ANNUAL REPORT

UTAH WOLF MANAGEMENT

CONTRACT NO. 136039 | BIGGAME FOREVER | JULY 2017

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BIGGAME FOREVER

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TABLE OF CONTENTS

INTRODUCTION

INTRODUCTION

This report is submitted in compliance with State of Utah Contract 136039. The contract requires Big Game Forever (BGF) to provide a "summary report of accomplishments to DWR." The focus of Big Game Forever's efforts pursuant to its contract with the State of Utah has been to restore State management authority over wolves in Utah. This is consistent with our contractual obligations with the State of Utah and pursuant to Utah statute that states, "It is the policy of the state of Utah to legally advocate and facilitate the delisting of wolves in Utah under the Endangered Species Act and the return management authority to the state." See Utah Code 23-29-101-(10).

WOLF-DELISTING EFFORTS

BigGame Forever is committed to protecting and restoring a bright future of abundant world-class wildlife in the breathtaking landscapes of the state of Utah. State management of these herds and management flexibility to carefully regulate wolf populations are critical to protecting elk, moose, deer, and other native wildlife in Utah. Utah's $2.4 billion outdoor and hunting industry depend on our success.

Over the last seven years, BigGame Forever has led the effort to protect Utah's world-class herds of elk, mule deer, moose, and other native ungulates from unmanaged wolf populations. BGF has led efforts to permanently delist wolves through administrative and congressional action. Now that wolves have been confirmed within Utah, wolf delisting is more important than ever. Ensuring careful management of Canadian Gray Wolves is not about an anti-wolf ideology. It is about protecting a future of abundant wildlife in Utah for future generations.

BigGame Forever has made tremendous progress on wolf delisting. Our team of legal and political professionals and nationwide grassroots network have been at the forefront of five major achievements to return wolf management to Utah, including:

1. Administrative delisting of Gray Wolves in Idaho, Montana, Wyoming and a small portion of Utah.
2. 2011 congressional delisting of gray wolves for Idaho, Montana and Utah, which includes litigation safe harbor language.
3. Successful defense of congressional delisting in federal district court and the Ninth Circuit Court of Appeals.
4. Amended Mexican Wolf plan, moving northern recovery boundary from Interstate 70 in Utah to Interstate 40 in Arizona.
5. Nationwide delisting of gray wolves (Canis Lupus), published during the Obama Administration and once again moving toward delisting within the current U.S. Department of Interior. This delisting will return state management authority over wolves across the entire state of Utah.

Here is why management flexibility to carefully regulate wolves in Utah is so important. The experimental, non-essential introduction of Canadian Gray Wolves into central Idaho and Yellowstone National Park has had major deleterious consequences for wild game populations in Idaho, Montana, and Wyoming. Growth of wolf populations was rapid, impacts to game herds dramatic, and the loss of funding through the North American Model of Wildlife Conservation was almost immediate. We have learned from this experience how vital state wolf management is to protect wildlife populations. We have also learned that it can take years of legal and political efforts to restore wolf-management authority to state wildlife managers.

In the Northern Rockies, it took approximately 15 years and an act of Congress to restore this management authority to the states. In the meantime, wolf populations climbed from 300-500 wolves to over 1,700 wolves in the three-state area. The impacts to many of North America's most important herds of Rocky Mountain Elk, Mule Deer, and Shiras Moose were devastating. Ensuring Utah does not repeat the same mistakes is vital to protecting native wildlife populations in Utah. This is why the effort to delist wolves is so important to BigGame Forever.

RECENT DEVELOPMENTS

Mexican Wolves. On June 29, 2017, The U.S. Fish and Wildlife Service released a revised Mexican Wolf recovery plan for public comment. The recovery strategy establishes two Mexican Wolf populations of the United States and Mexico across historic range. The recovery plan for the American population is focused on the area south of I-40 in Arizona and New Mexico. This area is designated as a Mexican Wolf Experimental Population Area. The public comment period remains open through August 29, 2017.

The new Mexican Wolf recovery plan represents significant improvement from the recovery plan update proposed in 2013. The previous plan recommended two recovery areas in the United States; one in Arizona and Utah and the second in Colorado and New Mexico. Under the plan, the federal Endangered Species Act mandates would have required Mexican Wolf populations in areas outside of historic range, including Utah. The plan proposed the area extend to I-70 in central Utah.

New Delisting Rule. Administrative delisting remains a viable option for nationwide delisting in the coming year. We have confirmed that the Trump Administration is considering republishing a modified version of the June 2013 nationwide delisting rule. This would be an extremely helpful signal to members of Congress that the science and policy support removing Northern Gray Wolves from the endangered species list. Both biological and legal/political solutions to protect wild game in the state of Utah from uncontrolled wolf proliferation and to ensure the state has the ability to manage wolves that might end up in Utah.

"Ensuring Utah does not repeat the same mistakes is vital to protecting native wildlife populations in Utah."

UNDERSTANDING THE ISSUE

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OVERVIEW

Utah is home to world-class wildlife herds and a $2.4 billion outdoor and hunting industry. Many Utahns are unaware of how important Utah's outdoor and hunting industry is to the state. Not only does it contribute to Utah's tremendous economic prosperity, it provides jobs for thousands of Utahns and supports the health and viabilitiy of communities across the state. It supports the wildlife, landscapes and experiences that provide a special dimension to the life of hundreds of thousands of Utahns. One of the driving factors for this flourishing industry is Utah's world-class herds of Rocky Mountain Elk, Mule Deer, Shiras Moose, Bighorn Sheep, Wild Bison, Mountain Goats, Antelope, and other wild game populations. Hunting and outdoor products provide tens of millions of dollars annually for conservation of these and hundreds of other species in the state. Protecting these species is critically important to protect this economic prosperity, jobs, and funding for conservation of healthy and robust native wildlife for Utah and its citizens.

IMPACTS OF WOLVES BEING LISTED IN UTAH

Decline of Wildlife. The rapid growth of Canadian Gray Wolf populations and the resulting decline of key elk, moose, deer and other wildlife populations in the Northern Rockies has been a significant conservation issue in the western United States. In particular, important elk and moose herds in wolf states of Idaho, Montana, and Wyoming are showing dramatic declines. Some wildlife herds, such as the Northern Yellowstone Elk Herd have lost as much as 80-90% of their population. Family ranchers are also feeling the impacts of livestock depredation and economic loss from unmanaged wolves. A major reason for these declines was the failure to maintain wolf populations at sustainable levels after they were introduced. Even with years of wolf management after congressional delisting of wolves in 2011, recovery of these herds has been a slow and difficult process. It appears that some of these herds will take decades to recover--if they recover at all.

Wolves in Utah. The influx of Canadian Gray Wolves into Utah is likely inevitable. The important question is whether the State of Utah will have management authority to protect our native ungulate herds when gray wolves begin to arrive in the state. In 2014, a wolf was confirmed in central Utah when a coyote hunter accidentally killed the animal.

Efforts to Educate the Public and Build Support for Wolf Delisting in Utah

Through BigGame Forever's efforts, public support for wolf delisting is now well-established. BigGame Forever's educational and public outreach efforts have been and will continue to be an important part of building support for and implementing lasting wolf-delisting solutions for Utah. Our understanding of issues surrounding wolves and protection of wildlife in Utah have been

critical to our success. We have found that the public has a high level of support for conservation of and protection of native ungulate species including moose, elk, and deer. Our extensive research and outreach efforts have allowed us to educate the public on the importance of wolf management to conservation of wildlife. Our outreach strategy involves the following:

1. Educating the Public
2. Recruiting New Supporters
3. Mobilizing BigGame Forever Members

The Message

It's About Conservation of Native Wildlife. One critical component of the public outreach campaign is the message we share with the public. Wolf delisting for the state of Utah is not only about restoring state management authority over the species. More importantly it is about conservation of elk, moose, deer and other native wildlife in the state. Wolf delisting and restoring state management authority will allow Utah to protect its wildlife, livestock, outdoor recreation, and rural economies from the impacts that have been documented in Idaho, Montana, and Wyoming.

Learning From the Mistakes of the Northern Rockies. One major educational initiative is to help the public understand the dramatic declines of wildlife when wolf management is delayed. When wolves were introduced into the Northern Rockies, promises were made that once wolves reached a recovery objective of 300 wolves, wolves would be delisted and returned to state management authority. Almost immediately demands were made to increase the number to 450 wolves to provide a 50% population buffer. Repeated lawsuits and administrative processes lasted for almost a decade before meaningful wolf management could begin. By the time wolves were delisted in the Northern Rockies DPS, wolf populations had reached 1,700 wolves and wildlife

populations plummeted. This should serve as an important cautionary tale to people concerned about wildlife conservation in Utah. Here are two important lessons:

1. Do not wait to manage wolf populations.
2. It takes years to secure wolf-management authority even when desperately needed to protect native wildlife.

Economic Impacts of Unmanaged Wolves

Economic Impacts of Declining Wildlife. In Northern Rockies wolf states, declining wildlife populations have dramatically impacted revenue for state wildlife agencies. One article reports that the states of Montana and Idaho are losing millions in revenue due to the loss of abundant wildlife herds of deer and elk (see Exhibit 2). Additionally, these state wildlife agencies face substantially increased costs for recovery of impacted wildlife populations and for management of Canadian Gray Wolves.

The total annual economic loss to the states of Idaho, Wyoming and Montana presents a cautionary tale. For example, the state of Idaho has determined that it is now losing as much as $24 million in sportsmen generated revenue annually (see Exhibit 3). When loss of sportsmen generated revenue is combined with losses experienced by livestock producers and increased costs associated with wolf management and mitigation, the total annual economic impacts in Idaho is much higher. Economic impacts from unmanaged wolves are not limited to Idaho. The states of Montana and Wyoming are also experiencing high levels of economic impact as a result of unmanaged wolves. Considering existing burdens on rural economies, the economic impacts experienced in Idaho, Montana and Wyoming show there are legitimate concerns regarding the economic impacts that unmanaged Canadian Gray Wolves could have in Utah.

Impacts to Grazing. Economic impacts in these states are not limited to wildlife. U.S. Fish and Wildlife Service confirms wolf predation on cattle, sheep, horses, pets and other domestic animals in Idaho, Montana and Wyoming. However, many actual livestock kills by wolves are not included in USFWS wolf predation statistics. This is due, in part, to practical considerations related to finding and reporting livestock kills within the short time frame in which wolf predation can be confirmed. This is also a result of the evidentiary restrictions and the exclusionary nature of the USFWS wolf depredation review process. In fact, USFWS acknowledges that its statistics of confirmed livestock kills by wolves is likely only 1/6 of actual numbers (see Exhibit 4). This is supported by statistics from the U.S. Department of Agriculture showing that 8,100 cattle were killed in the United States by wolves during 2010 (see Exhibit 5). Documented domestic sheep losses are even higher than cattle losses (see Exhibit 4). Financial costs to livestock producers are not limited to livestock killed by wolves. Low body weights, diminished reproductive success and other issues resulting from excessive predatory pressure by wolf packs further precipitate financial losses. Private individuals and hard working rural communities bear most of the financial burden associated with depredation by wolves.

Impacts to Wildlife

Utah Wild Ungulate Populations Much Smaller than Northern Rockies. Because Utah's herds are much smaller than the Northern Rockies herds, decline of elk, moose, and deer could occur much more rapidly. One reason for concern regarding impacts of wolf predation on wild ungulates in Utah relates to the small size of Utah's ungulate herds. Wolves consume a huge amount of game. Just a handful of elk herds in Utah could even support a single wolf pack. Even more importantly, unmanaged wolf predation would quickly decimate virtually every herd in the state.

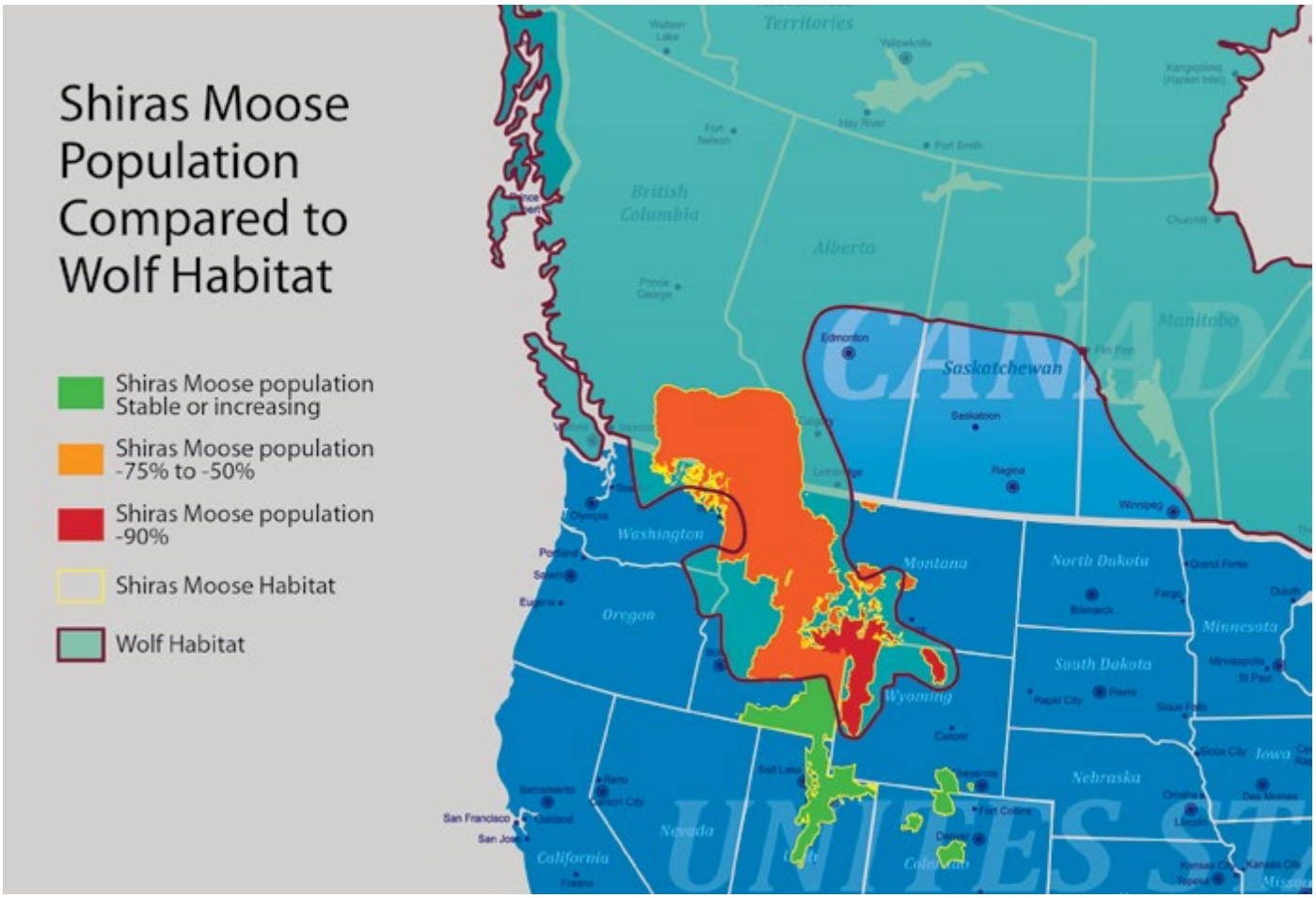
Here is how this occurs. Large numbers of ungulates are needed to support a pack of wolves. In fact, some scientific estimates suggest each wolf consumes 15-30 elk per year. Wolf packs can vary from seven wolves in a pack to as high as 20 wolves in one pack. This means one pack of wolves could consume as much as 300-600 elk in one year.

If a wolf pack kills 300-600 elk in a year, it can take a population of as much as 3,600 elk to support a single wolf pack sustainably. This is due to the natural reproduction rates of elk herds and the importance of replacing natural mortality within elk herds. Considering that normal mortality on adult elk and calf elk are already high, this leaves very little room for error before a elk herd declines. In a stochastic event such as a hard winter, wolf predation can mean insufficient calf recruitment to recover the herd before the next stochastic event. This leads to a rapid decline of the herd.

Just as important, wolf populations do not regulate themselves. Instead, population growth occurs very quickly. As a result, wolf populations and wolf predation are at levels that are much higher than can be supported by local prey base. The result is that in just a few short years native ungulate populations often decline dramatically. While many of the wilderness herds in the Northern Rockies had populations of 16,000 to 20,000 elk, within 20 years many of these herds had experienced declines of 80-90%. In Utah the situation is even more delicate. Just one elk population in Utah exceeds 10,000 elk. A few units have 5,000 elk, but most elk herds live in much smaller numbers in pockets of suitable habitat across the state In the absence of careful and aggressive management, wolves could quickly decimate many of Utah's most important herds of elk and deer.

Wolf Predation, Young Elk/Moose, and Recruitment. It is also important to help the public understand how wolves impact survival of young elk, moose and deer and why this is so important to the health of native ungulate populations. The impact of wolf predation on survival of young elk, moose, and deer is significant. In healthy wild ungulate populations, wildlife managers typically aim for survival rates of 35-50 calves/fawns per 100 cows/does. This ensures adequate replacement of adult animals lost to natural mortality, highway mortality, and other factors. Unfortunately, while wolves do predate on adult male and adult female elk, moose, and deer, they appear to prefer young calves and fawns.

In many areas with unmanaged wolves, survival rates drop to a mere fraction of healthy levels. In many cases survival drops to as low as 10 calves/fawns per 100 cows/does. This is insufficient for survival of these wild ungulate herds. When large stochastic events such as drought, harsh winters, or other high mortality events occur, herds numbers plummet. With high predation rates, recruitment of young elk, moose and deer is simply not sufficient to restore herd numbers. Given the cyclical nature of stochastic events in western habitats, within two or three generations (10-20 years) populations are a mere fraction of their previous numbers. Therefore management of wolves is so critical to protect survival rates of young calves and fawns and for long-term health of game herds.



(Above) Map showing worldwide Shiras Moose population/range compared to wolf habitat.

Fully Endangered vs ESA§10(j) Population Management Considerations. Another problem relates to the lack of wolf management in Utah for livestock attacks. In the Northern Rockies DPS, most wolves lived in areas designated at ESA§10(j), experimental, non-essential populations. In these areas, wolf removal was allowed for livestock predation by USDA wildlife services. Due to the high levels of livestock depredation, literally hundreds of wolves were lethally removed in the 1990's and 2000's. In these areas, professional wolf control regulated wolf numbers and impacts to wild game populations were not as drastic as the large wilderness areas where few wolves were removed for attacks on livestock. Nevertheless, a decade of delays in wolf delisting, wolf numbers and wolf predation were simply unsustainable. Many herds of elk, moose and deer were devastated by unmanaged or undermanaged wolves.

Speed of Native Ungulate Decline. In Utah, wolves are currently classified as fully endangered. What this means is that take provisions that were used in the Northern Rockies for depredating wolves are unlikely to be available in Utah. This also means that wolf population growth could be even more extreme than in the Northern Rockies. Impacts to wild ungulates could be more severe and occur in a shorter period of years.

In the Northern Rockies, wolf populations grew from 30 wolves in 1995 to 1,700 wolves in 2010. In that same period, several herds of 15,000 to 20,000 elk declined to 1,600 to 3,500. These dramatic declines occurred even with the lethal removal of hundreds of wolves for depredation of livestock. Considering the additional restrictions on management in Utah under a fully endangered designation, there is significant reason to be concerned about influx of wolves into Utah without immediate management authority.

Shiras Moose

The Threat to Utah's Shiras Moose and Shiras Moose Worldwide. One of the most sensitive species threatened by the introduction of Canadian Gray Wolves into Utah is the Shiras Moose. Utah is an important safe haven for Shiras Moose worldwide. Unregulated wolf predation in Yellowstone, Jackson Hole, and northern Idaho has led to the dramatic decline of Shiras Moose across most of their range. Moose populations in Montana also appear to be suffering similar declines. Because of the level of predation, moose populations in Utah, Colorado, and southern Wyoming are some of the last remaining healthy Shiras Moose herds in the world. In fact, there are more moose in the mountains surrounding Salt Lake City than Yellowstone, Jackson Hole, and the Bighorn Basin combined. These areas were once the heart of Shiras Moose populations worldwide.

Despite the relative abundance of Shiras Moose in Utah, the species resides in fairly low densities. In fact, moose populations in Utah total approximately 3,000 moose. Numbers in Colorado are closer to 5,000 moose. It is vital for long-term survival of the species that the States of Utah and Colorado can manage wolf and other large predators to protect the health of Shiras Moose. With current Endangered Species Act protections, Utah does not currently have wolf management authority except in the northern portion of the state that resides within the Rocky Mountain DPS boundary. This is a serious and precarious situation for wild game conservation in Utah.

Impacts to Shiras Moose Across the Range. Here is why wolf management is so important to Shiras Moose. When wolves were introduced into Yellowstone, federal environmental documentation predicted that moose would largely be unaffected by growing wolf populations with 5-13% decline of Shiras Moose. Shiras Moose is one of the most important indicator species. Shiras Moose are the largest deer species in the Western United States. In fact, almost the entire worldwide population of Shiras Moose is found in Idaho, Montana, Wyoming, Washington State, Utah, and Colorado. The following provides a more detailed overview of impacts to Shiras Moose in America.

Moose in Yellowstone. America's moose are in serious trouble. Nowhere is this decline more pronounced than in Yellowstone. Yellowstone National Park and the Yellowstone Ecosystem were the heart of America's moose population 20 years ago. There were literally thousands of moose. People traveled from all over the world to Yellowstone to view and photograph moose populations.

(Below) A cow moose and its calf in Yellowstone National Park

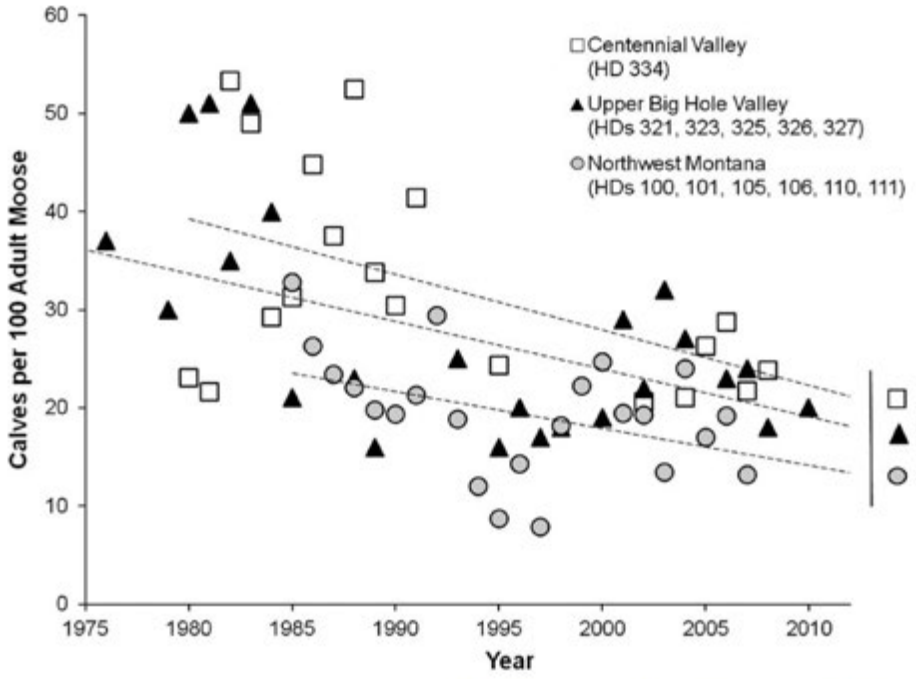


Fig. 5. Annual moose calves per 100 adult recruitment data and associated linear regression trend lines calculated from fixed-wing and helicopter late winter aerial surveys in 3 regions of Montana, 1976–2010.

(Above) Calves per 100 Adult Moose in Montana.

This past winter, efforts to count moose in Yellowstone show just how dire the situation has become. Reportedly, biologists flew over 350 miles of prime winter range in Yellowstone over seven hours, under prime viewing conditions. This is the best time of year to count moose. But only six total moose were located. Even the most optimistic population calculations project that there are less than 100-300 moose left in Yellowstone National Park. Most who have been watching the issue more closely indicate that the real number is likely much lower. The near extirpation of moose from Yellowstone National Park is a tragedy of modern conservation. It is also a cautionary tale for states like Utah and Colorado that still have stable or growing moose populations. While these states have many times the moose in Yellowstone, Jackson Hole, and Wyoming's Bighorn Basin, total moose numbers in Utah and Colorado are approximately 8,000 moose. What this means is that if, or when, wolves move into these states, America's remaining Shiras Moose could be decimated in just a few short years.

Moose in Montana. Research of first source material conducted by BigGame Forever shows that moose decline extends far beyond Yellowstone. Since wolves were introduced into Montana 20 years ago, survival of young moose has plummeted. In fact, calf moose survival has declined from 50 calves per hundred cows to approximately 20 calves per hundred cows just 20 years later. This level of calf recruitment is not enough to maintain or protect moose populations in the state. See Figure 5 above.

Predation by wolves is a major concern to moose biologists. Here is a very telling quote from this report on moose populations in Montana:

> *While predation was not considered a concern 40 years ago (Schladweiler 1974), the expanded composition and abundance of predator species may have the potential to limit local moose populations. Predation was the most common concern of regional biologists relative to moose population dynamics.*
>
> *Research on winter prey selection by recolonizing wolves in the North Fork of the Flathead River drainage from 1986-1996 indicated that while wolves disproportionately used areas where deer were concentrated, they pref-*

erentially killed larger moose and elk over more abundant deer. Moose, particularly calves and cows, comprised a greater proportion of wolf kills as winter progressed (Kunkel et al. 2004)(See Exhibit 10).

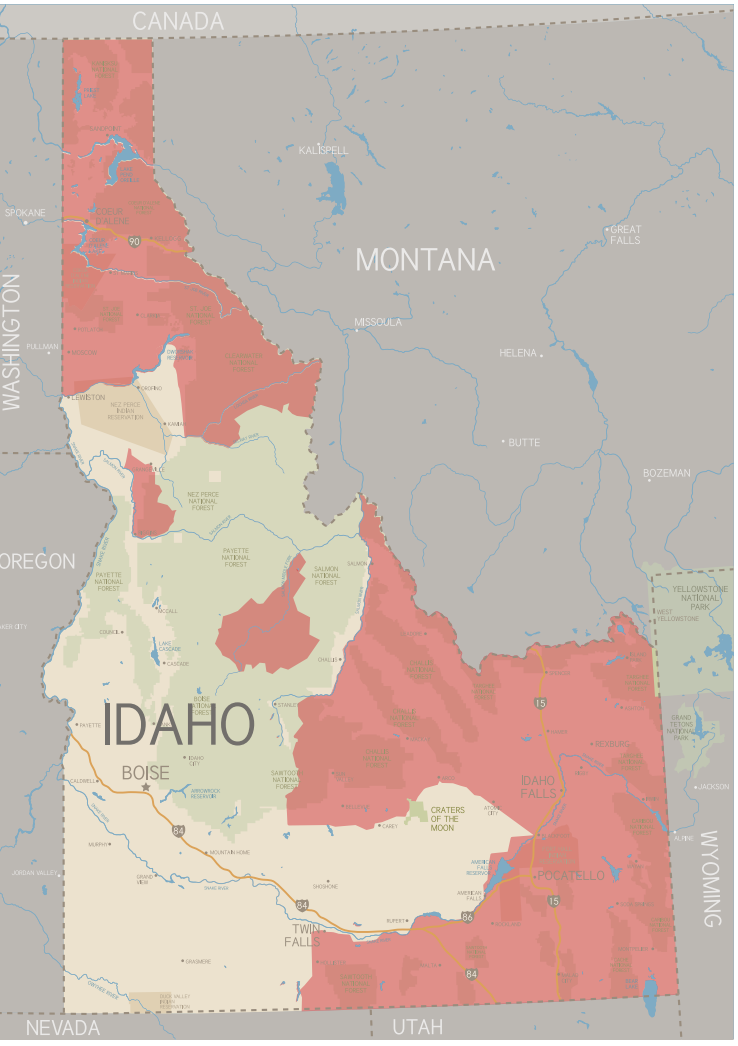
Moose in Jackson Hole, Wyoming. Before Canadian wolves were introduced into northern Wyoming, moose in Jackson Hole, Wyoming numbered 3,000 to 5,000 moose. Today, less than 20 years after the experimental wolf introduction, there are less than 450 moose left in Jackson Hole. This is a 90% reduction in moose in Jackson since Canadian wolves were introduced into Northern Wyoming.

Here is a quote from one scientific study showing just how dire the situation is for moose in Jackson Hole, Wyoming:

> *This* [moose] *population is 88% below its postseason management objective. Native moose populations naturally expanded and colonized the Jackson area in the late 19th century. The species arrival was followed by a classic exponential population increase, peaking at approximately 3,000-5,000 animals (depending on the modeling techniques.) For many years, the Jackson moose herd served as a source for moose transplants in multiple states and supported nearly 500 hunting licenses. However, the population underwent a dramatic population crash beginning in the early 1990's. Despite drastic reductions in hunting licenses, the population has failed to recover and continues to decline." (Houseon 1968, Berger 2004, Becker 2008, Vartanian 2011)*

In 2010, when Congress delisted wolves in Montana and Idaho, there were still 1,000 moose left in Jackson Hole, Wyoming. In this five-year period since wolf delisting in 2010 for the Northern Rockies DPS (excluding Wyoming), over 50% of the remaining moose in Jackson Hole have disappeared. In total, since introduction of the Canadian Gray Wolf 20 years ago, 90% of moose in Jackson Hole have disappeared. Wolves were delisted in Wyoming temporarily in 2012, however a judge in Washington D.C. almost immediately overturned the listing decision for Wyoming after one or two wolf seasons had been completed.

(Below) Moose distribution in Idaho.



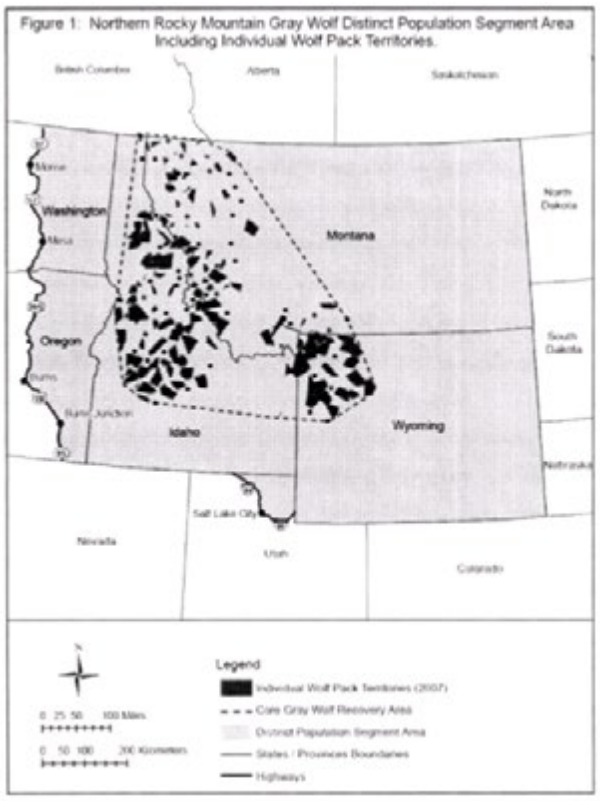
Moose in Idaho. Moose populations in three of Idaho's four moose regions have been in steady decline since wolves were introduced in central Idaho in 1995. In talking with senior wildlife biologists, outfitters, and sportsmen in the state of Idaho, indications suggest that moose populations have declined by as much as 50% or more. Perhaps this is why the state of Idaho has cut 50% of moose permits since wolves were introduced.

Just like in Montana and Wyoming, a major culprit of moose decline in Idaho appears to be predation of calf moose by wolves. The results of a recent collar study of calf moose which was conducted to better understand high calf mortality in Idaho are instructive. What the study found was startling - 50% of collared calves were killed by wolves:

> *Harvest records, field staff and hunter reports indicated however, that moose populations in central Idaho Wilderness and other areas of Clearwater and Southeast Idaho continue to decline…In February 2011, an additional 22 moose were captured and radio-collared (2 bulls, 8 cows, and 12 calves). Since January 2012, wolves had killed one adult cow moose and 6 calves in addition to 2 unknown cow and 1 non-predation bull mortalities…if early trends in wolf-caused calf mortality continue, calf survival and recruitment could be a serious issue. See Idaho Department of Fish and Game, FY 2014 Statewide Report, Moose (Study 1, Job 6) (page 3, 20)*

Protecting Utah's Wildlife

Biological Protections. While it is likely that wolves will move into the state of Utah, we are making significant strides in protecting Utah from the unnecessary influx of large numbers of wolves. The natural pathway for wolves into Utah is currently through Wyoming. While Idaho has a significant wolf population, there is currently little threat of wolves migrating through the snake river valley into the state. BigGame Forever has been a strong advocate of Wyoming's buffer zone. While the wolves are designated as game animals and provided significant protections in the northeast corner of Wyoming, wolves are designated as a predator in the buffer zone and can be harvested year round without a permit. This is due to the fact that the buffer zone is not suitable wolf habitat and predation of livestock is a serious issue due to the lack of large ungulate populations in this part of the state. The buffer zone covers 88% of the state of Wyoming. This provides a two hundred mile buffer between established wolf packs in the northeastern portion of the state and Utah.



(Above) Map Showing Rocky Mountain DPS.

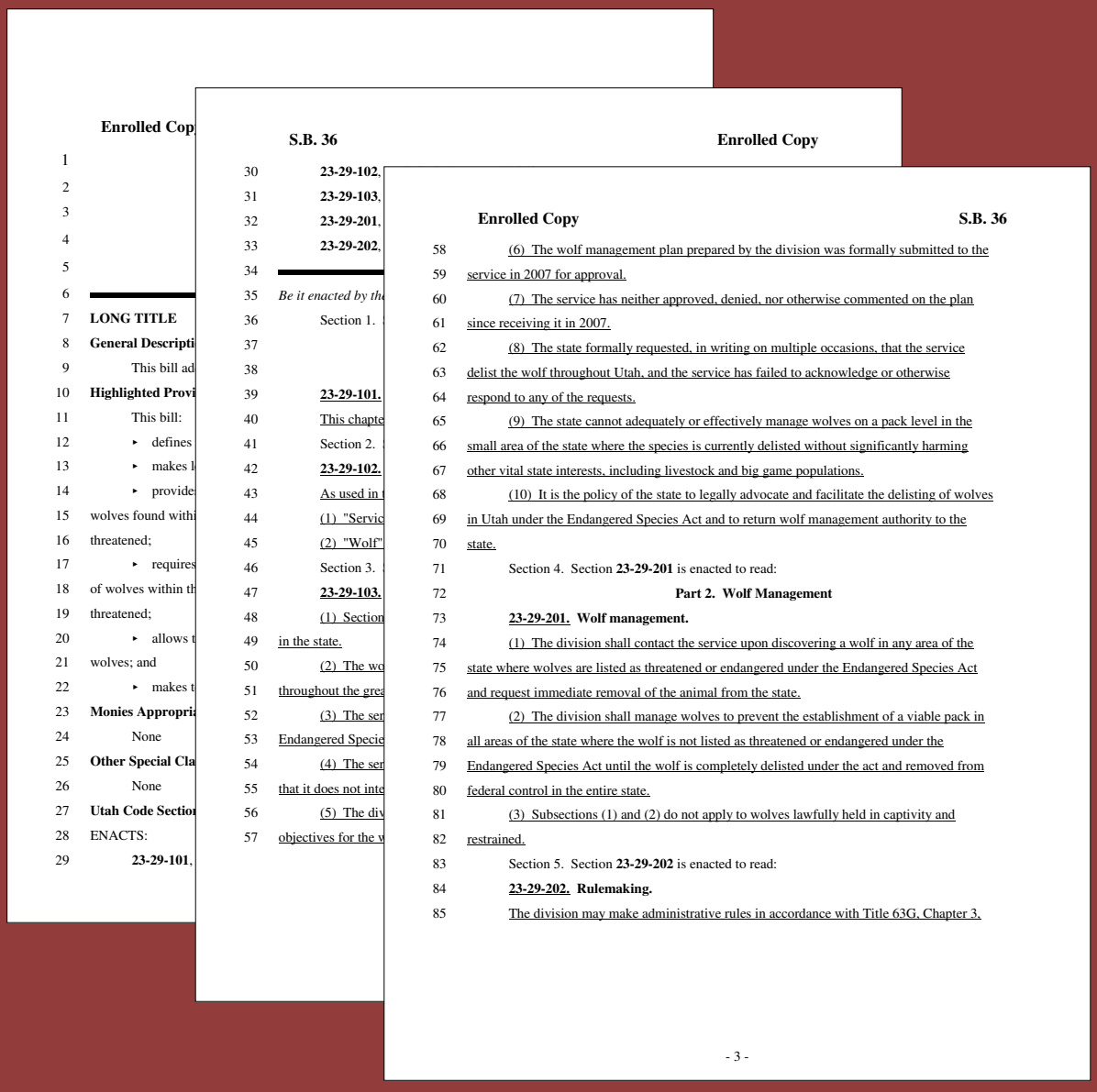
There has been significant efforts expended by BigGame Forever to protect Wyoming's plan. A significant reason for the efforts were to stop, or at least slow, the flow of wolves into Utah. We drafted a provision included within the 2011 congressional wolf delisting preserving a court ruling in support of Wyoming's plan. This has allowed Wyoming to continue to pursue delisted status. We are pleased to report that in 2017, Wyoming's wolf plan was again upheld in federal district court. Wolf activists have announced that they will not appeal this ruling. It is extremely important to note that when interviewed about the reason for not pursuing appeal, the plaintiffs suggested that their hope was that by dropping their appeal Congress would no longer seek a permanent legislative delisting for Wyoming. It is clear that the threat of congressional action is an important tool to ensure state management of wolves. It is equally important that Congress passes legislation to return state management of wolves to Wyoming and to protect Wyoming's plan including the buffer zone.

Past Efforts to Clarify Utah's Legal Status Relative to Wolves. Utah has repeatedly made efforts to restore state management authority over wolves. Beginning in 2006, Governor Jon Huntsman and members of Utah's congressional delegation began sending letters to federal wildlife officials as wolf populations in neighboring states of Montana, Idaho and Wyoming surged past delisting objectives (See Exhibits 6 and 7). These letters attempted to clarify the direction of wolves and wolf management in relation to the state of Utah. Governor Gary Herbert has also sought action from federal officials to restore management authority to the state (see Exhibits 8 and 9). BigGame Forever has been informed that the U.S. Department of the Interior and U.S. Fish and Wildlife Service have never responded to these letters. This may be due to

the fact that most of the state of Utah does not meet federal endangered species guidelines regarding suitable wolf habitat and significant portion of range. This is one of the reasons why Utah was not included in recovery plan objectives established during the late 1980's and early 1990's. This does not mean that wolf populations could not grow quickly in Utah. Instead, what it means is that high amounts of conflict (e.g. livestock predation, wildlife loss, etc.) at human population interfaces will occur with Canadian Gray Wolves. Conflict is likely due a variety of factors including: (1) the fact that wolf packs cover large geographic areas; (2) migration habits of resident prey populations; (3) the large amount of prey base biomass needed to support packs of Canadian Gray Wolves; and (4) the geographic proximity of cities and towns across Utah.

Utah Statute on Wolves and Funding for Delisting Efforts. During the 2010 legislative session, Utah enacted a statute 23-29-101. The statute states that "It is the policy of the state to legally advocate and facilitate the delisting of wolves in Utah under the Endangered Species Act and to return management authority to the state." The statute also explains that Utah is not critical to recovery of wolves and does not intend to actively recover wolves.

(Below) Utah Senate Bill 36 on Wolf Management Policy in Utah.



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(6) The wolf management plan prepared by the division was formally submitted to the service in 2007 for approval.
(7) The service has neither approved, denied, nor otherwise commented on the plan since receiving it in 2007.
(8) The state formally requested, in writing on multiple occasions, that the service delist the wolf throughout Utah, and the service has failed to acknowledge or otherwise respond to any of the requests.
(9) The state cannot adequately or effectively manage wolves on a pack level in the small area of the state where the species is currently delisted without significantly harming other vital state interests, including livestock and big game populations.
(10) It is the policy of the state to legally advocate and facilitate the delisting of wolves in Utah under the Endangered Species Act and to return wolf management authority to the state.
Section 4. Section **23-29-201** is enacted to read:
Part 2. Wolf Management
23-29-201. Wolf management.
(1) The division shall contact the service upon discovering a wolf in any area of the state where wolves are listed as threatened or endangered under the Endangered Species Act and request immediate removal of the animal from the state.
(2) The division shall manage wolves to prevent the establishment of a viable pack in all areas of the state where the wolf is not listed as threatened or endangered under the Endangered Species Act until the wolf is completely delisted under the act and removed from federal control in the entire state.
(3) Subsections (1) and (2) do not apply to wolves lawfully held in captivity and restrained.
Section 5. Section **23-29-202** is enacted to read:
23-29-202. Rulemaking.
The division may make administrative rules in accordance with Title 63G, Chapter 3,

- 3 -

(Above) Three members of the Yellowstone National Park Druid Wolf Pack.

CONCLUSION

There are substantial efforts to introduce wolves in Utah, Colorado, and across the Southern Rockies. As wolves begin to move into the state, it is vitally important that the state of Utah have management authority to protect our native ungulate herds. There have already been several wolves that have been documented within Utah. Adjacent states are also beginning to document wolves moving into their states. The purpose of our efforts is to ensure that the State of Utah will have management authority of wolves before wolves become established in the state. BigGame Forever's efforts since 2010 have build significant public support and in Congress for state management of wolves. This is consistent with state policy and with good conservation practice. Ongoing efforts in the public outreach and education space will be critical to build support for national wolf delisting through administrative and congressional action.

WOLF-DELISTING STRATEGY

WOLF-DELISTING STRATEGY

APPROACH

Proliferation of Canadian Gray Wolves across the Northern Rockies has become an important topic from a legal/political perspective in recent years. The growth and expansion of unmanaged wolf populations have led to significant declines of important herds of elk, deer, moose, and other prey species. State management of gray wolf populations, which would provide needed protection of wild ungulates, has been hamstrung by federal endangered species "take" provisions. This report describes our approach to the work and the level of effort needed to return control of wolf management to the State of Utah.

Assessment of Work to Be Performed: Administrative Delisting. The only way to restore state management flexibility of wolves is removing wolves from the Endangered Species List. Administrative delisting functions as a legal and scientific acknowledgement from U.S. Fish and Wildlife Service that the national wolf recovery plan for Northern Gray Wolves has been completed and that gray wolves are not threatened with extinction. Another important administrative action is finalizing the proposed administrative rule on Mexican Wolves. The new proposed rule dictates that the northern boundary of Mexican Wolves is I-40 (in central Arizona) and excludes the state of Utah.

Assessment of Work to Be Performed: Congressional Action. Due to the repeated lawsuits by wolf proliferation advocates, technicalities under the Endangered Species Act, and the level of judicial activism in some courts, there is a high likelihood that an administrative delisting could be reversed. This is why permantly delisting wolves will likely require congressional action.

It is also notable that the areas of the Northern Rockies DPS which were covered by this congressional action are the only areas that have consistently been able to manage wolves the last six years. In fact, the states of Wyoming, Wisconsin, Michigan, and Minnesota have been tied up in lawsuits and administrative processes almost the entire six years due to the lack of a judicial safe harbor for those states.

Our team's approach involves:

I. **Engaging the Public**—These efforts include: (a) science and research, (b) collaborating with interested stakeholders, non-governmental organizations, and other entities who support state management of wildlife, and (c) public outreach.

II. **Direct Action**—These efforts focus on engaging: (a) BigGame Forever supporters; (b) affiliate organizations, and (c) the general public. Our methodology for including the public in the process is both innovative and a significant component for building the current level of support in Congress.

III. **Administrative Solutions**—These efforts include working with the U.S. Fish and Wildlife Service, the Department of the Interior, and state agencies on gray wolf delisting through administrative processes.

IV. Legislative Action—These efforts include working with members of Congress and congressional staff to educate and provide information related to: (a) wolves and wolf proliferation; (b) impacts to conservation of wild ungulates, livestock producers, jobs, and the economy; (c) worldwide abundance of gray wolf populations, (d) the importance of state management of wildlife including gray wolves; (e) and the best and latest available science and other recent developments.

V. Legal Strategies—Providing an understanding of compliance with federal statute through administrative solutions, congressional action, and the courts to achieve removal of the gray wolf from the list of threatened and endangered species and to protect state management of wolves in the courts and avoid restrictions of state efforts.

PUBLIC OUTREACH

(Below) BigGame Forever's Billboard Campaign outside Yellowstone National Park. For the past eight years BigGame Forever has been actively engaged in educating the public and enlisting their help to promote wildlife conservation throughout the United States. BGF's campaigns are multifaceted and wide reaching. The Yellowstone billboard campaign specifically addresses the decreasing ungulate population as a result of unmanaged Canadian Gray Wolf population.

I. ENGAGING THE PUBLIC

BigGame Forever's public outreach efforts are an important part of building support for and implementing lasting wolf-delisting solutions. This includes helping the public to understand that state management of wolves is important for: (1) the conservation of moose, elk, mule deer, and other wild ungulates; (2) protecting livestock producers; (3) conservation funding requisite for healthy and abundant wildlife, and (4) protecting economic prosperity and jobs.

Science and Research. Understanding the science, data, and experiences in wolf states has been vital to BigGame Forever's wolf-delisting efforts. To accomplish this, our team has conducted extensive research on the scientific, biological, and policy considerations surrounding wolf delisting. Through these efforts, BigGame Forever has become a trusted source for information on the importance of protecting native wildlife and the need for responsible management of Canadian Gray Wolves.

Multi-State Collaboration. Educating concerned individuals, organizations, and states from across the country has been important to building support for lasting solutions. BigGame Forever has developed positive relationships with state wildlife managers, wildlife conservation organizations, agricultural and grazing stakeholders, and the public in "wolf states" of Idaho, Montana, Wyoming, Wisconsin, Alaska, Arizona, New Mexico, and Minnesota. We also work extensively across states experiencing or at risk of wolf expansion including Utah, Colorado, Washington, Oregon, California, Nevada, and Texas.

Public Outreach. BigGame Forever has invested significant resources to spread the word regarding the need for state wolf management through marketing, social media outlets, email blasts, newspaper ads, billboards, and other outreach activities. On a regular basis, BigGame Forever provides updates on the best available science, results of delayed management, and developments from the legislative, legal, and administrative arenas. Additionally, Mr. Benson has been interviewed on multiple national radio and television spots regarding the need for wolf delisting.

II. DIRECT ACTION

Our goal is to unite like-minded people in support of legislative solutions to America's most difficult conservation challenges. We have top-tier grassroots and media professionals to educate the public about legislative, legal, and administrative solutions to protect native ungulate populations. We invite those people to join our grassroots network to encourage our leaders in Congress to support lasting solutions to ensure state management of wolves now and in the future.

For the last seven years, BigGame Forever's team has worked full time traveling the country to build our grassroots network. Through these efforts, BigGame Forever supporters have sent hundreds of thousands of messages in support of state management of wildlife and wolf delisting using the BigGame Forever political action system.

BigGame Forever Supporters. Our network of grassroots support now includes:

- 85,000 BigGame Forever members
- Partnerships with hundreds of sportsmen conservation organizations
- Over 100,000 followers on social media platforms

Direct action through our grassroots network has been vital to building support in Congress. As an example, we obtained over 100 signatures on a "Dear Colleague Letter" in Congress by engaging our members. Building this level of support on an issue requires thousands of hours of effort and aggressive execution.

Affiliate Organization Support. Another important source of support are like-minded conservation organizations and livestock groups. BigGame Forever's team spends significant time and resources educating, building support, and requesting the involvement of other organizations. We have been very successful in these endeavors. On one recent Endangered Species Act issue in Congress, over 200 sportsmen organizations signed our letter in support of congressional action. These organizations have millions of members across the country.

Public Support. Engaging the public to support responsible management of wolves is another important part of our efforts. Our model is to keep our message simple, clear, and concise. We continue to see significant support from the public to protect wild ungulate populations and for state wolf management. Public support and acceptance of the need for wolf management has been critical to build significant bi-partisan support in Congress for wolf delisting.

III. ADMINISTRATIVE SOLUTIONS

Completion of National Recovery Plans. It is important to recognize that the national wolf recovery plan is largely complete. In the 1990's, when national wolf recovery began in earnest, three distinct population segments were identified where sufficient wolf habitat was available to re-establish wolves without creating conflict in areas of high wild-human interface. These areas include the following areas:

1. Northern Rockies Distinct Population Segment
2. Western Great Lakes Distinct Population Segment
3. Blue Range Recovery Area

No additional areas in the continental United States met the scientific criteria for gray wolf recovery. While gray wolves could certainly populate additional areas, the U.S. Fish and Wildlife Service was unable to identify any areas of sufficient size and topography which would ensure gray wolves could exist without significant conflict with human populations. Based on these recovery criteria, wolves are mandated for recovery only within these three areas. With recovery of Canadian Gray Wolves within U.S. distinct population segments complete, nationwide Canadian Gray Wolf delisting can proceed. Included below is additional information on status of wolves within these distinct population segments:

Northern Rockies DPS. The Northern Rockies Distinct Population Segment (the "Northern Rockies DPS) covers Idaho, Montana, and Wyoming, along with small portions of northern Utah, eastern Washington State, and eastern Oregon. In 1995, 29 Canadian Gray Wolves were transplanted into central Idaho and Yellowstone National Park. These populations quickly grew and new wolf packs were established. There was also some dispersion of wolves from Canada into northern Idaho and northern Montana. Within just seven years, wolf populations had quickly expanded. The U.S. Fish and Wildlife Service indicated that "recovery goals…equitably distributed wolf population containing at least 300 wolves and 30 breeding pairs for three consecutive years were reached in 2002." Despite administrative delisting of wolves during the Bush and Obama administrations, lawsuits by activist organizations led to the relisting of wolves.

Western Great Lakes DPS. The Western Great Lakes Distinct Population Segment includes portions of Minnesota, Michigan, and Wisconsin. These areas are also populated with Canadian Gray Wolves. Unlike the Northern Rockies DPS, much of this area was populated through transplanted or naturally migrating wolves from Minnesota and Canada. Minnesota met its recovery goal of 1,200 wolves in the 1970's. Now more than 40 years later and despite several attempts to delist the Western Great Lakes DPS administratively, Minnesota, Wisconsin, and Michigan still do not have management authority over wolves.

Blue Range Recovery Area. The Blue Range Recovery Area was designated for Mexican Wolves and includes a portion of New Mexico and Arizona. Mexican Wolf objective levels of 100 wolves have been reached in the last few years. However, the U.S. Fish and Wildlife Service is in the process of updating the Mexican Wolf Recovery Plan. In 2013, there was an effort to utilize southern Utah and southern Colorado for Mexican Wolf recovery. However, this is not the species native range. New plans published just weeks ago moves the northern boundary for Mexican Wolves to I-40 which runs through Arizona and New Mexico. This is important progress to ensure Mexican Wolves are not mandated in southern portions of Utah.

Western Great Lakes Administrative Delisting. After the passage of Section 1713, the USFWS aggressively pursued expanded wolf delisting through administrative action. In late 2011, the Western Great Lakes Distinct Population Segment states were delisted. Wyoming was also delisted by administrative action in October 2012. Eventually, the 2011 and 2012 wolf delisting of Minnesota, Michigan, Wisconsin, and Wyoming were all relisted. Bills have once again been filed in Congress to provide permanent delisting, much like Section 1713 of the 2011 Continuing Resolution.

48-State Delisting and Five Year Recommendation. In February 2012, the U.S. Fish and Wildlife Service released its 5-year recommendations on wolf management in America. When the report was released, it appeared to suggest that the Service recognized that Canadian Gray Wolves were not endangered and that expanded delisting to the lower 48 states was likely. Subsequent meetings confirmed that the Service was preparing to a delisting of Canadian Gray Wolves in the lower 48 states. This was important because expanded delisting would return management authority over Northern Gray Wolves to the State of Utah and other western and midwestern states. BigGame Forever worked integrally with key members of Congress and the U.S. Fish and Wildlife Service in support of this expanded delisting.

Public Notified of Pending Delisting. In Spring 2013, a draft of the 48-state delisting was disseminated to the press in advance of the pending delisting. During this time, wolf proliferation advocates worked to prevent publication of the 48-state delisting rule. On March 4, 2013, a "Dear Colleague Letter" signed by 52 members of Congress was sent to U.S. Fish and Wildlife Service Director Dan Ashe. The letter suggested that plans to publish a draft 48-state delisting rule should be abandoned.

Support from 72 Members of Congress. In light of the March 4th "Dear Colleague Letter," BigGame Forever worked with Utah's congressional delegation and many members of Congress from across the country on a "Dear Colleague Letter" in support of state management of wolves and the 48-state administrative delisting. On March 22nd, 2013, this letter, signed by 72 members of Congress in support of nationwide delisting was sent to U.S. Fish and Wildlife Service Director Dan Ashe (See Exhibit 1)

Publication of 48-State Delisting Rule. On June 7, 2013, U.S. Fish and Wildlife Service announced the new draft rule to delist Canadian Gray Wolves nationwide. The draft rule was published June 13, 2013. The draft rule directed returned management over Canadian Gray Wolves to the State of Utah and other states across America. As a result, state wildlife agencies would have management flexibility needed to protect, moose, elk, and deer populations. While publication of the draft rule was a step in the right direction, after a year and a half of public comment periods, administrative processes, and waiting periods, the draft rule was never finalized.

Mexican Wolves. On June 29, 2017, The U.S. Fish and Wildlife Service released a revised Mexican Wolf recovery plan for public comment. The recovery strategy establishes two Mexican Wolf populations of the United States and Mexico across historic range. The recovery plan for the American population is focused on the area south of I-40 in Arizona and New Mexico. This area is designated as a Mexican Wolf Experimental Population Area. The public comment period remains open through August 29, 2017.

The new Mexican Wolf recovery plan represents significant improvement from the recovery plan update proposed in 2013. The previous plan recommended two recovery areas in the United States; one in Arizona and Utah and the second in Colorado and New Mexico. Under the plan, the federal Endangered Species Act mandates would have required Mexican Wolf populations in areas outside of historic range, including Utah. The plan proposed the area extend to I-70 in central Utah.

Administrative Solutions: Progress and Results

In June 2013, the Obama Administration announced that gray wolf recovery had been successful for Canadian Gray Wolves (*Canis lupus occidentalis*) and that they would be delisted nationwide. Pursuant to this nationwide delisting, Utah would be given full state management authority over any wolves in the state. This would give the State of Utah and other states the management flexibility needed to immediately manage and protect moose, elk, deer, and other wildlife species.

In its press release, the U.S. Fish and Wildlife Service explained its decision:

> *The U.S. Fish and Wildlife Service today proposed to remove the gray wolf (Canis lupus) from the list of threatened and endangered species. The proposal comes after a comprehensive review confirmed its successful recovery following management actions undertaken by federal, state and local partners following the wolf 's listing under the Endangered Species Act over three decades ago. The Service also proposed to maintain protection and expand recovery efforts for the Mexican wolf (Canis lupus baileyi) in the Southwest, where it remains endangered." See http://www.fws.gov/home/newsroom/serviceproposes-graywolvesNR06072013.html*

U.S. Fish and Wildlife Service Director Dan Ashe further explained the basis for the decision, "From the moment a species requires the protection of the Endangered Species Act, our goal is to work with our partners to address the threats it faces and ensure its recovery . . .An exhaustive review of the latest scientific and taxonomic information shows that we have accomplished that goal with the gray wolf, allowing us to focus our work under the ESA on recovery of the Mexican wolf subspecies in the Southwest." See id.

Western Gray Wolves Not Endangered: The following testimony from U.S. Fish and Wildlife Service Deputy Director Gary Frazier presents a cogent and instructive explanation of the fact that Western Gray Wolves (excluding subspecies Canis lupus Baileyi) are no longer endangered:

> *We looked at Gray Wolves as a species, Canis Lupus, range-wide, and we found no evidence to suggest that Gray Wolves, Canis Lupus, are at risk of extinction. So we concluded that listing at the species levels is not warranted.*
>
> *We also looked at the three subspecies of Gray Wolves that historically existed within the lower 48 and found that there's no basis to conclude that Nubilus or Occidentalis are in danger of extinction, but we did find that Baileyi, the Mexican wolf in the southwest, is currently at risk of extinction throughout its range.*
>
> *Finally, we looked in the Pacific Northwest. We found that there are wolf packs now in Western Washington. Wolves are expanding into Western Oregon. There was one wolf that wandered into Northern California, and we've concluded these don't constitute a population at this time. They may constitute a population in the future, if it's consistently reproducing and that carries over recruiting into the population.*
>
> *But, more significantly, we found that these wolves are not discrete. They're not separate. They are, in fact, on the advancing edge of the recovering wolf population Northern Rockies and Wolves in Canada. So we've concluded that this would not valid distinct population segment.*
>
> *So this table summarizes our...and it's all laid out in our proposed rule. We found that the current listed entity is not a valid listable entity, that Canis Lupus, range-wide, listing is not warranted. The same for Nubilus and Occidentalis. That Baileyi, the Mexican wolf, is endangered and should be listed, and that wolves in the Pacific Northwest are not a valid DPS.*
>
> *So on that basis, we came to our proposal, which was to focus Endangered Species Act protection for the Mexican wolf by listing the subspecies Baileyi as endangered wherever found, and remove the*

current Gray Wolf listing from the list of endangered and threatened wildlife, and also to improve the operation of the experimental rule for Mexican wolves in the Southwest.

So again, in conclusion, our goal is to administer the Endangered Species Act, to prevent extinction and to secure a species from the threat of extinction now and into the foreseeable future.

We believe that the Gray Wolf has recovered in the Western Great Lakes and the Northern Rockies, and that we now need to focus the Endangered Species protections on the Mexican wolf in the Southwest.

Instrumental Support from Western States. During this period, support of Western States was instrumental in continuing the momentum toward finalizing a delisting decision. The following statements by several Western States showing support for the nationwide wolf-delisting rule.

Utah

"The State of Utah commends the U.S. Fish and Wildlife Service, state and local governments, and others for decades of effort in successfully recovering the gray wolf (canis lupus) from the threat of extinction.

Both the Utah Legislature and the Office of the Governor have long advocated removing the gray wolf from the list of threatened and endangered species. Utah concurs with the U.S. Fish and Wildlife Service's conclusion that the species no longer warrants protection under the Endangered Species Act. Additionally, we fully support the agency's decision to move forward with finalizing a rule that will delist the species in Utah and elsewhere in the United States.

While Utah does not currently have a confirmed population of gray wolves, we are prepared to manage responsibly any wolves that enter the state. Through a process involving significant research and stakeholder input, we developed and adopted a wolf management plan. This plan ensures the viability of wolf populations while providing reasonable protections for Utah residents."

Utah Governor Gary R. Herbert

Colorado

"The gray wolf's progress represents years of successful work by state and federal agencies and the Fish and Wildlife Service proposal reflects that; this is good news for the species and for our state. The delisting allows the state, through CPW and the Parks and Wildlife Commission, to manage the species consistent with public desires and resource needs as we do many other important wildlife species."

Rick D. Cables, Colorado Parks and Wildlife Director

Oregon
"With a solid state conservation and management plan in place for the Northern grey wolf, an experienced wildlife management agency that is committed to wolf recovery, and established populations recovering at an increasing rate, Oregon is ready to take on further responsibility for wolf management in this state. We know that there are questions that need to be resolved in moving toward a delisting of the Northern grey wolf under the federal ESA, and we believe the rulemaking process is an appropriate forum to address these issues. Oregon is supportive of the U.S. Fish and Wildlife Service publishing a proposed rule to begin this dialogue, and we look forward to participating in the scientific review process."

Roy Elicker, Director of the Oregon Department of Fish and Wildlife

Wyoming
"After years of hard work by the states and our federal partners, I am pleased that wolves are ready to stand on their own under the management of state professional wildlife biologists."

Wyoming Governor Matt Mead

North Dakota
"We're glad to see the delisting effort of the gray wolf in western North Dakota. It's been confusing for the public to understand how the wolf is under state jurisdiction in the eastern half of the state while under federal jurisdiction in the western half. With this delisting effort the wolf will be under state jurisdiction with the borders of the state."

State of North Dakota

Washington
"The Washington Department of Fish and Wildlife is firmly committed to the long-term persistence of wolves in Washington. In 2011, the Washington Fish and Wildlife Commission unanimously approved Washington's Wolf Conservation and Management Plan (Plan). A wide range of stakeholders participated in the development of that Plan. Washington's Plan established recovery objectives throughout the state and assures that state protections will remain in place over the long-term. The Plan contains management tools designed to minimize wolf-livestock interactions and address potential impacts on the state's deer and elk populations. The Commission believes the state should be responsible for the management of wolves and supports the U.S. Fish and Wildlife Service's consideration of delisting gray wolves under the federal Endangered Species Act. By publishing the proposed rule, the Service ensures this important consideration can take place in an open and public process."

Miranda Wecker, Chair of the Washington Fish and Wildlife Commission

Public Comment Reopened. On February 7, 2014, U.S. Fish and Wildlife Service announced it was reopening the public comment period following the receipt of the independent scientific peer review. The public comment period reopened February 10, 2013 for a period of 45 days. "Peer review is an important step in our efforts to assure that the final decision on our proposal to delist the wolf is based on the best available scientific and technical information," indicated U.S. Fish and Wildlife Service Director Dan Ashe. "...We are incorporating the peer review report into the public record for the proposed rulemaking, reopening the public comment period to provide the public with the opportunity for input."

Final Rule Never Published. In February 2014, U.S. Fish and Wildlife Service indicated they would finalize the delisting rule by the end of 2014. While the initial projections indicated that a delisting was likely to occur much sooner in 2014, public comment period extensions and the 2013 "government shutdown" resulted in moving the finalization date to later in 2014. U.S. Fish and Wildlife Service subsequently indicated a final delisting rule would be published by December 2014. Months

passed after the expected final rule publication date without publication of the final rule. Subsequently, officials from U.S. Fish and Wildlife Service have signaled that an administrative delisting rule is unlikely to be finalized.

New Delisting Rule. Administrative delisting remains a viable option for nationwide delisting in the coming year. We recognize that the administrative delisting would almost immediately be challenged in court by wolf activists. The history of judicial activism and repeated relisting of gray wolves in the Northern Rockies DPS and the Western Great Lakes DPS suggests that administrative delisting would need a congressional backstop to ensure long-term state management of Northern Gray Wolves nationwide. It is important to note that a no-sue clause, similar to the one included in Section 1713 of the 2011 Appropriations Act would most likely be needed to ensure long-term state management of wolves in the event of a nationwide administrative delisting rule.

IV. LEGISLATIVE ACTION

BigGame Forever was formed specifically to build support for permanent legislative delisting by congressional action. As such, BigGame Forever has been integral in building congressional support for immediate and comprehensive wolf-delisting solutions in Utah and other western states.

Why Congressional Action is Important. While nationwide administrative delisting should be considered, from a legal standpoint lasting solutions will likely require an act of Congress. Due to the level and frequency of lawsuits by wolf activists, the open-ended nature of ESA legal interpretation, a judicial safe harbor will likely be required.

The good news is there is significant support in Congress for wolf delisting. This is not a partisan issue. In fact, a bill that would provide permanent delisting for the remaining "wolf states" of Minnesota, Wisconsin, Michigan, and Wyoming enjoys original Republican and Democratic Senate sponsors.

Congressional Delisting for Northern Utah. The 2011 legislative language restoring management authority to the portion of Utah within the Rocky Mountains Distinct Population Segment is vitally important. It establishes a legislative framework for returning authority over wolf management to the states through Congress. The congressional language, including the no-sue clause, has successfully been defended in the courts. Several years of wolf management has been conducted successfully. Now is the time to implement these solutions through lasting legislative solutions to continue to protect Utah's important wild game populations from unmanaged wolf populations.

Successful Delisting of the Northern Rockies DPS. Our team's efforts building broad based support in Congress for a national wolf-delisting bill have led to (1) the successful delisting of the gray wolf; (2) restoration of state management authority over wolves; (3) the ability of states to begin restoring balance in predator and prey populations. These collaborative legal, legislative, and administrative strategies led to delisting of the gray wolf. The following are some of our accomplishments:

1. Congressional delisting of wolves in the Northern Rockies in 2011 (Section 1713 Full Year Appropriations Act of 2011, P.L. 112-10)
2. District court ruling in support of constitutionality of congressional delisting (August 3, 2011 on summary judgment, Western District of Montana; BigGame Forever intervenor)
3. Ninth Circuit ruling upholding constitutionality of congressional delisting (March 4, 2012 before three judge panel; BigGame Forever intervenor)
4. Delisting of Western Great Lakes Distinct Population Segment of wolves through administrative action – (delisting published December 2011)
5. Wyoming wolf delisting – (October 2012) specific provisions in Section 1713 protecting Wyoming's court victory in support of its wolf management plan
6. National Gray Wolf Delisting administrative rule published (June 13, 2013)

Building Support in Congress. Mr. Benson has been at the forefront of the successful legislative efforts to delist wolves through congressional action beginning in 2010. Mr. Benson's expertise on wolves and wolf delisting have been sought in many of the legislative proposals presented before Congress. Working with a professional team of lawyers, lobbyists, and grassroots professionals, Mr. Benson has met with congressional offices from across the country to provide information and education on the issues related to unmanaged wolves and protection of elk, moose, deer, and other native ungulate populations.

Building Support with Members of Congress and Other Key Decision Makers. On nationwide delisting, our team secured 62 cosponsors from 32 different states despite the regional nature of the wolf-delisting issue and the sometimes controversial nature of the issue. This kickstarted seri-

ous movement in Congress toward the delisting of wolves. This momentum continues today with significant bipartisan support on this issue.

HR 509 and S 249. This bill was originally filed in 2010 as HR 6028. This bill would delist wolves nationwide and immediately return full management authority to the State of Utah. This bill enjoyed broad bi-partisan support with dozens of cosponsors. The original sponsor of this bill was Democratic Congressman Chet Edwards. This bill was re-filed with new bipartisan cosponsors in 2011.

2010 "Lame Duck" Proposal. This bill was suggested by members of the Idaho delegation and was heavily negotiated with key Idaho, Montana, Wyoming, and Utah Senators in December 2010. This proposal would have set minimum numbers to maintain delisting and would have immediately delisted Idaho, Montana, Wyoming, and Utah. Several important changes were made by BGF in the last hours of negotiations to ensure that this bill would result in state management over wolf management. An earlier version of the bill would have resulted in permanent federal control of wolf populations. Unfortunately a last minute demand that would have required 1,000 wolves as a minimum population objective doomed this bill shortly before the 2010 congressional adjournment.

HR 1819. This bill was introduced by Michigan Congressman Candice Miller. This bill would result in the delisting of all states which were included in any wolf DPS, including the entire state of Utah. Mexican Wolf recovery numbers were maintained at 100 wolves with state management authority automatically being returned once these recovery objectives were met. This bill was widely praised as a compromise approach by many within the conservation community. Support for this bill was impacted by language in the continuing resolution to delist wolves in Idaho and Montana and subsequently delist wolves in the Western Great Lakes.

Early 2011. On Feb. 16, 2011, BigGame Forever organized a meeting with 40 leaders of top wildlife and agricultural groups at the U.S. Capitol. Ten members of Congress from both the Senate and House, comprised of both Republicans and Democrats, spoke at the event. A variety of legislative proposals quickly followed these meetings. Though BigGame Forever advocated a solution to include the entire state of Utah, Section 1713 emerged as the final solution. Ryan Benson drafted a legislative fix to Section 1713 once it was clear that only a portion of Utah would be included in the final bill. The fix protected a court victory which supported Wyoming's management plan and the administrative delisting. Without this language, wolves in Wyoming would have remained listed for the foreseeable future. Instead, Wyoming's court victory was upheld and administrative delisting for the state of Wyoming has followed.

It is important to point out that BigGame Forever has not only worked on productive legislative efforts, but has also worked extensively to improve or stop potentially harmful bills. One bill would have permanently left wolves under federal control. Another bill would have delisted wolves for five years with an automatic relisting after the five-year period. These do not provide the immediate return to state management authority or the lasting solutions that are needed to protect and recover wildlife affected by unmanaged wolves.

Legislative Action: Progress and Results

2011 Congressional Action to Delist Wolves in the Northern Rockies. BigGame Forever has worked diligently to delist wolves in Utah. We have led the push in Congress for permanent wolf delisting. Many legislative proposals have been introduced in Congress since 2010. BigGame Forever has worked diligently to build broad based support in Congress for national wolf delisting. In early 2011, this broad-based support for congressional action resulted in legislation that removed wolves from the endangered species list in all of the Northern Rockies DPS except Wyoming. The small portion of Utah that lies within the boundary of the Northern Rockies DPS was included in this delisting. The wolf-delisting provision, which was inserted as Section 1713 of the Full-Year Appropriations Act of 2011, I.L. 112-10 was passed by Congress and signed into law by President Barack Obama on April 15, 2011. It is important to recognize the contribution of many members of Congress, conservation organizations, and the general public in support of congressional action to delist wolves. Each member of Utah's congressional delegation played an important role in building support for wolf delisting by Congress.

(Above) An article from the BBC on congressional wolf delisting action signals the attention the issue receives on a worldwide basis. http://www.bbc.com/news/world-us-canada-13086459

V. LEGAL STRATEGIES

The legal and political history of wolves, wolf reintroduction, wolf proliferation, and wolf delisting is long, convoluted, and full of controversy. Of particular interest is the following abbreviated history regarding wolf recovery in the state of Minnesota. In the 1970's, the state of Minnesota met its recovery objective for wolf numbers with 1,200 wolves. Over 40 years later, Minnesota still does not have management authority over wolf populations, despite repeated administrative delisting decisions. Why?

Despite the worldwide abundance of Northern Gray Wolves, lawsuits filed by wolf proliferation activists have been rampant. These lawsuits, exploiting a variety of technicalities under the Endangered Species Act, have been used to stop all wolf management in states like Minnesota. Unfortunately, these protections have further exacerbated the declines of much more fragile populations of wild game species in states which have substantial wolf numbers.

Legal Strategies: Progress and Results

Ninth Circuit Lawsuit Challenging Congressional Delisting Decision. One of the important examples of past success was the challenge in the Ninth Circuit to the 2011 congressional action delisting wolves in the Northern Rockies Distinct Population Segment (excluding Wyoming). The lawsuit attacked passage and implementation of Section 1713 of the April 2011 Continuing Resolution. On May 5, 2011, U.S. Fish and Wildlife Service had complied with Section 1713 by reissuing the 2009 Rule. 50 C.F.R. Part 17,76 Fed. Reg. 25,590. That same day, several plaintiffs filed a lawsuit challenging the constitutionality of Section 1713. The lawsuit, filed in United States District Court for the Western District of Montana before Judge Donald W. Molloy, challenged the congressional action under the separation of powers doctrine relying on United States v. Klein, 80 U.S. 128 (1871). The choice of court is notable due to the fact other lawsuits challenging administrative wolf-delisting decisions by the Bush and Obama administrations were also filed in Judge Molloy's court. BigGame Forever worked with other concerned conservation organizations to intervene in the lawsuit to defend the congressional action to delist wolves.

Western District of Montana Ruling Upholds Constitutionality of Congressional Delisting Decision. On August 3, 2011, Judge Donald W. Molloy granted summary judgment upholding the congressional wolf delisting by finding that Congress acted within its enumerated powers by amending the Endangered Species Act using Section 1713 of the 2011 Appropriations Act, P.L. 112R10. Judge Molloy's ruling holds that:

> *Because the 2009 Rule was invalidated, the re-issuance of the Rule pursuant to congressional directive, by implication amended the ESA as to this particular delisting. In other words, the ESA is no longer intact as to the re-issuance of the 2009 rule...under Ninth Circuit law a constitutional reading of Congress's directive to reissue the Rule is possible.*

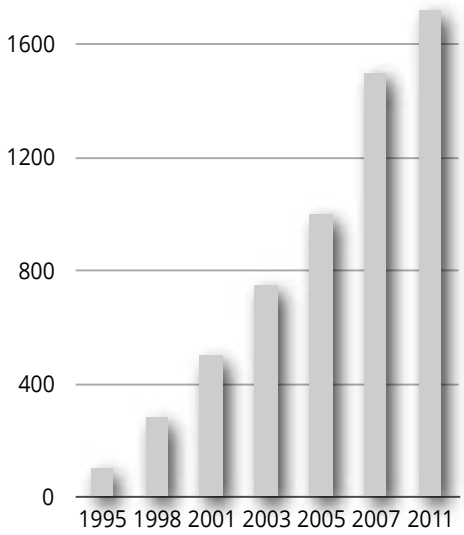
Ninth Circuit Upholds Constitutionality of Congressional Delisting Decision. The plaintiffs appealed Judge Molloy's ruling to the United States Court of Appeals for the Ninth Circuit in San Francisco. Arguments were heard before a three-judge panel at the Ninth Circuit on November 8, 2011. BigGame Forever's attorney, Ted Lyon, presented arguments at the hearing. The Ninth Circuit ruling, written by Judge Mary Schroeder was issued on March 14, 2012. In affirming the district court's finding of constitutionality of the congressional delisting, the court indicated, "... Congress effectively provided that no statute, and this must include the ESA, would apply to the 2009 rule. Congress thus amended the law applicable to the agency action...The meaning and intended effect of Section 1713 are perfectly clear. The partial delisting was to take effect within 60 days, with no court review or interference...Section 1713...is entitled to be enforced."

TIMELINE OF GANADIAN GRAY WOLF REINTRODUCTION AND DELISTING EFFORTS

The Introduction of the **Canadian Gray Wolf**

1995
29 Canadian Gray Wolves introduced in Northern Rockies

2001
Wolf population numbers exceed 500 wolves in the Northern Rockies.



Northern Rocky Mountain Wolf Population Trends (based on minimum counts), 1995-2011

2010
April
Formation of Big Game Forever.

May
Big Game Forever announces effort to pursue congressional wolf delisting.

September
S 3919 introduced by Senator Orrin Hatch.

December
Congressional wolf delisting debated on floor of the US Senate.

2007
Wolf population numbers exceed 1500 wolves in the Northern Rockies.

July
HR 6028 introduced by Congressman Chet Edwards (D) Texas.

2006
Governor Huntsman and members of Utah's Congressional delegation send correspondence to USFWS requesting acceptance of Utah wolf management plans.

2005
Wolf population numbers exceed 1000 wolves in the Northern Rockies.

"Recovery goals... equitably distributed wolf population containing at least 300 wolves and 30 breeding pairs for 3 consecutive years were reached in 2002."

--USFWS

Canadian Gray Wolf
Delisting Efforts

2011

January/February
HR 509 and S 249 American Big Game and Livestock Protection Act introduced with 24 co-sponsors.

February
Big Game Forever summit announcing unified effort of 55 co-sponsors to achieve delisting.

September
Governor Herbert requests that USFWS delist the remainder of Utah and explains that non-native Mexican Wolves will not be permitted in the state.

December
Delisting of Western Great Lakes Gray Wolf Distinct Population Segment is announced.

March
9th Federal Appellate Court in San Francisco rules that Congressional Action to delist wolves in the Northern Rockies is fully constitutional.

2013

March
72 members of Congress send "Dear Colleageue Letter: to USFWS director Dan Ashe in support of expanded wolf delisting.

May
Final rule implementing 1713 is published by US Fish and Wildlife Service.

April
Congressman Mike Simpson includes section 1713 in Full-Year Appropriations Act with endorsement of Senator John Tester and Max Baucus. President Obama signs 1713 into law.

2012

February
USFWS 5-year recommendations of wolves suggest expanded delisting is supported by the science and policy underlying the endangered species act.

October
State of Wyoming Wolf Plan approved and delisting finalized.

June 13
USFWS publishes draft 48 state delisting and opens public comment period.

June 7
USFWS announced decision to delist Canadian Gray Wolves in the lower 48 states. Mexican Wolves listed as a separate subspecies.

CONCLUSION

CONCLUSION

Progress continues to be made in the efffort to return wolf-management authority to the State of Utah by delisting of the gray wolf. As the issue moves forward, Administrative Delisting and Congressional Action are the two clear objectives that need to be met.

Administrative Delisting. The only way to restore state management flexibility of wolves is removing wolves from the Endangered Species List. Administrative delisting functions as a legal and scientific acknowledgement from U.S. Fish and Wildlife Service that the national wolf recovery plan for Northern Gray Wolves has been completed and that gray wolves are not threatened with extinction. Another important administrative action is finalizing the proposed administrative rule on Mexican Wolves. The new proposed rule dictates that the northern boundary of Mexican Wolves is I-40 (in central Arizona) and excludes the state of Utah.

Congressional Action. Due to the repeated lawsuits by wolf proliferation advocates and technicalities under the Endangered Species Act, there is a high likelihood that an administrative delisting could be reversed. This is why permantly delisting wolves will likely require congressional action. It is also notable that the areas of the Northern Rockies DPS which were covered by this congressional action are the only areas that have consistently been able to manage wolves the last six years.

BigGame Forever will continue its efforts to educate and activate the public and elected officials. BGF will provide the support needed to encourange Administrative Delisting and pass successful legislation to uphold State management of the gray wolf in Utah. BGF will also continue to monitor progress on the Mexican Wolf plan and work to ensure the plan does not include territory in Utah. BigGame Forever looks forward to continuing its efforts to protect Utah's world-class herds of elk, mule deer, moose, and other native ungulates from unmanaged wolf populations.

APPENDIX

APPENDIX

EXHIBIT 1

Letter to Dan Ashe Signed by 72 Members of Congress on Wolf Management

Congress of the United States
Washington, DC 20510

March 22nd, 2013

The Honorable Dan Ashe
Director
U.S. Fish and Wildlife Service
1849 C Street, NW
Washington, DC 20240

Dear Director Ashe:

We understand the U.S. Fish and Wildlife Service (USFWS) is in the process of reviewing the Endangered Species Act (ESA) recovery status of the gray wolf in the lower 48 States and is preparing to announce the delisting of the species. We support the nationwide delisting of wolves and urge you to move as quickly as possible on making this a reality. We were supportive of the USFWS decision in 2009 when most wolves were delisted in the Northern Rocky Mountains, again in 2011 when wolves in the Great Lake States were delisted, and the 2012 delisting in Wyoming. It is unfortunate that these decisions were met with lawsuits from environmental activists.

Wolves are not an endangered species and do not merit federal protections. The full delisting of the species and the return of the management of wolf populations to State governments is long overdue. As you know, State governments are fully qualified to responsibly manage wolf populations and are able to meet both the needs of local communities and wildlife populations.

Unmanaged wolves are devastating to livestock and indigenous wildlife. Currently State wildlife officials have their hands tied any time wolves are involved. They need to be able to respond to the needs of their native wildlife without being burdened by the impediments of the federal bureaucracy created by the ESA. During the four decades that wolves have had ESA protections, there has been an uncontrolled and unmanaged growth of wolf populations resulting in devastating impacts on hunting and ranching in America as well as tragic damages to historically strong and healthy herds of moose, elk, big horn sheep, and mule deer.

As you consider these much needed changes to federal protections with regard to the gray wolf, we urge you to expand the delisting of the species to all of the lower 48 states. It is critical that the states be given the ability to properly manage all of the species within their boundaries.

Sincerely,

Representative Cynthia Lummis

Senator Orrin Hatch

EXHIBIT 1

The Honorable Dan Ashe
Page Two
March 22nd, 2013

Representative Doc Hastings

Senator John Barrasso

Representative Rob Bishop

Senator Heidi Heitkamp

Representative Steve Stivers

Senator Mike Lee

Representative Marsha Blackburn

Senator Dean Heller

Representative Jeff Duncan

Senator Mike Enzi

Representative Jim Matheson

Senator John Thune

Representative Lynn Westmoreland

Senator Joe Manchin

The Honorable Dan Ashe
Page Three
March 22nd, 2013

Representative Terri Sewell

Senator Mike Crapo

Representative Mike Pompeo

Senator James Risch

Representative Blayne Luetkemeyer

Senator David Vitter

Representative Steve Southerland II

Senator Lisa Murkowski

Representative Stephen Fincher

JOHN CORNYN
UNITED STATES SENATE

Representative Collin Peterson

Representative Kevin Brady

EXHIBIT 1

Representative Kristi Noem

Representative Steve King

Representative Steve Scalise

Representative Kevin Cramer

Representative Rob Wittman

Representative Steve Stockman

Representative Bob Gibbs

The Honorable Dan Ashe
Page Five
March 22nd, 2013

Representative Bill Johnson

Representative Jason Chaffetz

Representative Chris Stewart

Representative Kenny Marchant

Representative Howard Coble

Representative Mike Conaway

Representative Sam Graves

EXHIBIT 1

(TX-32)
Representative Pete Sessions

Representative Marlin Stutzman

Representative Dennis Ross

Representative Steven Daines

Representative Bill Huizenga

Representative Randy Neugebauer

Representative Dan Benishek

The Honorable Dan Ashe
Page Seven
March 22nd, 2013

Representative Candice Miller

Representative Don Young

Representative Michele Bachmann

Representative Doug Lamalfa

Representative Reid Ribble

Representative Jim Renacci

Representative Mick Mulvaney

EXHIBIT 1

Representative Ron DeSantis

Representative David Schweikert

Representative John Kline

Representative Steve Palazzo

Representative Alan Nunnelee

Representative Paul Ryan

Representative Adrian Smith

The Honorable Dan Ashe
Page Nine
March 22nd, 2013

Representative Tom Cole

Representative Glenn Thompson

Representative Jeff Miller

Representative Patrick McHenry

Representative Tim Walz

Representative Duncan Hunter

Representative Austin Scott

EXHIBIT 1

Representative Bob Latta

Representative Randy Weber

EXHIBIT 2

Billings Gazette Article on effects of wolves and other issues to fish and game agency budgets in Montana and Idaho

BILLINGS GAZETTE

Nonresident hunters cooler to Montana, Idaho

SEPTEMBER 02, 2012 12:00 AM • RICH LANDERS THE SPOKESMAN-REVIEW

Weather, wolves, politics and the economy are slamming a quadruple whammy on the budgets of fish and game agencies in Idaho and Montana.

Nonresidents are no longer clamoring for the quota of permits the states offer for their fabled deer and elk hunts despite the standout hunting opportunities.

Nonresidents are cash cows for state budgets. Just as they boost university tuition revenues, nonresidents pay up to 15 times more than residents for the privilege to hunt elk.

While some locals welcome less competition in their favorite hunting areas, local economies are feeling the pain, too. Hardest hit are rural towns where nonresident hunters book motel rooms, eat at restaurants and support numerous other businesses with out-of-area dollars.

Losses are huge in license revenue alone.

The Idaho Fish and Game Department watched $3.5 million in license revenue vaporize last year because it could not sell all of its allotted nonresident deer and elk tags, according to Craig Wiedmeier, license division manager.

That amounts to a 4.5 percent divot in the department's already strapped $77 million annual operating budget, which is funded almost entirely by hunting and fishing license fees.

Idaho's sales of nonresident deer and elk tags have steadily declined each year since 2008. The trend apparently hasn't bottomed out.

Last year, sales of nonresident Idaho deer tags were down 22 percent from 2010 and elk tag sales were down 23 percent, Wiedmeier said.

The number of tags sold this year is down about 18 percent from August 2011.

Montana is hurting, too. For the second time in 30 years, the state has a surplus of nonresident big-game combo licenses — tags that used to sell out by March 15.

At last count, Montana was still holding 795 unsold big-game combo licenses (from a 17,000 quota), 1,935 elk combo licenses and 1,921 deer combo licenses.

That amounts to a whopping $3.36 million shortfall at this point, although the state is banking on selling more tags in the next two months.

"We normally get a spike in nonresident sales in September and even October, especially from Washington state," said Ron Aasheim, Montana Fish, Wildlife and Parks spokesman in Helena.

EXHIBIT 2

"But we're still concerned. We're talking about a lot of money."

Before 2008, Idaho and Montana enjoyed high demand for their quotas of nonresident deer and elk tags. Sell-outs were the norm until the following occurred in the following two years:

-- Wall Street and the mortgage banking industry tanked the nation's economy.

-- Winter weather hammered Idaho elk herds as well as Montana deer and antelope.

-- Word of wolves ravaging deer and elk populations — sometimes exaggerated, sometimes not — spread through hunting communities.

-- Politics compounded revenue problems by ignoring the economic climate.

Despite warnings from fish and game officials, Idaho's legislature and Montana's voters raised nonresident license fees, asking out-of-staters to pay more for less.

In 2009, Idaho lawmakers raised nonresident deer tags from $259 to $302 and bumped the elk tag from $373 to $417.

Fish and Game officials confirmed their assumptions about declining license sales in a 2009 survey of nonresident hunters, many of whom indicated the economy, fee increases and wolf impacts played into their decisions to forgo hunting in Idaho.

Montana voters created even more economic heartburn for their wildlife agency and local economies by approving an initiative that took a swipe at guides who were tying up hunting ground.

Initiative 161 eliminated outfitter sponsored big-game licenses that guaranteed big-spending nonresidents a chance to hunt in Montana. The outfitter combo big- game tags that sold for $1,250 helped finance the state's popular Block Management program that gives all hunters access to private land.

The Montana initiative also significantly raised prices of the nonresident big-game combination license from $643 to $944, the elk combo from $593 to $794 and the deer combo from $343 to $561.

Meanwhile, both states are trying to get out the message that they still have tremendous hunting opportunities.

For example, despite the impact of weather and wolves, Montana wildlife officials say elk populations in 70 percent of the state's hunting units are at or above management objectives.

"In this economy, buying patterns have changed," Idaho's Wiedmeier said. "A lot more hunters wait to the last minute before making the decision to buy a license. It's like they know they want to hunt in Idaho, but they want to be sure they can make it."

EXHIBIT 3

Article on estimated lost revenue from elk killed by wolves in Idaho according to the Idaho Department of Fish and Game.

Report: Wolves cost Idaho big bucks

Study estimates hunting revenue from elk killed by wolves

By William L. Spence of the Tribune

Friday, February 20, 2009

BOISE - An updated economic analysis indicates Idaho could be losing $7 million to $24 million per year in hunting revenue due to the introduction of wolves.

The Idaho Department of Fish and Game provided the analysis at the request of Sen. Gary Schroeder, R-Moscow. It updates a 1994 environmental impact statement related to the introduction of gray wolves in Yellowstone.

"We've gone through this type of analysis before with chinook salmon," said Assistant Director Sharon Kiefer. "It helps illustrate for the public and the Legislature that there are economic costs to foregone opportunities."

The 1994 study assumed a statewide wolf population of about 100 animals. It estimated they would kill 1,650 ungulates per year, of which 70 percent were deer and 30 percent elk, and went on to say that "a reduction in big game animals available for harvest directly affects the available hunting opportunities. Reduced hunting opportunities translates into a reduced number of hunters and hunter days spent in the field."

Fish and Game updated the 1994 study using the current wolf population estimate of 824. Based on more recent research, it assumed 70 percent of the ungulates killed would be elk. It then extrapolated the depredation figures and estimated that Idaho wolves kill about 9,517 elk per year.

The updated study provides four estimates of the economic value of that lost resource. As outlined in a letter to Schroeder, they are:

Harvest value: The economic value of each harvested elk in Idaho
is about $8,000, including direct and indirect benefits. Consequently, if those 9,517 elk had been available to hunters, typically about 20 percent of them, or 1,903 animals, would have been harvested - representing an economic loss of about $15.2 million.

Animal value: For the purposes of assessing damages, the Legislature has set the value of an illegally taken elk at $750. Based on that figure, the 9,517 elk killed by wolves would be worth about $7.1 million.

Reduced hunting opportunity (2): A 1986 U.S. Forest Service publication indicated that one day of elk hunting generated $39.10 in economic activity. The 1994 environmental impact statement used that figure to estimate that 100 wolves would cost the state between $572,000 and $857,000, based on 14,619 to 21,928 days in lost hunting opportunities.

After adjusting the 1986 figure to 2008 dollars, and assuming a linear relationship between reduced hunting opportunities and wolf population, the updated study estimated the current cost of lost hunting days at between $7 million and $11 million.

EXHIBIT 3

Using a second estimate of $127.40 per day cited by another study, the opportunity cost ranged from $15 million to $24 million.

"I think this at least gives us some data with some science behind it," Schroeder said of the updated study. "The two main points are that we have a lot more wolves than the biologists ever thought we'd have, and they were wrong about them eating more deer than elk.

"The question is, as wolf numbers increase, are we going to have to curtail hunting opportunities? Overall, I like seeing economic activity, because it drives tax revenue. Anytime I see something that drives business away, that's important to me."

Schroeder asked other organizations, such as guides and outfitters and tourism groups, to provide their perspective on this issue, but he hasn't heard back from them yet.

Fish and Game said it hasn't seen a significant decline in the sale of big game tags over the past decade, but it has no way of knowing if tag sales would have increased in the absence of wolves.

Kiefer said the 1994 study also used some unrealistic assumptions that would tend to inflate the calculated costs. Those assumptions were maintained in the updated study, she said, but as more specific data is collected, the cost estimates can be refined.

Spence may be contacted at bspence@lmtribune.com or (208) 848-2274.

EXHIBIT 4

U.S. Fish and Wildlife statistics on confirmed livestock kills by wolves

Edward E. Bangs
U.S. Fish and Wildlife Service
585 Shepard Way, Helena, MT 59601
406/449-5225 ex 204; Fax: 406/449-5339; E-mail: ed_bangs@fws.gov

Wolf recovery in the northwestern United States

Ed Bangs, U.S. Fish and Wildlife Service, Helena, Montana; Mike Jimenez, USFWS, Jackson, WY; Carolyn Sime, Montana Fish, Wildlife and Parks, Helena, MT; Jon Rachael, Idaho Department of Fish and Game, Boise, ID; Curt Mack, Nez Perce Tribe, Lapwai, ID; Doug Smith, National Park Service, Yellowstone National Park, WY; Kenneth Mills, Wyoming Game and Fish Department, Pinedale, WY; and Jeff Green, USDA APHIS, Wildlife Services, Denver, CO.

Abstract- Gray wolf (Canis lupus) populations were deliberately eliminated from the northern Rocky Mountains (NRM) of the northwestern United States by 1930. Naturally dispersing wolves from Canada first denned in Montana in 1986. In 1995 and 1996 wolves from western Canada were reintroduced to central Idaho and Yellowstone National Park, Wyoming by the U.S. Fish and Wildlife Service (Service) to accelerate recovery. In December 2009, there were at least 1,706 wolves in 242 packs and in April 2010 another >600 pups were born. Research demonstrates the NRM wolf population has very high genetic diversity as a result of management actions during recovery and that it will be maintained solely by natural dispersal. Wolves occupy over 110,000 square miles in the NRM and suitable habitat (largely forested mountainous public land) appears saturated with resident wolf packs. Wolf restoration initially proceeded with more benefits (public viewing and restoration of ecological processes in natural areas), and fewer problems (livestock and pet depredation and decreases in wild ungulate populations) than predicted. However, problems have increased since 2002 when the population first exceeded its minimum recovery goal. Since 1987, more than 1,301 cattle, 2,854 sheep, 142 dogs, 31 goats, 25 llamas, and 10 horses have been confirmed killed by wolves, perhaps 1/8th of the actual damage. Nearly $2,000,000 has been paid by private and state wolf damage compensation funds. In addition to a wide variety of non-lethal tools, we relocated wolves 117 times and killed >1,259 to reduce conflicts. On May 4, 2009, the NRM Distinct Population Segment (DPS) of the gray wolf (Montana, Idaho, Wyoming, eastern Washington and Oregon, and a small part of southcentral Utah) was established and federal protections were removed. Wolves are now managed and hunted just like other resident wildlife, except in Wyoming which lacks a Service-approved state wolf management plan. While the NRM wolf population is biologically recovered, public opinion remains divisive and the legal and policy decisions made by the Service to not approve Wyoming's wolf plan and to delist wolves in the NRM are both being litigated in Federal District Courts in Wyoming and Montana.

Cattle Death Loss

ISSN:

Released May 12, 2011, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, United States Department of Agriculture (USDA).

Cattle and Calf Death Losses

This report is released every five years as a cooperative effort between the National Agricultural Statistics Service and Animal and Plant Health Inspection Service – Wildlife Services and Veterinary Services. The information presented in this report is based on producer reports from the January 2011 Cattle survey and includes detailed percentage breakouts of cattle and calf losses by predators and non-predator causes as well as non-lethal control measures.

Cattle and calf losses from predators and non-predator causes in the United States totaled 3.99 million head (excluding Alaska) during 2010. This represents 4.3 percent of the 93.9 million cattle and calves in the United States at the beginning of 2010. Losses of cattle weighing more than 500 pounds totaled 1.73 million head or 43.4 percent of total losses. Calves weighing less than 500 pounds lost to all causes totaled 2.26 million head or 56.6 percent of total losses.

Cattle and calf losses from animal predators totaled nearly 220 thousand head during 2010. This represented 5.5 percent of the total deaths from all causes and resulted in a loss of $98.5 million to farmers and ranchers. Coyotes and dogs caused the majority of cattle and calf predator losses accounting for 53.1 percent and 9.9 percent respectively.

Cattle and calf losses from non-predator causes totaled 3.77 million head or 94.5 percent of the total losses during 2010. Respiratory problems represented the leading cause of non-predator deaths, accounting for 28.0 percent, followed by digestive problems at 13.4 percent.

Non-lethal predator control measures cost farmers and ranchers throughout the United States $188.5 million during 2010. Use of guard animals was the most common method at 36.9 percent. Exclusion fencing, frequent checking, and culling were the next most commonly used methods of preventing cattle and calf losses at 32.8 percent, 32.1 percent, and 28.9 percent respectively.

EXHIBIT 5

Contents

Number of Head and Total Value of Cattle and Calf Death Loss by Cause – United States: 2010

[Totals may not add due to rounding]

Cause	Number of head	Percent of total	Total value
	(number)	(percent)	(1,000 dollars)
Predator			
Coyotes	116,700	53.1	48,185
Mountain lions and bobcats [1]	18,900	8.6	9,221
Dogs	21,800	9.9	10,067
Vultures	11,900	5.4	4,641
Wolves	8,100	3.7	3,646
Bears	2,800	1.3	1,415
Other predators	12,400	5.6	6,352
Unknown predators	27,300	12.4	14,948
Total predator	219,900	100.0	98,475
Non-predator			
Digestive problems	505,000	13.4	267,799
Respiratory problems	1,055,000	28.0	643,146
Metabolic problems	59,800	1.6	47,558
Mastitis	62,000	1.6	59,112
Lameness/injury	140,900	3.7	112,251
Other diseases	179,500	4.8	114,577
Weather related	489,000	13.0	274,092
Calving problems	494,000	13.1	274,670
Poisoning	36,100	0.9	26,817
Theft	15,100	0.4	9,309
Other non-predator	301,600	8.0	247,092
Unknown non-predator	435,000	11.5	276,476
Total non-predator	3,773,000	100.0	2,352,899
United States Total [2]	3,992,900	100.0	2,451,374

[1] Includes cougars, pumas and lynx.
[2] Excludes Alaska.

Cattle Death Loss (May 2011) **5**
USDA, National Agricultural Statistics Service

EXHIBIT 5

Number of Head of Cattle and Calves Lost by Cause – States and United States: 2010

State	All causes		Predators		Non-predators	
	Cattle	Calves	Cattle	Calves	Cattle	Calves
	(head)	(head)	(head)	(head)	(head)	(head)
Alabama	23,000	30,000	1,000	5,200	22,000	24,800
Arizona	20,000	18,000	2,200	2,100	17,800	15,900
Arkansas	35,000	40,000	1,900	4,800	33,100	35,200
California	100,000	135,000	1,400	8,200	98,600	126,800
Colorado	55,000	55,000	800	4,300	54,200	50,700
Connecticut	1,100	1,200	-	100	1,100	1,100
Delaware	400	500	-	-	400	500
Florida	23,000	31,000	900	5,400	22,100	25,600
Georgia	19,000	23,000	1,300	3,500	17,700	19,500
Hawaii	5,000	4,000	100	500	4,900	3,500
Idaho	42,000	51,000	1,900	4,200	40,100	46,800
Illinois	18,000	30,000	300	1,500	17,700	28,500
Indiana	13,000	22,000	100	800	12,900	21,200
Iowa	70,000	95,000	200	1,400	69,800	93,600
Kansas	125,000	80,000	800	3,900	124,200	76,100
Kentucky	44,000	68,000	1,200	9,500	42,800	58,500
Louisiana	18,000	19,000	1,800	4,600	16,200	14,400
Maine	1,900	2,700	-	300	1,900	2,400
Maryland	3,000	5,000	100	100	2,900	4,900
Massachusetts	1,000	1,000	-	-	1,000	1,000
Michigan	22,000	43,000	200	600	21,800	42,400
Minnesota	46,000	88,000	400	2,100	45,600	85,900
Mississippi	21,000	27,000	800	2,800	20,200	24,200
Missouri	65,000	125,000	700	6,500	64,300	118,500
Montana	23,000	57,000	1,000	4,200	22,000	52,800
Nebraska	110,000	85,000	200	2,200	109,800	82,800
Nevada	5,000	12,000	500	2,300	4,500	9,700
New Hampshire	800	800	-	-	800	800
New Jersey	500	700	-	100	500	600
New Mexico	22,000	35,000	3,300	6,600	18,700	28,400
New York	32,000	43,000	300	1,400	31,700	41,600
North Carolina	13,000	20,000	1,400	4,000	11,600	16,000
North Dakota	15,000	40,000	300	2,500	14,700	37,500
Ohio	21,000	29,000	500	2,300	20,500	26,700
Oklahoma	90,000	130,000	3,400	10,500	86,600	119,500
Oregon	20,000	35,000	600	3,200	19,400	31,800
Pennsylvania	35,000	43,000	100	600	34,900	42,400
Rhode Island	100	200	-	-	100	200
South Carolina	7,000	8,000	300	1,000	6,700	7,000
South Dakota	68,000	90,000	300	2,600	67,700	87,400
Tennessee	34,000	56,000	1,300	7,800	32,700	48,200
Texas	310,000	290,000	6,000	40,000	304,000	250,000
Utah	13,000	26,000	300	2,300	12,700	23,700
Vermont	6,000	8,000	100	200	5,900	7,800
Virginia	26,000	52,000	600	4,800	25,400	47,200
Washington	20,000	19,000	200	1,500	19,800	17,500
West Virginia	5,000	15,000	100	1,000	4,900	14,000
Wisconsin	75,000	140,000	500	3,100	74,500	136,900
Wyoming	11,000	30,000	400	3,500	10,600	26,500
United States [1]	1,733,800	2,259,100	39,800	180,100	1,694,000	2,079,000

- Represents zero.
[1] Excludes Alaska.

Total Value per Head and Total Value of Cattle and Calf Losses by Cause – States and United States: 2010

[Totals may not add due to rounding]

State	Total value per head		Total value predator losses		Total value non-predator losses	
	Cattle [1]	Calves [2]	Cattle	Calves	Cattle	Calves
	(dollars)	(dollars)	(1,000 dollars)	(1,000 dollars)	(1,000 dollars)	(1,000 dollars)
Alabama	852	324	852	1,685	18,744	8,035
Arizona	790	354	1,738	743	14,062	5,629
Arkansas	807	339	1,533	1,627	26,712	11,933
California	923	348	1,292	2,854	91,008	44,126
Colorado	1,037	372	830	1,600	56,205	18,860
Connecticut	1,095	300	-	30	1,205	330
Delaware	843	312	-	-	337	156
Florida	766	333	689	1,798	16,929	8,525
Georgia	793	330	1,031	1,155	14,036	6,435
Hawaii	520	273	52	137	2,548	956
Idaho	967	354	1,837	1,487	38,777	16,567
Illinois	1,001	336	300	504	17,718	9,576
Indiana	955	321	96	257	12,320	6,805
Iowa	1,097	360	219	504	76,571	33,696
Kansas	1,017	378	814	1,474	126,311	28,766
Kentucky	871	330	1,045	3,135	37,279	19,305
Louisiana	871	318	1,568	1,463	14,110	4,579
Maine	879	300	-	90	1,670	720
Maryland	911	312	91	31	2,642	1,529
Massachusetts	824	300	-	-	824	300
Michigan	942	278	188	167	20,536	11,787
Minnesota	987	375	395	788	45,007	32,213
Mississippi	821	315	657	882	16,584	7,623
Missouri	997	357	698	2,321	64,107	42,305
Montana	1,058	384	1,058	1,613	23,276	20,275
Nebraska	1,128	393	226	865	123,854	32,540
Nevada	969	369	485	849	4,361	3,579
New Hampshire	973	300	-	-	778	240
New Jersey	918	249	-	25	459	149
New Mexico	894	354	2,950	2,336	16,718	10,054
New York	911	276	273	386	28,879	11,482
North Carolina	838	315	1,173	1,260	9,721	5,040
North Dakota	1,135	366	341	915	16,685	13,725
Ohio	908	321	454	738	18,614	8,571
Oklahoma	914	360	3,108	3,780	79,152	43,020
Oregon	972	345	583	1,104	18,857	10,971
Pennsylvania	996	300	100	180	34,760	12,720
Rhode Island	951	300	-	-	95	60
South Carolina	843	315	253	315	5,648	2,205
South Dakota	1,133	381	340	991	76,704	33,299
Tennessee	820	324	1,066	2,527	26,814	15,617
Texas	889	354	5,334	14,160	270,256	88,500
Utah	984	360	295	828	12,497	8,532
Vermont	842	300	84	60	4,968	2,340
Virginia	801	330	481	1,584	20,345	15,576
Washington	949	342	190	513	18,790	5,985
West Virginia	884	297	88	297	4,332	4,158
Wisconsin	949	423	475	1,311	70,701	57,909
Wyoming	1,094	396	438	1,386	11,596	10,494
United States [3]	952	354	35,720	62,755	1,615,102	737,797

- Represents zero.
[1] Cattle value per head is based on a two-year straight average of the value of beef cows reported in the January 1 Cattle survey from 2010 and 2011.
[2] Calf value per head is based on the market year average calf price. An average weight of 300 pounds was used in all States.
[3] Excludes Alaska. United States value per head for cattle and calves derived.

Cattle Death Loss (May 2011) **7**
USDA, National Agricultural Statistics Service

EXHIBIT 5

Percent of Total Cattle Predator Losses by Predator – States and United States: 2010

[Totals may not add due to rounding]

State	Coyotes	Mountain lions and bobcats [1]	Dogs	Vultures	Wolves	Bears	Other predators	Unknown predators
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	38.3	-	49.9	3.4	-	-	-	8.4
Arizona	15.8	7.3	-	-	-	1.5	0.7	74.7
Arkansas	37.5	-	43.1	-	-	-	2.2	17.2
California	57.0	32.5	8.5	-	-	1.0	-	1.0
Colorado	17.7	4.0	0.8	-	-	21.4	47.6	8.5
Connecticut	-	-	-	-	-	-	-	-
Delaware	-	-	-	-	-	-	-	-
Florida	40.8	1.9	9.0	3.1	-	-	25.6	19.6
Georgia	7.0	-	14.1	0.1	-	-	71.5	7.3
Hawaii	-	-	67.2	-	-	-	14.8	18.0
Idaho	3.9	1.5	0.5	-	30.0	0.4	3.2	60.5
Illinois	66.5	17.4	-	-	-	-	16.1	-
Indiana	67.6	16.2	-	-	-	-	16.2	-
Iowa	38.0	7.1	26.1	-	-	-	-	28.8
Kansas	66.1	24.6	1.8	-	-	-	3.4	4.1
Kentucky	50.7	-	16.8	7.1	0.5	2.4	7.5	15.0
Louisiana	68.8	-	4.8	1.1	-	-	19.6	5.7
Maine	-	-	-	-	-	-	-	-
Maryland	-	-	-	-	-	-	-	100.0
Massachusetts	-	-	-	-	-	-	-	-
Michigan	59.5	-	25.0	-	-	-	15.5	-
Minnesota	52.1	5.4	7.0	-	16.8	-	-	18.7
Mississippi	79.3	-	17.2	-	-	-	3.5	-
Missouri	10.3	-	44.0	-	-	-	-	45.7
Montana	4.8	-	-	-	44.0	6.5	3.7	41.0
Nebraska	39.0	59.0	-	-	-	-	-	2.0
Nevada	4.7	17.3	-	-	-	-	-	78.0
New Hampshire	-	-	-	-	-	-	-	-
New Jersey	-	-	-	-	-	-	-	-
New Mexico	25.9	44.3	1.7	-	2.4	0.4	3.4	21.9
New York	7.3	-	5.9	-	-	-	-	86.8
North Carolina	26.1	-	23.1	-	-	6.8	-	44.0
North Dakota	85.8	-	-	-	-	-	-	14.2
Ohio	79.5	-	-	6.8	-	-	13.7	-
Oklahoma	35.7	6.8	19.5	7.8	-	-	13.6	16.6
Oregon	63.6	13.3	-	-	-	7.3	-	15.8
Pennsylvania	-	-	-	-	-	-	-	100.0
Rhode Island	-	-	-	-	-	-	-	-
South Carolina	65.8	-	6.3	-	-	-	25.5	2.4
South Dakota	72.0	24.0	-	4.0	-	-	-	-
Tennessee	62.1	-	26.4	-	-	-	-	11.5
Texas	22.2	27.7	6.5	6.0	-	0.1	11.3	26.2
Utah	44.0	1.9	-	-	-	42.8	0.4	10.9
Vermont	100.0	-	-	-	-	-	-	-
Virginia	31.7	-	5.9	7.8	-	0.8	1.7	52.1
Washington	80.7	7.5	-	-	-	-	-	11.8
West Virginia	49.5	-	-	-	-	18.4	-	32.1
Wisconsin	31.5	-	-	-	58.0	10.5	-	-
Wyoming	19.8	11.9	1.0	-	18.6	15.7	-	33.0
United States [2]	34.4	12.1	11.3	2.3	3.8	1.9	9.3	24.9

- Represents zero or less than 0.1 percent.
[1] Includes cougars, pumas, and lynx.
[2] Excludes Alaska.

Percent of Total Calf Predator Losses by Predator – States and United States: 2010

[Totals may not add due to rounding]

State	Coyotes	Mountain lions and bobcats [1]	Dogs	Vultures	Wolves	Bears	Other predators	Unknown predators
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	48.4	1.5	26.0	9.9	-	-	6.7	7.5
Arizona	38.3	31.9	5.7	-	12.7	3.4	2.5	5.5
Arkansas	38.7	3.2	30.6	13.8	-	-	7.1	6.6
California	75.7	11.7	4.3	-	-	0.1	2.3	5.9
Colorado	82.2	6.3	1.0	-	-	7.8	0.3	2.4
Connecticut	100.0	-	-	-	-	-	-	-
Delaware	-	-	-	-	-	-	-	-
Florida	77.4	-	0.5	8.7	-	-	6.2	7.2
Georgia	53.7	-	15.8	12.5	-	-	13.3	4.7
Hawaii	-	-	89.9	-	-	-	7.5	2.6
Idaho	26.9	4.3	3.3	0.3	47.4	0.7	3.0	14.1
Illinois	87.9	7.1	1.0	0.3	-	-	1.6	2.1
Indiana	71.8	-	26.8	1.4	-	-	-	-
Iowa	66.9	1.0	13.9	-	-	-	8.4	9.8
Kansas	71.2	7.9	13.8	-	-	-	-	7.1
Kentucky	79.0	0.4	8.1	2.5	0.4	0.4	1.3	7.9
Louisiana	81.7	-	6.1	6.9	-	-	3.0	2.3
Maine	14.0	-	-	-	-	-	86.0	-
Maryland	56.6	-	6.6	-	-	-	-	36.8
Massachusetts	-	-	-	-	-	-	-	-
Michigan	55.5	-	5.6	-	-	-	-	38.9
Minnesota	35.3	1.9	1.4	-	37.7	-	5.2	18.5
Mississippi	65.9	1.2	16.0	3.8	-	-	12.1	1.0
Missouri	29.5	14.4	33.2	3.8	-	2.2	1.5	15.4
Montana	46.9	5.2	-	-	20.3	2.3	1.6	23.7
Nebraska	59.4	37.5	-	-	-	-	-	3.1
Nevada	61.8	2.4	1.7	-	-	0.1	3.6	30.4
New Hampshire	-	-	-	-	-	-	-	-
New Jersey	59.4	-	-	32.8	-	7.8	-	-
New Mexico	65.2	16.4	6.3	-	-	1.3	3.6	7.2
New York	88.5	1.8	3.6	-	-	-	-	6.1
North Carolina	63.7	-	12.1	10.4	-	-	1.8	12.0
North Dakota	86.2	3.7	1.7	-	0.7	-	2.4	5.3
Ohio	90.0	-	1.4	1.7	-	-	6.9	-
Oklahoma	52.6	7.1	13.8	4.4	1.5	1.5	9.3	9.8
Oregon	70.0	8.7	0.5	-	7.7	1.0	8.7	3.4
Pennsylvania	66.7	-	1.9	1.5	-	-	-	29.9
Rhode Island	-	-	-	-	-	-	-	-
South Carolina	80.2	0.5	5.0	7.0	-	-	3.8	3.5
South Dakota	95.5	3.5	-	-	-	-	1.0	-
Tennessee	62.5	0.3	16.0	8.8	-	-	0.9	11.5
Texas	40.1	15.4	9.3	14.0	0.4	-	7.9	12.9
Utah	58.8	6.2	4.8	-	1.8	15.4	9.8	3.2
Vermont	95.2	-	-	-	-	-	-	4.8
Virginia	65.0	-	7.5	12.9	-	5.4	0.8	8.4
Washington	77.3	3.4	-	-	2.4	3.3	-	13.6
West Virginia	80.9	-	-	-	-	8.8	-	10.3
Wisconsin	42.0	3.2	-	0.1	47.5	0.9	-	6.3
Wyoming	46.5	11.5	1.7	-	14.6	7.7	3.3	14.7
United States [2]	57.2	7.8	9.6	6.1	3.7	1.1	4.8	9.7

- Represents zero or less than 0.1 percent..
[1] Includes cougars, pumas, and lynx.
[2] Excludes Alaska.

Cattle Death Loss (May 2011) **9**
USDA, National Agricultural Statistics Service

EXHIBIT 5

Percent of Total Cattle Non-Predator Losses by Type – States and United States: 2010

[Totals may not add due to rounding]

State	Digestive problems	Respiratory problems	Metabolic problems	Mastitis	Lameness or injury	Other diseases
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	4.9	5.3	2.6	0.7	3.9	5.9
Arizona	8.6	10.9	0.5	3.1	5.0	1.1
Arkansas	8.1	13.6	1.2	1.1	1.2	11.0
California	7.9	27.3	3.9	10.6	11.0	5.6
Colorado	18.2	39.7	1.6	2.0	5.3	7.1
Connecticut	13.9	11.1	8.5	23.0	13.2	5.5
Delaware	8.9	2.7	1.5	21.6	6.2	6.2
Florida	5.9	10.8	3.8	5.3	6.8	2.3
Georgia	4.6	12.5	3.1	2.5	4.6	7.0
Hawaii	1.0	0.6	0.3	-	0.6	2.2
Idaho	13.4	25.6	5.6	7.6	9.9	8.1
Illinois	14.0	25.6	4.5	3.2	10.5	3.9
Indiana	10.9	20.9	6.7	3.8	8.9	2.4
Iowa	10.0	45.5	1.5	2.3	6.8	3.8
Kansas	5.2	63.8	0.3	0.7	1.8	2.9
Kentucky	9.9	35.7	1.0	1.1	3.3	1.9
Louisiana	4.1	11.6	0.2	1.1	4.8	5.6
Maine	5.6	30.5	16.0	6.5	20.9	2.7
Maryland	9.7	6.5	6.4	7.5	9.1	5.3
Massachusetts	9.6	8.1	13.0	16.8	6.9	0.2
Michigan	11.4	27.1	7.6	9.2	9.1	6.0
Minnesota	13.2	24.2	5.1	6.8	8.4	4.6
Mississippi	5.1	14.3	1.7	0.7	3.9	3.3
Missouri	4.5	11.5	1.5	1.0	5.0	8.3
Montana	6.6	16.9	0.7	0.5	5.1	4.7
Nebraska	9.3	39.2	0.4	0.3	4.2	2.0
Nevada	8.0	11.0	4.3	3.7	8.1	6.0
New Hampshire	8.5	6.2	9.0	7.5	11.6	9.9
New Jersey	2.7	7.1	8.3	0.8	7.9	2.7
New Mexico	19.8	18.2	2.9	17.7	2.7	7.2
New York	11.3	11.5	8.4	13.3	17.7	4.5
North Carolina	4.6	11.3	5.6	3.0	6.1	4.3
North Dakota	9.7	24.7	0.7	0.2	3.0	4.2
Ohio	13.0	25.7	5.7	6.3	12.7	3.9
Oklahoma	4.7	28.3	0.6	0.5	3.9	6.8
Oregon	9.9	9.9	4.5	5.0	12.4	3.6
Pennsylvania	10.1	14.3	6.1	16.8	13.2	9.8
Rhode Island	36.6	-	3.6	3.6	13.4	5.3
South Carolina	19.8	6.5	1.7	4.2	3.2	4.0
South Dakota	12.6	31.1	2.7	1.9	5.4	5.2
Tennessee	5.1	11.6	1.6	1.3	5.1	5.2
Texas	7.3	22.1	1.2	1.2	2.8	4.8
Utah	12.6	19.3	5.9	3.8	6.5	2.8
Vermont	14.0	10.0	6.6	16.7	12.8	9.5
Virginia	4.3	12.4	2.5	2.8	7.8	6.3
Washington	10.7	25.5	3.9	8.1	8.6	6.7
West Virginia	7.3	9.2	2.1	1.3	4.6	5.6
Wisconsin	10.8	17.3	8.2	9.4	17.5	5.0
Wyoming	5.2	11.7	1.6	1.4	3.0	5.5
United States [1]	8.7	26.5	2.6	3.7	6.1	5.0

See footnote(s) at end of table.

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Percent of Total Cattle Non-Predator Losses by Type – States and United States: 2010 (continued)

[Totals may not add due to rounding]

State	Weather related	Calving problems	Poisoning	Theft	Other non-predator	Unknown non-predator
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	16.4	16.8	3.1	1.3	25.1	14.0
Arizona	8.5	6.7	1.9	0.1	6.1	47.5
Arkansas	16.3	12.1	6.3	0.1	19.3	9.7
California	1.5	10.2	-	0.2	12.9	8.9
Colorado	5.2	3.3	2.3	0.1	5.7	9.5
Connecticut	0.7	9.7	4.3	0.6	4.9	4.6
Delaware	-	20.1	-	-	10.8	22.0
Florida	18.5	17.6	1.5	0.1	20.7	6.7
Georgia	3.4	21.8	0.3	-	26.4	13.8
Hawaii	74.4	6.5	0.1	2.5	9.8	2.0
Idaho	3.1	9.0	2.6	0.1	9.7	5.3
Illinois	11.4	9.4	0.9	-	12.5	4.1
Indiana	1.8	15.1	0.5	0.9	13.5	14.6
Iowa	8.5	7.1	0.6	-	7.2	6.7
Kansas	13.0	3.2	0.3	0.3	4.3	4.2
Kentucky	6.5	8.8	1.7	-	14.5	15.6
Louisiana	17.1	15.7	4.2	-	19.9	15.7
Maine	-	6.7	-	-	5.1	6.0
Maryland	1.6	12.8	0.3	-	22.0	18.8
Massachusetts	1.4	16.6	4.7	2.4	10.7	9.6
Michigan	1.5	8.6	-	-	7.7	11.8
Minnesota	5.3	7.7	1.2	-	14.3	9.2
Mississippi	17.1	17.4	0.7	0.6	21.6	13.6
Missouri	20.7	14.9	1.0	1.2	20.0	10.4
Montana	9.7	7.1	3.6	1.1	19.7	24.3
Nebraska	17.9	4.8	0.4	0.2	7.2	14.1
Nevada	1.5	4.2	6.8	9.4	9.5	27.5
New Hampshire	-	18.5	-	-	16.0	12.8
New Jersey	21.3	9.4	-	-	39.2	0.6
New Mexico	3.2	7.2	1.8	1.1	5.3	12.9
New York	1.6	11.0	2.3	0.2	10.5	7.7
North Carolina	10.9	21.3	0.5	1.0	21.0	10.4
North Dakota	16.0	2.4	0.4	0.4	22.4	15.9
Ohio	2.4	14.7	0.2	0.1	10.8	4.5
Oklahoma	11.1	10.4	0.4	1.8	18.6	12.9
Oregon	3.3	8.4	1.7	0.1	29.7	11.5
Pennsylvania	1.3	10.1	0.3	-	9.7	8.3
Rhode Island	-	6.3	-	-	31.2	-
South Carolina	10.4	18.4	1.4	0.2	20.0	10.2
South Dakota	13.1	5.9	3.1	0.1	13.3	5.6
Tennessee	7.9	16.8	1.9	0.7	28.1	14.7
Texas	10.8	12.2	1.4	0.2	17.4	18.6
Utah	6.2	4.8	3.7	1.4	13.6	19.4
Vermont	0.5	10.8	0.9	-	7.2	11.0
Virginia	19.4	14.3	2.5	-	17.3	10.4
Washington	3.0	6.8	-	0.1	13.8	12.8
West Virginia	28.2	18.4	2.7	2.1	9.6	8.9
Wisconsin	3.1	10.9	1.3	-	8.8	7.7
Wyoming	15.2	6.6	7.5	1.3	17.0	24.0
United States [1]	9.9	9.8	1.4	0.4	13.8	12.1

- Represents zero or less than 0.1 percent..
[1] Excludes Alaska.

Cattle Death Loss (May 2011) **11**
USDA, National Agricultural Statistics Service

EXHIBIT 5

Percent of Total Calf Non-Predator Losses by Type – States and United States: 2010

[Totals may not add due to rounding]

State	Digestive problems	Respiratory problems	Metabolic problems	Lameness or injury	Other diseases
	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	5.0	12.7	2.5	2.8	4.7
Arizona	15.0	25.2	-	1.1	6.2
Arkansas	4.3	24.7	0.1	1.3	4.9
California	24.1	46.6	2.1	1.6	5.8
Colorado	18.4	30.8	0.2	1.2	2.6
Connecticut	38.8	20.5	0.4	1.1	6.0
Delaware	21.4	18.9	2.4	-	16.0
Florida	12.4	14.1	2.0	2.7	14.4
Georgia	8.1	16.4	0.5	1.0	2.6
Hawaii	5.6	4.7	-	2.6	4.3
Idaho	24.9	33.9	1.8	3.0	5.5
Illinois	18.1	25.8	0.3	2.8	5.2
Indiana	25.6	29.5	0.7	0.5	1.5
Iowa	21.0	30.7	0.5	1.3	1.7
Kansas	8.3	35.4	0.3	1.5	2.2
Kentucky	14.8	21.0	0.1	2.1	5.9
Louisiana	4.9	22.5	0.1	0.4	3.7
Maine	24.8	30.5	4.4	6.5	2.0
Maryland	14.6	13.4	0.6	3.8	6.9
Massachusetts	21.8	15.0	-	10.0	7.1
Michigan	30.1	41.7	0.1	1.4	2.9
Minnesota	27.7	31.6	1.3	2.6	2.8
Mississippi	5.7	24.7	0.5	2.8	1.5
Missouri	10.1	24.8	0.2	1.4	2.1
Montana	14.3	13.6	0.1	0.7	1.2
Nebraska	15.9	22.6	0.5	0.9	2.2
Nevada	12.1	21.6	-	0.7	0.9
New Hampshire	35.9	34.6	3.8	0.7	0.4
New Jersey	6.0	10.2	-	-	5.1
New Mexico	15.1	33.1	1.3	2.9	3.8
New York	32.9	31.8	2.4	3.2	7.6
North Carolina	9.4	18.7	2.6	2.8	6.7
North Dakota	14.5	28.6	0.4	0.8	3.0
Ohio	27.2	28.5	0.5	3.0	4.6
Oklahoma	4.3	35.1	0.8	2.0	6.4
Oregon	18.4	31.2	1.1	1.6	3.8
Pennsylvania	25.3	39.0	0.4	1.3	4.3
Rhode Island	39.0	22.0	-	-	-
South Carolina	24.4	10.7	1.5	0.5	2.8
South Dakota	12.8	29.2	0.3	0.4	0.9
Tennessee	14.4	21.0	0.6	2.6	6.6
Texas	11.8	28.2	0.5	2.2	9.2
Utah	23.4	25.7	0.5	0.9	2.1
Vermont	38.6	28.4	1.6	1.9	2.3
Virginia	9.9	12.7	0.2	1.8	3.8
Washington	19.4	31.8	0.8	2.8	4.9
West Virginia	8.0	12.7	-	2.6	4.2
Wisconsin	38.1	37.5	1.3	2.0	4.3
Wyoming	9.3	18.3	0.1	0.4	3.9
United States [1]	17.2	29.1	0.8	1.8	4.5

See footnote(s) at end of table.

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Percent of Total Calf Non-Predator Losses by Type – States and United States: 2010 (continued)
[Totals may not add due to rounding]

State	Weather related	Calving problems	Poisoning	Theft	Other non-predator	Unknown non-predator
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	20.5	22.0	0.2	0.7	7.1	21.8
Arizona	9.3	12.1	0.2	3.1	3.6	24.2
Arkansas	16.6	20.1	8.5	-	5.9	13.6
California	3.6	7.0	0.1	0.1	1.9	7.1
Colorado	15.8	17.1	2.4	0.2	4.1	7.2
Connecticut	1.6	7.3	-	-	4.2	20.1
Delaware	-	35.4	-	-	-	5.9
Florida	11.0	29.2	0.4	0.1	0.3	13.4
Georgia	7.0	35.6	2.6	-	3.7	22.5
Hawaii	66.5	5.9	-	1.2	4.3	4.9
Idaho	5.4	20.5	0.1	0.2	1.0	3.7
Illinois	13.7	20.5	-	-	8.6	5.0
Indiana	7.3	13.4	0.1	-	6.1	15.3
Iowa	12.5	19.2	0.6	-	4.1	8.4
Kansas	24.6	15.3	0.1	0.5	2.4	9.4
Kentucky	19.4	13.5	0.7	0.6	3.5	18.4
Louisiana	23.4	22.8	3.1	2.0	5.4	11.7
Maine	11.4	10.9	-	-	1.3	8.2
Maryland	32.8	9.4	-	-	5.9	12.6
Massachusetts	10.3	12.5	-	-	14.7	8.6
Michigan	5.0	5.6	-	0.2	4.3	8.7
Minnesota	7.6	16.4	0.9	-	1.9	7.2
Mississippi	12.7	31.1	0.4	0.6	2.1	17.9
Missouri	28.8	20.7	0.1	-	2.2	9.6
Montana	27.1	22.4	1.3	2.3	1.6	15.4
Nebraska	28.0	23.2	0.3	-	1.3	5.1
Nevada	9.2	7.5	0.7	-	-	47.3
New Hampshire	-	19.0	1.1	-	0.5	4.0
New Jersey	21.6	27.2	-	-	12.5	17.4
New Mexico	15.1	6.0	1.1	3.2	4.5	13.9
New York	1.7	10.9	0.2	0.3	4.1	4.9
North Carolina	17.7	16.8	0.3	0.4	3.6	21.0
North Dakota	26.3	17.7	0.2	0.1	2.8	5.6
Ohio	8.3	24.7	-	-	0.6	2.6
Oklahoma	15.0	17.8	0.7	1.5	4.6	11.8
Oregon	10.5	19.2	0.2	-	2.8	11.2
Pennsylvania	2.5	12.9	0.6	-	3.6	10.1
Rhode Island	4.9	29.2	-	-	4.9	-
South Carolina	3.8	23.9	0.3	-	1.2	30.9
South Dakota	36.8	15.6	0.1	0.1	0.6	3.2
Tennessee	11.0	26.8	0.6	0.5	6.0	9.9
Texas	10.9	11.5	0.5	0.4	3.8	21.0
Utah	21.3	7.7	0.2	2.2	2.1	13.9
Vermont	1.6	9.5	-	-	2.2	13.9
Virginia	30.0	15.5	0.3	-	12.1	13.7
Washington	3.7	17.1	0.1	-	3.2	16.2
West Virginia	52.6	12.4	-	0.6	2.2	4.7
Wisconsin	5.5	5.7	0.3	-	1.6	3.7
Wyoming	29.0	25.0	0.5	0.4	2.6	10.5
United States [1]	15.4	15.8	0.6	0.4	3.3	11.1

- Represents zero or less than 0.1 percent.
[1] Excludes Alaska.

Cattle Death Loss (May 2011) **13**
USDA, National Agricultural Statistics Service

EXHIBIT 5

Percent of Operations using Non-Lethal Methods to Prevent Losses of Cattle and Calves to Predators by Method– States and United States: 2010

[Use of multiple non-lethal methods will result in percentages summing to greater than 100]

State	Guard animals	Exclusion fencing	Herding	Night penning	Fright tactics
	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama	53.0	32.1	1.2	1.5	1.4
Arizona	26.8	8.5	81.8	53.4	0.1
Arkansas	51.7	15.0	0.3	11.1	3.2
California	29.8	74.6	1.6	0.5	1.4
Colorado	27.5	22.6	1.7	28.5	2.7
Connecticut	59.0	35.2	1.2	1.2	-
Delaware	-	-	-	-	-
Florida	37.4	14.1	2.8	2.3	0.5
Georgia	49.2	31.9	1.9	0.6	-
Hawaii	0.8	80.6	0.4	-	2.1
Idaho	21.8	19.6	10.9	12.7	12.8
Illinois	39.9	42.5	2.9	20.6	2.7
Indiana	16.4	36.8	2.3	18.0	4.8
Iowa	46.5	22.3	-	6.6	-
Kansas	19.1	10.3	7.1	-	8.3
Kentucky	36.9	52.2	2.2	1.7	0.2
Louisiana	31.0	38.5	7.9	-	2.0
Maine	46.5	85.7	-	7.6	-
Maryland	-	80.5	-	-	-
Massachusetts	26.7	93.1	1.2	22.7	0.5
Michigan	38.6	23.3	-	2.8	0.8
Minnesota	59.0	24.9	5.2	12.8	6.7
Mississippi	72.4	17.2	-	-	-
Missouri	35.9	31.2	6.0	4.8	-
Montana	34.6	3.1	12.7	19.8	4.4
Nebraska	24.5	48.1	1.7	5.1	2.7
Nevada	58.1	-	-	-	-
New Hampshire	4.0	59.6	5.2	13.2	-
New Jersey	0.8	94.1	-	17.8	19.3
New Mexico	38.0	25.3	5.7	11.5	0.1
New York	23.8	51.0	9.3	4.9	2.0
North Carolina	64.0	36.2	0.7	0.5	0.4
North Dakota	38.6	19.2	1.5	1.0	16.4
Ohio	30.1	59.0	2.0	22.7	0.7
Oklahoma	41.8	24.7	8.9	3.6	3.2
Oregon	27.3	24.4	1.7	7.2	1.9
Pennsylvania	6.3	78.4	5.6	5.7	2.0
Rhode Island	10.9	94.5	5.5	13.1	-
South Carolina	16.5	65.7	7.3	-	0.5
South Dakota	39.9	16.9	0.6	14.6	4.5
Tennessee	33.9	33.9	4.6	4.2	0.5
Texas	50.2	24.1	4.7	1.2	1.3
Utah	17.9	79.2	6.9	0.5	0.4
Vermont	37.3	82.7	4.5	4.5	-
Virginia	36.8	17.8	10.1	6.0	5.1
Washington	45.7	32.2	1.6	0.4	10.7
West Virginia	47.0	47.3	15.3	9.9	0.1
Wisconsin	27.0	41.3	5.4	22.1	5.0
Wyoming	19.8	23.5	22.7	19.4	3.5
United States [1]	36.9	32.8	5.3	6.6	2.5

See footnote(s) at end of table.

--continued

Percent of Operations using Non-Lethal Methods to Prevent Losses of Cattle and Calves to Predators by Method– States and United States: 2010 (continued)

[Use of multiple non-lethal methods will result in percentages summing to greater than 100]

State	Livestock carcass removal	Culling	Frequent checks	Other non-lethal
	(percent)	(percent)	(percent)	(percent)
Alabama	17.2	20.4	14.2	2.4
Arizona	0.7	5.4	46.8	0.6
Arkansas	7.8	46.6	22.5	-
California	26.6	5.2	20.3	7.3
Colorado	21.1	18.6	36.8	17.6
Connecticut	1.2	-	-	5.9
Delaware	-	-	-	100.0
Florida	74.2	68.5	80.6	0.4
Georgia	25.1	34.9	21.0	9.2
Hawaii	2.1	12.8	9.9	4.5
Idaho	28.8	36.3	66.4	13.4
Illinois	38.5	28.1	13.7	4.2
Indiana	40.1	31.3	35.3	4.3
Iowa	22.8	30.7	32.3	23.9
Kansas	45.4	40.6	41.4	1.4
Kentucky	14.2	14.2	18.1	4.8
Louisiana	17.9	19.7	24.5	18.9
Maine	-	-	-	-
Maryland	14.0	32.4	29.3	1.3
Massachusetts	-	-	-	-
Michigan	15.4	24.7	14.5	11.2
Minnesota	17.7	14.7	23.1	3.7
Mississippi	0.7	0.7	4.1	14.0
Missouri	18.8	44.4	15.3	0.1
Montana	36.9	30.1	26.6	17.1
Nebraska	63.7	72.7	64.9	11.6
Nevada	17.1	23.3	36.2	-
New Hampshire	4.0	3.8	28.5	1.1
New Jersey	2.9	8.3	20.7	0.8
New Mexico	13.5	9.2	37.6	0.9
New York	11.5	26.5	19.3	2.0
North Carolina	10.7	2.6	9.3	-
North Dakota	20.8	30.8	26.6	11.5
Ohio	22.6	19.8	44.4	4.4
Oklahoma	18.2	24.7	16.7	14.3
Oregon	12.9	12.6	60.9	5.9
Pennsylvania	17.5	21.2	15.2	7.4
Rhode Island	18.5	13.1	18.5	-
South Carolina	28.3	26.6	39.0	1.0
South Dakota	12.1	18.8	37.7	15.3
Tennessee	25.3	22.0	45.0	7.6
Texas	8.1	31.4	29.6	7.2
Utah	12.6	21.9	17.6	50.8
Vermont	4.5	12.7	4.5	-
Virginia	34.3	47.9	37.7	14.8
Washington	1.3	2.6	2.2	11.4
West Virginia	10.2	33.8	15.2	13.9
Wisconsin	19.0	22.4	31.4	6.6
Wyoming	42.9	28.3	47.0	8.3
United States [1]	23.9	28.9	32.1	7.0

- Represents zero or less than 0.1 percent.
[1] Excludes Alaska.

EXHIBIT 5

Statistical Methodology

Survey Procedures: A random sample of United States producers were contacted during the January Cattle Inventory survey to provide data for these estimates. Survey procedures ensured that all cattle producers, regardless of size, had a chance to be included in the survey. Large producers were sampled more heavily than small operations. Data were collected from about 40,000 operators during the first half of January by mail, telephone, and face-to-face personal interviews and 78 percent of the reports were usable.

Estimating Procedures: These estimates of death loss were prepared by the Livestock Branch of the National Agricultural Statistics Service using producer data from the January 2011 Cattle survey. Cattle and calf inventory estimates were published in the *Cattle* report released on January 28, 2011 while total cattle and calf death losses from all causes were published in the *Meat Animals Production, Disposition and Income* report released on April 28, 2011. In setting the predator and non-predator loss estimates, first total predator and non-predator losses were estimated first as a percent of total losses, then specific predator and non-predator losses were estimated as a percent of total predator and non-predator losses. Value estimates were rounded to the nearest $1,000.

Revision Policy: Revisions to previous estimates are made to improve current estimates. Previous year estimates are subject to revision when current estimates are made. Estimates of losses from all causes are subject to revision in next year's Meat Animals Production, Disposition and Income report. No revisions to predator and non-predator loss estimates are planned.

Reliability: Since all cattle operators are not included in the sample, survey estimates are subject to sampling variability. Survey results are also subject to non-sampling errors such as omissions, duplications, and mistakes in reporting, recording, and processing the data. The effects of these errors cannot be measured directly. They are minimized through rigid quality controls in the data collection process and through a careful review of all reported data for consistency and reasonableness.

Terms and Definitions

Cattle includes all cows, bulls, steers, and heifers weighing over 500 pounds. This includes beef and milk breeds as well as cattle on feed.

Calves include beef and milk breed steers, heifers, and bulls weighing less than 500 pounds.

Information Contacts

Listed below are the commodity specialists in the Livestock Branch of the National Agricultural Statistics Service to contact for additional information. E-mail inquiries may be sent to nass@nass.usda.gov

Dan Kerestes, Chief, Livestock Branch ..... (202) 720-3570

Scott Hollis, Head, Livestock Section ..... (202) 690-2424
- Travis Averill – Dairy Products Prices ..... (202) 690-2168
- Sherry Bertramsen – Livestock Slaughter ..... (515) 284-4340
- Doug Bounds – Hogs and Pigs ..... (202) 720-3106
- Jason Hardegree – Cattle, Cattle on Feed ..... (202) 720-3040
- Mike Miller – Milk Production and Milk Cows ..... (202) 720-3278
- Everett Olbert – Sheep and Goats ..... (202) 720-4751
- Lorie Warren – Dairy Products ..... (202) 690-3236

Access to NASS Reports

For your convenience, you may access NASS reports and products the following ways:

- All reports are available electronically, at no cost, on the NASS web site: http://www.nass.usda.gov
- Both national and state specific reports are available via a free e-mail subscription. To set-up this free subscription, visit http://www.nass.usda.gov and in the "Receive NASS Updates" box under "Receive reports by Email," click on "National" or "State" to select the reports you would like to receive.
- Printed reports may be purchased from the National Technical Information Service (NTIS) by calling toll-free (800) 999-6779, or (703) 605-6220 if calling from outside the United States or Canada. Accepted methods of payment are Visa, MasterCard, check, or money order.

For more information on NASS surveys and reports, call the NASS Agricultural Statistics Hotline at (800) 727-9540, 7:30 a.m. to 4:00 p.m. ET, or e-mail: nass@nass.usda.gov.

EXHIBIT 6

Letter from Governor John Huntsman, Jr. to Gale Norton about proposed boundaries for the Northern Rocky Mountain DPS.

Office of the Governor

State of Utah

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

March 6, 2006

Gale Norton
Secretary of the Interior
United States Department of the Interior
1849 C Street, N.W.
Washington DC 20240

Subject: Advanced Notice of Proposed Rulemaking for Delisting of Northern Rocky Mountain Gray Wolves

Dear Secretary Norton,

My purpose in writing is to express disappointment in the proposed boundary of the Northern Rocky Mountain (NRM) Distinct Populations Segment (DPS) for the Gray wolf and urge you, and the U.S. Fish and Wildlife Service (USFWS), to consider an alternative boundary.

On January 10, 2006, I sent you a letter requesting the entire State of Utah be included in the proposal to create an NRM DPS, and wolves within it be delisted. This request was consistent with the previously proposed boundary for a Western Gray Wolf DPS (65 FR 43450, July 13, 2000). In addition, the Utah Division of Wildlife Resources (UDWR) submitted comments through the formal process making the same request. To date we have not received a response from your office or the USFWS. Nor does it appear that the USFWS addressed the comments we submitted.

We do not believe that the DPS boundary currently being proposed is consistent with either the requirement for discreteness of a DPS or statements made by the USFWS in their 90-day finding on the Wyoming petition, which initiated the delisting proposal (70 FR 61770, October 26, 2005). According to USFWS policy a DPS may be considered discrete if it satisfies one of the following conditions: 1) It is markedly separated from other populations as a consequence of physical, physiological, ecological or behavioral factors; and/or 2) It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a) (1) (D) ("the adequacy of existing regulatory mechanisms") of the ESA (61 FR 4722, February 7, 1996).

East Capitol Complex Building, Suite E220, Salt Lake City, Utah 84114

EXHIBIT 6

The Wyoming petition makes three arguments for discreteness including differences in management among populations in the United States and Canada, physiological differences between populations, and geographic and ecological factors separating populations. In its 90-day finding, the USFWS agreed that each of these arguments was consistent with its own data and information (70 FR 61770, October 26, 2005). We take no issue with the differences in management or the physiological differences put forward in the Wyoming petition or the UFWS evaluation of these contentions and we believe that these are valid. We also believe there are geographic barriers separating the NRM wolf population from other populations, however, we do not believe there are geographic barriers separating the majority of Utah from the NRM wolf population. Nor do we believe that the current boundary proposal represents a discrete geographic barrier.

In the 90-day finding on the Wyoming petition the USFWS states: "we believe that the existing geographic isolation of wolf populations far exceeds the Vertebrate Populations Policy's criterion for discreteness" (68 FR 15818, April 1, 2003). The USFWS supported this statement based on the results of suitable habitat modeling published in scientific journals by Carroll et al. (2006) and Oakleaf et al. (in press) (70 FR 61770, October 26, 2005). Both of these publications clearly identify dispersal corridors of suitable habitat connecting the NRM wolf population with Utah (Figures 1 and 2) and Carroll et al. (2006) shows suitable habitat continuing throughout most of Utah (Figure 2).

Based on the findings of Carroll et al. (2006) and Oakleaf et al. (in press) we propose the following boundary for the NRM DPS, which we believe is consistent with the USFWS policy regarding the creation of a DPS and satisfies the requirement for discreteness. Beginning at the Utah-Idaho Border we propose that the boundary of the NRM DPS follow I-84 south to I-15, then south on I-15 to the Utah - Arizona Border, then east on this border to the Colorado River, and then east and north along the Colorado River to the Utah - Colorado Border (Figure 3). Our justification for this boundary proposal is as follows: 1) this area consists of suitable wolf habitat that is directly connected to the NRM wolf population (Carroll et al. 2006), and 2) we believe the physical characteristics of the Colorado River corridor through this area which includes the Grand Canyon, Lake Powell and Cataract Canyon represent a substantial barrier separating the NRM wolf population from the Mexican wolf population in central Arizona and New Mexico.

It is also important to recognize that Utah is not part of the historic range of the Mexican wolf (Figure 4) and therefore should not be subject to recovery efforts related to it. It is crucial that any boundary adjustments, whether for the NRM DPS or for the Mexican Wolf Nonessential Experimental Population Area, not result in inadvertent full protection for wolves (through "similarity of appearance" or other rule interpretations) that were intended to have lesser protection, whether in the context of a delisted population or an experimental population.

If our proposed boundary were to be adopted there is no reason to believe that wolves dispersing to Utah would not be managed responsibly. The Utah Wildlife Board passed the Utah Wolf Management Plan on June 9, 2005. This plan outlines how wolves will be managed in Utah and is similar to the current 4(d) rule under which wolves are being managed in the 10(j) area encompassing Idaho, Montana and Wyoming. In addition to a species specific management plan, wolves are also protected under State code and administrative rules. We believe that the existing regulatory mechanisms in Utah are adequate in light of section 4(a) (1) (D) ("the adequacy of existing regulatory mechanisms") of the ESA.

Thank you for taking the time to consider this request. We look forward to your response and the results of the upcoming meeting between USFWS Director Dale Hall, UDWR Director Jim Karpowitz and members of Utah's congressional delegation.

Sincerely,

Jon M. Huntsman, Jr.
Governor

cc: Dale Hall

Literature Cited:

Carroll, C. M. K. Phillips, C. A. Lopez-Gonzalez, and N. H. Schumaker. 2006. Defining recovery goals and strategies for endangered species; the wolf as a case study. Bioscience 56:25-37.

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

EXHIBIT 6

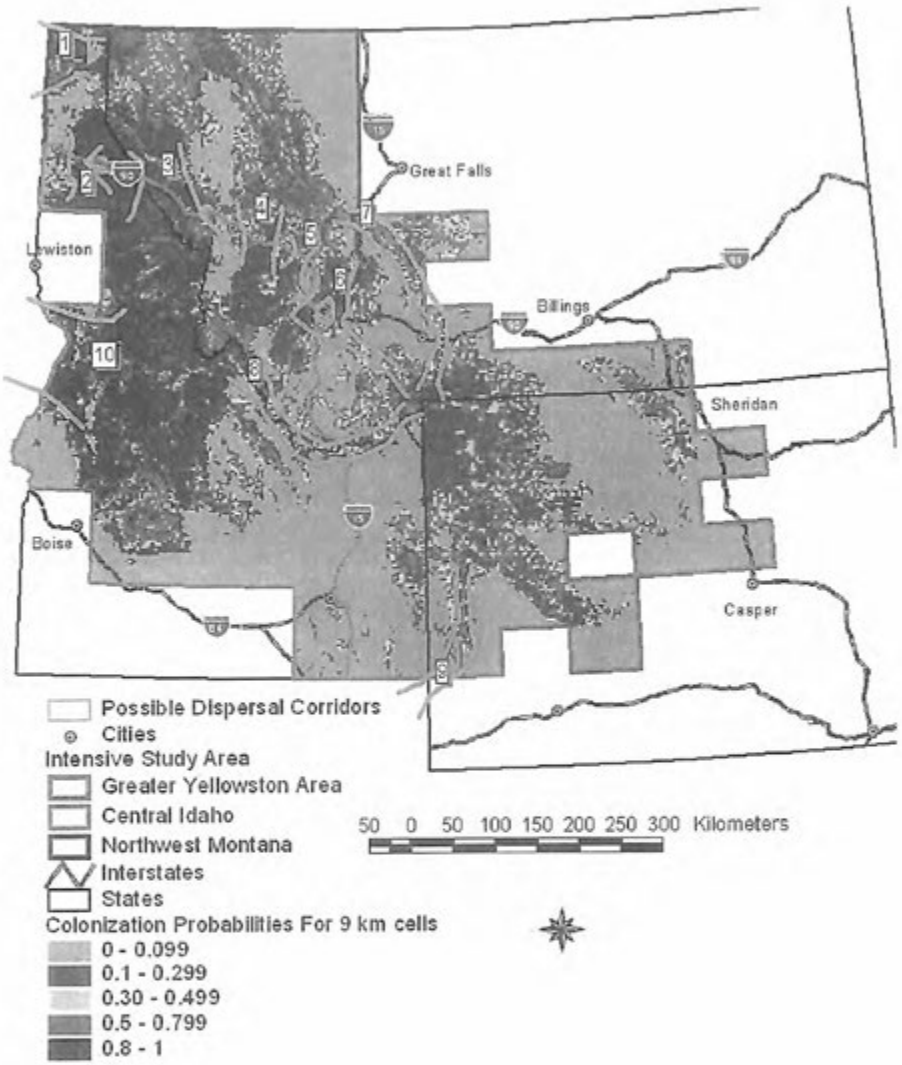

Figure 1. Suitable wolf habitat in the northern rocky mountains and dispersal corridors identified by Oakleaf et al. (in press) (adapted from Oakleaf et al. in press)

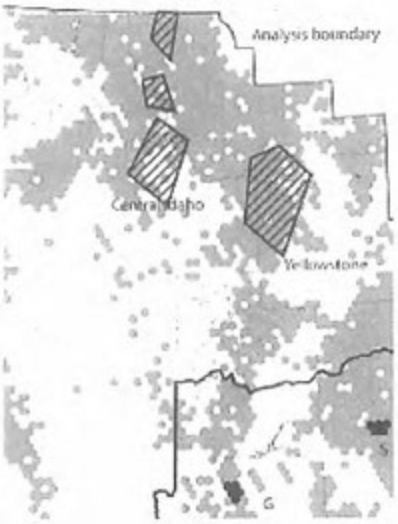

Figure 2. Map of occupied (cross hatched areas) and suitable (shaded areas) wolf habitat in the intermountain region, identifying suitable wolf habitat in Utah that is directly connected to the northern rocky mountain wolf population (Adapted from Carroll et al. 2006).

EXHIBIT 6

Figure 3. Proposed boundary for a northern rocky mountain distinct population segment for the gray wolf, which includes suitable wolf habitat in Utah that is directly connected to the NRM wolf population.

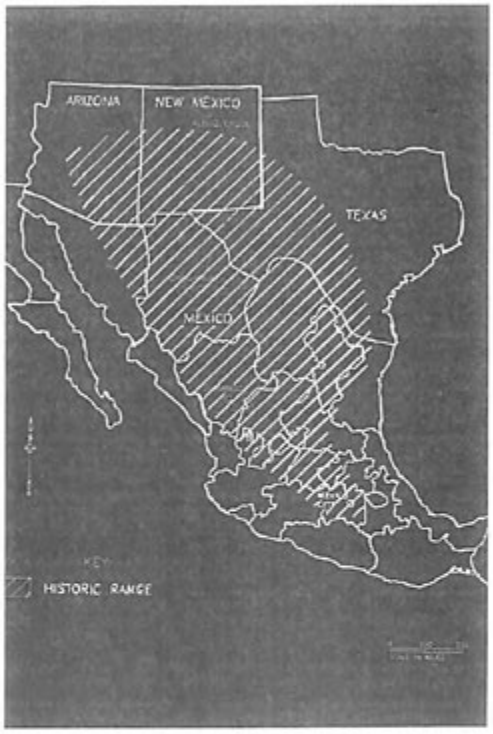

Figure 4. Historic range of the Mexican wolf

EXHIBIT 7

Letter from Jon Huntsman, Jr. to P. Lynn Scarlet inquiring about the delisting of Wolves in the State of Utah

STATE OF UTAH

JON M. HUNTSMAN, JR.
GOVERNOR

OFFICE OF THE GOVERNOR
SALT LAKE CITY, UTAH
84114-2220

GARY R. HERBERT
LIEUTENANT GOVERNOR

November 30, 2007

P. Lynn Scarlett, Deputy Secretary
U. S. Department of the Interior
1849 C Street, NW
Washington, D. C. 20240

Dear Secretary Scarlett:

The purpose of this letter is to inquire about the progress of de-listing wolves under the Endangered Species Act (ESA) in the State of Utah.

As you may recall, during a meeting last January with Utah Department of Natural Resources Executive Director Styler, it was agreed that if the Utah Wolf Management Plan was determined to be adequate, a delisting process, parallel to that being undertaken for the Northern Rocky Mountain (NRM) population would take place in Utah. The Utah Wolf Management Plan was submitted to the U. S. Fish and Wildlife Service (Service) Regional Director Mitch King in late January 2007. To date, we have received no communication about the status of this review. Meanwhile, it appears the delisting of the NRM population is moving forward. We respectfully request for the Service and the Department of the Interior to expedite the review of Utah's plan and start a similar delisting process for Utah.

Now that it is determined that wolves in the NRM are recovered, it makes ecological and economical sense to include Utah in the delisting process. The Service stated it has no plans to recover wolves in Utah. Furthermore, the Service noted that suitable wolf habitat in Utah occurs in isolated and fragmented sections, and is connected to the NRM habitat (see attached for details). A wolf finding its way to Utah would most certainly come from the NRM, a potentially delisted population.

Please respond to this inquiry with a plan, including a timeline, for how the Department of the Interior and the Service plan to proceed with the delisting of wolves in Utah. If you need additional information, please contact Michael Styler, Executive Director of the Utah Department of Natural Resources at 801-538-7201 or mikestyler@utah.gov. Thank you.

Sincerely,

Jon M. Huntsman, Jr.
Governor

cc: Michael Styler

EXHIBIT 8

Letter from Governor Gary Herbert to Secretary of the Interior Ken Salazar about the review of the Utah Wolf Management Plan and delisting wolves in Utah

COPY

STATE OF UTAH

GARY R. HERBERT
GOVERNOR

OFFICE OF THE GOVERNOR
SALT LAKE CITY, UTAH
84114-2220

GREG BELL
LIEUTENANT GOVERNOR

February 25, 2010

RECEIVED
MAR 1 / 2010
WILDLIFE DIRECTOR'S OFFICE

The Honorable Ken Salazar
Secretary of the Interior
U.S. Department of the Interior
1849 C Street, N.W.
Washington, D.C. 20240

Subject: Review of the Utah Wolf Management Plan and Delisting of Wolves in Utah

Dear Secretary Salazar,

This letter serves to renew our request to have the Utah Wolf Management Plan officially reviewed by the U.S. Fish and Wildlife Service (Service) and to have wolves in all of Utah removed from the protection of the Endangered Species Act. This issue has been ongoing for several years and former Governor Jon Huntsman sent two letters to your predecessor (Gale Norton) and one to former Deputy Secretary Lynn Scarlett regarding the status of wolves in Utah. These letters received no response. Copies of the letter are attached for your reference.

Delisting of the Northern Rocky Mountain (NRM) wolf population in only a small portion of northern Utah, as is currently the case, presents a serious dilemma. The Utah Wildlife Board approved the Utah Wolf Management Plan in 2005. This plan was intended for implementation when all of the State of Utah was delisted; however, this plan cannot be fully implemented given the current situation. The management of wolf conflicts is untenable, because the Utah Division of Wildlife Resources (Division) lacks authority to respond to conflicts in most of the state. Consequently, the Utah Legislature has recently passed a law requiring the Division to "*manage wolves to prevent the establishment of a viable pack in all areas of the State where the wolf is not listed as threatened or endangered under the Endangered Species Act until the wolf is completely delisted under the act and removed from federal control in the entire state*". As soon as delisting is accomplished in the entire state, the Utah Wolf Management Plan will be fully implemented.

To alleviate this situation, we urge the Service and the current administration of the Department of the Interior to honor the commitments made by then Interior Deputy Secretary, Lynn Scarlett, during a meeting in January 2007 with Utah Department of Natural Resources, Executive Director, Mike Styler. In this meeting, Ms. Scarlett promised to expedite a review of Utah's wolf management plan and to initiate a process to delist wolves in all of Utah. The Utah Wolf Management Plan was submitted to the director of the Mountain-Prairie Region of the Service shortly after this meeting. To date (3-years later), we have yet to receive any communication about the status of this review despite several inquiries.

EXHIBIT 8

We believe that wolves in Utah should be removed from the protections of the Endangered Species Act for the following reasons:

1. Utah has a Wolf Management Plan as a result of a rigorous public process that is fair and based on sound biological and social principles.

2. The Service has no intention to actively recover wolves in Utah through reintroductions or any other means (Ed Bangs, Wolf Recovery Coordinator, U.S. Fish and Wildlife Service, Pers. Communication). As such, it seems inconceivable that the Service would create the dilemma described above by delisting only a small portion of Utah and retaining management authority for the majority of the state with no intentions of pursuing recovery.

3. As noted in the final rule to delist the NRM wolf population and two recently published studies (Oakleaf et al. 2006 and Carrol et al. 2006), the potentially suitable wolf habitat in Utah is fragmented and isolated and therefore will not contribute to wolf recovery. Given this, delisting Utah is analogous to the inclusion of unsuitable habitat in the eastern portions of Montana and Wyoming and southern Idaho in the NRM delisting.

4. As recognized in the final rule to delist the NRM wolf population, Utah has adequate regulatory mechanisms in place in the form of state code, administrative rule, and a species management plan to ensure that any wolves that might disperse into Utah would have adequate legal protection.

Given these factors we hope you will agree that the only viable way forward is for the Department of the Interior and the Service to honor its previous commitment to expedite the review of the Utah Wolf Management Plan and initiate a process to delist wolves in Utah.

We respectfully request that the Service respond to this inquiry with a plan, including a timeline, describing how your administration will proceed with delisting wolves in Utah. If you need additional information, please contact Mr. Mike Styler, Executive Director, Utah Department of Natural Resources at (801) 538-7201 or mikestyler@utah.gov.

Thank you for your consideration.

Sincerely,

Gary R. Herbert
Governor

cc: Mike Styler, Executive Director, Utah Department of Natural Resources
James Karpowitz, Director, Utah Division of Wildlife Resources

EXHIBIT 9

Letter from Governor Gary Herbert to Secretary of the Interior Ken Salazar on a recovery plan for the Mexican wolf and delisting other wolves in the U.S.

STATE OF UTAH

GARY R. HERBERT
GOVERNOR

OFFICE OF THE GOVERNOR
SALT LAKE CITY, UTAH
84114-2220

GREG BELL
LIEUTENANT GOVERNOR

September 22, 2011

Ken Salazar, Secretary
Department of the Interior
1849 C Street, N.W.
Washington, D.C. 20240

Dear Secretary Salazar:

I am writing in regard to the on-going efforts by the Fish and Wildlife Service to list and develop a recovery plan for the Mexican wolf and delist the remainder of wolves in the United States. The State of Utah is participating on the Mexican wolf recovery team and we have serious concerns about the apparent direction the Service is taking. Under the ESA, the Service can protect the Mexican wolf as either a *distinct population segment* ("DPS") or as a *subspecies*. All of the states (Utah, Arizona, and Colorado) participating on the Mexican wolf recovery team support listing the wolf as a DPS rather than as a subspecies.

Despite the obvious advantages of a DPS listing over a subspecies listing, the Service remains inexplicably resistant to the concept. Thus far, the Service maintains it must list the Mexican wolf as a subspecies to ensure the greatest degree of management flexibility and legal defensibility. It further resists all efforts by the participating states to exclude Utah and Colorado from the Mexican wolf recovery equation, despite the lack of evidence that either state was within its core historic range. The only explanation they give is that Utah and Colorado have unoccupied wolf habitat, and therefore must contribute to the recovery of the Mexican wolf, even though the wolves that once occurred in Southern Utah and Colorado were a separate subspecies.

The State of Utah's position is twofold: 1) delist wolves in the remaining portions of the State; and 2) list and successfully recover the Mexican wolf in compliance with ESA and using the best scientific evidence available. The unavoidable conclusion is that the Mexican wolf must be listed, managed and protected by means of a distinct population segment that is confined to the core historic range of the subspecies. A more detailed letter explaining our position is being sent to Service Director Dan Ashe by the Utah Department of Natural Resources.

The State of Utah will vigorously resist any effort by the Service to: 1) leave wolves listed in the State, 2) list the Mexican wolf as a subspecies, or 3) include Utah within any distinct population segment created to protect wolves under the ESA.

Sincerely,

Gary R. Herbert
Governor

MOOSE STATUS AND MANAGEMENT IN MONTANA

Nicholas J. DeCesare[1], Ty D. Smucker[2], Robert A. Garrott[3], and Justin A. Gude[4]

[1]Montana Fish, Wildlife and Parks, 3201 Spurgin Road, Missoula, Montana, USA 59804; [2]Montana Fish, Wildlife and Parks, 4600 Giant Springs Road, Great Falls, Montana, USA 59405; [3]Fish and Wildlife Ecology and Management Program, Department of Ecology, Montana State University, 310 Lewis Hall, Bozeman, Montana, USA 59717; [4]Montana Fish, Wildlife and Parks, 1420 East Sixth Avenue, Helena, Montana, USA 59620.

ABSTRACT: Moose (*Alces alces*) are currently widespread across Montana where regulated moose hunting has occurred since 1872, >140 years ago. The number of annual moose hunting permits has averaged 652 over the past 50 years. The popular permits are allocated via a random drawing, with an annual average of ~23,000 applicants in 2008–2012 who faced a 1.9% chance of success. Monitoring of moose largely occurs through annual harvest statistics collected via post-season phone surveys. Recent harvest statistics indicate lower hunter success, increased effort, and lower kill per unit effort, concurrent with >50% reduction in available permits since the 1990s. Aerial surveys also show decline in calf:adult ratios. In combination, these data suggest a declining trend in the statewide population, despite some ambiguity of certain data. Potential limiting factors include harvest, predation, vegetative succession and degradation, parasites, and climatic conditions, which were all identified as concerns in surveys of state biologists. Accordingly, Montana Fish, Wildlife and Parks will direct funds derived from moose permit auctions toward calibrating and refining statewide monitoring methods and research of population dynamics and potential limiting factors of Montana moose.

ALCES VOL. 50: 35–51 (2014)

Key words: *Alces alces shirasi*, *Elaeophora schneideri*, harvest statistics, hunter success rates, KPUE, Montana, Shiras moose, subspecies.

Moose (*Alces alces*) colonized North America roughly 14,000 years ago and have since occupied much of Alaska, Canada, and northern portions of the contiguous United States (Hundertmark et al. 2002, Hundertmark and Bowyer 2004). Considered rare throughout the U.S. Rocky Mountains until the mid-1800s (Karns 2007), their earlier presence in several regions of Montana were documented by the Lewis and Clark expedition in 1805–1806, Alexander Ross in 1824, and others (reviewed by Schladweiler 1974). Widespread prevalence of moose in Montana during early settlement is supported to some extent by a review of place names throughout the state, including at least 22 creeks and 6 lakes bearing "moose" in their names (Schladweiler 1974).

Regulation of moose hunting in Montana began in 1872, yet after subsequent decline brought near extirpation, hunting was closed statewide for almost 50 years from 1897–1945 (Stevens 1971). In 1910, the state warden estimated a rebounding population of 300 moose as the result of "ten years of careful protection" (State of Montana 1910). Allowable harvest began again in 1945 with 90 permits issued. Subsequently, annual permit numbers rose quickly to a maximum of 836 in 1962, and thereafter averaged 652 until 2012 (Fig. 1a). The limited number of permits have been allocated via a random drawing process. In 2008–2012, an average of ~23,000 hunters applied annually for <600 permits, with a 1.9% chance of success. Beginning in 1988, one

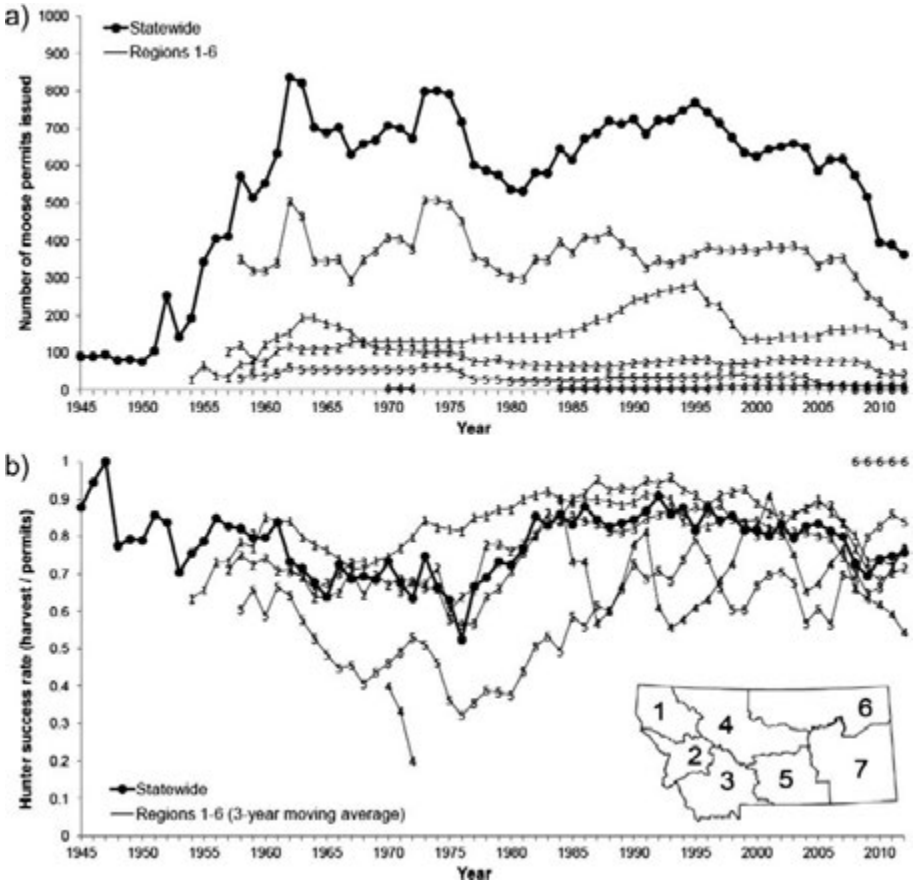

Fig. 1. Statewide and regional trends of a) number of permits issued and b) hunter success rates (number harvested/number of permits issued) for moose in Montana, 1945–2012.

additional permit has been auctioned to the highest bidder, with revenue directly earmarked for moose management or research. Additionally, since 2006 applicants can purchase unlimited numbers of chances at drawing one available moose "super-tag," valid in any permitted hunting district. Along with super-tag chances for other species, revenue from these sales is earmarked for hunting access programs and wildlife habitat conservation.

Moose in Montana typically occur at relatively low density and are vastly outnumbered by seasonally sympatric elk (*Cervus elaphus*), white-tailed deer (*Odocoileus virginianus*), and mule deer (*O. hemionus*) populations. Relative ungulate densities are reflected in their harvest level; in 2012 hunters harvested ~274 moose versus >20,000 elk, 37,000 mule deer, and 49,000 white-tailed deer. Rigorous statewide abundance estimates of moose are lacking, but based on professional opinion among regional management biologists in 2006, the estimated statewide population was 4,500–5,500, albeit without estimable accuracy or precision

(Smucker et al. 2011). Moose are distributed widely across western portions of the state, with lower density extending to the east, as reflected by the current distribution of allowable harvest (Fig. 2). The majority of annual permits are offered in the southwest (56% in Region 3) and northwest (25% in Region 1). In recent decades moose have continued to colonize, or re-colonize, portions of central and eastern Montana allowing for added harvest opportunity.

Moose occupy forested landscapes throughout western Montana ranging from regenerating areas within dense mesic forest, such as the Cabinet Mountains in the northwest, to areas with extensive willow fen habitat, as found within the Centennial and Big Hole Valleys in the southwest. Moose in the prairie landscapes of the east inhabit wetlands, particularly along the Missouri river, other riparian corridors, and areas supporting healthy willow communities.

TAXONOMY

Moose within the Rocky Mountains of the United States have historically been classified as Shiras moose (*A. a. shirasi*). The subspecies was first described in Wyoming (Nelson 1914), and subsequent morphological sampling by Peterson (1952) suggested its range to extend northward through Montana and into a zone of intergradation with the northwestern subspecies (*A. a. andersoni*) in western Alberta and eastern British Columbia. While genetic evaluation of subspecies designations using mitochondrial haplotypes generally upheld some level of differentiation between Shiras moose in Colorado and representative samples from other subspecies (Hundertmark et al. 2003), such methods have not been applied to evaluate moose in Montana. Particular interest in subspecies distinctions has arisen recently with anecdotal evidence of immigration of moose in northern and northeastern Montana from expanding populations in southern Alberta and Saskatchewan. For example, the Boone and Crockett Club has traditionally used the Canadian border to distinguish Shiras from "Canada" moose (a designation that essentially lumps northwestern and eastern [*A. a. americana*] subspecies into a

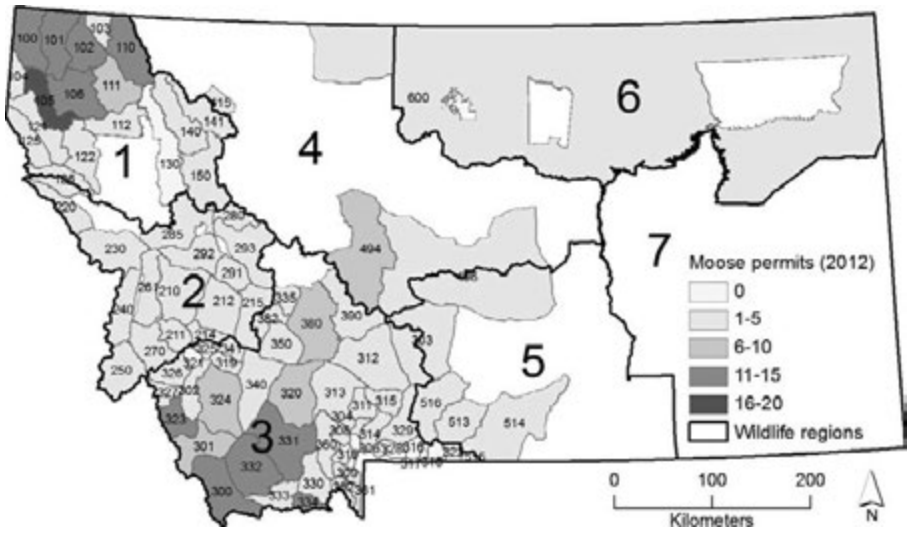

Fig. 2. Number of moose permits issued by moose hunting district in Montana, 2012.

single category) in scoring and record keeping of trophy animals. The advent of hunting in northeastern Montana's hunting district 600 has prompted informal discussion of classifying moose harvested within northern Montana and east of interstate highway I-15 as Canada moose, though none have been submitted for scoring to date (personal communication, J. Spring, Boone and Crockett Club, Missoula, Montana). Further sampling and analysis of population genetic structure of moose within and surrounding Montana may be needed to evaluate and update the subspecies range extents in the region.

MONITORING METHODS AND DATA

Resources have been limited for monitoring moose given their relatively low abundance and hunting opportunity compared to other Montana ungulates. Post-season surveys of permit holders have been used to estimate wildlife harvest since 1941 (Cada 1983, Lukacs et al. 2011), and in recent years phone surveys are used to collect annual harvest data. Montana Fish, Wildlife & Parks (MFWP) attempts to survey every permit holder to measure hunter success and effort, and adjusts harvest estimates according to annual hunter responses and rates. During 2005–2012, surveys yielded hunter response rates of 81–96% and statewide harvest estimates with coefficients of variation of 0.6–2.3%. These are the most consistent monitoring data through time and across the state, and are estimated distinctly for each district and permit type. Though potentially less precise than more intensive aerial survey methods, hunter statistics provide a cost-effective means for monitoring moose population trend (Boyce et al. 2012). Generally, there are 4 statistics computed annually that provide insight into potential moose population trends: 1) number of permits issued, 2) hunter success rate, 3) days of moose hunter effort, and 4) kills per unit effort (KPUE).

Beyond harvest statistics, MFWP biologists in most regions have made at least intermittent efforts to conduct aerial surveys, but sustained survey efforts are limited to the few areas with historically higher density. In the northwest (Region 1), December helicopter surveys have been conducted annually since 1985 in a subset of moose hunting districts centered around the Cabinet, Purcell, Salish, and Whitefish Mountains. Moose in this densely forested region selectively use and are more visible in regenerating (15–30 years old) stands during early winter, but move into mature, closed-canopy forest as winter progresses (Matchett 1985). While an explicit model with sightability covariates has not been developed for the area, an early 1990s mark-resight study with 81 neck-banded individuals produced average sightability estimates of 0.53–0.55 (Brown 2006). In the southwest (Region 3), fixed-wing aerial surveys have been conducted during most years since the 1960s in the hunting districts of the Big Hole and Centennial Valleys. These surveys typically yield calf:adult ratios and uncorrected minimum counts, and their timing (September–May) has varied considerably by year and district. Sporadic helicopter and fixed-wing aircraft surveys have occurred in other lower-density regions of the state including Regions 2, 4, and 5. The MFWP is currently exploring the utility and cost-effectiveness of standardizing and coordinating survey efforts.

The MFWP is also exploring the utility of cheaper monitoring methods including hunter sighting surveys at voluntary hunter check stations, and post-season phone surveys used to measure deer and elk harvests. While both the observation rate and age ratios collected from hunter sightings can be indicative of population trends (Ericsson and Wallin 1999, Bontaities et al. 2000), there is potential to incorporate spatial and temporal attributes of sightings data into a patch occupancy modeling framework

similar to recent efforts with hunter sightings of wolves (*Canis lupus*; Rich et al. 2013). Additionally, the MFWP is exploring the cost-effectiveness of estimating population trends using the fates and reproductive status of marked individuals (*sensu* Lukacs et al. 2009) which can be integrated into population models that estimate annual growth rate (DeCesare et al. 2012).

MOOSE HARVEST STATISTICS AND TREND

As a consequence of perceived population declines and declining population indices from harvest data in recent decades, the number of moose permits issued in Montana was reduced by 53% (769 to 362) between 1995 and 2012 (Fig. 1a). Most reductions were in areas with traditionally the most available permits (Regions 1 and 3). In contrast, the first 2 permits ever offered in northeastern Montana (Region 6) were added in 2008. Notably, the 2010 hunting season was the first in more than 50 years when the number of statewide permits was <500 (Fig. 1a).

Statewide hunter success is estimated as the number of moose harvested relative to the number of permits issued, averaging 78.4% during regulated moose hunting in Montana (1945–2012; Fig. 1b). This success rate is similar to that in adjacent Idaho (61–85%; Toweill and Vecellio 2004), but relatively higher than in other areas with typically more moose and moose hunters such as Alberta (30–50%; Boyce et al. 2012), Alaska (28–37%; Schmidt et al. 2005), Newfoundland (25–54%; Fryxell et al. 1988), and Ontario (36–40%; Hunt 2013). From 2008–2012, success rates (average = 73.4%) were lower than the previous 20-year average (83.7%; $t = 2.07$, 23 df, $P < 0.001$). Additionally, hunter effort, defined as the number of days spent hunting moose per hunter, increased from 6.3 in 1986 to ≥11 days/hunter in 2010–2012 (Fig. 3). Similarly, kill per unit effort (KPUE) that integrates hunter success and effort statistics into a metric of

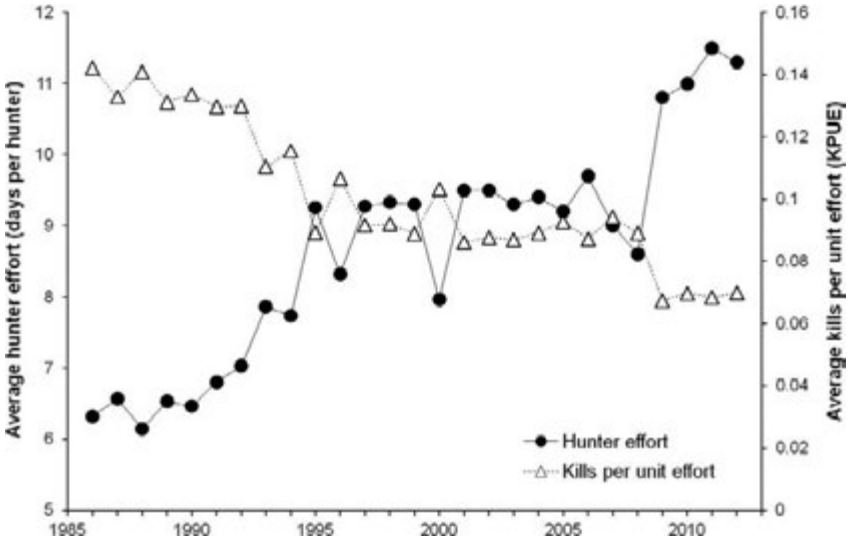

Fig. 3. Statewide annual averages of moose hunter effort (days per hunter) and moose kill per unit effort (KPUE) in Montana, 1986–2012.

hunter efficiency, declined >50% from >0.14 to <0.07 moose killed per hunter-day over the same time period (Fig. 3). The KPUE for antlered bull-specific tags also varied by hunting district level (Fig. 4), reflecting regional differences in moose distribution and ecotypes (e.g., more closed forests in the northwest compared to more open foothills and large riparian complexes in the southwest).

In combination, lower hunter success and KPUE, increased hunter effort, and a concurrent >50% reduction in available permits are indicative of a declining statewide population trend. In Ontario, years with fewer permits resulted in increased hunter success rate, even after accounting for changes in underlying moose density (Hunt 2013), which suggests that hunter behavior can complicate interpretation of hunter statistics (Bowyer et al. 1999, Schmidt et al. 2005). Change in permit type over space and time (e.g., shifting between antlered bull, antlerless, or either-sex permits) can also complicate or confound interpretation of hunter statistics. For example, recent (2008–2012) increases in KPUE also coincide with a prescribed reduction in the antlerless harvest that may reduce KPUE by limiting the proportion of animals hunters are allowed to harvest, regardless of underlying population dynamics. Thus, we cautiously interpret harvest statistics as imperfect indices. Concurrent declines in available permits, success rates, and KPUE may result from population decline and/or reflect other confounding factors.

In addition to statewide hunter statistics, regional calf:adult ratios in areas with consistent aerial survey data indicate decline in recruitment (Fig. 5). Three distinct survey areas show significant ($P < 0.05$) overall declines in ratios since 1980, though the temporal pattern of decline may be non-linear with subsequent stability at a lower level in recent years (Fig. 5). Low or declining recruitment is often associated with declining ungulate populations (e.g., DeCesare et al. 2012), so these data may be corroborative with harvest statistics that indicate a

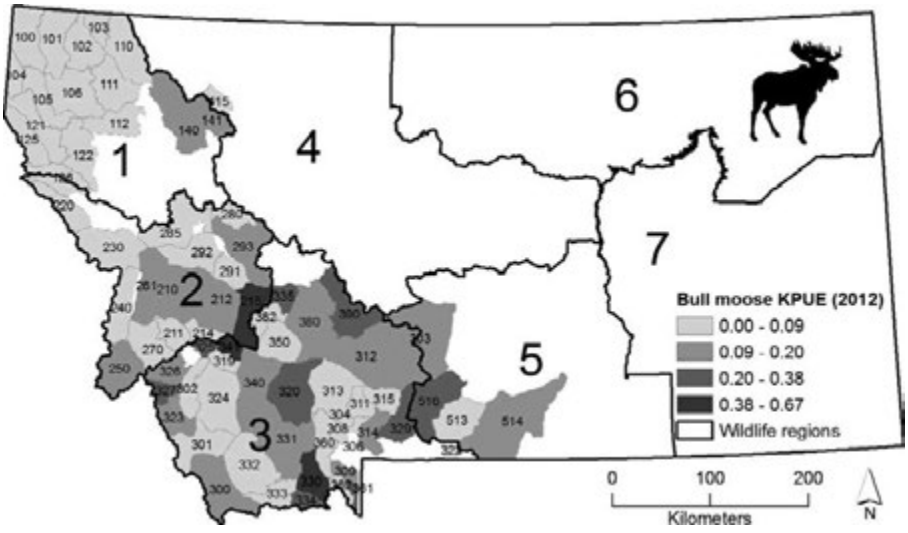

Fig. 4. Bull moose kills per unit effort (KPUE; effort recorded in days) per moose hunting district by hunters carrying antlered-bull-only permits in Montana, 2012.

declining moose population. However, declining recruitment may also reflect an ungulate population approaching carrying capacity (Gaillard et al. 1998, Eberhardt 2002), so this index also does not unambiguously indicate decline.

Biologist interviews: local trends and management

In 2010, we used structured interviews of 20 MFWP and cooperating agency biologists to assess the state of knowledge regarding moose population status, management, and factors of concern within Montana (Appendix A). A majority (63%) of responding biologists reported "decreasing" or "stable to decreasing" trends in their populations, with stable and increasing trends reported in some areas. These trend assessments are tempered, however, because only 10% of biologists had adequate data for making management decisions; 55 and 35% described their data as partially inadequate and inadequate, respectively. Lastly, when asked about factors that potentially limit local moose populations, biologist listed predation (70%), habitat succession (45%), MFWP-permitted hunter harvest (45%), parasites and/or disease (40%), Native American hunter harvest (30%), and habitat loss or fragmentation (15%).

POTENTIAL LIMITING FACTORS

Many factors may currently limit moose abundance and distribution including hunter harvest, predation, habitat succession, parasite and disease prevalence, and climatic conditions. The relative importance of these factors has likely changed over time. Overharvest may have been responsible for decline in moose numbers in the late 1800s (Stevens 1971). By the early 1970s, research

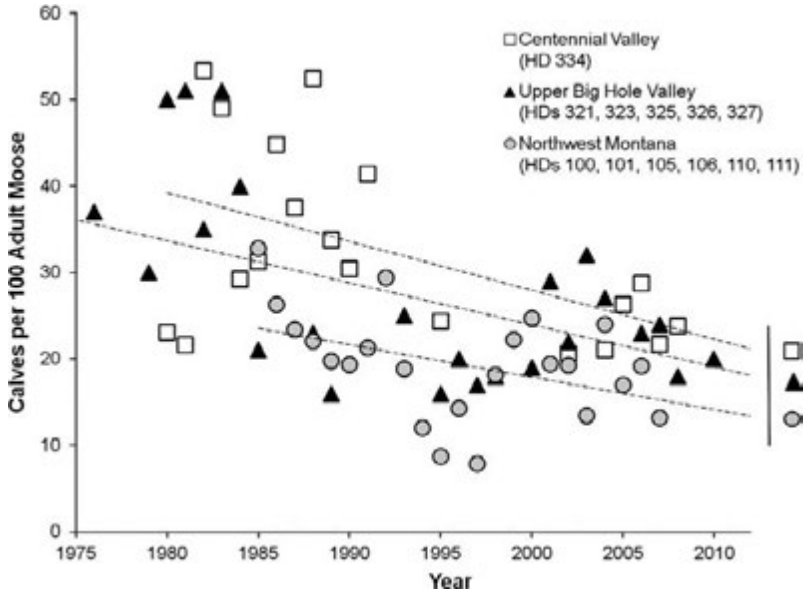

Fig. 5. Annual moose calves per 100 adult recruitment data and associated linear regression trend lines calculated from fixed-wing and helicopter late winter aerial surveys in 3 regions of Montana, 1976–2010.

in southwest Montana indicated that hunter harvest and nutritional inadequacies were the most important factors limiting moose populations, whereas parasites, disease, and predation had little direct effect on mortality rates (Schladweiler 1974). Presently there is a need to re-evaluate the relative importance of potential limiting factors in light of recent changes in many of these factors and subsequent monitoring and research in Montana and elsewhere.

Hunter harvest

The goals and objectives behind moose hunter harvest quotas vary somewhat across MFWP regional jurisdictions. Managers in Regions 1 and 3, where populations are largest, generally aim to sustainably maximize hunter opportunity and minimize landowner conflicts (e.g., greater numbers of permits that include either-sex or antlerless opportunities), whereas regions 2, 4, 5, and 6 manage harvest with less intent to affect moose population dynamics (e.g., bull-only hunting or low permit numbers). During the past 2 decades, numbers of antlerless permits were increased substantially in certain areas, particularly in Region 3, in response to depredation complaints, perceptions that moose were unfavorably limiting vegetative growth (i.e., riparian plants), and high moose counts on aerial surveys. These prescriptive increases in moose permits were intended to induce local declines in some hunting districts.

Statewide, the sex ratio of harvested adult moose (i.e., excluding calves) averaged 28% female in 1971–2008, but dropped to an average of 14% in 2009–2012; female harvest is through either-sex and antlerless-only permits. In Region 1, either-sex tags were issued historically, and harvest was typically skewed heavily towards males; the 1984–2004 harvest was 78% bulls, 19% cows, and 3% calves. As of 2012, all permits in this region were changed to antlered-bull only. In Region 3, permits have been typically specified as antlered- or antlerless-only, which is more restrictive to hunters but facilitates targeted management.

Additional moose harvest by members of the Confederated Salish and Kootenai Tribes (CSKT) is permitted off-reservation by the Hellgate Treaty of 1855. One permit per year is allowed to each interested Tribal member for hunting on primarily federal land, with mandatory reporting to CSKT officials. While the sample size of animals harvested is lower than that regulated by MFWP, these harvest data provide additional opportunity for indexing population trend and are without confounding changes in permit number and type. Trends in tribal harvest are similar to that of the MFWP (Fig. 6); total harvest peaked in 1991 at 97 representing an additional 16.3% to the MFWP harvest of 595, and in 2012 the Tribal harvest was only 18, an additional 6.6% to the MFWP harvest of 274 moose. We point out that interpretation of tribal harvest statistics with respect to the rate of population change is also not unambiguous. While some evidence exists of reduced success by tribal hunters (Fig. 6), a portion of the decline can probably be attributed to fewer permit requests. Also, these data do not include information about hunter effort or tribal interest in hunting other game species as allowed by treaty rights.

Illegal harvest of moose also occurs but has not been quantified to date. Data from Idaho suggest that illegal harvest can represent upwards of 31–50% of mortality (Pierce et al. 1985, Toweill and Vecellio 2004), warranting explicit monitoring and documentation of such in Montana.

Predation

After decades of predator control in the early and mid-1900s, and subsequent recovery efforts in the late 1900s, Montana currently hosts widespread populations of

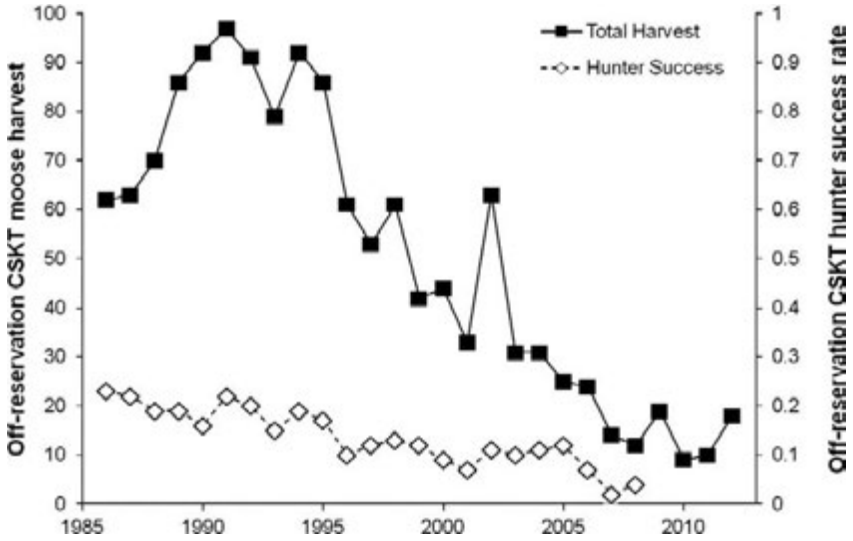

Fig. 6. Moose harvest and hunter success rates by members of the Confederated Salish and Kootenai Tribes (CSKT) off-reservation (primarily on federal lands in western Montana), 1986–2012.

grizzly bears (*Ursus arctos*), black bears (*Ursus americanus*), wolves, mountain lions (*Puma concolor*), and coyotes (*Canis latrans*). While predation was not considered a concern 40 years ago (Schladweiler 1974), the expanded composition and abundance of predator species may have the potential to limit local moose populations. Predation was the most common concern of regional biologists relative to moose population dynamics.

Research on winter prey selection by recolonizing wolves in the North Fork of the Flathead River drainage from 1986–1996 indicated that while wolves disproportionately used areas where deer were concentrated, they preferentially killed larger moose and elk over more abundant deer. Moose, particularly calves and cows, comprised a greater proportion of wolf kills as winter progressed (Kunkel et al. 2004). However, annual survival of 32 adult female moose monitored concurrently in the North Fork (1990–1992) was relatively high (0.9137 ± 0.0773; Langley 1993), with 3 mortalities attributable to predation (1 wolf and 2 grizzly bear). In a recent dietary study of 12 wolf packs in northwest Montana, moose was the most common prey item based on stable isotope analysis, constituting an average of 41% of the diet; however, these results were not supported by scat analysis from a sub-set of 4 packs in which moose averaged 18% of the diet (Derbridge et al. 2012).

High densities of elk and deer throughout much of the Rocky Mountain region may support higher predator populations and facilitate increased predation rates on sympatric moose via apparent competition (Holt 1977). In such cases, a less abundant, secondary prey species can become more vulnerable to depensatory predation when faced with predator populations boosted by more numerous primary prey species (Messier 1995, Garrott et al. 2009). While

moose across much of Canada have been attributed with the role of a primary prey species driving predator-mediated declines in less abundant woodland caribou (*Rangifer tarandus caribou*) populations (DeCesare et al. 2010), they may in fact be vulnerable themselves to such a mechanism within the elk- and deer-dominated prey populations of Montana. The effects of apparent competition from increased predation risk may be reduced somewhat by differential selection of winter and calving habitat among ungulates. Moose in Montana typically use higher elevations during winter and may accordingly spatially separate themselves from increased predation risk in some cases (Jenkins and Wright 1988, Burcham et al. 2000, Kunkel and Pletscher 2001).

The ultimate effect of predators on prey dynamics varies according to predation rates on different age classes (Gervasi et al. 2011), as well as with differences in the nutritional quality of prey habitat (Melis et al. 2009). Because moose may have colonized many areas of western Montana when predators were largely reduced, it is uncertain to what extent recolonized and expanding predator populations pose an additive source of mortality on local populations. In such cases, management of moose populations may require that predation rates be accounted for when deriving sustainable harvest quotas (Hobbs et al. 2012).

Vegetative succession and degradation

Moose habitat requirements and preferences have been well documented (reviewed by Peek 2007, Shipley 2010). Moose in Montana use a variety of mid to high elevation forest types in summer, including closed canopy lodgepole pine (*Pinus contorta*) and subalpine fir (*Abies lasiocarpa*) forests, as well as aspen (*Populus tremuloids*) and willow (*Salix* spp.) stands, mountain parklands, and alpine meadows (Knowlton 1960, Peek 1962, Schladweiler 1974). During winter, they often forage on willow where available, and snow depth can either restrict local use and movement (Burkholder 2012) or shift use to conifer forests (Tyers 2003).

Many studies of Shiras moose in the Rocky Mountains have documented the importance of early successional habitats (Peek 2007). Large-extent wildfires in 1910, 1919, and 1929 converted much of the conifer forest in northwest Montana to early-seral stages and moose populations in the state appeared to increase in response (Brown 2006). While the positive association with early successional habitat following wildfires is well documented, negative impacts of the 1988 fires in Yellowstone National Park contradict this tenant (Tyers 2006; Vartanian et al. 2011). During the 1950s–1980s, timber harvest became the dominant form of disturbance shaping conifer forests in the West and was generally favorable to moose, particularly 10–30 years following harvest (Eastman 1974, Matchett 1985, Telfer 1995). It is believed that the high amount of timber harvest combined with fire history may have set the stage for abundant moose populations through the early 1990s (Brown 2006). A time-lagged decrease in early-seral forests has presumably resulted from reduced timber harvesting since the late 1980s (Spoelma et al. 2004).

Riparian areas have been severely degraded globally by a variety of stressors (Richardson et al. 2007), and in some parts of the western United States, cottonwood-willow riparian habitats have been reduced by as much as 90–95% (Johnson and Carothers 1982). Historically, persistent riparian habitat along rivers and streams may have provided long-term stability to moose populations and functioned as corridors to allow moose to expand into ephemeral post-fire habitats (Peek 2007). In many areas of Montana, habitat management has focused on restoration of riparian areas via fencing and

grazing management with the goal of restoring robust willow communities.

Parasites

Moose are exposed to a suite of parasites with potential implications for population dynamics. Winter ticks (*Dermacentor albipictus*) are known to occur in moose range across much of North America south of 60° N latitude (Samuel 2004), and have been detected in disparate regions and vegetation types of Montana (N. DeCesare, unpublished data). While data are not available concerning the demographic impact of ticks on moose in Montana, negative effects of ticks on moose populations have been well documented elsewhere (Samuel 2007, Musante et al. 2010). Given that die-offs have been known to occur synchronously across various portions of moose range (DelGiudice et al. 1997), impacts of tick epizootics on moose in Montana seem likely.

Giant liver flukes (*Fascioloides magna*) were reported as the greatest single source of mortality for a declining moose population in northwest Minnesota (Murray et al. 2006, Lankester and Foreyt 2011). Such effects of flukes on moose mortality may be accentuated when individuals are malnourished (Lankester and Samuel 2007). Both *F. magna* and the common liver fluke (*F. hepatica*) have been documented widely within Montana's cattle populations (Knapp et al. 1992), and multiple species of lymnaid snails, the intermediate host, are also known to occur (Dunkel et al. 1996). Data concerning infection rates or impacts of flukes on moose or other wild ungulates in Montana are lacking.

Also of concern in Minnesota and elsewhere in eastern North American is the meningial worm (*Parelaphostrongylus tenuis*). Prevalent in central and eastern moose populations, this parasite is carried by white-tailed deer, transmitted by terrestrial gastropod intermediate hosts, and is commonly associated with moose declines in areas of high overlap with dense deer populations (Lankester 2010). While *P. tenuis* has not been documented in Montana, detection of infected white-tailed deer in western North Dakota suggest the possibility of intermittent spread into portions of Montana (Maskey 2008).

The arterial worm (*Elaeophora schneideri*) is a filarioid nematode found in the common carotid and internal maxillary arteries of ungulates in the west and southwestern US (Henningsen et al. 2012). Mule deer are definitive hosts of carotid worms, while moose and other ungulates are aberrant hosts, susceptible to blockage of blood to the optic nerve, ears, and brain and related symptoms such as blindness, ataxia, necrosis of the muzzle and nostrils, and emaciation (Hibler and Metzger 1974). *E. schneideri* was first detected in moose in Montana in 1971 (Worley et al. 1972), and subsequent sampling of 74 harvested moose detected carotid worms in 3 (4.0%; Worley 1975). More recently, approximately 30% prevalence was detected in Montana among 94 moose harvested in 2009–10 (J. Ramsey, MFWP, unpublished data) and 49% prevalence (n = 165) was detected in Wyoming (Henningsen et al. 2012). While infection is not necessarily lethal, increasing prevalence and the potential for subclinical effects warrant further investigation.

Climate

Moose in North America occur across a great range of latitudes (40° N to 70° N), though generally are best-adapted for cold climates (Renecker and Hudson 1986). Winter severity can affect physical condition (Cederlund et al. 1991) and fecundity (Solberg et al. 1999) of moose, yet recent attention has been given largely to concerns over warm temperatures. A small sample (n = 2) of captive moose in Alberta exhibited metabolic and respiratory signs of heat stress

at temperatures above −5°C and 14°C in winter and summer, respectively (Renecker & Hudson 1986). In Minnesota, a heat stress index based on these thresholds explained >78% of the annual variability in moose survival (Lenarz et al. 2009), and annual population growth rates decreased with increasing summer temperatures (Murray et al. 2006). Concerns over heat stress effects on moose are compounded by predicted patterns of future climatic warming across southern moose ranges (Lenarz et al. 2010), yet much remains unclear and the relationships in Minnesota were strictly correlative.

It is not known whether the mechanism linking temperature to demography is a direct link between heat stress and malnutrition (Murray et al. 2006) or an indirect link via parasites or other mortality agents (Samuel 2007). Increased mortality as a result of heat stress is likely to result in decreased abundance and a contraction in moose distribution along the southern range extent, yet local expansions of moose in other southern jurisdictions (e.g., Base et al. 2006, Wolfe et al. 2010, Wattles and DeStefano 2011) and an Ontario field study (Lowe et al. 2010) do not directly support this hypothesis. Within Montana it is unclear whether any climatic variables underlie spatial variation in the productivity of local populations.

RESEARCH NEEDS AND FUTURE DIRECTIONS

Comprehensive review of the current status of moose and methods in practice for monitoring and management revealed 3 primary research needs in Montana: 1) calibration of various trend indices to evaluate agreement and uncertainty regarding moose population trends, 2) development or refinement of monitoring programs to produce consistent data at appropriate scales to inform harvest or habitat management decisions, and 3) research into rates of adult survival and recruitment and the potential limiting factors of each. Accordingly, during fiscal year 2012–2013 the MFWP began directing moose permit auction funds toward a new research program to address these research needs. Generally speaking, the work aims to provide rigorous and reliable information as a foundation for understanding moose population dynamics and management practices in Montana.

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APPENDIX A: MOOSE MANAGEMENT SURVEY QUESTIONS PROVIDED TO 20 MFWP BIOLOGISTS IN 2010.

1. In your experience and professional judgment, what are the major concerns or limiting factors for moose in your area of responsibility (can choose more than one)?
   - [ ] Disease
   - [ ] Predation
   - [ ] Hunter harvest
   - [ ] Habitat loss/ fragmentation
   - [ ] Habitat succession
   - [ ] Other: _____
2. How would you describe the current status of moose within your area of responsibility?
   - [ ] Decreasing
   - [ ] Stable
   - [ ] Increasing
3. What type of moose management decisions are you typically required to make?
   - [ ] Harvest quota recommendations
   - [ ] Habitat enhancement
   - [ ] Habitat conservation
   - [ ] Large carnivore harvest recommendations
4. What information do you currently have and use for moose management (this information should be collected at the time of interview)?
   - [ ] Landowner reports
   - [ ] Hunter reports
   - [ ] Unadjusted trend counts
   - [ ] Sightability-corrected population estimates
   - [ ] Recruitment ratio counts
   - [ ] Bull: Cow ratio counts
   - [ ] Harvest estimates
   - [ ] Habitat condition
5. Which limiting factors have you addressed with moose management programs or decisions (this question will be accompanied by collection of past management actions: season proposals & rationales, regulations, specific habitat enhancement projects, land management plans, etc.)?
   - [ ] Disease
   - [ ] Predator harvest or control
   - [ ] Moose harvest
   - [ ] Habitat management
   - [ ] Habitat conservation
   - [ ] Other: _____
6. How would you describe your moose survey and inventory information?
   - [ ] Adequate to make decisions for moose management
   - [ ] Adequate in some ways, not adequate in others
   - [ ] Not adequate to make moose management decisions
7. What information would most help you in your efforts to conserve and manage moose populations in your area?
8. Can you list previous research projects and products from your area, and describe how results have been applied in your current management program?

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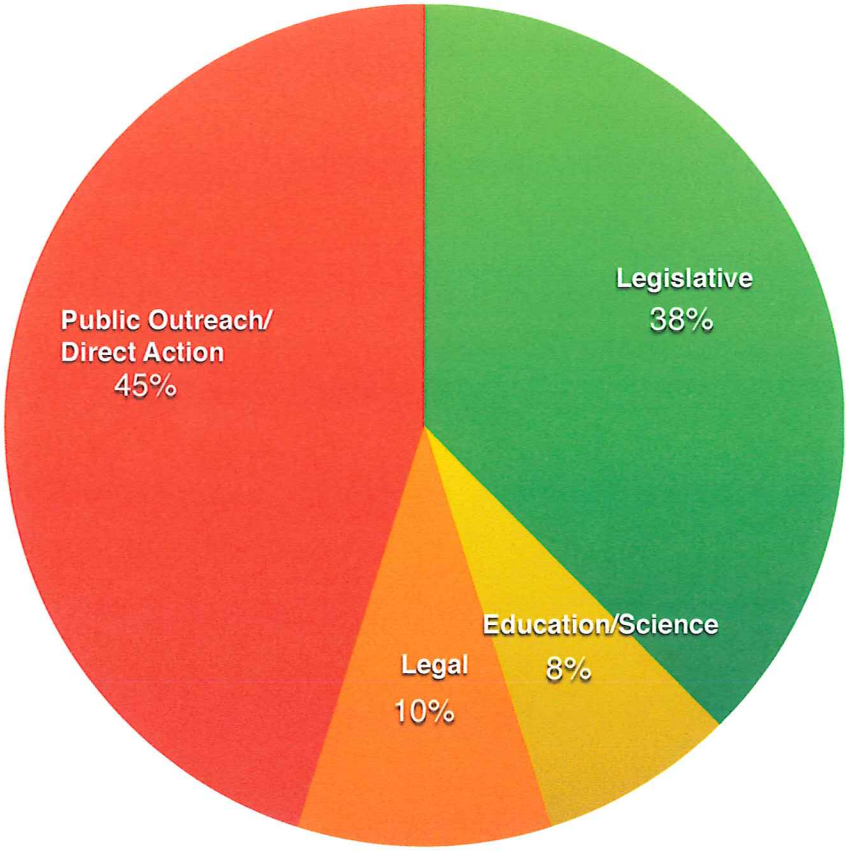
Budget Expenditures



July 1, 2016 - June 30, 2017

Total Expenditures (12 months)	400,105
Public Outreach/ Direct Action	180,302
Legislative	150,000
Education/Science	30,000
Legal	39,125
Compliance	678