Northern Rocky Mountain Wolves: A Public Policy Process Failure

How Two Special Interest Groups Hijacked Wolf Conservation in America

By Wendy Keefover • WildEarth Guardians

WildEarth Guardians
A Force for Nature

Mission Statement

WildEarth Guardians protects and restores the wildlife,
wild places and wild rivers of the American West.

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Front cover: **Silver Shadow** and **The Raven**, courtesy Ray Rafiti, *Wild Faces * Wild Places*; **Grizzly Mom and Cub of the Year** and **Yellow-Rumped Warbler**, courtesy David C. Jones.

Seven Frequently Asked Questions about Northern Rockies Wolves

1. Which two user groups caused Northern Rockies wolves to lose their Endangered Species Act protections and why?

The livestock industry and some sportsmen's organizations, each separately opposed to wolf conservation, convinced Congress in April 2011 to delist Northern Rockies wolves from the Endangered Species Act. Their contentions about resource competition are unsupported by data, as described below.

a. Do wolves kill vast numbers of livestock?

No. This constant complaint by the livestock industry is without merit. Wolves have killed less than one percent of the cattle or sheep inventories in the Northern Rockies. Even in Idaho, Montana, and Wyoming where most wolves live (and before the commencement of wolf hunting in 2011-2012) and even using *unverified* livestock loss data (that is, numbers that are based upon livestock growers' uninvestigated complaints), wolves killed less than one percent of the cattle (0.07 percent) and sheep (0.22 percent) inventories in those states. *Verified* livestock losses are even lower.

These livestock loss numbers mirror the national average where all other carnivores (i.e., coyotes, cougars, bears and domestic dogs) killed less than 0.5 percent of the (2010) cattle and (2009) sheep inventory in the entire United States. The biggest source of mortality to livestock actually comes from disease, illness, birthing problems and weather, but not from native carnivores such as wolves.

b. Do wolves kill too many elk?

No, despite the claims of some sportsmen's organizations. Human hunters have much greater negative effects on elk populations than wolves, according to a host of biologists, who published their findings in peer-reviewed science journals.

In fact, the level of human off-take of elk populations is considered "super additive" – that is, human-hunting pressures on elk far exceed the levels of mortality that would otherwise occur naturally. Further, human hunters generally kill prime-age, breeding animals, whereas wolves prey upon older, non-breeding elk. Wolves do hold elk populations at levels that mediate starvation, weather, and other stochastic events.

c. Does sport hunting of wolves increase hunters' tolerance of them?

No. Two peer-reviewed studies show that hunting wolves does not increase hunters' tolerance for them, and especially in the case of wolf and bear hunters.

2. Is wolf management by Idaho and Montana sufficient to conserve the species?

No. These states have set hunting quotas that are too high to be sustainable and are based upon uncertain population data. Both states have estimated populations to be higher than estimates by the U.S. Fish and Wildlife Service, and Montana's population censuses, in particular, are criticized by experts as inadequate and inaccurate. Idaho and Montana both offered overlong hunting seasons on wolves for the 2011-2012 season. In fact, Idaho's 10-month season extends until June when wolves have dependent young.

Hunters and trappers killed more than 540 wolves in 2011-2012. Biologists, in peer-reviewed literature, have written that wolves in the Northern Rocky Mountains have not yet recovered and that hunting them could put their populations at risk.

Other researchers have warned that hunting could reduce wolves beyond their ability to recover. Killing wolves not only causes direct mortality to individuals, but also creates social disruption in wolf packs, which can cause packs to disband, leading to the loss of yearling animals and pups.

3. To whom do Northern Rockies wolves belong?

The public trust doctrine, affirmed by the U.S. Supreme Court, asserts that all wildlife, including wolves, belong to all Americans. Indeed, all Americans contributed to the restoration of wolves in the Northern Rockies, spending approximately $40 million over 17 years to reintroduce wolves in the region. Unfortunately, with the assumption of management by western states (following delisting of the population under the Endangered Species Act), wolves are now primarily managed for the interests of the livestock industry and some sportsmen's organizations. The interests of these tiny minority groups do not comport with values shared by the broad American public that supports continued recovery of wolves in the West.

4. How has the news media influenced people's values about wolves?

The news media can affect people's values about wolves, and studies show the media is increasingly publishing negative stories about wolves. At the same time, surveys on people's attitudes have shown that most still value wolf and habitat conservation. We note that the media often broadcasts inaccurate or exaggerated statements by the livestock industry or sportsmen's groups about the supposed negative effects of wolves on livestock or native ungulate populations.

5. How many wolf-hunting or trapping licenses have been sold in Idaho and Montana and how many wolves live in those states?

Idaho and Montana have sold over 62,000 tags for the 2011-2012 wolf-hunting/trapping season. At the end of 2010, the Fish and Wildlife Service estimated the wolf population in those states stood at 1,271 individuals. License buyers are primarily residents of Idaho and Montana, 89 percent and 99 percent, respectively. Those states sell their wolf-hunting tags at prices far below market value. The high level of resident participation might indicate that citizens in these two states are less tolerant of wolves than other Americans.

6. Are wolves important to ecosystems?

Wolves and other apex carnivores contribute significantly to increased biological diversity—from beetles to birds to grizzly bears—and to greater ecosystem function (such as indirectly protecting riparian habitats for a host of fauna and flora), staving off effects from global warming by providing carrion as food sources for other species, and facilitating beaver recovery in the West.

7. How can we both restore wolves and find ways for people to coexist with them?

States have shown themselves incapable of managing wolves in a manner that supports the interests of the majority of Americans who love and appreciate wolves. The majority deserves input into how wolves are managed. Instead, decision makers cater to two vocal minority user groups, who base their anxieties about wolves on false claims about resource competition. Wolves have become political animals. They

need to be shielded from mercurial political processes, especially since the American public has spent tens of millions of dollars on wolf restoration and research.

More protected refuges should be established to support wolf restoration, such as the designation of more national parks. Refuges promote persistence of rare native carnivores such as wolves and mountain lions. Refuges also serve as source areas to other subpopulations, which maximizes natality and minimizes mortality.

Livestock producers can produce “risk maps” to anticipate where conflicts may occur and prevent future problems. Producers can also employ a host of non-lethal livestock protections such as keeping sick or pregnant livestock close to humans, housing livestock in buildings or pens (especially to protect small or young livestock), using guard animals and electronic scaring devices, properly disposing of livestock carcasses and more.

On public lands, another approach is to retire livestock grazing through voluntary grazing permit buyout. This practice allows the government or third parties to compensate ranchers to permanently retire their grazing permits on public lands, leaving the landscape to wolves and other wildlife and saving taxpayers millions of dollars in grazing subsidies over time.

Finally, wolf policy should privilege wildlife watchers. Wolf watchers in the Northern Rocky Mountains spend millions of dollars each year to view wolves, as compared to the $1 million dollars that hunters and trappers spent to buy wolf tags in Idaho and Montana.

Snow Ball. Photograph courtesy Ray Rafiti, *Wild Places * Wild Faces*.

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Dedication

This report is dedicated to Wolf 527, whose courageous life inspired this telling of human events.

I. Introduction

Wolf 527 was born into the Druid wolf pack of the Lamar Valley in Yellowstone National Park in 2002. She sported a fluffy black coat and startling amber eyes. She hunted elk, gave birth to numerous pups, and founded her own pack. A highly intelligent creature, Wolf 527 lived by her wits and maintained her pack in an area where four other packs had previously failed. She vigilantly avoided humans. But in 2009, while hunting outside of the Park's boundary, she was felled by a gun. Wolf 527 was one of the first wolves taken during state-regulated wolf hunts in Montana and Idaho.

Wolf 527 and her pack mates were killed under a state law based on flawed science and an irrational fear of wolves held by a minority of westerners who are primarily represented by two groups. The first is the livestock industry, which enjoys enormous lobbying powers and fears that wolves cause significant damage to their herds. The second are hunters, who complain that wolves consume too many deer and elk. These two groups, joined in common cause, managed to engineer policy changes that altered the course of federal policy that safeguarded wolves in the Northern Rocky Mountains for nearly two decades. In one year alone, 2011-2012, sportsmen have killed over 540 wolves, while federal trappers and sharpshooters have eliminated hundreds more.

A sedated Wolf 527 being fitted with a radio collar. Photograph courtesy National Park Service.

On April 8, 2011, Senators Jon Tester (D-MT) and Max Baucus (D-MT) and Representative Mike Simpson (R-ID) attached a legislative "rider" to a must pass budget bill that delisted Northern Rockies wolves from the Endangered Species Act (ESA). Congress passed the bill on April 14, 2011 and President Obama signed it the next day.[1] Lobbyists pushing the rider primarily represented the livestock industry or gun clubs and hunting organizations (Ketchum 2012). The rider represented the first time Congress has stripped protections from a species safeguarded by ESA. The premature removal of gray wolves from the threatened and endangered species list was not informed by biology but powered by mythology and influenced by special interest money.[2] This extraordinary Congressional action appeased a tiny minority of westerners, against the interests of the great majority of the American public that want to restore wolves in the West. On March 14, 2012, a federal appellate court upheld the rider, holding that Congress has the authority to delist species without explicitly amending the ESA. Now there is concern that Congress will continue to meddle with individual species listings whenever requested by favored constituencies.

1 Public Law 112-010.

2 According to OpenSecrets.org, Senator Tester ranks as the top recipient in the Senate for contributions received from the livestock industry in 2012; he has received $37,650 to date—a year after he passed the wolf rider in 2011. By comparison, Tester ranked only tenth for contributions from the livestock industry in 2010, when he received $10,600.

Wolves, once welcomed and restored with verve in the Northern Rocky Mountains, are now killed by the hundreds by well-armed hunters. Idaho and Montana have issued over 62,000 hunting tags on a wolf population that totaled less than 1,300 individuals.

While empirical data show that wolves kill only miniscule numbers of domestic livestock and generally prey upon only the weakest native ungulates, the myth of the savage predator and the wile of lobbying groups prove stronger than truth for some important decision makers. Northern Rocky Mountain wolves go untolerated and unprotected, yet, without wolves, ecosystems are impoverished, the public is deprived of prized wildlife viewing, and decades of federal investments in wolf restoration are at risk. The Northern Rocky Mountain wolves may not long endure such intolerance.

The American West, and indeed the planet, suffers from a lack of apex carnivores. In July 2011, twenty-three biologists issued an admonition in *Science* with the publication of their article, "Trophic Downgrading of Planet Earth." Authors forewarn that events not previously imagined, such as changes in fire regimes, exotic species invasions, carbon sequestration, and other calamities, will befall earth's ecosystems as a result of the loss of apex consumers—both aquatic and terrestrial.

In this report, we explore facets of wolf policy, biology and ecology. We look at the economics and human values associated with wolves, and offer five pragmatic solutions to end unfounded violence upon wolves.

White wolf in Yellowstone National Park's Northern Range. Wolves are considered "coursing carnivores." Their large lung capacity allows them to run long distances to pursue prey. Trailing and tackling prey can be dangerous work, and wolves can be injured or killed; consequently, wolves carefully select more vulnerable prey, compared to human hunters who typically choose prime age, breeding animals. Photograph courtesy David C. Jones.

II. Wolves, Human Values and Wildlife "Management"

Carnivores have historically engendered conflict with humans because of perceptions that they compete with humans for food, including both wild and domestic animals (Noss et al. 1996, Primm and Clark 1996, Baker et al. 2008, Treves 2009)[3] or because of largely exaggerated fears that carnivores routinely kill or harm people (Schwartz et al. 2003).[4] Large carnivores inspire special indignation in some because they symbolize federal authority that connotes interference with individual property rights (Primm and Clark 1996, Mattson et al. 2006).

To many, wild carnivores invoke powerful symbols that elicit strong feelings—from savagery that needs to be conquered, to spiritual totems, to important ecological actors (Mattson et al. 2006). Those values are informed by human belief systems or convictions.[5] In turn, those belief systems inform policy and the media, which itself changes people's perceptions. In the midst of the biggest wolf hunt in modern times, Hollywood film director Joe Carnahan released his unfortunate film, "The Grey" in 2012, with its embellished depictions of monstrous-sized wolves that stalk human protagonists stranded in the Arctic. The archetype of ravenous wolves feeds well into current management policies that prioritize livestock protection and increasing elk and deer herds at the expense of wolves and biological data.

Don Peay, founder of Sportsmen for Fish and Wildlife, a vehemently anti-carnivore organization, urges hunters to "engage in the wolf wars" to stem the supposed harm done to "big game" herds (Peay 2011). More important, he crows about a meeting with President George W. Bush, Vice President Dick Cheney, and U.S. senators that "result[ed] in wolves being delisted so states could manage them" (Peay 2011). Peay overstates his influence—wolf delisting came during the Obama Administration in 2011—but his point remains. Wolf delisting followed intense lobbying by agribusiness (i.e., the livestock industry), a variety of gun clubs, and other industry groups (Ketchum 2012).[6]

The "management" that Peay sought has resulted in sportsmen killing 541[7] wolves during hunting/trapping seasons in Idaho and Montana in 2011-2012. He writes:

> My fellow sportsmen, if we want abundant herds in the future on our great public lands we must ALL get involved in the effort to keep wolf numbers to a minimum. If not, there will be a 60 – 80% reduction in game herds . . . [and then] hunting and conservation programs will collapse, and the greatest freedoms we can experience as Americans will be lost (Peay 2011).

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3 Some even believe that wolves kill excessive numbers of animals and leave them uneaten or only partially consumed and that wolves kill for pleasure. "Surplus killing" can occur with carnivores but usually in limited circumstances, for example, when prey have poor anti-predator responses such as with neonate fawns, or are penned animals that cannot escape and their attempts to flee trigger an attack (Baker et al. 2008, p. 134). Wolves do not kill for pleasure, they kill to eat and sustain themselves and provision for their young. To say wolves kill for pleasure is to anthropomorphize them and fails to acknowledge that the act of predation comes with costs and risks to wolves (Stahler 2006).

4 Perhaps one—or maybe two—people have ever been recorded as killed by wild wolves in North America, such an infinitesimally small number that the issue will not be addressed further in this report.

5 Belief systems "are deeply held convictions about how the world works and how it ought to work . . . [they are] religious in nature and extremely resistant to change" (Primm and Clark 1996, p. 1042).

6 OpenSecrets.org reports that Sportsmen for Fish and Wildlife spent $25,000 lobbying Congress in 2010 and $110,000 in 2011. The organization and others, including the American Farm Bureau, the National Cattlemen's Beef Association, the National Rifle Association, Safari Club International, National Endangered Species Act Reform Coalition, and the American Sheep Industry Alliance, lobbied for wolf delisting. Conservation groups (Defenders of Wildlife, Earthjustice Legal Defense Fund) also lobbied Congress—to not pass anti-wolf legislation.

7 This total is current is as of March 27, 2012, but Idaho's wolf-hunting season does not end until June 2012.

Peay conflates the presence of large ungulates in ecosystems with patriotism, and the presence of large carnivore competitors, in his belief system, likely causes him to be fearful (e.g., Jost et al. 2003). Peay styles himself a "wildlife conservationist," but his notion of wildlife conservation harkens back to an earlier time when the only wildlife worth saving had no predatory tendencies (Mighetto 1991). Ironically, he wants to conserve ungulates so that he himself can hunt them without competition from native carnivores (Baker et al. 2008, Treves 2009). The anxiety felt by Peay is grounded in a dominionistic-utilitarian belief system (Kellert 1996, Kellert and Smith 2000, Jost et al. 2003) that all too often informs wildlife policies (Jacobson et al. 2010, Bruskotter et al. 2011, Nelson et al. 2011).

States manage wildlife according to the "North American Model of Wildlife Conservation," a doctrine embraced by wildlife professionals that is based upon a faulty historical narrative that wrongfully conflates hunting with conservation (Nelson et al. 2011). Recreational hunters, state wildlife managers, and others view hunters as the "stewards" of wildlife because they pay for hunting licenses that support game agencies (Jacobson et al. 2010, Nelson et al. 2011), but hunting does not necessarily support species' conservation.

The "Model" narrative ignores the broader social history of other conservation measures such as the Wilderness Act, the Endangered Species Act, and a host of other environmental policies (Nelson et al. 2011). The Model fails to consider that the vast public contributes to the maintenance of the public and private lands where wildlife lives. The Model has failed because wildlife populations have declined and their habitats have been degraded since its inception (Jacobson et al. 2010). The paradigm advanced by the Model and the institutions upon which it is based serves only a narrow section of the public (the hunters, trappers, and anglers), and not the broader public (Jacobson et al. 2010).

Those that support the Model fail to consider that hunters are part of a commercially-driven industry. Companies profit from killing wildlife. Outfitters make money by guiding hunts, trappers by selling furs, while Cabela's and Bass Pro Shops sell gear. All of these entities require an overabundance of certain wildlife for consumption (Nelson et al. 2011).

While the North American Model of Wildlife Conservation holds sway over those in positions of decision making power and with ties to money, it fails to conserve species for the general public (Jacobson et al. 2010), nor does it conform with most Americans' values for wildlife conservation (Kellert 1996). To date, the states of Idaho, Montana, Utah, and Wyoming have shown that they cannot be trusted to conserve wolves as part of their "public trust" obligation, which should include enacting laws to preserve wolves for the benefit of all the people (Bruskotter et al. 2011). A series of U.S. Supreme Court cases have found that states must manage wildlife for all of the people and specifically may not privilege private interests over the public (Horner 2000, Bruskotter et al. 2011). Large carnivore conservation and attitudes can be mercurial – all the more reason for broader public participation and funding in wildlife management.

Wolves and wildlife belong to everyone (Horner 2000). Yet in 2011 and 2012, Idaho and Montana have "managed" wolves to appease a vocal minority that seek to reduce or eliminate wolf populations (e.g., Jacobson et al. 2010, Bergstrom 2011, Bruskotter et al. 2011, Nelson et al. 2011). Wolf management should be based on the best available science and support the public's desire to restore these animals in the West, but state and federal policies have fallen prey to special interests.

The North American "Model" for wildlife management, based on a faulty historical narrative about sportsmen as stewards of wildlife, fails to conserve species for the general public. Rather, wildlife management in America is a profit-motivated endeavor that falls short of the duties imposed on states to hold wildlife in trust for the entire public.

Druid guardian at Soda Butte Creek. Photograph courtesy Ray Rafiti, *Wild Places * Wild Faces*.

A. Wolves, Human Values and the Media

As part of the American wildlife management paradigm, human values and money inform decision-making processes and outcomes for wolves, but the media also has an enormous ability to influence people's values about wildlife, often negatively and with inaccurate information (Baron 2005, Keefover-Ring 2005a, b). While decision making should transcend politics, decision makers come with their own belief systems and values, which may not be science-based, especially where large carnivores are the concern (Primm and Clark 1996).

In particular, the media can sway the public on wolf issues (Wilson and Bruskotter 2009, Houston et al. 2010). A recent study showed that the portrayal of wolves in the media has tracked more negatively over time, although attitudinal studies that overlapped in time had conflicting results (Houston et al. 2010).

The U.S. Fish and Wildlife Service (FWS) as part of its 2009 wolf rule concluded that attitudes towards wolves had improved over time and were no longer threatened by human intolerance; the agency relied upon a single citation to make this claim, however (Bruskotter et al. 2010, Houston et al. 2010, p. 401). Even the article used by the FWS, found that people's perceptions had changed more negatively toward wolves (Bruskotter et al. 2010). Houston et al. (2010, p. 401) write:

> By relying on assumptions about attitudes towards wolves—as opposed to empirical research—wildlife management agencies run the risk of prematurely lifting protections . . . wolves may need increased protection an/or monitoring in these regions for a time while people adapt.

Their research suggests that now more than ever, wolves need more federal protections to prevent their destruction.

Gordon Haber (1996, p. 1076), a wolf biologist, wrote that wolves need greater protections and fellow biologists should be their advocates:

> In her 1958 classic, *Arctic Wild*, Lois Crisler wrote with great sensitivity about the wolves she knew . . . marvelously intelligent, expressive, emotional . . . I recognize that my strong opposition to the way wolves are managed . . . involves more than pure biology. I receive frequent criticism for this position from my peers. Nevertheless, Aldo Leopold did not hesitate to venture into such areas of overlap between biology and ethics, to distinguish between right and wrong in advocating improved management of natural systems. Other wildlife scientists who regard his ideals as a guiding light for the profession should not hesitate to do the same.

Carnivores require adequate prey and freedom from the threat of human persecution in order to persist (Noss et al. 1996). Yet, decision makers, including those employed by the very agencies mandated to recover wolves, routinely hinder their restoration. The gamut of decision makers, from agency bureaucrats (state and federal), to governor-appointed wildlife commissioners, to Congressional representatives, cater to the whims of the minority and against the public's trust in wildlife conservation (Horner 2000, Jacobson et al. 2010, Bruskotter et al. 2011, Nelson et al. 2011). Yet, when ecosystems lose their top consumers, they fail and unintended negative consequences abound (Estes et al. 2011).

Skiers miss out. A wolf trots past inattentive cross-country skiers in Yellowstone National Park.
Photograph courtesy David C. Jones.

B. Wolves and Our Failed Policy Process

Humans first extinguished wolves in the lower 48 states by the 1940s because of misunderstanding and intolerance (Dunlap 1988, Mighetto 1991, Robinson 2005, Stolzenburg 2008). Yet during the 1940s, Aldo Leopold and others also began to demonstrate that wolves are critical ecosystem engineers on their landscapes (Leopold 1949, Reprint 1977). Decades passed before Leopold's observations on wolves were finally served in wildlife policies.

In 1995, under President Bill Clinton and the direction of Secretary of the Interior Bruce Babbitt, the FWS restored wolves to the Greater Yellowstone Ecosystem and Idaho to the delight and wonder of most Americans. To many, reintroducing wolves was the first step toward correcting long-standing erroneous and misguided wildlife and land management policies. The newly reintroduced wolves expanded their ranges in Idaho, Montana, and Wyoming between 1990 and 2010. New packs are now established in Oregon and Washington, and solitary wolves have made forays into the Southern Rockies ecosystem and California.

In 1987, prior to reintroduction, the FWS had set a goal to restore 100 wolves in each of the States of Idaho, Montana, and Wyoming—the states that surround Yellowstone National Park. The FWS designated wolves as "experimental non-essential" and allowed for liberal lethal control to accommodate those who opposed wolf reintroduction. The figure of 100 wolves in each state was not based on biological considerations, but on "opinions" from the recovery team members (Bergstrom et al. 2009).

In February 2008, the FWS under the George W. Bush Administration, arbitrarily removed ESA protections for gray wolves in the Northern Rocky Mountain region.[8] But Judge Donald Molloy of the U.S. District Court of Montana reinstated ESA protections in July 2008 after finding that genetic connectivity between subpopulations had not been established.[9] In October 2008, the FWS itself requested that the court vacate the 2008 delisting rule. Then in January 2009, the FWS bizarrely produced a duplicate delisting rule (except in Wyoming)—this time with slightly elevated recovery goals: 15 packs and 150 wolves in each state of Idaho, Montana, and Wyoming.

Barack Obama was elected President in November 2008. He pledged to uphold scientific integrity in his administration. In March, however, President Obama's newly appointed Secretary of the Interior Ken Salazar was already seeking to delist wolves only a month after taking his post (Bergstrom et al. 2009). The new delisting rule was published on April 2, 2009 (74 Fed. Reg. 15123).

Secretary Salazar reaffirmed the Bush-era decision by the FWS to remove protections for gray wolves in Idaho and Montana but left full protections for wolves in Wyoming because the state's management plan would have allowed wolves outside of national parks to be shot on sight. The new "wolf rule" went into effect on May 4, 2009.[10] For the first time since they were reintroduced to Yellowstone and Idaho fourteen years earlier, the Northern Rockies wolves were without protection.

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8 Any species, subspecies, or distinct population segment of a vertebrate species can be listed under the ESA (16 U.S.C. § 1533). Our usage of the term "distinct population segment" is found within the ESA's meaning of this term. The Northern Rockies gray wolf distinct population segment is located in Idaho, Montana, and Wyoming, and in portions of Oregon, Washington, and Utah (see 73 Fed. Reg. 10514 (2/27/08)).

9 Defenders of Wildlife v. Hall, 565 F. Supp. 2d 1160 (Dist. Mont. 2008).

10 The FWS's April 2009 delisting rule included the entire Northern Rockies DPS (Montana, Idaho, and the eastern one-third of Washington and Oregon and a portion of north-central Utah) but not Wyoming because the State's "wolf law" was focused on exterminating wolves (74 Fed. Reg. 15123 (4/2/09)).

In announcing the new wolf rule, Secretary Salazar indicated that Idaho and Montana should not be "punished" for Wyoming's failure to offer a plan that would sustain wolves. A host of biologists led by Bradley Bergstrom objected to such rationalization and published a peer-reviewed article in 2009 stating: "[claiming that] hosting an endangered species living mostly on federal public lands in the northern Rockies is forced punishment on a state" is a poorly reasoned position by the nation's top wildlife official. These same biologists further argued that wolves had been recovered to less than one-third of the Northern Rockies recovery area and, therefore, delisting was premature. In 2009, hunters and others killed 571 wolves in the Northern Rockies, mostly in Idaho and Montana. (Table 1).

Unlike bald eagles, which had been recovered to almost all of their historic range before they were delisted from the ESA, wolves were declared recovered in the Northern Rockies despite their absence from most of the region (Carroll et al. 2009). According to some experts, when Congress enacted the ESA, its definition for an endangered species encompassed not only biological bases, such as extinction risk and population viability, but also a directive to restore a species across its former ecological range (Carroll et al. 2009). The FWS has routinely ignored or misinterpreted that provision. It certainly was not followed for the Northern Rockies wolves.

In June 2009, a coalition of 14 conservation and animal welfare organizations sued Secretary Salazar in an attempt to reverse his delisting decision and enjoin Idaho and Montana's wolf hunt. Judge Molloy denied a preliminary injunction to stop the wolf hunts in September 2009 while he considered the case. In August 2010, he found Secretary Salazar's wolf rule illegal, barred further wolf hunting and reinstated the wolves' "threatened" status under the ESA.[11]

Soon thereafter some Congressional members began to threaten to remove wolves from the threatened and endangered species list in order to appease a vocal minority that was making mythic claims about wolves' appetites for domestic livestock and their native prey such as deer and elk.

In March 2011, the coalition of 14 litigating organizations dissolved. Some groups signed an agreement with FWS to remove wolves in the Northern Rocky Mountains from the ESA list (settling plaintiffs). Others, Alliance for the Wild Rockies, Friends of the Clearwater, the Humane Society of the United States and Western Watersheds Project (non-settling plaintiffs) refused to compromise with FWS. They sought to retain the wolf's protected status to protect recovering populations and because there was no guarantee that a settlement would stem Congressional action to delist the wolves in any case.

In March 2011, WildEarth Guardians stepped into the discord to represent three of the non-settling plaintiffs in their opposition to the settlement between the settling plaintiffs and FWS. On April 9, 2011, Judge Molloy ruled that, because not all parties had agreed to the settlement, he would not certify it.[12] The Northern Rockies wolves remained on the threatened and endangered species list…but not for long.

In April 2011, Senator Max Baucus, Senator Jon Tester and Representative Mike Simpson sponsored a rider on an unrelated budget bill that delisted gray wolves in Montana, Idaho, and portions of Oregon, Washington and Utah. The rider contravened Judge Molloy's 2010 order relisting the wolves, throwing their management back to the states.

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11 Defenders of Wildlife v. Salazar, 729 F.Supp.2d 1207 (D.Mont. 2010).

12 Defenders of Wildlife v. Salazar, 776 F.Supp.2d 1178 (D.Mont. 2011).

The Agate pack on a ridge in Yellowstone National Park. Photograph courtesy David C. Jones.

In May 2011, Alliance for the Wild Rockies, Friends of the Clearwater and WildEarth Guardians challenged the constitutionality of the congressional rider, arguing that it violated the Separation of Powers Doctrine in the U.S. Constitution. Western Watersheds Project joined other organizations in a companion case. The groups lost in Judge Molloy's court in Montana in August 2011, but appealed to the Ninth Circuit Court, which heard the case in November 2011, but ruled against the plaintiffs in March 2012. These organizations sought to preserve wolves, protect the public's interest in wolf conservation and their long-term investment in the wolf recovery program, and uphold the U.S. Constitution.

In the meantime, in July 2011, Secretary Salazar announced that the FWS was working towards an agreement with Wyoming to delist wolves and give management authority to the state so long as it maintained a minimum of 15 breeding pairs and 150 wolves statewide, including those on Native American lands. The proposed rule to delist wolves in Wyoming was published in October 2011 (76 Fed. Reg. 61782 (10/5/11)).

Wyoming has proposed two systems for hunting wolves once they are delisted. In the northwest part of the state, wolves will be considered a trophy animal, where the state will issue a limited number of hunting licenses, presumably at a high price. Most of the rest of the state is a designated a "predator management zone," where Wyoming proposes to maximize wolf kills by allowing unlimited hunting, probably with low license fees. In other words, Wyoming will manage wolves as varmints. The precedent has been set in Idaho and, to some extent, in Montana during the overlong 2011-2012 hunting season.[13]

Biologists have found that the Obama Administration's actions to remove federal protections from wolves are not based on the best available science and requirements under the ESA. They contend that delisting wolves is merely a response to pressure from "western politicians, ranchers, and sport hunters" (Bergstrom 2011, p. 1092, Bruskotter et al. 2011).

Over the past year, the media have reported on numerous politicians—whether county commissioners,

13 In Idaho, hunting commenced August 30, 2011 and extended to March 30 in most zones, except in the Selway and Lola hunting zones; the season ends in those two areas in June 2012. In Montana, the season began September 3, 2011 and was scheduled to end in December, but was extended to February 15, 2012. The State proposed a second extension to April 1 in the West Fork of the Bitterroot, but the MFWP Commission did not approve it because of ethical hunting concerns involving wolves with young pups in the den.

Montana gubernatorial candidates, or U.S. senatorial candidates[14]—who have called for wolf extermination policies such as bounties, increased hunting, and more federal wolf-killing in the Northern Rocky Mountains. Idaho State Senator Jeff Siddoway proposed a bill that would have allowed the use of dogs as live bait, night scopes, and ultralight aircraft to kill wolves, drawing national media attention when it passed out of committee to the Senate floor on February 22, 2012.[15] Even the Rocky Mountain Elk Foundation, a sportsmen's organization, in a March 2012, letter to the director of Montana Fish, Wildlife & Parks offered the agency $50,000 to employ a federal agency, Wildlife Services, to kill even greater numbers of wolves and then promised to call upon the Montana legislature to appropriate additional predator-control funding.

The policy process for wolves in the Northern Rocky Mountains is broken and marred by political interference driven by influential special interests and by decision makers' failures to consider science, the costs to American taxpayers, the interests of wildlife watching enthusiasts, and effects on western ecosystems.

Wolf chasing coyote. "Meso-carnivore release" is a phenomenon whereby large carnivores limit the populations of medium-sized carnivores, which confers myriad ecosystem benfits. For example, where wolves limit coyote populations, they indirectly benefit pronghorn, lynx, and foxes. Photograph courtesy David C. Jones.

14 Jefferson County, Montana considered a wolf bounty; "Hunters tell Jefferson County: think twice about wolf bounty" http://m.billingsgazette.com/mobile/article_ca0612aa-1a15-543a-8021-3195e12d5be0.html (2/1/12). In Ravalli County officials sought to set bounties at $100/adult and $20/pup; "Ranchers seek bounty hunters to cut wolf numbers" http://thecabin.net/news/2012-03-05/ranchers-seek-bounty-hunters-cut-wolf-numbers#.T3X_z45I4rY (3/3/12); Rick Hill, a candidate for Montana Governor, called for widespread wolf removal in Montana; "Republican candidate for governor proposes 'no tolerance zone' for wolf management" http://www.therepublic.com/view/story/9a258a88db2d4ddc93a8c0d5817e1ca0/MT--Hill-Wolves (3/29/30); and in the race for U.S. Senate, Jon Tester and his rival Denny Rehberg bragged about who is the biggest wolf opponent; "Tester, Rehberg stake out campaign positions" (opinion) http://billingsgazette.com/news/opinion/editorial/gazette-opinion/article_91d880c3-c627-57e0-9fbd-22a9b37d536c.html (2/16/11).

15 "Siddoway's live bait bill passes committee on party-line vote," voices.idahostatesman.com/2012/02/22/rockybarker/siddoways_live_bait_wolf_bill_passes_committee_partyline_vote. Congressman Mike Simpson warned that if Siddoway's bill passed, Northern Rockies wolves may be listed under the ESA again.

Table 1.
Wolf Mortality in the Northern Rocky Mountains, 2008-2011
(data: USFWS Annual Reports)

2008	Livestock Protection[1]	Sport Hunters	Poach/Law Enforcement Investigation	Vehicle	Un-known/ Other/ Natural	Total
ID	108	0	13	10	18	149
MT	110	4	8	16	20	158
WY	46	11	8	2	12	79
Total	264	15	29	28	50	386

2009	Livestock Protection[1]	Sport Hunters	Poach/Law Enforcement Investigation	Vehicle	Un-known/ Other/ Natural	Total
ID	93	135	12	0	32	272
MT	145	72	16	8	16	257
OR	2	0	0	0	0	2
WY	31	0	7	0	2	40
Total	271	207	35	8	50	571

2010	Livestock Protection[1]	Sport Hunters	Poach/Law Enforcement Investigation	Vehicle	Un-known/ Other/ Natural	Total
ID	80	48	5	0	11	144
MT	141	0	13	11	13	178
UT	1	0	0	0	0	1
WY	40	0	13	0	5	58
Total	262	48	31	11	29	381

2011	Livestock Protection[1]	Sport Hunters[2]	Poach/Law Enforcement Investigation	Vehicle	Unknown Other Natural	Total
ID	63	200	11	7	0	281
MT	64	121	8	8	2	203
OR	2	0	0	0	0	2
WY	36	0	6	1	8	51
Total	165	321	25	16	10	537

[1]Most of these wolves eliminated to protect domestic livestock are killed by the U.S. Department of Agriculture's Wildlife Services, a federal program that shoots, traps, and poisons wildlife to benefit agriculture and other interests.

[2] Sport hunters included trappers in Idaho in 2011.

III. Tackling the Myths

There are three common myths about wolves in the West. The first is that wolves and other native carnivores such as coyotes, cougars and bears are significant livestock predators, but the government's own data show that belief to be false. Second, hunters believe that wolves have deleterious effects on elk herds. Once again, published data demonstrate otherwise.

Finally, some believe that allowing people to hunt wolves will create more tolerance for them. Instead, wolf hunting has only served to polarize the issue to an even greater extent and called into question the ethics around hunting and trapping of wolves (Zuckerman 2012).

A. Tackling the Myth: "Wolves Kill Too Many Livestock"

Wolves and other native carnivores (such as coyotes, cougars and domestic dogs) altogether killed less than one percent of the U.S. cattle inventory and about four percent of the sheep inventory, respectively, according to the U.S. Department of Agriculture (see Charts 1 and 2). The government's data show that while, predation accounts for few livestock losses, disease, birthing problems, and weather are the real livestock killers (see Charts 3 and 4).

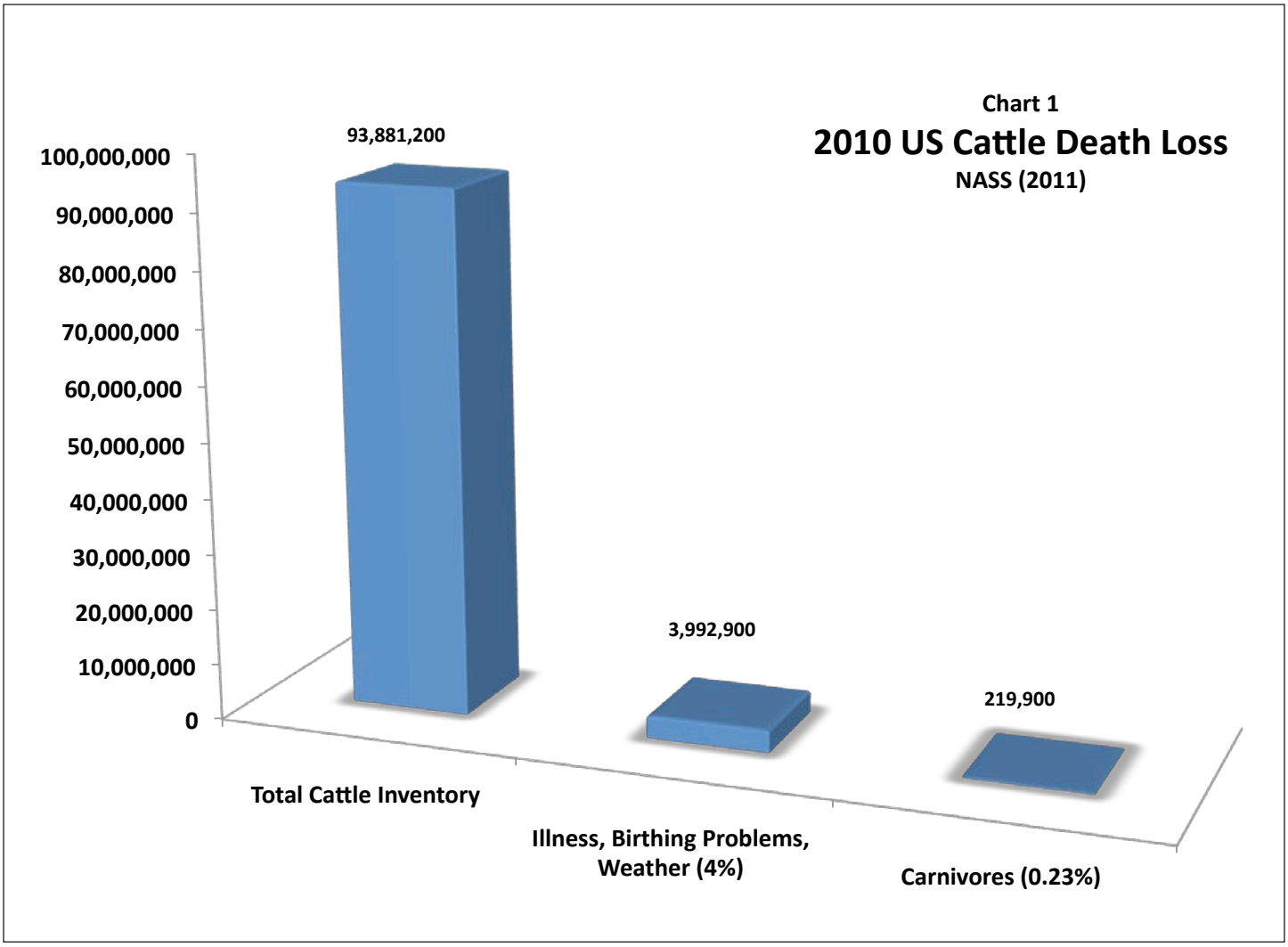

Chart 1: 2010 U.S. Cattle Death Loss. NASS (2011)

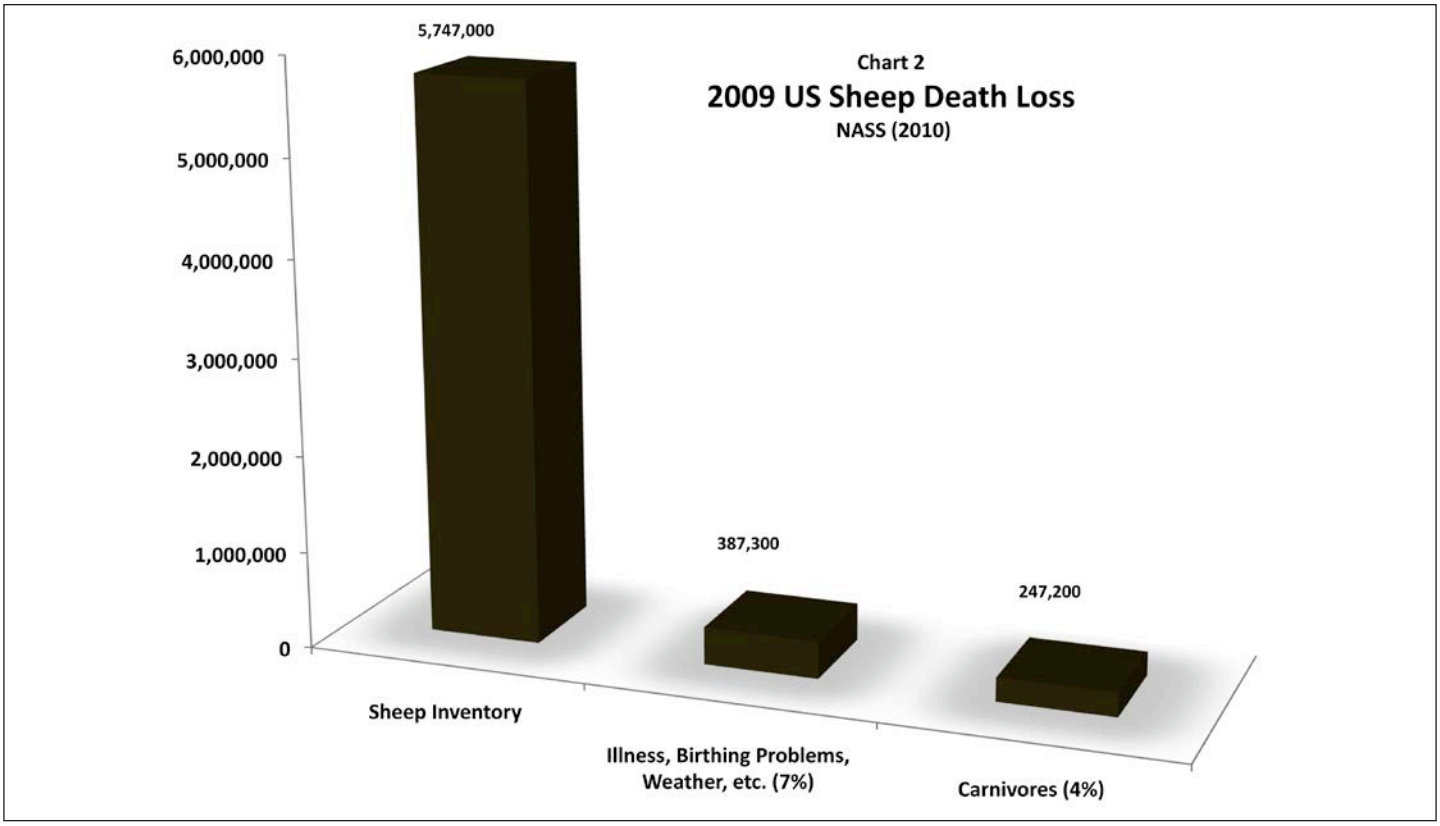

Chart 2: 2009 U.S. Sheep Death Loss. NASS (2010)

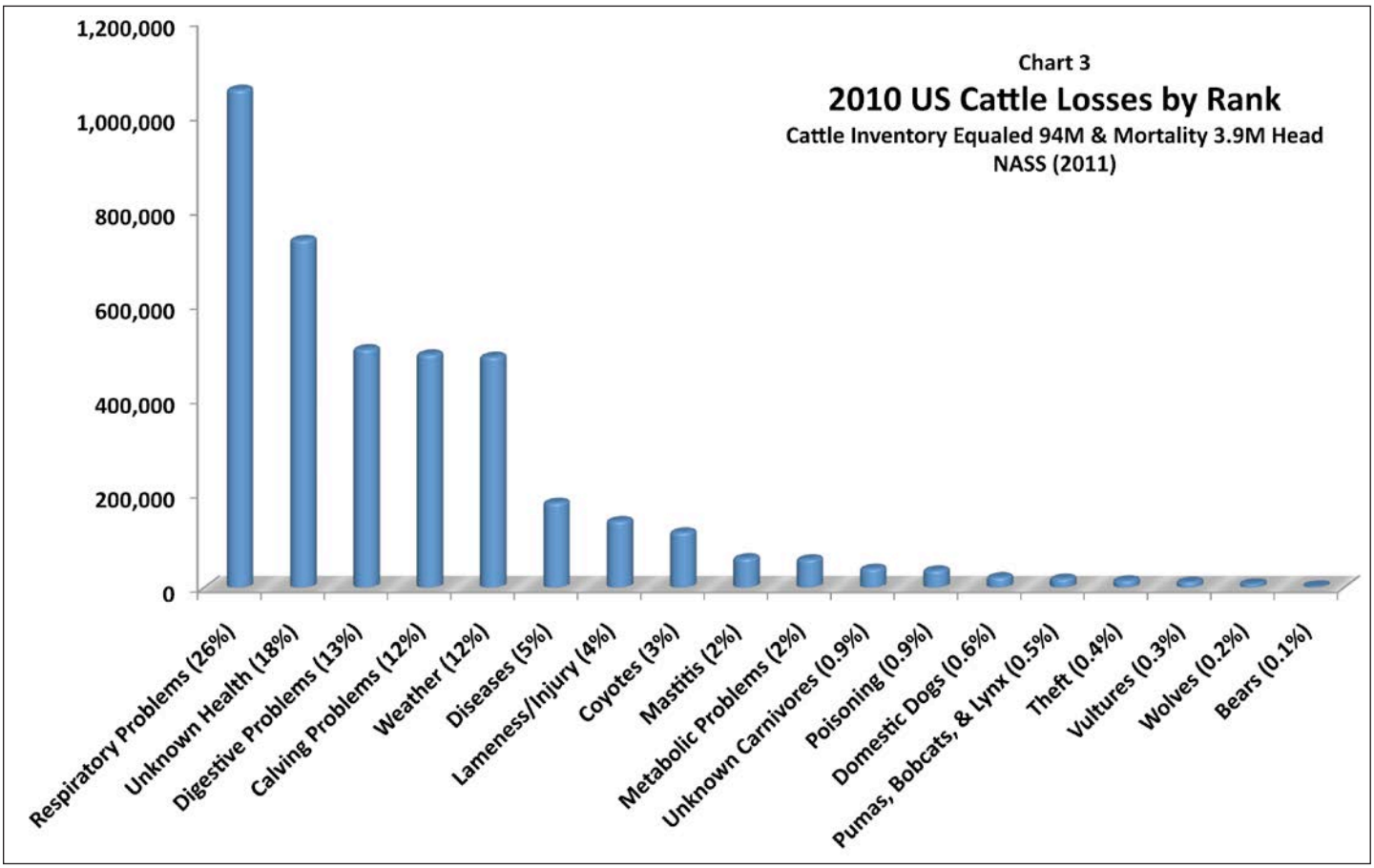

Chart 3: 2010 U.S. Cattle Losses by Rank. NASS (2011)

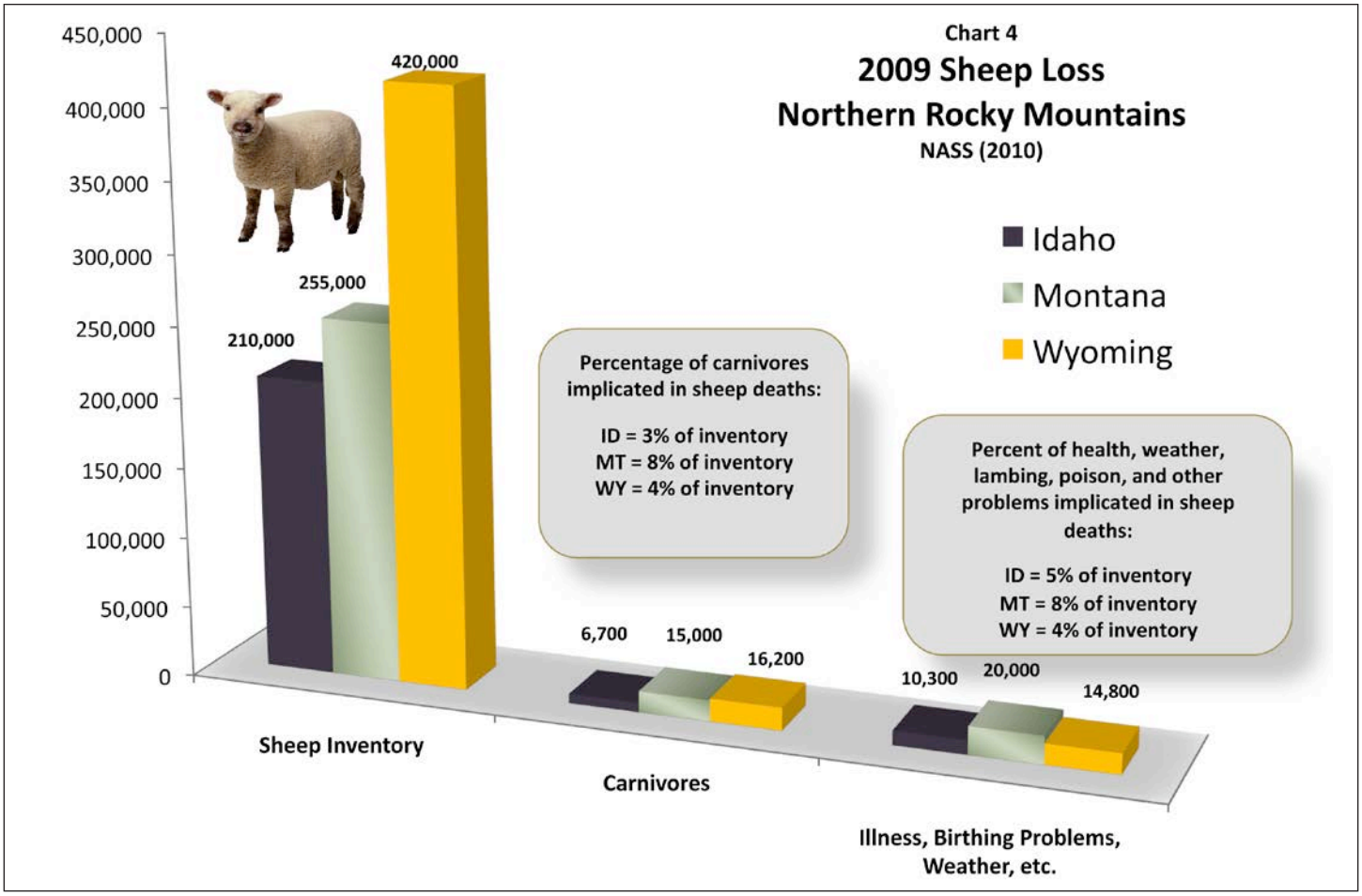

Chart 4: 2009 Sheep Loss Northern Rocky Mountains. NASS (2010)

The total 2010 cattle and 2009 sheep inventory totaled 99,628,200 (NASS 2010a, NASS 2011a) in the U.S. Of that number, 467,100 sheep and cattle (NASS 2010b, NASS 2011a), or 0.5 percent of the total inventory, were killed by native carnivores such as wolves and coyotes, or by domestic dogs. Less than a quarter of one percent (0.23 percent) of the American cattle inventory was lost to native carnivores and dogs in 2010 (NASS 2011a). According to the National Agricultural Statistics Service (NASS) (2011):

- The top five causes of cattle deaths are respiratory problems (over one million); digestive problems (505,000); complications while calving (494,000); weather (489,000); and "unknown" causes (435,000). Non-predator cattle losses totaled nearly four million cattle. Respiratory, digestive, and calving problems and weather caused 64 percent of all cattle mortality (see Chart 3).

- In comparison, predation by native carnivores totaled 170,800 in 2011. Dogs killed more livestock (21,800) than any other species except coyotes (116,700). "Unknown" predators killed 27,300 cattle. Wolves reportedly killed 8,100 cattle, while felids (pumas, bobcats, and lynx) killed 18,900 cattle (see Chart 3).

The same trends hold true in the Northern Rocky Mountains, even though an entire suite of native carnivores reside in the region. Idaho claims that one purpose for wolf hunting in that state is to reduce wolf conflicts with domestic livestock (IDFG 2011), but the number of cattle and sheep preyed upon by wolves as reported by ranchers in the Northern Rockies is highly exaggerated. Baker et al. (2008: 127) write that surveys of livestock producers are inaccurate because growers generate "maximum estimates" that not only include animals killed, but also missing animals, "nonviable stock," and exaggerated losses. Two different federal agencies track livestock losses attributed to wolves—FWS and NASS. While the

FWS uses verified reports from agents, NASS relies on unverified reports from the livestock industry. The difference between their annual counts raises significant questions as to the veracity of NASS's reports (see Tables 2 and 3). The discrepancies between the two agencies' numbers are quite striking, but even when one uses the unverified numbers, the livestock losses are quite small.

Table 2
2011 Reported Cattle Losses by Predation

	NASS[1] (unverified)	FWS[2] (verified)	Difference
Idaho	2,561	75	3415%
Montana	1,293	87	1486%
Wyoming	585	26	2250%

[1] (U.S. Department of Agriculture - National Agricultural Statistics Service 2011a)
[2] (U.S. Fish and Wildlife Service 2011)

Cattle:

- NASS's unverified cattle losses to wolves equaled 4,439, or 0.07 percent of the cattle inventory of 6,040,000 in Idaho, Montana, and Wyoming.

- FWS's verified cattle losses to wolves amounted to 188 individuals, or 0.003 percent of the cattle inventory.

Table 3
2011 Reported Sheep Losses by Predation

	NASS[3] (unverified)	FWS[4] (verified)	Difference
Idaho	900	148	508%
Montana	600	64	938%
Wyoming	300	33	909%

[3] (U.S. Department of Agriculture - National Agricultural Statistics Service 2011b, c, d)
[4] (U.S. Fish and Wildlife Service 2011)

Sheep:

- NASS's unverified sheep losses to wolves equaled 1,800, or 0.22 percent of the total sheep inventory of 830,000 in Idaho, Montana, and Wyoming.

- FWS's verified sheep losses to wolves amounted to 245 animals, or 0.03 percent of the total sheep inventory.

Even if NASS's exaggerated predation data were accurate, it still indicates that the real killers of cattle and sheep are not wolves and other native carnivores, but rather a plethora of other health and climate factors. Even in Idaho, Montana, and Wyoming where most wolves lived (before the commencement of the 2011-2012 wolf-hunting season) and even using *unverified* loss data (that is, numbers that are based upon livestock growers' unverified complaints), wolves killed less than one percent of the cattle (0.07 percent) and sheep (0.22 percent) inventory in those states.

Livestock growers in Idaho and Montana can kill wolves in the act of preying upon livestock, but most wolves are killed by the federal government, specifically a branch of the U.S. Department of Agriculture called "Wildlife Services" (Keefover-Ring 2009). This agency annually kills hunderds of wolves and other native carnivores, ostensibly to protect domestic livestock—many of which graze on public lands. On June 16, 2011, Congress voted not to cut $11 million from Wildlife Services' budget for carnivore control after intense lobbying from agribusiness entities such as the Farm Bureau, gun clubs like the National Rifle Association, and sportsmen's clubs like Sportsmen for Fish and Wildlife and Safari Club International.

Before Northern Rockies wolves were delisted from the ESA in 2011, most wolves were killed purportedly to protect livestock and Wildlife Services agents were responsible for the majority of these kills (see Table 1). During the years 2008-2010, Wildlife Services killed nearly 800 wolves in the Northern Rocky Mountain region, compared to 270 killed by sport hunters. But that trend is now reversed: sport hunters killed more wolves in just a few short months in 2011 than Wildlife Services and individuals seeking to protect livestock, and wolf hunting will continue in some parts of Idaho until June (Table 1).

B. Tackling the Myth: "Wolves Kill Too Many Elk"

Elk, deer, pronghorn, and moose populations in the Northern Rocky Mountains are affected by a suite of factors, including a guild of native carnivores, extreme weather events (i.e., prolonged drought or too much snow), disease, and, especially, overhunting by humans (Vucetich et al. 2005, Wright et al. 2006, Mallonee 2011). In several studies of elk populations conducted in and near Yellowstone National Park, biologists consistently found that human hunters and weather conditions represented the greatest negative effects on elk numbers. In fact, hunters actually constitute the largest mortality factor on ungulate herds by removing prime-age breeding females, while wolves generally prey upon the weak and infirm, which improves herd health.

Idaho reported that elk herds "meet" or "exceed" the state's management objectives in 19 of 29 elk management zones, which cover about 66 percent of the state. Idaho hosts more than 100,000 elk, which "provide a variety of elk hunting opportunities desired by sportsmen" (IDFG 2012, p. 28).

Montana manages for a statewide elk population objective of 90,910 animals, but its 2011 elk population numbered 140,613. Montana's elk population is 55% over its stated goal. Of the 113 elk-hunting units, 87 or or 77 percent are "at" or "above" the state's management objective (MFWP, 2012).

Wyoming's last elk population count in 2010 yielded 103,810 elk, which is a 24 percent above the state's objective of 83,640 elk. Wyoming's goal is to reduce its elk herds (WGFD 2011, p. A-2).

In the 1970s and 1980s, the elk population north of Yellowstone was too large to be sustainable. Montana sponsored culling efforts to cut the population. Then several harsh weather events occurred, including droughts (Vucetich et al. 2005, Wright et al. 2006). Two decades later, another extreme drought from 1998 to 2005 reduced the amount of forage available to elk (Barber-Meyer et al. 2008), just after wolves had been reintroduced into the ecosystem in 1995.

While many have and now blame wolves for the elk population declines north of Yellowstone National Park, a close analysis finds that human hunting pressure and climate are the greatest causes of population declines (Vucetich et al. 2005). Other studies show that as winter severity increases, elk

vulnerability to wolves also increases, reinforcing the idea that weather may influence elk population size more than wolves (Smith et al. 2004, Bergman et al. 2006). The long-term effect of wolves on elk herds is that they most likely hold populations at lower levels, which mediates mortality from starvation, weather and other stochastic events (Wright et al. 2006).

Aspens without wolves. For decades, Yellowstone National Park's aspen trees suffered overbrowsing by elk. Wolves keep elk more vigilant and on the move. The result: the Park's aspens and willows are also experiencing restoration. With the return of once-scarce flora come fauna—especially beavers. Their dam-building work brings water above ground, which creates diverse riparian habitat for many other species (from fish, to amphibians, to birds, to moose). Wolves and beavers together create functional, biologically rich ecosystems. Photograph courtesy David C. Jones.

In fact, the number of Yellowstone elk killed by human hunters is considered by biologists to be "super-additive"—meaning that heavy hunting pressures far exceed what would otherwise have occurred in nature (Vucetich et al. 2005, p. 267, Wright et al. 2006). Whereas wolves select for vulnerable age classes of elk, humans killed prime-age breeding animals (Vucetich et al. 2005, Wright et al. 2006). Human hunters typically killed female elk at an average age of 6.5 years, whereas wolves killed much older elk, averaging 13.9 years (Wright et al. 2006).

Additional research in the Northern Rocky Mountains has further complicated the wolf-elk question by demonstrating that other carnivores in the ecosystem also affect elk population size. Grizzly bear numbers increased three-fold between the years 1983 to 2005 (from 135 to 431) (Barber-Meyer et al. 2008). Grizzly bears, efficient at preying on elk calves, selected more elk calves than did any other native carnivore (coyotes, wolves, and cougars). Bears search for elk calves in the springtime by systematically combing the grounds where calves are stowed, whereas wolves and coyotes only happen

upon calves while sorting out weak animals from a herd (Barber-Meyer et al. 2008).

Many biologists (Smith et al. (2004), Vucetich et al. (2005), Wright et al. (2006), Barber-Meyer et al. (2008)) argue that the elk herd on the northern boundary of Yellowstone National Park has experienced what is called "compensatory mortality." That is, if no wolves were present in the system, elk would die anyway from other causes. But there was some initial disagreement in the scientific community about this finding.

Other biologists argued that wolf mortality to elk populations is "additive"—meaning that wolves killed more elk than would have otherwise died from all other causes, including from weather and starvation (Garrott et al. 2005, White and Garrott 2005b, Evans et al. 2006). The chief proponents of this argument were P.J. White and Robert Garrott in their 2005-2006 articles (Garrott et al. 2005, White and Garrott 2005b, Evans et al. 2006). Even as they had claimed that wolves had a substantial effect on the Yellowstone elk herd, White and Garrott, along with other "compensatory mortality" biologists, recognized that Montana had maintained liberal hunting seasons that allowed for too many female elk to be hunted annually by sportsmen. Humans had contributed to the total elk population decline. The state failed to rein in hunting and in fact, has held late season hunts on antlerless (female) elk.

Interestingly, White and Garrott then co-authored a subsequent publication (Eberhardt et al. 2007), which determined that wolves were far less important elk predators than are human hunters. The authors found that wolves removed more calves and senescent individuals than do humans (Eberhardt et al. 2007). This is important because adult female survival is key to arresting an elk population decline (Eberhardt et al. 2007). After examining 70 years of elk population data, Eberhardt et al. (2007, p. 601) write: "[a] key finding from our study is that removals by wolves have a much lower overall impact on ungulate populations than do removals by hunters."

The consensus of the scientific community is that the decline of elk herds north of Yellowstone National Park is the result of human mismanagement, not wolf predation.

From a behavioral standpoint, it makes sense that wolves cause only compensatory mortality and not additive mortality. Wolves pick vulnerable prey to minimize the substantial risks—injury and even death—they face while hunting elk (Smith et al. 2004, Stahler et al. 2006). Wolves select for calves, then cows, and finally for bulls (Smith et al. 2004, Stahler et al. 2006). If they hunt bulls, they take the weakest animals in poor body condition (Winnie and Creel 2007). Interestingly, in the summer months, wolves kill fewer ungulates—if they are not provisioning for pups—and their diet becomes more varied, including even vegetation (Stahler et al. 2006).

Other studies show that humans are the greatest source of mortality to all medium- and large-sized mammals in North America, and hunting accounts for most human-caused mortality (Collins and Kays 2011). Human hunting has caused mammals to decrease their body sizes (Coltman et al. 2003, Collins and Kays 2011). Hunting forces rapid evolutionary shifts in both behavior and body size, and this response may change a species' ability to adapt, particularly when added to the burdens of habitat loss and climate change (Collins and Kays 2011).

Many biologists in the Northern Rocky Mountain region have suggested that Montana reduce human hunting pressures to allow elk herds to rebound (e.g., Ruth et al. 2003, Vucetich et al. 2005, White and Garrott 2005a, Wright et al. 2006, Eberhardt et al. 2007, Barber-Meyer et al. 2008). Elk respond directly to the presence of human hunters. According to one study, elk are more displaced by human hunters than by wolves (Proffitt et al. 2009). Elk move from high-risk hunting areas during the human hunting season to avoid being killed (Proffitt et al. 2009). Because elk are wary of humans during the hunting

season, they avoid roads. According to one news story in Montana, the elk are present but not where "road hunters would spot them" (Backus 2011). A Montana Fish, Wildlife & Parks official stated: "[t]hose hunters not willing to get out of their vehicles and wander off the roads are going to have a hard time finding game right now" (Backus 2011). So given the data, why are hunters complaining so vociferously about wolves?

Rather than blame the wolves, the State of Montana should limit elk hunting, curb elk and deer poaching, and encourage elk hunters to engage athletically in the sport rather than hunt from a vehicle.

C. Tacking the Myth: "Wolf Hunting Leads to Increased Tolerance among Hunters"

There is a notion that if hunters can hunt and kill carnivores as a game species, their anxieties about resource competition will dissipate. This theory does not hold merit when tested (Treves 2009). Carnivore hunters in the Northern Rocky Mountains endorsed wolf hunting in greater numbers than other hunters, and they still wanted fewer wolves than other hunters (Treves and Martin 2011). In fact, the majority of hunters of wolves and bears were opposed to the conservation of these species (Treves and Martin 2011). The authors suggest that decision makers should not expect carnivore hunters to endorse carnivore conservation (Treves and Martin 2011).

IV. Hunting Wolves is Biologically Harmful, Unethical and Uneconomical

Wolves, highly intelligent mammals, maintain complex social networks and work as a community to survive (Mallonee 2011). Researchers warn that hunting wolves, even at low levels, prevents population recovery (Creel and Rotella 2010). Yet, the new hunting seasons for wolves have not been limited to low-level take, but emphasize "heavy direct" killing (Creel and Rotella 2010).[16] This level of take of a species that was only recently removed from the protection of the ESA challenges federal conservation efforts and presents ethical implications.

Wolves can suffer physical, psychological, and emotional trauma (Mallonee 2011). Wolf pack members associate with each other, and those packs maintain networks with other packs. Social animals, wolves experience disruption when fellow pack members are killed, which can affect not only individual packs but the entire network of wolves in a region (Mallonee 2011). Social disruption can cause packs to disband and elimination of the breeding pair can lead to the loss of pups from starvation (Creel and Rotella 2010).

The proposal by Montana Fish, Wildlife & Parks in January 2012 to extend the wolf hunt from February to April in the Bitterroot region concerned one wildlife commissioner. The hunt would extend into the spring when wolves have their pups. Commissioner Ron Moody, himself a hunter, argued that the state requested and already received one wolf-season extension (the season was extended from December to February). A second extension, he noted, would harm the perception of sportsmen among the non-hunting public. Commissioner Moody stated that the tenants of ethical hunting are "not infinitely elastic" and that hunters should "treat animals with respect" and not as "living targets" or a "commodity" (Mauk 2012).

Wolves and other large carnivores did not evolve with high levels of human exploitation. Human hunting can and has caused carnivore extirpation and extinction (Dunlap 1988, Mighetto 1991,

16 For large carnivores to endure, human-caused disturbance must be restrained so that populations can remain resilient (Noss et al. 1996, Weaver et al. 1996). Weaver et al. (1996: 965) define resilience as the "ability of systems to absorb disturbance and still maintain the same relationships between populations." With population and system resilience comes persistence. Some species, such as wolves, are more resilient than, for example, mountain lions or grizzly bears, due to fecundity, competitive advantage in a multi-carnivore community, and habitat requirements (Weaver et al. 1996).

Robinson 2005, Stolzenburg 2006, Stolzenburg 2008). Many top carnivores face an extinction crisis in North America and across the earth (Berger et al. 2001, Ritchie and Johnson 2009, Estes et al. 2011). For wolves the problem is not having sufficient habitat or prey to pursue but high levels human exploitation of their populations.

U.S. Forest Service employee Josh Bransford with a trapped wolf. The trapped wolf attracted onlookers, and one person reportedly shot and wounded it before Bransford arrived to check his trap. Bransford then posed for photos with the wolf—both before and after killing it. He posted those photos on Trapperman.com. The images were reposted on Facebook by wildlife advocates at Footloose Montana, prompting a death threat. The Reuters' news article that chronicled these events was published in the international media (Zuckerman 2012).

In Idaho, where wolf trapping is permitted, the manner of take is arbitrarily left to the trapper, which can lead to cruelty and abuse. A U.S. Forest Service employee, Josh Bransford, posed with a grin in front of a bleeding and fearful wolf trapped by the rear foot and wounded by a .22. Animal advocates publicized the images on the Internet and immediately received a threat of gun violence to their children, prompting a national media story (Zuckerman 2012) that was ultimately published in the United Kingdom and France.

Table 4 Wolves Killed by Sportsmen in Idaho and Montana, 2011-2012 Season (data: August 30, 2011- April 2, 2012; IDFG & MFWP)			
	Hunted	Trapped	Total
Idaho	252	123	375
Montana	166	0	166
Totals	418	123	541

Even as wolf recovery has struggled (wolves occupy about five percent of their historic range in the lower 48 states), the level of wolf hunting in Idaho and Montana has taken a toll on the small existing populations. More than 62,000 hunters and trappers have purchased wolf tags in the two states (see Table 5). The vast majority of wolf hunters (and trappers in Idaho) in both states are residents: 89 percent in Idaho and 99 percent in Montana. Montana received $407,389 in license sales for the 2011-12 season, which ended in February. As of March 28, Idaho has derived $592,775.75, but its 2012 wolf season will continue until June.

Table 5 Wolf-Hunting Licenses Sold in Idaho and Montana, 2011-2012 Season (data: IDFG & MTFWP, March 28, 2012)					
	Resident Wolf Hunting Tags	Non-Resident Wolf Hunting Tags	Resident Wolf Trapping Tags	Non-Resident Wolf Trapping Tags	Totals
Idaho	38,478	4,551	503	23	43,555
Montana	18,531	158	0	0	18,689
Totals	57,009	4,709	503	23	62,244

Wolf biologists have questioned state management of Northern Rockies wolves, noting the lack of science in decision making and describing management as being politically driven (Bergstrom 2011, Bruskotter et al. 2011). The dearth of science in wolf management begins with state estimates of wolf populations, which is the basis of state hunting seasons. In 2010, while the FWS estimated that Idaho had 705 wolves, the Idaho Department of Fish and Game claimed to have "more than 1,000 wolves." The Idaho Fish and Game then set a goal to "manage for at least 150 wolves," the federal minimum to avoid listing the wolf again under the ESA. In other words, once wolves were delisted, the agency immediately set a hunting quota to reduce the state's population to the federally-mandated minimum. The hunting season began August 30, 2011, and extends until March 30 in some zones and to June 30, 2012 in the Selway and Lola hunting zones—a ten-month season. Hunters can purchase two tags per person. Idaho also permitted wolf trapping from November to March across most of the state. One trapper can capture and kill two wolves. Idaho's proposed hunting and trapping seasons for 2012-2013 will be even more extreme.[17]

17 For the 2012-2013 season, Idaho has proposed even more killing, including holding extended seasons on private lands, a bag limit of five wolves for hunters and trappers in some zones, and increased quotas in other zones.

There were also discrepancies in wolf population estimates in Montana. In 2010, FWS estimated the state had 566 wolves, while Montana Fish Wildlife & Parks claimed 645 wolves inhabit the state, which was disputed. Wolf biologist Jay Mallonee called Montana's wolf count totally "inaccurate" (Mallonee 2011). Because Montana has few radio-collared wolves, it relies on anecdotal information gathered from the public, and especially hunters, to estimate populations. To accurately count wolves, one needs to know the number of births, deaths, immigrants and emigrants, which is nearly impossible if animals are not marked (Mallonee 2011). Additionally, Montana likely adds immigrant wolves from Canada and Idaho and Wyoming to its state count (Mallonee 2011). Montana can justify neither its population estimate nor its hunting quota, which is based on inaccurate information (Mallonee 2011).

Montana issued 18,689 hunting licenses and set a kill quota of 220 wolves for 2011. The hunting season commenced on September 3, 2011, and was scheduled to end in December, but was extended to February 15, 2012—a six-month season—to maximize take. In the West Fork of the Bitterroot, the state proposed to extend the season again until April 1, but following a public outcry, the Fish Wildlife & Parks Commission did not approve the extension at its February 2012 hearing.

Table 6
Price for Wolf-Hunting Licenses
(2011-2012 Season)

	Resident Wolf Hunting Tags Price	Non-Resident Wolf Hunting Tags Price
Idaho[1]	$11.50	$31.75
Montana	$19	$350

Table *7*
Hunting License Price Comparison, Idaho
(2011-2012 Season)

	Bighorn Sheep, Moose, Mountain Goat	Pheasant
Resident	$166.75	$23.75
Non-Resident	$2,101.75	$97.75

Idaho and Montana sell wolf tags cheaply. In Idaho, it is two to three times more expensive to hunt pheasants, an Asian exotic, than wolves (see Tables 3 and 4). Meanwhile, both Idaho and Montana charge top prices to hunt animals considered trophies, such as bighorn sheep, moose, and mountain goats. The wolf is clearly undervalued and is being hunted as a nuisance in both states.

Compare this level of exploitation to carnivore conservation programs in South Africa. There one pays $10,000 to hunt a leopard—a species that is nearly as rare as mountain lions (*Puma concolor*) in the American West and a species that is comparatively greater in number than wolves in the Northern Rocky Mountains. High fees for hunting permits contribute directly to species' conservation programs in Africa (Balme et al. 2009). That is the opposite of Idaho and Montana (and soon, probably Wyoming), which apparently seek to maximize wolf mortality from hunting by pricing hunting tags far below market value, without regard to their ecological importance, devaluing the ecosystem services wolves provide.

WildEarth Guardians does not endorse wolf hunting, but these examples are offered to show that low prices for hunting tags are indicative of the failure by states to conserve wolves and appreciate their ecological value. Low prices also show an enormous failure to uphold the public's trust or protect the public's investment in wildlife conservation (e.g., Jacobson et al. 2010, Bergstrom 2011, Bruskotter et al. 2011, Nelson et al. 2011). Taxpayers have paid approximately $40 million to reintroduce wolves in the West (Ketchum 2012) and thousands more for innumerable studies on their behavior and ecological influences. Collared research wolves have been killed, which is both expensive and frustrating to researchers and wildlife watchers (Morell 2009). These investments are at risk from wolf hunting.

V. The Ecological Importance of Wolves

Apex carnivores significantly influence biological diversity and ecosystem function (e.g., Beschta and Ripple 2009, Ritchie and Johnson 2009, Estes et al. 2011). Ecologically functioning populations of wolves have been instrumental in restoring biological diversity in the Northern Rockies, including increasing the number of song birds, pronghorn, lynx and other species, while simultaneously improving the ecology of vital riparian systems (e.g., Smith et al. 2003, Fortin et al. 2005, Berger et al. 2008, Beschta and Ripple 2009, Ripple et al. 2011). Their presence even affects soil nutrients, soil microbes and plant quality because decomposing carcasses of prey enrich soils (Bump et al. 2009). Small populations of wolves cannot effect ecological restoration, they need to be restored to ecologically-functional population sizes sufficient to influence ecosystems (Belant and Adams 2010).

Large herbivores such as moose and elk affect riparian zones. Without carnivores in the system, their populations irrupt and they over-browse and over-graze riparian vegetation, which degrades habitat for other species such as birds (Berger et al. 2001). In places where hunting is forbidden and large carnivores are largely absent, such as in Grand Teton National Park and Rocky Mountain National Park, biodiversity, especially avian fauna, decline because of their inability to compete with large ungulates such as elk for riparian resources (Berger et al. 2001).

Grizzly bear mother and cub. Photograph by David C. Jones.

Raven on elk bones. Ray Rafiti.

With the return of wolves, more food is available to a host of other animals. For grizzly bears, having wolves back in the system has provided new food sources, aiding their recovery in Yellowstone National Park. Wolves leave food for bears to scavenge and provide opportunities for them to usurp carcasses.

Once wolves had been restored to Yellowstone National Park and Banff National Park in sufficient numbers, researchers found that they mediated elk populations and curbed ungulate browsing of aspens through behavioral changes (Hebblewhite et al. 2005, Beschta and Ripple 2006, Ripple and Beschta 2007), and that aspen recruitment increased for the first time in over a half century due to the presence of wolves (Ripple and Beschta 2007). Even when the elk population had decreased in Yellowstone prior to wolf recovery, elk browsing continued to negatively effect willow and plant communities (Beschta and Ripple 2006). With the return of wolves, changes in the trophic processes were immediate and noticeable: first elk browsing, then willow recovery, then beaver lodge density, then stream restoration (including reduced flooding, channeling, and bank erosion), and now songbird diversity (Hebblewhite et al. 2005, Beschta and Ripple 2006).

Wolves use their family structure, packs, to maintain boundaries and defend against other wolf packs. Wolves in Yellowstone generally feed on elk and either share or compete with pack members in a hierarchical manner at kill sites (Stahler et al. 2006). Wolves lose significant amounts of their kills to scavengers such as ravens, magpies, eagles, coyotes, and grizzly bears (Stahler et al. 2006). Wolves also increase biological diversity by checking the effects of mesopredators on numerous species (e.g., Ritchie and Johnson 2009, Estes et al. 2011, Ripple et al. 2011), to the benefit of species such as pronghorn and lynx (Berger et al. 2008, Ripple et al. 2011).

In the Yellowstone ecosystem, wolves act as a buffer to the effects of climate change by creating more carrion for scavengers and making it available year round, to the advantage of bald and golden eagles, grizzly bears, ravens, magpies and coyotes (Wilmers and Getz 2005, Stahler et al. 2006). By leaving carcasses available, wolves may be important in protecting an extraordinarily rare species, the grizzly bear, whose major food source, whitebark pine, is disappearing due to global warming (Constible et al. 2008).

In short, if wolves are present in ecologically functional populations, they can mediate ungulate populations, which then confers greater biological diversity and function to ecosystems. Wolves are a critical component to ecosystem health, which is not properly recognized in western state management schemes.

VI. Five Solutions to Stem Wolf-Human Conflicts and Conserve Wolves for Future Generations

Wolf Solution 1: Restore Wolves to "Threatened" Status

As noted above, most wolf hunters in Idaho and Montana are residents of those states, 89 percent and 99 percent, respectively. Of the 62,244 wolf tags issued, 57,512 were sold to residents and 4,732 to non-residents. These data may indicate a localized animosity toward wolves (which stems from mistaken archetypes that depict wolves as competitors for livestock and elk, or wolves as proxies for federal interference).

As this report also described using government data and after reviewing much literature on the relationships between wolves and elk (and humans and elk), it is clear that wolves have little influence on either cattle/sheep numbers or elk numbers.

The most important factors in livestock losses are health problems, birthing issues and weather, but not carnivores. Meanwhile for elk, reduced herds are caused by overexploitation by humans, loss of habitat, and weather, but not wolf predation. In fact, studies show that wolves generally take aged elk, while humans kill the prime age breeding animals and in numbers that are unsustainable. Human hunters have "super additive" mortality effects on both elk and wolf populations.

Belief systems held by the vociferous few have hijacked the public policy process and sidelined the interests of the majority of Americans to restore wolves in the West. The policy process has failed.

As biologists (Bruskotter et al 2010 and Houston et al. 2010) have shown, the FWS, at the behest of Congress have prematurely removed Northern Rockies wolves from the federal threatened and endangered species list based on local attitudes regarding this large carnivore. The Northern Rockies population should be relisted as "threatened" under the ESA. Wolves had not yet recovered when federal protections were lifted and Western states assumed management of the species, and then heavy human exploitation of their populations began. States have are captured by local interests and shown they cannot competently manage wolves. Federal listing would shield wolves from political interference at all levels of government, as influenced by monied lobbyists, support management by ethical agency biologists,[18] and ensure the species full recovery in the lower 48 states.

Wolf Solution 2: Create More Refugia

The fate of many large native carnivores would be significantly improved if more public lands in the Rocky Mountain West were managed for carnivore conservation. As Weaver et al. (1996, p. 972) write, "the powerful role of refugia in population persistence has emerged as one of the most robust concepts of modern ecology." Refugia should serve as source areas to support other populations by maximizing natality and minimizing mortality. Unfortunately, most of our public lands in the Rocky Mountains are open for hunting and trapping for almost any apex carnivore.

Not all public lands, including wilderness areas and roadless lands, are habitat for large carnivores, however. Biologists note that the Rocky Mountains contain large swathes of land that is "rough, inhospitable terrain" (Noss et al. 1996, p. 955), which is good for wildlife such as wolverines but not most other carnivores and their large-bodied prey. As a result, apex carnivores can often be found in the same habitable portions of roadless landscape as domestic livestock (Keefover-Ring 2010). The two, livestock and large carnivores, do not mix because of human intolerance stemming from largely from misperceptions about livestock safety. Thus carnivores are frequently subject to direct human exploitation fostered by livestock-protection regimes in the very areas the species needs to persist as a valuable contributor to the ecosystem.

Wolf Solution 3. Employ Non-Lethal Livestock Protections

Non-lethal methods of carnivore control can effectively reduce livestock losses and with less controversy than shooting, trapping, and poisoning. Unfortunately, livestock producers are not required to use these methods and are without incentive to do so because producers already enjoy highly subsidized lethal predator control.

Wildlife damage can be mapped to predict and prevent future attacks, which staves off human retaliation against individual carnivores for livestock damage, allows ecosystem processes to continue, and reduces conflicts between carnivores and humans and their livelihoods (Treves et al. 2011).

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18 Haber (1996, p. 1076) reminds: "Aldo Leopold did not hesitate to venture into such areas of overlap between biology and ethics, to distinguish between right and wrong in advocating improved management of natural systems. Other wildlife scientists who regard his ideals as a guiding light for the profession should not hesitate to do the same." But perhaps we need new agency representatives because belief systems are "religious in nature and extremely resistant to change," (Primm and Clark, 1996, p. 1042). The fact that the grinning man who posed in front of a live, trapped and injured wolf and who works for the U.S. Forest Service gives many of us pause.

Developing a risk map saves resources because preventive measures can be focused in targeted areas (Treves et al. 2011). To date, indiscriminate killing has often been used to prevent attacks to livestock. But research from federal coyote killing, for instance, has found that random control has not reduced domestic sheep losses, and in fact, can exacerbate them (Knowlton et al. 1999, Treves et al. 2011). Risk mapping allows for more selectivity in alleviating conflicts and identifies areas where more non-lethal deterrents should be applied.

To avoid predation, livestock husbandry practices prove useful, such as keeping sick or pregnant animals close to humans or buildings and keeping herds away from cover (Treves and Karanth 2003). Human herders and several types of guard animals (llamas, some breeds of dogs, and burros) can be used, especially to guard against coyotes and black bears (Andelt 1996, Treves and Karanth 2003). Also, sheep and goats can be bonded with cattle, which more aggressively defend themselves (Andelt 1996). Small-sized animals and juvenile animals are particularly susceptible to predation (Baker et al. 2008). Some livestock, because of their domestication (which selects for animals that are highly productive but docile), have poor predator-avoidance skills (Knowlton et al. 1999, Baker et al. 2008). For example, sheep, because of their docile nature and inability to defend themselves against predators, require special protections (Knowlton et al. 1999).

During lambing and calving season, livestock housed behind barriers such as fences (sometimes electric), barns, pens or sheds are more protected (Andelt 1996, Treves and Karanth 2003), but barriers can be breached and should be coupled with other non-lethal protections (Treves and Karanth 2003). Research on synchronizing the birthing season with that of wild prey species has also proven effective at reducing predation by carnivores. Because coyotes (even breeding coyotes) generally do not specialize on sheep, operators can minimize their livestock losses by concentrating sheep into small, well-guarded areas (Sacks and Neale 2002).

Scaring devices, like strobe lights, flashing highway lights, firecrackers, sirens, shock collars (for wolves) and noisemakers or fladry (flags tied to ropes or fences) are alternatives for protecting livestock on the range or in pastures (Shivik et al. 2003). In a study of captive wolves, electrified fladry was two to ten times more effective than fladry at protecting livestock (Lance et al. 2010).

Aversive conditioning methods may also prevent predation (Shivik et al. 2003). New studies on conditioned taste aversion show promise in protecting eggs, crops, and fruit from mammals (Baker et al. 2005a, Baker et al. 2005b, Baker et al. 2007).

In Alberta, livestock bone yards (where carcasses are dumped) represent an important food source to wolves (Morehouse and Boyce 2011). Because of concerns about Bovine Spongiform Encephalopathy (BSE), commonly known as mad-cow disease, downed livestock are no longer used in livestock feed, pet food and fertilizer, which has resulted in an increase in livestock piles (Morehouse and Boyce 2011). Livestock piles have negative consequences for wolf management: native carnivores could be spreading BSE from the piles themselves; the piles bring wolves and other carnivores closer to other livestock areas and facilities, such as calving areas; and the piles may habituate wildlife to humans (Morehouse and Boyce 2011). Authors recommend the immediate and sanitary disposal of carcasses as a means to reduce future predation on livestock (Morehouse and Boyce 2011).

Livestock growers must use multiple defenses simultaneously that are adapted to particular species, and that growers be willing to modify to prevent habituation (Treves and Karanth 2003). Investment in non-lethal alternatives is not only less expensive but can be more effective at deterring predators.

Wolf Solution 4. Voluntary Grazing Permit Retirement

Domestic livestock grazing is the most pervasive and destructive use of federal public lands. Millions of non-native livestock remove and trample vegetation, damage soil, spread invasive weeds, despoil water, deprive native wildlife of forage and shelter, accelerate desertification and even contribute to global warming. Former Secretary of the Interior Bruce Babbitt has written that federal public lands livestock grazing "is the most damaging use of public land."

Conflicts between livestock grazing and carnivores are frequently and widely reported. Many of these conflicts occur on public lands where federal agencies attempt, often unsuccessfully, to balance multiple uses, including grazing and carnivore restoration. Wolves are often killed, usually by Wildlife Services, to protect continued public lands grazing. Non-lethal control may be too costly or cumbersome for some grazing permittees to implement. Fortunately, there is another option to permanently address grazing conflicts on public lands.

Conservationists, ranchers and Congress are increasingly proposing voluntary grazing permit retirement to reduce grazing conflicts with other public values on public lands. Voluntary grazing permit retirement allows ranchers to choose if and when they want to retire their grazing permit. The conservation community compensates ranchers to waive their permit, often at several times the fair market value. Ranchers could use their compensation to pay off debt, reconfigure their operations solely on private land, start new businesses or retire.

Recent Congresses have authorized voluntary grazing permit retirement on select public lands, including in the Cascade-Siskiyou National Monument in Oregon, the Owyhee wilderness areas in Idaho, the California Desert Conservation Area and public lands in the West where domestic sheep grazing conflicts with native bighorn sheep recovery.

Public lands ranchers across the West are interested in voluntary grazing permit retirement and the program would be ideal to support to wolf restoration in the West.

Wolf Solution 5. Privilege Wolf-Watching Recreation

Most Americans want wolves conserved. Wolf-watching in the Northern Rockies by 94,000 visitors generated $35.5 million in economic activity in 2005 (Duffield et al. 2008). In comparison, Idaho and Montana have derived only $1 million in revenues from wolf tags (although hunters have likely also generated a few million dollars in associated economic activity). A government study shows that wildlife watchers outspend hunters in both Idaho and Montana, especially in Montana (FWS 2007).

The importance of wildlife watchers must be elevated and appreciated in wolf management. State agencies currently do not directly benefit from wildlife watching and so are predisposed to manage wolves for those who buy hunting tags but not for other wildlife-recreation constituents. State legislatures should update the funding formulae for their fish and wildlife agencies, so agencies will not feel compelled to sell hunting tags to fund their budgets, and so the real work of wildlife conservation can begin.

School trip to Yellowstone National Park. Wolf-watching tourism generated $35 million to Idaho, Montana, and Wyoming in just one year. Photograph courtesy David C. Jones.

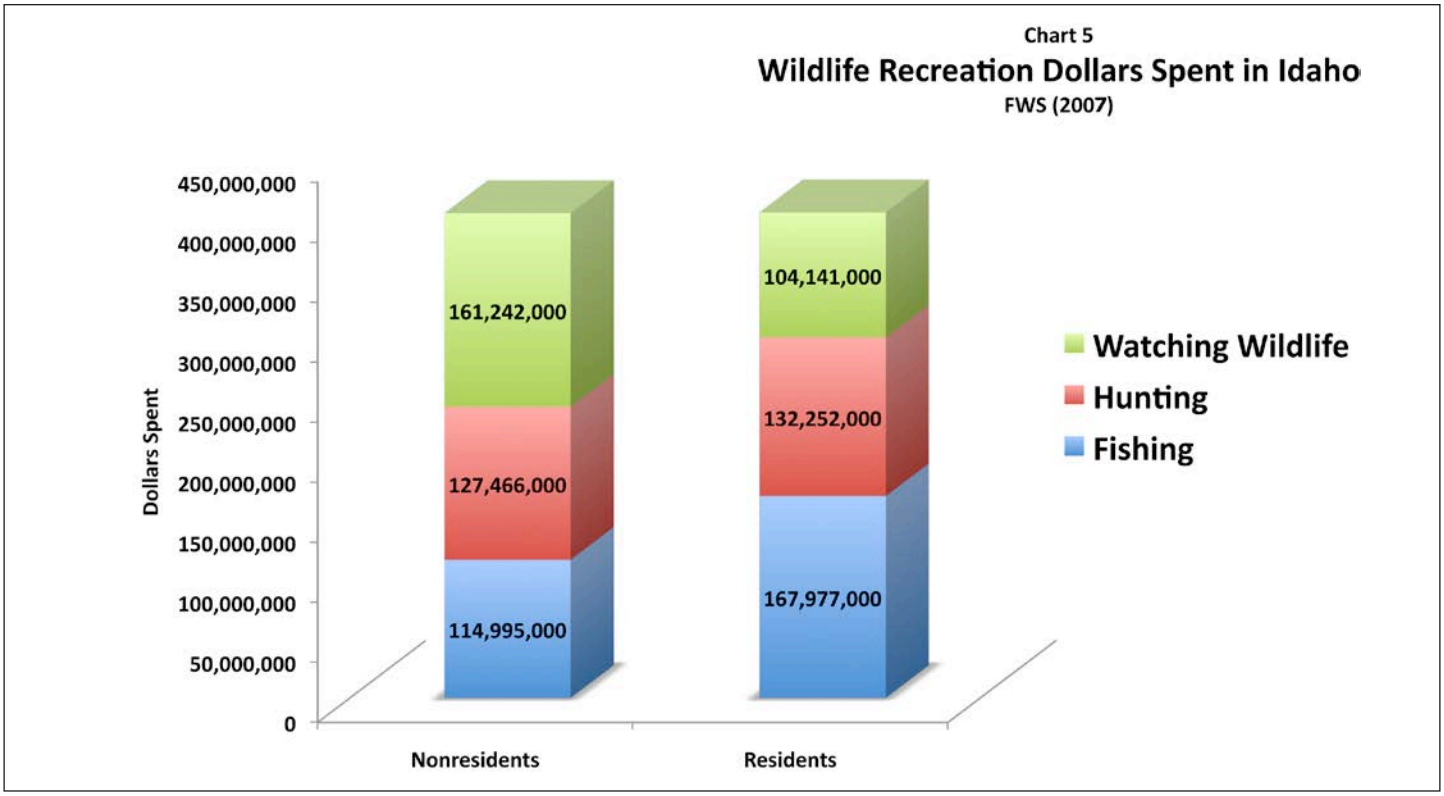

Chart 5: Wildlife Recreation Dollars Spent in Idaho. FWS (2007)

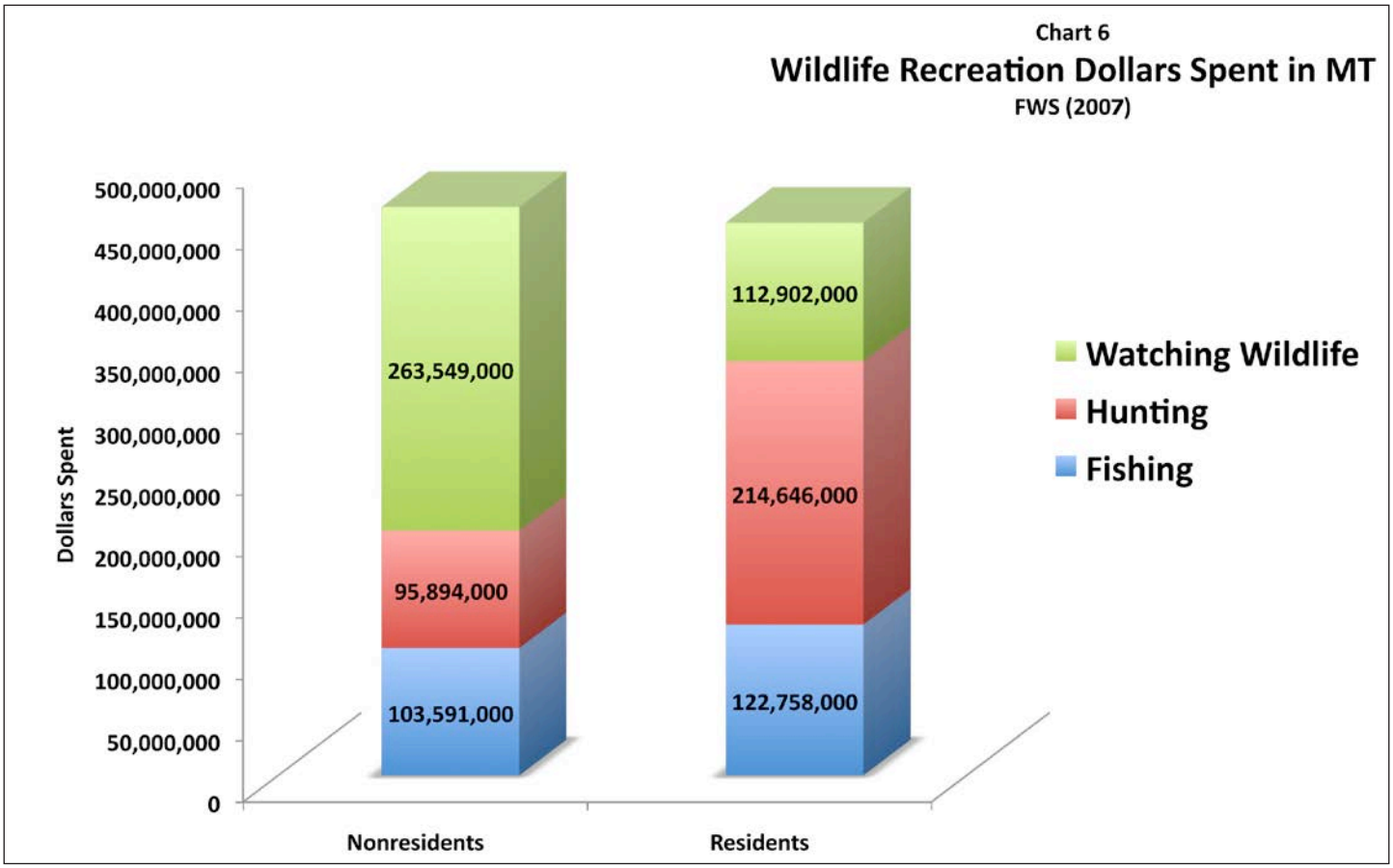

Chart 6: Wildlife Recreation Dollars Spent in Montana. FWS (2007)

VII. Conclusion

The policy process failure for wolves in the Northern Rockies was caused by two vociferous groups with inordinate political power and with archetypal intolerance of wolves. These groups demanded that the federal government abandon a successful federal recovery program in favor of state management of wolves, which quickly devolved into state mismanagement. Congress responded by delisting the population and the Ninth Circuit Court of Appeals affirmed that action. These decisions have jeopardized wolf recovery in the region and may have set a negative precedent for Congressional interference in listing decisions for threatened and endangered species.

Hundreds of wolves have been killed since the Northern Rockies population was delisted in April 2011. Their loss diminishes biological diversity and ecosystem function and offends the public's trust in wildlife management. The majority of Americans share a vision of Western wild lands replete with a full complement of wildlife species, including wolves. That vision is not represented in state agency decision-making and, in the case of wolves, will be more difficult to achieve under current state management influenced by local politics.

Wolves are not ravenous killers of elk or deer or livestock. They do not threaten humans. They are intelligent, gregarious, sociable animals that delight millions of Americans. They create many important benefits to the ecosystems where they occur. We must reject uninformed prejudice against wolves, embrace science, and restore wolves to their rightful place in the West.

Black wolves at dusk. Photograph courtesy David C. Jones.

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Appendix: The Story of Wolf 527

Wolf 527 was born into the Druid wolf pack in the Lamar Valley of Yellowstone National Park in 2002. She sported a fluffy black coat and startling amber eyes. She hunted elk, gave birth to numerous pups, and founded her own pack. A highly intelligent creature, Wolf 527 lived by her wits and maintained her pack in an area where four other packs had previously failed. She vigilantly avoided humans. But in 2009, while hunting outside of the Park's boundary, she was felled by a gun and treachery. Wolf 527 was one of the first wolves taken during state-regulated wolf hunts in Montana and Idaho. This is her account.

Most of the founding members of the Druids were captured in Canada and released into the Yellowstone in 1996, the second year wolves were restored to the Northern Rockies. The Druids prevented other wolf packs from incursion into their territory, while they themselves seized large swaths of land from other packs in the Lamar Valley. At its peak, the Druid pack numbered 37 members, the largest wolf pack ever recorded.

In 2003, as a yearling, Wolf 527 left the Druids to join the Slough Creek pack, which had been founded by her sister, Wolf 217, another former Druid. A year later, Wolf 527 bested other pack members to become the Slough Creek pack's beta female, second only to the alpha female in a wolf pack.

A sedated Wolf 527 being fitted with a radio collar. Photograph courtesy National Park Service.

Much to biologists' surprise, four Slough Creek females gave birth to pups in 2005. Before that point, most believed that only the dominant pair in a pack would breed. But in 2005, distemper ravaged the band of new pups; three survived, however, including 527's daughter, the "Dark Female." She was so named by wolf watchers and biologists because of her distinctive ebony coat.

In January 2006, Park Service biologists fitted Wolf 527 with a radio collar. It soon fell off, and in December, she was reoutfitted with another. The radio collar enabled researchers to detect her whereabouts, so they could glean information about the life of wolves in Yellowstone, including information about reproduction, movements, and behavior. With the help of Wolf 527, the Slough Creek pack eventually took over the Lamar Valley from the Druids.

Wolves continually battle each other for territory and resources. In 2006, rival wolves laid a dramatic siege on the Slough Creek pack. Observers named the intruders the "Unknowns" because they wore no radio collars and suddenly appeared in Yellowstone from the forests outside the Park. For twelve days, the Unknowns encamped outside the den of the Slough Creek pack females. The females, perhaps numbering six, including 527, survived on liquid alone, hurredly nipping snow at the den's entrance, then retreating.

Under these hostile conditions, the females rallied. They escaped the den under cover of darkness and met up with their male pack mates. In the ensuing battle, the Slough Creek pack drove the interlopers

away. The cost of the struggle included the loss of all the pups that year. Apparently, they had been consumed because the biologists who entered the den after the siege found no remains.

In 2007, Wolf 527 took a mate and, along with her daughter, the Dark Female, and a couple of large males, Wolf 527 founded the Cottonwood pack. The Dark Female would flow between the Cottonwood and the Slough Creek packs.

Wolf watchers declared Wolf 527 an unusually wary alpha female, and one who had talents not possessed by others—either before or since—because the Cottonwood pack managed to thrive in marginal habitat situated on the Park's northern boundary. It was centered between two rival camps, the Slough Creek pack and the Leopold pack. Four other wolf packs in this territory had previously failed, and no wolf pack has succeeded in this area since.

The Cottonwood pack proved a mystery to researchers and wolf watchers. Its members avoided roads and often travelled outside of the Park to feed, perhaps even on gut piles left by human hunters, but Wolf 527 always denned with her pups inside the Park.

The Dark Female, 527's daughter, and one of the three pups that had survived the 2005 distemper outbreak, proved hearty. In one instance, a biologist watched her chase a healthy elk for 2.5 miles. While the Dark Female's 19 pack mates fell back, she never relented. When the exhausted elk finally stopped in a river, the Dark Female was still in pursuit, and her other pack mates finally loped up behind her. The elk landed powerful kicks on some of the wolves. Some went underwater. But the wolf pack, lead by the athletic Dark Female, won this day, and the Sloughs fed on the elk.

In February 2009, the Dark Female was captured by Park Service biologists and outfitted with a radio collar of her own and renamed Wolf 716. Park Service biologists could now monitor both Wolf 527 and Wolf 716. The Cottonwood pack, so visually elusive, suddenly gave trace.

While Wolf 527's signal could be detected, she rarely made herself visible. Wolf 527 would not cross roads when people were present, but would cross after quiet nightfall, especially when provisioning for her pups.

In April 2009, Wolf 527 denned and produced five new pups, three black and two gray. In July, Wolf 527's collar stopped transmitting data and so the only remaining working collar in the Cottonwood pack belonged to Wolf 716.

On September 24, 2009, a party of hunters led by an outfitter shot Wolf 716 and the Cottonwood alpha male, 527's mate, when the two wolves stepped from the safety of the Park. On October 3, 2009, another outfitter shot Wolf 527 outside of the Park. Wilderness packs, unused to people, are easily "howled" in to rifle range.

The year 2009 marked the first legal wolf hunt in Montana in decades, a result of Secrectary Salazar's wolf-delisting rule. Wolf watcher Laurie Lyman lamented, "527 had a strategy for every natural situation, but was not able to out think the rifle." In 2009, human hunters killed a total of six members of the Cottonwood pack. Some may have been Wolf 527's yearling pups.

The Yellowstone Wolf Project studies the reproductive success of wolves in the Park. Wolf 527 was studied for the majority of her life span. Unlike other subjects, Wolf 527 had remained alive for a long period, and had not dispersed from the Park. Her death marked the loss of an important subject, and the beginning of an era, one that marked the coming of hundreds more wolf mortalities.

Apex carnivores are critical to our planet. It is counter intuitive, but predation actually creates more life. When wolves kill their prey, they help to create rich, abundant, diverse, healthy and varied life forces in their systems. Unfortunately, politics, not biology, drive wolf "management." May a new time arrive when decision makers see the beauty and necessity of conserving large, connected, intricate systems for wolves and all species. May a time come when decision makers "hear" the majority who appreciate the wonder of wolves and the magic of their work. May the spirit of Wolf 527 and the sound of her brethren's howls be heard by our grandchildren as they stand in wild Wilderness.

Members of the Druid pack engage in rough play. Photograph courtesy David C. Jones.

Back cover: **Alpha Gray,** courtesy Ray Rafiti, *Wild Faces * Wild Places*.

Northern Rocky Mountain Wolves: A Public Policy Process Failure

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By Wendy Keefover • WildEarth Guardians • 2012

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