Glenda Wiles

From: marc@wolfwatcher.org
Sent: Saturday, January 28, 2012 4:11 PM
To: Suzy Foss; Matt Kanenwisher; Ron Stoltz; Greg Chilcott; J.R. Iman
Cc: Perry Backus; Glenda Wiles
Subject: Comments from National Wolfwatcher Coalition on Predator Policy
Attachments: RAVALLI PRED CONTROL STATEMENT.pdf; Hunting Wolves In Montana.pdf; Disease Bulletin.pdf

Ravalli County Commissioners.

Attached are comments with support research. If there are any questions, feel free to contact me at contact information provided.

Sincerely, Marc

Electronically submitted: 28 Jan 12
Mailed : 30 Jan 12

Ravalli County Commission
Attn: Commissioners
215 S 4th St Suite A
Hamilton, MT 59840

January 26, 2012
Re: Comments on Proposed Predator Control Policy,
WMU 250

National Wolfwatcher Coalition
P. O. Box 141
Lolo, Montana 59847-9313
http://wolfwatcher.org

Dear Commissioners:

Based on our knowledge of and participation during the Jan. 18th. Commission meeting, we understand a draft of Ravalli County's proposed predator control policy was introduced to members of the community. It is our expectation that you will consider this statement as our official comment to said proposal during your deliberations.

First, in reference to **Sec III Public Health and Safety,** it is the Commission's statement that members of the general public have raised concerns regarding an "*increasing number of wolves...that may present a real danger to persons while on private or public lands.*" We would like to respectfully remind the Commission that based on a rather definitive historical record in Ravalli County and throughout the entire state of Montana, there has never been a documented case of a wolf attack on a human being. The Commission, itself, stated that it is not aware of a single instance of such an incident and thus, its assumption that there exists "*a real danger...* " is admittedly baseless.

Secondly, the Commission reported in Sec. III that the county received, "*a half dozen reports of injury or predation upon pets, hunting hounds, and horses,*" thus far. Ravalli County is home to over 40,000 residents. Six unconfirmed complaints of wolf conflict demonstrates a statistically insignificant impact, although it is unfortunate to hear this news if, in indeed, these details have been confirmed with law enforcement. The Commission, itself, acknowledged, "*The total number is not the primary concern rather, that an individual may exercise poor judgment while witnessing an attack on an animal family, friend and attempt to intervene resulting in harm or death to that pet or livestock owner.*" Is it the Commission's premise that wildlife management should be based on

the apparent ignorance of residents of the Ravalli community who have little or no experience with living among wildlife on the landscape? Is it the premise of the Commission to suggest that predators be intensively managed because its constituents are potentially unable to learn the best practices for living with wildlife? If wolves are considered to be a real threat, we speculate about the reasons that led the Commission to eliminating the position of the County's Animal Control Officer – a position that could have, no doubt, addressed many of these supposed "threats."

Relative to this section of the proposal, we wish to share two important points. First, one of Montana FWP's guiding principles, as stated on its website, is "*to provide family-oriented educational opportunities to help citizens of all ages learn to participate in and enjoy Montana's many and varied wildlife and other natural resources.*" Perhaps our county would be best served if the Commission encouraged its constituents to avail themselves of these educational opportunities, all of which are provided via their own tax dollars, in an attempt to promote the safety and security the Commission seeks for them. In addition, many wildlife conservation organizations, including ours, promote educational opportunities that teach citizens how to simultaneously protect themselves, pets and livestock and save wolves by avoiding and/or minimizing conflicts with wolves. These measures have been proven to be highly effective in promoting peaceful coexistence with wildlife, including wolves, on wild public lands, as well. **Montana-based Keystone Conservation** (P.O. Box 6733, Bozeman, MT 59771; 104 East Main, Suite 307, Bozeman, MT 59715) provides programs that combine local knowledge, science, and the entrepreneurial spirit of the West to devise and implement practical solutions for wildlife conservation. Range riders patrol Montana's open range on horseback to deter conflicts with wolves before they arise; they use telemetry, herding, vigilant observation, and non-lethal hazing techniques to keep wolves and livestock safe. Since the future of keystone species, like wolves, depends on human action, Keystone Classroom teaches children and adults about wildlife behavior, habitat requirements and common sense precautions. Their interactive programs have reached hundreds of children and parents throughout Montana and the Northern Rockies. If Ravalli County Commissioners were, indeed, interested in promoting the safety and security of its constituents, it seems that many constructive outcomes could be achieved by reaching out to Keystone Conservation.

Thirdly, in reference to **Sec III Public Health and Safety,** the Commission asserts that *"large predators, particularly wolves, may act as a vector for parasites responsible for hydatid cyst diseases."* The Commission also mentioned that "lack of data" indicates the potential for increased spread of this infection. We assert that there is copious scientific data on this issue and consideration of these facts will shed some objective insight on this concern. Krysten Schuler, PhD, Wildlife Ecologist, Field Investigation Team, USGS National Wildlife Health Center addressed a recent session of the State Capitol Environmental Quality Council in Helena. She reported that echinococcus granulosus poses low mortality and no health risks to humans, ungulates and wolves themselves. She further explained that handling wolf feces is the most likely route of infection and can easily be prevented with proper hygiene, similar to that used with other zoonotic parasites. She also added that there is no evidence that this parasite has the potential to cause fluctuations in wolf and ungulate populations; actually, she stated that it is highly unlikely that this parasite has any substantial impact on wildlife populations. Furthermore, Montana Fish Wildlife and Parks Veterinarian, Jennifer Ramsey DVM, MPVM, confirmed that this parasite is not a threat to humans or our wildlife, as well. Finally, a quick review of the science from the Department of Health and Human Welfare shows that the risk of this parasite exposure to people is rare.

Resources:

MtFWP Fact sheet:
http://leg.mt.gov/content/Committees/Interim/2009_2010/Environmental_Quality_Council/Meeting_Documents/March/fwp-fact-sheet.pdf

Department of Health and Human Welfare
http://www.healthandwelfare.idaho.gov/LinkClick.aspx?fileticket=yrb8A0GvnMI%3d&tabid=682

Fourth, in reference to **Sec. IV: Custom and Culture/ Historic Use,** the Commission stated *"Hunting has been a part of the Bitterroot's history for as long as people have inhabited this area."* While this may be true, it is also important to note that the U.S. Fish and Wildlife Service has released its report, *Trends in Fishing and Hunting 1991-2006: A focus on Fishing and Hunting by Species,* (published every five years) which provides a detailed look at fishing and hunting by species and offers a wealth of information on national and state demographic trends. Among highlights contained in the report is the clear statement that the overall number of hunters has declined in our nation, and recruitment of new hunters has declined as well since 1991. As a matter of fact, in a Jan. 24th radio interview re: the wolf hunt extension proposal for the Bitterroot, MtFWP

Commissioner Ron Moody reported, ***"There are 305 million people in our nation and less than 5% of them buy hunting licenses; the vast majority of people do not hunt. Montana is part of the national economy, and non-resident tourism has become the state's second largest industry."***

Resource:

U.S. Fish and Wildlife Services

http://library.fws.gov/Pubs/nat-survey2006-trends-fishing-hunting-1991-2006-focus-on-species.pdf

MtFWP Commissioner Moody's testimony

http://www.mtpr.org/podcasts/audio/mtee_features/01-23-2012Feature.mp3

In addition, a 2006 study in Yellowstone determined that tourists visiting the park to view wolves and other wildlife have brought $35 million annually to the region's economy, which turns over to more than $70 million for Northern Rockies communities. In fact, visitation to Yellowstone National Park in 2011 topped the 3 million mark for the fifth straight year. When considering the aforementioned facts, it quickly becomes apparent that, while it may be convenient to suggest that wolves are responsible for the negative economic impacts to Ravalli County's industry and its tax base (referred to in **Sec. V: The Local Economy and Tax Base**), the evidence re: national and state trends simply do not support the Commission's assertion. Compounding the effects of these demographic trends is the fact that hunting is a seasonal activity; it lasts one to two months in duration. Wildlife watchers/tourists, photographers, outdoor recreationists, etc. can provide the County with a more reliable, year-round source of revenue if outfitters and other related industries accepted these trends and also encouraged alternative activities which will stimulate the economy of the County by attracting a broader base of resident and nonresident consumers.

Next, in reference to **Sec.VI: Involvement of Predators in large ungulate mortality,** the Commission attempts to promote the belief that wolves, exclusively, caused the elk population in the County to crash despite the fact that independent Montanan scientists have provided evidence that wolf-related economic impacts are negligible. It is apparent that elk and deer population goals have turned into a numbers game that reflects a human agenda and not the limits of natural ecosystems. As you know, House Bill 42 mandated MtFWP to study and identify ungulate target population numbers which were acceptable to Montanan legislators. This legislation forced MtFWP to comply with the law which, of course, led to over hunting in virtually all hunting districts in Montana, including the West Fork of the Bitterroot HD 250. This not only created an artificially high hunt

success rate in the past, but many elk cows were killed. MtFWP's **EIS overview** of this situation stated: "*Predation by wolves is sometimes blamed for the recent decline in elk numbers, and wolves certainly kill elk. However, MT FWP increased the number of antlerless elk permits in the mid-2000s because elk populations exceeded objectives.*" Mt FWP goes on to state that the decline in elk numbers in the Bitterroot is likely primarily due to increased antlerless harvests achieving a planned management reduction. Also the FWP felt that much of the decline in 2007 was due to nutritional stress caused by poor forage conditions in 2006 that may have caused poor calf survival. There is ongoing research looking into the physical health and nutrition of elk on the West Fork drainage. Results are pending. Elk are moving lower sooner, resulting in fewer hunting opportunities and inadequate over-wintering nutrition. But to blame wolves for all, or even most of the elk decline, is simply untrue. If areas are so decimated of elk and deer populations then why continue selling hunting tags for these areas?

As you know, FWP researchers recently tagged elk calves in both the east and west forks of the Bitterroot starting last spring as part of a major three-year elk study. So far, it was determined that mountain lions have been the main source of calf mortality. Through Jan. 4, mountain lions killed 13 of the tagged elk calves; black bears killed four and wolves two. Although some biologists believe that wolves may have a larger impact on elk during the winter, the statistics do not support their assumptions at the present time. FWP Region 2 Wildlife Manager Mike Thompson reported at a recent meeting that the proposal to increase the lion harvest in the area is a direct result of the ongoing research in the Bitterroot. So again, the scientific evidence does not support the Commission's assertion that wolves have had a negative impact the elk population.

Interestingly, during MTFWP Commissioner Moody's radio interview on KUFM-89.1 on Mon., January 23rd, he reported,

> ***"The Department pursued every device to remove wolves from the Bitterroot. Sooner or later, you have to think about the real reason for the decline in elk. Just because everyone in the room believes wolves are the cause of declining elk populations, it doesn't mean they are correct. That is why we insist that the Dept.'s model of wildlife management be based on valid science and all the science is not in yet. First the preliminary reports from the study say it's not the wolves, it's the mountain lions....the Bitterroot has to accept that all predators are responsible, not just one species as well as the human manipulation of habitat in the area....serial bad winters, overharvest of cow elk, and habitat fragmentation happened collectively and you cannot single out the wolf, eradicate the wolf and think that will fix the problem. If you do that, it only means there is one less excuse for what the real problem is."***

Furthermore, it is important to bring to your attention Montana Code: MCA 87-1-201: Powers and duties, and let the Code speak for itself:

(9) (a) The department shall implement programs that:
(i) manage wildlife, fish, game, and nongame animals in a manner that prevents the need for listing under 87-5-107 or under the federal Endangered Species Act, 16 U.S.C. 1531, et seq.;
(ii) manage listed species, sensitive species, or a species that is a potential candidate for listing under 87-5-107 or under the federal Endangered Species Act, 16 U.S.C. 1531, et seq., in a manner that assists in the maintenance or recovery of those species;
(iii) manage elk, deer, and antelope populations based on habitat estimates determined as provided in 87-1-322 and maintain elk, deer, and antelope population numbers at or <u>below</u> population estimates as provided in 87-1-323. In implementing an elk management plan, the department shall, as necessary to achieve harvest and population objectives, request that land management agencies open public lands and public roads to public access during the big game hunting season.

Hunters, guides, outfitters, the state and national organizations representing them have become vocal about their concerns that wolf populations are decimating ungulate populations in Montana despite the fact that *the evidence is quite to the contrary.* Some hunters have reported that it is harder to find elk since wolves have returned to the region, but this is not because there are fewer elk. For example, Montana's elk herd has grown from 55,000 in 1978 to 150,000 today. Rather, as documented by researchers and experienced by sportsmen, wolves cause elk to change their behavior on the landscape. Since the return of wolves to the West, elk tend to linger less in open areas, often move to higher altitudes, and may even leave one valley to seek out more hidden locales in another valley. While changes in elk behavior may create more challenging hunting experience (for wolves as well as for people), elk populations throughout the region remain high. As a matter of fact, Montana has the second highest elk population of any state!

Yes, in the Bitterroot Valley there have been declines due to the aforementioned factors (i.e.: harsh winters, overharvest of cow elk, habitat fragmentation, etc.). However, MtFWP reports that the overall elk populations are either at, or above, statewide population objectives. Although widely assumed that wolves decrease hunting success, hunter harvest of elk in the Northern Rockies continues to be good. Montana's hunter success rate is 22%. (Resource: Rocky Mountain Elk Foundation). Again, in past years,

MtFWP issued surplus elk tags and season extensions to reduce the elk numbers. This is especially true in the Bitterroot where wolves are now blamed for a drop in herd numbers. We assert that the biggest threat to elk is not the wolf, but rather the loss of habitat due to residential and industrial development. Development not only displaces elk into an ever-shrinking range of quality habitat, but also results in the loss of sportsmen access to traditional hunting grounds. For this reason, preserving as much of our wild lands as possible for elk and all wildlife is crucial, and will require sustained, cooperative effort by conservationists, sportsmen and wildlife lovers.

We also offer more conclusive evidence regarding the issue of the wolf's impact on elk predation. Chronic wasting disease could wipe out our elk and deer. Results from simulations by N. Thompson Hobbs suggest that predation by wolves has the potential to eliminate CWD from an infected elk population. Bruce L. Smith, PhD, (**Where Elk Roam** , Chapter 9, Who Lives, Who Dies P.150) reports:

> "Among the twelve elk populations studied in the Northwest (each supporting three to five species of large carnivores), survival during the first three months of life ranged from 31 to 84 percent. Neonatal survival greater than 40 percent was capable of increasing elk populations. Predation was the leading cause of mortality. In study areas with four and five large predator species, competition among predators diminished the proportion of calves killed by lions, coyotes, and wolves, but not bears. That is, as the most successful predators on elk neonates, only bears additively decreased survival of calves regardless of the competition. **Where wolves were restored, they were the least significant predator on newborn elk.** The synthesis also found that climatic conditions interacted with competition among species of predators to limit the impact of predation on neonatal mortality. As I found in Jackson elk, when spring weather was unfavorable, predators killed some calves that likely would have died of other causes. Lastly, **the synthesis concluded that efforts to increase elk populations through predator control may prove futile. The effects of weather and competition between predators may thwart any benefits of this management approach."** Smith adds on page 113, **"The report identified one additional element that could limit amplification of CWD: predators.** It stated, 'The absence of predators may allow sick animals a longer period in which to spread CWD.' A Colorado study showed that mountain lion predation did not stop the spread of CWD. "However, mountain lions are solitary ambush predators; packs of gray wolves chase and single out disadvantaged prey. This is what Dr. David Mech and other wolf biologists have called the 'sanitation effect' of predation. Recent modeling suggests wolf predation may suppress CWD emergence in deer."

Thus, it is our assertion that these facts must be taken into consideration before enacting any "predator control policy" in Ravalli County.

It appears that some of Ravalli's hunters have been spoiled by the easy pickings in a country stripped of native predators, and sadly, outfitters say they are feeling the economic backlash because of it. Let's remember that outfitters profit from the use of *public* lands supported by *everyone's* tax dollars – a privilege afforded them, but certainly not an entitlement. Hunters who feel entitled to hunt as many animals as they want, and thus advocate for the destruction of native predators, turn a blind eye to ecosystems out of balance, the general health of the wild lands we hold precious and the rights of other citizens who value the role of predators in the maintenance of our environment. *None of us are so entitled.* Much to the dismay of the typical Ravalli County hunter, elk have finally returned to behaving more like elk now and less like cattle. This has made elk hunting more challenging. It's apparent that Ravalli County's objective is to manipulate the population of wolves in order to grow more elk, and that is in direct conflict with how wildlife should be managed if we use science to guide decision-making. It is ethically and scientifically wrong to manipulate the population of one species to benefit the hunting of another. Allowing this practice will reflect negatively on Ravalli County, all ethical sportsmen, and all of Montana in the eyes of those who are watching the state's first attempt at management of wolves.

Last but not least, we refer to **Sec. VIII: Proposed mitigation measures, actions, and processes.** It seems trapping is being considered as part of the proposal. We are sure you are aware that according to MtFWP's own statistics, every year trappers kill around 40,000 animals they actually mean to catch--and kill *thousands more* "non-target" animals by accident. These indiscriminate numbers, the "accidents," are never collected or reported, but pets should be included in those numbers. Those numbers also include other endangered, threatened and sensitive species like lynx, bald eagles, marten, fisher, wolverines, hawks, eagles, owls and other raptors. Trapping, and the collateral damage it incurs, should not be an acceptable practice in Ravalli County, let alone in Montana.

In conclusion, science has taught us that drastic and sudden reductions in wildlife populations can have broad implications on the health of a species. In the case of wolves, which have complex social networks, it can lead to the disruption of existing packs and a loss of genetic diversity. Because of this, many conservationists, including the Board of Directors of the National Wolfwatcher Coalition, contend that Ravalli County's proposed predator policy plan does not adequately consider all aspects of the wolves' ecology in its proposal. Thus, we are strongly opposed to it. As the general human population

increases and moves into and uses the habitat of the wild creatures, further conflicts will continue. Independent research, non-biased recommendations by all special interest groups as well as the general population should be done and considered equally before any policy is put into effect. As wolves recover in parts of our state, there is a growing need to develop both a better understanding of wolves and how to live harmoniously with them so that we can be afforded the ecological benefits they provide across the landscape. By helping communities - livestock producers, landowners, hikers, hunters, anglers, outdoor enthusiasts and resource professionals - identify and implement working solutions to wolf conflict, we learn to share the landscape with them for the benefit of healthy ecosystems across Montana, including those in Ravalli County.

Thank you for this opportunity to comment on Ravalli County's proposed predator control policy.

Respectfully submitted,

_____

Co-President Marc Cooke
Telephone: 1-406-777-2026
on behalf of the Board of Directors and Officers,
National Wolfwatcher Coalition

National Wolfwatcher Coalition
P. O. Box 141
Lolo, Montana 59847-9313
http://wolfwatcher.org

Hunting Wolves In Montana - Where Is The Data?

Jay Mallonee, Wolf & Wildlife Studies, P. O. Box 151, Whitefish, MT, info@wolfandwildlifestudies.com.

As an independent wolf biologist I have studied the Fishtrap pack in northwest Montana since January 2001. They, like all packs in Montana, Idaho, and Wyoming, are involved in wolf recovery. This involves a complex and convoluted social-political process in which the wolves must contend with some negative public opinions as well as official management. Management agencies have stated that wolf recovery is based in science. From a scientific perspective, however, I reviewed the government's data on wolf management (state and federal) in Montana and found that science is not necessarily involved when management decisions are made, especially about hunting wolves. I have several main concerns:

1. How realistic are the claims used by Fish, Wildlife, and Parks to justify hunting wolves?
2. The Fish, Wildlife, and Parks summary of the 2009 Montana wolf hunting season.
3. Is the data collected by Fish, Wildlife, and Parks accurate and sound?

The process of wolf recovery has generated a great deal of emotion with the general public, and misconceptions about wolves have only fueled the debate. Therefore, this review paper is fully referenced so that readers can access the source material and judge for themselves the conclusions made here. Several editorial components are also based on science and experience. When available, live web links allow direct access to this information, both in the text and in Literature Cited. Should these become unavailable in the future, alternate links to pdf archives of source material are provided under Literature Cited.

Background

Since 1974, with the passage of the Endangered Species Act of 1973 (ESA) (U. S. Congress 1973), wolves in the northern Rocky Mountains have been classified as endangered by the U. S. Fish and Wildlife Service (USFWS). This is the federal agency responsible for defining which species are endangered, placing them on the Endangered Species List, and eventually recover their numbers so that federal protection is no longer necessary. In May 2009, the USFWS determined that wolf populations in Montana and Idaho had recovered enough to remove them from the list (Montana Fish, Wildlife, and Parks 2009a). The responsibilities of wolf management then shifted to state agencies. Wolves in Montana fell under the jurisdiction of Montana Fish, Wildlife, and Parks (FWP), and by fall 2009 both Montana and Idaho had begun an annual hunting season to augment their current management techniques. Because Wyoming had not yet submitted a comprehensive management plan to the federal government, wolves in this state remained on the Endangered Species List. This eventually lead to a legal dilemma.

On August 5, 2010, U.S. District Judge Donald Molloy of Missoula, Montana, ruled that the USFWS could not delist wolves in only two of the three wolf recovery states. Wolves must be listed as endangered or not endangered in all three states simultaneously. Therefore, wolves in Montana and Idaho were again placed on the Endangered Species List, which cancelled the fall 2010 hunt in both states. Presumably, wolves will remain under federal protection until Wyoming provides an approved management plan.

Despite the ruling, however, there has been a flurry of activity and comments by FWP, some hunters and ranchers, and even Members of Congress, to reinstate wolves as recovered so that Montana and Idaho can continue to hunt them. In an attempt to remove wolves from the Endangered Species List, Montana Congressman Denny Rehberg, who is up for reelection this November, has introduced legislation to

amend the Endangered Species Act and prohibit the classification of wolves as either endangered or threatened (Peterson 2010). The ESA is considered one of the strongest pieces of environmental legislation, because species are designated as threatened or endangered based on science rather than politics (U. S. Congress 1973, Raven and Berg 2004). Rehberg's legislation contradicts this premise and caters instead to a region of the United States that is intolerant of wolves. Montana senators Max Baucus and Jon Tester have introduced a bill of their own to remove wolves from Endangered Species Act protection (Chaney 2010b). Within hours of Molloy's decision, FWP officials also expressed their disappointment in losing the hunt as a management tool (Volz 2010). A coalition has even formed among livestock producers, outfitters, hunters and the state of Montana to continue finding ways to kill wolves, despite their endangered status (Bryon 2010). Various proposals made by state agencies seem to echo the past when wolves were exterminated from the lower 48 states: burying pups in their dens then poisoning them with carbon monoxide gas, allow "research" hunts, and the more modern approach of surgically sterilizing adult wolves (Brown 2010).

On the other side of the issue, FWP has claimed that wolf hunts are based in science. Ed Bangs, the Wolf Recovery Coordinator for USFWS stated, "The bottom line is, by law, the Fish and Wildlife Service is required to use the best available science. We're mandated if there's new information that indicates the recovery goal should be lower or higher to look at that" (Hatch 2010). Perhaps they have looked at different areas of wolf research, but ignored them. For example, outside of Yellowstone National Park, I have had the longest running behavioral study of wolves in the state of Montana. I have even discovered wolf pack behavior never before documented, which demonstrated that at least the Fishtrap pack likely spends the minority of time fully assembled (Mallonee 2008). This is because rather than a "thing," a wolf pack is a dynamic process. It is greater than the sum of its parts. The parts consist of pack members interacting with each other and with their surrounding environment. The net result is a force that changes over time as the pack reacts to endless environmental variations such as increasing or decreasing prey populations, prey migration, climatic changes, or when pack members come and go. Despite these findings, my research has never been cited in any management documents, and neither have the sources I've used in my area of expertise. Unless it is about wolf predation, animal behavior research has not been perceived as relevant to the wolf management process.

Scientifically or not, all wolves in Montana, Idaho, and Wyoming will be removed eventually from the Endangered Species List. FWP will then continue with their wolf management policies, including hunting (Volz 2010, Montana Fish, Wildlife, and Parks 2010b). This is a good time, therefore, to evaluate what they have done so far and if these policies have been productive. If not, Judge Molloy's decision has provided time to make adjustments to Montana's wolf management practices.

How realistic are the claims used by FWP to justify hunting wolves?

On their website, FWP stated two justifications for eliminating wolves through annual public hunts:

FWP believes its prudent to begin a wolf hunting season now due to increasing levels of wolf-livestock conflicts as the wolf population has increased, and due to concerns about the status of some deer and elk populations where wolves and other predators exist (Montana Fish, Wildlife, and Parks 2010a).

Livestock depredation

Depredation is the term used by biologists when predators kill domesticated livestock rather than their natural prey. Each year a summary of the wolf recovery process, including livestock loss to predators, is published in the USFWS Annual Reports. This data is public information and anyone can access it. The reports review wolf numbers and population trends in each of the three recovery areas: Yellowstone National Park (reintroduction), central Idaho (reintroduction), and northwest Montana (natural

recovery). In the 2009 Annual Report (Sime et al. 2010), a table is provided that shows the numbers of livestock lost to wolves in the state of Montana:

Table 5b: Northern Rocky Mountain Confirmed Wolf Depredation[1], 1987-2009, by State.
(Does not include Oregon and Washington. See Table 5c.)

YEAR	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	TOTAL
Montana																								
cattle	6	0	3	5	2	1	0	6	3	10	19	10	20	14	12	20	24	36	23	32	75	77	97	495
sheep	10	0	0	0	2	0	0	0	0	13	41	0	25	7	50	84	86	91	33	4	27	111	202	786
other 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	3	2	2	14	17	6	53
dogs	0	0	0	1	0	0	0	0	4	1	0	1	2	5	2	5	1	4	1	4	3	2	4	40
wolves moved	0	0	4	0	3	0	0	2	8	22	20	0	14	6	17	0	0	0	0	0	0	0	0	96
wolves killed	4	0	1	1	0	0	0	0	0	5	18	4	19	7	8	26	34	40	35	53	73	110	145	583

In science, there is a basic tenant that states: *compared to what?* A number by itself means nothing. For example, 97 cattle were lost in 2009, out of how many? Government statistics show that 2.6 million cattle, including calves, live in Montana (U. S. Department of Agriculture 2007, U. S. Department of Agriculture 2009). Ninety-seven out of 2.6 million is only 0.004%. To be fair, these cattle are not evenly distributed across the landscape. Western Montana, where the wolves live, has fewer cattle than on the east side of the state. As of 2009, there were 494,100 cattle (U. S. Department of Agriculture 2009). However, only 97 of these animals were killed by wolves, or 0.02% of the western cattle population. Similar low percentages apply to sheep. There were approximately 33,000 sheep, including lambs, in western Montana in 2009 (U. S. Department of Agriculture 2009). Using the table above, wolves were documented to have killed 0.6% of these animals. In 2009, therefore, wolves were responsible for about 0.06% of total livestock loss.

Note that the table contains "confirmed" kills by wolves on livestock. Having worked with the ranchers in my area since 1993, I've experienced how their cattle have been lost each year, mostly through accidents, illness, or the birthing process. Undoubtedly there have been other depredations by wolves that could not be confirmed by government biologists. The number remains unknown, however (Sime et al. 2007). Even if 1,000 cattle were reported for 2009, this would only be 0.2% or less of the cattle in western Montana killed by wolves.

Statistically, the wolf depredation "problem" barely exists. Socially and economically, however, those who lost their cattle would likely disagree. There is nothing "statistical" about suffering a real financial loss, sometimes thousands of dollars, often accompanied by a range of emotions. I think most people can empathize with this because we have all experienced loss in some form. I might be angry too if a wolf killed my dog, for example. However, many incidents with wolves could have been prevented by using some caution. For example, some ranchers have prevented problems by using clean ranching practices: dispose of placentas during the birthing season or place pregnant livestock into a smaller area where they can be observed. Although some ranchers have lost a good number of livestock to wolves, the statistics do not show how many animals they had to begin with. Losing 9 out of a thousand animals would be quite different from 9 out of 10 animals.

Despite the statistics, FWP insists that a hunting season is necessary to help prevent livestock losses to wolves (Sime et al. 2007, Dennison 2010, Volz 2010, Chaney 2010a). However, the vast majority of wolf packs have not depredated on livestock. Even Ed Bangs helped to determine that compared to all causes of livestock death, those caused by wolves have been relatively rare (Bangs et al. 2005). When depredations have occurred, non-lethal methods have worked well to deter wolves from killing livestock, although 10 - 12 percent of the wolf population were removed annually to prevent repeated attacks (Sime et al. 2007). It appears that some wolf management is necessary, but annual hunts remain

unjustified. Must wolves in the northwest die for problems created by wolves in the southwest and vice versa, especially for events that rarely occur?

Threat to prey populations

As confirmed by Kent Laudon, Wolf Management Specialist for northwest Montana (Montana Fish, Wildlife, and Parks, personal communication), there has been no relevant research conducted in northwest Montana to determine the effects wolves have on wild prey populations. Elk populations, however, have been studied in southwest Montana and Yellowstone National Park - a very different habitat than where most of Montana's wolves live. This research concluded that wolves at best had mixed impacts on these herds: some declined, some increased (southwestern Montana), and others showed little or no effect from wolves (Hamlin and Cunningham 2009, Sime et al. 2009). Many other factors, such as weather and predation by grizzly bears and other animals, also affected the total elk population.

The environment is infinitely complex and we may never fully understand how it works. Nevertheless, the "potential" threat to prey populations, specifically elk, has been used as another reason to kill additional wolves annually (Montana Fish, Wildlife, and Parks 2010a). Yet, no data is available to support this contention. There is still no scientific consensus on how wolf predation influences prey population dynamics anywhere, currently or in the past (Mech and Peterson 2003). This is because of unpredictable environmental conditions, such as colder than normal winters, heat spells, disease, predation effects of other predators, and the interactions among all species in the environment which science does not yet fully understand.

Without doubt, wolves influence prey populations. This is their food base, and wolves and prey have co-evolved for thousands of years. In Montana, prey population numbers are not measured annually. So from year to year, as population numbers vary, it remains unknown how many deer, elk, and moose are really in the environment. However, some estimates are available for white-tailed deer, elk, and mule deer (Montana Fish, Wildlife, and Parks 2007, 2008a, 2008b). Therefore, without research in specific areas, such as the elk studies, the influence of wolves remains unknown. If it is found that wolves have a negative affect on prey in certain areas, FWP could deal with those animals rather than hunt all wolves for a problem that is only implied in a small number of areas.

Public attitude

The public and livestock owners have always voiced their views about wolf depredation, especially since this year's wolf hunt was cancelled by Judge Molloy's decision last August. Congressman Rehberg has been holding public meetings around the state of Montana to promote his proposed legislation to amend the Endangered Species Act so that wolves can continue to be killed. To gain more experience with this point of view, I attended the meeting in Kalispell, Montana, on October 6, 2010. All dozen or so panel members voiced anti-wolf sentiments for a variety of reasons, ranging from depredations to fear of wolves. Many people in the crowd of over 150 also voiced resentment toward wolves. Most of the views expressed were biased and not supported by science, or even common sense in some cases. No numbers were presented by the panel and no scientific studies were cited to support their contentions. Furthermore, their views did not represent all livestock owners nor were they necessarily accurate. Over a 10 period, only 50% of owner complaints about wolves to management agencies were confirmed as wolf damage (Sime et al. 2007).

In 2005, the National Agricultural Statistics Service conducted a survey (Sime et al. 2007) in which Montana cattle producers reported they had lost 66,000 cattle, including calves, to all causes. Predators were responsible for 3,000 of these losses, or 4.5%. Of the 3,000 cattle, 2,400 were calves. According

to the cattle producers, coyotes had killed 54% of these calves. The remainder were killed by all other predator species combined, with an unknown number by wolves. So despite the rhetoric of some cattle producers about wolf depredation, they didn't know how many cattle had been killed by wolves. In the 2005 annual report, USFWS reported that 23 wolf depredations on cattle had been confirmed (table above). During the same year, sheep producers claimed that 200 sheep, including lambs, had been killed by wolves. This was 1.4% of reported loss of sheep to predators. Yet only 33 depredations were confirmed by management agencies (table above). Coyotes, however, were claimed to have killed 10,100 sheep, or 72% of reported predator depredation on sheep. Even when given the opportunity to express themselves, livestock owners as a group seem to know little about how wolves affect their livestock, and they are apparently angry at the wrong species.

Coyotes can be hunted year round in Montana, but are still the leading cause of livestock loss to predators (Collinge 2008, Adams 2010). Nevertheless, there have been no public meetings, with Members of Congress in attendance, to deal with the "coyote problem." Perhaps this is a perceptual issue in which livestock owners perceive that hunting has given them some "control" over coyotes. However, it seems to have done little good. Wolves cause only minimal damage, but they are under federal protection, which gives the appearance that everyone's hands are tied when it comes to solving depredation issues. Given this kind of frustration, I can see how hatred becomes the path of least resistance. It takes effort to find the truth and accept it for what it is. Livestock owners do not have to like wolves, but it would behoove them to at least work with the basic facts to create a clear perspective of the issues.

Despite the negative attitude some livestock owners have toward wolves, the ranchers I have worked with saw and heard wolves all the time, yet took responsibility for their actions. Consequently, wolves have been only an occasional problem, even though they were constantly present. Dealing with these issues on an individual basis has often worked, even to the point of removing the pack in that local area (Sime et al. 2007). Perhaps a better question to ask than how many livestock wolves have killed, would be how often does free range cattle encounter predators throughout the year and nothing happens? Hundreds of thousands of times? Perhaps allowing cattle to roam is not that risky. Ranchers and I have worked together to avoid potential conflicts with wolves. We found that wolves were often mixed in with the cattle but did nothing to harm them (Mallonee unpublished data). Throughout the state most ranchers that have experienced wolf depredation were not hit again (Sime et al. 2007). Perhaps those that were could examine how their ranching techniques may have attracted predators, rather than deter them.

Although some people perceive wolves as a threat to livestock or prey populations, others hate them simply because they are wolves. Such intolerance has no basis in reality, and alternate viewpoints only enrage these people further. This is bigotry, no different from what we have shown toward other races of people, religions, and animals. It is like a disease and can spread and infect entire towns, even nations. Bigotry is a force that cannot be reasoned with. It feels no remorse, no pity, and no compassion. By allowing people to vent this kind of anger, hunting wolves has great potential for promoting and perpetuating these attitudes.

The FWP summary of the 2009 Montana wolf hunting season

On their website, FWP posted the summary of last year's first, and so far only hunting season on wolves in Montana (Montana Fish, Wildlife, and Parks 2010c). It also summarizes how wolf recovery in

Montana works and the lack of science involved, both in thought and practice. Key statements point this out:

Hunters report seeing wolves while hunting deer and elk, and it appears that they are able to detect wolves in their relative degrees of abundance on the western Montana landscape. Therefore knowledge about deer and elk hunter effort and success will provide important insight into future wolf harvest management.

Apparently FWP uses opportunistic data collection as a basis for management policy. They obtain "data" from the people who paid for the opportunity to kill wolves. Although I can understand the necessity of collecting as much data as possible about these animals, impressions about their abundance from hunters is not science. There are no controls in the data collection, and hunters do not necessarily like wolves, given the fact they want to kill them. Therefore the data has great potential for bias.

Total license revenue was $325,916.
When the state of Montana created revenue by killing its own wolves, hunting them became a self-serving process, as with the hunting of all managed wildlife. Comments in the news by wildlife officials reflect this attitude: "We have 20 people scattered throughout the state, and it's becoming more and more work, which is stretching them thinner and thinner," a statement made by John Steuber the Montana director of U. S. Wildlife Services (Associated Press 2010). This is the agency that typically shoots problem wolves. In the same news article, Ed Bangs said, "You can see from the wolf reports that we've been heading toward this for years - more depredations so there's more control. When we started, we would move problem animals around, capturing them and putting them somewhere else, but there's enough now that we just kill them." He went on to say, "That's one of the reasons that hunting can be so important. You can have hunters pay to remove wolves rather than use tax payers' money to go after them. It's a good management tool to reduce conflicts and costs."

There are several concerns about these statements. Before the wolf hunting season, wolf management officials often killed problem wolves. Yet, according to Sime et al. 2007, in which Bangs was a co-author, "Removal results in a cycle of wolf colonization, depredation, and wolf removal that repeats itself (Bradley 2004, Musiani et al. 2005)." Thus, the killing of wolves can continue in a cyclic manner in certain places. By using a hunting season, FWP can adjust wolf quotas in areas where depredations may be a consistent problem for that year (Kent Laudon, Wolf Management Specialist, Montana Fish, Wildlife, and Parks, personal communication) and the state receives a revenue from hunting fees and permits. Now hunters can do the job instead, but without making the distinction between the "problem" wolves, of which there are few, and all the others. The state of Montana made $325,916 in a hunting season that lasted only 23 days. That was $98,762 per week. The hunting summary states that "hunter harvest did not appear to accelerate or contribute to livestock conflicts." This conflicts with the statement Bangs made that hunting is a good management tool to reduce conflicts and costs. Apparently, hunting wolves had no affect on any existing "conflicts," according to FWP data.

In summary, wolf recovery is a business. With the arrival of public wolf hunts, it became profitable. Hunting wolves can save the state money by reducing costs, creating revenue, collecting opportunistic data from hunters, and in helping to reduce the stress of apparently overworked government employees. Therefore, money and convenience are some of the reasons to hunt wolves, and the problem of wolf depredation remains unsolved - a problem that statistically barely exists. What is still missing, however, is scientific accountability for hunting these animals. It seems that until a solution is found that makes the conservation of wolves profitable, they will be killed.

Wolf hunter harvest decreased the size of individual packs by one to four wolves just ahead of the February 2010 breeding season. But even so, the level of hunter harvest combined with all other mortality in 2009 will not harm Montana's wolf population.
To state with any certainty that hunting will not harm the wolf population would require a follow up study of any affects the killing had on wolf packs. The fact that FWP wanted to increase the 2010 wolf hunt to 186 wolves before it was cancelled indicates that no follow up study was planned. Even so, there is no baseline data to use as comparison on general wolf behavior and pack structure before the hunt occurred.

By default, hunting wolves harms their population. That is the point of hunting them, to cut back on their numbers. Presumably, FWP meant that plenty of wolves survived the hunt to procreate and produce more wolves for the future. However, there are plenty of ways to harm wolves. We just do not readily see the effects, or they are of no concern to us. Carolyn Sime was reported as saying, "Even if we kill all the wolves, wolves will re-colonize" (Puckett 2010). Even if true, I doubt this statement was meant to be taken literally. Nevertheless, it demonstrates that it is the number of wolves that FWP concentrates on, not the quality of their population or even an appreciation of how wolf populations work.

Throughout their 15 month tenure of officially managing wolves, FWP posted policy information on their website and made the following statement:

FWP considers wolves as its does all other wildlife species it is charged to conserve and manage. An annual, regulated, well planned, and ***science-based hunt*** *serves as one tool among many for Montana to use to conserve, manage and maintain a wild wolf population that's in balance with its habitat, other wildlife, and the people who live in Montana* (Montana Fish, Wildlife, and Parks 2010a).

The reality is that wolves are not like any other wildlife species. They are not hunted for meat and consumed. Wolves are killed mostly out of fear, hatred, and a perceived competition for the other animals that we do eat. Research has revealed a good deal about the complex social nature of these sentient animals, their intelligence, how they work together as a group to survive, and the complex affects they have on their surrounding environment (Allen 1979, Mech and Boitani 2003, Packard 2003, Hebblewhite et al. 2005, Mallonee 2008, Mallonee 2010). When pushed to their physical and psychological limits, they can also suffer emotional disorders similar to those observed in humans (Mallonee and Joslin 2004). Wolf packs are a process in which all members participate (Mech and Boitani 2003, Mallonee 2008), and these processes are linked in geographic regions to form networks (Miklosi 2007). Such a widespread social system cannot be managed, at least in the traditional sense. Hunts cause harm to wolf populations by removing a large number of individuals in a short time and disrupting the population network, which already helps to control wolf numbers (Packard and Mech 1980, Miklosi 2007, Rutledge et al. 2009).

It is a matter of perspective on what is meant by "harming" the wolf population. As predators, they greatly influence the environment through all trophic levels (Allen 1979, Hebblewhite et al. 2005). Disruption of this process by lethal removal can result in continued wolf depredation on livestock (Bradley 2004, Musiani et al. 2005) and interfere with the daily complexities of pack assembly (Mallonee 2008, Mallonee unpublished data) and social patterns over time (Rutledge et al. 2009). This is because wolf packs act as family units (Mech and Boitani 2003) year round, unlike other predators, such as cougars and bears which are solitary most of the year (Hummel et al. 1991).

There were no biological red flags in the harvest.
Data provided in the 2009 hunting summary demonstrated that out of 72 wolves killed, 61% were subadults. This should be a biological red flag, because subadults are the future of wolf packs, both

Details
General age classification:
- 22 juveniles: 31% of total harvest
- 22 yearlings: 31% of total harvest
- 27 adults: 38% of total harvest
- 1 unknown

reproductively and socially. Killing mostly these age groups provides fewer wolves to replace those that will die or leave the pack during the year. Juveniles and yearlings are also still learning social skills and their place in the pack (Packard 2003), which may cause disruption of family units and the ability of the pack as a whole to fend for itself, i.e., hunting effectively. For example, human-caused mortality for wolves outside of Algonquin Park, Canada, was found to affect the evolution of important social patterns for wolf packs inside the protected park (Rutledge et al. 2009). This research demonstrated the need to consider the effects of hunting on social behavior as well as population numbers. Killing mostly the young of virtually any mammalian population would potentially cause the greatest influence on future population levels, ranging from slow population recovery to social and genetic effects (Raven and Berg 2004).

The State Wildlife Chief Ken McDonald stated that increasing the hunting quota will allow for a decrease in the population while keeping within the objectives of the management plan's goals (Backus 2010). Federal law requires Montana to maintain a minimum of 100 wolves and 10 breeding pairs (Montana Fish, Wildlife, and Parks 2009b), although no scientific data has been provided to suggest these numbers have any significance. No one knows the minimum number of wolves it would take to support an overall wolf population over time. Instead, FWP is attempting to create a population level that is in "balance" with its surrounding habitat, local economics, and social tolerance of these animals, based primarily on the number of wolves they can estimate annually. These estimates, therefore, would need to be accurate and ideally based in science.

Is the data collected by FWP accurate and sound?

For a clearer understanding of how their data is analyzed, I contacted FWP and was told they work with a biostatistician and the University of Montana to create models and predictions of how hunting affects the wolf population (Kent Laudon, Wolf Management Specialist, Montana Fish, Wildlife, and Parks, personal communication). The modeling results, however, have not been published, and the only data available for viewing by the public is mostly in the annual reports. Some of it is the raw data used in the modeling procedure. For an accurate view of wolf populations, data collection is critical because its analysis can only be as good as the quality of data that was collected. Therefore, a scientific approach is necessary. Because the modeling results are not available to view, some discrepancies in the annual report data will need some explanation from FWP.

Their data was collected using several methods. The most accurate numbers were from flights that located radio-collared wolves (Kent Laudon, Wolf Management Specialist, Montana Fish, Wildlife, and Parks, personal communication). From the signals, biologists knew an animal's location and identification, and therefore its gender and approximate age. Other data, from depredations and human-caused mortality, such as management and hunting, have also been fairly accurate. Like the information from collared wolves, there was something tangible that could be measured, i.e., a body, radio signals,

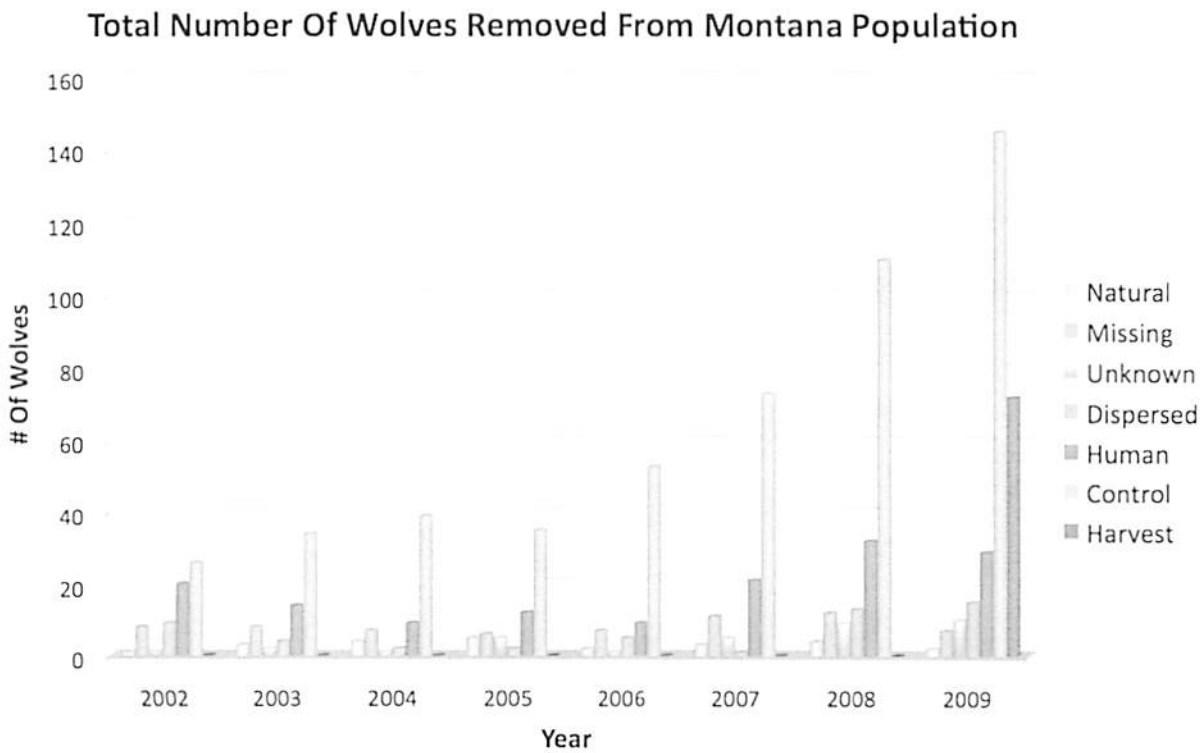
and even sightings. Overall, however, the wolves in these categories represent the minority of the total population.

Collecting information about the remaining wolves has been problematic and does not follow a scientific protocol (Kent Laudon, Wolf Management Specialist, Montana Fish, Wildlife, and Parks, personal communication). Some of this data has been opportunistic, including anecdotal information from the public (Montana Fish, Wildlife, and Parks 2010c, Kent Laudon, Wolf Management Specialist, Montana Fish, Wildlife, and Parks, personal communication), yet is used to estimate the minimum total number of wolves each year. How many wolves live in Montana? This basic question has been the center of controversy among the public and management agencies for many years. The number is crucial in determining how wolves are managed and how many are hunted, so it needs to be accurate. Using unscientific techniques, however, can produce data that is inaccurate and questionable, which can be seen in the annual reports:

Number Of Wolves Removed
From Montana Population

Year	# Wolves (Dec)	Natural	Missing	Unknown	Dispersed	Human	Control	Harvest	Total Removed	Total Wolves (for year)	
2002	184	1	8	1	9	20	26	0	65	249	26.1
2003	182	3	8	2	4	14	34	0	65	247	26.3
2004	153	4	7	1	2	9	39	0	62	215	28.8
2005	256	5	6	5	2	12	35	0	65	321	20.2
2006	316	2	7	1	5	9	53	0	77	393	19.6
2007	422	3	11	5	1	21	73	0	114	536	21.3
2008	497	4	12	9	13	32	110	0	180	677	26.6
2009	524	2	7	10	15	29	145	72	280	804	34.8

The table above summarizes the population numbers from 2002 through the present (U. S. Fish and Wildlife Service et al. 2003, 2004, 2005, 2006, 2007, 2008, Sime et al. 2009, 2010). The different



categories of wolf mortality, along with other factors that remove wolves from the population, are listed as seen in the reports. The numbers for human causes of mortality are light blue to highlight the fact that by far people have caused the most deaths observed in Montana's wolf population each year. The graph above is another way to view the same information. It gives a more visual aspect to what the data represents instead of only numbers. The columns in various shades of blue are the human factors that affect Montana's wolf population and are grouped together. Some biologists who are involved in wolf management have stated that human influence is only another of many factors the wolves must deal with each year. Their own data clearly demonstrates that *humans are the primary factor*.

As noted previously, the mortality information is probably the most accurate of all the data collected by FWP. It is the total number of wolves annually that is in question, because this information cannot be verified directly using the data provided. For example, there are unaccountable discrepancies in the total number of wolves from year to year. This total number is not provided directly. It must be calculated by adding the end of the year total (December) with how many wolves were removed from the population that year. Therefore in 2009, 804 wolves existed in the wolf population, but not all at once. As some were born or joined the population from other places, others were killed or left the population, i.e., dispersed. The table below summarizes these totals and the annual change in wolf numbers claimed by FWP.

Year		Claimed Pop. Growth			Corrected Total Wolves For The Year
2002	249		65		
2003	247	-2	65	-67	180
2004	215	-32	62	-94	121
2005	321	106	65	41	362
2006	393	72	77	-5	388
2007	536	143	114	29	565
2008	677	141	180	-39	638
2009	804	127	280	-153	651

In 2009, the wolf population apparently gained 127 wolves from the year before. However, 280 wolves were removed from the population, 88% of which was human-caused. This left 153 wolves unaccounted for in the 2009 population. In other words, 19% of the total population just vanished. Although the total discrepancy over the past eight years is 288 wolves, the end of the year totals (December) have been rising over the past five years. Given the discrepancies, why the rise and where are the missing wolves? The most likely explanation is that the total number of wolves claimed by FWP each year is invalid because these numbers cannot be confirmed, which means the December totals are also incorrect. This matches well with how the majority of data is collected: opportunistic and without scientific protocol. Perhaps there is a good explanation for the discrepancies, but FWP will need to provide them. Although data analysis appears to be scientific, data collection is not, therefore the claim that wolf hunts are based in science is incorrect. FWP's data appears to suffer from the same problems as past studies that have attempted to assess wolf populations in which pup mortality rates, dispersal, immigration, and other key factors remained virtually unknown (Fuller et al. 2003). Therefore management decisions, including an annual wolf hunt, are based on incomplete and perhaps misleading information.

Summary and conclusions

As you can now see, there is little science involved in the killing of Montana's wolves. FWP has been unable to provide the appropriate data necessary to justify the two main reasons for such a program:

livestock depredation and threat to prey populations. The fact that wolves have been slaughtered for no justifiable reason should be a concern to everyone, both morally and financially. Tax payer money is used to finance the hunting of wolves and other management practices. To claim that wolf management and hunting will "maintain a wild wolf population that's in balance with its habitat, other wildlife, and the people who live in Montana" is without merit.

As a research biologist, my experiences with these animals, both in captivity and in the field, have taught me they are something quite different from what most people have imagined. Wolves are not crops to be harvested and then regrown each year. They are societies of individuals that have complex social interactions, emotions, and a profound affect on their surroundings, all of which develop over time. For example, one of the wolves I studied in captivity had come from the Ninemile pack in southwest Montana where she had been chased twice by government biologists from a helicopter and darted each time. She was eventually placed into captivity where she was shot two more times with tranquilizers during escape attempts. By the time I arrived nine months later, she had developed post-traumatic stress which I verified through scientific study (Mallonee and Joslin 2004).

Wolves, like other animals that have been abused, can suffer emotional trauma. However, this has not been considered throughout the wolf recovery process. I presented these results to the park official who was in charge of the captive wolves in Yellowstone National Park during the beginning of reintroduction in the mid-1990s. The wolves had been taken from Canada and placed into captive facilities before their release into the park. After viewing my paper, he made it clear that he "was not there to monitor a bunch of wacko wolves, only to release them." The study was not against reintroduction, only to suggest that wildlife managers could show some sensitivity towards the animals they manipulate and use the best available science.

I have experienced this attitude repeatedly over the 19 years I have studied wolves, most often from wolf recovery agencies and their officials. Their concern is strictly numbers, despite research that demonstrates these animals have a profound and positive affect on their natural surroundings, and possess complex social behavior and emotions (Mallonee and Joslin 2004, Miklosi 2007, Mallonee 2008, Rutledge et al. 2009, Bekoff 2010). Such compassionless attitudes help demonstrate our cultural perception that morals and ethics are different for humans versus other life forms. As stated by Marc Bekoff (2010), "It is individuals who personally feel pain and suffer, not species." Bekoff is a prominent ethologist who has studied animal behavior around the world for decades. Because of his experiences and those of other scientists, he and Jane Goodall cofounded Ethologists for the Ethical Treatment of Animals: Citizens for Responsible Animal Behavior Studies. Consequently, hunting wolves is also a moral issue. In response to comments by pro-wolf conservation groups, Ed Bangs was quoted in the news as saying, "People will argue that the recovery goal should be higher. That's a moral judgement. A population of 45 breeding pairs and 450 wolves will never be threatened" (Hatch 2010). Because of their actions, FWP has made the moral decision to eliminate additional wolves through public hunts to augment their management practices, and with no scientific justification.

Overall, hunting seasons on a variety of species have turned our forests into giant game farms. However, instead of paying the owners to hunt on their land, we pay the government by way of game tags and hunting permits. Adding wolves to this practice makes no scientific sense. The current system of "killing wolves to protect them" is a paradoxical approach to solving our perceived conflicts with these animals (Herring 2010). To do so demonstrates another potential reason for killing wolves. It is the easiest and cheapest way of dealing with them, and it creates revenue for the state. Regardless, wolf management is in dire need of reform. It promotes our agendas rather than what is best for the environment and wolves. Given the money involved, wolf recovery appears to be a morally flexible, self-serving process that blatantly ignores vast areas of science to achieve its goals, such as animal

behavior, emotions, intelligence, interactions among life forms, and basic ecological principles. The process may include empathetic and compassionate people, but their views are superseded by the system in which they work. Although some management may be necessary, hunting wolves remains unjustified.

Ultimately we have the greatest influence on how many deer, elk, wolves, and other predators are present in our ecosystems. Until the current management paradigm changes, along with public attitude, there is no permanent solution to the apparent "wolf problem." However, a temporary solution already exists because wolves are again on the Endangered Species List. As part of the long-term solution, they should not be removed from the list until there is a wolf management plan that makes sense and based in science. I can appreciate how hard FWP works to obtain data on wolves and I know they do their best. Their best, however, is not science as they have claimed. Future solutions will have to take into account the full range of what science knows about wolves. Until that happens, agendas, opinions, and politics will guide wolf management, and over problems that are either mostly unknown (effects on prey populations) or rarely happen (depredations). This is a social issue, not a biological one.

Author background

Jay Mallonee is a research biologist with a master's degree in neurobiology/animal behavior. Through his business of Wolf & Wildlife Studies, he currently studies the Fishtrap pack in northwest Montana under the name of Project HOWL, and has done so since January 2001. Details of this study and others can be found on his web site at www.wolfandwildlifestudies.com. Previous research has included the documentation of traumatic stress displayed by a wild wolf placed into captivity, and behavioral studies on rodents, primates, and a variety of cetaceans, such as gray whales and bottlenose dolphins. He is also the author of *Timber - A Perfect Life*, the profound 16 year journey with his canine companion. Mallonee is a college professor and has taught a wide range of science classes for Michigan Tech University, U. C. Santa Barbara, San Francisco State University, and several community colleges.

Literature cited

Adams, T. 2010. Coyotes lead the pack for predator-related livestock losses. Farm & Ranch Guide. 10 March 2010.
<http://www.farmandranchguide.com/articles/2010/03/10/bullseye/livestock_news/live1.txt>
pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/adamscoyotes.pdf>

Allen, D. L. 1979. Wolves of Minong: their vital role in a wild community. Houghton Mifflin, Boston, MA.

Associated Press. 2010. State officials kill 15 wolves from 5 packs; 18 more to be shot. Missoulian. 31 May 2010.
<http://missoulian.com/news/state-and-regional/article_deff6636-6c28-11df-ba7d-001cc4c002e0.html>
pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/stateofficialskillwolves.pdf>

Backus, P. 2010. Proposal more than doubles Bitterroot wolf harvest. Associated Press and Ravalli Republic. 14 May 2010.
<http://www.ravallirepublic.com/news/local/govt-and-politics/article_e9487306-5efb-11df-9456-001cc4c002e0.html>
pdf archive <http://www.wolfandwildlifestudies.com/downloads/huntingpaper/backusbitterrootharvest.pdf>

Bangs, E. E., J. A. Fontaine, M. D. Jimenez, T. J. Meier, E. H. Bradley, C. C. Niemeyer, D. W. Smith, C. M. Mack, V. Asher, and J. K. Oakleaf. 2005. Managing wolf-human conflict in the northwestern United States. Pages 340-356 *in* R. Woodroffe, S. Thirgood, and A. Rabinwitz, editors. People and wildlife: conflict or coexistence? Cambridge University Press, Cambridge, UK.

Bekoff, M. 2010. The animal manifesto. New World Library, Novato, CA.

Bradley, E. 2004. An evaluation of wolf-livestock conflicts and management in the northwest United States. Thesis, University of Montana, Missoula, Montana, USA.

Brown, M. 2010. Endangered or not, wolf killings set to expand. Associated Press. 5 September 2010.
<http://news.yahoo.com/s/ap/20100905/ap_on_re_us/us_killing_wolves>
pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/brownkillingexpands.pdf>

Byron, E. 2010. Groups form coalition on wolf issue. Independent Record. 21 August 2010.
<http://helenair.com/news/article_ed09bea8-ace6-11df-8b11-001cc4c03286.html>

pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/byroncoalitiongroup.pdf>

Chaney, R. 2010a. Montana, Idaho consider wolf-control options with hunts shut down. Missoulian. 7 August 2010. <http://missoulian.com/news/local/article_dd7916f4-a1d4-11df-8e84-001cc4c002e0.html> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/chaneycontroloptions.pdf>

Chaney, R. 2010b. Baucus, Tester introduce wolf bill. Missoulian. 30 September 2010. <http://helenair.com/news/local/govt-and-politics/article_056e04a2-cc56-11df-a7f1-001cc4c002e0.html> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/baucustester.pdf>

Collinge, M. 2008. Relative risks of predation on livestock posed by individual wolves, black bears, mountain lions and coyotes in Idaho. Proceedings of the 23th Vertebrate Pest Conference (R. M. Timm and M. B. Madon, Eds). <http://rliv.com/pic/Collinge%20Paper.pdf> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/collingecoyotes.pdf>

Dennison, M. 2010. Montana aims to settle lawsuit or remove, kill gray wolves. Missoulian. 13 August 2010. <http://missoulian.com/news/local/article_6804d402-a68a-11df-9036-001cc4c002e0.html> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/dennisonremovewolves.pdf>

Fuller, T. K., L. D. Mech, and J. F. Cochrane. 2003. Wolf population dynamics. Pages 161-191 *in* L. D. Mech and L. D. Boitani, editors. Wolves: behavior, ecology, and conservation. University of Chicago Press, Chicago, IL.

Hamlin, K. L. and J. A. Cunningham. 2009. Monitoring and assessment of wolf-ungulate interactions and population trends within the Greater Yellowstone Area, southwestern Montana, and Montana statewide: Final Report. Montana Department of Fish, Wildlife, and Parks, Wildlife Division, Helena, Montana, USA. <http://fwpiis.mt.gov/content/getItem.aspx?id=36743> pdf archive <http://www.wolfandwildlifestudies.com/downloads/huntingpaper/elkwolfinteractions.pdf>

Hatch, C. 2010. Wolf recovery target has changed, feds acknowledge. Jackson Hole News & Guide. 5 May 2010. <http://www.jhnewsandguide.com/article.php?art_id=5945> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/hatchwolfrecovery.pdf>

Hebblewhite, M., C. White, C. Nietvelt, J. Mckenzie, T. Hurd, J. Fryxell, S. Bayley, and P. C. Paquet. 2005. Human activity mediates a trophic cascade caused by wolves. Ecology 86: 1320–1330.

Herring, H. 2010. One way to save the wolf? Hunt it. High Country News. 10 May 2010. <http://www.hcn.org/issues/42.8/one-way-to-save-the-wolf-hunt-it> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/herringonewaytosave.pdf>

Hummel, M., S. Pettigrew, and J. Murray. 1991. Wild hunters: predators in peril. Roberts Rinehart Publishers, Niwot, CO.

Mallonee, J. S. 2008. Movements of radio collared wolves and their significance on pack assembly. The Journal of American Science 4(1):53-58. <http://www.americanscience.org/journals/am-sci/0401/07_0339_Mallonee_movement_am0401.pdf> pdf archive<http://www.wolfandwildlifestudies.com/researchpapers.php>

Mallonee, J. S. 2010. The truth about wolves. Flathead Living Magazine. Summer: 108-111. <http://digital.publicationprinters.com/magazine/?i=42527&pre=1> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/truthaboutwolves.pdf>

Mallonee, J. S. and P. Joslin. 2004. Traumatic stress disorder observed in an adult wild captive wolf (*Canis lupus*). Journal of Applied Animal Welfare Science 7:107-126. <http://www.animalsandsociety.org/assets/library/187_s15327604jaws07023.pdf> pdf archive<http://www.wolfandwildlifestudies.com/researchpapers.php>

Mech L. D. and L. D. Boitani. 2003. Wolf social ecology. Pages 1-34 *in* L. D. Mech and L. D. Boitani, editors. Wolves: behavior, ecology, and conservation. University of Chicago Press, Chicago, IL.

Mech L. D. and R. O. Peterson. 2003. Wolf-prey relations. Pages 131-160 *in* L. D. Mech and L. D. Boitani, editors. Wolves: behavior, ecology, and conservation. University of Chicago Press, Chicago, IL.

Miklosi, A. 2007. Dog behaviour, evolution, and cognition. Oxford University Press, New York, NY. <http://ebook3000.com/animals/Adam-Miklosi---Dog-Behaviour--Evolution--and-Cognition_64834.html>

Montana Fish, Wildlife, and Parks, "2007 Montana White-tailed Deer Distribution and Population Estimate," 2007, <http://fwpiis.mt.gov/content/getItem.aspx?id=29793> (22 July 2010). pdf archive <http://www.wolfandwildlifestudies.com/downloads/huntingpaper/2007whitetaileddeer.pdf>

Montana Fish, Wildlife, and Parks, "2008 Elk Objectives and Status," 2008a, <http://fwpiis.mt.gov/content/getItem.aspx?id=36361> (22 July 2010). pdf archive <http://www.wolfandwildlifestudies.com/downloads/huntingpaper/2008elk.pdf>

Montana Fish, Wildlife, and Parks, "2008 Mule Deer Status," 2008b, <http://fwpiis.mt.gov/content/getItem.aspx?id=36461> (22 July 2010). pdf archive <http://www.wolfandwildlifestudies.com/downloads/huntingpaper/2008muledeer.pdf>

Montana Fish, Wildlife, and Parks, "Montana Gray Wolf Program," 2009a, <http://fwpiis.mt.gov/content/getItem.aspx?id=42353> (4 September 2010). pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/montanagraywolfprogram.pdf>

Montana Fish, Wildlife, and Parks, "Fact Sheet: Montana Wolf Delisted May 4, 2009," 2009b, <http://fwpiis.mt.gov/content/getItem.aspx?id=36447> (2 October 2010). pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/factsheetmay42009.pdf>

Montana Fish, Wildlife, and Parks, "FWP Fact Sheet, Questions and Answers: Montana's Regulated Wolf Hunt," 2010a, <http://fwpiis.mt.gov/content/getItem.aspx?id=39994> (22 July 2010). pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/regulatedwolfhunt.pdf>

Montana Fish, Wildlife, and Parks, "State Officials Decry Wolf Decision," 2010b, <http://fwpiis.mt.gov/content/getItem.aspx?id=45627> (2 October 2010). pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/officialsdecrydecision.pdf>

Montana Fish, Wildlife, and Parks, "The 2009 Montana Wolf Hunting Season Summary," 2010c, <http://fwpiis.mt.gov//content/getItem.aspx?id=41454> (1 September 2010). pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/2009wolfhuntsummary.pdf>

Musiani, M., T. Muhly, C. C. Gates, C. Callaghan, M. E. Smith, and E. Tosoni. 2005. Seasonality and reoccurrence of depredation and wolf control in western North America. Wildlife Society Bulletin 33:876-887.

Packard, J. M. 2003. Wolf behavior: reproductive, social, and intelligent. Pages 35-65 *in* L. D. Mech and L. D. Boitani, editors. Wolves: behavior, ecology, and conservation. University of Chicago Press, Chicago, IL.

Packard, J. M. and L. D. Mech. 1980. Population regulation in wolves. Pages 135-150 *in* M. N. Cohen, R. S. Malpass, and H. G. Klein eds. Biosocial mechanisms of population regulation. Yale University Press, New Haven, CT.

Peterson, C. 2010. Lawmakers seek to delist gray wolf. Hungry Horse News. 18 August 2010. <http://www.flatheadnewsgroup.com/articles/2010/08/19/hungryhorsenews/news/news_8717847971_01.txt> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/petersonlawmakers.pdf>

Puckett, K. 2010. Wolves back in cattle country. Great Falls Tribune. 28 March 2010. <http://www.greatfallstribune.com/article/20100328/NEWS01/3280302/1002/news01/Wolves-back-in-cattle-country> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/puckettwolvesback.pdf>

Raven, P. H. and L. R. Berg. 2004. Environment. John Wiley and Sons, Inc., Hoboken, NJ.

Rutledge, L. Y., B. R. Patterson, K. J. Mills, K. M. Loveless, D. L. Murray, and B. N. White. 2009. Protection from harvesting restores the natural social structure of eastern wolf packs. Biological Conservation, doi:10.1016/j.biocon.2009.10.017. pdf archive <http://www.wolfandwildlifestudies.com/downloads/huntingpaper/rutledgepackstructure.pdf>

Sime, C. A., E. Bangs, E. Bradley, J. E. Steuber, K. Glazier, P. J. Hoover, V. Asher, K. Laudon, M. Ross, and J. Trapp. 2007. Gray wolves and livestock in Montana: a recent history of damage management. Proceedings of the 12th Wildlife Damage Management Conference (D. L. Nolte, W. M. Arjo, and D. H. Stalman, Eds). <http://fwpiis.mt.gov/content/getItem.aspx?id=36751> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/simedamagecontrol.pdf>

Sime, C. A., V. Asher, L. Bradley, K. Laudon, N. Lance, and M. Ross, and J. Steuber. 2009. Montana gray wolf conservation and management 2008 annual report. Montana Fish, Wildlife & Parks. Helena, Montana. 154 pp. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt08/index.html>

Sime, C. A., V. Asher, L. Bradley, K. Laudon, N. Lance, and M. Ross, and J. Steuber. 2010. Montana gray wolf conservation and management 2009 annual report. Montana Fish, Wildlife & Parks. Helena, Montana. 173 pp. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt09/index.html>

U. S. Congress. 1973. Endangered Species Act of 1973, Public Law 93-205, 87 Stat. 884, 16 U.S.C. 1531-1544. <http://www.epa.gov/lawsregs/laws/esa.html> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/esa.pdf>

U. S. Department of Agriculture, "2007 Census of Agriculture: State Profile - Montana," 2007, <http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Montana/cp99030.pdf> (11 August 2010). pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/2007livestock.pdf>

U. S. Department of Agriculture, "National Agricultural Statistics Service - Montana Cattle and Sheep Losses to Predators," 2009, <http://quickstats.nass.usda.gov/> (11 August 2010).

U. S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, and USDA Wildlife Services. 2003. Rocky Mountain Wolf Recovery 2002 Annual Report. T. Meier, ed. USFWS, Ecological Services, 100 N Park, Suite 320, Helena MT. 64 pp. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt02/>

U. S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, and USDA Wildlife Services. 2004. Rocky Mountain Wolf Recovery 2003 Annual Report. T. Meier, ed. USFWS, Ecological Services, 100 N Park, Suite 320, Helena MT. 65 pp. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt03/>

U. S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, Montana Fish, Wildlife and Parks, Idaho Fish and Game, and USDA Wildlife Services. 2005. Rocky Mountain Wolf Recovery 2004 Annual Report. D. Boyd, ed. USFWS, Ecological Services, 100 N Park, Suite 320, Helena MT. 72 pp. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt04/>

U. S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, Montana Fish, Wildlife & Parks, Idaho Fish and Game, and USDA Wildlife Services. 2006. Rocky Mountain Wolf Recovery 2005 Annual Report. C.A. Sime and E.E. Bangs, eds. USFWS, Ecological Services, 585 Shepard Way, Helena, Montana, 59601. 130pp. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt05/>

U. S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, Montana Fish, Wildlife & Parks, Idaho Fish and Game, and USDA Wildlife Services. 2007. Rocky Mountain Wolf Recovery 2006 Annual Report. C.A. Sime and E.E. Bangs, eds. USFWS, Ecological Services, 585 Shepard Way, Helena, Montana, 59601. 235pp. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt06/index.htm>

U. S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, Montana Fish, Wildlife & Parks, Blackfeet Nation, Confederated Salish and Kootenai Tribes, Idaho Fish and Game, and USDA Wildlife Services. 2008. Rocky Mountain Wolf Recovery 2007 Interagency Annual Report. C.A. Sime and E.E. Bangs, eds. USFWS, Ecological Services, 585 Shepard Way, Helena, Montana, 59601. 275pp. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt07/index.html>

Volz, M. 2010. Judge orders protections reinstated for gray wolf. Associated Press. 5 August 2010. <http://www.boston.com/news/nation/articles/2010/08/05/judge_orders_protections_reinstated_for_gray_wolf/> pdf archive<http://www.wolfandwildlifestudies.com/downloads/huntingpaper/volzjudgeorders.pdf>

IDAHO DEPARTMENT OF HEALTH & WELFARE

Disease Bulletin

- *Echinococcus granulosus*
- Rabies Vaccine
- Cryptosporidiosis in Idaho

VOLUME 17 NUMBER 2 • APRIL 2010

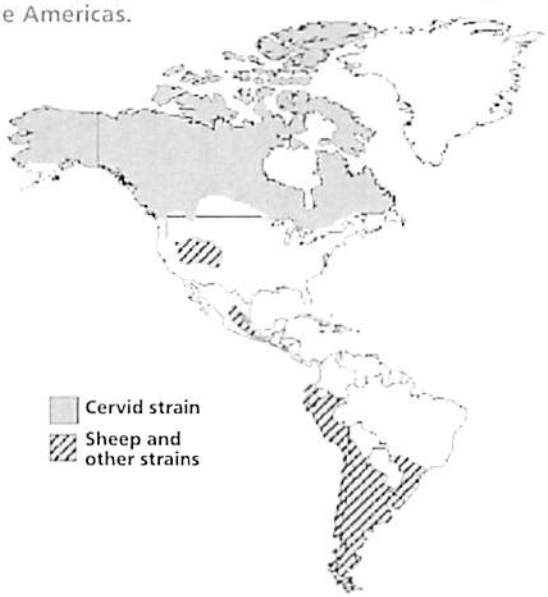
Echinococcus: Focus on Idaho

Echinococcus granulosus is a zoonotic, diminutive tapeworm that causes hydatid (unilocular) cyst disease in humans. *E. granulosus* occurs worldwide, including in many regions of the Americas (Figure 1). Several species of *Echinococcus* have been identified. Because *E. granulosus* is the species described in Idaho wildlife, this article will focus on the human health risks, clinical features, diagnosis, and management of hydatid cyst disease. In the continental United States, *E. granulosus* is found in holarctic tundra, boreal forest, other northern latitudes with favorable conditions, and in sheep husbandry areas of the western United States.

The majority of documented human infections in the United States have been acquired in endemic countries or in persons whose cultural practices allowed close contact with a definitive parasite host[1]. In 2009, Foreyt *et al*[2] reported finding *E. granulosus* in 62% of Idaho wolves evaluated between 2006 and 2008. *E. granulosus* was also detected in elk, deer, and a mountain goat. The authors consider this the first report of *E. granulosus* in a wildlife cycle in Idaho.

Echinococcus spp. have a complex two-host life cycle. Carnivores, the definitive host, and herbivores, the typical intermediate host, are required to complete the cycle (Figure 2). Definitive hosts shed in their feces eggs or gravid proglottids produced by adult worms residing in their gastrointestinal tract (GIT). The egg-containing feces may contaminate grazing grounds or local waterways. *E. granulosus* eggs survive for only short periods of time if they are exposed to direct sunlight and dry conditions, but may remain viable for several months under moist conditions and in moderate temperatures. Intermediate hosts consume viable eggs while grazing or drinking, initiating the second phase of the life cycle.

Figure 1. Approximate geographic occurrence of *Echinococcus granulosus*, agent of cystic echinococcosis, in the Americas.



Reprinted from Moro P and Schantz PM. Cystic Echinococcosis in the Americas. *Parasitol Int* 2006; 55(Suppl):S181-6, with permission from Elsevier Science.

CONTINUED ON NEXT PAGE

OFFICE OF EPIDEMIOLOGY, FOOD PROTECTION, AND IMMUNIZATION

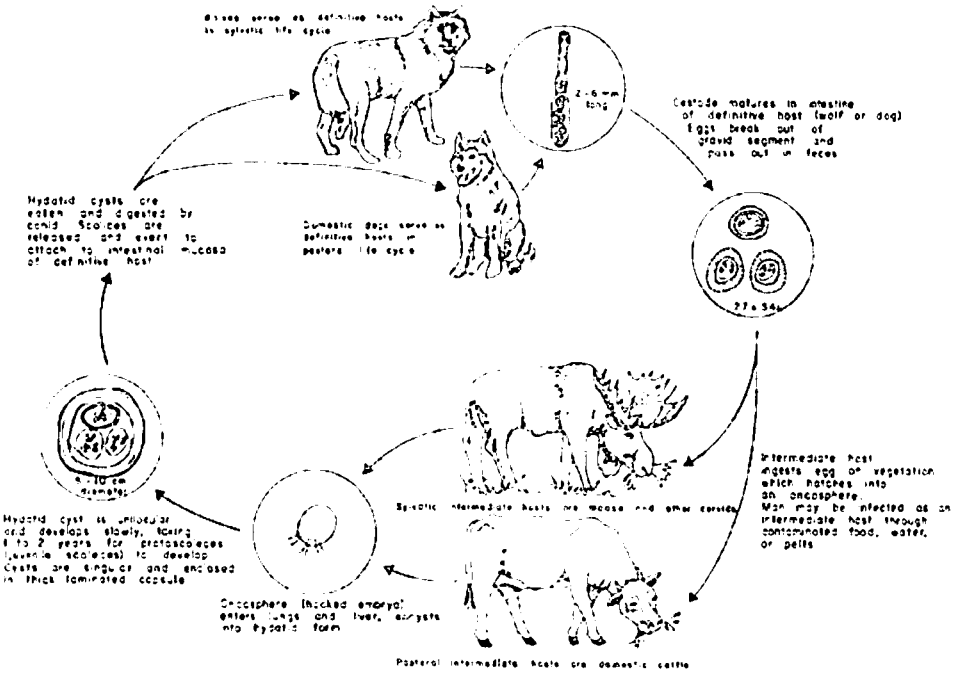
Idaho Department of Health and Welfare

P.O. Box 83720
450 W. State Street,
4th Floor
Boise, Idaho 83720-0036
WWW.EPI.IDAHO.GOV

CONTINUED FROM FIRST PAGE

In this phase, the eggs hatch and larvae migrate throughout the body, eventually lodging in tissues, usually the lung or liver. The larvae reproduce, generating fluid filled brood cysts containing numerous immature parasites (protoscolices). The life cycle is complete when a definitive host consumes the brood cyst during predation of the intermediate host, allowing for the establishment of adult worms once again in the definitive host GIT. Intermediate hosts cannot transmit the parasite by casual contact. Eight defined strains (G1–3, G6–10) of *E. granulosus* have been described to date, often aligning with specific intermediate and definitive host cycles, morphology, and molecular characteristics[3]. Two *E. granulosus* life cycles have been described in the United States. The sylvatic (wild, or northern) (G8) cycle is maintained in nature generally between wild ungulates (*e.g.*, elk, mule deer, moose) which are the intermediate hosts, and wild canids (*e.g.*, wolves, coyotes) which are the definitive hosts. In the United States the sylvatic cycle is predominantly found in northern tier states, Alaska, and Canada. The synanthropic (G1) cycle is also known as the pastoral or domestic cycle. In this cycle, the parasite is maintained primarily between domestic dogs (*e.g.*, herding dogs) and sheep. Hydatid cysts were reportedly found in domestic sheep from Idaho that were sent to California for slaughter in the late 1960s and early 1970s[4].

Figure 2. Lifecycles of *Echinococcus* spp.



Reprinted from Dietrich RA (ed). *Alaska Wildlife Diseases*. University of Alaska Institute of Arctic Biology; 1981 with permission from the University of Alaska Institute of Arctic Biology.

Risk factors for human infection

Humans are considered incidental intermediate hosts.

- *Eggs shed by definitive hosts are considered infectious to humans.* Eggs are transmitted through the fecal-oral route by direct transfer of fecal material of canids or by consuming contaminated food or water.
- *Fertile (brood) cysts found in intermediate hosts are not considered a direct human health risk.* The greatest zoonotic disease risk from *E. granulosus* G8 and G1 strains appears to be associated with feeding working and domestic dogs (*e.g.*, sled dogs, herding dogs) affected tissues from intermediate hosts (*e.g.*, moose, caribou, elk, sheep), with subsequent peridomestic shedding of eggs and zoonotic transmission. Changes in cultural practices, including increased awareness of the parasite life cycle, hand hygiene and the elimination of feeding offal to dogs, have been documented to significantly reduce zoonotic disease transmission[5].

Incidence

Human echinococcosis is not reportable in most states in the United States, including Idaho. Because of this, the incidence of human infection in the United States is unknown. According to the Centers for Disease Control and Prevention (CDC), most documented cases in North America are diagnosed in immigrants or travelers returning from endemic countries, rather than in persons with no such history. Autochthonous transmission of *E. granulosus*, primarily of the sylvatic strain, has been reported rarely in Alaska[5,6]. Rare reports of locally-acquired human illness have also come from Arizona, California, New Mexico and Utah and were primarily of the sheep-associated pastoral strain and associated with cultural practices allowing working dogs to feed on sheep carcasses. *E. granulosus* has been present in Minnesota wolves for over thirty years. Surveillance data collected there have revealed no evidence of *E. granulosus* infection in humans or livestock (Dr. J. Scheftel, MN State Public Health Veterinarian, personal communication). In Idaho, human cases of hydatidosis are rarely reported.

Clinical illness in humans

E. granulosus causes hydatid disease, also known as hydatidosis, cystic echinococcosis or unilocular echinococcosis[1,8]. Infected persons may remain asymptomatic for many years or permanently. Many human infections are detected incidentally during imaging studies. Clinical manifestations are determined by the site and size of the slowly enlarging brood cyst. In approximately 90% of cases, cysts are located in the liver or lung; the remaining 10% could be found in any organ of the body, including brain, heart, and bones. Mass effect can cause a variety of conditions such as biliary, bronchial, or renal outflow obstruction. Allergic reactions, including anaphylaxis have been described, with cyst leakage or rupture. Clinical manifestations might be *Echinococcus* strain-dependent. G8 infections are characterized by predominantly pulmonary localization, slower and more benign growth, and less frequent

occurrence of clinical complications than reported for other forms[5].

Diagnosis

There is no standard, highly sensitive, and specific serological test for antibody detection in cases of human cystic echinococcosis. Seroconversion is poor in the absence of brood cyst leakage or rupture (CDC personal communication); therefore, serologic testing (which is commercially available) in the absence of suspicious imaging results has marginal sensitivity and predictive value and should be considered only as an adjunct method of diagnosis. Diagnosis usually requires ultrasound, CT, or MRI to detect the location of one or more brood cysts[1]. Diagnosis can also be confirmed by examining cyst tissue or contents for evidence of the parasite, but cyst rupture is a risk with this method. The Office of Epidemiology, Food Protection, and Immunization (OEFI) is available to discuss the epidemiologic features of any suspected case, and, upon prior approval, the Idaho Bureau of Laboratories, in association with the CDC, could assist in sample evaluation.

Treatment

Treatment options may include surgical removal of brood cysts and/or use of antiparasitic drugs such as albendazole or benzimidazole. Recent advances have included combination approaches, including albendazole initiation for one month followed by percutaneous aspiration of cyst contents and injection of a protoscolicidal agent, followed by re-aspiration. Consultation with an infectious disease or tropical medicine specialist for diagnosis and treatment is recommended.

Education and prevention

No human vaccine is available; therefore, education about avoiding parasite eggs is key to disease prevention, particularly for persons who might come in close contact with definitive hosts. Messages for your patients who hunt wolves or elk, or who have working sheepdogs or hunting dogs include:

- When handling feces, pelts, or carcasses from live or dead canines (including wolves) suspected to carry *Echinococcus* eggs, wear disposable gloves and thoroughly wash your hands after handling the material.
- Manage your pet and working dogs appropriately.
  - To avoid passive carriage of eggs, do not allow dogs to roll in wild canid feces.
  - To prevent dogs from becoming infected, do not allow them to consume internal organs from wild herbivores. *Echinococcus* cysts found in herbivores can infect dogs.
  - Once infected, dogs can be a source of infection to you and your family. If you think your dog might have been exposed, talk to a veterinarian about testing and treatment for your dog.
- Because fecal matter can contaminate food or water, use safe food and water practices in the field. Heat potentially contaminated food and water at 140° F (>60° C) for at least 30 minutes to destroy the eggs[1].

For more information on the disease in wildlife, visit the Idaho Department of Fish and Game web site: http://fishandgame.idaho.gov/cms/wildlife/manage_issues/echinococcus.cfm.

REFERENCES

1 [illegible] Echinococcosis (Hydatid Disease). In: Centers for Disease Control and Prevention. CDC Health Information for International Travel 2010 (Travelers' Health-Yellow Book). Atlanta, GA: Dept of Health and Human Services, Public Health Service; 2009. http://wwwnc.cdc.gov/travel/yellowbook/2010/chapter-5/echinococcosis.aspx

2 [illegible] Echinococcus granulosus in Gray Wolves and Ungulates in Idaho and Montana, USA. Journal of Wildlife Diseases. 2006; 42(4):1208-1212.

3 [illegible] Thompson RC. Emergence/re-emergence of Echinococcus spp—A global update. [illegible] Parasitology. 2008; 35:1205-1219.

4 Idaho Department of Fish and Game Parasite Tapeworm – Echinococcus Granulosus Q and A. January 2010. http://fishandgame.idaho.gov/cms/wildlife/manage_issues/echinococcus.cfm

5 Moro P and Schantz PM. Cystic Echinococcosis in the Americas. Parasit. [illegible] 2006; 55(Suppl, S181-6.

6 Rausch R. Cystic Echinococcosis in the Arctic and Sub-Arctic. Parasitology. 2003; 127: S73-86.

7 Schantz PM, Von Reyn CF, Welty T, Schultz MG. Echinococcosis in Arizona and New Mexico: Survey of Hospital Records, 1969-1974. Am J Trop Med Hyg. 1976; 25(3):374-377.

8 King C. Cestodes ("tapeworms"). In: Mandell G, Bennett J, Dolin R, eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 6th ed. Philadelphia, PA: Elsevier; 2009; 3285-3293.

Rabies Post-exposure Vaccine Schedule Update

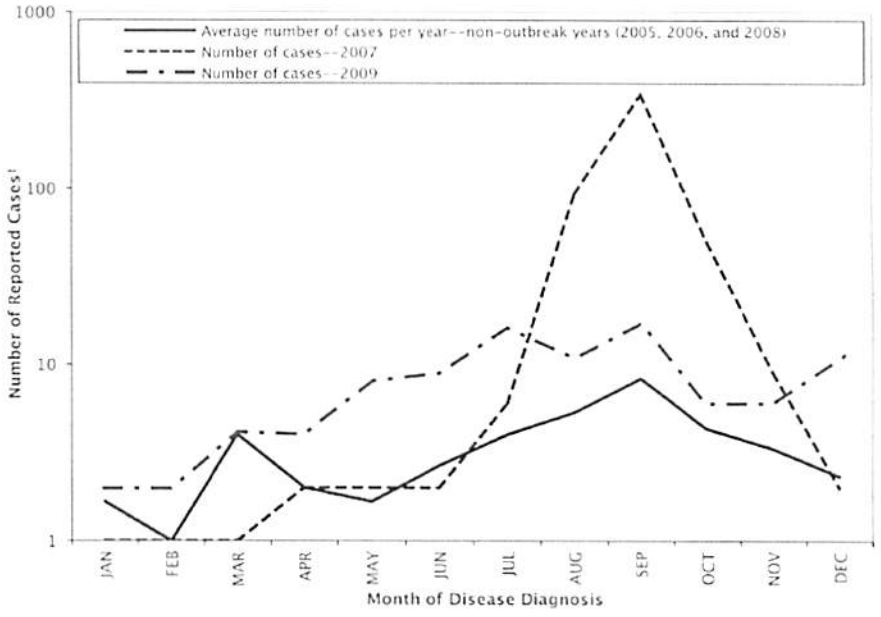
The Advisory Committee on Immunization Practices (ACIP) recently updated their recommendations for post-exposure prophylaxis (PEP) to prevent human rabies in immunocompetent persons. Previously, ACIP recommended a 5-dose rabies vaccination regimen. These new recommendations reduce the number of vaccine doses to four by eliminating the last dose in the series. The series now consists of doses at day 0, 3, 7, and 14. These recommendations do not alter ACIP's guidance for the use of human rabies immune globulin, to be given on day 0. The recommendation was based on evidence from rabies virus pathogenesis data, experimental animal work, clinical studies, and epidemiologic surveillance. A 5-dose vaccine series is still recommended for those with altered immunocompetence.

The full ACIP report is found at the following web site: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5902a1.htm. In the report, Table 3 outlines the rabies PEP schedule for both those not previously and those previously vaccinated.

Rise in Cryptosporidiosis in Idaho

In 2007, a large increase in the number of reported cryptosporidiosis cases was due in part to outbreaks associated with recreational water venues. In 2008, case reporting declined to background levels. In 2009, the number of reported cases remained low, but was higher than the average for the preceding three non-outbreak years (Figure), raising concern about the potential for an outbreak in summer 2010. Among cases reported during 2006–2009 where information was complete, 46% were in children aged <12 years. Hospitalization was required in 26% of patients aged 50 years and older and 8% of all patients. The mean time from onset of illness to diagnosis was 12 days. Cryptosporidiosis should be considered when patients present with watery diarrhea and can be misdiagnosed as viral gastroenteritis in children presenting with vomiting and fever. Routine ova and parasite tests do not always detect the oocysts: *Cryptosporidium*-specific tests are available. See http://www.rwi.dhw.idaho.gov.

Figure. Reported cryptosporidiosis cases by month of diagnosis*—Idaho, 2005–2009.



* 17 (2%) of 752 reported cases excluded due to missing diagnosis date.

† Y-axis is log scale

Idaho Disease Bulletin

IDAHO DEPARTMENT OF HEALTH & WELFARE

Division of Public Health
P.O. Box 83720
Boise, ID 83720-0036

ROUTINE 24-Hour Disease Reporting Line
1.800.632.5927
EMERGENCY 24-Hour Reporting Line
1.800.632.8000

An electronic version of the Rules and Regulations Governing Idaho Reportable Diseases may be found at http://adm.idaho.gov/adminrules/rules/idapa16/0210.pdf.

Current and past issues are archived online at www.epi.idaho.gov.

PRSRT STD
U.S. Postage
PAID
Permit No. 1
Boise, ID