Comparability of Confirmed Wolf Depredations to Actual Losses Wolves Denning in Calf/yearling Core Areas Catron County, New Mexico 01/21/11

DRAFT SUBJECT TO CALCULATIONS CHANGE

In 1998 Mexican gray wolves were re-introduced on the landscape in Arizona by the U.S. Fish and Wildlife Service. Shortly thereafter Mexican wolves dispersed across the state line into New Mexico. Wolves were also trans-located into New Mexico from Arizona; among them were problem wolves that had prior confirmed livestock depredations. These problem wolves continued to kill livestock on family ranches in New Mexico.

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Discussion

The Gila Wilderness

The Gila Wilderness is ideal, pristine Mexican wolf habitat containing 558,065 acres. There is little human activity and little livestock grazing in the Gila Wilderness compared to the human use, activity, and livestock grazing in the Gila Forest, which is fragmented by homesteaded family ranches, subdivisions and isolated homes.

For the last 10 years the U.S. Fish & Wildlife Service (USFWS) has released numerous Mexican wolf packs into the interior of the Gila Wilderness. Not one of the released wolf packs has stayed there. The released wolf packs leave the Gila Wilderness within a short time and travel to human activity, ranches, homes and communities. Mexican wolves seek out humans and human use areas due to their habituation, and lack an avoidance response towards humans.

The data have shown that ideal, pristine, remote wolf habitat such as the Gila Wilderness is not utilized by Mexican wolves. The designation of critical wolf habitat is useless when the wolves will not utilize such designation unless the designation of critical wolf habitat includes homes, communities, and people.

Since April 2006 there have been 350 wolf-animal, wolf-human interactions. 172 were on private property and 178 were on non-private property. This represents approximately 50% of wolf interactions, which clearly indicates the severe habituation of wolves towards humans and human use areas.

Grazing information within the Gila Wilderness provided by the USFS Wilderness District

There are six existing small livestock grazing permits within the Gila Wilderness. In Catron County the Jordan Mesa/Black Mountain permit is allotted 20 cows and is in Non-Use. There are five permits in Grant County located in the southern portion of the Gila Wilderness; Canyon Creek is grazing 5 cows, permitted for 20 cows; Indian Creek is grazing 50 head; Mimbres is grazing 230 cow/calves; East Canyon is grazing 65 cow/calves; and the Shepard permit is grazing 72 steers. The total numbers of grazing cattle in the 558,065 acres of the Gila Wilderness is 422 head. All other historic grazing permits have been eliminated by the U.S. Forest Service.

Adaptive Management Oversight Committee (AMOC)

Adaptive Management Oversight Committee (AMOC) members have challenged wolf-livestock depredation findings by Wildlife Services. An unwritten AMOC rule went into

effect tightening wolf/livestock depredation confirmations to a specific standard of “a canine spread with corresponding hemorrhage”. Investigative findings have been changed by AMOC from confirmed to probable and probable to possible because of this unwritten AMOC rule. Also, AMOC members have assigned depredation strikes to non-depredating wolves contrary to Wildlife Services findings of identified depredating wolves to protect female wolves and wolves with 2 strikes against them from permanent removal. The arbitrary action’s of AMOC members have resulted in compensation loss to the resource owners, has allowed habituated livestock depredating wolves to remain on the landscape and caused mistrust through out the wolf recovery area.

Documented historic Mexican wolf behavior

Due to the lack of documented historic Mexican wolf behavior, data has been collected by Catron County, New Mexico since the USFWS release of Mexican wolves in 1998. There are many unknowns, and unusual wolf behavior has been documented by Catron County including:

- Mexican wolves urinating on vehicle tires and on an ice chest located outside an occupied camp trailer.
- A wolf defecating on the front of an ATV vehicle located in a front yard.
- Wolves defecating on porches and yards at door entrances of occupied homes.
- Territorial scrapes at occupied residences where the wolves were claiming the residence as part of their territory.
- Numerous territorial scrapes at one residence where wolves were documented at the home 23 times.

A major flaw in Mexican wolves is habituation towards humans and human use areas. All of the stated above incidences are contrary to wild wolf behavior, but appear to be the norm for captive released wolves and their wild born offspring. Habituated wolf parents will teach their offspring to become habituated towards humans and human use areas.

AMOC Wolf-Livestock Depredation Confirmation Requirements

Utilizing the current strict, specific confirmation requirements set by AMOC, few confirmed wolf-livestock depredations or probable wolf-livestock depredations can actually be confirmed by USFWS, Wildlife Services or Catron County. AMOC confirmation standards currently in place to confirm a wolf-livestock depredation consist of wolf evidence at the scene and on the carcass include:

1. Measurable canine spreads with corresponding hemorrhage;
2. Massive hemorrhage in the muscle tissue;
3. Large bones broken;
4. Measurable compression canine spreads;
5. Blood trail;
6. Ground disturbance;
7. Uprooted/torn/tramped vegetation;

8. Wolf tracks;
9. Wolf scat;
10. Attack site;
11. Feeding site;
12. Drag marks;
13. Ground and aerial telemetry documenting wolves at the scene or in the area; and/or
14. Other confirmed livestock depredations in the immediate area

Loss of evidence

Evidence that has a direct effect on the findings of livestock death investigations by USFWS, WS and Catron County may be lost for various reasons. Loss of evidence does not equate to non-depredation. Reasons for loss of evidence include but are not limited to:

1. Missing livestock with no remains resulting from wolves eating the whole carcass of calves including skull, hooves, bones, and hair;
2. Coyotes' or other scavengers consuming remainder of calf carcasses;
3. Calves/yearlings/cows not being found in rough remote terrain;
4. Advanced decomposition, rapid and severe in summer weather;
5. Insect infestation;
6. Scavenging birds;
7. Other scavenging carnivores;
8. Weather condition;
9. Rocky, hard ground conditions limit impressions; and/or
10. Untimely carcass detection.

Many ranchers feel they will go out of business, not from confirmed/probable wolf-livestock losses but from the ratio of losses as it is felt that for every confirmed wolf depredation there are seven (7) more that are not found and confirmed. Our hypothesis is that the presence of wolves denning in calf core areas equal more than seven (7) depredations for each confirmed wolf/livestock depredation. Note that wolves select denning sites based on easy prey (livestock). Indicators are that when wolves den in calf core areas the ratio of confirmed losses to true losses grows expediently beyond the numbers suggested in a 2003 USFWS study by John Oakleaf.

Catron County that has documented on one ranch that 36% of the depredated yearlings that were confirmed as having been attacked, and fed upon by the Middle Fork Pack were still alive after the initial attack/feeding. Furthermore, after the wolves attacked and fed, the yearlings traveled a long distance before being found alive or dead at the found alive/carcass site. Livestock found alive after a wolf fed upon them have been documented with maggots three quarters of an inch long living in the wounds, indicating the yearling lived for some time post-attack. Livestock have been found in the past with canine spreads and rake marks with corresponding hemorrhage consistent with wolves; as the scene lacked wolf presence, the findings of investigations were less than

confirmed. Wolves stress cattle to a point they can no longer stand; once they go down the feeding begins while they are alive. Wolves kill livestock by consumption, not by slaughter, and therefore in these cases there are non-lethal capture bite sites on the carcass rather than lethal bite sites. Under these types of circumstances where livestock leave the attack/feeding site there has been investigative findings less than confirmed and lost compensation to the resource owner.

One note of interest concerning yearlings: USFWS initiated supplemental feeding stations in an effort to discourage depredation of livestock. When wolves were not supplementally fed, they returned to a carcass and continued to feed. However, after a supplemental feeding station was put out by the USFWS the wolves attacked and ate approximately 15 to 20 pounds out of the rear ends of three yearlings and did not remain to feed. These yearlings lived and traveled from the attack/feeding site. During this same period when the wolves were heavily hazed out of the yearling herd, the wolves would circle the hazer's and make additional confirmed depredations. The kill interval averaged every four days.

The significance of livestock leaving the attack/feeding site is that evidence confirming a depredation may be lost. However, indicators that a victim traveled from an attack/feeding site to a carcass site include:

1. Blood stains/drainage on carcass inconsistent with carcass position;
2. Blood stains/drainage on lower legs indicating that the victim was standing after being fed upon;
3. Lack of blood drainage from wound onto the ground;
4. Blood droplets (spatter) indicating the droplets came from a height consistent with standing victim;
5. Wound/skin glazed over (dried) inconsistent with the time of death;
6. Fresh areas exposed within the glazed over (dried) area due to non-wolf scavenging;
7. Scavengers identified at the carcass site, (e.g. birds, coyotes, etc.);
8. Insect infestation inconsistent with time of death (e.g. fly eggs hatch within 24 hours, live for approximately one week, turn into pupae; depending on species, flesh fly life cycle 8 to 21days).

Negative effects beyond wolf-caused mortality

The negative effects to livestock producers caused by Mexican Wolves are a wide spectrum not addressed and/or ignored by the US Fish and Wildlife Service. Prior negative data and documentation of wolf recovery from other states were not utilized to mitigate the same negative effects of Mexican wolf recovery in New Mexico and Arizona.

Wolf-caused chronic stress in cattle leads to loss of body condition, cows birthing weak calves, pre-mature birth of calves, abortion of calves, immune suppression, decreased pregnancy rates-open cows, increased susceptibly to disease, weight loss, and alters the demeanor of cows from docile to aggressive.

The negative impacts of Mexican Wolf recovery to livestock producers have severe economic effects on local agricultural industry, including:

1. True livestock losses are not reflected in confirmed and probable investigative findings;
2. Few livestock depredations are actually compensated;
3. Cumulative effects of wolf predation makes livestock production untenable;
4. Impact on individual family ranchers is devastating, even though the impact to the entire livestock industry of the state may be small;
5. Wolf depredation disrupts grazing management plans;
6. Increased uncompensated hours tending injured calves;
7. Increased uncompensated hours checking livestock;
8. Increased uncompensated hours mending fences when wolves attack/run livestock through them;
9. Increased uncompensated hours gathering livestock and returning to proper pasture;
10. Loss of market value for maimed and disfigured calves;
11. Loss of replacement heifers/production;
12. Loss of revenue while new herd takes several years to acclimate;
13. Loss of revenue while replacement heifers take three years to acclimate into an existing herd.

Catron County has compiled information from numerous ranches with wolves' denning in calf/yearling core areas and investigations which indicate the following:

1. Wolves subsistence on small calves;
2. High incidence of wolf depredation during the period when wolves were most active, i.e. providing sustenance to denning female and offspring;
3. Intensive localized wolf depredation of small calves;
4. After initial wolf gorging off calf and returning to the den, calf carcasses are scavenged and consumed by coyotes, requiring wolves to advance their frequent kill sequence;
5. Wolves' utilize 20 pounds per calf depredation, coyotes and scavenging birds utilize remainder of carcass;
6. Wolf killing steadily in an area invariably causes a coyote swarm to that area;
7. Few calf carcasses (as compared to adult cattle carcasses) are found for investigation;
8. Carcass remains are mostly consumed, destroying evidence of depredation;
9. Handicapped wolves with missing limbs/feet target (prefer) livestock, as wild game is difficult to capture;
10. When wolves den on a ranch the USFWS blame ranchers for not preventing livestock depredations;
11. USFWS demands that ranchers change their entire husbandry scheme to accommodate the presence of wolves; if the rancher refuses, no compensation is

paid on Wildlife Services findings on confirmed or probable livestock depredations by Defenders of Wildlife;

12. Ranchers cooperating with the USFWS wolf recovery agencies nevertheless continue to have livestock losses.

Comparability Study

This study consist of five ranches A, B, C, D, E, located within the Blue Range Wolf Recovery Area in Catron County, New Mexico. These ranches were identified as having wolves denning in and or near calf/yearling core areas. Prior to this study the relationship between high calf loss rate and proximity of denning wolves was not understood. It was also not realized that coyotes swarm to areas where wolves are continually killing livestock, contributing to the removal and destruction of evidence of the remains. Of the five ranches; four are cow/calf operations and one a yearling operation. All five ranches share a constant factor: Mexican wolf packs denning in and or near calf and yearling core areas.

This study compares the following factors on the five subject ranches:

1. Historic pre-wolf normal calf/yearling losses;
2. Confirmed and probable wolf calf/yearling depredations;
3. Actual calf/yearling losses;
4. Compensation paid by Defenders of Wildlife.
5. USFWS John Oakleaf 2003 study, carcasses found 1 to 8 ratio

When wolves den in calf/yearling core areas there are major livestock losses with few carcasses found resulting in a low number of confirmed or probable depredation investigation findings by USFWS, WS, and Carton County. Wolves are notorious for traveling long distance and take a short time to travel ten miles.

A core area is a primary grazing pasture where mother cows with calves and yearlings are legally present and are regulated to be maintained within this confined barbwire enclosure by the US Forest Service and The Bureau of Land Management.

Cattle confined within fences and are easy prey when wolves attack. Elk and deer have the ability and agility to clear barbwire fences and escape perusing wolves. Elk will abandon an area that has continued wolf activity.

Mexican wolves do kill livestock throughout the year, not just during denning. It is noted that when wolves begin to den, wolf packs travel to areas where livestock are present and seldom den in areas lacking livestock.

There is insufficient information and research conducted by USFWS biologists, scientist, and universities on the cause and effect on livestock losses when Mexican wolves are denning in/near calf and yearling core areas.

Since June, 2010 the USFWS have been supplementally feeding horse meat as well as elk and deer road kills to the San Mateo Pack (with 5 confirmed livestock kills) and the Middle fork Pack (with11 confirmed livestock kills) to keep them from depredating more livestock. Once the supplemental feeding ends, these packs will continue to kill livestock and teach their offspring to become livestock killers also.

Analyses results: Conclusions and recommendations

Confirmed and probable findings do not reflect the true number of livestock losses. The information provided in this document indicates the true livestock loss and effects on family ranchers for sustainable economic viability. The final analyses indicate that annual post-wolf introduction losses are higher than the average annual pre-wolf losses for the five study ranches:

- Total combined livestock losses = 651.0 head,
- Total combined dollar value losses = $ 382,198.50

In this comparability study, two of the five ranches went out of business; one selling the ranch and the second is on the market now. A third ranch sold off their livestock in the fall of 2009 and did not re-stock cattle in 2010.

Wolf-caused stress disrupts a cow's breeding cycle; the resulting calf loss must be measured in monetary value as if the wolf depredated a calf. To alleviate the taking of private property without compensation by the Federal Government, confirmation standards and the compensation scheme as a whole must be reevaluated. In-depth studies must be conducted to evaluate the negative impacts of wolves' denning in calf/yearling core areas and the effects of wolf-related stress on livestock. Evaluation of data must include the wide spectrum of negative impacts to livestock and livestock producers, rather than the current focus solely on benefits to wolves. Recommended areas of study include:

1. Pre-wolf introduction historic annual losses;
2. Post-wolf introduction annual livestock losses;
3. Wolves denning in calf/yearling core areas;
4. Wolves denning near calf/yearling core areas;
5. Wolf rendezvous sites located in calf/yearling core areas;
6. Wolf-claimed territory overlapping livestock core areas; and
7. Wolf-caused chronic stress and effects on livestock.

Submitted by Jess Carey, Catron County Wolf Interaction Investigator

Jess Carey
Catron County Wolf Interaction Investigator
HC 62 Box 1-8

Reserve, N.M. 87830
575-533-6668

Appendix A – Ranch Study Data

Ranch A

Ranch A is a cow/calf operation. Records of average annual pre-wolf introduction losses were 16%. The herd consisted of 300 head. Herd makeup: 20 bulls, 25 replacement heifers (not expected to calve), 0 steers and 255 production cows. 255 production cow numbers X 16% average pre-wolf annual calf losses = a 41.0 head loss. 255 – 41 = 214 fall calf crop number, representing an 83.9% calf crop. Losses pre-wolf were attributed to calving, open cows, coyote predation, and winter weather.

2008, the San Mateo Pack denned in calf core areas on Ranch A. The heard consisted of 300 head. Herd makeup: 20 bulls, 0 steers, 25 replacement heifers (not expected to calve) and 255 production cows. Fall calf crop numbers were 95.0 head.

255 production cows – 41.0 head pre-wolf calf loss = 214.0 calves – 95.0 fall calf crop numbers = 119.0 additional calf crop loss.

Fall calf crop numbers dropped from 214.0 head to 95.0 head, representing an additional 47% loss beyond normal pre-wolf losses.

Monetary loss = 47% calf loss with wolves' denning in calf core area. 119.0 X $600.00 = $71,400.00 additional dollar loss with no compensation.

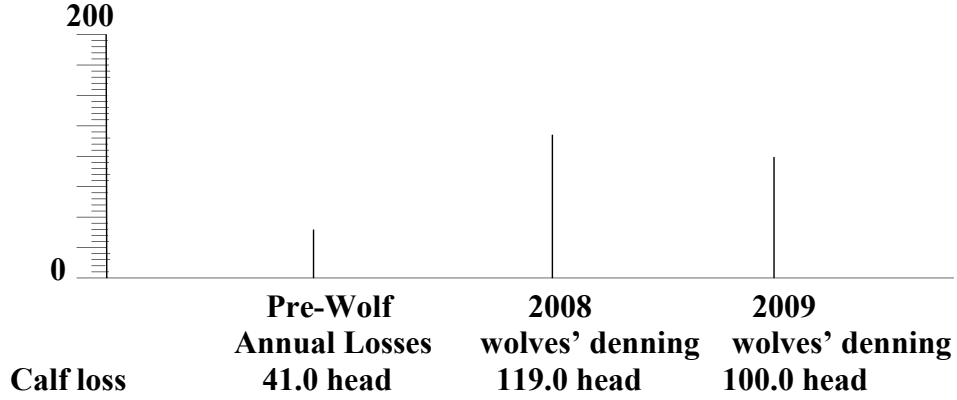
2009, the San Mateo Pack denned in calf core areas on Ranch A. The herd consisted of 300 head. Herd makeup: 20 bulls, 23 replacement heifers (not expected to calve), 0 steers and 257 production cows.

257.000 head – 41.0 head pre-wolf calf loss = 216.0 calves – 116.0 fall calf crop numbers = 100.0 additional calf crop loss.

Fall calf crop numbers dropped from 216.0 head to 116.000 head, representing an additional 39% loss beyond normal pre-wolf losses.

Monetary loss = 42.800% calf loss with wolves' denning in calf core area. 100.0 X $600.00 = $60,000.00 additional dollar loss with no compensation.

Graph - Calf Loss - Ranch A



Wolf denning losses are additional to pre-wolf losses

On Ranch A, the findings of investigations by USFWS, Wildlife Services and Catron County utilizing AMOC set standard for wolf depredation confirmation were:

2008: wolf depredations = calf confirmed 1, calf unknown 1
2009: wolf depredations = calf confirmed 1, calf probable 1

Defenders of Wildlife compensation Rate;

Confirmed at 100% market value
Probable at 50% market value
Possible at 00% market value
Unknown at 00% market value

2008
Confirmed: 1 – calf = $600.00
Probable: 0- calf = $000.00
Possible: 0 - = $ 000.00
Injury: 0 – = $000.00
Unknown: 1 –calf = $000.00
Total = $900.00

2009
Confirmed: 1– calves = $ 600.00
Probable: 1- calf = $ 300.00
Possible: 0– = $ 000.00
Unknown: 0 – = $ 000.00
Total $ 900.00 compensation denied

Compensation paid to Ranch A: 2008 = $600.00
2009 = $00000
Total $600.00

2008, Compensation was for 1 confirmed wolf killed calf at 100% market value = $600.00, paid by Defenders of Wildlife.

2009, Compensation of $900.00 was denied to resource owner by Defenders of Wildlife. The stated reason was that the resource owner did not conform to changing his husbandry scheme as requested by USFWS to prevent wolf-livestock interactions. The USFWS wanted the resource owner to corral his calves and let the cows out during the day to pasture, and then herd them into the corral at night so the calves could suck the cows. Also, the rancher was to feed the cows hay at night. The resource owner refused this suggestion and was penalized for failure to obey the USFWS.

The combined actual calf losses above pre-wolf average annual losses for Ranch A for 2008 and 2009 were 219.0 head X $600.00 = $131,400.00 loss value.

$ 131,400.00 loss value - $600.00 compensation value paid by Defenders of Wildlife = $ 130,800.00 total loss beyond pre-wolf normal losses.

Graph - Dollar Loss - Ranch A

Wolf denning loss is additional to pre-wolf dollar loss.

USFWS John Oakleaf study (2003) states that for every (1) one confirmed wolf-calf depredation there are (7) seven more wolf killed calves that are not found by the resource owner.

Oakleaf study ratio of 1 to 8 applied to Ranch A:

2008 - all confirmed, probable, possible- 1 – 1 X 7 = 7 not confirmed
1 divided into119.0 = 119.0
Ratio 1 to 119.0

2009 - all confirmed, probable, possible – 2 – 2 X 7 = 14 not confirmed
2 divided into 100.0 = 50.0
Ratio 1 to 50.0

Note: in the fall 2009 Ranch A sold the remainder of his livestock and went out of business, then passed away.

Comment;
On May 30, 2010, rancher A passed away, a sad day in our community. I talked numerous times with rancher A before his passing about the psychological stress of loosing his calves to wolves that put him out of business. He stated to me he could not take it anymore and in the fall of 2009 sold off what was left of his herd. In 2008 and 2009 with a combined loss of 219.0 head, valued at $130,800.00 his ranch was doomed. He was worried all the time about wolves killing his calves. His children could not take over the ranch because it was not sustainable with wolf presence. Also, he had trouble sleeping, the hopelessness and helplessness to protect his private property. He was a law abiding citizen and would not take matters in his own hands against the Federally protected wolves. The USFWS would not remove the San Mateo pack that had numerous confirmed depredations and they remained on the landscape and continued to kill his livestock. There are many family ranchers that suffer psychological stress due to wolves killing their livestock with no compensation, a taking of private property.

Ranch B

Ranch B adjoins Ranch A.

Ranch B is a cow/calf operation. Records of average annual pre-wolf introduction calf losses were 2.455% for 3 years running with an average annual loss of 4.000 to 6.000 head per annum. The herd consisted of 256 head. Herd makeup: 18 bulls, 30 replacement heifers (not expected to calve), 5 steers and 203 production cows. Average calf crop = 97.5%. Losses pre-wolf were attributed to calving, open cows, coyote predation, and winter weather.

2008, the San Mateo Pack denned near calf core areas on Ranch B. Herd makeup: 18 bulls, 5 steers, 30 replacement claves (not expected to calve) and 203 production cows. Fall calf crop numbers were 171.0 head.

203 production cows – 5.0 head pre-wolf calf loss = 198.0 calves – 171.0 fall calf crop numbers = 27.0 additional calf crop loss.

Fall calf crop numbers dropped from 198.0 head to 171.0 head, representing an additional 13.5% loss beyond normal pre-wolf losses.

Monetary loss = 13.5% calf loss with wolves' denning in calf core area, 27.0 X $600.00 = $16,200.00 additional dollar loss with no compensation.

2009, the San Mateo Pack denned near calf core areas on Ranch B. The herd consisted of 287 head. Herd makeup: 19 bulls, 25 replacement claves (not expected to calve) and 243 production cows.

With wolves denning in calf core areas, calf losses increased to 23.895% with losses of 58.0 head.

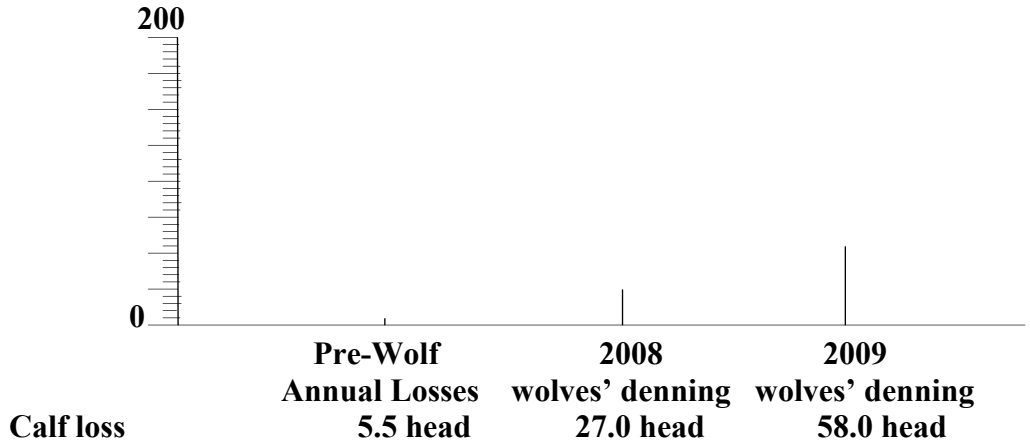
243 production cows – 6.0 head pre-wolf calf loss = 237.0 calves – 179.0 fall calf crop numbers = 58.0 additional calf crop loss.

Fall calf crop numbers dropped from 238.0 head to 179.0 head, representing an additional 23.845% loss beyond normal pre-wolf losses.

Monetary loss = 23.845% calf loss with wolves' denning in calf core area, 58.0 X $600.00 = $34,800.00 additional dollar loss with no compensation.

Of the 58.0 additional losses, a portion of the decrease is attributed to the harassment by wolves disrupting the breeding cycle[1].

Graph - Calf Loss - Ranch B



Wolf denning losses are additional to pre-wolf losses

The findings of investigations by USFWS, Wildlife Services and Catron County utilizing AMOC set standard for wolf depredation confirmation were:

- **2008:** wolf depredations = calf confirmed 1, calf probable 1, calf injuries confirmed 3 (no compensation)

[1] Idaho Wolf Depredation Compensation Plan (2004 Grazing Season) excerpt: "Some scientific data also suggests that further effects of wolf predation include stress-related loss of body condition in harassed herds and subsequent decreases in pregnancy rates and weaning weights". (Stricklin and Mench, 1989)

- **2009:** wolf depredations = calf confirmed 1

Defenders of Wildlife compensation Rate (there was no contact between Ranch B and Defenders of Wildlife; compensation was not paid):

Confirmed at 100% market value
Probable at 50% market value
Possible at 00% market value
Unknown at 00% market value

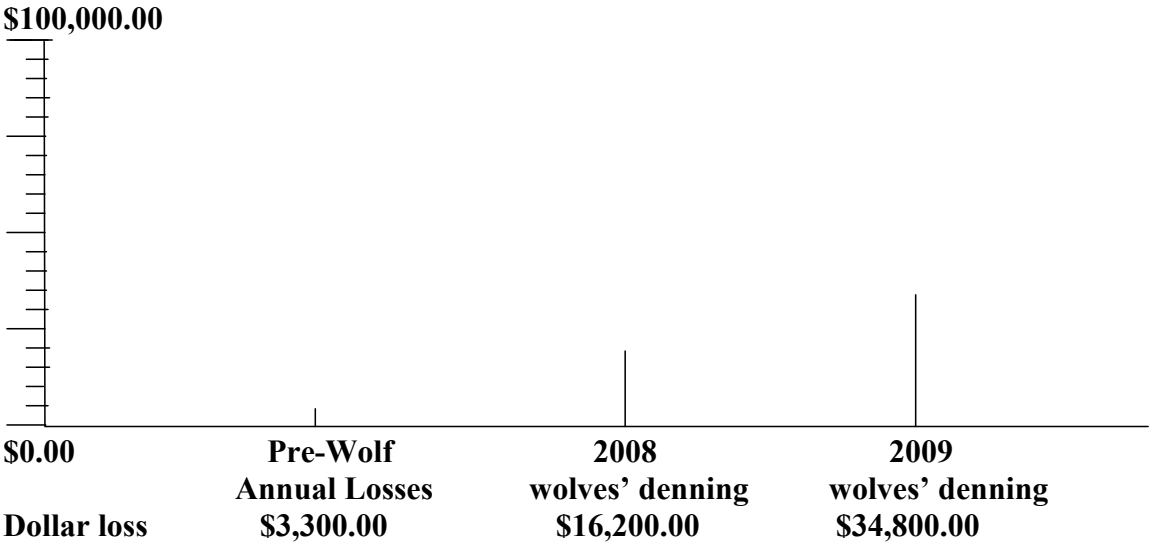
2008
Confirmed: 1 – calf = $600.00
Probable: 1- calf = $300.00
Possible: 0 - = $ 000.00
Injury: 3 – calves = $000.00
Unknown: 0 – calves = $ 000.00
Total = $900.00

2009
Confirmed: 1– calves = $ 600.00
Probable: 0- = $ 000.00
Possible: 0– = $ 000.00
Unknown: 0 – = $ 000.00
Total $ 600.00
2008 = $900.00
2009 = $600.0
Total $1500.00

2008 and **2009** combined calf loss with wolf presence; 85.0 head above pre-wolf average annual losses. 85.0 head X $600.00 = $51,000.00 additional loss value.

$ 51,000.00 loss value – $0000.00 compensation paid by Defenders of Wildlife = $51,000.00 non-compensated additional livestock loss value.

Graph - Dollar Loss - Ranch B



Wolf denning loss is additional to pre-wolf dollar loss.

Oakleaf study ratio of 1 to 8 applied to Ranch B:;

2008 - all confirmed, probable, possible = 2 – 2 X 7 = 14
2 divided into = 27.0 = 13.50
ratio 1 to 13.508

2009 - all confirmed, probable, possible = 1 – 1 X 7 = 7
1 divided into = 58.0 = 58.0
ratio 1 to 58.0

Ranch C

Ranch C is located approximately 35 miles as the crow flies in a southerly direction from Ranch A and Ranch B.

Records show that Ranch C had a 3% average annual pre-wolf introduction loss. Total herd is 330 head. Herd makeup: 18 bulls, 0 steers, 30 replacement heifers (not expected to calve), and 282 production cattle. Average annual pre-wolf losses of 8.46 head per annum were noted. Fall calf crop numbers were 231 head representing an 81.9% calf crop. Losses were attributed to birthing, coyote depredations, open cows, and winter weather.

2005, the Luna Pack denned in calf core areas on Ranch C[2]. Herd makeup: 18 bulls, 0 steers, 30 replacement claves (not expected to calve) and 282 production cows. Fall calf crop numbers were 231 head.

282 production cows – 8.46 head pre-wolf calf loss = 273.5 calves – 231.0 fall calf crop numbers = 42.0 additional calf crop loss.

Fall calf crop numbers dropped from 273.5 head to 231.0 head, representing an additional 15.0% loss beyond normal pre-wolf losses.

Monetary loss = 15.0% calf loss with wolves' denning in calf core area. 42.0 X $600.00 = $ 25,200.00 additional dollar loss with no compensation.

2006, the Luna Pack denned in calf core areas on Ranch C. Herd makeup: 20 bulls, 0 steers, 15 replacement claves (not expected to calve) and 295 production cows. Fall calf crop numbers were 204 head.

295 production cows – 9.0 head pre-wolf calf loss = 286.0 calves – 204.0 fall calf crop numbers = 82.0 additional calf crop loss.

Fall calf crop numbers dropped from 286.0 head to 204.0 head, representing an additional 28.0% loss beyond normal pre-wolf losses.

Monetary loss = 28.0% calf loss with wolves' denning in calf core area. 82.0 X $600.00 = $ 49,200.00 additional dollar loss with no compensation.

2007, the Luna Pack denned in calf core areas on Ranch C. Herd makeup: 21 bulls, 0 steers, 0 replacement claves (not expected to calve) and 309 production cows. Fall calf crop numbers were 231head. .

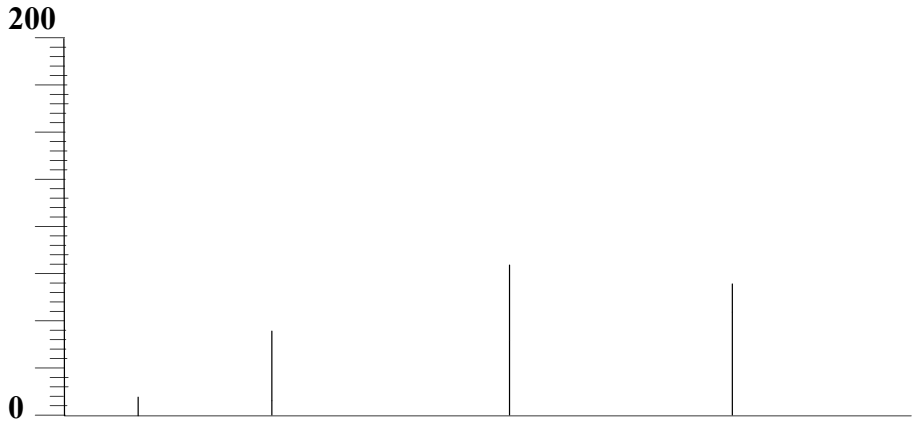
309 production cows – 9.0 head pre-wolf calf loss = 300.0 calves – 231.0 fall calf crop numbers = 69.0 additional calf crop loss.

Fall calf crop numbers dropped from 309.0 head to 231.0 head, representing an additional 22.0% loss beyond normal pre-wolf losses.

Monetary loss = 22.0% calf loss with wolves' denning in calf core area. 69.0 X $600.00 = $ 41,400.00 additional dollar loss with no compensation.

[2] Merkle, Jerod et al. 2009. *Summer diet of Mexican gray wolf (Canis lupus baileyi)*. Study excerpt: "In 2005, the researchers say that the Luna pack consumed 52.7 percent of their diet as cattle and 45.9 percent as elk. The following year, the pack ate 24.1 percent of their diet as cattle, and 75.1 percent as elk."

Graph - Calf Loss - Ranch C



	Pre-Wolf Losses	2005 wolves' denning	2006 wolves' denning	2007 wolves' denning
Calf loss	9.0 head	42.0 head	82.0 head	69.0 head

Wolf denning losses are additional to pre-wolf losses

Ranch C combined losses for 2005, 2006, and 2007 were 190.0 head beyond pre-wolf annual losses. 190.0 head X $600.00 = $ 115,800.00 additional loss.

On Ranch C, the findings of investigations by USFWS, Wildlife Services and Catron County utilizing AMOC set standards for wolf depredation confirmation were:

2005: wolf depredations = confirmed -1 colt, 3 calves, probable -1 calf, injuries confirmed -1 horse, unknown 4 calves

2006: wolf depredations = confirmed -2 calves, probable – 5 calves, possible – 1 calf, unknown – 4

2007: wolf depredations = confirmed -4 calves, probable – 0, possible – 2 calf, unknown – 4

Defenders of Wildlife compensation Rate

Confirmed at 100% market value
Probable at 50% market value
Possible at 00% market value
Unknown at 00% market value

2005
Confirmed: 1 – colt = $ 1,000.00
3 – calves = $ 1,800.00
1 – Injury - horse = $ 2,500.00 sold by resource owner for $ 125.00
Probable: 1- calf = $ 300.00

Possible: 0 - = $ 000.00
Unknown: 4 – calves = $ 000.00
Total $ 5,600.00

2006
Confirmed: 2 –calves = $1,200.00
Probable: 5 - calf = $1,500.00
Possible: 1 – calf = $ 000.00
Unknown: 4 –calves = $ 000.00
Total $ 2,700.00

2007
Confirmed: 4 – calves = $ 2,400.00
Probable: 0- calf = $ 000.00
Possible: 2 – calf = $ 000.00
Unknown: 4 – calves =$ 000.00
Total $ 2,400.00

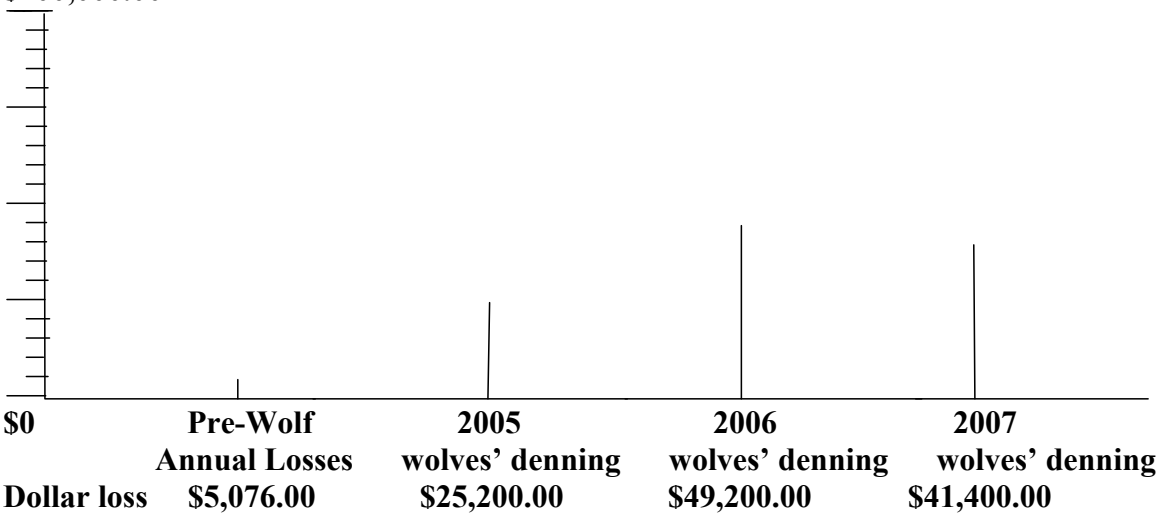
Total compensation value = $ 10,700.00

Total compensation paid to Ranch C by Defenders of Wildlife = $ 00.00

The combined actual calf losses beyond pre-wolf annual losses for Ranch C in 2005, 2006, and 2007 were: 193.0 head X $600.00 = $ 115,800.00 loss value.

$115,800.00 loss value – $0000.00 compensation paid by Defenders of Wildlife = $115,800.00 non-compensated additional livestock loss value.

Graph - Dollar Loss - Ranch C



Wolf denning loss is additional to pre-wolf dollar loss.

Comment: June 2006, Craig Miller of Defenders of Wildlife (a pro-wolf organization) stated at an AMOC meeting at the Honda Casino in Arizona that his compensation fund was to purchase tolerance and those who were not tolerant would be finding it harder to be compensated. Several ranches received no compensation on livestock depredation investigations conducted by Wildlife Services for documented; confirmed or probable losses. The failure of DOW to pay these legitimate claims cost the resource owner thousands of dollars. These DOW compensation denials appear to be selective and target New Mexico ranchers.

USFWS John Oakleaf took claim forms and Wildlife Services reports to Defenders of Wildlife, still DOW refused to make compensation payment to Ranch C.

Oakleaf study ratio of 1 to 8 applied to Ranch C:

2005 - all confirmed, probable, possible – 4 X 7 = 28
4 divided into 42.0 = 10.5
Ratio 1 to 10.5

2006 - all confirmed, probable, possible – 8 X 7 = 56
8 divided into 82.0 = 10.25
Ratio 1 to 10.25

2007 - all confirmed, probable, possible - 6 X 7 = 42
6 divided into 69 = 11.5
Ratio 1 to 11.5

Note: In the fall of October 2007, Ranch C went out of business and the ranch was sold.

Ranch D

Ranch D is located to the west of Ranch C. When the livestock were removed from Ranch C the wolves immediately left the vicinity of Ranch C and dispersed to Ranch D where there were livestock.

Records show Ranch D had an 11% annual pre-wolf introduction loss. Total herd is 205 head. Herd makeup: 15 bulls, 0 steers, 10 replacement heifers (not expected to calve), and 180 production cattle. Average annual pre-wolf losses of 19.0 head per annum were noted. Losses were attributed to birthing, coyote, bear depredations, open cows, and winter weather.

2008, the Luna Pack denned in calf core areas on Ranch D. Herd makeup: 15 bulls, 0 steers, 10 replacement heifers (not expected to calve) and 180 production cows. Fall calf crop numbers were 125.000 head.

180.000 production cow numbers – 19.0 head pre-wolf calf loss = 161.0 calves – 125.0 fall calf crop numbers = 36.0 additional calf crop loss with wolf presence.

Fall calf crop numbers dropped from 161.0 head to 125.0 head, representing an additional 20.0% loss beyond normal pre-wolf losses.

Monetary loss = 20.0% calf loss with wolves' denning in calf core area, 36.0 X $600.00 = $ 21,600.00 additional dollar loss with no compensation.

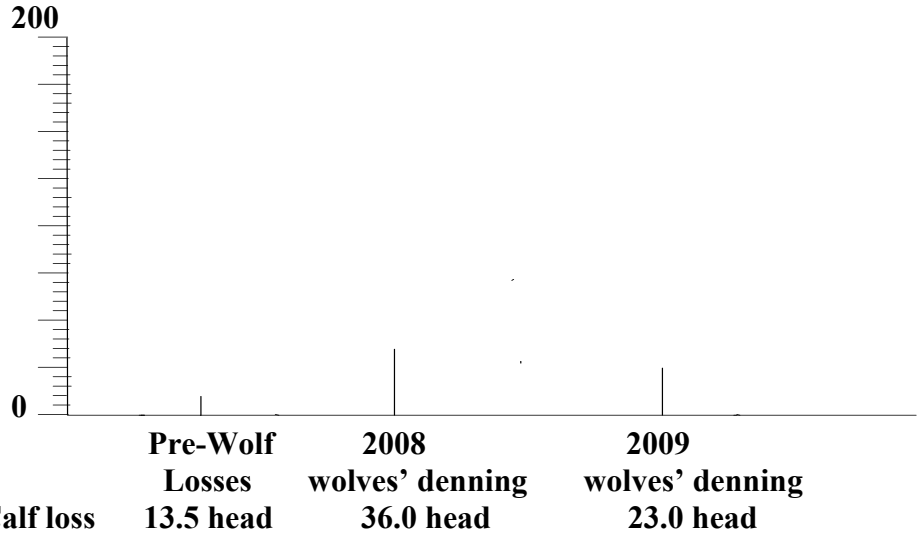
2009, the Luna Pack denned in calf core areas on Ranch D. Total herd 205. Herd makeup: 15 bulls, 0 steers, 20 replacement heifers (not expected to calve) and 170 production cows. Fall calf crop numbers were 128.000.

Note: Ranch D moved 65 production cows to another pasture several miles away from the denning wolves. This area contained no known wolves. Also a range rider patrolled the remaining 105 production cows at the original pasture where the Luna Pack again denned in 2009.

105.0 production cow numbers – 12.0 head pre-wolf calf loss = 93.0 calves – 70.00 fall calf crop numbers = 23.0 head additional loss with wolf presence.

This represents an additional 22.0% calf loss with wolf presence, 23.0 X $600.00 = $13,800.00 additional loss.

Graph - Calf Loss - Ranch D



Wolf denning losses are additional to pre-wolf losses

Defenders of Wildlife compensation Rate:

Confirmed at 100% market value
Probable at 50% market value
Possible at 00% market value
Unknown at 00% market value

2008
Confirmed: 0 = $ 0
Probable: 0 = $ 0
Possible: 0 = $ 0

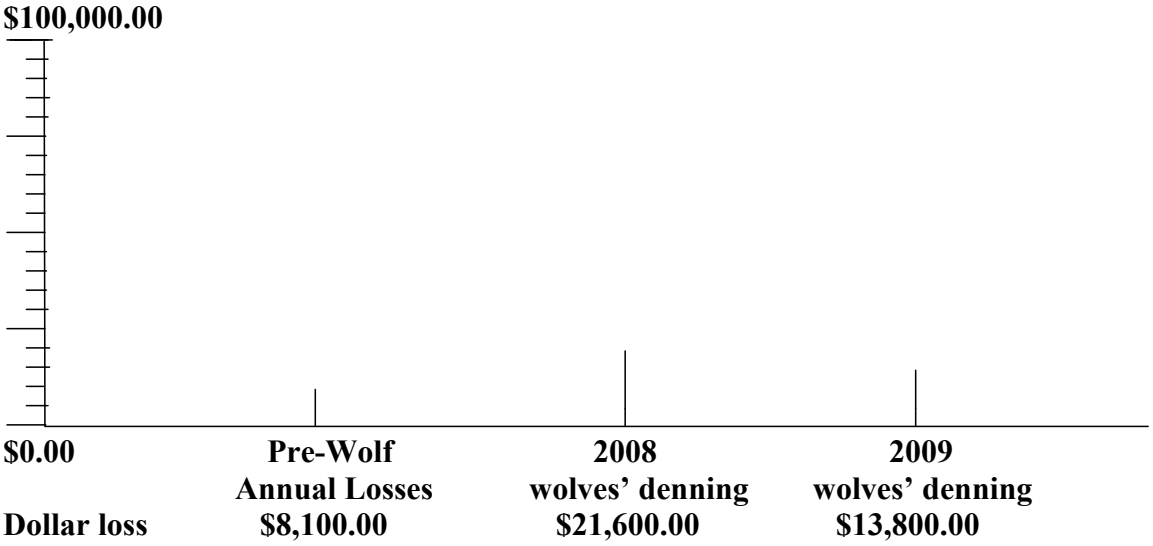
Injuries confirmed wolf: 3 – calves = $ 0
Missing confirmed wolf: 2 – calves = $ 1,200.00
(2 calves missing with wolf presence, 3 wolf confirmed calf injuries at scene)
Unknown: 1 – cow = $ .00
Total $ 1,200.00

2009
Confirmed: 0 = $ 0
Probable: 0 = $ 0
Possible: 0 = $ 0
Injuries: 0 = $ 0
Unknown: 1 – cow = $ 0
Total $ 0

Total compensation $ $1,200.00. Amount paid by Defenders of Wildlife = $ 0

The combined actual calf losses above pre-wolf average annual losses for Ranch D in 2008 and 2009 were: 59.0 head X $600.00 = $35,400.00 loss value

Graph - Dollar Loss - Ranch D



Wolf denning loss is additional to pre-wolf dollar loss.

Oakleaf study ratio of 1 to 8 applied to Ranch C:

2008 - all confirmed, probable, possible – 2 X 7 = 14
2 divided into 35.450 = 17.725
Ratio 1 to 17.725

2009 - all confirmed, probable, possible - 0 X 7 = 0
0 divided into 22.450 =
Ratio 1 to 22.450

Ranch E

Ranch E is located north east of Ranch C and run yearlings.

2009, the Middle fork Pack denned in yearling core areas on Ranch E. The Allotment consisted of three (3) pastures. There were 300 yearlings in excellent condition in Pasture A and B, and 287 yearlings in pasture C. Average pre-wolf losses were 5. Of these, there were 10 confirmed wolf depredations, 14 carcasses found that were too far gone to investigate and 80 yearlings' location unknown.

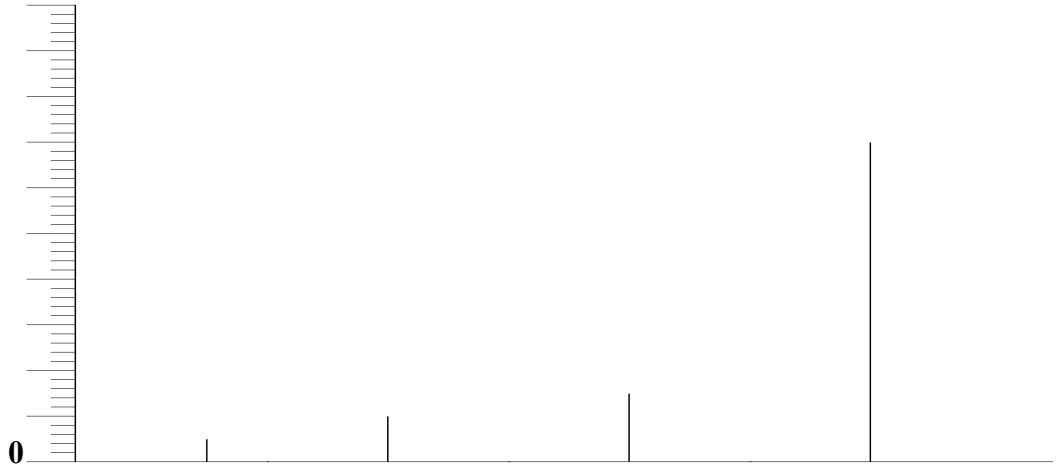
Pasture A, B, and C yearlings were run through fences by wolves chasing them. Many hours were spent by the resource owner mending fences and trying to locate and put livestock back in their proper pasture. The area is very remote and mountainous with thick tree covered canyons.

It has been documented on Ranch E that 4 of the 11 yearlings that were confirmed, attacked, and fed upon by the Middle Fork Pack were alive after the initial feeding. After the wolves fed, 36% of the yearlings traveled a long distance before being found alive or dead at the carcass site. Livestock have been found in the past with canine spreads and rake marks consistent with wolves but the scene lacked wolf presence and the finding of investigations were less than confirmed. Under these circumstances the results represent lost compensation to the resource owner.

Of the 80 missing yearlings, 7 yearlings were recovered in good health in the spring and were moved to the headquarters pasture on private property. On 04-27-10 one of the yearlings were attacked and its rear end eaten out, suffering a loss of approximately 20 pounds of tissue. The yearling was located 4 miles away from the attack/ feeding site that contained wolf tracks, blood trail and torn up ground. This yearling was a confirmed wolf kill by the Middle Fork Pack. The other six yearling had barbwire cuts on them from running into barbwire fences try to evade the wolves. No more yearlings have been found to date even though a rigorous search is ongoing.

Of the11 confirmed wolf depredations; 8 were heifers, 2 steers and 1 sex unknown.

Graph - Yearling Loss - Ranch E



Wolf denning losses

Defenders of Wildlife compensation Rate:

Confirmed at 100% market value;
Steers =.94c @ 650 lbs = $611.00
Heifers =.87c @ 650lbs = $565.50
Probable at 50% market value
Possible at 00% market value
Unknown at 00% market value

2009:
Confirmed: steers = 2 = $1,222.00
heifers = 9 = $5,085.00
Probable: 0 = $ 0
Possible: 0 = $ 0
Injuries: 0 = $ 0
Unknown: = $ 0
Total $ 6,307.00

Total compensation amount $ 6,307.00.

Of the 80 yearlings missing, 7 were found resulting in 73 yearlings still missing.

11 confirmed wolf depredations
14 carcasses to far gone to investigate

73 missing
Total = 98

Total number of yearlings put on pasture = 887 – 98 head loss = 789
Percentage loss of herd = 11.048 %

Value loss:
Confirmed wolf depredations = 11 = $6,307.00
Carcasses to far gone to investigate = 14 X $565.50 = $7,917.00
Missing yearlings = 73 X $565.50 = $41,281.50
Total = $55,505.50

Graph - Dollar Loss - Ranch E

Wolf denning loss is additional to pre-wolf dollar loss.

Amount paid by Defenders of Wildlife = $6,307.00 – 55,505.50 = a total loss of =$49,198.50

Ranch E sold off their livestock in the fall of 2009 and did not stock the ranch in 2010 due to livestock losses.

Note of interest concerning yearlings: When wolves were not being supplementally fed the wolves returned to carcasses and continued to feed. After a supplemental feeding station was put out by the USFWS to feed the wolf pups (including dragging a confirmed wolf killed livestock yearling to the feeding station with the permission on resource owner) and thereby deter the Middle Fork Pack from continued livestock depredations, the wolves attacked and ate approximately 15 to 20 pounds out of the rear ends of each of four (4) yearlings. These yearlings survived the attack and traveled from the attack/feeding site. During this same period, although the wolves were heavily

hazed from the yearling herd by USFWS and New Mexico Game and Fish employees, the wolves would circle the hazer's and make additional confirmed depredations. The Kill sequence interval averaged one every four (4) days.

Oakleaf study ratio of 1 to 8 applied to Ranch E:

2009 - All confirmed, probable, possible – 11 X 7 = 77
11 divided into 98 = 8.909
Ratio 1 to 8.909

The findings of confirmed and actual losses are consistent in other ranches across Catron County where wolves den in calf and yearling core areas. Of major losses, very few livestock carcasses are found or found in a timely manner with evidence retained. When carcasses are found very few meet the standards for confirmation set by AMOC, due to lost evidence.

Many ranchers have cooperated with wolf recovery agencies utilizing recommended non-lethal schemes to prevent wolf-livestock interactions that result in livestock depredation. The ranches have added additional range riders, moved livestock to other pastures, penned livestock and fed hay and worked multiple additional hours to prevent wolves from killing their livestock. Still the wolves depredate their livestock. The ongoing added effort, stress and expense is a high loss cost factor beyond pre-wolf introduction.

Appendix B: Literature Cited

Idaho Wolf Depredation Compensation Plan (2004 Grazing Season)

Wolf-caused mortalities are difficult to detect in range livestock areas. Heavy cover, large pastures, great topographical variation and complete carcass consumption by wolves lend increasing degrees of difficulty to timely detection of wolf kills. The proportion of wolf-related depredations that go undetected or unconfirmed is unknown and will vary by area.

For example, two studies (Oakleaf, et. al., 2000 and Bjorge and Gunson, 1985) on cattle have shown that for every 5.8 or 6.7 cattle lost only 1 confirmed kill was noted. Given this, the number of unconfirmed depredation losses attributed to wolves will always be a contentious issue.

Some scientific data also suggests that further effects of wolf predation include stress-related loss of body condition in harassed herds and subsequent decreases in pregnancy rates and weaning weights (Stricklin and Mench, 1989).

Cattle seeking to escape wolves may leave areas where they are supposed to be and disrupt grazing management plans. Economic losses and/or penalties from land management agencies could be the result.

For some ranchers, the cumulative effects of wolf predation may cause losses sufficiently severe that livestock production becomes untenable. Although the impact of wolf predation to the entire livestock industry of the state is expected to be small, the impact to the individual can be devastating.

USFWS John Oakleaf study on wolf-livestock depredations indicated for every confirmed wolf-livestock depredation there are (7) seven more that area not confirmed.

In Catron County there is evidence to conclude Mr. Oakleaf's findings are supported per wolves overlapping livestock areas, but differ when wolves den in calf/yearling core areas. In the case of Ranch A, Ranch B, Ranch C, Ranch D, and Ranch E the ratio is much higher than 1 to 8.

The Cost of Wolves to Ranchers

By Ron Skinner D.V.M.

Excerpt:

- Many animals that are killed are not found; one Idaho study showed one out of eight cattle killed are found.
- Stress is a significant problem for both animals and humans. Stress increases the cortisol level in the blood stream in both cattle and humans. Increased cortisol levels will cause pre-mature delivery of calves or abortion of calves. A direct result of this increased stress from wolves is that we are seeing a decreased pregnancy rate in our cattle.
- Cortisol also causes immune suppression as is commonly acknowledged in the medical field. Cortisol also causes recrudescence (bringing the virus from a dormant stage to an active stage). A virus in cattle called Infectious Bovine Rhinotrachitis (IBR) can recrudesce and causes abortion in cattle.
- It also causes fetal deformities, latent carriers, weak newborns, and sick newborns that die shortly after birth.
- With suppression of the immune system, other groups of organisms that can create diseases such as foot rot, pink eye, and pneumonia become active. These diseases often show up 48 to 72 hours after stress.
- There is injury to livestock from the wolves while they are chasing them. The wolves try to take animals down by biting and tearing at their hindquarters on the run. Some may get away but later die a slow death from gangrene.
- Stress on livestock producers is significant. The constant hunting for depredation and sick cattle is stressful.
- Cattle stressed at a young age do not grade choice at a high enough percent. This has been shown in numerous trials. In today's market that can cost $59.00 per head and varies with the time of the year and sometimes can be twice that. Another cost that the buyer must incur and another reason for him to decide he does not want your cattle.
- Another problem ranchers face is deciding how many replacement heifer calves to keep to offset the decreased pregnancy rates because of the wolves. The net cost of keeping extra replacement heifers back as the result of wolves is $603.25 per pregnancy loss. If there is a 5% increase in open cows, then a rancher with 500 cows will lose $15,081.25.

- Scott Creel, Montana State University, shows lower birth rates in the elk population in Yellowstone Park area due to wolves. Although partially due to wolf kills on the calves, Creel shows the largest factor to be nutrition. The elk are forced into areas without good feed by the wolves and to compound that they eat 27% less now and are slowly starving to death. This means the elk are choosing survival over reproduction and that is simply not sustainable for any population over the long run. We see this same scenario with ranchers and their livestock.

Wolf-Caused Stress (various sources)

The regular presence of wolves in close proximity to livestock may result in a chronic stress situation for the domestic animals. Many infectious diseases result from a combination of viral and bacterial infections and are brought on by stress (Faries and Adams 1997). Wolves chase ungulates much more frequently than actual kills are made as part of the testing of the prey (MacNulty 2002). While wild ungulates are probably well adapted to being occasionally tested by predators, domestication and genetic selection for docility in livestock has likely resulted in animals more susceptible to increased stress from predator harassment.

Stress can result in increased susceptibility to disease and weight loss, reduction in the value of the meat, and interfere with reproduction (Fanatico 1999). Stress prior to slaughter is thought to be a contributor to “dark-cutters,” meat which is of unacceptable color not being the normal bright cherry red but rather almost purple. Dark-cutters are discounted severely because these meat products are difficult to sell (Fanatico 1999).

In addition, the stress of being repeatedly chased/harassed by predators can cause cattle to abort, calve early or give birth to a weak calf (Dr. Gregory Palmquist, personal communication).

Wolf-caused livestock Stress Death in Catron County

Catron County brought to the attention of Wildlife Services that wolves were causing stress deaths in livestock. Case AP-030, 08-24-06 was the first case of stress death confirmed by Wildlife Services and Catron County. I also requested a study be done by Wildlife Services concerning livestock stress deaths on 11-01-06.

Pathological Fatigue

In this case it would be the over exertion of cattle by wolf harassment, chasing, and prey testing. The wolf attack would also produce extreme fear or fright in cattle.

Pathological Fatigue interferes with the activity of every gland in the cows system; its principle effect is to destroy the capacity of muscles and nerves to perform the work natural to them. A chemical change takes place in the muscles; these toxic substances are #1. Lactic Acid, #2. Creatine, and #3. Carbon Dioxide. These toxic substances are acids and cause a state of fatigue in the cow's muscles and system.

During rest following fatigue, these acids are neutralized by alkaline of the blood and internal secretions, which restores freshness, strength and tone of the muscle.

I conclude, once a cows system has been saturated to a certain point, "beyond recovery" of these toxic substances, there is no ability for the cows system of neutralization (alkalinity) and the cows system shut down and it dies.

I have seen healthy cows in prime condition just seem to fall over dead; lying on their sides there is no indication of head movement or leg movement, no sign that the hooves disturb the ground or ground liter at all. Some had wolf capture bite sites, some not.

Case AP-030, 08-24-06 was the first case of stress death recognized and documented by Wildlife Services in Catron County. The 1200 pound Black Angus cow was 6 years old and in good health, ear tag #208. Cow was pursued and attacked by wolf F924. This collared female wolf weighed approximately 45-50 pounds and was documented by Ariel Telemetry 250 yards away from the carcass on the side of a hill. The cow had been run by F924 in the pasture, ending where the cow was running around in circles. The pasture looked like a race track with the cow's hooves tearing up the ground and up-rooting vegetation. There were non-lethal bite sites with corresponding hemorrhage on the cow's tail from the root of the tail down approximately twelve inches. Canine spreads were documented at; 41.00mm and 39.89mm consistent with the Mexican wolf. Some cattle are stressed to death and there are no capture bite sites or feeding on the carcass.

In Manitoba, wolves and coyotes are able to spatially and temporally coexist with each other (Paquet, 1992)

Wolves did not always consume the entire ungulate carcass: 91% of elk kills were abandoned before all of the edible portions were eaten and 86% of moose remained only partially eaten.

In this study, all wolf-killed carcasses were visited by coyotes, in most instances the carcass was scavenged by these coyotes.

Another key factor in considering the consumption habits of wolves, when ungulate abundance is high enough they do not have to devour all of the ungulate, they can leave some.

Moose calves and yearlings were the primary targets of the attacks in Ballard et al.'s (1987) study, as wolves prefer to prey on the weakest members of any ungulate herd.

The Mexican Wolf (Canis lupus baileyi): A Historical Review and Observation On Its Status and Distribution

A Progress Report to the U.S. Fish and Wildlife Service by Roy T. McBride Completed March, 1980

Excerpt:

Wolves in Mexico do not appear to be scavengers, nor do they appear to feed upon sick, wounded or crippled animals. Contrarily, the wolves feed upon and prefer top-of-the-line animals (Figs 16 and 17).

When cattle are weaned, a percentage of young calves usually do not adjust easily, responding with much slower growth and generally poorer condition than the other calves. These animals, when being driven to the pen, usually drop to the rear and have to be pushed along, while the healthier calves get far ahead in the drive.

The same occurs during attack by wolves. The cattle stampede and during the chase the “Sanchos” (poor calves) drop to the rear and present easy targets for the wolves. However, the wolves pass by these cattle and take better, heavier calves even though it is more of a struggle to kill them. **At times large chunks are bitten from the steer’s hindquarters or flanks (Fig. 18) and wolves do feed at times without killing the steer, although these steers invariably die.**

Even though some stricken cattle were still alive the second night the wolves did not feed upon them but returned to catch another steer. At times wolves kill three to four animals in the same night but only feed on one. This habit makes them a hated enemy of the cattlemen.

In Mexico, the wolf seems to totally ignore the coyote, while the coyote takes great interest in where the wolf has been. I have frequently seen coyote tracks following wolf tracks in the opposite direction, probably intent in finding a kill.

When a wolf is killing steadily in an area there is invariably a swarm of coyotes, ravens, and eagles taking advantage of the remains of kills.

Study; Blue Range Wolf Recovery Area

Merkle, Jerod et al. 2009. Summer diet of Mexican gray wolf (Canis lupus baileyi).

Excerpt:

In 2005, the researchers say that the Luna pack consumed 52.7 percent of their diet as cattle and 45.9 percent as elk. The following year, the pack ate 24.1 percent of their diet as cattle, and 75.1 percent as elk

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Summer Diet of the Mexican Gray Wolf (Canis Lupus Baileyi)

By Jerod A. Merkle, Paul R. Krausman, Dan W. Stark, John K. Oakleaf, and Warren B. Ballard.
The Southwestern Naturalist 54(4):480–524 December 2009

Excerpt:

Calving by cattle takes place year around, but peaks during spring and summer, and parts of the Blue Range Wolf Recovery Area do not support cattle in winter. These grazing dynamics may account for the increase in biomass of cattle in scats in our study relative to results reported by Reed et al. (2006).

All territories of packs of Mexican wolves' overlapped active cattle-grazing allotments during our collection period (i.e., summer). However, grazing takes place seasonally or year around throughout the Blue Range Wolf Recovery Area due to a climate gradient.

We detected a difference in diet between grazing areas, but the difference was driven by one pack. The Luna pack consumed a significantly higher amount of cattle than all other packs in the study area.

One potential hypothesis for the observed diet of the Luna pack is decreased predation on cattle in areas where they were not consistently exposed to cattle as a potential prey item. Younger calves (i.e., more vulnerable cattle; Oakleaf et al., 2003; Chavez and Gese, 2005) are likely more consistently present on year-around grazing allotments relative to seasonal grazing patterns, possibly subsidizing diet of the Luna pack.

These results suggest that significant wolf-livestock issues may be pack specific, and that further research is needed.

Studies addressing the following questions may elucidate impacts of different cattle grazing regimes on diet of the Mexican wolf.

Are there a higher proportion of cows with young calves on grazing allotments occupied by packs that consume livestock?

Does a higher proportion of calving take place on territories of wolves that consume more livestock compared to other territories of wolves?

Finally, what are the ages of cattle stocked on allotments occupied by territories of wolves that consume more livestock compared to other territories of wolves?

With a better understanding of predation by wolves and grazing dynamics of livestock, improved management decisions regarding successful conservation of Mexican wolves can be made.