2015 IDAHO WOLF MONITORING PROGRESS REPORT

Photo by IDFG

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EXECUTIVE SUMMARY

At the end of 2015, Idaho's wolf population remained well-distributed and well above population minimums required under Idaho's 2002 Wolf Conservation and Management Plan.

Wolves range in Idaho from the Canadian border south to the Snake River Plain, and from the Washington and Oregon borders east to the Montana and Wyoming borders. Dispersing wolves are reported in previously unoccupied areas.

The year-end population for documented packs, other documented groups not qualifying as packs and lone wolves was estimated at 786 wolves.

Biologists documented 108 packs within the state at the end of 2015. In addition, there were 20 documented border packs counted by Montana, Wyoming, and Washington that had established territories overlapping the Idaho state boundary. Additional packs are suspected but not included due to lack of documentation. Mean pack size was 6.4 wolves, nearly identical to the 2014 average of 6.5.

Reproduction (production of at least 1 pup) was documented in 69 packs, representing the minimum number of reproductive packs extant in the state.

Determination of breeding pair status was made for 53 packs at year's end. Of these, 33 packs (62%) met breeding pair criteria, and 20 packs did not. No determination of breeding pair status was made for the remaining 55 packs.

Mortalities of 358 wolves were documented in Idaho in 2015, and remained essentially unchanged from 2014 (n = 360). Human-caused mortality accounted for 352 of 354 (99%) wolf mortalities during 2015 where cause of death could be determined. Legal harvest was 256, identical to that for 2014.

Seventy-five wolves were lethally controlled in 2015, identical to the previous 5-year average. Fifty-four of 75 wolves lethally controlled were removed in response to livestock depredations, or were killed by livestock producers/landowners in defense of property. The remaining 21 wolves lethally controlled were taken in a portion of northern Idaho to mitigate impacts of wolf predation on ungulate populations.

Four wolf mortalities were attributed to unknown causes and two were attributed to natural causes.

USDA APHIS Wildlife Services agents classified 35 cattle, 125 sheep, 3 dogs, and 1 horse as confirmed wolf depredations in 2015. Nine cattle and 9 sheep were classified as probable wolf depredations.

ACKNOWLEDGEMENTS

Wolf monitoring and management in Idaho is a cooperative effort between the State of Idaho, Nez Perce Tribe, USDA APHIS Wildlife Services, and the U.S. Fish and Wildlife Service. Dustin Miller and Jon Beals, Governor's Office of Species Conservation, provided valuable administrative support. Todd Grimm, George Graves, and all USDA APHIS Wildlife Services field personnel worked to resolve wolf-livestock conflicts. U.S. Fish and Wildlife Service personnel Mike Jimenez, Hilary Cooley, and Mike Carrier provided support and assistance with wolf monitoring.

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We would like to extend our thanks to the multitude of IDFG employees that assisted in deploying and maintaining trail cameras across the state to facilitate increased wolf monitoring efforts during 2015.

Thanks go out to Curt Mack and Josh Irving, Nez Perce Tribe Wolf Recovery Project; the wildlife management agencies of the states of Montana, Oregon, Washington, and Wyoming, and their respective wolf staffs; Dr. Lisette Waits and Dr. Jennifer Adams, University of Idaho Laboratory for Ecological, Evolutionary and Conservation Genetics; Lindsey Rich, Virginia Tech; Dr. Dan Savage; Dr. Barrett Edgren; Cam Heusser and Nate Albrecht, Coeur d'Alene Tribe; Pete Gardner, Owyhee Air Research; Trent Brown, Quicksilver Air; Mike Feiger and Scott Bodle, U.S. Forest Service; Mike McGee, Bureau of Land Management; and Jared Hedelius and Brandon Klinger, USDA APHIS Wildlife Services.

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INTRODUCTION

Gray wolves (*Canis lupus*) were listed as an endangered species in 1974, and a subsequent recovery plan established 3 wolf recovery areas (Northwest Montana [NWMT], Central Idaho [CID], and Greater Yellowstone [GYA]; Figure 1) across the Northern Rocky Mountain (NRM) states of Idaho, Montana, and Wyoming (USFWS 1987). During 1986, an active gray wolf den was documented near Glacier National Park, Montana. This den was the result of natural dispersal from Canada and was the first wolf den in the Rocky Mountains since at least the 1930s (Ream et al. 1989). The recovery plan recommended relying on natural dispersal to colonize the CID and NWMT Recovery Areas while transplanting wolves from Canada into the GYA Recovery Area (USFWS 1987).

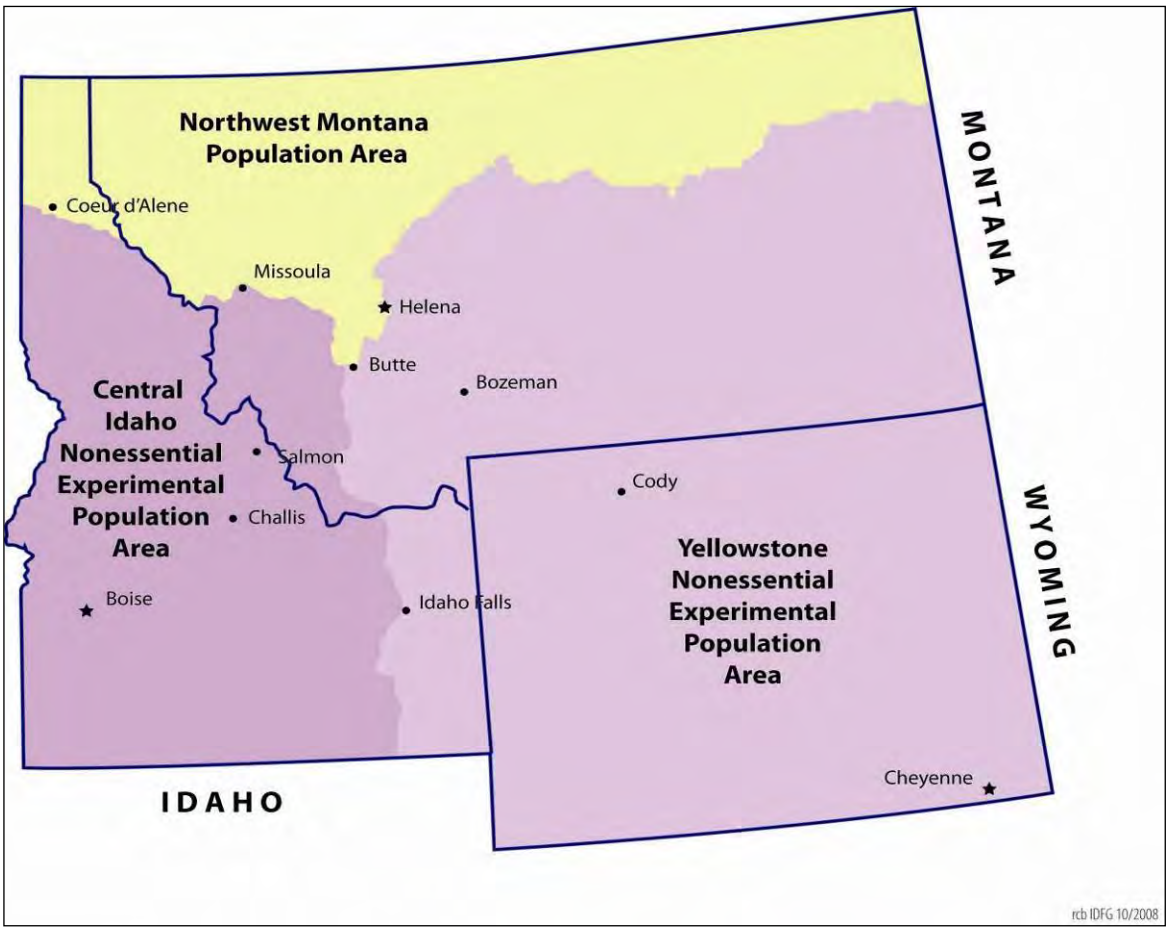

Figure 1. Recovery areas established by the U.S. Fish and Wildlife Service to restore gray wolf populations in the northern Rocky Mountains of Idaho, Montana, and Wyoming (USFWS 1994).

By 1994, approximately 48 wolves inhabited northwestern Montana (Montana Fish, Wildlife and Parks 2015). In the Wolf Recovery Environmental Impact Statement, the U.S. Fish and Wildlife Service (USFWS) recommended wolf translocations into the CID Recovery Area in addition to the GYA Recovery Area to speed recovery (USFWS 1994).

The USFWS released 35 wolves in the CID Recovery Area and 31 wolves in the GYA Recovery Area during winters of 1995 and 1996. Established recovery goals (300 wolves and 30 breeding pairs equitably distributed across the 3 Recovery Areas for 3 successive years) were met in the NRM states in 2002.

During March 2002, the Idaho Legislature adopted the *Idaho Wolf Conservation and Management Plan* (Idaho Legislative Wolf Oversight Committee 2002). The USFWS approved the 2002 wolf plan in January 2004.

The State of Idaho became the designated agent of the USFWS in January 2006, and assumed day-to-day monitoring and management authority for wolves in Idaho.

During February 2007, the USFWS initiated the process to delist wolves by creating an NRM Distinct Population Segment (DPS; Figure 2) and published the delisting proposal in the Federal Register (USFWS 2007). The NRM DPS included all of Idaho, Montana, and Wyoming, eastern portions of Washington and Oregon, and a small part of northern Utah.

The delisting rule became final in March 2008 (USFWS 2008) and the State of Idaho assumed full management responsibility for wolves. Delisting was challenged in federal court by a coalition of groups and in July 2008, a ruling returned Endangered Species Act (ESA) protections to wolves in the NRM DPS. The State of Idaho continued as the designated agent.

The USFWS published a second delisting rule in the Federal Register in January 2009. This delisting proposal was finalized in May 2009 (USFWS 2009) and the State of Idaho again assumed full management responsibility for wolves. Idaho held its first regulated wolf hunting season from fall 2009 through spring 2010.

The 2009 delisting rule was also challenged in federal court. A federal judge ordered in August 2010 that the 2009 rule be vacated, which restored ESA protections to wolves (USFWS 2010). Subsequently, 15 April 2011, President Obama signed the 2011 federal appropriations bill that included language that directed the Secretary of the Interior to reissue the 2009 delisting rule. As a result of this action, wolves were again delisted in Idaho, Montana, eastern Washington, eastern Oregon, and north-central Utah. Wolf management responsibility returned to the State of Idaho on 5 May 2011.

For a more comprehensive chronology of events related to wolf recovery, conservation, and management in Idaho and the NRM, see:
http://fishandgame.idaho.gov/public/wildlife/wolves/?getPage=161

Figure 2. Northern Rocky Mountain Gray Wolf Distinct Population Segment boundaries established by the U.S. Fish and Wildlife Service.

Wolf monitoring and management activities have been reported by Wolf Management Zone (WMZ or Zone) since 2008. The Idaho Department of Fish and Game (IDFG) divided the Southern Mountains Zone into 2 zones in 2011 (Southern Mountains, Beaverhead) and the Upper Snake Zone was renamed the Island Park Zone. There are currently 13 WMZs (Figure 3).

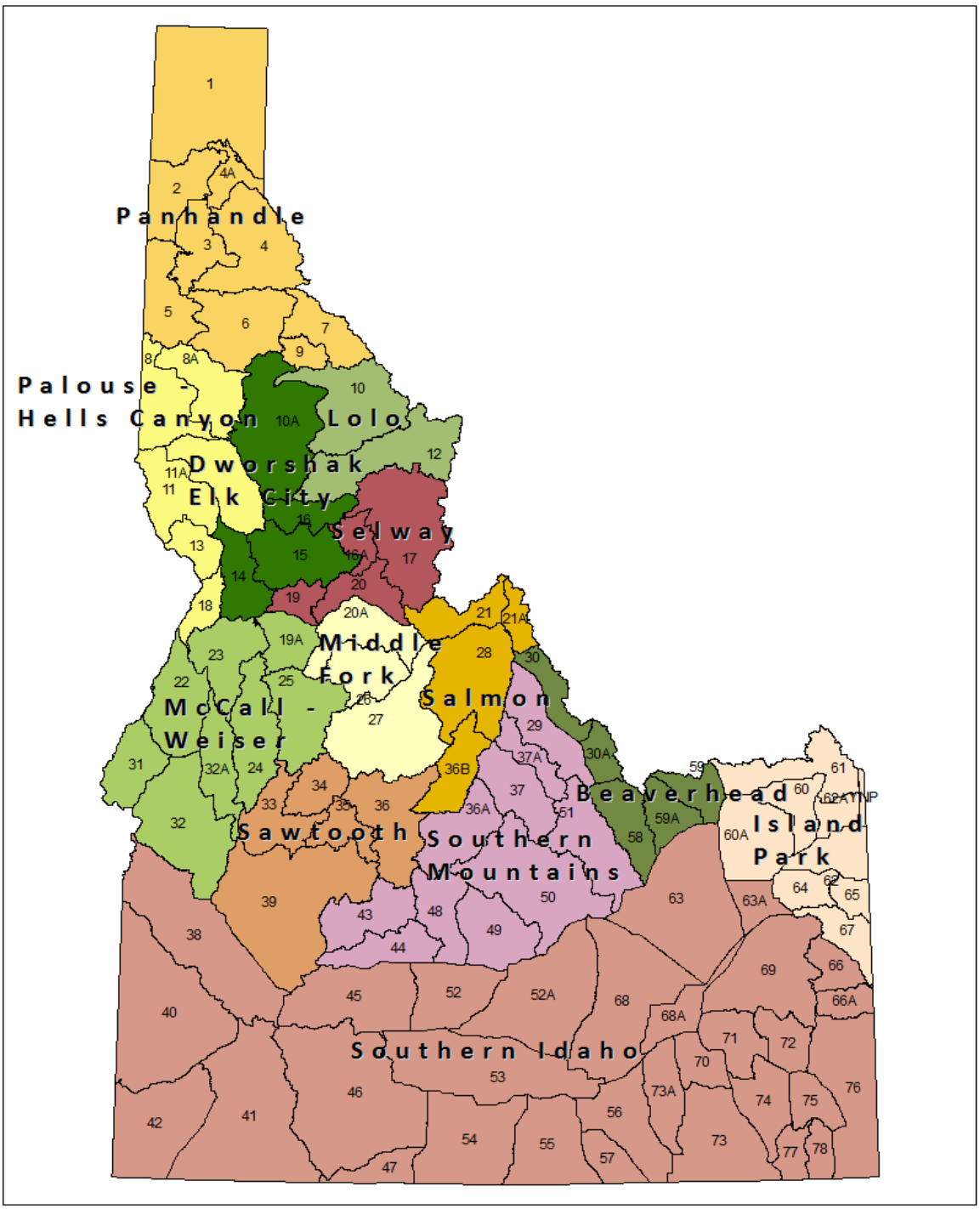

Figure 3. Idaho Wolf Management Zones.

STATEWIDE SUMMARY

Idaho has a diverse landscape comprised of large expanses of varied habitats which support populations of elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), moose (*Alces alces*), and other wolf prey species. Central Idaho includes 3 contiguous wilderness areas: the Selway-Bitterroot, Frank Church-River of No Return, and Gospel Hump Wildernesses. These wilderness areas encompass almost 4 million acres (1.6 million ha), the largest block of wilderness in the lower 48 states. Outside of wilderness areas, land ownership and human use patterns result in varying levels of potential human conflict with wolves. Southern Idaho includes the vast Snake River Plain, which is predominantly private agricultural land and also contains most of Idaho's urban centers. Three major mountain chains and 2 large river systems intersect these very different landscapes, many of which are managed for multiple uses. A moisture gradient also influences habitats of both wolves and their prey, with maritime climates in the north supporting western red cedar-western hemlock (*Thuja plicata*, *Tsuga heterophylla*) vegetation types, transitioning into continental climates of Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) to the south. Elevations vary from 1,500 feet (457 m) to just over 12,000 feet (3,657 m). Annual precipitation across the state varies from less than 8 inches (20 cm) to almost 100 inches (254 cm).

Wolf Population Monitoring

Information presented in this report was obtained primarily from a concerted undertaking by State and Tribal biologists collecting important demographic information (reproduction, mortality, pack size, breeding pair status, etc.) through intensive field surveys, capture and radiocollaring, and year-round monitoring. During 2015, more than 9,600 camera-trap nights of effort were expended to help determine pack presence, size, and composition.

Public sightings and confirmed depredations also facilitated the confirmation of wolf activity by directing agency personnel efforts to areas in need of further investigation. During 2015, 124 wolf observations were reported through the IDFG online wolf reporting system. Utilized in a patch occupancy modeling framework, wolf observations from hunters afield have proven to be a reliable means of enumerating wolf packs (Ausband et al. 2014).

Data collected from harvested wolves have provided confirmation of pack presence, particularly useful for remote areas where traditional monitoring methods were not feasible due to access difficulties. DNA sampling (tissue or scat) has provided information on summer pack sizes, verification of reproduction, apparent survival, and other relevant demographic information.

Because the amount of effort has varied annually over the past 21 years, and because not all areas are accessed equally across years, caution should be maintained in interpreting differences from year to year in documented wolf numbers and breeding pairs.

<u>Population status</u>

The year-end estimate for documented packs, other documented groups of wolves, and associated lone wolves was 786 (Figure 4, and see Appendix A)--well above the minimum of

150 wolves required in the 2009 delisting rule (USFWS 2009). Based on additional data collected during 2015, the 2014 population estimate for documented packs, other documented groups, and lone wolves was revised from 770 to 785 wolves.

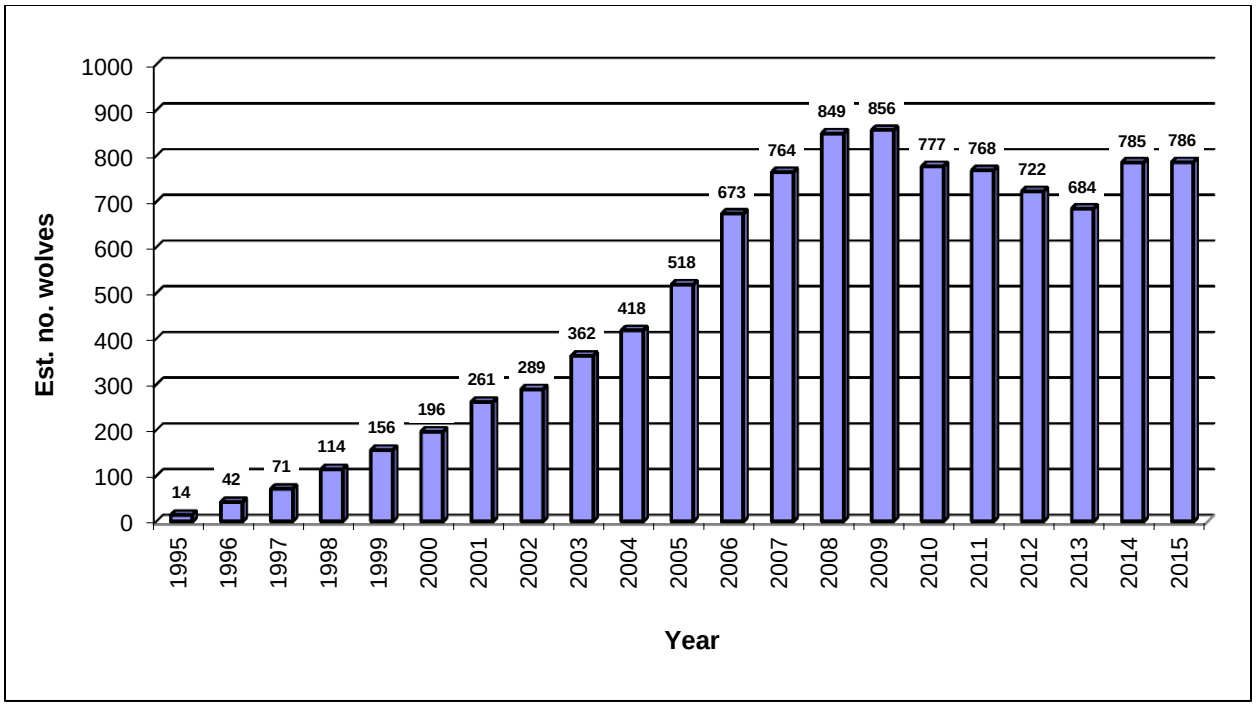

Figure 4. Estimated number of wolves in documented packs, other documented groups, and lone wolves in Idaho at year-end, 1995-2015. Annual numbers were based on best information available and were retroactively updated as new information was obtained. See Appendix A for methodology.

Number of packs documented

During 2015, 124 Idaho wolf packs were documented at some point during the year. The number of packs documented year-end was 108 (Table 1; Figure 5). Sixteen new packs were documented during 2015 and 2 previously dropped packs were reinstated. Sixteen documented packs were dropped by the end of the year because either there was no more than 1 wolf left in the pack, or there was a lack of documentation spanning the previous two years that the pack remained extant. Three border packs previously attributed to adjacent states were counted by Idaho in 2015 based on evidence these packs denned in Idaho (Diamond, Lost, Lost Peak). One border pack previously attributed to Idaho was counted by Montana in 2015 (Four Eyes).

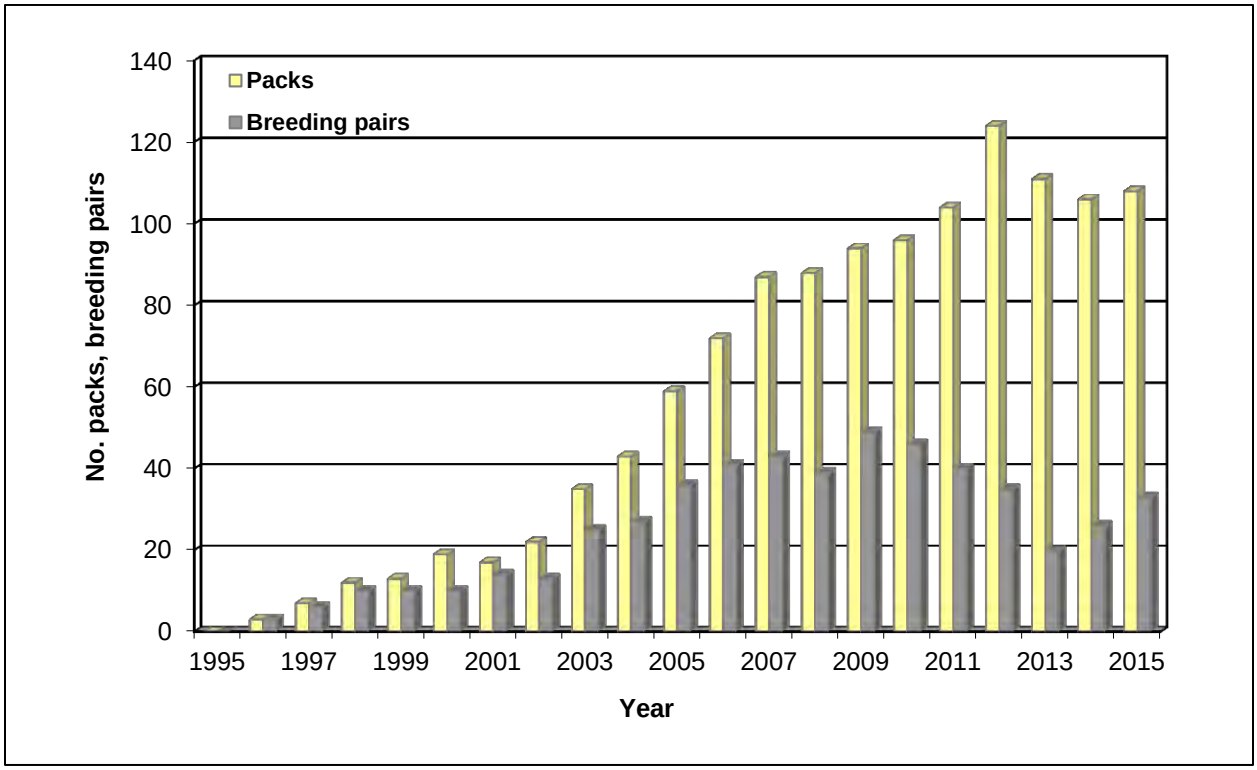

Figure 5. Number of documented wolf packs and documented breeding pairs in Idaho, 1995-2015. Annual numbers were based on best information available and were retroactively updated as new information was obtained.

Table 1. [JS1]Number of wolves detected, documented packs, and other documented wolf groups, pack reproductive status, known dispersal, documented mortality by cause, and wolf-caused depredations within Idaho Wolf Management Zones, 2015.

	Panhandle	Palouse-Hells Canyon	Dworshak-Elk City	Lolo	Selway	McCall-Weiser	Middle Fork	Salmon	Sawtooth	Southern Mtns	Beaver-head	Island Park	Southern Idaho	Total
Minimum number wolves detected[a]	70	0	35	35	5	34	16	84	71	30	4	7	6	397
Documented packs														
No. during year	25	4	17	7	6	14	6	13	13	9	2	6	2	124
No. dropped	4	3	1	1	0	1	1	2	0	1	0	1	1	16
No. at end of year[b]	21	1	16	6	6	13	5	11	13	8	2	5	1	108
Other documented groups[c]														
No. during year	4	0	1	9	0	1	1	2	1	3	0	0	0	22
No. dropped	0	0	1	6	0	1	1	0	0	2	0	0	0	11
No. at end of year	4	0	0	3	0	0	0	2	1	1	0	0	0	11
Reproductive status														
Minimum no. pups produced(died)	55(14)	2	38(13)	5(1)	6(3)	13(5)	5(1)	39(7)	47(9)	12(6)	1	5(2)	3	231(61)
No. of reproductive packs detected	16	1	11	2	2	8	2	10	9	4	1	2	1	-69
No. of breeding pairs[d]	8	0	4	1	1	2	1	5	7	2	0	1	1	33
Known dispersal	4	0	2	0	0	1	0	2	2	1	0	0	0	12
Documented mortalities														
Natural	0	0	1	0	0	0	0	0	0	1	0	0	0	2
Control[e]	3	0	14	19	0	11	0	0	3	19	0	6	0	75
Harvest	88	1	47	23	15	14	12	26	7	12	3	8	0	256
Other human-caused[f]	6	1	0	0	0	1	0	1	5	5	1	1	0	21
Unknown	1	0	1	0	0	0	0	1	1	0	0	0	0	4
Total mortalities	98	2	63	42	15	26	12	28	16	37	4	15	0	358
Confirmed (probable) wolf-caused losses														
Cattle	0(1)	1(1)	4(4)	0	0	13(2)	0	2	2	9(1)	1	3	0	35(9)
Sheep	0	0	0	0	0	13(8)	0	0	56	5(1)	0	51	0	125(9)
Dogs	0	0	0	0	0	0	0	0	0	1	0	2	0	3
Other	0	0	0	0	0	1	0	0	0	0	0	0	0	1

[a] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year data. Summing this row does not equate to the number of wolves present in the population.

[b] Number remaining extant at end of 2015 after subtracting those dropped via harvest, agency control, other human-related, or natural causes, and those dropped due to lack of verified evidence for the preceding 2 years.

[c] Other documented wolf groups include known and suspected mated pairs or verified groups of wolves that do not meet Idaho's definition of a documented pack.

Table 1. Continued.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."
[e] Includes agency lethal control and legal or State-authorized take by landowners.
[f] Includes all other human-related deaths exclusive of control and harvest.

Of the 16 newly documented packs, 2 packs were retroactively added to 2014 totals based on evidence of multiple adults or reproductive confirmation via harvested pups (typically from tooth cementum results) from the 2014 litter-year (Gabes Bathtub, Donnelly). Additionally, 2 packs reinstated in 2015 were retroactively added to 2014 totals based on confirmation of pack persistence (Cobalt, Pleasant Valley). Two packs (Little Bear, Red Ives) were retroactively dropped from 2014 totals when new location data confirmed adjacent documented packs (Hoodoo and Lost Peak, respectively) accounted for the documented activity. The revised number of packs for 2014 is 106.

Pack size

Mean observed pack size at the end of December 2015 was 6.4 wolves per pack (n = 41), nearly identical to the 2014 average of 6.5 wolves per pack, and substantially lower than the pre-harvest average of 8.1 wolves per pack (2005-2008 average).

Reproduction

Sixty-nine packs were confirmed to have produced a minimum of 231 pups, with litter sizes ranging from 2 to 8 pups. The mean litter size for 2015 was 4.6 pups (n = 35), similar to previous years.

Breeding pair criteria

Under the federal definition, a pack meeting breeding pair criteria consists of "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth" (USFWS 2009).

Determination of breeding pair status was made for 53 packs still extant at year-end. Of these, 33 packs (62%) met breeding pair criteria at the end of 2015 (Table 1; Figure 5), and 20 packs did not. No determination of breeding pair status was made for the remaining 55 packs.

Distribution

Wolf distribution was assessed directly through monitoring radiocollared wolves, field investigations, and wolf observation reports received from the public. We monitored 140 radiocollared wolves at least once during 2015 that originated from, or had established residence within Idaho, including 92 wolves captured and radiomarked during the year.

Wolves were distributed across the state from the Canadian border, south to the Snake River Plain, and from the Washington and Oregon borders east to the Montana and Wyoming borders (Figure 6). Territories of most wolf packs were predominantly on public lands managed by the U.S. Forest Service (USFS).

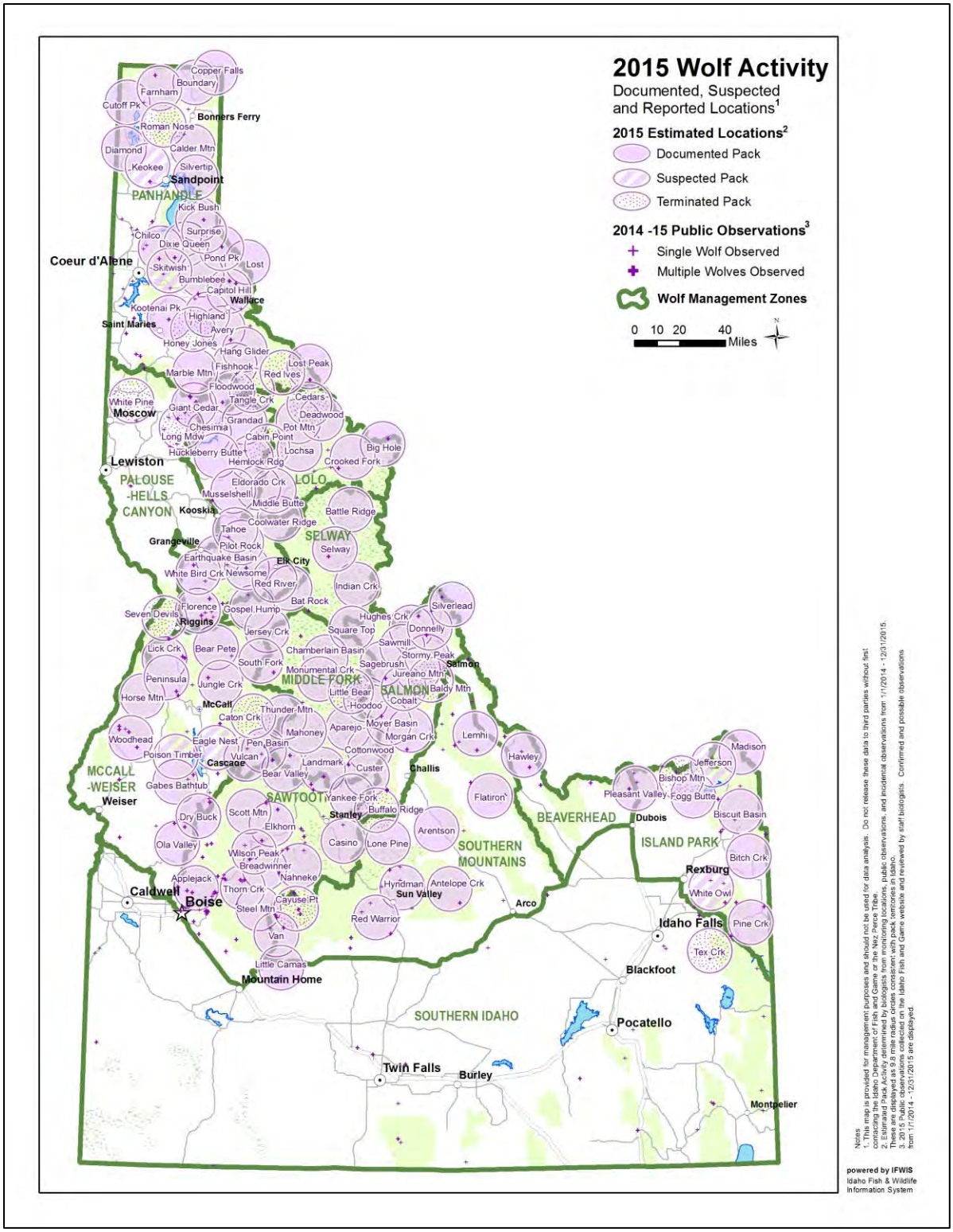

Figure 6. Distribution of documented and suspected wolf packs in Idaho, 2015.

Occupancy modeling provides a useful methodology for estimating distribution using multiple survey methods in a robust sampling design while accounting for false positive reports (MacKenzie et al. 2002). Occupancy modeling results lag by one year and the following are results for 2014. To further evaluate distribution of wolves in Idaho during 2014, a single-season occupancy model was developed using hunter observations (n = 2,492) and radiotelemetry data (n = 33 packs) with 6 covariates: forest cover, slope, antlered elk harvest density, hunter effort, sampling month, and proportion of cell in Idaho. Using this model, an estimated 50.2% of Idaho (108,482 km^2) was used by groups or packs of 2+ wolves during fall 2014.

The 2014 distribution of wolves in Idaho estimated through occupancy modeling was greater than that predicted by available high quality wolf habitat (50% probability of occupancy; 72,011 km^2) and includes more area than modeled at a 10% or greater probability of occupancy (88,669 km^2; Oakleaf et al. 2006).

Mortality

These mortality figures are intended to demonstrate patterns in known mortality, and do not represent all mortality.

We documented 358 wolf mortalities in 2015, similar to the prior year total of 360 documented mortalities (Table 1, Figure 7). Nearly all documented mortalities of known-cause (n = 354) were human-caused (n = 352; 99%). Of the human-caused mortalities, 256 wolves were harvested legally by hunters and trappers (no change from 2014; n = 256).

Seventy-five wolves were lethally controlled in 2015, identical to the previous 5-year average. Fifty-four of 75 wolves lethally controlled were removed in response to livestock depredations, or were killed by livestock producers/landowners in defense of property. The remaining 21 wolves lethally controlled were taken in the Lolo Elk Zone to mitigate impacts of predation on ungulate populations.

Twenty-one wolf mortalities were attributed to other human-caused sources (illegal take = 14; vehicle = 4; capture-related = 3). Four remaining mortalities were attributed to unknown causes.

Livestock depredations

The numbers of cattle and sheep killed by wolves have generally been stable to declining since wolf harvest began in 2009 (Figure 8).

USDA APHIS Wildlife Services (WS) agents recorded 44 cattle, 134 sheep, 3 dogs, and 1 horse that were classified as confirmed or probable wolf depredations (killed by wolves) during the 2015 calendar year (Table 1; T. Grimm, USDA APHIS Wildlife Services, personal communication).

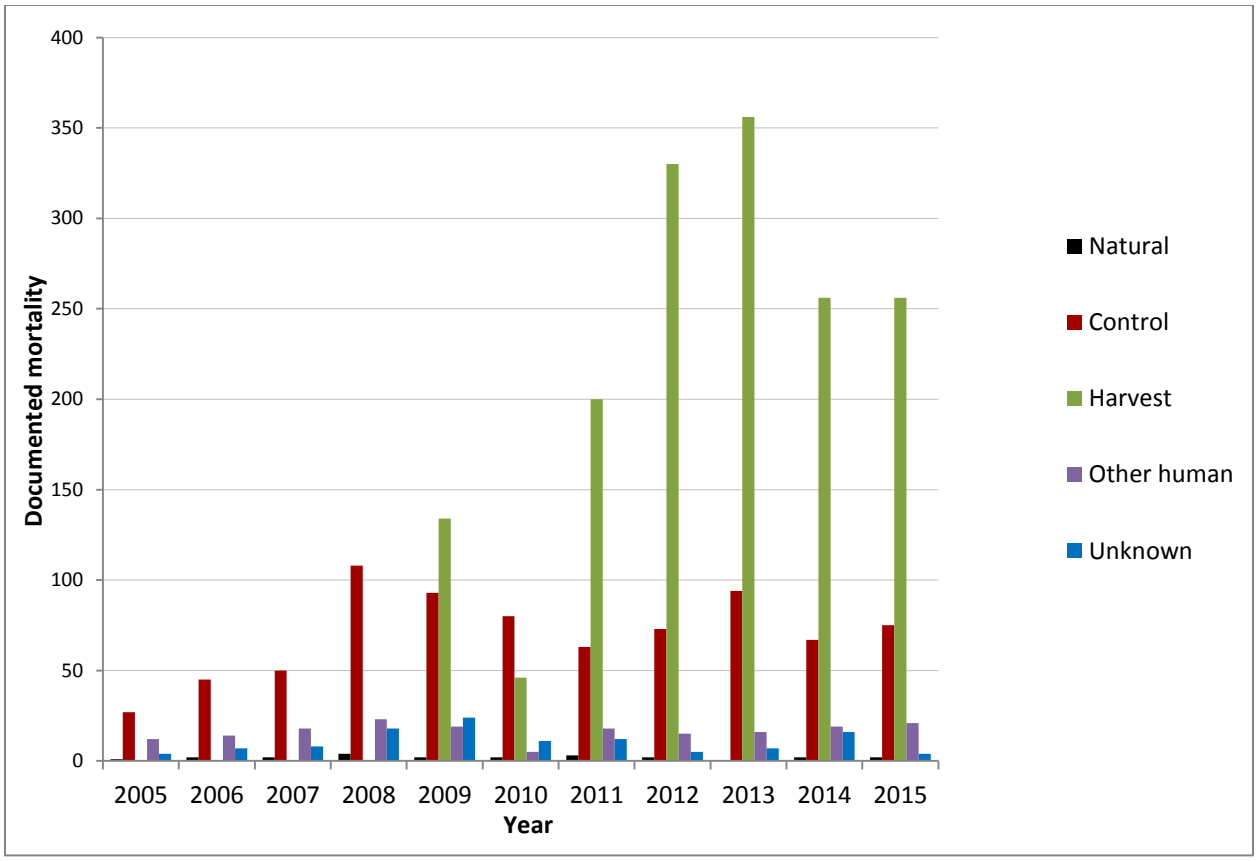

Figure 7. Annual documented wolf mortality by cause, 2005-2015.

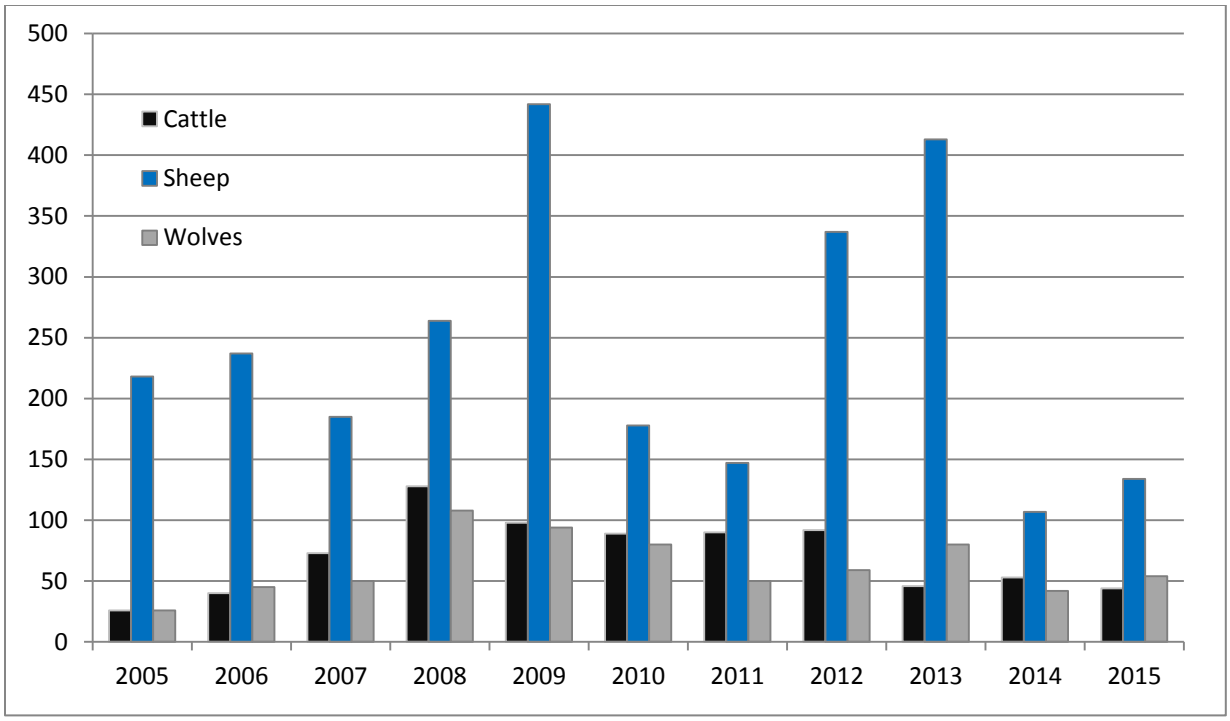

Figure 8. Number of confirmed and probable cattle and sheep killed by wolves, and corresponding number of wolves removed through agency control and legal take (excluding harvest) by private citizens, 2005-2015.

Confirmed and probable wolf depredations on cattle decreased by 17% in 2015 compared to 2014 (n = 44 and n = 53, respectively; Figure 8). The number of cattle killed or injured by wolves was highest in the McCall-Weiser Zone, followed by the Southern Mountains Zone (Figure 9). Cattle losses have steadily decreased in the recent past, with 2015's cattle losses being considerably lower than the prior 5-year (2010-2014) average of 74 confirmed or probable killed cattle.

Confirmed and probable wolf depredations on sheep increased by 25% in 2015 compared to 2014 (n = 134 and n = 107, respectively; Figure 8). The number of sheep killed or injured by wolves occurred primarily within the McCall-Weiser and Island Park Zones, although a single incident resulting in the death of 54 sheep occurred in the Sawtooth Zone (Figure 10). Sheep losses have trended down despite the slight increase this year, with 2015's sheep losses being lower than the prior 5-year (2010-2014) average of 236 confirmed or probable wolf-killed sheep.

During 2015, 54 wolves were killed by WS, or killed legally by livestock producers or private citizens to resolve wolf conflicts with livestock or dogs in Idaho (Figure 8).

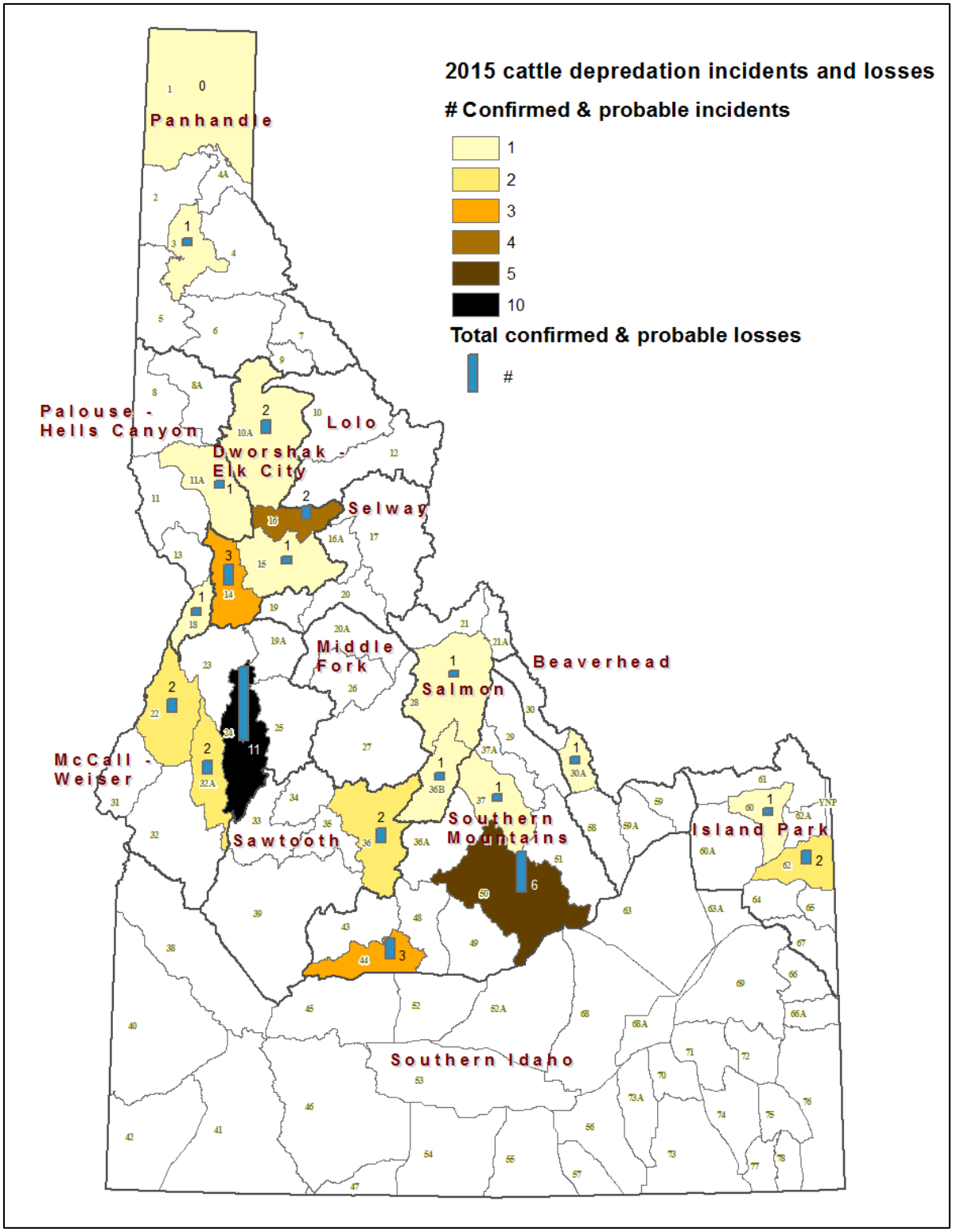

Figure 9. Number of confirmed and probable cattle depredation incidents (including injured cattle) and corresponding losses in Idaho attributed to wolves by Game Management Unit and Wolf Management Zone, 2015.

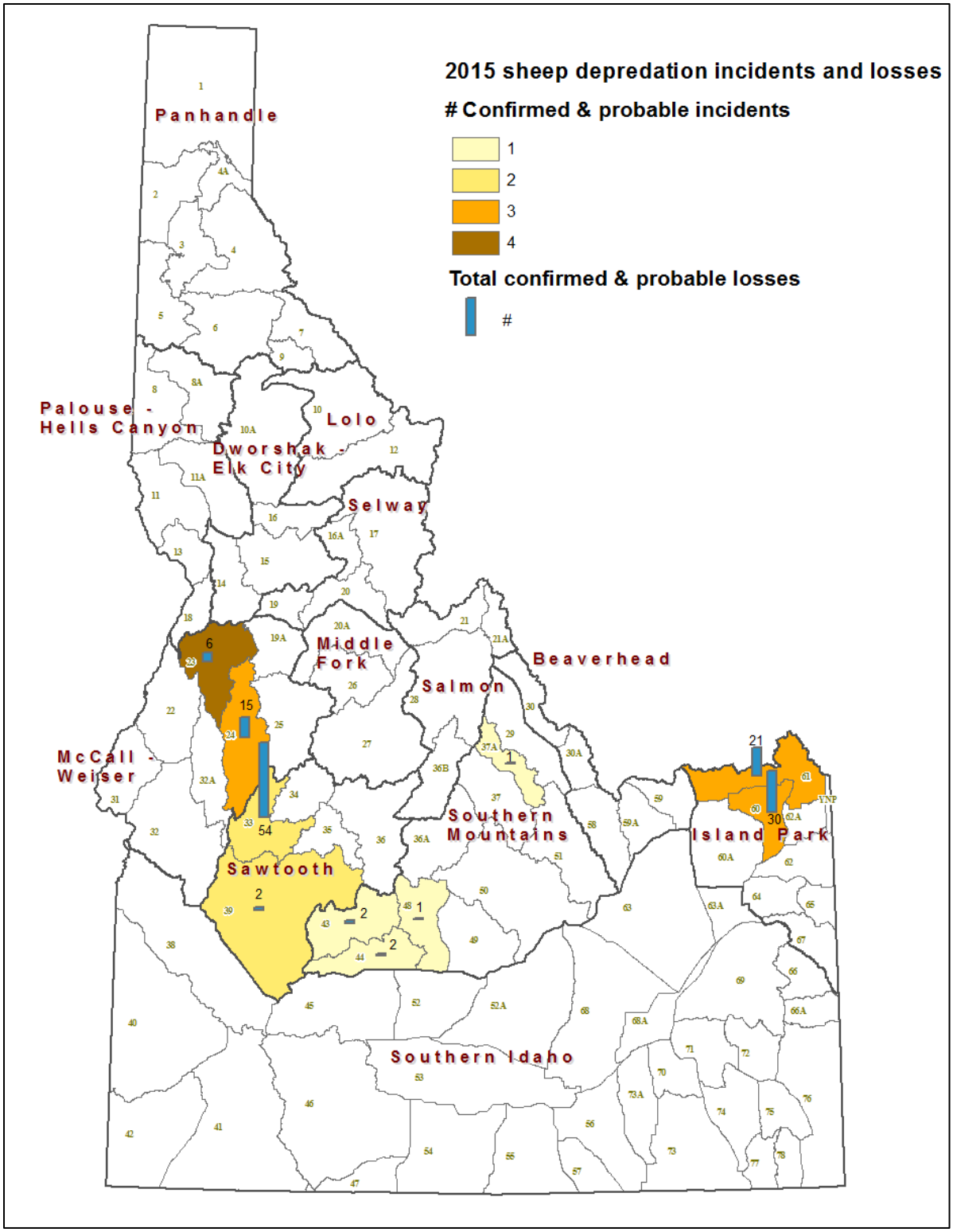

Figure 10. Number of confirmed and probable sheep depredation incidents (including injured sheep) and corresponding losses in Idaho attributed to wolves by Game Management Unit and Wolf Management Zone, 2015.

Research

IDFG, NPT, and other organizations continued to coordinate and support scientific research assisting in long-term wolf monitoring efforts, conservation, and management.

Effects of wolf predation on elk and moose populations

During 2015, IDFG continued long-term efforts to measure the effects of wolf predation and habitat on elk and moose populations within Idaho. Project objectives include: 1) determining survival, cause-specific mortality, pregnancy rates, and body condition for radiocollared animals; 2) monitoring wolf distribution and abundance within study areas; 3) developing habitat condition and trend maps for Idaho; and 4) developing a model set to predict elk mortality across a range of wolf:elk ratios and habitat/environmental conditions. This project is focused on 2 intensive areas (Lowman study area in the Sawtooth zone and North Fork Clearwater River study area in the Lolo zone) where detailed information regarding wolf and ungulate interactions was gathered via satellite radiocollars.

Data collection began in the Lowman study area in 2008 and in the North Fork of the Clearwater River study area in 2009. Data collection was completed in the Lowman area in 2013, and in the North Fork of the Clearwater in 2015, when satellite radiocollars were recovered. This research is providing contemporary data regarding survival, important mortality factors, and productivity of elk and moose populations that will help biologists identify and evaluate specific predator and habitat management actions necessary to address ungulate population objectives. The data are currently being compiled in preparation for development of a wolf integrated population model to estimate wolf abundance and trend through time, and for use as a covariate in elk survival analysis.

Evaluation of non-invasive genetic survey techniques for documenting reproduction in a harvested population

In summer 2015, we re-evaluated the usefulness of rendezvous site surveys for locating and documenting reproduction in Idaho's wolf packs. We resurveyed 455 predicted rendezvous sites and collected 1,861 genetic samples in GMUs 4, 28, and 33-35. Technicians detected every known pack, as well as 4 new packs, and detected 77% of the known litters in the focal study areas. Although complete DNA results are not yet available, it appears that rendezvous site surveys remain a viable method for locating and sampling wolf packs in a harvested population. Similar results were found in a heavily harvested wolf population in Alberta (Ausband and Bassing 2015).

Outreach

IDFG, NPT and cooperating agency biologists provided wolf-specific information and education programs to high school and college students, community and professional groups, wildlife biologists, cooperating agency personnel, the Idaho Fish and Game Commission, the Idaho Legislature, Idaho Master Naturalists, University of Idaho students and faculty, sportsmen's clubs, and outfitters and guides. We participated in interviews with local radio, newspaper, and TV outlets and talked to members of the public via telephone, email, and in person. News articles were released by IDFG regularly that summarized noteworthy items about wolves. Wolf issues continued to be an

interesting topic for the public; and television, radio, and print media contacted program staff often to obtain wolf information and agency perspective.

The Fish and Game Commission established wolf trapping seasons that were first implemented during the 2011-2012 wolf harvest year. Those wishing to participate in the trapping seasons were required to attend a wolf trapper education class before purchasing wolf trapping tags. Program biologists, in collaboration with regional staff and volunteers, developed and delivered a curriculum for the classes. Classes focused on trapping ethics, trapping regulations, wolf biology and conservation, avoiding non-target captures, equipment selection, and trapping and snaring techniques. Sixteen classes were held during the 2015-2016 season, and 330 trappers were certified.

PANHANDLE WOLF MANAGEMENT ZONE

Background

The Panhandle Zone is comprised of game management units (GMUs) 1, 2, 3, 4, 4A, 5, 6, 7, and 9. This area is predominantly timbered and consists of public forests managed by state and federal agencies, as well as large areas of private corporate timber holdings. Timber harvest is the predominant land use, but large tracts of roadless designation or remote access are scattered throughout the area. White-tailed deer, elk, mule deer, and moose occur throughout the zone. Livestock grazing is minimal on public properties but exists on many private lands. The climate is strongly influenced by Pacific maritime patterns that produce heavy late fall and winter precipitation and moderate temperatures. Typical spring weather has prolonged periods of rain, while summer months are warm and dry.

Monitoring Summary

The Panhandle Zone was occupied by 21 documented packs (including 7 Idaho border packs), and 4 other documented groups at the conclusion of 2015 (Figure 11, Table 2). Four packs were no longer considered extant by the end of 2015, including 1 pack that was dropped (Red Ives) because the activity was attributed to another documented pack (Lost Peak). Three suspected packs were attributed to this zone. Six border packs reported for Montana were presumed to spend some time in this zone. Two new packs were documented in 2015, and 3 packs were reassigned to Idaho from adjacent states. One pack (Red Ives) was retroactively removed from the 2014 pack count. Sixteen packs were confirmed to have produced litters, and 8 qualified as breeding pairs (Table 2). The reproductive status of 5 packs was unknown. Four radiocollared wolves were known to have dispersed in 2015. Documented mortalities (n = 98) were attributed to harvest (n = 88), other human (n = 6), control (n = 3), and unknown causes (n = 1; Table 3). One probable wolf-caused cattle depredation loss occurred in this zone during 2015 (Table 3).

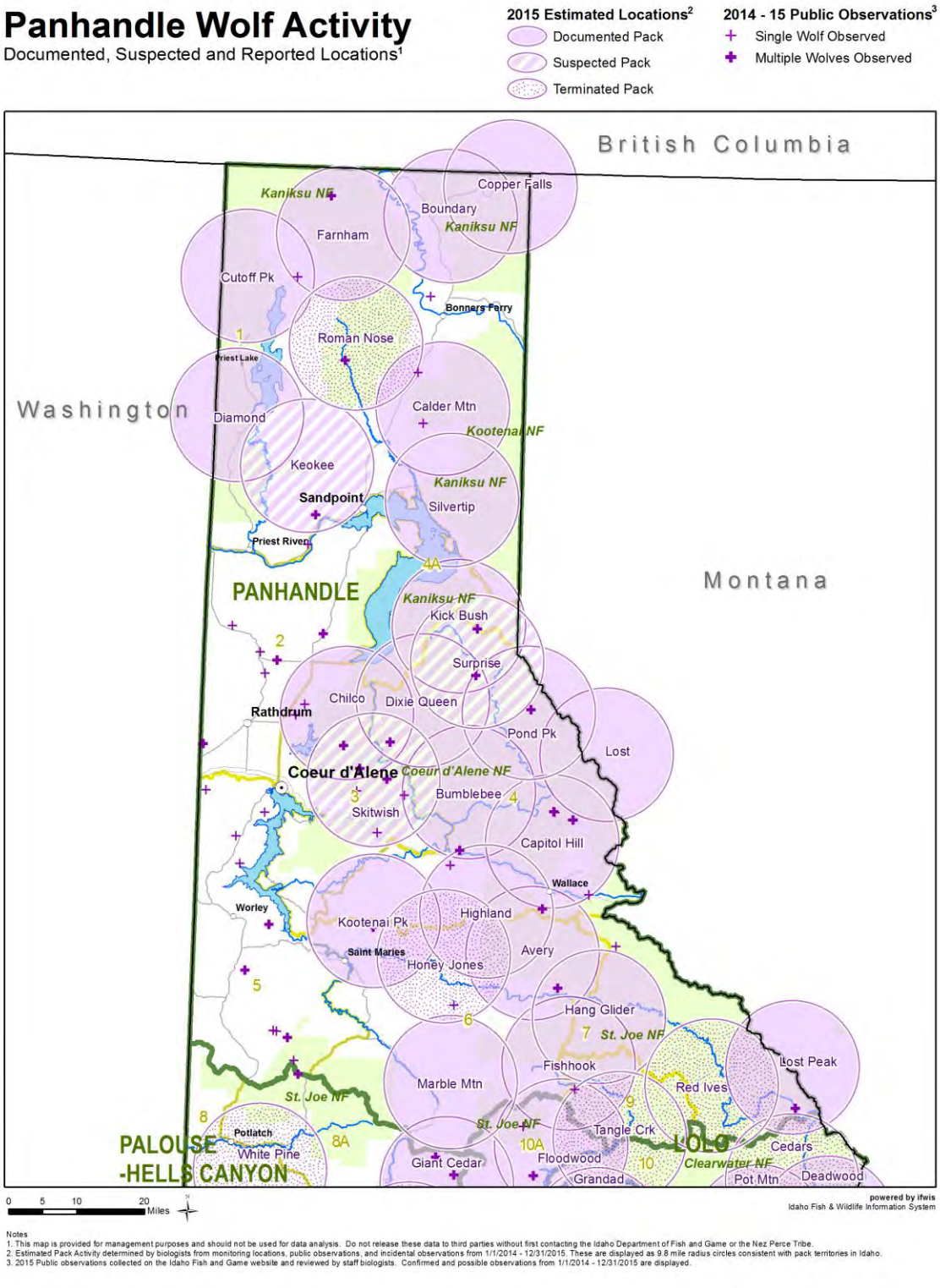

Figure 11. Distribution of documented and suspected wolf packs in the Panhandle Wolf Management Zone, 2015.

Table 2. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Panhandle Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status: Min. no. pups prod. (died)[c]	Reproductive status: Breeding pair[d]	Known dispersal
Documented Pack				
Avery	?	1(1)	UNK	0
Boundary (ID)	?	?	UNK	0
Bumblebee	8	8	UNK	1
Calder Mountain	?	1(1)	UNK	0
Capitol Hill	3	0	NO	1
Chilco	6	4	YES	0
Copper Falls (ID)	?	?	UNK	0
Cutoff Peak (ID)	?	5(1)	NO	0
De Borgia (MT)				
Diamond (ID)	?	1(1)	NO	0
Dixie Queen	6	7(1)	YES	0
Farnham	?	1(1)	UNK	0
Fishhook	7	6(4)	YES	0
Hang Glider	2	?	NO	0
Highland	4	2	YES	0
~~Honey Jones~~	0			
Kick Bush	?	3(3)	UNK	0
Kootenai Peak	?	?	UNK	0
Lost (ID)	5	3	YES	0
Lost Peak (ID)	8	2	YES	0
Marble Mountain	?	?	UNK	0
Pond Peak (ID)	11	4	YES	0
Preacher (MT)				
~~Red Ives~~	0			
~~Roman Nose~~	0	2		2
Silver Lake (MT)				
Silvertip	6	5	YES	0
Solomon Mountain (MT)				
~~Tangle Creek~~	0			
Twilight (MT)				
Wiggletail (MT)				
Unknown		1(1)		
Subtotal	66	55(14)		4
Suspected Pack				
Keokee	?			
Skitwish	?			
Surprise	?			
Subtotal	0	0		0
Other Documented Group				
ID696	1			
ID781	1			
ID794	1			
ID795	1			
Subtotal	4			
WMZ Total	**70**	**55(14)**		**4**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did

Table 2. Continued.

not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Strike-throughs indicate packs or other documented groups no longer assumed extant at the end of 2015. Border packs officially tallied to (STATE); territory known/likely shared with ID. Data on non-resident packs can be found in Rocky Mountain Wolf Recovery 2015 Annual Report.
[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.
[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 3. Pups documented via mortality whose pack association could not be definitively assigned were designated as Unknown in Documented Pack column, and were not counted towards the zone reproduction total to avoid potential double-counting.
[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 3. Documented wolf mortality and wolf-caused depredations by GMU within the Panhandle Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
1	0	1	42	1	0	0	0	0	0
2	0	0	0	1	0	0	0	0	0
3	0	0	2	0	0	0(1)	0	0	0
4	0	0	22	2	0	0	0	0	0
4A	0	0	3	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0
6	0	0	5	1	0	0	0	0	0
7	0	2	10	1	1	0	0	0	0
9	0	0	4	0	0	0	0	0	0
WMZ Total	**0**	**3**	**88**	**6**	**1**	**0(1)**	**0**	**0**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.
[b] Includes all other human-related deaths exclusive of control and harvest.

PALOUSE-HELLS CANYON WOLF MANAGEMENT ZONE

Background

The Palouse-Hells Canyon Zone is comprised of GMUs 8, 8A, 11, 11A, 13, and 18. Game Management Units 8, 8A, and 11A contain portions of the highly productive Palouse and Camas prairies. Dry-land agriculture began in this zone in the 1880s and, until the 1930s, large areas of native grassland existed. Currently, virtually all non-forested land has been tilled, and only small, isolated patches of native perennial vegetation remain. Timber harvest in the corporate timber, private timber, state land, and federal land areas of GMU 8A increased dramatically through the 1980s and 1990s, creating vast acreages of early successional ungulate habitat. Non-forested land is not anticipated to be suitable habitat for wolves.

Habitat within GMUs 11, 13, and 18 varies widely from steep, dry, river-canyon grasslands having low annual precipitation to higher elevation forests with greater precipitation. This area contains large tracts of both privately- and publicly-owned land: GMU 11 is mostly private land except for Craig Mountain Wildlife Management Area along the Snake and Salmon rivers (Craig Mountain has been extensively logged); GMU 13 has been mostly under private ownership since settlement and has been managed mostly for agriculture and livestock; GMU 18 is one-third private ownership located at lower elevations along the Salmon River. Road density is moderate, with restricted access in many areas. The majority of Hells Canyon Wilderness Area is in GMU 18.

Monitoring Summary

The Palouse-Hells Canyon Zone was occupied by 1 documented pack at the conclusion of 2015 (Figure 12, Table 4). Three packs were considered no longer extant at the end of 2015. One pack was confirmed to have reproduced, but it did not qualify as a breeding pair (Table 4). No radiocollared wolves were known to have dispersed in 2015. Documented mortalities ($n = 2$) were attributed to harvest ($n = 1$) and other human causes ($n = 1$; Table 5). One confirmed and 1 probable wolf-caused cattle depredation loss occurred in this zone during 2015 (Table 5).

Figure 12. Distribution of documented and suspected wolf packs in the Palouse-Hells Canyon Wolf Management Zone, 2015.

Table 4. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Palouse-Hells Canyon Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status: Min. no. pups prod. (died)[c]	Reproductive status: Breeding pair[d]	Known dispersal
Documented Pack				
Giant Cedar	?	2	NO	0
~~Long Meadow~~				
~~Seven Devils~~				
~~White Pine~~				
Subtotal	0	2		0
Suspected Pack				
Subtotal	0			
Other Documented Group				
Subtotal	0			
WMZ Total	**0**	**2**		**0**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Strike-throughs indicate packs or other documented groups no longer assumed extant at the end of 2015.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 5.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 5. Documented wolf mortality and wolf-caused depredations by GMU within the Palouse-Hells Canyon Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
8	0	0	0	0	0	0	0	0	0
8A	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0
11A	0	0	0	1	0	1	0	0	0
13	0	0	0	0	0	0	0	0	0
18	0	0	1	0	0	0(1)	0	0	0
WMZ Total	**0**	**0**	**1**	**1**	**0**	**1(1)**	**0**	**0**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.

[b] Includes all other human-related deaths exclusive of control and harvest.

DWORSHAK-ELK CITY WOLF MANAGEMENT ZONE

Background

The Dworshak-Elk City Zone is comprised of GMUs 10A, 14, 15, and 16. Game Management Unit 10A is predominantly timbered, with the remaining areas in either open or agricultural lands, and is bisected by canyons leading to the Clearwater River. During the 1980s and 1990s, timber harvest occurred on almost all available state and private land as demand for timber and management of these lands intensified. In GMUs 14, 15, and 16, most of the land base is in public ownership with privately-owned portions at lower elevations along the Clearwater and Salmon rivers. Productive conifer forests with intermixed grasslands characterize the majority of this zone. Many forested areas have become overgrown with lodgepole pine (*Pinus contorta*) and fir species due to fire suppression during the past 40 years. A small segment of this zone is federally-designated wilderness.

Monitoring Summary

The Dworshak-Elk City Zone was occupied by 16 documented packs at the conclusion of 2015 (Figure 13, Table 6); 1 pack and 1 other documented group were no longer considered extant by the end of 2015. Eleven packs were confirmed to have produced litters, and 4 packs qualified as breeding pairs (Table 6); the reproductive status of 5 packs was unknown. Two radiocollared wolves were known to have dispersed in 2015. Documented mortalities (n = 63) were attributed to harvest (n = 47), control (n = 14), natural (n = 1), and unknown causes (n = 1; Table 7). Four confirmed and 4 probable wolf-caused cattle losses occurred within the zone in 2015 (Table 7).

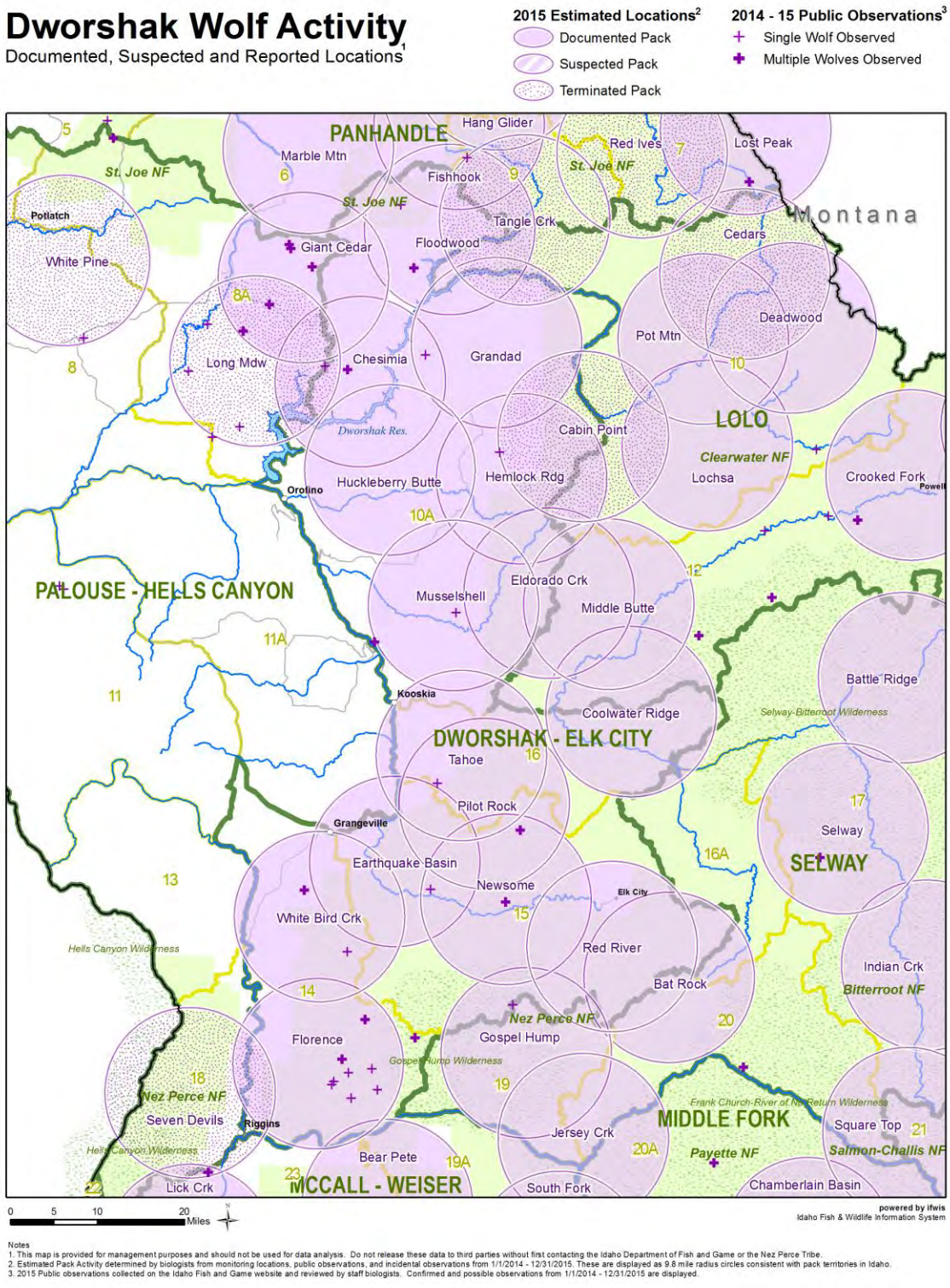

Figure 13. Distribution of documented and suspected wolf packs in the Dworshak-Elk City Wolf Management Zone, 2015.

Table 6. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Dworshak-Elk City Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status: Min. no. pups prod. (died)[c]	Reproductive status: Breeding pair[d]	Known dispersal
Documented Pack				
Bat Rock	?	?	UNK	0
~~Cabin Point~~	0			1
Chesimia	4	1	UNK	0
Coolwater Ridge	?	1(1)	UNK	0
Earthquake Basin	5	5(1)	YES	0
Eldorado Creek	?	?	UNK	0
Floodwood	4	6	UNK	0
Florence	?	5(5)	NO	0
Grandad	?	?	UNK	0
Hemlock Ridge	?	4	UNK	0
Huckleberry Butte	?	?	UNK	0
Musselshell	6	4	YES	0
Newsome	4	2	YES	1
Pilot Rock	5	6(5)	NO	0
Red River	4	2	YES	0
Tahoe	?	?	UNK	0
White Bird Creek	3	2(1)	NO	0
Subtotal	35	38(13)		2
Suspected Pack				
Subtotal	0			
Other Documented Group				
~~ID720~~				
Subtotal	0			
WMZ Total	**35**	**38(13)**		**2**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Strike-throughs indicate packs or other documented groups no longer assumed extant at the end of 2015.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 7.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 7. Documented wolf mortality and wolf-caused depredations by GMU within the Dworshak-Elk City Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
10A	0	0	23	0	1	0(2)	0	0	0
14	0	6	12	0	0	2(1)	0	0	0
15	0	0	7	0	0	1	0	0	0
16	1	8	5	0	0	1(1)	0	0	0
WMZ Total	**1**	**14**	**47**	**0**	**1**	**4(4)**	**0**	**0**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.
[b] Includes all other human-related deaths exclusive of control and harvest.

LOLO WOLF MANAGEMENT ZONE

Background

The Lolo Zone (GMUs 10, 12) is primarily forested and land ownership is almost entirely publicly-owned national forests administered by the USFS. Historically, habitat productivity was high in this zone, but has decreased following decades of intensive fire suppression. Until the 1930s, wildfires were the primary habitat disturbance in this zone. Between 1900 and 1934, approximately 70% of the Lochsa River drainage was burned by wildfires. Approximately one-third of the zone provides access for motorized vehicles with medium road densities. The remaining portion has low road densities. In 1964, most of the southern portion of GMU 12 was designated part of the Selway-Bitterroot Wilderness.

Monitoring Summary

The Lolo Zone was occupied by 6 documented packs (including one Idaho border pack) and 3 other documented wolf groups at the conclusion of 2015 (Figure 14, Table 8); 1 documented pack and 6 other documented groups were no longer considered extant by the end of the year. Five border packs reported for Montana were presumed to spend some time in this zone. One new pack was documented in this zone in 2015. Reproduction was confirmed in 2 packs, one of which qualified as a breeding pair (Table 8). The reproductive status of 4 packs was unknown. No radiocollared wolves were known to have dispersed during 2015. Documented mortalities ($n = 42$) were attributed to harvest ($n = 23$), and control ($n = 19$; Table 9). There were no confirmed or probable wolf-caused depredations in this zone in 2015.

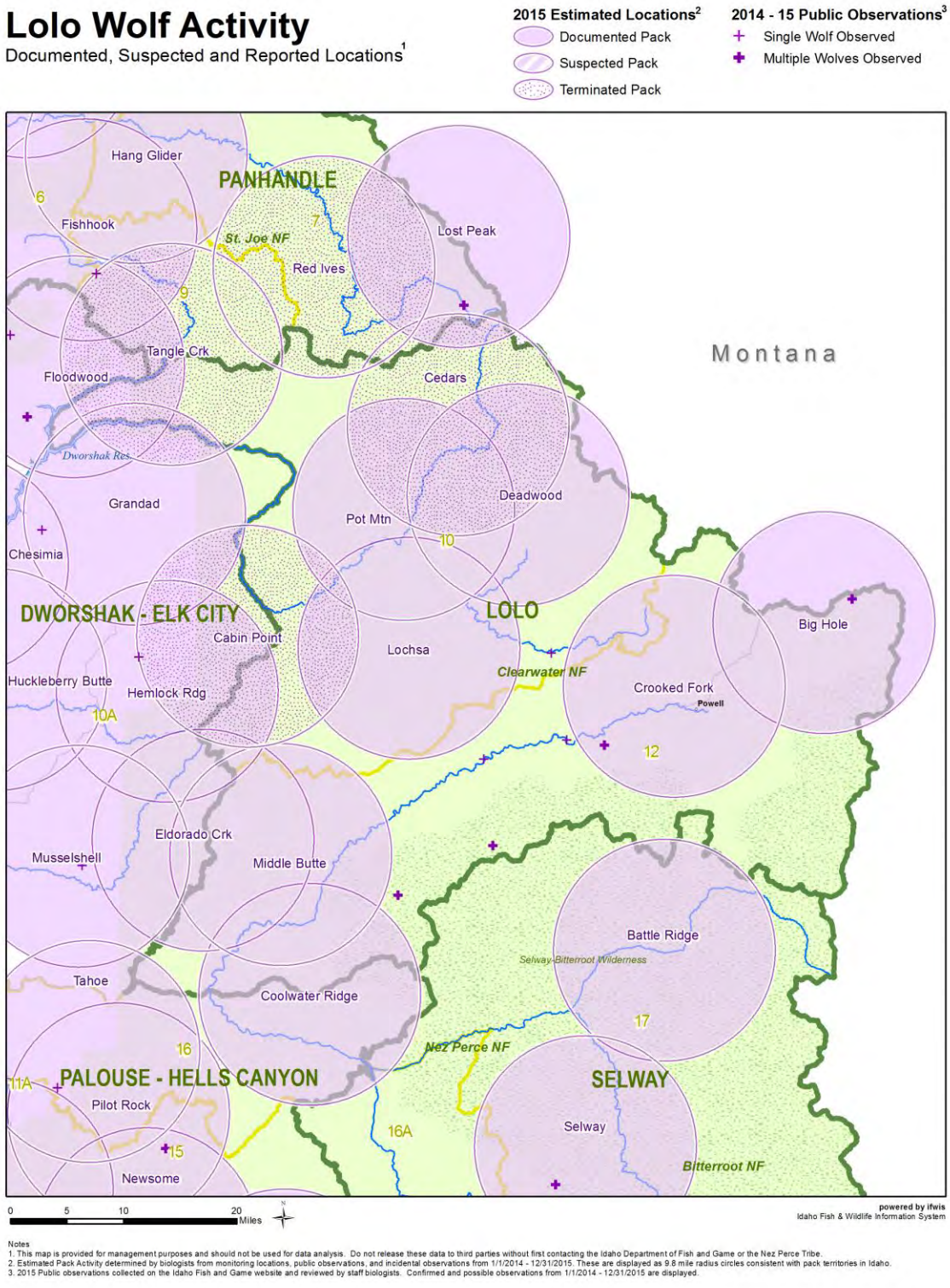

Figure 14. Distribution of documented and suspected wolf packs in the Lolo Wolf Management Zone, 2015.

Table 8. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Lolo Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status: Min. no. pups prod. (died)[c]	Reproductive status: Breeding pair[d]	Known dispersal
Documented Pack				
Big Hole (ID)	8	2	YES	0
Cache Creek (MT)				
~~Cedars (ID)~~	0			
Crooked Fork	4	3(1)	UNK	0
Deadwood	6	?	UNK	0
Gash Creek (MT)				
Lochsa	7	?	UNK	0
Middle Butte	4	?	UNK	0
One Horse (MT)				
Pot Mountain	?	?	UNK	0
Quartz Creek (MT)				
Sunrise Mountain (MT)				
Subtotal	29	5(1)		0
Suspected Pack				
Subtotal	0			
Other Documented Group				
~~B574~~	0			
~~B581~~	0			
~~ID637~~	0			
~~ID650~~	0			
~~ID663/ID664~~	0			
~~ID703~~	0			
ID783	1			
ID818/ID819	2			
Stanley Creek (uncollared)	3			
Subtotal	6			
WMZ Total	**35**	**5(1)**		**0**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Strike-throughs indicate packs or other documented groups no longer assumed extant at the end of 2015. Border packs officially tallied to (STATE); territory known/likely shared with ID. Data on non-resident packs can be found in Rocky Mountain Wolf Recovery 2015 Annual Report.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 9.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 9. Documented wolf mortality and wolf-caused depredations by GMU within the Lolo Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
10	0	19	6	0	0	0	0	0	0
12	0	0	17	0	0	0	0	0	0
WMZ Total	**0**	**19**	**23**	**0**	**0**	**0**	**0**	**0**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.
[b] Includes all other human-related deaths exclusive of control and harvest.

SELWAY WOLF MANAGEMENT ZONE

Background

The Selway Zone is comprised of GMUs 16A, 17, 19, and 20. Habitat within the Selway Zone varies from high-precipitation, forested areas along the lower reaches of the Selway River to dry, steep, south-facing ponderosa pine and grassland habitat along the Salmon River. Many areas along the Salmon River represent a mix of successional stages due to frequent fires within the wilderness. Fire suppression within portions of the Selway River drainage has led to decreasing forage production for big game. Road densities within this zone are low.

Noxious weeds, especially spotted knapweed (*Centaurea maculosa*), have encroached upon many low-elevation areas. Due to the rugged and remote nature of this zone, human impacts have been limited. In 1964, almost all of GMU 17 and a small portion of GMU 16A were included in the Selway-Bitterroot Wilderness. Most of GMU 19 became part of the Gospel Hump Wilderness in 1978, and in 1980, part of GMU 20 was included in the Frank Church-River of No Return Wilderness.

Monitoring Summary

The Selway Zone was occupied by 6 documented packs (including 1 Idaho border pack) in 2015 (Figure 15, Table 10). One border pack reported for Montana was presumed to spend some time in this zone. One new pack was documented in this zone in 2015. Reproduction was verified for 2 packs within this zone, one of which qualified as a breeding pair (Table 10). The reproductive status of 4 packs was unknown. No radiocollared wolves were known to have dispersed in 2015. All documented wolf mortalities in this zone were attributed to harvest (n = 15; Table 11). There were no confirmed or probable wolf-caused depredations in this zone in 2015.

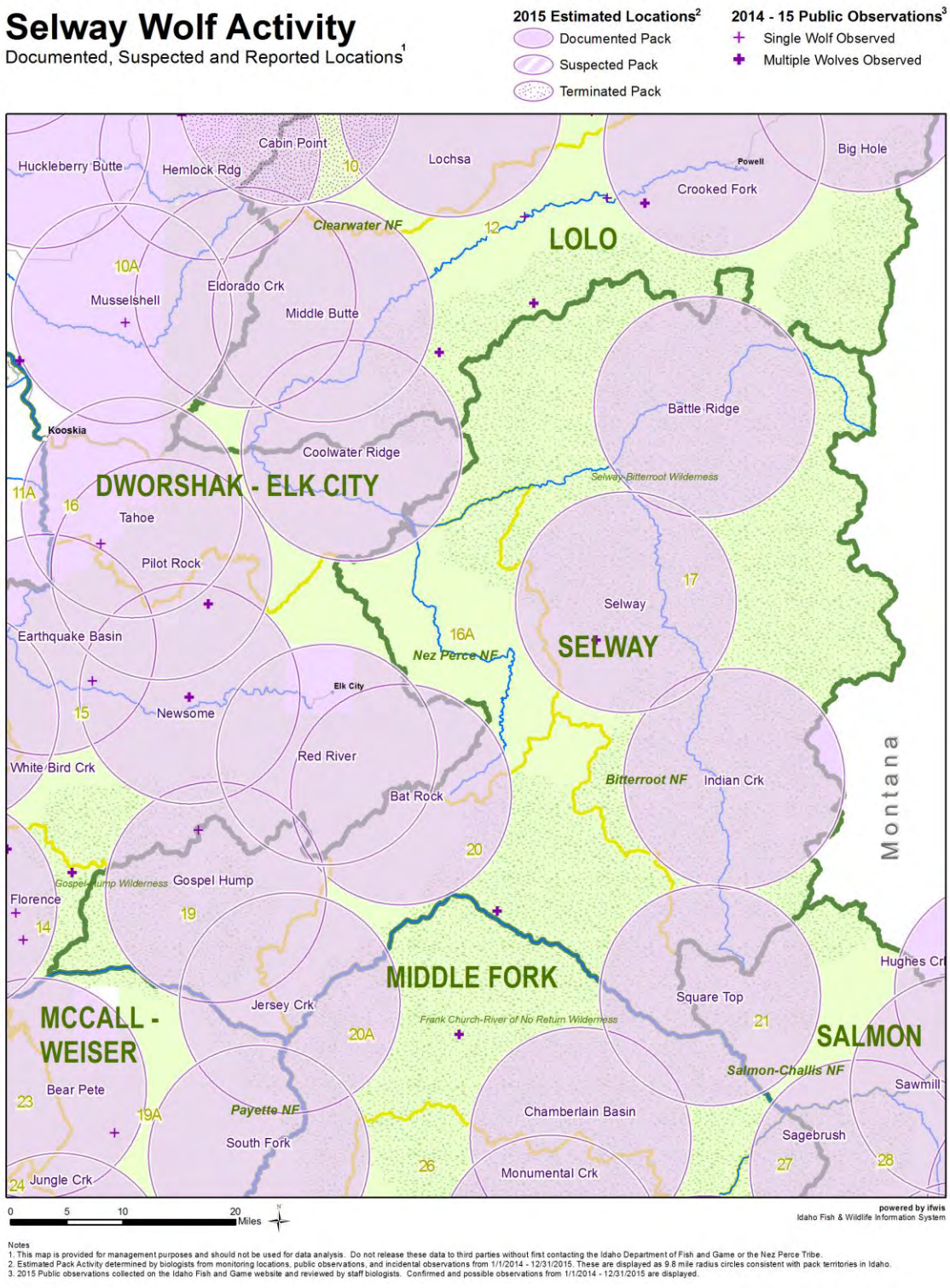

Figure 15. Distribution of documented and suspected wolf packs in the Selway Wolf Management Zone, 2015.

Table 10. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Selway Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status: Min. no. pups prod. (died)[c]	Reproductive status: Breeding pair[d]	Known dispersal
Documented Pack				
Battle Ridge	?	3(3)	UNK	0
Gospel Hump	?	?	UNK	0
Indian Creek (ID)	?	?	UNK	0
Jersey Creek	?	?	UNK	0
Selway	?	?	UNK	0
Square Top Watchtower (MT)	5	3	YES	0
Subtotal	5	6(3)		0
Suspected Pack				
Subtotal	0			
Other Documented Group				
Subtotal	0			
WMZ Total	**5**	**6(3)**		**0**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Border packs officially tallied to (STATE); territory known/likely shared with ID. Data on non-resident packs can be found in Rocky Mountain Wolf Recovery 2015 Annual Report.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 11.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as “an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth.”

Table 11. Documented wolf mortality and wolf-caused depredations by GMU within the Selway Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
16A	0	0	0	0	0	0	0	0	0
17	0	0	5	0	0	0	0	0	0
19	0	0	10	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0
WMZ Total	**0**	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.
[b] Includes all other human-related deaths exclusive of control and harvest.

MCCALL-WEISER WOLF MANAGEMENT ZONE

Background

The McCall-Weiser Zone is composed of GMUs 19A, 22, 23, 24, 25, 31, 32, and 32A. Over 70% of the land area in GMUs 19A, 23, 24, and 25 is in public ownership and management. The Little Salmon River and North Fork Payette River valley bottoms contain most of the private ownership. Private land in these GMUs is predominantly agricultural or rural subdivision in nature. Timber harvest and livestock grazing are prevalent. Several large fires have burned in these GMUs in the last few decades. Road densities are relatively low in GMUs 19A and 25. Road densities in GMUs 23 and 24 are moderate to high.

About 60% of GMUs 22 and 32A and 20% of GMU 32 is in public ownership and management. Privately-owned land comprised much of the western portion of GMU 32 and the Weiser River Valley of GMUs 22 and 32A. Timber harvest and livestock grazing are prevalent. Most forested habitat is in the early- to mid-successional stage. Andrus Wildlife Management Area in the southwest portion of GMU 22 is managed for elk and mule deer winter range and encompasses about 8,000 acres (3,237 ha).

About 50% of GMU 31 is in public ownership and management. Privately-owned lands compose much of the southern and eastern portions of the GMU. Higher elevations are timbered, whereas lower elevations are primarily shrub-steppe or desert habitat types. Timber harvest and livestock grazing are prevalent.

Monitoring Summary

The McCall-Weiser Zone was occupied by 13 documented packs at the conclusion of 2015 (Figure 16, Table 12); 1 pack and 1 other documented group were no longer considered extant by the end of the year. Two suspected packs were attributed to this zone. Three new packs were documented in this zone in 2015, including 1 pack that was upgraded from suspected to documented status in 2015 and retroactively added to the 2014 pack totals (Gabes Bathtub, formerly Friday Butte). Eight packs were confirmed to have produced litters, and two qualified as breeding pairs (Table 12). The reproductive status of 3 packs was unknown (Table 12). One radiocollared wolf was known to have dispersed in this zone in 2015. Documented mortalities (n = 26) included harvest (n = 14), control (n = 11), and other human causes (n = 1; Table 13). Thirteen confirmed and 2 probable wolf-caused cattle losses occurred within the zone in 2015 (Table 13). Thirteen confirmed and 8 probable wolf-caused domestic sheep losses occurred within the zone in 2015. One confirmed wolf-killed horse was reported for this zone.

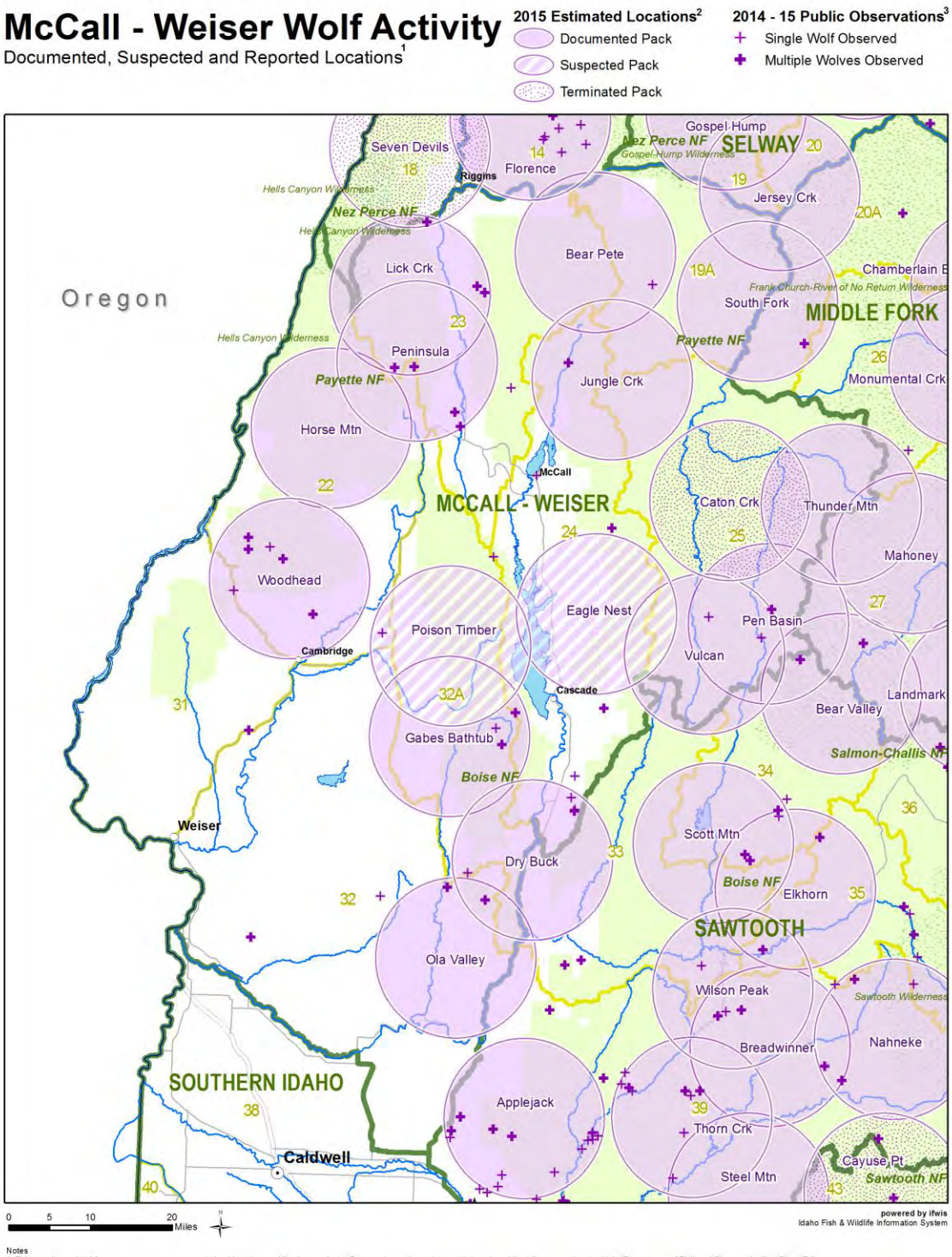

Figure 16. Distribution of documented and suspected wolf packs in the McCall-Weiser Wolf Management Zone, 2015.

Table 12. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the McCall-Weiser Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status: Min. no. pups prod. (died)[c]	Reproductive status: Breeding pair[d]	Known dispersal
Documented Pack				
Bear Pete	4	?	UNK	0
~~Caton Creek~~	0			0
Dry Buck	6	?	UNK	0
Gabes Bathtub	4	2	YES	0
Horse Mountain	2	0	NO	1
Jungle Creek	?	?	UNK	0
Lick Creek	?	1(1)	UNK	0
Ola Valley	2	1(1)	NO	0
Pen Basin	6	3(1)	NO	0
Peninsula	2	0	NO	0
South Fork	4	1	UNK	0
Thunder Mountain	4	2	YES	0
Vulcan	?	1	UNK	0
Woodhead	?	2(2)	UNK	0
Subtotal	34	13(5)		1
Suspected Pack				
Eagle Nest	?			
Poison Timber	?			
Subtotal	0			
Other Documented Group				
~~ID727~~	0			
Subtotal	0			
WMZ Total	**34**	**13(5)**		**1**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Strike-throughs indicate packs or other documented groups no longer assumed extant at the end of 2015.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 13.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 13. Documented wolf mortality and wolf-caused depredations by GMU within the McCall-Weiser Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
19A	0	0	1	0	0	0	0	0	0
22	0	0	3	0	0	0(2)	0	0	0
23	0	0	5	0	0	0	5(1)	0	0
24	0	8	1	0	0	11	8(7)	0	0
25	0	0	3	1	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0
32	0	3	0	0	0	0	0	0	0
32A	0	0	1	0	0	2	0	0	1
WMZ Total	**0**	**11**	**14**	**1**	**0**	**13(2)**	**13(8)**	**0**	**1**

[a] Includes agency lethal control and legal or State-authorized take by landowners.
[b] Includes all other human-related deaths exclusive of control and harvest.

MIDDLE FORK WOLF MANAGEMENT ZONE

Background

The Middle Fork Zone is comprised of GMUs 20, 26, and 27. All GMUs are predominantly within the Frank Church-River of No Return Wilderness. With the exception of several private inholdings, GMU 27 is primarily wilderness lands within the Middle Fork of the Salmon River drainage. Large areas of the wilderness have burned creating a patchwork of vegetative seral stages.

Monitoring Summary

The Middle Fork Zone was occupied by 5 documented packs in 2015 (Figure 17, Table 14); 1 pack (Little Bear) was dropped and retroactively subtracted from the 2014 pack totals upon determination that an adjacent pack (Hoodoo) accounted for the activity. One documented pack (Landmark) was reassigned to the Sawtooth Zone. One other documented wolf group was removed in 2015. Lack of radiocollared wolves in conjunction with the remote nature of this management zone hindered efforts to conduct reproductive surveys; reproduction was verified for two of the 5 documented packs, one of which qualified as a breeding pair (Table 14). No radiocollared wolves were known to have dispersed in 2015. Documented mortalities were all attributed to harvest (n = 12; Table 15). This predominantly wilderness zone contains few domestic livestock and no losses were reported (Table 15).

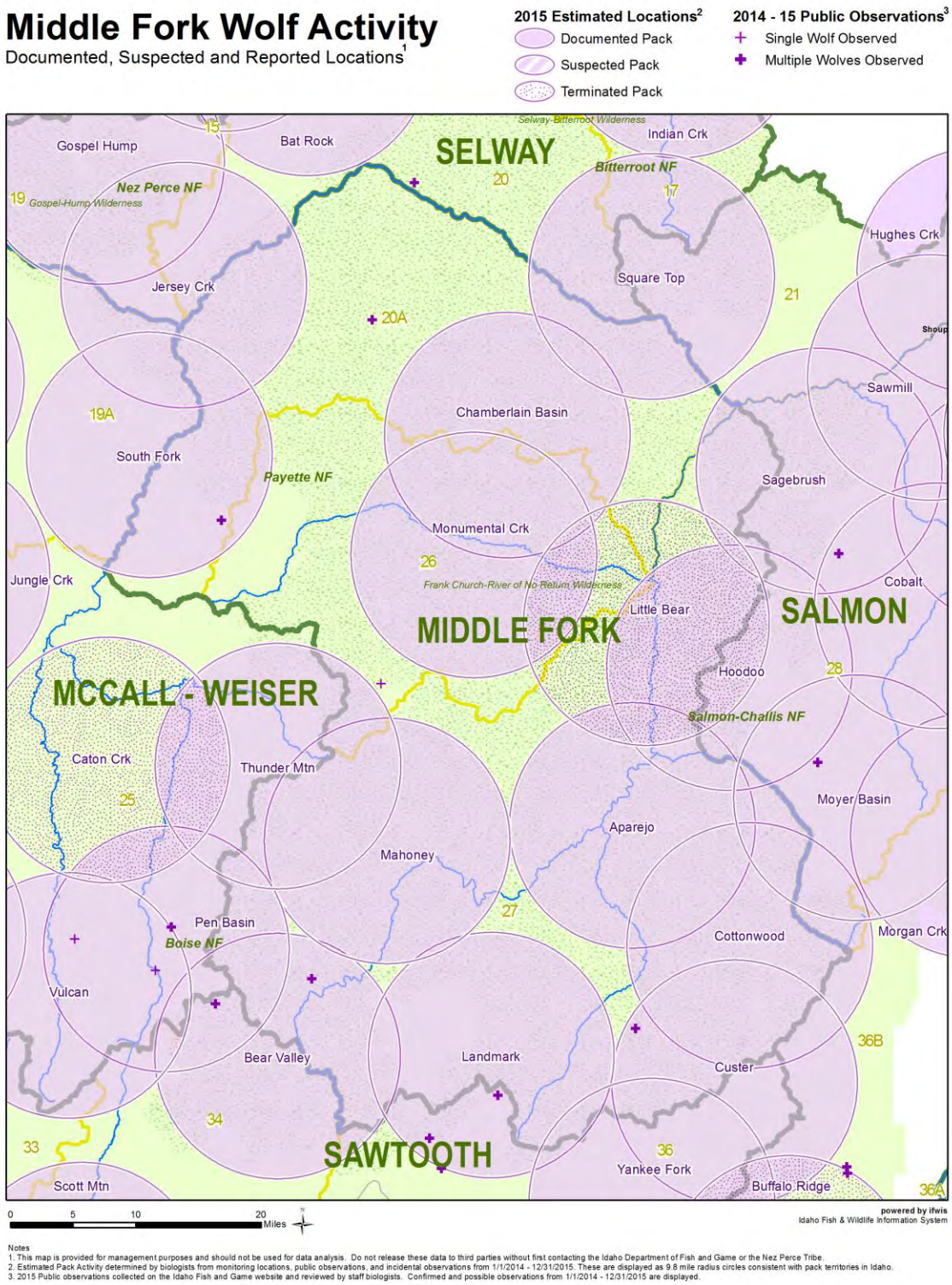

Figure 17. Distribution of documented and suspected wolf packs in the Middle Fork Wolf Management Zone, 2015.

Table 14. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Middle Fork Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status: Min. no. pups prod. (died)[c]	Reproductive status: Breeding pair[d]	Known dispersal
Documented Pack				
Aparejo	8	4	YES	0
Chamberlain Basin	8	1(1)	UNK	0
Cottonwood	?	?	UNK	0
~~Little Bear~~	0			
Mahoney	?	?	NO	0
Monumental Creek	?	?	UNK	0
Subtotal	16	5(1)		0
Suspected Pack				
Subtotal	0			
Other Documented Group				
~~B534~~	0			
Subtotal	0			
WMZ Total	**16**	**5(1)**		**0**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Strike-throughs indicate packs or other documented groups no longer assumed extant at the end of 2015.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 15.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 15. Documented wolf mortality and wolf-caused depredations by GMU within the Middle Fork Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
20A	0	0	1	0	0	0	0	0	0
26	0	0	3	0	0	0	0	0	0
27	0	0	8	0	0	0	0	0	0
WMZ Total	**0**	**0**	**12**	**0**	**0**	**0**	**0**	**0**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.

[b] Includes all other human-related deaths exclusive of control and harvest.

SALMON WOLF MANAGEMENT ZONE

Background

The Salmon Zone encompasses 4 GMUs (21, 21A, 28, 36B) that also compose the Salmon Elk Zone. The topography within the Salmon Zone is characterized by steep, mountainous slopes interspersed by river valleys. The habitat consists primarily of timbered hillsides with grass understory, although lower elevations are more arid and typified by sagebrush and bunchgrass vegetation types. Land ownership is primarily public, with approximately 95% under USFS, Bureau of Land Management (BLM), or State ownership. Cattle ranching, livestock grazing, mining, timber harvesting, and recreation are the dominant human uses in this zone.

Monitoring Summary

The Salmon Zone was occupied by 11 documented packs (including 3 Idaho border packs) and 2 other documented groups during 2015 (Figure 18, Table 16); 2 packs were no longer considered extant at the end of the year. Four new packs were documented in this zone in 2015, including one that was retroactively added to the 2014 pack totals (Donnelly). One previously terminated pack was reinstated and retroactively added to the 2014 pack totals (Cobalt). Four border packs attributed to Montana were presumed to spend some time within Idaho. Ten packs produced litters, five of which qualified as breeding pairs (Table 16). Two radiocollared wolves were known to have dispersed in 2015. Documented mortalities within the Salmon Zone (n = 28) were attributed to harvest (n = 26), other human (n = 1), and unknown causes (n = 1; Table 17). Two confirmed wolf-caused cattle losses occurred in this zone (Table 17).

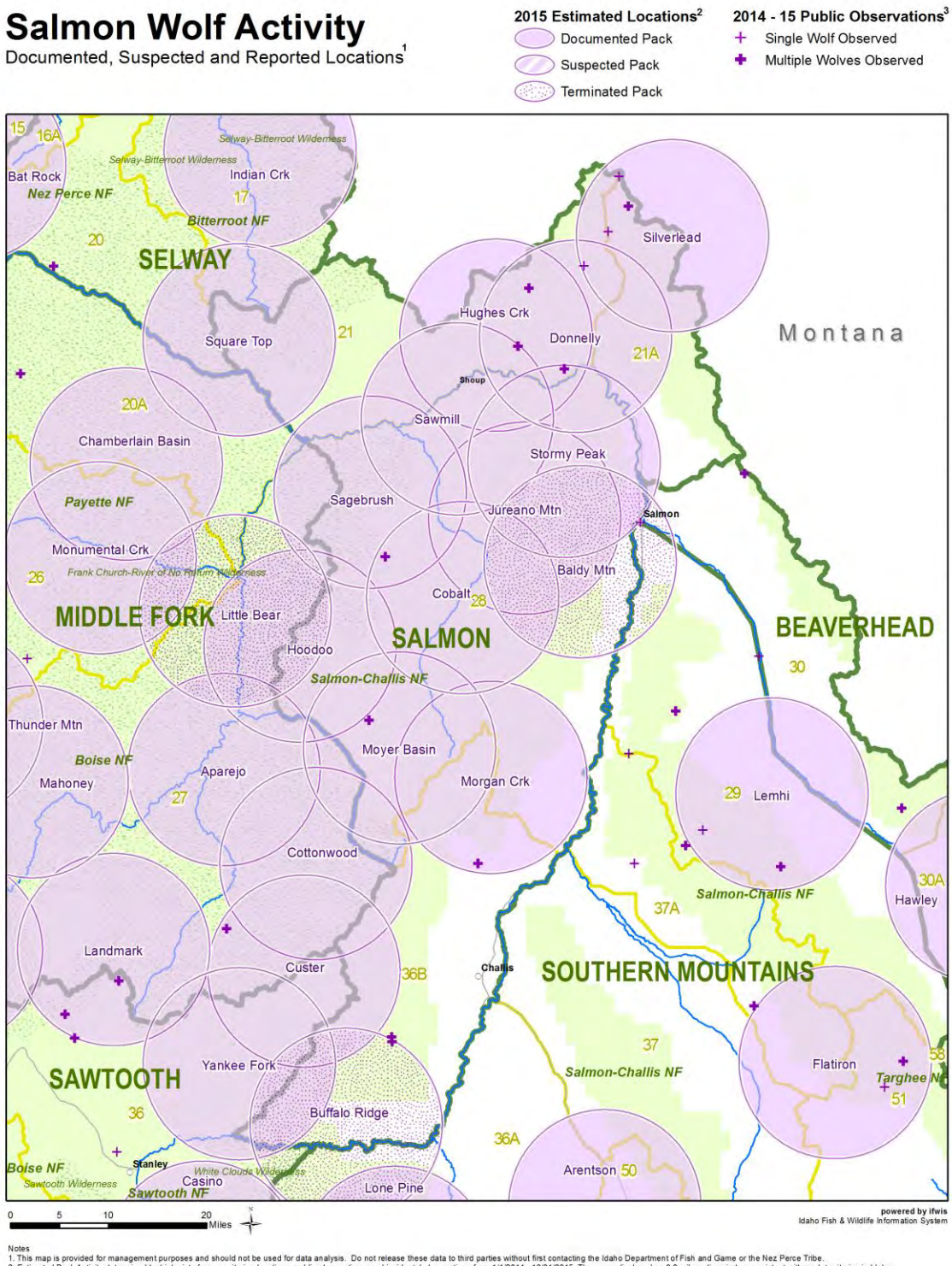

Figure 18. Distribution of documented and suspected wolf packs in the Salmon Wolf Management Zone, 2015.

Table 16. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Salmon Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status: Min. no. pups prod. (died)[c]	Reproductive status: Breeding pair[d]	Known dispersal
Documented Pack				
Alta (MT)				
~~Baldy Mountain~~	0			
~~Buffalo Ridge~~	0	5	NO	1
Cobalt	5	3	YES	0
Donnelly (ID)	12	1(1)	UNK	0
Hoodoo	10	5(1)	YES	0
Hughes Creek (ID)	3	4(3)	NO	1
Jureano Mountain	11	4	YES	0
Morgan Creek	?	?	UNK	0
Moyer Basin	8	4	YES	0
Overwhich (MT)				
Pyramid (MT)				
Sagebrush	14	8(2)	YES	0
Sawmill	9	1	UNK	0
Silverlead (ID)	6	?	UNK	0
Stormy Peak	4	4	UNK	0
Sula (MT)				
Subtotal	82	39(7)		2
Suspected Pack				
Subtotal	0			
Other Documented Group				
ID660	1			
ID699	1			
Subtotal	2			
WMZ Total	**84**	**39(7)**		**2**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Strike-throughs indicate packs or other documented groups no longer assumed extant at the end of 2015. Border packs officially tallied to (STATE); territory known/likely shared with ID. Data on non-resident packs can be found in Rocky Mountain Wolf Recovery 2015 Annual Report.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 17.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 17. Documented wolf mortality and wolf-caused depredations by GMU within the Salmon Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
21	0	0	11	0	1	0	0	0	0
21A	0	0	6	0	0	0	0	0	0
28	0	0	6	0	0	1	0	0	0
36B	0	0	3	1	0	1	0	0	0
WMZ Total	**0**	**0**	**26**	**1**	**1**	**2**	**0**	**0**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.
[b] Includes all other human-related deaths exclusive of control and harvest.

SAWTOOTH WOLF MANAGEMENT ZONE

Background

The Sawtooth Zone encompasses 5 GMUs (33, 34, 35, 36, 39) that also compose the Sawtooth and Boise River Elk zones. Access within the Sawtooth Zone ranges from heavily roaded urban areas to roadless wilderness areas. The majority of this zone is forested public land administered by the Boise and Sawtooth National Forests. However sections of private agricultural land also exist in the Mayfield and Horseshoe Bend areas. A portion of the Treasure Valley--Idaho's largest metropolitan area--is also found in this zone. The climate tends to be warm and dry in the summer and wet and cold in the winter. Lower elevations tend to receive more rain in the winter trending to heavy snow in higher elevations . Dominant human uses in this zone include livestock grazing, mining, and recreation.

Monitoring Summary

The Sawtooth Zone was occupied by 13 documented packs and 1 other documented group at the conclusion of 2015 (Figure 19; Table 18). Two new packs were documented in this zone in 2015, and 1 pack was reassigned to this zone from the Middle Fork Zone. Nine packs produced litters, and 7 packs qualified as breeding pairs (Table 18). The reproductive status of 4 packs was unknown. Two radiocollared wolves were known to have dispersed during 2015. Documented mortalities (n = 16) included harvest (n = 7), other human (n = 5), control (n = 3), and unknown causes (n = 1; Table 19). Two confirmed wolf-caused cattle losses and 56 confirmed wolf-caused sheep losses occurred in this zone in 2015 (Table 19).

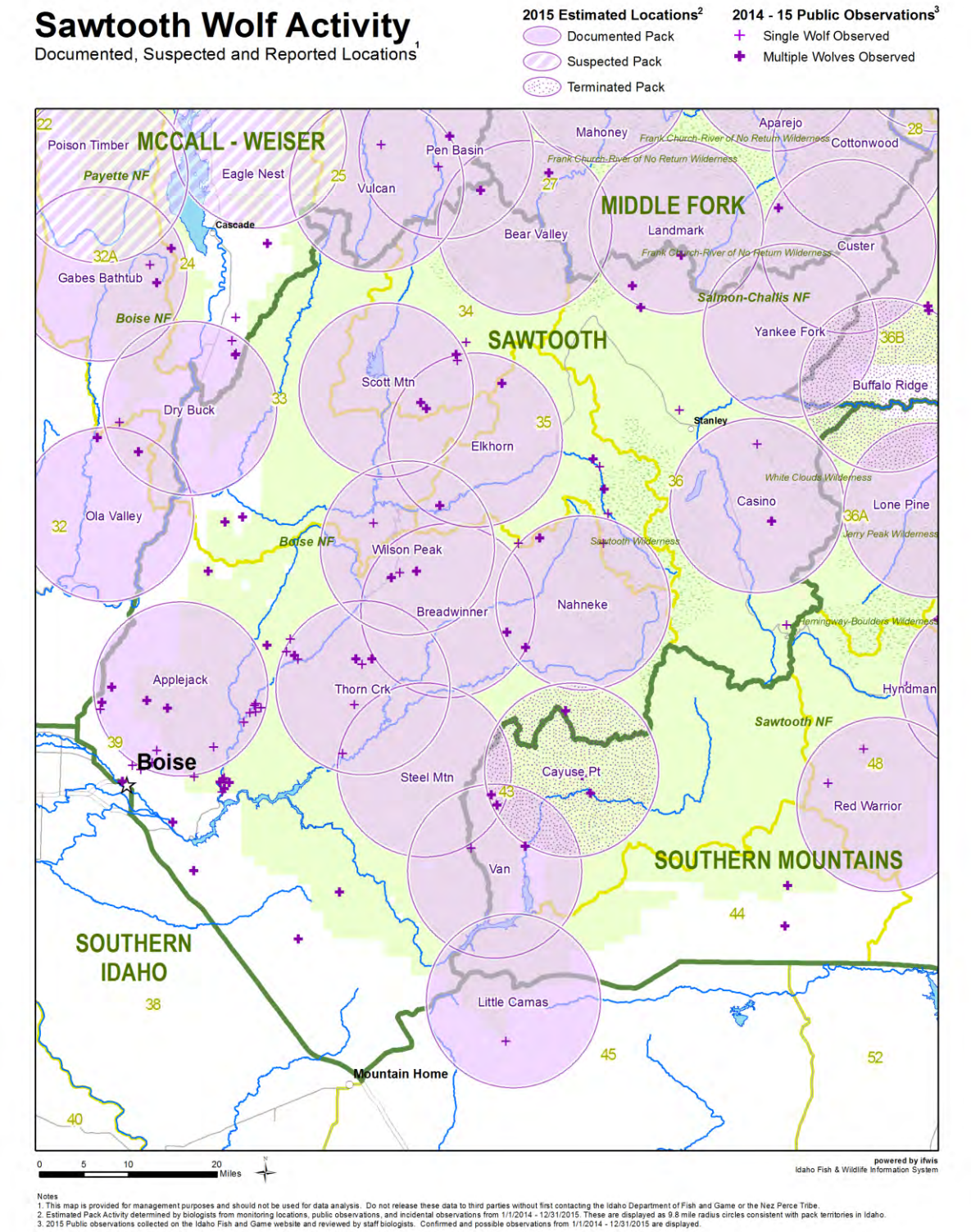

Figure 19. Distribution of documented and suspected wolf packs in the Sawtooth Wolf Management Zone, 2015.

Table 18. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Sawtooth Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status		Known dispersal
		Min. no. pups prod. (died)[c]	Breeding pair[d]	
Documented Pack				
Applejack	?	?	UNK	0
Bear Valley	9	4	YES	0
Breadwinner	2	?	NO	0
Casino	3	6(6)	NO	0
Custer	?	?	UNK	0
Elkhorn	7	5	YES	1
Landmark	13	5	YES	0
Nahneke	7	6	NO	0
Scott Mountain	13	5	YES	0
Steel Mountain	7	10	YES	1
Thorn Creek	?	?	UNK	0
Wilson Peak	4	3(1)	YES	0
Yankee Fork	4	3(1)	YES	0
Unknown		1(1)		
Subtotal	69	47(9)		2
Suspected Pack				
Subtotal	0			
Other Documented Group				
ID735	2			
Subtotal	2			
WMZ Total	**71**	**47(9)**		**2**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.).

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 19. Pups documented via mortality whose pack association could not be definitively assigned were designated as Unknown in Documented Pack column, and were not counted towards the zone reproduction total to avoid potential double-counting.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 19. Documented wolf mortality and wolf-caused depredations by GMU within the Sawtooth Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
33	0	0	1	0	0	0	54	0	0
34	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0
36	0	3	0	5	0	2	0	0	0
39	0	0	6	0	1	0	2	0	0
WMZ Total	**0**	**3**	**7**	**5**	**1**	**2**	**56**	**0**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.
[b] Includes all other human-related deaths exclusive of control and harvest.

SOUTHERN MOUNTAINS WOLF MANAGEMENT ZONE

Background

The Southern Mountains Zone is comprised of GMUs 29, 30, 30A, 36A, 37, 37A, 43, 44, 48, 49, 50, 51, 58, 59, and 59A. It includes 4 elk management zones: the Smoky-Bennett, Pioneer, Lemhi, and Beaverhead zones. The Southern Mountains Zone contains a wide diversity of terrain transitioning from relatively flat prairies in the southwestern portion to rolling and moderately steep terrain of the Smoky and Soldier Mountain ranges in the central portion and steeper, spire-like peaks of the Boulder, White Cloud, Pioneer, and Beaverhead mountain ranges in the northeast portion. These mountain ranges are intersected by several major river drainages, including the South Fork Boise, Big Wood, Big Lost, Little Lost, East Fork Salmon, Salmon, Pahsimeroi, and Lemhi rivers. Because of this varied terrain, habitats range widely and include grass prairie, coniferous forest, high desert shrub-steppe, and alpine; this diversity reflects the wide range of variation in annual precipitation across this region. Land ownership is predominantly public (USFS, BLM) within this zone. Cattle ranching, livestock grazing, and recreation are the dominant human uses in this zone.

Monitoring Summary

The Southern Mountains Zone was occupied by 8 documented packs and one other documented group at the conclusion of 2015 (Figure 20, Table 20); 1 documented pack and 2 other documented wolf groups were no longer considered extant at the end of the year. One new pack was documented but subsequently terminated in 2015. At least four packs produced litters, two of which qualified as breeding pairs in 2015 (Table 20).One radiocollared wolf was known to have dispersed in 2015. Documented mortalities (n = 37) included control (n = 19), harvest (n = 12), other human (n = 5), and natural causes (n = 1; Table 21). Nine confirmed and 1 probable wolf-caused cattle losses occurred in the zone (Table 21). Five confirmed and 1 probable wolf-caused domestic sheep losses occurred in the zone. One confirmed dog loss occurred in the zone.

Figure 20. Distribution of documented and suspected wolf packs in the Southern Mountains Wolf Management Zone, 2015.

Table 20. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Southern Mountains Wolf Management Zone, 2015.

		Reproductive status		
Wolf group[a]	Min. no. wolves detected[b]	Min. no. pups prod. (died)[c]	Breeding pair[d]	Known dispersal
Documented Pack				
Antelope Creek	5	2(2)	NO	0
Arentson	3	?	NO	0
~~Cayuse Point~~	0	3(3)	NO	1
Flatiron	?	?	UNK	0
Hyndman	4	?	UNK	0
Lemhi	?	?	UNK	0
Lone Pine	7	2	YES	0
Red Warrior	?	0	NO	0
Van	9	5	YES	0
Unknown		1(1)		
Subtotal	28	12(6)		1
Suspected Pack				
Subtotal	0			
Other Documented Group				
~~ID626/ID743~~	0			
ID658	2			
~~ID731~~	0			
Subtotal	2			
WMZ Total	**30**	**12(6)**		**1**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Strike-throughs indicate packs or other documented groups no longer assumed extant at the end of 2015.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 21. Pups documented via mortality whose pack association could not be definitively assigned were designated as Unknown in Documented Pack column, and were not counted towards the zone reproduction total to avoid potential double-counting.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 21. Documented wolf mortality and wolf-caused depredations by GMU within the Southern Mountains Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
29	0	0	1	1	0	0	0	0	0
36A	0	0	0	0	0	0	0	0	0
37	0	3	1	0	0	1	0	0	0
37A	0	0	0	0	0	0	1	0	0
43	0	4	1	0	0	0	1(1)	0	0
44	0	4	0	0	0	2(1)	2	0	0
48	1	2	0	1	0	0	1	1	0
49	0	0	0	2	0	0	0	0	0
50	0	6	7	1	0	6	0	0	0
51	0	0	2	0	0	0	0	0	0
WMZ Total	**1**	**19**	**12**	**5**	**0**	**9(1)**	**5(1)**	**1**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.
[b] Includes all other human-related deaths exclusive of control and harvest.

BEAVERHEAD WOLF MANAGEMENT ZONE

Background

The Beaverhead Zone is comprised of GMUs 60, 60A, 61, 62, 62A, 64, 65, and 67. The Beaverhead Mountains are characterized by steep, rocky peaks intersected by numerous steep-gradient creek drainages. The northern portion of this zone is bounded to the south by the Lemhi River and its relatively flat, productive pastureland transitioning to lodgepole forest and steep, mountainous terrain. The central and southern portions of the Beaverhead Zone are comprised of high elevation shrub-steppe habitat transitioning to lodgepole forest and mountainous terrain. Land ownership is primarily Federal (BLM and USFS; 85%). Dominant land use activities include livestock production and agriculture.

Monitoring Summary

The Beaverhead Zone was occupied by 2 Idaho border packs at the conclusion of 2015 (Figure 21, Table 22). One pack was reinstated (Pleasant Valley) and retroactively added to the 2014 pack totals after being dropped in that year. Two border packs attributed to Montana were presumed to spend some time within Idaho. One pack was upgraded from suspected to documented (Hawley) based on confirmation of reproduction but we did not confirm that it met breeding pair status (Table 22); the reproductive status of the remaining pack was unknown. No radiocollared wolves were known to have dispersed in 2015. Documented mortalities ($n = 4$) resulted from harvest ($n = 3$) and other human-causes ($n = 1$; Table 23). One confirmed cattle loss occurred within the zone (Table 23).

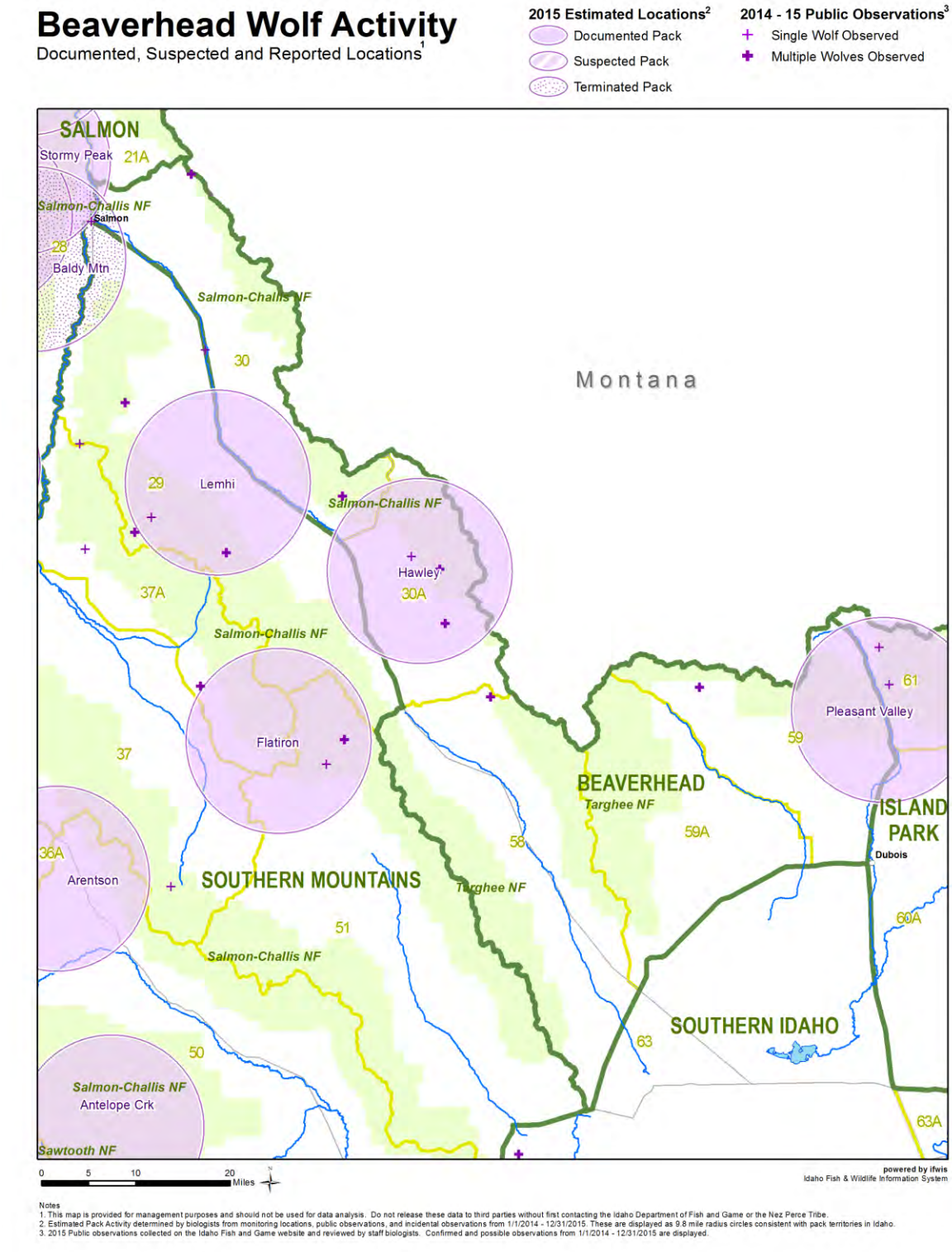

Figure 21. Distribution of documented and suspected wolf packs in the Beaverhead Wolf Management Zone, 2015.

Table 22. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Beaverhead Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status		Known dispersal
		Min. no. pups prod. (died)[c]	Breeding pair[d]	
Documented Pack				
Bloody Dick (MT)				
Four Eyes (MT)				
Hawley (ID)	?	1	UNK	0
Pleasant Valley (ID)	4	?	UNK	0
Subtotal	4	1		0
Suspected Pack				
Subtotal	0			
Other Documented Group				
Subtotal	0			
WMZ Total	**4**	**1**		**0**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Border packs officially tallied to (STATE); territory known/likely shared with ID. Data on non-resident packs can be found in Rocky Mountain Wolf Recovery 2015 Annual Report.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 23.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 23. Documented wolf mortality and wolf-caused depredations by GMU within the Beaverhead Wolf Management Zone, 2015.

GMU	Documented mortality					Confirmed (probable) wolf-caused losses			
	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
30	0	0	0	0	0	0	0	0	0
30A	0	0	2	0	0	1	0	0	0
58	0	0	1	1	0	0	0	0	0
59	0	0	0	0	0	0	0	0	0
59A	0	0	0	0	0	0	0	0	0
WMZ Total	**0**	**0**	**3**	**1**	**0**	**1**	**0**	**0**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.

[b] Includes all other human-related deaths exclusive of control and harvest.

ISLAND PARK WOLF MANAGEMENT ZONE

Background

Topography in the Island Park Zone (GMUs 60, 60A, 61, 62, 62A, 64, 65, 67) consists of gentle to moderately sloping terrain, but contains portions of several mountain ranges. At relatively high elevation, winters are often severe, with associated deep snow accumulations. Habitat communities comprise a mixture of forest types (lodgepole pine, Douglas-fir, quaking aspen [*Populus tremuloides*]) associated with adequate moisture, and high-desert, shrub-steppe habitat types indicative of a drier climate. Land ownership consists of a checkerboard of state, federal, and private properties, roughly one half being under federal/state ownership. Dominant land use activities include timber harvest, livestock production, and agriculture.

Monitoring Summary

The Island Park Zone was occupied by 5 documented packs (including 3 Idaho border packs) at the conclusion of 2015 (Figure 22, Table 24). One pack was no longer considered extant at the end of 2015. Two border packs reported for Wyoming were presumed to spend some time in this zone. Two suspected packs were attributed to this zone. Reproduction was confirmed in 2 packs, one of which qualified as a breeding pair for 2015 (Table 24); the reproductive status of 3 packs was unknown. No radiocollared wolves were known to have dispersed in 2015. Documented mortalities (n = 15) resulted from harvest (n = 8), control (n = 6), and other human causes (n = 1; Table 25). Three confirmed cattle losses occurred in the zone (Table 25). Fifty-one confirmed wolf-caused domestic sheep losses occurred in the zone, as well as 2 confirmed wolf-killed dogs.

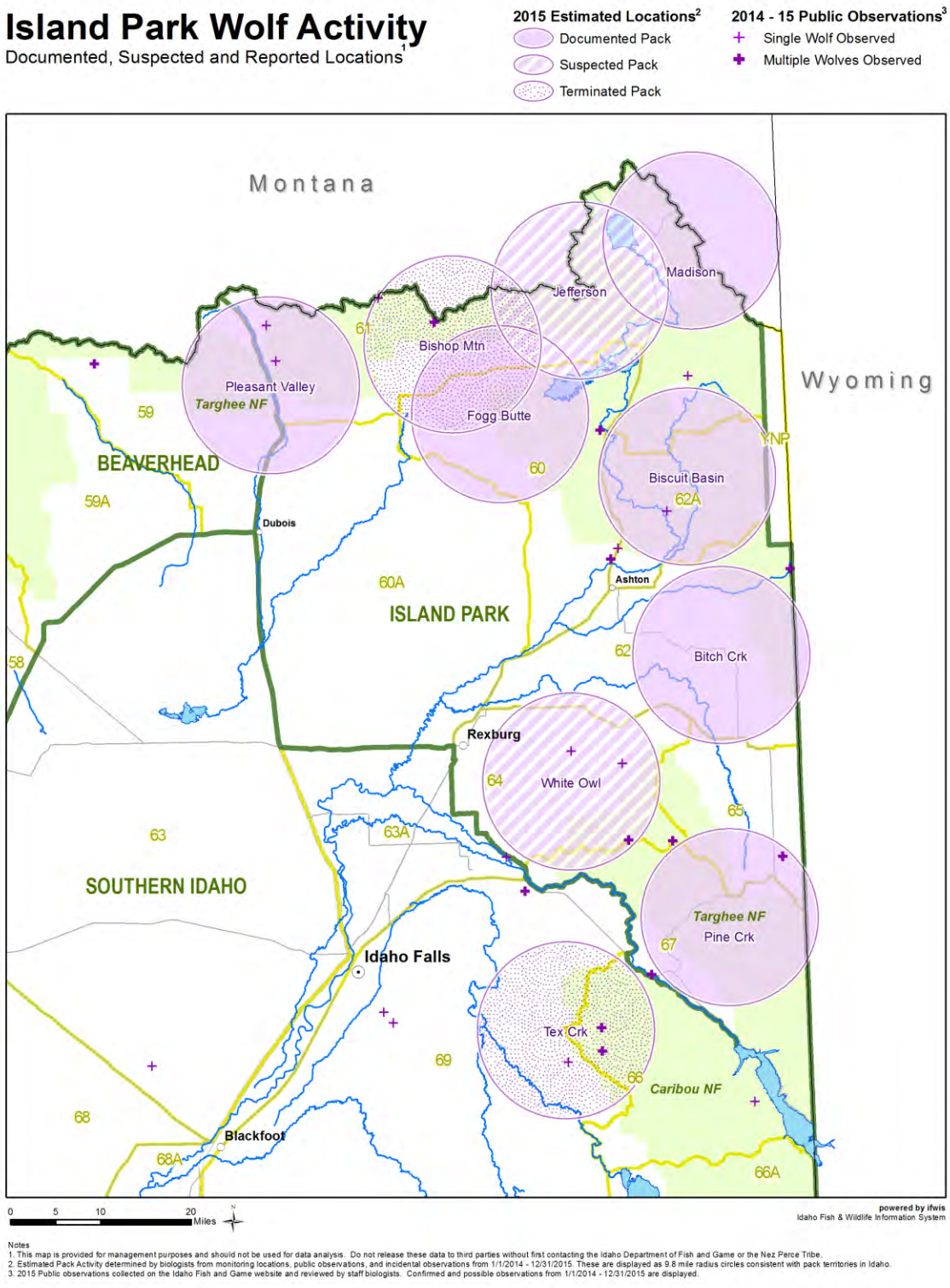

Figure 22. Distribution of documented and suspected wolf packs in the Island Park Wolf Management Zone, 2015.

Table 24. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Island Park Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status: Min. no. pups prod. (died)[c]	Reproductive status: Breeding pair[d]	Known dispersal
Documented Pack				
Bechler (WY)				
Biscuit Basin	?	2(2)	UNK	0
~~Bishop Mountain (ID)~~	0			
Bitch Creek (ID)	?	?	UNK	0
Chagrin River (WY)				
Fogg Butte	7	3	YES	0
Madison (ID)	?	?	UNK	0
Pine Creek (ID)	?	?	UNK	0
Subtotal	7	5(2)		0
Suspected Pack				
Jefferson	?			
White Owl	?			
Subtotal	0			
Other Documented Group				
Subtotal	0			
WMZ Total	**7**	**5(2)**		**0**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Strike-throughs indicate packs or other documented groups no longer assumed extant at the end of 2015. Border packs officially tallied to (STATE); territory known/likely shared with ID. Data on non-resident packs can be found in Rocky Mountain Wolf Recovery 2015 Annual Report.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 25.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 25. Documented wolf mortality and wolf-caused depredations by GMU within the Island Park Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
60	0	5	1	0	0	1	30	0	0
60A	0	0	0	1	0	0	0	0	0
61	0	0	3	0	0	0	21	2	0
62	0	1	0	0	0	2	0	0	0
62A	0	0	1	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0
65	0	0	3	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0
WMZ Total	**0**	**6**	**8**	**1**	**0**	**3**	**51**	**2**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.
[b] Includes all other human-related deaths exclusive of control and harvest.

SOUTHERN IDAHO WOLF MANAGEMENT ZONE

Background

The Southern Idaho Zone includes the Snake River Plain, which comprises an area of heavy agricultural use with a metropolitan corridor along U.S. Interstate 84. GMUs include 38, 40, 41, 42, 45, 46, 47, 52, 52A, 53, 54, 55, 56, 57, 63, 63A, 66, 66A, 68, 68A, 69, 70, 71, 72, 73, 73A, 74, 75, 76, 77, and 78. The zone includes several mountain ranges spanning from the Owyhees in the west to the Portneufs in the east. These ranges might act as corridors for dispersing wolves, but potential for livestock conflicts could be high. The zone also contains some protected areas including Craters of the Moon National Monument and the Idaho National Laboratory. The climate tends to be hot and dry during summer and cold and wet during winter. Temperatures range from mild in the west to more severe in the east.

Monitoring Summary

One newly documented pack occupied the Southern Idaho Zone in 2015 (Figure 23, Table 26). One documented pack was considered no longer extant at the end of 2015. Reproduction was documented in one pack in 2015, and it qualified as a breeding pair (Table 26). No radiocollared wolves were known to have dispersed in 2015. There were no documented mortalities in this zone in 2015 (Table 27). There were no confirmed or probable wolf-caused livestock depredations in this zone in 2015 (Table 27).

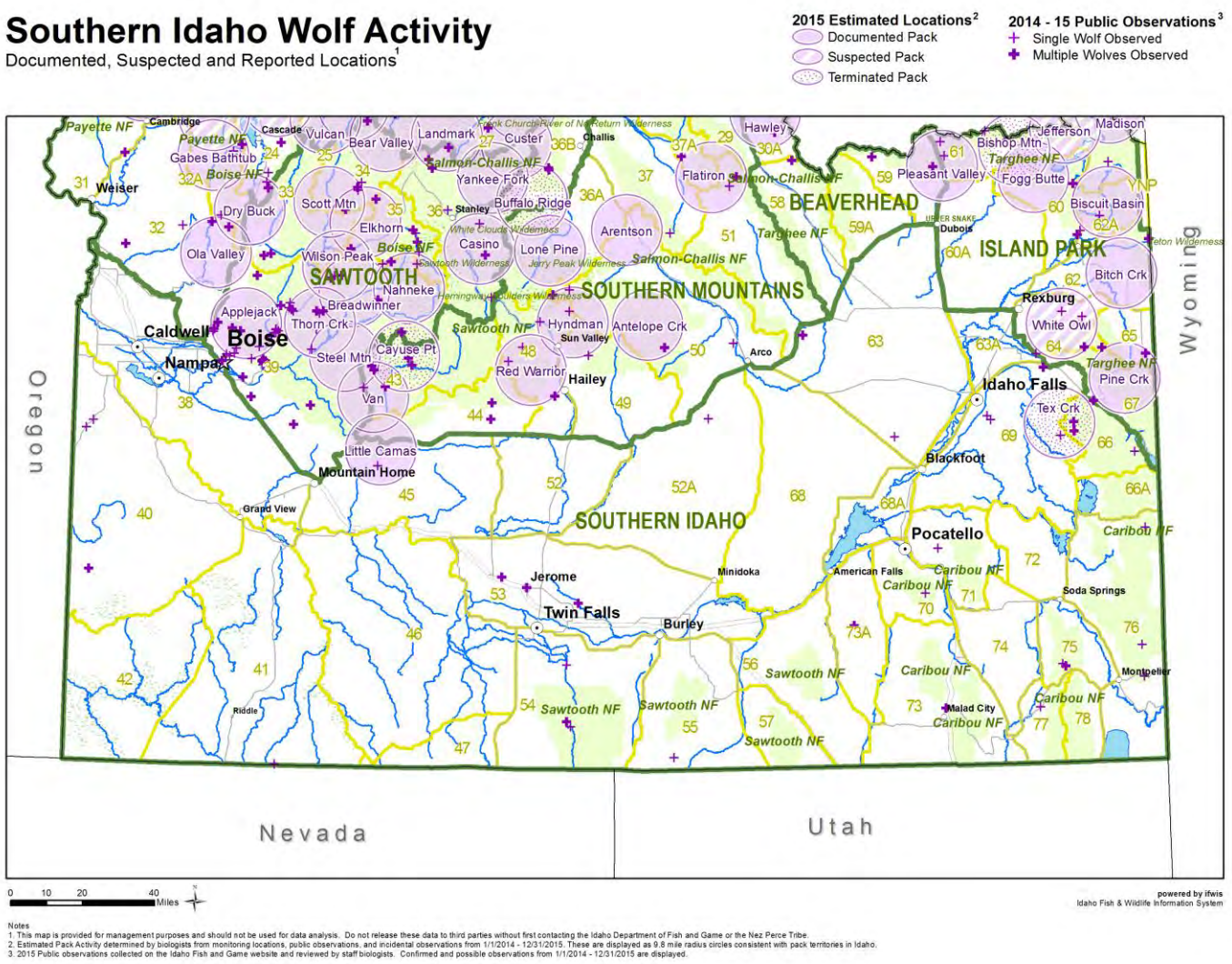

Figure 23. Distribution of documented and suspected wolf packs in the Southern Idaho Wolf Management Zone, 2015.

Table 26. Minimum number of wolves detected, reproductive status, and known dispersal for documented and suspected wolf packs and other documented wolf groups within the Southern Idaho Wolf Management Zone, 2015.

Wolf group[a]	Min. no. wolves detected[b]	Reproductive status: Min. no. pups prod. (died)[c]	Reproductive status: Breeding pair[d]	Known dispersal
Documented Pack				
Little Camas	6	3	YES	0
~~Tex Creek~~	0			
Subtotal	6	3		0
Suspected Pack				
Subtotal	0			
Other Documented Group				
Subtotal	0			
WMZ Total	**6**	**3**		**0**

[a] Documented packs = territorial groups of wolves usually consisting of an adult male and female and their offspring from one or more generations, and has the potential to reproduce (2 adults of opposite sex). Suspected packs = geographic areas where wolf pack presence was suspected but not verified, or where wolf presence was verified but did not meet documented pack status. Other documented group = verified groups not meeting either documented or suspected pack status (e.g., lone wolves, potential mated pairs, etc.). Strike-throughs indicate packs or other documented groups no longer assumed extant at the end of 2015.

[b] Number of wolves detected by qualified agency personnel from monitoring flights or ground observations conducted during winter 2015/2016, documented late fall/early winter harvest mortality data, or verified observations; represents end of year (2015) data. Summing this row does not equate to number of wolves estimated to be present in the population.

[c] Number in parentheses indicates known pup mortality; pup mortalities tallied in the appropriate row/column in Documented Mortality in Table 27.

[d] Breeding pairs are the measure of Federal and State wolf recovery and management goals. A breeding pair is defined as "an adult male and a female wolf that have produced at least 2 pups that survive until December 31 of the year of their birth."

Table 27. Documented wolf mortality and wolf-caused depredations by GMU within the Southern Idaho Wolf Management Zone, 2015.

	Documented mortality					Confirmed (probable) wolf-caused losses			
GMU	Natural	Control[a]	Harvest	Other human[b]	Unk.	Cattle	Sheep	Dogs	Other
38	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0
52A	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0
63A	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0
66A	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0
68A	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0
73A	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0
WMZ Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

[a] Includes agency lethal control and legal or State-authorized take by landowners.
[b] Includes all other human-related deaths exclusive of control and harvest.

LITERATURE CITED

Ausband, D. E., L. N. Rich, E. M. Glenn, M. S. Mitchell, P. Zager, D. A. W. Miller, L. P. Waits, B. B. Ackerman, and C. M. Mack. 2014. Monitoring gray wolf populations using multiple survey methods. Journal of Wildlife Management 78:335–346.

Ausband, D. E., and S. B. Bassing. 2015. Final report for testing monitoring techniques for wolves in southwest Alberta. 26 p. Missoula, MT, USA.

Idaho Legislative Wolf Oversight Committee. 2002. Idaho wolf conservation and management plan as modified by the 56th Idaho Legislature, second regular session.

MacKenzie, D. I., J. D. Nichols, G. B. Lachman, S. Droege, J. A. Royle, and C. A. Langtimm. 2002. Estimating site occupancy rates when detection probabilities are less than one. Ecology 83:2248–2255.

Mech, D. L., and L. Boitani. 2003. Wolves: behavior, ecology, and conservation. The University of Chicago Press, Illinois.

Montana Department of Fish, Wildlife, and Parks. (2015, March 16). Gray wolf history. Retrieved from http://fwp.mt.gov/fishAndWildlife/management/wolf/history.html.

Oakleaf, J. K., D. L. Murray, J. R. Oakleaf, E. E. Bangs, C. M. Mack, D. W. Smith, J. A. Fontaine, M. D. Jimenez, T. J. Meier, and C. C. Niemeyer. 2006. Habitat selection by recolonizing wolves in the northern rocky mountains of the United States. Journal of Wildlife Management 70:554–563.

Ream, R. R., M. W. Fairchild, D. K. Boyd, and A. Blakesley. 1989. First wolf den in western U.S. in recent history. Northwestern Naturalist 70:39-40.

USFWS (U.S. Fish and Wildlife Service). 1987. Northern Rocky Mountain wolf recovery plan. U.S. Fish and Wildlife Service, Denver, Colorado.

USFWS (U.S. Fish and Wildlife Service). 1994. Endangered and Threatened Wildlife and Plants; Establishment of a Nonessential Experimental Population of Gray Wolves in Central Idaho and Southwestern Montana. Federal Register in Wyoming, Idaho, and Montana. Federal Register 59(224):60266-60281.

USFWS (U.S. Fish and Wildlife Service). 2007. Endangered and Threatened Wildlife and Plants; Final Rule Designating the Northern Rocky Mountain Population of Gray Wolf as a Distinct Population Segment and Removing This Distinct Population Segment From the Federal List of Endangered and Threatened Wildlife. Federal Register 72(26):6106-6139.

USFWS (U.S. Fish and Wildlife Service). 2008. Endangered and Threatened Wildlife and Plants; Final Rule Designating the Northern Rocky Mountain Population of Gray Wolf as a Distinct Population Segment and Removing This Distinct Population Segment From the Federal List of Endangered and Threatened Wildlife. Federal Register 73(39):10514-10560.

USFWS (U.S. Fish and Wildlife Service). 2009. Endangered and Threatened Wildlife and Plants; Final Rule To Identify the Northern Rocky Mountain Population of Gray Wolf as a Distinct Population Segment and To Revise the List of Endangered and Threatened Wildlife. Federal Register 74(62):15123-15188.

USFWS (U.S. Fish and Wildlife Service). 2010. Endangered and Threatened Wildlife and Plants; Reinstatement of Protections for the Gray Wolf in the Northern Rocky Mountains in Compliance With a Court Order. Federal Register 75(206):65574-65579.

APPENDIX A. POPULATION ESTIMATION TECHNIQUE USED TO DETERMINE WOLF POPULATION NUMBERS IN IDAHO

From 1996 until 2005, the Idaho wolf population was estimated using a total count technique that was appropriate and feasible when wolf numbers were low and a substantial number of wolves were radiocollared. Since then, as the wolf population increased in size and distribution, we have used an estimation technique that is more feasible for a larger population that is more difficult to monitor. In 2006 we began using an estimation technique that has been peer reviewed by the University of Idaho and northern Rocky Mountain wolf managers. This technique relies on documented packs, mean or median pack size (mean or median of the sample pool of packs where pack counts are considered complete), number of wolves documented in small groups not considered packs, and an estimated percentage (12.5%; Mech and Boitani 2003, p. 170) of the population presumed to be lone wolves. The calculation uses a total count of wolves for those packs where we have a high degree of confidence that we observed all pack members, and applies the mean or median pack size to the remaining documented packs with incomplete counts. We use the statistical mean when number of packs with complete year-end counts is ≥20; otherwise median pack size is applied. Lastly, a multiplication factor of 1.125 is applied to account for lone wolves not associated with packs or smaller groups. Although this technique is feasible given the types of data we are able to collect, no measure of precision is available for this estimate. Mathematically this technique is represented as:

$$\mathbf{(D + (P*M) + G)*L}$$

Where for 2015:

D = 261	The number of wolves counted in documented packs with a complete count.
P = 67	Documented packs without a complete count. Number of documented packs extant at the end of 2015 was 108. Complete pack size counts were obtained for 41 of those, leaving 67 packs without complete counts.
M = 6.4	Mean pack size.
G = 9	Total count of wolves in radiocollared groups of 2-3 wolves that were not considered packs under Idaho's definition.
L = 1.125	Lone wolf factor. A conservative value from a range derived from 5 peer-reviewed studies and 4 non-reviewed papers from studies that occurred in North America (Mech and Boitani 2003).

Using this technique, 786 wolves were estimated in documented packs, documented groups, and lone wolves at the end of 2015.

APPENDIX B. CONTACTS FOR IDAHO WOLF MANAGEMENT

Idaho Fish and Game Headquarters Wildlife Bureau: (208) 334-2920
For information about wolves in Idaho and IDFG involvement or to report wolf sightings:

IDFG wolf management webpage: http://fishandgame.idaho.gov/public/wildlife/wolves/

IDFG wolf reporting webpage: https://fishandgame.idaho.gov/ifwis/observations/wolf/

The Nez Perce Tribe's Idaho Wolf Recovery Program:
Telephone: (208) 634-1061
Mail: 14054 Burr Road
McCall, ID 83638-1922
Email: cmack@nezperce.org

For information about the Nez Perce Tribe's Wildlife Program and to view Recovery Program Progress Reports, please visit the following website:
http://www.nezperce.org/programs/wildlife_program.htm

To report livestock depredations within Idaho:
USDA APHIS Wildlife Services State Director, Boise, ID
(866) 4US-DAWS or (208) 373-1630

To report information regarding the illegal killing of a wolf or a dead wolf within Idaho:
Citizens Against Poaching (24hr) 1-800-632-5999 or any IDFG Regional Office.

U.S. Fish and Wildlife Service Northern Rocky Mountain Wolf Recovery:
For information about wolf recovery in the Northern Rocky Mountains, please visit the USFWS website: http://www.westerngraywolf.USFWS.gov/

USFWS Idaho State Office: (877) 661-1908