as frequency of occurrence, indicated by the proportion of the total samples in which the prey species was detected. This analysis does not reveal the absolute importance of each prey item in wolf diets, because the biomass consumed of each prey species (how many animals eaten) is unknown. Nevertheless, it does provide a list of prey species occurring in wolf diets and identifies those that are more commonly and more rarely consumed.

Ungulates (elk, white-tailed and mule deer, and moose) composed the bulk of all wolf pack summer diets in 1997 (Table 7). Elk (53%) and deer (42%) were the most frequently detected prey item in collected scats from all packs. Moose was also detected in scats from all packs, but less frequently (19%). Most of the moose hairs identified in scats were from juveniles, indicating that wolves preyed predominantly on smaller, calves . Hair from domestic cattle was detected in only a few scat samples (1%), and at least 6% of each pack's scats contained rodent hair, most of which was identified as beaver.

Assuming that the 1997 data are representative of all of Idaho's packs, wolves in Idaho are preying mostly on large ungulates, as anticipated. The potential effects that the recovering wolf population may have on big game populations and hunter opportunity is a key concern of Idaho's outfitters and guides industry and sportspersons. Future research is needed to assess these effects. Research on the interactions of wolves with other predators and the cumulative effects on native ungulate populations will increase our understanding and contribute to effective wolf management in the future.

WOLF MANAGEMENT

Livestock Depredations

During the summer grazing season, over 80,000 cattle and 220,000 sheep graze on over four million acres of public allotments on National Forest lands within the Central Idaho Restoration Area. Most livestock grazing occurs in the southern half of the Restoration Area south of the Salmon River. Summer territories of six of the 13 wolf packs and pairs in Idaho are either completely or partially within active livestock allotments. Members of these packs frequently interact with cattle throughout the summer grazing season, which corresponds with the wolf pup rearing season. Three of these packs, Jureano Mountain, Moyer Basin, and White Cloud, were involved in confirmed livestock depredations during 1998. Continued livestock depredations by these packs and the potential for depredations by another three packs also established near active grazing allotments is a serious concern of livestock producers in those areas and has become a key management issue for the Recovery Program.

The USDA APHIS Wildlife Services (formerly Animal Damage Control) has the primary responsibility to verify reports of wolf depredations on livestock. The Nez Perce Tribe and Wildlife Services work cooperatively with livestock producers to document livestock killed by wolves and minimize losses. The Defenders of Wildlife (Defenders), a private conservation

organization, has established a Wolf Compensation Trust to provide economic incentives to promote tolerance of wolves and help reduce the economic burden of wolf recovery to livestock producers. Defenders administers this trust fund to reimburse livestock producers for verified livestock losses caused by wolves. Livestock producers are compensated full fall market value for confirmed wolf-caused losses and one half fall market value for unconfirmed but probable wolf-caused losses.

Although the number of reports of wolf depredations received by Wildlife Services in Idaho has gradually increased since wolves were released (from two in 1995 to 13 in 1998), the number of confirmed depredations has remained fairly consistent (three in 1996 to five in 1998; Table 8). On average, over the past four-year period, 59% of all reports were either confirmed or unconfirmed but probable (those cases in which wolf presence was documented but no physical evidence of killing was available). In slightly greater than 40% of all reports received, livestock losses were conclusively determined to be caused by factors other than wolves.

The first confirmed wolf-caused livestock losses occurred during the 1996 grazing season. Sheep and cattle have been the main livestock prey of wolves, and numbers lost have varied by year (Table 8). Total confirmed and unconfirmed but probable losses from 1995 to 1998 include 90 sheep (23 average per year) and 31 cattle (eight average per year). In addition, the loss of one horse was unconfirmed but probable. A marked increase in the number of cattle confirmed and suspected to have been depredated by wolves was noted in 1998. This is largely due to depredations by the Jureano Mountain and Moyer Basin packs. Both packs have established summer home sites wholly within active grazing allotments and interact with livestock throughout the summer. Although both packs have maintained territories since 1996, no confirmed livestock losses due to wolves were documented until 1998. The numbers of wolves hunting for these packs increased from two (alpha pair) during 1996 and 1997, to 7-8 in 1998. We theorize that the increased number of wolves hunting and the increased energy demands of the expanding packs may have led to increased conflicts with livestock in 1998.

During fall of 1998, increased reports of missing cattle on public grazing allotments within these two pack territories suggested that wolves may have preyed on additional livestock that were not detected. Low detectability of wolf-caused livestock losses has become a major concern of livestock producers. Livestock producers are not compensated for missing cattle. More importantly, the combined number of detected losses and missing cattle can amount to a substantial economic loss.

All but one livestock producer who suffered losses to wolves accepted reimbursement from the Defenders of Wildlife's Wolf Compensation Trust. Defenders has compensated over $14,000 for confirmed and highly probable livestock losses in Idaho from 1996 to 1998, an average of about $4,709 annually (Table 8).

Wolf Relocations

Wolves were relocated within and between restoration areas to reduce conflicts with livestock and to provide relocated wolves the greatest opportunity to contribute to recovery. As a result of

livestock depredations and/or consequent control actions in the Central Idaho Experimental Population Area, six wolves were relocated and two wolves were killed. Wolf relocations have so far been successful. In most cases where wolves were captured and relocated during management control actions, depredations on livestock were curtailed. Three wolves (B07, B11, and B20) successfully paired and formed new packs (Big Hole and Snow Peak) after they were moved. The remaining three wolves were relocated in 1998 to the Selway Bitterroot Wilderness and have not returned to areas grazed by cattle. Of the two wolves killed, one (B21) accidentally drowned during a control action and the other (a dispersing subadult from Yellowstone National Park) was legally shot while killing sheep.

During the summer of 1997, the Idaho Wolf Recovery Program received four wolf pups from Montana. Adult wolves from the Boulder Creek pack near Deer Lodge, Montana, were lethally controlled for repeated depredations on livestock. Four of their six pups were relocated to a holding facility in the Selway Bitterroot Wilderness in Idaho. The facility already held adult wolves B07 and B11 which were relocated to the enclosure after they were implicated in livestock depredations in the Big Hole county of Montana. It was hoped that the pups and adults would bond and form a new pack, and that the pups would keep the adults from straying back to the Big Hole after their release into the wild. The adult wolves did not accept the pups and killed two of them. A third pup was killed accidentally during capture. The remaining male pup (B43) was released into the wild during spring of 1997 and survived until he was shot by a hunter in fall of 1998.

FUTURE OUTLOOK

Restoration of wolves to the northern Rocky Mountains is quickly being recognized as one of the great conservation achievements of the century. Long-term recovery of wolves in central Idaho is predicated on balancing both the biological needs of wolves and sociopolitical concerns of Idahoans. Because reintroduction of a wolf population had never been attempted before, the central Idaho and GYA recovery programs were initiated with anxiety and uncertainty about the challenges that wolves and the public faced. Four years after initial releases, it is now clear that wolves have overcome the biological challenges to recovery and are successfully recolonizing central Idaho. From a biological perspective, wolves are recovering faster than anticipated by the USFWS (Table 9). Wolves have survived longer, established more packs, and produced more pups than projected for this point in time, despite fewer wolves translocated from Canada than planned. In 1998, the fourth year after initial releases, the wolf population has attained a recovery benchmark of 10 breeding pairs.

To date, the Idaho Wolf Recovery Program has focused on biological considerations by monitoring the wolves' response to translocation and tracking their progress towards recovery. It is now clear that, given the chance, wolves will recover in central Idaho. It is also clear that long-term persistence of wolves will depend more on social values and the level of acceptance of wolves especially by rural communities near occupied wolf range. Two important wolf management concerns are the effects of wolves on livestock, and big game populations and hunter opportunities. As we enter this new phase of recovery, the Idaho Wolf Recovery Program will focus on working with rural communities to foster an acceptance of wolves. The geographic

distribution of wolves in relation to livestock and big game herds, the continued ability of the Recovery Program to address the concerns of livestock producers and outfitters, and the tolerance afforded wolves by Idahoans will ultimately determine the long-term recovery of wolves in Idaho.

IDAHO WOLF PACKS AND PAIRS

Bear Valley Pair

The Bear Valley pair established their home range in the high meadow complex of Bear Valley, just northwest or Stanley, Idaho. Their territory is wholly encompassed by the Boise National Forest. Although their territory is mostly remote and contains few roads, portions are grazed by cattle and sheep and the area receives high recreational use during the summer. This pair is bordered to the north by the Landmark pack, and to the east by the Stanley Basin pack. The Bear Valley pair originated as a group of three wolves (the Bear Valley trio) including male wolves B19 and B28, and female wolf B30. This trio formed in May of 1996, shortly after their release at Dagger Falls, and remained together for almost two years. In April of 1998, this trio traveled into the heart of the Landmark pack's territory. This was the first documented trespass between any established packs. The Bear Valley trio remained in the Landmark pack's territory for over a month and then returned south to their own territory. Shortly after their return the Landmark pack alpha male and female were discovered dead. There was no evidence of interpack aggression when the alpha female was examined. Shortly after the Bear Valley trio returned to their own territory, B19 left the group and is now thought to be paired, possibly with a subadult female from the Landmark pack. B19 is now attempting to establish his own territory on the east side of the Middle Fork of the Salmon River between four established packs. Interestingly, the Bear Valley pair expanded their territory northward to include the southern end of the Landmark pack's territory, subsequent to the deaths of the Landmark alpha pair, and occupied this new area continuously through the summer of 1998. Curiously, the Bear Valley pair is the only pair of wolves that has not produced a litter of pups, despite being together for the last two breeding seasons. During December of 1998, the radio collar of B30 went on mortality mode. The incident is currently under investigation and at the time of this report, the status of this pair is uncertain.

Big Hole

The alpha pair of this pack, male wolf B07 and female wolf B11, were both released at Dagger Falls in 1996. They pair bonded in March of 1996 and established their initial territory in the Big Hole country of northwestern Montana. This is the only wolf pair to establish a territory outside of the Central Idaho Restoration Area, as well as the only pack territory to include a substantial amount of private property. Their territory was situated along the edge of National Forest lands and was proportioned about evenly between the forested foothills of the Beaverhead National Forest and open sage and pasture of private ranch lands. This area is heavily grazed by livestock, and during the fall of 1996 this pair was implicated in cattle depredations. Attempts to capture and relocate the pair were only partially successful. The female was relocated to the Selway Bitterroot Wilderness, while the male eluded capture. Within two weeks after the female was relocated, she found her way back to her mate in the Big Hole, crossing two major river drainages and traveling a straight line distance of over 140 miles (225 km). A second attempt to capture and relocate the pair that winter was successful and the pair was placed in a holding facility in the Selway Bitterroot Wilderness. Shortly thereafter, however, the male escaped by jumping over the 11 foot fence of the enclosure. After spending over a week around the facility,

he eventually returned to their territory in the Big Hole in March of 1997. During April of 1997, the male was observed in close proximity to cattle once again and for conservation reasons, was again captured and reunited with his mate in the modified enclosure. Four wolf pups from the Boulder Creek pack in Montana (see ***Wolf Relocations*** section) were placed in the Selway Bitterroot enclosure in hopes that the Big Hole pair would adopt these pups. Unfortunately, B07 and B11 did not accept the pups, and were released on their own in August of 1997 within the North Fork of the Clearwater River drainage. The Big Hole pair established a new territory along the Bitterroot Divide just south of Lolo Pass. After several years of struggle, conservation efforts appear to have paid off -- the Big Hole pack produced their first litter of 5 pups in 1998. Their new territory is predominantly public lands administered by the Clearwater and Lolo national forests. Although cattle graze portions of their territory, the Big Hole pack has not depredated on livestock. The saga of the Big Hole pack is one of the many success stories of the Idaho recovery effort.

Chamberlain Basin

Alpha pair B09 (male) and B16 (female) have occupied an established territory in Chamberlain Basin within the Payette National Forest since pairing in 1995. Their territory is wholly contained within the Frank Church River-of-No-Return Wilderness. The Chamberlain Basin pack is situated between the Selway pack to the north, Thunder Mountain Pack to the south, and Jureano Mountain and Moyer Basin packs to the east. This pack is one of the three packs that first produced pups in Idaho, and the only pack to successfully produce pups for three consecutive years. Although this pack appears to have used different den sites each year, denning has occurred in the same general area within their home range. This pack consists of as many as 13 wolves, although we suspect that some of the subadult wolves from early litters may have dispersed. One pup born during the spring of 1998 was shot that fall during hunting seson.

Jureano Mountain

Alpha pair B32 (male) and B25 (female) were released and paired in 1996. They established a territory east of Salmon, Idaho, and have produced litters for the last two years. This pack used two different den sites on extreme opposite ends of their territory. While located within the Salmon National Forest, the territory is close to the boundary between Forest and private lands. During the summer, this pack's territory overlaps with two active Forest Service livestock allotments. During the summer, over 900 cow-calf pairs (1,800 head) graze these two allotments. Members of the Jureano Mountain pack interact with these cattle on a daily basis throughout the summer grazing season. The pack was first documented to have depredated on cattle during the 1998 grazing season, although the extent of livestock losses was difficult to determine. This pack was reduced in size during 1998, resulting from natural dynamics and human intervention. Two subadults were relocated to the Selway Bitterroot Wilderness as a result of control actions. Two of the estimated 4 pups produced in 1998 died, and up to two yearling subadults dispersed. This was the first documented dispersal from an Idaho wolf pack. One of the dispersers was subsequently struck and killed by a vehicle 100 miles (161 km) north of its home range. Pack size is now estimated at six. The potential for livestock loss from this pack and the neighboring Moyer Basin pack to the south has become a key management concern for the Recovery Program.

Kelly Creek

Female wolf B15 was released in 1995 and was the first wolf to establish a territory north of the Lochsa River. She mated with male wolf 9013 in 1996. Wolf 9013 was originally captured and collared in Glacier National Park, Montana, in 1990. He dispersed to the Ninemile area outside of Missoula, Montana, in 1991. In 1992 he established a territory in the Kelly Creek drainage along the Bitterroot Divide between Idaho and Montana. B15 and 9013 have produce litters of pups for the past two years, using the same den site. This was the first documented case of a released wolf mating with a naturally dispersing wolf. This pack's territory is situated in undeveloped, largely roadless portions of the Clearwater and Lolo national forests. The area is remote and rugged, is not grazed, and receives frequent summer recreational use.

Landmark

Male wolf B08 and female wolf B06 were released and paired in 1995. They were one of the first three packs to produce litters in Idaho. They produced pups in both 1996 and 1997 using the same den site. This site was to be used again in 1998, but both B06 and B08 were found dead in April of that year before their third litter had been born. The cause of death is unknown. Since these two animals were the only radio collared wolves in the Landmark pack, the current status of this pack is unknown. The Landmark pack's territory lies between the Jureano Mountain and Moyer Basin packs to the east across the Middle Fork of the Salmon River, the Bear Valley pair to the south, and the Thunder Mountain pack to the north. The southern portion of their territory has been used consistently by the Bear Valley pair since the summer of 1998.

Moyer Basin

The Moyer Basin pack shares many similarities with the Jureano Mountain pack. The Moyer Basin pack's territory is adjacent and to the south of the Jureano Mountain pack. Both packs have established territories on the eastern side of the Salmon National Forest and both territories border the boundary between public and private lands. Like the Jureano Mountain pack, alpha wolves B29 and B37 were released, paired, and established their territory in 1996. They have produced litters of pups for the past two years. The Moyer Basin pack's territory overlaps three National Forest grazing allotments, and pack members were involved in confirmed livestock depredations in 1998. One subadult member of this pack was captured and relocated to the Selway Bitterroot Wilderness during a control action to mitigate further livestock losses.

Selway

The Selway alpha male B05 and female B10 were one of the three initial breeding pairs in Idaho. Their territory is within the Selway Bitterroot Wilderness and includes high elevation mountainous country between the Main Salmon and Selway rivers. Their territory includes public lands within the Bitterroot and Nez Perce national forests and is the largest of any established wolf pack in Idaho; encompassing 695 square miles (1,800 km^2). This pack has not produced pups since their initial litter of two in 1996.

Snow Peak

Although alpha wolves B31 (male) and B20 (female) were both released in 1996, they did not pair and produce offspring until 1998. Female wolf B20 initially paired with male wolf B24 in 1996. They were in the process of establishing a territory north of McCall, Idaho, when they depredated on sheep grazing on a public Forest Service allotment. B20 was captured and relocated to the Selway Bitterroot Wilderness Area, but attempts to capture and reunite B24 were unsuccessful. Male wolf B31 traveled widely throughout central Idaho as a lone male. During the summer of 1997, B31 was also implicated in depredations, ironically on sheep in the same Forest Service allotment as B20 the summer before. Attempts to capture and relocate B31 were unsuccessful. B20 and B31 were discovered paired during the 1998 breeding season. They established a territory along the Bitterroot Divide between Idaho and Montana centered around the headwaters of the St. Joe River, and produced their first litter of 5 pups that year. This is the northernmost established wolf pack in Idaho. The area is within the Clearwater and Idaho Panhandle national forests and is mostly roadless, remote, and undeveloped mountainous country. There is no livestock grazing in this area.

Stanley Basin

The Stanley Basin pack is one of the largest packs in Idaho, composed of an estimated 14 wolves. Alpha wolves B27 (male) and B23 (female) were released and paired in 1996 and have produced litters of pups for the past two years. Their territory is centered around Stanley Basin near Stanley, Idaho, and lies mostly within the Sawtooth National Recreation Area administered by the Sawtooth National Forest. The northern portion of their territory lies within the Salmon-Challis National Forest and the Frank Church River-of-No-Return Wilderness. This pack is unique among Idaho wolf packs in that their territory includes private inholdings within the Recreational Area. Although cattle and sheep graze both private and public allotments within this pack's territory, no livestock depredations have been documented. This pack is situated between the Twin Peaks pack to the north, White Cloud pack to the east, and Bear Valley pair and Landmark packs to the west.

Thunder Mountain

Female wolf B22 was released in 1996 and was first suspected to have paired in December of her release year when she was observed from the air during a monitoring flight with a large black wolf of unknown origin. Her mate is probably a naturally-occurring wolf or a released wolf whose radio collar has failed. Although she established a territory in 1997 and was observed with her mate on several occasions, the pair did not produce their first litter of pups until 1998. The Thunder Mountain pack's territory is situated on the Payette National Forest in the heart of the Frank Church River-of-No-Return Wilderness Area. This pack is bordered by the Chamberlain pack to the north, Jureano Mountain and Moyer Basin packs to the east and across the Middle Fork of the Salmon River, and the Landmark pack to the south.

Twin Peaks

Alpha pair B18 (male) and B35 (female) were released in 1996. B35 was a pup at the time of her release and the sibling of male wolf B34 captured from the Petrie pack in Canada. These two wolves spent most of 1996 together and/or with adult female B36, who was also a member of the Petrie pack. B35 paired with lone male wolf B18 in 1997 when she was about two years of age. They produced their first litter of three pups in 1998. The Twin Peaks territory is situated within the Salmon-Challis National Forest and the Frank Church River-of-No-Return Wilderness. It lies between the Moyer Basin pack to the north, the Stanley Basin pack to the south, and the Landmark pack to the west across the Middle Fork of the Salmon River.

White Cloud

Alpha female wolf B36 was released in 1996 along with three other members of her Canadian Petrie pack. She spent most of her release year loosely associated with B34 and B35, two pups of the Petrie pack. During 1997 she traveled alone extensively outside of the Central Idaho Restoration Area east of the Salmon River near the town of Salmon, Idaho. She paired with an uncollared male wolf in early 1998. The identity of her mate remains uncertain and may be either a naturally-occurring wolf or possibly a dispersing yearling wolf from either the Landmark or Chamberlain packs. The White Cloud Pack produced their first litter of 9 pups in 1998, the largest documented litter size in Idaho. This pack's territory is situated in the Boulder and White Cloud Mountains just east of Stanley, Idaho. The area has few roads and is mostly remote, rugged, mountainous terrain. Portions of their home range are grazed by cattle and sheep. The White Cloud pack was involved in a sheep depredation during the 1998 grazing season. A control action was implemented, but no wolves were captured because the pack moved on into inaccessible country and no further depredations occurred.

FIGURE AND TABLE TITLES.

Figure 1. Central Idaho and Greater Yellowstone gray wolf restoration (shaded) and experimental population areas.

Figure 2. Rate-of-movement index for gray wolves in central Idaho during the first six months after release, 1995. Calculated from distance between consecutive locations over time based on 326 locations of 15 wolves.

Figure 3. Average bimonthly distance from release site of wolves released in central Idaho in 1995 and 1996.

Figure 4. Comparison of areas used by wolves B18 (male) and B35 (female) before and after pairing. This illustrates the typical pattern for released wolves in Idaho as they paired and established home ranges.

Figure 5. Locations of central Idaho wolf packs and pairs in relation to wilderness areas and other national forest lands, 1998.

Figure 6. Minimum fall estimates of numbers of wolves in the Central Idaho Restoration Area, 1995-1998.

Table 1. Canadian wolves translocated to central Idaho in 1995 and 1996.

Table 2. Pair bonding success of breeding-age female wolves translocated to central Idaho, 1995-1998.

Table 3. Estimated numbers of pups produced and mean litter sizes of wolves translocated to central Idaho, 1995-1998.

Table 4. Status of known wolf packs and pairs in the Idaho Experimental Population Area as of January 1999.

Table 5. Known and suspected wolf mortalities in the Central Idaho Experimental Population Area, 1995-1998.

Table 6. Number of packs, minimum number of pups produced, documented and suspected mortalities, and fall population estimates for wolves translocated to the Central Idaho Restoration Area, 1995-1998.

Table 7. Prey species identified in summer scats of wolves in central Idaho, 1997.

Table 8. Number of reports, livestock losses, and compensation for wolf depredations in central Idaho, 1995-1998.

Table 9. Projected and actual recovery benchmarks four years after initial release of translocated wolves in the Central Idaho Restoration Area, 1995-1998.