# WYOMING GRAY WOLF POPULATION MONITORING AND MANAGEMENT INTERIM REPORT

## JANUARY 1, 2014 THROUGH SEPTEMBER 23, 2014

***Prepared by the Wyoming Game and Fish Department in cooperation with the National Park Service, USDA-APHIS-Wildlife Services, and the U.S. Fish and Wildlife Service to fulfill the U.S. Fish and Wildlife Service requirement to report the status, distribution and management of the wolf population in Wyoming outside Yellowstone National Park and the Wind River Reservation from January 1, 2014 through September 23, 2014.***

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## EXECUTIVE SUMMARY

The State of Wyoming was responsible for monitoring and managing the gray wolf population in Wyoming outside Yellowstone National Park, Wyoming (Yellowstone), and outside Tribally-owned and Native American-owned fee-titled lands within the Wind River Reservation (hereafter, Wind River Reservation) from January 1, 2014 through September 23, 2014. On September 23, 2014, U.S. Federal District Court in Washington, D.C. released a ruling that overturned the 2012 Wyoming wolf delisting rule. This ruling returned Endangered Species Act protections for wolves throughout Wyoming and transferred wolf monitoring and management authority back to the U.S. Fish and Wildlife Service. Additionally, the U.S. Fish and Wildlife Service determined the court's ruling directed wolf protection under the 1994 10(j) rule. The State of Wyoming is responsible to report wolf monitoring and management activities to the U.S. Fish and Wildlife Service for the period wolves were delisted in Wyoming and the Wyoming Game and Fish Department had management authority for wolves. This interim report fulfills this requirement.

As of September 23, 2014, the gray wolf population in Wyoming outside Yellowstone and Wind River Reservation remained above minimum delisting criteria. At least 195 wolves in ≥34 packs inhabited Wyoming outside Yellowstone and the Wind River Reservation on September 23, 2014. Sixteen packs successfully reproduced and raised ≥2 pups of the year through September 23, 2014, all of which were located primarily within the Wolf Trophy Game Management Area. Causes of mortality included: human-caused = 57 (control in response to confirmed livestock depredation = 31, preemptive damage control in the predatory animal area = 9, legal public harvest in the predatory animal area = 12, vehicles = 1, illegal = 2, other = 2); natural = 3; and unknown = 3. Fifty-seven wolves were captured from January 1 through September 23, 2014. Seventy radio-collared wolves were being monitored as of September 23, 2014 in Wyoming outside Yellowstone and the Wind River Reservation (36% of the known population on September 23, 2014).

The wolf hunting season in the Wolf Trophy Game Management Area was slated to open October 1, 2014. The wolf hunting season was cancelled prior to opening because the U.S. Federal District Court decision reinstated Endangered Species Act protections for wolves in Wyoming on September 23, 2014. Wolves could be taken anytime in any legal manner in Wyoming outside Yellowstone and the Wind River Reservation where they were designated as predatory animals from January 1 through September 23, 2014. Twelve wolves were harvested in the area where wolves are designated as predatory animals during this timeframe.

Wolves were confirmed to have killed 55 head of livestock (49 cattle, six sheep) in Wyoming outside Yellowstone and the Wind River Reservation from January 1 through September 23, 2014. An additional seven cattle were injured by wolves during this timeframe. Seventeen packs (50% of 34 packs in Wyoming outside Yellowstone and the Wind River Reservation) were involved in ≥1 depredation. Of the 17 packs involved in ≥1 depredation; 13 packs (76%) were involved in ≥2 depredations; and nine packs (53%) were involved in ≥3 depredations. Thirty-one depredating wolves were lethally removed through control efforts to reduce livestock losses.

A total of $764,382 was spent for wolf monitoring, management, and compensation for livestock depredation by agencies in Wyoming outside Yellowstone and the Wind River Reservation from January 1 through September 23, 2014.

## BACKGROUND

### *Wolf Delisting and Current Legal Status*

In 1995 and 1996, the USFWS reintroduced 31 gray wolves into Yellowstone National Park, WY (Yellowstone) as a nonessential experimental population under the Endangered Species Act with the goal of reestablishing a sustainable wolf population in the northern Rocky Mountains. The U.S. Fish and Wildlife Service (USFWS) was the federal agency charged with administering, monitoring, and managing the wolf population following reintroduction until wolves reached recovery levels and Endangered Species Act protections could be removed ("delisting"). The wolf population expanded quickly in number and distribution throughout northwest Wyoming. The population reached the required delisting criteria by 2002 and has exceeded the criteria every year since. More information on wolves and the background and history of the wolf reintroduction program can be found on the Wyoming Game and Fish Department's (WGFD) and USFWS's websites at the following links:

http://www.fws.gov/mountain-prairie/species/mammals/wolf/
http://wgfd.wyo.gov/web2011/wildlife-1000380.aspx

In August 2011, the USFWS and the state of Wyoming finalized a cooperative planning effort which outlined a mutually agreed upon wolf management framework for the wolf population in Wyoming. The Wyoming Gray Wolf Management Plan (and an addendum that was added for clarification; referred to collectively as the "Wolf Management Plan" hereafter), applicable state statutes, and Wyoming Game and Fish Commission regulations were subsequently revised and given final approval by USFWS on September 10, 2012. Wolves were delisted in Wyoming on September 30, 2012.

Following delisting, several non-governmental organizations challenged the USFWS delisting rule in U.S. Federal District Court in Washington, D.C. The Federal Court released a decision that overturned the USFWS delisting rule on September 23, 2014. This ruling immediately placed wolves in Wyoming back under Endangered Species Act protections and removed state management authority for wolves in Wyoming outside Yellowstone and outside Tribally-owned and Native American-owned fee-titled lands within the Wind River Reservation (hereafter, referred to as the Wind River Reservation) from the State of Wyoming.

The WGFD is required to provide the USFWS with a report on wolf monitoring and management activities conducted during the period wolves were under state authority in 2014 (January 1 through September 23) as part of post-delisting recovery criteria. This report incorporates all monitoring and management data for wolves in Wyoming outside Yellowstone and the Wind River Reservation and fulfills this requirement. Data in this report were provided by the WGFD, the National Park Service for data collected on lands administered by the National Park Service within Grand Teton National Park, the U.S. Department of Agriculture-Animal Plant Health Inspection Service-Wildlife Services (Wildlife Services) for wolf conflict data in areas under predatory animal designation, and the USFWS for data collected on the National Elk Refuge. Data presented within this report are interim data and should NOT be used for interannual comparison.

***Wolf Management Framework***

Wolves in Wyoming outside Yellowstone and the Wind River Reservation were monitored and managed by the WGFD while delisted, except on lands administered by the National Park Service within Grand Teton National Park and on the National Elk Refuge, where the National Parks Service and USFWS monitor wolves, respectively. The WGFD had wildlife management authority, within the John D. Rockefeller, Jr. Memorial Parkway, and on non-indian owned fee-titled lands on the Wind River Reservation. The management approach of the WGFD was to maintain a recovered wolf population in areas of suitable wolf habitat in Wyoming while balancing the need to minimize wolf conflicts with livestock and wild ungulate herds. Wyoming's Wolf Management Plan also seeks to incorporate sport hunting opportunity into its wolf population management strategy. As required by state law, wolves in Wyoming outside Yellowstone and the Wind River Reservation were managed under the dual classifications of trophy game animal and predatory animal as outlined in the Wolf Management Plan and approved by the USFWS. The three wolf management "zones" in Wyoming outside Yellowstone and the Wind River Reservation, are as follows:

1. *Wolf Trophy Game Management Area (WTGMA):* Wolves are designated as trophy game animals year-round within the WTGMA (see Figure 1). Wolves in the WTGMA are managed similar to other trophy game species (e.g., black bears and mountain lions) and may only be taken by members of the public in self defense, when in the act of doing damage to private property, under the authority of a lethal take permit, or by licensed hunters during an open wolf hunting season. Livestock owners who have confirmed wolf depredation on livestock in the WTGMA may qualify for compensation from the state.
2. *Seasonal WTGMA:* Wolves are designated as trophy game animals in the Seasonal WTGMA from October 15 through the end of February of the subsequent year and as predatory animals from March 1 to October 14 each year (see Figure 1). Wolves may be taken by the public with the same limitations that apply in the WTGMA while they are designated as trophy game animals (see above), or may be taken as predatory animals for the remainder of the year (see below). Livestock owners who have confirmed wolf depredation on livestock in the Seasonal WTGMA may qualify for compensation from the state regardless of wolf status designation.
3. *Areas when and where wolves are designated as predatory animals:* Wolves are designated as predatory animals year-round in areas of primarily unsuitable habitat outside of the WTGMA and also within the Seasonal WTGMA from March 1 to October 14 (see above and Figure 1). State statute allows for the take of predatory animals without a hunting license and at any time, in any legal manner. Livestock owners who have confirmed wolf depredation on livestock outside the trophy game management areas do not qualify for compensation from the state.

For more information on the wolf management framework in Wyoming outside Yellowstone and the Wind River Reservation, including the Wolf Management Plan and regulations, please visit the following link:

http://wgfd.wyo.gov/web2011/wildlife-1000380.aspx

# MONITORING

### *Capture and Radio-collaring*

Radio-collars are the primary tool used to monitor wolf populations in Wyoming and throughout the northern Rocky Mountains. Wolves are captured using foothold traps or darted/net gunned from a helicopter. Radio-collars are affixed to captured wolves and personnel collect morphological information, genetic samples, and blood for disease testing. Radio-collared wolves are released at or near the capture site and monitored to document overall population demographics, including: pack territories, movements (including dispersal), pack numbers, pack composition, breeding status and success, den locations, livestock conflict resolution, and to aid in law enforcement investigations.

Fifty-seven wolves were captured from January 1 through September 23, 2014 (helicopter capture = 50; trapping = 7), including 10 recaptures. Fifty-four wolves were radio-collared and released at or near the capture site, two wolf pups were released without collaring, and one wolf died as a result of capture. As of September 23, 2014, 68 radio-collared wolves in 31 packs and 2 collared solitary wolves that had dispersed from their packs were being actively monitored, for a total of 70 radio-collared wolves (36% of the known wolf population on September 23, 2014).

### *Population and Reproductive Status*

The minimum wolf population in Wyoming outside Yellowstone and the Wind River Reservation on September 23, 2014 was determined using standard wolf monitoring methods that have been used since reintroduction. The number of wolves in each pack was documented by aerial counts during telemetry flights and capture operations, observations confirmed by qualified agency personnel, or pictures of known packs taken with remote cameras. All pack counts used to report the wolf population as of September 23, 2014 were obtained in mid-summer through September 23, 2014 when the WGFD ceased wolf monitoring efforts due to the federal court ruling which returned management authority of wolves in Wyoming to the USFWS. Solitary wolves were included in the estimate only if the observations were confirmed by qualified agency personnel and the animal was not a member of a known pack. Trans-boundary packs were assigned to the appropriate jurisdiction (both between jurisdictions within Wyoming, and between Idaho and Montana) based on where they denned, or if denning was not verified, to the jurisdiction containing >50% of the pack's territory. The final minimum wolf population count is the sum of all pack counts and single wolves known to be present on September 23, 2014. Wolf monitoring in Wyoming outside Yellowstone and the Wind River Reservation is focused in the WTGMA with less intensive monitoring in the Seasonal WTGMA and predatory animal areas.

Reproductive status of each wolf pack was also monitored using methods utilized since wolves were reintroduced. Denning behavior for individual packs was confirmed using aerial and ground telemetry and ground investigations during spring and summer. Pup presence was verified with observations made during aerial and ground monitoring efforts using radio-telemetry equipment, investigations of potential den and rendezvous sites, howling surveys, public reports confirmed by qualified agency personnel, pictures taken with remote cameras,

evaluations of changes in pack size, pups captured during radio-collaring efforts or a combination of methods. Breeding pair status (1 adult male and 1 adult female wolf that successfully raise ≥2 pups of the year through December 31) could not be verified at the time of this interim report because we did not monitor pup survival through December 31. As an alternative, packs that successfully reproduced and raised ≥2 pups of the year through September 23, 2014 are reported as a proxy. The USFWS will continue monitoring wolf packs through December 31, 2014 and will determine wolf population and breeding pair status for wolf packs in their annual report.

As of September 23, 2014, ≥195 wolves in ≥34 packs were documented in Wyoming outside Yellowstone and the Wind River Reservation, of which ≥186 wolves in ≥32 packs resided primarily within the WTGMA/Seasonal WTGMA and ≥8 wolves in ≥2 packs resided primarily in areas where wolves are designated as predatory animals (Figure 1 and Table 1). These figures should be considered a minimum estimate because wolves are difficult to observe during the summer and early autumn, which coincided with the ending date for this interim report (September 23, 2014). Three known packs where only one wolf could be verified as of September 23, 2014 are listed as packs because end of year surveys are highly likely to detect additional individuals within the pack (e.g., Huckleberry, North Fork, and Soda Lake). Pack size ranged from 2-22 and averaged 6.1 wolves/pack not including three packs where only one wolf was verified as of September 23, 2014. Sixteen packs successfully reproduced and raised ≥2 pups of the year through September 23, 2014, all of which were located primarily within the WTGMA (Figure 1 and Table 1).

New packs documented for the first time in 2014 prior to September 23 included Clark's Fork, South Fork and Warm Springs. The Rim pack's name was changed to the Dell Creek pack because the WGFD was able to trap and collar a wolf from this pack and subsequent telemetry monitoring centered on the Dell Creek area, not the Hoback Rim area. In addition, all but one known location for the Owl Creek pack was outside the Wind River Reservation through September 23, 2014, thus this pack was assigned to Wyoming. The Prospect Peak pack in the predatory animal area was the only pack that existed in 2013 that was not verified as of September 23, 2014. No wolf packs were removed in control actions following confirmed livestock depredation or as the result of any form of human-caused mortality as of September 23, 2014.

There was little evidence suggesting the presence of wolf packs in Wyoming outside Yellowstone and the Wind River Reservation that were not documented in the minimum interim wolf population estimate (Figure 1 and Table 1). The vast majority of wolf observations recorded in Wyoming outside Yellowstone and the Wind River Reservation could be attributed to documented packs included in this report.

### *Mortality*

Wolf mortality was monitored in Wyoming outside Yellowstone and the Wind River Reservation using multiple methods. Tracking radio-collared wolves was the primary method used for

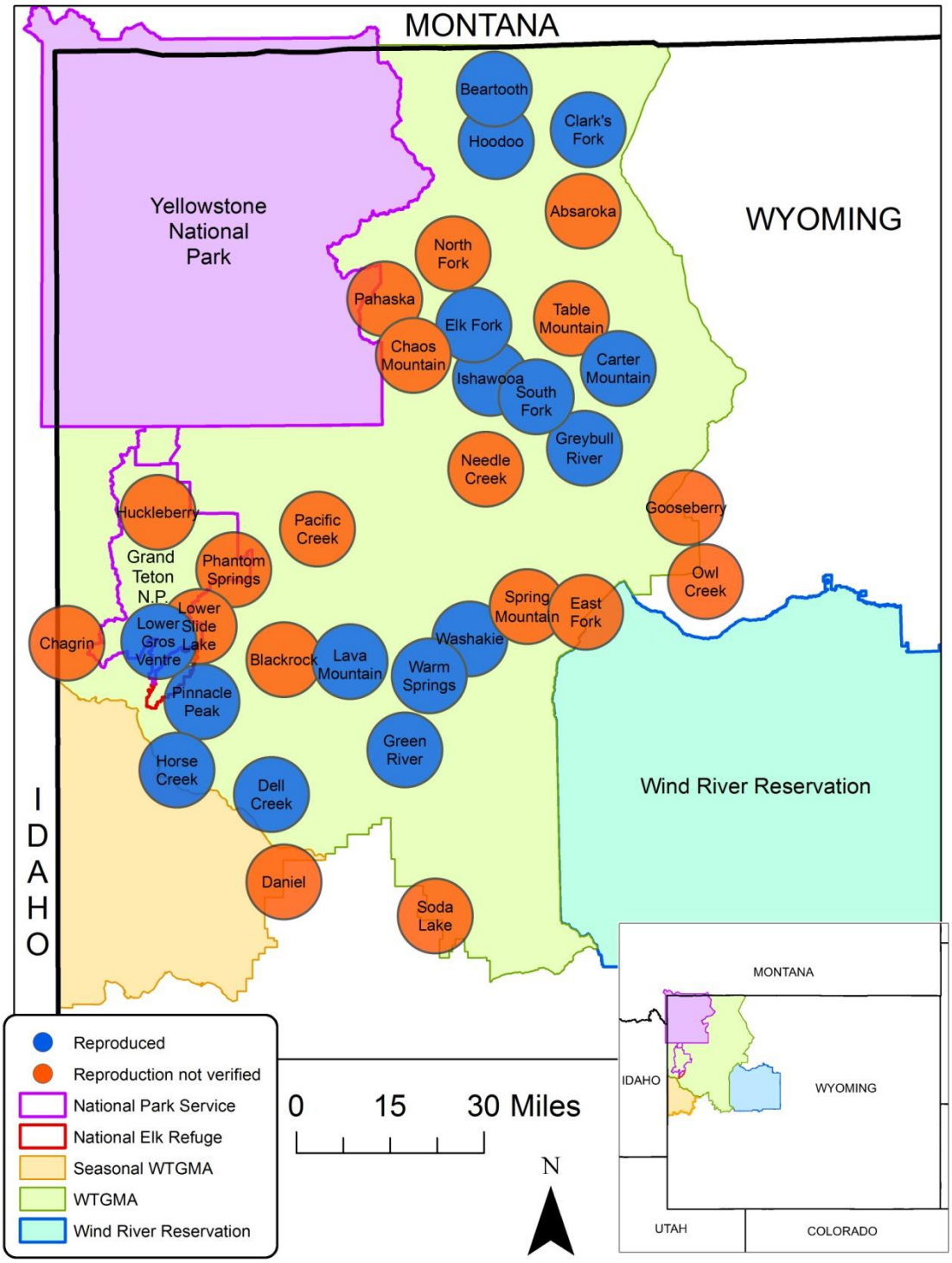


**Figure 1**. Territory centroids and reproductive status of confirmed wolf packs present in Wyoming outside Yellowstone National Park and the Wind River Reservation on September 23, 2014. Wolf packs were considered to have successfully reproduced (blue centroids) if they contained ≥2 pups of the year on September 23, 2014, otherwise they were considered to have not successfully reproduced or reproduction was unverified (orange centroids). White areas of the map within the Wyoming state boundary depict areas of primarily unsuitable habitat where wolves are designated as predatory animals year-round.

**Table 1.** Wolf pack names, population data, and depredation information for confirmed wolf packs in Wyoming outside Yellowstone National Park and the Wind River Reservation from January 1 through September 23, 2014. Wolf pack presence, reproductive status, and size are presented as of September 23, 2014.

| WOLF PACK[1,2] | RECOV AREA | STATE | MIN. ESTIMATED PACK SIZE | DOCUMENTED MORTALITIES | | | | | KNOWN DISPERSED | MISSING[7] | CONFIRMED LOSSES[8] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | NATURAL | HUMAN[3] | UNKN[4] | HARVEST[5] | CONTROL[6] | | | CATTLE | SHEEP | DOGS | OTHER |
| **Wyoming Outside Yellowstone National Park and the Wind River Reservation** | | | | | | | | | | | | | | |
| Absaroka | GYA | WY | 2 | | | | | 2 | 1 | 1 | 1 | | | |
| Beartooth | GYA | WY | 8 | | | | | 1 | | | 3 | | | |
| Blackrock | GYA | WY | 2 | | | | | | | 1 | 3 | | | |
| Carter Mountain | GYA | WY | 8 | | 1 | | | 6 | | | 10 | | | |
| Chagrin River[9] | GYA | WY | 2 | | | | | | | | | 3 | | |
| Chaos Mountain | GYA | WY | 2 | | | | | | | | | | | |
| Clark's Fork | GYA | WY | 4 | | | | | | | | | | | |
| Daniel | GYA | WY | 2 | | 1 | | 2 | | | | | | | |
| Dell Creek | GYA | WY | 8 | | | | 1 | | | | | | | |
| East Fork | GYA | WY | 4 | | | | 2 | | 1 | | 2 | | | |
| Elk Fork Creek | GYA | WY | 10 | | | | | | | | | | | |
| Gooseberry | GYA | WY | 7 | | 1 | | 1 | 3 | | | | | | |
| Green River | GYA | WY | 6 | | | | | 3 | | | 6 | | | |
| Greybull River | GYA | WY | 7 | | | | | | 1 | | 1 | | | |
| Hoodoo | GYA | WY | 10 | | | 1 | | 4 | | | 2 | | | |
| Horse Creek | GYA | WY | 5 | | 1 | | | | | | | | | |
| Huckleberry | GYA | WY | 1 | | | | | | | | | | | |
| Ishawooa | GYA | WY | 12 | | | | | 3 | | | 2 | | | |
| Lava Mountain | GYA | WY | 22 | 1 | | 1 | | | | | 2 | | | |
| Lower Gros Ventre | GYA | WY | 4 | | | | | | | | | | | |
| Lower Slide Lake | GYA | WY | 2 | | | | | | | | | | | |
| Needle Creek | GYA | WY | 2 | | | | | | | | 1 | | | |
| North Fork | GYA | WY | 1 | | | | | | 2 | | | | | |
| Owl Creek | GYA | WY | 1 | | 6 | | 1 | 2 | | | 1 | 3 | | |
| Pacific Creek | GYA | WY | 5 | | | | | | 1 | | | | | |
| Pahaska | GYA | WY | 3 | | 1 | | | | | | | | | |
| Phantom Springs | GYA | WY | 7 | | | | | | 1 | | | | | |
| Pinnacle Peak | GYA | WY | 12 | | | 2 | | | 1 | 3 | | | | |
| ~~Prospect~~ | GYA | WY | | | | | | | | | | | | |
| Soda Lake | GYA | WY | 1 | | | | | | | | | | | |
| South Fork | GYA | WY | 4 | | | | | | | | 3 | | | |
| Spring Mountain | GYA | WY | 7 | | | | 1 | | | | | | | |
| Table Mountain | GYA | WY | 2 | | | | | 2 | | | 3 | | | |
| Warm Springs | GYA | WY | 6 | | | | | 3 | | | 4 | | | |
| Washakie | GYA | WY | 12 | | | | | | 1 | | 1 | | | |
| Misc/Lone wolves | GYA | WY | 4 | 1 | 3 | | 4 | 2 | | | 4 | | | |
| **Wyoming Total (outside YNP/WRR)** | | | 195 | 2 | 14 | 4 | 12 | 31 | 9 | 5 | 49 | 6 | 0 | 0 |

[1] Underlined packs successfully reproduced and raised ≥2 pups of the year through September 23, 2014.

[2] Strikethough packs were not documented during 2014 and/or did not exist on Sept. 23, 2014 and are not displayed in Figure 1.

[3] Excludes wolves killed in control actions and legal harvest.

[4] Includes wolves that died of unknown causes.

[5] Number of wolves legally harvested from January 1 through September 23, 2014.

[6] Includes agency-directed lethal control and wolves legally killed by private citizens to defend livestock or under terms of a lethal take permit.

[7] Collared wolves that became missing in from January 1 through September 23, 2014.

[8] Includes only livestock confirmed to have been killed by wolves. Does not include 7 calves that were injured by wolves but survived.

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

determining wolf mortalities occurring from non-hunting causes. Radio-collars were programmed to change pulse rate after the collar remained motionless for five hours, thereby allowing managers to monitor collared wolves for mortality status and visit the site to evaluate cause-specific mortality and collect carcasses for further evaluation through necropsy. Take of predatory animals was monitored via reporting as required in Wyoming Game and Fish Commission regulation Chapter 47. This requirement allowed WGFD personnel to document mortalities and collect information on harvested wolves. Cooperating agencies also provided information on wolf mortalities, including wolves killed in control actions by Wildlife Services. Wolf mortalities from all causes were documented and confirmed, including those reported by the public and WGFD personnel.

From January 1 through September 23, 2014, 63 wolves were known to have died in Wyoming outside Yellowstone and the Wind River Reservation (Tables 1 and 2). Causes of mortality included: control in response to confirmed livestock depredation = 31; legal public harvest in the predatory animal area = 12; other human causes = 14 (preemptive damage control in the predatory animal area = 9, illegal kills = 2, vehicle strikes = 1, capture mortality = 1, and accidental = 1); natural = 3, and unknown = 3 (Tables 1 and 2). The wolf that died as a result of capture was the first capture-related mortality of 128 wolves (0.8% mortality rate) captured since 2012.

**Table 2.** Summary of wolf mortality in Wyoming outside Yellowstone National Park and the Wind River Reservation by general cause of death and wolf management area from January 1 through September 23, 2014.

| Cause of death | WTGMA | Seasonal WTGMA | Predatory animal | Total |
|---|---|---|---|---|
| Legal hunting | 0 | 1 | 11 | 12 |
| Control | 25 | 0 | 6 | 31 |
| Other human | 4 | 1 | 9 | 14 |
| Natural | 3 | 0 | 0 | 3 |
| Unknown | 3 | 0 | 0 | 3 |
| Total Mortality | 35 | 2 | 26 | 63 |

***Disease Monitoring***

*Mange:* Sarcoptic mange is a highly contagious skin disease caused by mites (*Sarcoptes scabiei*) and is commonly found in wolf populations throughout the world. Mange was first detected in Wyoming wolves outside Yellowstone and the Wind River Reservation in 2002. Between 2002 and 2008, four packs east of Yellowstone and at least one pack near Jackson, WY were suspected of having mange (Jimenez et al. 2010).

Mange infection continues to be present at a low level in the wolf population outside Yellowstone and the Wind River Reservation. During summer 2013 signs of mange (alopecia and seborrhea) were observed in the Absaroka pack west of Cody, WY. Wolves captured from the Absaroka pack in January 2014 continued to show signs of active mange infection. There were three other wolves showing signs of mange that were not members of a known pack but

were in close proximity to the Absaroka pack's territory in early 2014 and may have contracted the mite from members of the Absaroka pack or may be dispersing members of the pack. As of September 23, 2014, the WGFD documented no reproduction in the Absaroka pack and the pack appeared to at least partially dissolve, which may have been the result of continuing active mange infection or undetected mortality caused by mange. No other packs showed signs of mange infection through September 23, 2014.

*Canine Distemper Virus and Canine Parvovirus:* Canine distemper virus (distemper) and canine parvovirus (parvovirus) are highly contagious diseases that infect domestic dogs, coyotes, foxes, raccoons, skunks, and wolves. Based on other areas of the world that have experienced epizootic distemper and parvovirus infections, these diseases will occasionally cause mortality, particularly among pups. Outbreaks usually remain localized in specific areas/years and do not threaten regional wolf population viability.

The carcass of one uncollared adult wolf was found during summer 2014 that tested positive for exposure to distemper, and likely succumbed to the disease. An additional wolf carcass was located that tested positive for distemper exposure but was too decomposed to determine whether the infection was active and was the ultimate cause of death. The WGFD did not document loss of litters or failed reproduction due to the disease similar to outbreaks that have occurred in Yellowstone (Almberg et al. 2009). Wolf blood samples collected to date have not been tested for parvovirus exposure, but exposure to the virus is expected to occur at a high rate among wolves in Wyoming (>80% of wolves exposed) based on historic prevalence rates.

***Genetic Monitoring***

The USFWS determined that, in addition to minimum population criteria, genetic interchange must occur between wolf recovery areas in the northern Rocky Mountains to ensure recovery. To monitor whether this delisting criterion is met, USFWS requires that all states in the northern Rocky Mountains collect and analyze genetic samples from wolf populations. Analysis of genetic interchange will be conducted cooperatively between USFWS and the states of Wyoming, Montana, and Idaho on a periodic basis.

From January 1 through September 23, 2014, genetic samples were collected from 98 wolves that will be used in analysis of genetic connectivity. Genetic samples were collected from 50 wolves captured for monitoring purposes and 48 wolves that died. Genetic connectivity between the recovery areas may also be confirmed through dispersal movements of marked wolves (e.g., ear tagged, radio-collared, etc.) and subsequent identification of successful reproduction through observation data and/or subsequent genetic testing of potential offspring. The WGFD began analyzing genetic samples in summer 2014 to evaluate whether any of three known wolves who dispersed into Wyoming from central Idaho have identifiable offspring in the Wyoming wolf population indicating successful reproduction. This research will be in addition to the broader northern Rocky Mountains wide analysis mentioned above, and will provide data useful for this broader analysis and for evaluating genetic connectivity amongst wolf subpopulations in the northern Rockies.

## MANAGEMENT

### *Livestock Depredation*

From 2000-2009, the wolf population in Wyoming outside Yellowstone and the Wind River Reservation increased annually, then stabilized between 200 and 250 wolves from 2010-2011. During the period of wolf population growth, wolves also expanded in range and recolonized historic areas of distribution. Through 2006, cattle depredation by wolves increased rapidly as the wolf population increased and expanded in range (Figure 2). Beginning in 2006, the USFWS moved to a more aggressive approach of wolf control following confirmed livestock depredation, leading to a decrease in the number of livestock losses despite a continued increase in the overall wolf population (Figure 2).

Since 2000, wolves have commonly recolonized areas outside the WTGMA/Seasonal WTGMA, but have rarely persisted more than a year before being removed for confirmed livestock depredation. The state of Wyoming developed its wolf management framework to restrict wolf range expansion into areas of unsuitable habitat and high livestock density by designating wolves as predatory animals in these areas. Predatory animal designation is a tool that allows livestock producers more flexibility in protecting their livestock as well as liberal public harvest of wolves where conflicts have been chronic during wolf recovery. In general, wolves living in areas with relatively high native ungulate densities and relatively low exposure to domestic livestock have caused fewer conflicts with livestock than wolves that recolonized areas of unsuitable habitat where large numbers of livestock grazed on private and public lands, (e.g., those areas outside the WTGMA).

From January 1 through September 23, 2014, reported livestock depredations in Wyoming outside Yellowstone and the Wind River Reservation were investigated by WGFD and/or Wildlife Services. Only confirmed depredations were documented in this report and are based on specific criteria within Wyoming Game and Fish Commission regulations (Chapter 28), which generally requires confirmed evidence at the scene or on the livestock carcass indicating wolves were responsible for the death of the individual livestock (in the majority of confirmed cases, this evidence includes bite marks from wolves with pre-mortem hemorrhaging and tissue damage on the livestock carcass affirming that wolves were directly responsible). All reported livestock damage is investigated in the WTGMA and Seasonal WTGMA. Reporting and investigation of livestock depredation by wolves designated as predatory animals year-round is incomplete as compensation is not offered for livestock killed by wolves and verification of depredation is not required for the public, predator boards, or cooperating agencies to initiate wolf control actions in this area. Therefore, the number of confirmed wolf depredations where wolves are designated as predatory animals year-round as presented in this report represents a minimum of known depredations.

From January 1 through September 23, 2014, wolves in Wyoming outside Yellowstone and the Wind River Reservation were responsible for killing 55 head of livestock (Tables 1 and 3 and Figure 2). Confirmed livestock depredations included 49 cattle (37 calves and 12 cows/yearlings) and six sheep (three adults and three lambs; Tables 1 and 3). An additional seven calves were confirmed to have been injured by wolves but, to the knowledge of personnel

involved, these animals recovered from their injuries. Sheep depredations through September 23, 2014 were the lowest recorded since 2002, and were the result of reduced wolf numbers in areas occupied by sheep grazing operations within the Seasonal WTGMA and predatory animal areas. Cattle depredations were slightly higher through September 23, 2014 than documented in previous years.

**Table 3.** Confirmed livestock and dog depredations and number of wolves killed in control actions in Wyoming outside Yellowstone National Park and the Wind River Reservation from January 1, 2002 through September 23, 2014.

| Depredations | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Interim 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cattle | 23 | 34 | 75 | 54 | 123 | 55 | 41 | 20 | 26 | 35 | 44 | 40 | 49 |
| Sheep | 0 | 7 | 18 | 27 | 38 | 16 | 26 | 195 | 33 | 30 | 112 | 33 | 6 |
| Dogs | 0 | 0 | 2 | 1 | 1 | 2 | 0 | 7 | 0 | 1 | 3 | 1 | 0 |
| Goats | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Horses | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| Total Depredations | 23 | 43 | 105 | 83 | 162 | 74 | 67 | 222 | 60 | 67 | 160 | 75 | 55 |
| Wolves Controlled | 6 | 18 | 29 | 41 | 44 | 63 | 46 | 31 | 40 | 36 | 43 | 33 | 31 |

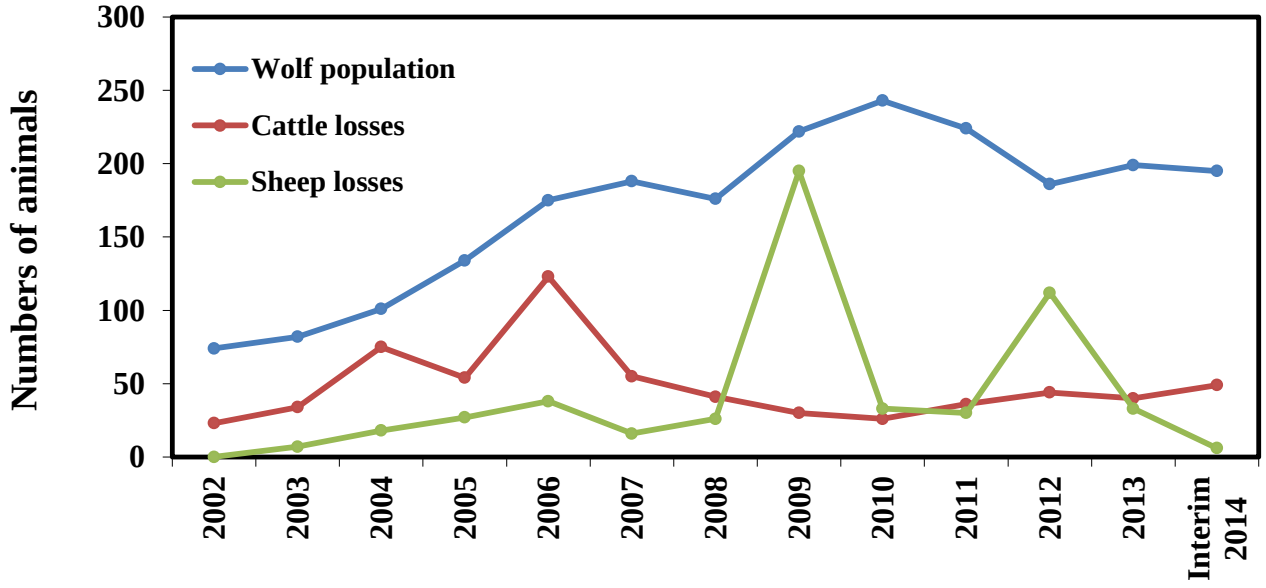


**Figure 2.** Wolf population size and number of confirmed cattle and sheep depredations in Wyoming outside Yellowstone National Park and the Wind River Reservation from January 1, 2002 through September 23, 2014.

Management actions in response to confirmed livestock depredations included trapping and radio-collaring wolves, intensive wolf monitoring, lethal removal through agency control actions, and issuance of 24 lethal take permits to livestock producers (12 initial permits and 12 renewals to expired permits due to continued wolf-livestock conflicts). Eleven wolves were killed through September 23, 2014 under the authority of lethal take permits. One additional

wolf was killed for defense of private property as provided in state statute and Wyoming Game and Fish Commission regulation. Non-lethal prevention was routinely considered, and was implemented in at least two circumstances through September 23, 2014 to reduce the likelihood of livestock depredation. In addition to monies spent by WGFD, USDA Wildlife Services spent $28,586 to investigate possible depredations and conduct control actions.

*Number of Packs Involved in Confirmed Depredations:* Seventeen packs (50% of 34 packs) in Wyoming outside Yellowstone and the Wind River Reservation were involved in ≥1 livestock depredation through September 23, 2014, including the Warm Springs and South Fork packs which were newly confirmed in 2014 (Table 1 and Figure 3). Of the 17 packs involved in ≥1 depredation; 13 packs (76%; 38% of packs in Wyoming outside Yellowstone and the Wind River Reservation) were involved in ≥2 depredations; and 9 packs (53%; 26% of packs in Wyoming outside Yellowstone and the Wind River Reservation) were involved in ≥3 livestock depredations. A total of 16 packs were involved in confirmed cattle depredation, of which the Green River and Carter Mountain packs were responsible for 33% of cattle depredations (six cattle or 12% by Green River and ten cattle or 21% by Carter Mountain). The Chagrin pack and Owl Creek pack were each responsible for 50% of sheep depredations (three sheep each).

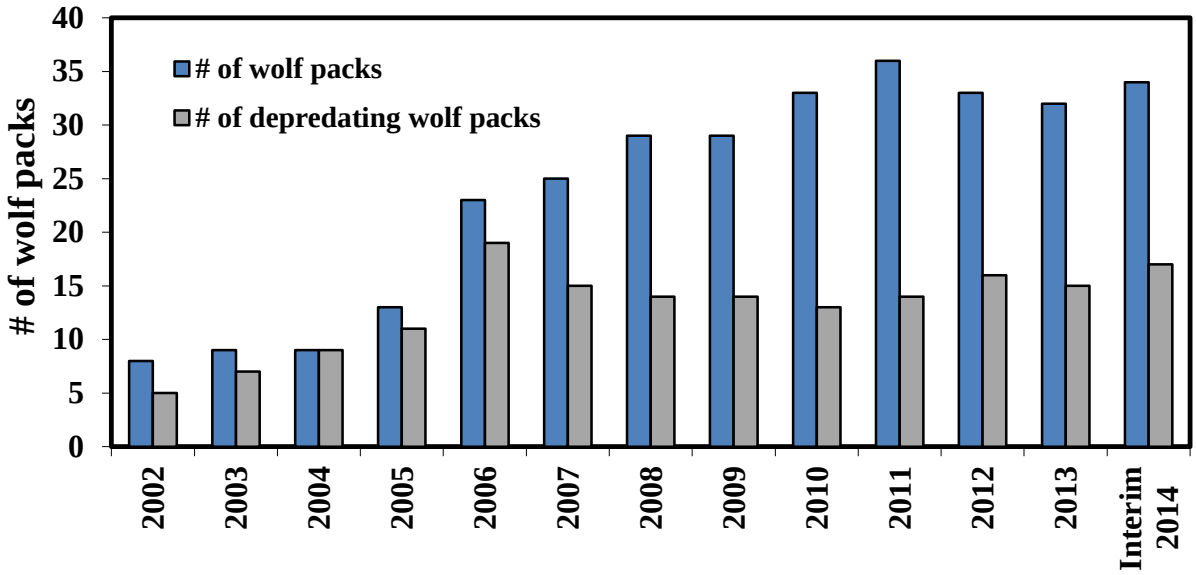


**Figure 3.** Number of wolf packs and number of wolf packs that were involved in ≥1 confirmed livestock depredation/year in Wyoming outside Yellowstone National Park and the Wind River Reservation from January 1, 2002 through September 23, 2014.

*Seasonal Trend in Livestock Depredations:* Confirmed cattle depredation followed a seasonal pattern through September 23, 2014 that was similar to 2011 and 2012. Cattle depredation began in March and remained at low levels until July, when depredations increased throughout the summer and early autumn (Figure 4). As of September 23, 2014, sheep depredations were low and were only documented in May and June (Figure 5). The seasonal trend in depredations, with the exception of higher cattle depredation in the spring of 2013, was comparable to other years and followed the pattern of open range summer grazing of livestock where livestock are distributed over large grazing allotments that overlap wolf distribution during the summer and autumn in northwest Wyoming.

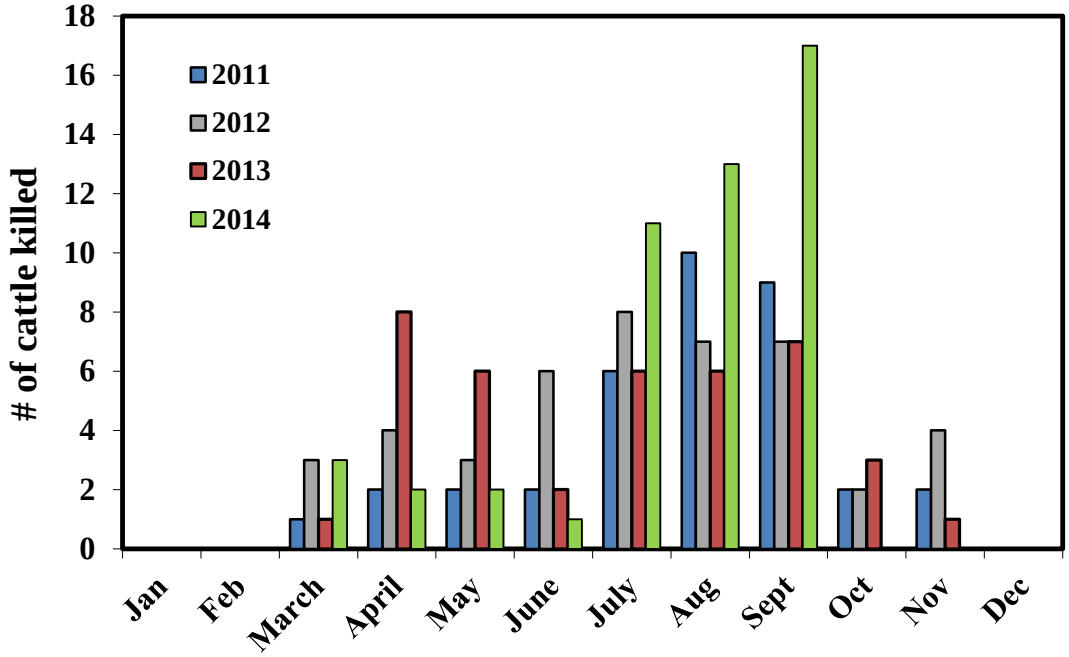


**Figure 4.** Number of confirmed cattle depredations per month by wolves in Wyoming outside Yellowstone National Park and the Wind River Reservation from January 1, 2011 through September 23, 2014.

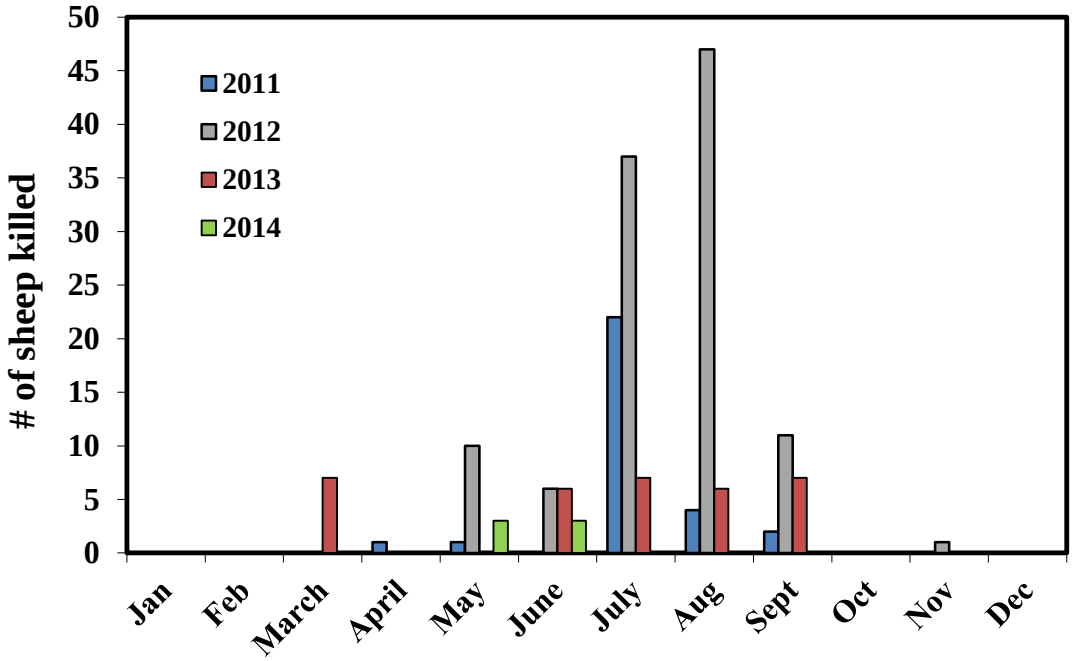


**Figure 5.** Number of confirmed sheep depredations per month by wolves in Wyoming outside Yellowstone National Park and the Wind River Reservation from January 1, 2011 through September 23, 2014.

*Location of Livestock Depredations:* Through September 23, 2014, 58% (32 cattle) of confirmed livestock depredations were on public land and 42% (23 livestock; 17 cattle and six sheep) of livestock depredations were on private land (Figure 6). Sixty-five percent (32 cattle) of confirmed cattle depredations were on public land and 35% (17 cattle) of cattle depredations were on private property (Figure 6). All six confirmed sheep depredations occurred on private land (Figure 6).

Through September 23, 2014, confirmed cattle depredations occurred in all but four wolf hunt areas (Table 4). Three of the confirmed sheep depredations occurred in wolf hunt area seven and three occurred in that portion of Wyoming where wolves are designated as predatory animals year-round (Table 4).

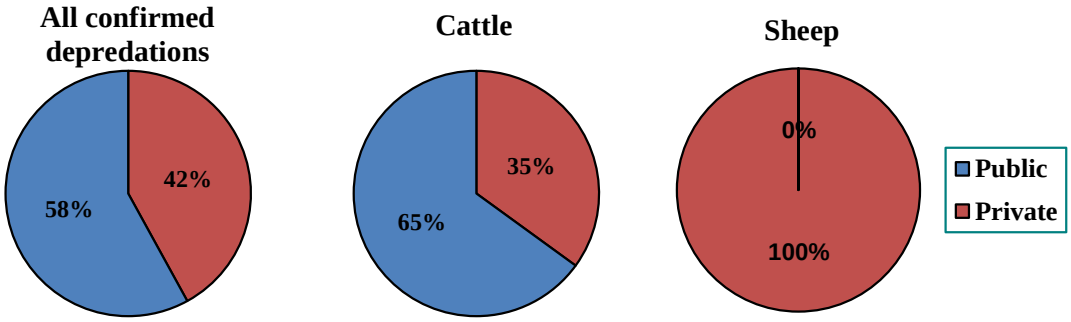


**Figure 6.** Land status where confirmed livestock depredations occurred in Wyoming outside Yellowstone National Park and the Wind River Reservation from January 1 through September 23, 2014.

**Table 4**. Confirmed cattle and sheep depredations in Wyoming outside Yellowstone National Park and the Wind River Reservation by wolf hunt area ("WHA") and in areas of the state where wolves are designated as predatory animals ("Pred") from January 1 through September 23, 2014.

| WHA | 1 | 2 | 4 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Pred | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cattle | 4 | 2 | 16 | 5 | 7 | 0 | 0 | 2 | 1 | 0 | 8 | 0 | 4 | 49 |
| Sheep | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 6 |
| Total | 4 | 2 | 16 | 5 | 7 | 0 | 3 | 2 | 1 | 0 | 8 | 0 | 7 | 55 |

*Compensation for Livestock Depredations:* The WGFD paid $160,258 to compensate livestock producers who lost livestock to wolves from January 1 through September 23, 2014. Compensation payments were made primarily from state funds ($128,792) with some matching funds from the federal Wolf-Livestock Demonstration Project Grant Program ($31,466). Wyoming Game and Fish Commission regulation Chapter 28 and state statute authorizes compensation only for damage that occurs in the WTGMA/Seasonal WTGMA. Livestock depredations in areas of the state where wolves are designated as predatory animals year-round are not eligible for compensation under state statute or Wyoming Game and Fish Commission regulation Chapter 28.

### *Unacceptable Impacts to Ungulates or Elk Feedgrounds*

Under the Wolf Management Plan, state statute, and Wyoming Game and Fish Commission regulation Chapter 21, WGFD may lethally remove wolves when it is determined that "wolf predation is causing an unacceptable impact on a wild ungulate population or herd" or when a "wolf-wild ungulate conflict has occurred at any state operated elk feedground." An "unacceptable impact on a wild ungulate population or herd" is defined in Chapter 21 as:

> "Unacceptable impact on a wild ungulate population or herd" means any decline in a wild ungulate population or herd that results in the population or herd not meeting the Commission population management goals, objectives or recruitment levels established for the population or herd. The Department shall determine whether a decline in a wild ungulate population or herd constitutes an "unacceptable impact" and whether wolf predation is a significant factor causing the "unacceptable impact" based upon the best scientific data and information available.

In addition, under Chapter 21, wolves may be lethally removed for conflicts caused at state-operated elk feedgrounds only "when a gray wolf or wolves displace elk from a feedground and it results in one of the following conflicts:"

1. Damage to private stored crops by displaced elk; or,
2. Elk co-mingling with domestic livestock; or,
3. Displacement of elk from a feedground onto a highway right of way causing human safety concerns.

No agency-directed lethal removal actions occurred from January 1 through September 23, 2014 to address unacceptable impacts on a wild ungulate population or herd or to address wolf-caused conflicts on state-operated feedgrounds. The WGFD determined wolves from the Horse Creek pack displaced elk from the Horse Creek elk feedground onto adjacent private land where they caused damage and also displaced elk from the Camp Creek elk feedground into areas closely adjacent to US Highway 189/191 south of Jackson, WY from January through March 2014. The WGFD erected dynamic message signs to warn motorists of elk on the roadway in this general area and the landowner was reimbursed for damages caused by elk displaced onto his property. Analyses of impacts to ungulate populations remain an integral part of ongoing management of wolves and their prey in Wyoming.

## RESEARCH

*Title:* Wolf predation on ungulates in the Upper Gros Ventre River drainage.
*Collaborators:* Wyoming Game and Fish Department
*Description:* This research is aimed at measuring wolf kill rates and predation characteristics on ungulates in the Upper Gros Ventre River drainage. The WGFD captured four wolves in packs present in the Upper Gros Ventre River drainage in March 2014 and fitted them with GPS collars to study specific wolf predation characteristics and their potential impacts on ungulate prey populations. Information will be used to guide management of wolves and ungulates in northwest Wyoming.

*Title:* Genetic verification of effective migration of wolves into Wyoming.
*Collaborators:* Wyoming Game and Fish Department
*Description:* Genetic parentage analyses will allow the WGFD to determine whether any known wolves in Wyoming are direct descendents of known immigrants into the Wyoming wolf population, thereby confirming continued genetic connectivity in the northern Rocky Mountains wolf subpopulations as required for wolf recovery.

*Title:* Summer wolf predation patterns in Grand Teton National Park, WY.
*Collaborators:* J. Stephenson, S. Dewey, and S. Cain, Grand Teton; M. Jimenez, USFWS.
*Description:* From 2011-2014, Grand Teton personnel documented summer predation patterns of the Phantom Springs pack with the aid of GPS collars.

*Title:* Winter wolf predation patterns in Grand Teton National Park, WY.
*Collaborators:* J. Stephenson, S. Dewey, and S. Cain, Grand Teton; M. Jimenez, USFWS.
*Description:* This research is a continuation of previous winter wolf predation research in Grand Teton and is aimed at investigating winter wolf predation patterns on wolf packs that inhabit portions of Grand Teton through 2014.

*Title:* Comparative Demography of Two Moose Populations with Contrasting Predator Densities.
*Collaborators:* B. Oates, M. Kauffman, K. Monteith, University of Wyoming and Wyoming Cooperative Fish and Wildlife Research Unit; J. Goheen, University of Wyoming; G. Fralick, A. Courtemanch, S. Smith, WGFD; G. Hanvey, United States Forest Service-Bridger-Teton National Forest.
*Description:* Quantifying the relative influence of wolf and grizzly bear density on the demography of two moose herds (Sublette and Jackson) in the southern GYE, while accounting for the influence of winter severity, spring green-up of vegetation, summer drought, habitat quality, and the effect of the 1988 Yellowstone fires. Project is expected to be completed by summer of 2015.

*Title:* Evaluating moose behavioral response to wolf presence in the southern Greater Yellowstone Ecosystem.
*Collaborators:* B. Oates, J. Goheen, M. Kauffman, and K. Monteith, Wyoming Cooperative Fish and Wildlife Research Unit; S. Dewey, S. Cain, and J. Stephenson, Grand Teton; M. Jimenez, USFWS.
*Description:* Planned research will use existing datasets to test how wolf presence influences Shiras moose habitat selection and movement rates. An enhanced understanding of such indirect risk effects will improve predictions about the potential demographic effects moose experience as a function of predation risk by wolves in the Greater Yellowstone Ecosystem (GYE). Project is expected to be completed by end of 2015.

## OUTREACH

Through September 23, 2014, WGFD personnel gave numerous formal presentations on wolf biology, monitoring, and management to the general public, special interest groups, civic organizations, and other agencies and associations, including eight public information gathering

meetings discussing proposed regulatory changes for wolves in Wyoming outside Yellowstone and the Wind River Reservation. The WGFD also met with multiple conservation and sportsmen's non-government organizations and several interested members of the public to discuss the status of the wolf population in Wyoming and wolf hunting season proposals. The WGFD conducted nine Living in Lion, Bear, and Wolf Country Workshops across western Wyoming where information on wolf biology and ecology and safety, primarily in regards to dogs and other pets was presented. WGFD personnel were also interviewed for multiple magazine, newspaper, radio, and television feature stories. As part of normal wolf monitoring and management activities, WGFD personnel interacted with members of the public on a daily basis with the goal of increasing public involvement and understanding of wolf monitoring and management throughout Wyoming.

## FUNDING

A total of $764,382 was spent by agencies conducting wolf monitoring and management activities in Wyoming outside Yellowstone and the Wind River Reservation from January 1 through September 23, 2014 (Table 5). The WGFD spent a total of $535,796 for wolf monitoring, management and livestock compensation during this timeframe. This total included $375,538 to monitor and manage wolves ($100,160 of federal funds, $21,964 of private funds, and $251,874 of state funds) and $160,258 to compensate livestock owners who were confirmed to have lost livestock to wolves ($128,792 of state funds and $31,466 from the federal Wolf Livestock Demonstration Project Grant Program). Grand Teton National Park spent $200,000 for wolf monitoring and research activities, including $60,000 in federal funds and $140,000 in private funds from the Grand Teton National Park Foundation. Wildlife Services spent $28,586 in federal funding for livestock depredation investigation and response.

**Table 5.** Funds expended by agencies conducting wolf monitoring and management activities in Wyoming outside Yellowstone National Park and the Wind River Reservation from January 1 through September 23, 2014.

| | Funding Source | | | |
|---|---|---|---|---|
| Agency | State | Federal | Private | Total |
| WGFD | $380,666 | $133,166 | $21,964 | $535,796 |
| Grand Teton N.P. | $0 | $60,000 | $140,000 | $200,000 |
| Wildlife Services | $0 | $28,586 | $0 | $28,586 |
| Total | $380,666 | $221,752 | $161,964 | $764,382 |

## ACKNOWLEDGEMENTS

Many personnel contributed to the content of the 2014 Wyoming Wolf Population Monitoring and Management Interim Report. Thanks go to all those who contributed from the WGFD: Ken Mills, Robert Trebelcock, Andy Johnson, Brian DeBolt, Ron Blanchard, Dan Thompson, Dan Bjornlie, Mike Boyce, Jason Wilmot, Justin Clapp, Luke Ellsbury, Zach Turnbull, Kyle Bales, Dusty Lasseter, Clint Atkinson, Colby Clark, Zach Gregory, Tracey Kupec, Kindra Brown, and Carol Bybee. From Grand Teton: Sarah Dewey and John Stephenson. Many USDA/Wildlife

Services personnel were instrumental in responding to wolf depredation reports and recording, compiling, and providing information used in this report.

The WGFD appreciates safe piloting from Dave Stinson, Mark Packila, Bob Hawkins and Tim Schell of Sky Aviation. We also thank Native Range Capture Services and Leading Edge Aviation for their wolf capture services. Numerous agencies and agency personnel contributed to the monitoring program. We thank the WGFD's Wildlife Divisions Administration for support and many regional WGFD biologists and wardens who were instrumental in collecting wolf monitoring data. We also thank many members of the public and private landowners who assisted the WGFD wolf monitoring and management program in 2014.

Grand Teton National Park thanks the Grand Teton National Park Foundation for supporting the park's wolf monitoring and research program through several private donations. We acknowledge the volunteers who assisted with the predation studies: Tom Arnold, Jenna Dodge, Kaitlin Harrigan, Justin Schwabedissen, and Leslie Skora. We are grateful to fixed-wing pilots Dave Stinson, Tim Schell, and Mark Packila from Sky Aviation and helicopter pilot Jim Pope and his crew from Leading Edge for assistance with wolf monitoring and captures.

Many additional agencies and personnel provided assistance with wolf monitoring and management in Wyoming. Thanks to Mike Jimenez of the USFWS for assisting in data collection and providing advice and information. The following personnel deserve thanks for their assistance to the wolf monitoring and research: Dale Deiter and Kerry Murphy at the Bridger-Teton National Forest; Andy Pils and Dianne Probasco at the Shoshone National Forest; Eric Cole, Chuck Mulcahy, Betty Mulcahy, Ture Schoultz, and Tim Pratt at the National Elk Refuge. We recognize a successful program needs a strong base of support and to all of the above we are indebted.

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Jimenez, M.D., E.E. Bangs, C. Sime, and V.J. Asher. 2010. Sarcoptic mange found in wolves in the Rocky Mountains in western United States. Journal of Wildlife Diseases. 46:1120-1125.

APPENDIX 1. FEDERAL GRAY WOLF POPULATION MONITORING AND MANAGEMENT IN WYOMING DURING 2014

*U.S. FISH AND WILDLIFE SERVICE 2014 WYOMING WOLF SUMMARY*

On September 23, 2014, the U.S. District Court for the District of Columbia vacated and remanded the Service's rule to delist wolves in Wyoming. As a result of that decision, the wolf was listed as an endangered species throughout the entire State of Wyoming and was again managed by the U.S. Fish and Wildlife Service outside of Yellowstone and Grand Teton National Parks and the Wind River Reservation. The most up-to-date information about the 2014 wolf population in Wyoming can be found in Table 2a, 2b, and 2c in the Northern Rocky Mountain Wolf Recovery 2014 Interagency Annual Report (USFWS et al. 2015[1]) which can be viewed at www.westerngraywolf.fws.gov.

*YELLOWSTONE NATIONAL PARK WOLF SUMMARY 2014*

Authored by Doug Smith, Dan Stahler, and Erin Stahler

For a more detailed description of wolf monitoring and management activities in Yellowstone National Park, please visit http://www.nps.gov/yell/learn/nature/wolfmgnt.htm to view the Yellowstone Wolf Project Annual Report 2014 which will be published later in 2015.

**Numbers, Packs and Breeding Pairs**

There were at least 104 wolves in 11 packs (9 breeding pairs) living primarily in Yellowstone National Park (YNP) through December 2014. This is an increase of nine wolves (2013 = 95 wolves) and one pack since 2013. Due to many years of being uncollared, for the first time the Bechler Pack was estimated via genetic sampling from scat samples obtained from their den site. Overall, wolf numbers have fluctuated between 83 -104 wolves from 2009 - 2014 (excluding the low of 83 in 2012 the range is 94-104) and 6-9 breeding pairs. Pack size ranged from 2-14 and averaged 9.2. Park-wide 40 pups survived to year end, 17 on the Northern Range and 23 in the Interior with an average surviving of 4.4/pack for the 9 of 11 (82%) packs that had pups.

**Wolf-Prey Relationships**

Project staff detected 227 kills that were definite, probable or possibly made by wolves in 2014: 148 elk (65%), 20 bison (9%), 13 mule deer (5%), 10 deer of unknown species (4%, probably mule deer), five coyotes (2%), three moose (1%), three wolves (1%), one badger (<1%), one beaver (<1%), one bighorn sheep (<1%), one goose (<1%), one raven (<1%), one pronghorn

[1] U.S. Fish and Wildlife Service, Idaho Department of Fish and Game, Montana Fish, Wildlife & Parks, Wyoming Game and Fish Department, Nez Perce Tribe, National Park Service, Blackfeet Nation, Confederated Salish and Kootenai Tribes, Wind River Tribes, Confederated Colville Tribes, Spokane Tribe of Indians, Washington Department of Fish and Wildlife, Oregon Department of Fish and Wildlife, Utah Department of Natural Resources, and USDA Wildlife Services. 2015. Northern Rocky Mountain Wolf Recovery Program 2014 Interagency Annual Report. M.D. Jimenez and S.A. Becker, eds. USFWS, Ecological Services, 585 Shepard Way, Helena, Montana, 59601.

antelope (<1%), and 19 unidentified animals (8%). The composition of elk kills was: 30% calves, 2% yearlings, 33% cows, 22% bulls, 10% adults of unknown sex, and 3% of unknown sex and age. Like previous years wolf predation is monitored intensively for five months of the year – one month in early winter (mid-November to mid-December), one month in late winter (March) and three months in spring-summer (May-July, although this year we only monitored in May and June). The type prey killed by wolves varies by time period, but consists primarily of elk, but predation on bison and mule deer appears to be increasing.

### *Winter Studies*

During March 2014, our 'late' winter study period, a total of 37 ungulate carcasses fed on by wolves were discovered by air and ground teams. Twenty-six (70%) of these ungulates were killed by wolves, including 23 elk, two deer, and one bison. Eight of the elk (35%) were calves, two (9%) were yearlings, seven (30%) were cows, five (22%) were bulls, and one (4%) was an adult of unknown sex. Wolves also fed on nine bison they did not kill. Compared to other late winter studies, the proportion of wolf-killed elk that were bulls was lower than average.

During November-December our 'early' winter study period, a total of 24 ungulate carcasses fed on by wolves were discovered by air and ground teams. Seventeen (71%) of these ungulates were killed by wolves, which included 15 elk, one deer, and one unknown species. Seven of the elk (47%) were calves, three (20%) were cows, four (27%) were bulls, and one (7%) was an adult of unknown sex. The wolves also fed on five bison and two bull elk that they did not kill. Compared to other early winter studies, the proportion of carcasses that wolves scavenged was high. In addition, one coyote was killed by wolves.

## Mortalities

Five radio-collared wolves died in 2014: two were harvested outside of the park, one was killed in an avalanche, one was killed by other wolves, and one was a capture-related mortality. One wolf was an old adult (>6 years old), two were adults (2-5 years old) and the other two were pups (<12 months of age).

## Disease

There was no evidence of any major disease mortality. Mange, although still present, did not affect many wolves, nor was hair loss on the affected wolves significant.

## Capture

Sixteen wolves in eight packs were captured and collared in 2014. In addition to marking them, a number of measurements and biological samples were taken as well. Nine females and seven males were captured; one was an old adult (>6 years old), seven were adults (2-5 years old), one was a yearling, and seven were pups (<12months).

APPENDIX 2. 2014 WIND RIVER RESERVATION GRAY WOLF POPULATION MONITORING AND MANAGEMENT ANNUAL REPORT

*This report is a cooperative effort between the Eastern Shoshone Tribe, Northern Arapaho Tribe, Tribal Fish and Game Department, and the Lander Fish and Wildlife Conservation Office, USFWS.*

**Authors:** Pat Hnilicka, Lander Fish and Wildlife Conservation Office, USFWS, and Ben Snyder, E. Shoshone and N. Arapaho Tribal Fish and Game Department, Ethete WY.

**Acknowledgements:** We gratefully acknowledge the following for their assistance with wolf conservation: Mike Mazur and Laurie Connell (USFWS), Western Thayer, Art Lawson and Lynelle Shakespeare (Tribal Fish & Game Department, TFG), Bob Trebelcock and Ken Mills (Wyoming Game & Fish Department, WGFD). We gratefully appreciate the WGFD for conducting and financing aerial telemetry surveys on the Wind River Reservation (Wind River) and Mike Jimenez of USFWS for providing trapping expertise and equipment.

**Background:** Since 1941, the Eastern Shoshone and Northern Arapaho Tribes of Wind River have been assisted by the Lander Fish and Wildlife Conservation Office (Lander FWCO) of the USFWS. The TFG and Lander FWCO are responsible for monitoring and management of wolves on Tribal lands within the exterior boundaries of Wind River. The Wolf Management Plan for the Wind River Reservation designates wolves as trophy game for which hunting seasons have remained closed. With wolves re-listed in fall 2014, management of wolves falls under the Amended 10J Rule of 2008 and can only be legally removed to defend life or property. The plan can be found at:

http://www.fws.gov/mountain-prairie/species/mammals/wolf/Wind_River_Res_Wolf_Plan_20070413.pdf

**Population Monitoring – *Capture and Radio-collaring*:** Between June 23 and July 3, 2014, traps were set in the St. Lawrence Basin area to capture and collar additional wolves in the St. Lawrence pack. No wolves were captured. Ground monitoring of radio-collared wolves occurred from May through September. At the end of 2014, at least 7 wolves in 4 packs that have a portion of their homerange on Wind River had radio collars (3 in East Fork, 1 in Owl Creek, 2 in Spring Mountain, 1 in St. Lawrence).

**Population Monitoring – *Population and Breeding Pairs*:** Wolves have been present on the reservation for at least 13 years and are currently distributed across the Wind River and Owl Creek mountain portions of the reservation (Figure 1). As of December 31, 2014, a minimum of 10 wolves and 1 pack (St. Lawrence) were documented on Wind River. No breeding pairs (defined as a least 1 adult male and 1 adult female wolf that raised at least 2 pups to December 31) were documented on Wind River. Breeding had occurred in the St. Lawrence pack, but pups were not verified at the end of 2014.

Assignment of packs by agency is determined by the percentage of a pack's homerange that occurs by jurisdiction. In 2014, there were 4 known packs that spent at least a portion of time on the reservation; however, of the 4, only the St. Lawrence pack had the majority of homerange occurring on Wind River. The East Fork, Owl Creek and Spring Mountain packs had less than 50% of their homeranges occurring on Wind River and so were assigned to the WGFD. In the interest of providing information to Tribal councilmembers and the general Tribal public, these 3 packs are reported here as well. For more complete information on the East Fork, Owl Creek and St. Lawrence packs, please refer to the 2014 annual report provided by the WGFD.

East Fork Pack: The maximum number observed was 7 on February 26, 2014 (aerial location of 6 black adults, 1 gray adult) located off of Wind River. Throughout 2014, this pack spent a portion of its time on Wind River in the East Fork and Crow Creek area. No pups were documented for this pack.

Owl Creek Pack: The maximum number observed was 2 on September 21, 2014 (aerial location of 1 black adult, 1 gray adult). These wolves occurred both on and off Wind River and have historically used the Blondy Pass to the Wind River Canyon area of the reservation. No pups were documented for this pack.

Spring Mountain Pack: The maximum number observed was 11 on January 9, 2014 (aerial location of 6 black adults, 5 gray adults) located off of Wind River. This pack spent the majority of its time off the reservation, and was located only twice on Wind River in the East Fork area. No pups were documented for this pack.

St. Lawrence Pack: The maximum number observed was 9 on May 23, 2014 (aerial location of 3 gray adults, 6 pups); however, in late January 2015, 10 were observed from the air. These wolves primarily occur on Wind River and range from Bold Mountain to the North Fork Popo Agie River. One pup was observed on camera in September (Figure on Page 1). Since pups were not verified at the end of 2014, this pack did not meet the definition of a breeding pair. Unfortunately, distinguishing adults from pups during aerial flights is difficult in late December.

Other observations: In late August 2014, 3 adults and at least 3 pups were observed in the Bob's Creek area and appear unrelated to the St. Lawrence pack. Further surveys will be conducted in the area in 2015.

**Population Monitoring – *Mortalities*:** No wolf mortalities were documented on Wind River in 2014 (Table 1). One radio-collared wolf (894M) was assumed dispersed after its signal was lost in early 2014, and has since not been re-located.

**Wolf Management:** Under Wind River's 2008 plan, wolves were defined as a trophy game animal; however the Tribes have elected not to allow hunting. Upon re-listing of wolves by court action in fall 2014, wolves are now managed under the Amended 10J Rule of 2008 which allows legal removal only for defense of life or property. No wolves were removed in management actions or by the Tribal public in 2014. Livestock conflicts or depredations are investigated by TFG or Lander FWCO. No livestock depredations or conflicts were reported during 2014.

**Outreach:** Personnel from the Lander FWCO provided 2 elementary school presentations to 30 participants, 1 presentation to the Native American Fish and Wildlife Society Regional Conference with 60 participants, and 1 presentation to USFWS Headquarter staff.

**Financial Expenses:** The Lander FWCO spent ~$18,200 in USFWS funds on personnel time, fuel, trapping supplies, and radio-collars during calendar year 2014. TFG spent ~$5,750 on personnel time, fuel, aerial flights and the refurbishment of an ARGOS satellite collar.

***Minimum Convex Polygons showing homeranges for wolf packs that were located at least once on the Wind River Reservation during 2014.***

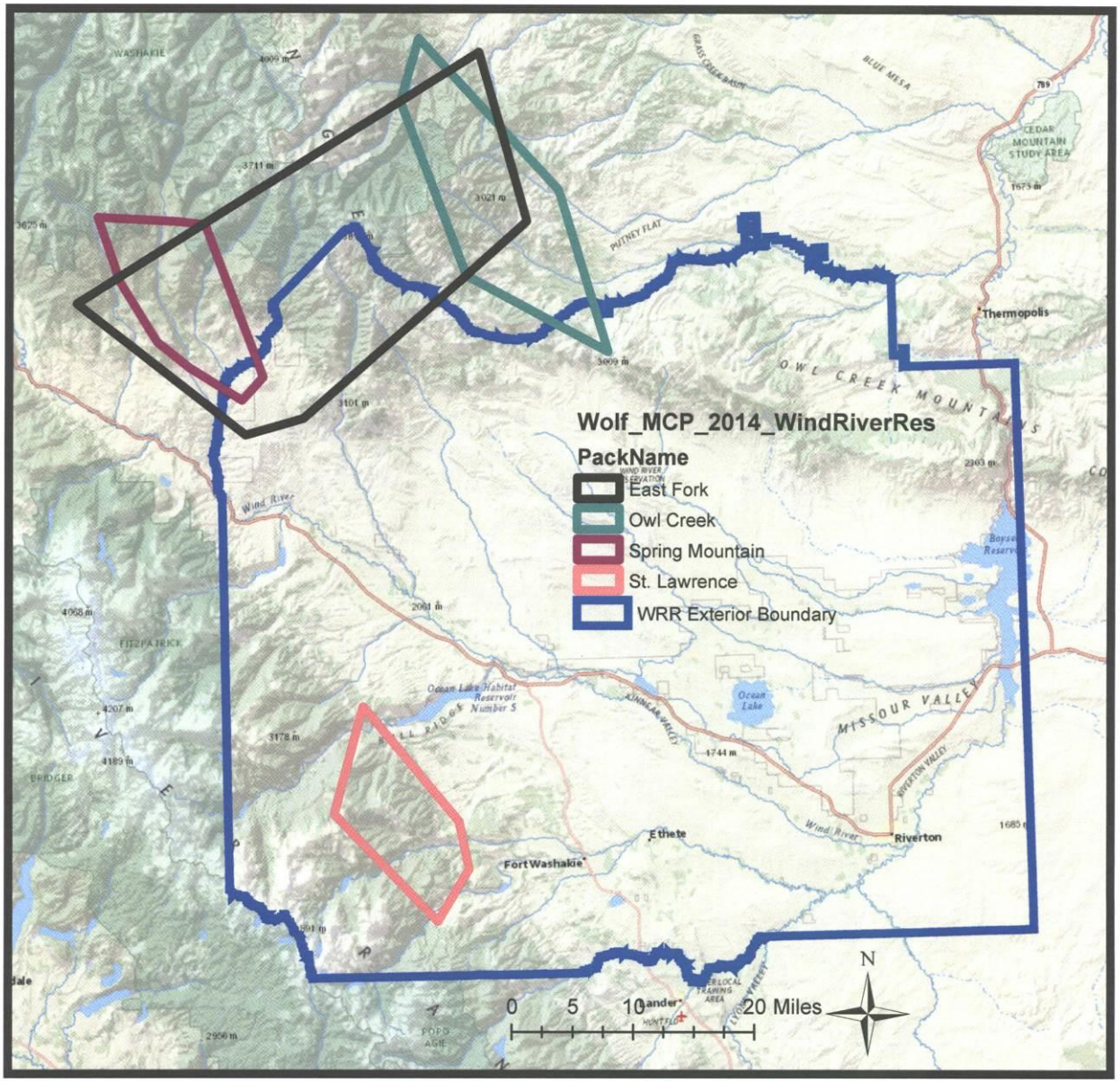


**Figure 1.**

**Table 1. Wolf Packs and Population Data for Wind River Reservation's Portion of the Greater Yellowstone Recovery Area (Outside YNP), 2014.**

| | | | | | DOCUMENTED MORTALITIES | | | | | | | CONFIRMED LOSSESS[6] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REF # | WOLF PACK | RECOV AREA | STATE | MIN. ESTIMATED PACK SIZE DEC 2014 | NATURAL | HUMAN[1] | UNKN[2] | HARVEST[3] | CONTROL[4] | KNOWN DISPERSED | MISSING[5] | CATTLE | SHEEP | DOGS | OTHER |
| | St. Lawrence | GYA | WY | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | |
| | **WRR Total** | | | 10 | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **0** | **0** | **0** |

[1] Excludes wolves killed in control actions and legal harvest.

[2] Includes wolves that died of unknown causes.

[3] Number of wolves legally harvested in 2014.

[4] Includes agency lethal control under federal/state regulations and wolves legally killed by private citizens to defend livestock or under terms of a lethal take permit.

[5] Collared wolves that became missing in 2014