Smackout Wolf Pack:
2017 lethal removal action

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Washington Department of
FISH and WILDLIFE

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Introduction

This report describes the management actions taken by the Washington Department of Fish and Wildlife (WDFW or department) from September 21, 2016 through September 21, 2017 to address recurrent livestock depredations by the Smackout Pack. While much of this information has been posted on the department's website, this report consolidates that material and provides a broader context for WDFW's management activities.

This report also fulfills a provision of the collaboratively developed current Wolf-Livestock Interaction Protocol (Protocol), which calls for the department to provide a final report to the public after using lethal removal to address livestock depredations.

The department's actions were guided by the state's Wolf Conservation and Management Plan (Wolf Plan), adopted by the Washington Fish and Wildlife Commission in 2011 to provide a path toward recovery of the species. In 2017, WDFW in collaboration with the 18-member Wolf Advisory Group (WAG) developed a wolf-livestock interaction protocol to help guide the decision making process of proactively reducing the potential for recurrent wolf depredations on livestock while continuing to promote wolf recovery.

Both the Wolf Plan and the Protocol describe a management strategy for addressing wolf-livestock interactions primarily with nonlethal preventative measures in recognition that lethal removal of wolves may be necessary to address recurring depredations.

Background

The Smackout Pack occupies a territory approximately 350 square miles in size, located northeast of Colville, WA (Figure 1). Over the winter of 2016-17, the pack contained a minimum of eight individuals (Washington Department of Fish and Wildlife 2017). As of May 1, 2017, three individuals in the pack wore Global Positioning Radio collars including a 65-pound adult female collared on January 19, 2017, a 70-pound adult female collared on February 17, 2016, and a 65-pound adult female collared on April 29, 2015. During the late spring of 2017, the Smackout Pack produced a litter of five to seven offspring raising the pack size to approximately 13 to 15 individuals going into the summer grazing season. Large packs, like Smackout, typically do not remain intact for long periods of time as individuals tend to disperse. However, a large pack size may increase the probability of negative interactions with livestock and potentially contribute to depredations (Bradley et al. 2015).

The Smackout Pack territory is characterized by rolling hills and forested, mountainous terrain interspersed with a mixture of meadow complexes. The land ownership is primarily United States Forest Service (USFS) and private timber, with private parcels interspersed along the valley bottoms within and on the periphery of the pack territory. The Smackout Pack territory overlaps six active USFS and one state Department of Natural Resources (DNR) grazing allotment, as well as several private pastures. On the USFS allotments, cattle are typically released in early June each summer and graze over a rotation until mid-October. In the summer of 2016, on one allotment, cattle were rotated through several pastures and released onto a larger section of the allotment to free range until the end of the summer.

Livestock are removed from the allotments as per the grazing allotment plans (typically by October 15 for these particular allotments). For approximately four years prior to confirmed depredations in the Smackout wolf pack territory, WDFW had been working with producers on both public and private lands to deter potential wolf depredations. These efforts included increased human presence near livestock on large grazing allotments. Other deterrents measures utilized over the past several years included sharing Wolf GPS collar data including information on den and rendezvous locations with applicable producers, sanitation (removal of livestock carcasses), fladry, fox lights, WDFW field personnel working with USFS range personnel, and monitoring by WDFW personnel.

The Protocol was developed to provide guidelines on how WDFW will proactively respond to wolf-livestock interactions. Under the Protocol, livestock producers are expected to proactively implement at least two (2) deterrence measures with concurrence from the local WDFW wildlife conflict specialist to help meet the goal of reducing the chances of recurring depredations. The department's expectation is that livestock producers and the local WDFW wildlife conflict specialist work in collaboration to identify and plan the proactive deployment of the best suited deterrence measures.

The proactive deterrence measures must be in place a sufficient amount of time prior to a wolf depredation. In most situations, the measures will have been in place for at least one week.

The department may consider lethal removal of wolves to attempt to change pack behavior and reduce the potential for recurrent depredations while continuing to promote wolf recovery when all the following criteria are met:

1. The department has documented at least three depredation events within a 30-day rolling window of time, or at least four depredation events within a 10-month rolling window of time. Stipulations include:

    - At least one of the depredation events is a confirmed wolf kill of livestock.

    - One (1) of the depredation events may be a probable wolf depredation if it is a part of a pattern of confirmed wolf depredations (i.e., the probable wolf depredation is on the same time scale, with similar periods of times between

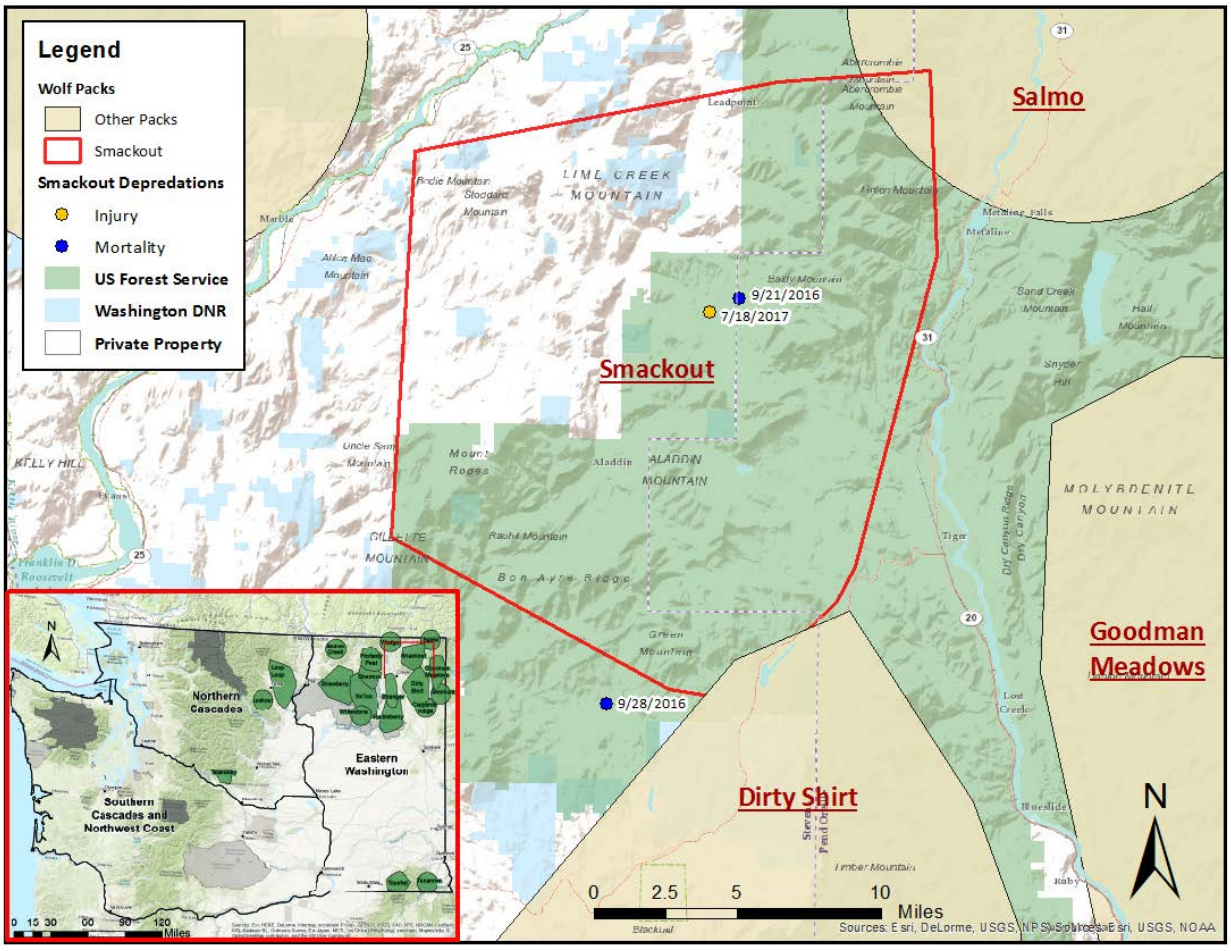

Figure 1. Smackout wolf pack territory in northeastern Washington in 2017. Depredations occurring on public land are displayed. Consistent with RCW 42.56.430, two depredations occurring on private property are not displayed.

depredations, as the confirmed wolf depredations, and in the same area of overlap of wolves and livestock as the confirmed wolf depredations).

2. At least two (2) proactive deterrence measures and responsive deterrence measures have been implemented and failed to meet the goal of influencing/changing pack behavior to reduce the potential for recurrent wolf depredations on livestock. Stipulations include:

    - If proactive deterrence measures are not in place a sufficient amount of time prior to the wolf depredations the department will only consider lethal removal at a higher number of wolf depredation events and after deterrence measures have been tried and failed at resolving the conflict.

3. WDFW expects depredations to continue (e.g., deterrence measures have not changed pack behavior, and overlap between wolves and livestock is expected to continue in near future),

4. The department has documented the use of appropriate deterrence measures and notified the public of wolf activities in a timely manner, and

5. The lethal removal of wolves is not expected to harm the wolf population's ability to reach recovery objectives statewide or within individual wolf recovery regions.

For the purposes of this report, the time line of events during the past year are divided into three periods as follows:

1. June 1, 2016 to July 19, 2017 - Proactive deterrence measures and emerging pattern of recurring depredations

2. July 20 to July 30, 2017 – Director authorized period of incremental wolf removal

3. July 31 to Sept 21, 2017 – Period of evaluation to see if nonlethal and lethal measures changed pack behavior

Timeline

<u>June 1, 2016 to July 19, 2017</u> – Proactive deterrence measures and emerging pattern of recurring depredations:

In early June, 2016, livestock were released onto public grazing allotments as per agreements with USFS. Livestock producers in the area spend their own time, employ range riders, and/or use WDFW contracted range riders to monitor cattle and carnivore activity in each allotment. During the initial turnout in 2016, WDFW deployed six contracted range riders throughout northeast Washington (Ferry, Stevens, and Pend Oreille counties) and some were used to supplement the range riding already occurring within the Smackout wolf territory.

Three producers in the area used damage prevention cooperative agreements for livestock contract cost shares to help pay for additional range riding activity. During the summer of 2016, graduate students from Washington State University (WSU) also provided additional support to producers and WDFW by monitoring livestock herds within the Smackout territory.

On September 21, 2016 WDFW was notified of a dead calf on a USFS grazing allotment that was confirmed by WDFW to be the result of a wolf depredation (Table 1). After the determination, WDFW and the producer responded with increased range riding in the area where the depredation occurred.

On September 28, 2016, a cow carcass was discovered on another USFS grazing allotment and was determined to be a probable wolf depredation. WDFW personnel and the producer increased deterrent activities on the allotment where the probable depredation occurred.

Finally, on September 29, 2016 a report of an injured calf was reported on private property and was confirmed as another Smackout wolf depredation. In response to this depredation, both WDFW and the producer shifted resources

to the area to more intensively monitor the livestock. By October 15, 2016, the livestock were removed from the allotment, coinciding with the end of the grazing season.

Cattle were released onto the allotment at the start of the grazing season on June 1, 2017 or shortly thereafter, but were confined in a large fenced pasture and monitored by one full time range rider. Several other range riders rotated through the area as needed. Livestock that were sick or injured were removed from the allotment. Livestock that were found dead from non-wolf causes were also removed from the allotment to reduce the likelihood of luring carnivores into the area to scavenge. Livestock producers were also utilizing wolf location data in addition to range riders to aid in focusing livestock monitoring efforts. On June 30, 2017, one adult wolf was lethally removed by the range rider while in the act of chasing and posing an imminent threat to livestock within the fenced pasture. After this interaction, range riders continued to monitor the livestock.

On July 18, 2017, a livestock producer notified WDFW that a calf was injured and WDFW staff subsequently confirmed those injures as a wolf depredation. Although it was the first event during the 2017 grazing season, this depredation was the fourth documented depredation event within a 10-month rolling window, which prompted WDFW to assess which actions may be appropriate for the circumstances.

In response to the depredation on July 18, 2017, WDFW considered responsive actions to disrupt the reoccurring depredations through both nonlethal means and lethal removal, consistent with the 2017 protocol.

In summary, the proactive nonlethal preventative measures utilized by the individual producers were:

Producer 1 – Wolf depredations to livestock occurred on Sept. 21 and 29, 2016, and July 18, 2017, on a federal grazing allotment. The producer continued to:

- Use a range rider, who was on the allotment daily and had a data sharing agreement with the department that enabled tracking the movements of collared wolves in the pack. The producer had additional range riders who fill in as needed. Range riders had firearms and pyrotechnics to deter wolves found near livestock.

- Maintain sanitation in the area. The range rider was removing sick or injured cattle from the range and securing or removing cattle carcasses from areas near livestock.

Producer 2 – Wolf depredations to livestock occurred Sept. 28, 2016 on a federal grazing allotment. The producer continued to:

- Use a range rider under contracted with WDFW, who also had a data sharing agreement.

- Maintain sanitation by removing sick or injured cattle from the range and by securing or removing cattle carcasses from areas near livestock.

Producer 3 – WDFW was notified of another depredation on July 22, 2017, in a private,

Table 1. Timeline of depredations within the Smackout Pack territory from Sept. 21, 2016 – Sept. 20, 2017.

Depredation #	Date	Livestock	Disposition	Determination	Ownership
1	Sept. 21, 2016	calf	mortality	confirmed	USFS
2	Sept. 28, 2016	calf	mortality	probable	USFS
3	Sept. 29, 2106	calf	injury	confirmed	private
4	July 18, 2017	calf	injury	confirmed	USFS
5	July 22, 2017	calf	injury	confirmed	private

fenced pasture near the producer's residence. This depredation was approximately two to three days old upon inspection and likely occurred before the first wolf removal on July 21, 2017. The producer was:

- Using fox lights (a type of strobe light designed to deter wolves and other large carnivores) around the pasture where the depredation occurred.

- Continuing to check the cattle daily.

July 20 to July 30, 2017 – Director-authorized incremental wolf removal:

WDFW personnel determined that because the preventative deterrence measures to that point had been unsuccessful, incremental lethal removal was the next appropriate action. On July 20, 2017, the department notified the public that the criteria and thresholds in the protocol had been met and the director authorized an incremental removal of wolves from the Smackout pack to achieve the goal of the protocol. Under that authorization, the department's directive was to remove up to two wolves from the pack, except the breeding female if possible given the removal method.

The rationale for removing any wolf (except the breeding female) was based on several considerations. The Protocol states that during the incremental removal period, the department will try to remove as few wolves as possible to achieve the goal of reducing depredations while maintaining the overall pack structure. To that end, during a removal process, the department considers the composition of the pack members that are not removed. Ideally, the post-removal pack would consist of both adults and pups (if pups were present at the time of removal).

To increase the likelihood of that outcome, removing a mixture of adults and pups can help reduce the potential for a post-removal pack that is skewed toward either mostly adults or mostly pups. Heavily skewed pack demographics have a greater potential to result in reduced pup survival and pack dissolution, which could potentially impact the timeframe to recovery. Brainerd et al. (2008) notes the value of leaving breeding wolves if possible to increase pup survival and reduce the chances of pack dissolution. However, the removal of any wolf from the pack has the potential to influence the location of wolf activity centers (e.g., move rendezvous site) or other pack dynamics that could break the pattern of depredations. WDFW recognized that removing different animals in the pack may have stronger or weaker influence on pack behavior, but any removal can impact the social dynamic within the pack and has the potential to influence pack behavior.

Research conducted in the Northern Rocky Mountain ecosystem (i.e., Idaho, Montana, and Wyoming) suggests that pack size is the best predictor of recurrent depredation events with larger packs being more likely to be involved in patterns of recurrent depredation (Bradley et al. 2014). Partial pack removals from any of the sex and age classes were only slightly more effective in reducing depredation recurrence than no removal and only if it occurred within 14 days of the depredation (Bradley et al. 2014). Partial pack removals tended to result in a subsequent break of about 45 days without additional depredations (Bradley et al. 2014).

One the goals of the Protocol is to ensure that lethal removal actions do not significantly affect wolf recovery. In general, wolf populations are resilient (Mech and Boitani 2003). The wolf population in Washington is recovering through immigration and reproduction. In 2016, the minimum number of wolves increased 28 percent from the previous year's count (Washington Department of Fish and Wildlife 2017). This growth rate is consistent with the growth rates documented in recolonizing wolf populations in the Northern Rocky Mountain ecosystem during recovery (USFWS 1999). Population modeling for wolves in Washington indicates that the probability of reaching recovery goals is not diminished by limited lethal removal actions (Maletzke et al. 2016).

The decision of which method to use for lethal removal is based on the details of each situation. If removal options are ground based (trapping or shooting from the ground), every attempt is

made to conduct this action in the vicinity of the livestock to provide a negative learning opportunity for other pack members and to provide more human activity to deter wolves from coming close to the livestock. The act of trapping, even without capturing a wolf, has been demonstrated to have some success deterring wolves from depredating on cattle (Harper et al. 2008). Aerial operations are far more expensive, more dangerous for personnel, and are limited by weather, terrain, and canopy cover.

Bradley et al. (2015) suggests the most effective response to incremental removals generally occurs within the first seven days after a depredation, so the WDFW Director authorized a period of incremental wolf removal. WDFW personnel promptly began an effort via trapping to capture and euthanize any wolf (except the breeding female) from the Smackout pack. On July 21, 2017, a 30-pound, young of the year female was captured and euthanized. As previously mentioned, because the demographics of the pack are important to consider, the removal of one of the five to seven pups prompted WDFW to reassess the removal strategy. WDFW continued trapping, however a decision was made that from this point forward only an adult wolf (other than the breeding female) would be euthanized, if captured. Thus after July 22, 2017, any young of the year captured in the Smackout pack, would have been tagged and released.

Although the lethal removal operation began almost immediately after the fourth depredation in a 10-month period, WDFW personnel continued to work with producers to employ both proactive and responsive nonlethal deterrence measures. During this time, WDFW personnel worked with the livestock producers to assess which nonlethal tools would be effective to further prevent depredations from occurring on each of the pastures and allotments in the area. Livestock were confined in a large fenced pasture on the grazing allotment where the depredations had occurred, however it was determined that it was possible to put fladry around the entire pasture. On July 25 and 26, 2017, WDFW personnel placed fladry around this pasture. On a second 40-acre private pasture nearby where the calf was injured on July 22, 2017, WDFW personnel also worked with the producer to place fox lights on the pasture-forest edge as another deterrent.

The lethal operation was concluded on July 30, when WDFW lethally removed the second wolf (a 70-pound, adult female), within 12 days of the fourth depredation. Both removals occurred within the 14-day window from the time of depredation, thereby having the most impact on changing the behavior of the pack (Bradley et al. 2015). The removals occurred within a short distance (one mile) from the livestock in an effort to provide the greatest influence on pack behavior related to livestock interactions.

July 31 to Sept. 21, 2017 – Period of evaluation to determine if nonlethal and lethal measures changed pack behavior:

In accordance with the wolf-livestock interaction protocol, WDFW began a period of evaluation on July 30 where personnel monitored pack behavior to determine if the goal of changing pack behavior to reduce the probability of recurrent depredations had been achieved.

Since there were no specialized contracted services (e.g., contracted helicopter vendor) or new equipment needed, there were no additional costs beyond standard personnel time. The preliminary estimated cost of the lethal removal operation was less than $7,000, which included personnel time and travel. Final costs of the operation will be specified in the 2017 annual wolf report.

WDFW and the producers continued to employ both proactive and responsive deterrence measures. As part of the grazing rotation, the producer moved the livestock to an adjacent pasture on the allotment on August 7-8, 2017, and WDFW personnel moved the fladry. WDFW personnel spent approximately 317 hours implementing the responsive nonlethal measures for the Smackout pack. On September 5, 2017, livestock were released in the open sections of the allotment as part of the grazing rotation.

As of September 21, 2017, no further depredations had been documented (53 days since the second wolf was removed and at least 61 days since the last depredation). The collaboration between WDFW personnel and the livestock producers, the approach highlighted in the protocol of both proactive and responsive nonlethal deterrents, and the incremental removal, appeared to have the intended effect of changing the Smackout pack's behavior to reduce the probability of reoccurring depredations while continuing to promote recovery.

There have been zero depredations in the last 30 days and two within the past 10 months. If depredations resume, WDFW would revert back to the protocol to assess the time since the previous depredations and assess any further actions.

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Appendix A

Wolf-Livestock Interaction Protocol

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Wolf-livestock interaction protocol
Revision date June 1, 2017

This protocol was jointly developed by the Washington Department of Fish and Wildlife (WDFW or Department) and its Wolf Advisory Group to guide the Department's efforts to reduce conflicts between wolves and livestock. The Wolf Advisory Group has expressed a strong value to reducing the likelihood of the loss of both wolves and livestock from adverse interactions. The protocol prescribes a variety of proactive measures livestock producers can take to reduce the probability of wolf-livestock conflicts and establishes a framework for WDFW's response when conflicts between wolves and livestock do occur.

The protocol draws on a diversity of perspectives expressed by people throughout the state for protecting wildlife populations as a public resource and livestock. These values include achieving a sustained recovered wolf population, supporting rural ways of life, and maintaining livestock production as part of the state's cultural and economic heritage. This protocol also serves to increase the transparency and accountability of the Department's activities and management actions related to wolves.

Section 1. Background and purpose of protocol

Gray wolves are listed as endangered under the federal Endangered Species Act (ESA) of 1973 in the western two-thirds of Washington, but are federally delisted in the eastern-third of the state (Fig. 1). Under Washington State rule, gray wolves as endangered statewide. Under the Federal listing status, the U.S. Fish and Wildlife Service (USFWS) is the lead agency for managing wolves in the western two-thirds of Washington, and WDFW has full management authority for wolves in the eastern third.

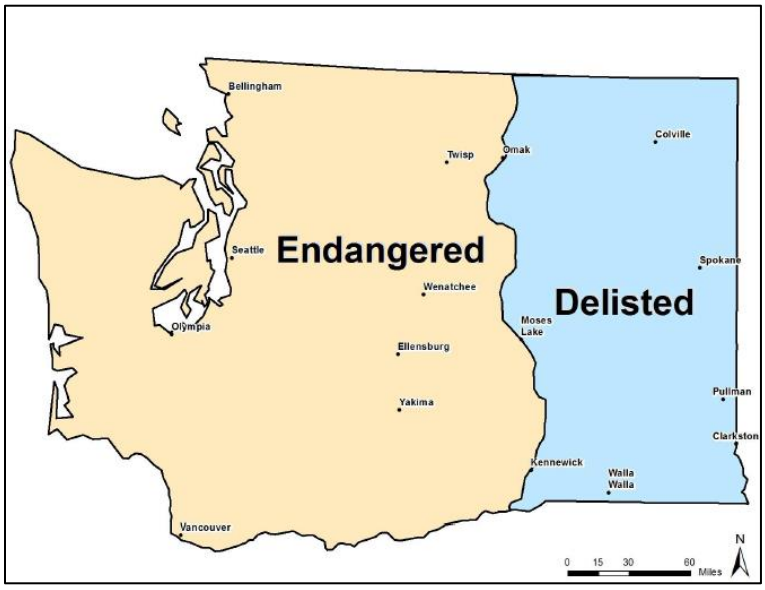

Figure 1. Federal classification of gray wolves in Washington State, 2017.

The Department developed a Wolf Conservation and Management plan (wolf plan) under the requirements of WAC 220-610-110, which requires that listed species be managed to attain "survival as a free-ranging population" (Section 1.1). This requirement is consistent with Department's responsibility to manage wildlife in trust for the citizens of Washington. Recovery plans need to include target population objectives, de-listing criteria, and an implementation plan for reaching population objectives "which will promote cooperative management and be sensitive to landowner needs and property rights" (WAC 220-610-110, Sections 11.1.1, 11.1.2, and 11.1.3).

The wolf plan was developed with the help of a multi-stakeholder working group and adopted by the Washington Fish and Wildlife Commission in 2011. The wolf plan has four goals, in accordance with state law and regulations: 1) recovery of the species, 2) reducing wolf-livestock conflict, 3) addressing interactions between wolves and native ungulates, and 4) promoting coexistence of livestock and wolves and public understanding of wolf management (see page 14 of WDFW Wolf Conservation and Management plan).

Under the umbrella of the wolf plan, this protocol outlines the various tools and actions WDFW uses to reduce wolf-livestock interactions in order to support wolf recovery and maintain the long-term coexistence of wolves and livestock. ***The goal of the tools and approaches described in this protocol is to influence/change wolf pack behavior to reduce the potential for recurrent wolf depredations on livestock while continuing to promote wolf recovery***. In addition, some tools have the ancillary benefit of increasing human awareness and/or influencing livestock behavior to increase the coexistence of wolves and livestock.

At this stage of recovery in Washington, most wolf packs share a portion of their territory with livestock on the rural landscape. WDFW encourages livestock producers in those environments to use proactive deterrence measures to reduce the probability for conflict. If conflict should occur, the Department considers the use of responsive deterrence measures and – within established guidelines – lethal removal of wolves (in areas where wolves are federally delisted) if appropriate deterrence measures have first been taken to attempt to change pack behavior and reduce the potential for recurrent wolf depredations on livestock.

This protocol describes a variety of livestock damage deterrence measures and the expectations for their use. While no single deterrence measure or combination of measures will guarantee that zero conflict between wolves and livestock occurs, the Department believes careful application of these techniques will help reduce conflict. This protocol also describes the criteria for and implementation of lethal removal of wolves.

Section 2. Definitions

Confirmed wolf depredation refers to any event where there is reasonable physical evidence that a wolf caused the death or injury of livestock. Primary confirmation would include bite marks and associated subcutaneous hemorrhaging and tissue damage, indicating that the wolf attacked a live animal, as

opposed to simply feeding on an already dead animal. Spacing between canine tooth punctures, location of bite marks on the carcass, feeding patterns on the carcass, fresh tracks, scat, and hairs rubbed off on fences or brush, and/or eyewitness accounts of the attack may help identify the specific species or individual responsible for the depredation. Wolf predation might also be confirmed in the absence of bite marks and associated hemorrhaging (i.e., if much of the carcass has already been consumed by a predator or scavengers) if there is other physical evidence to provide confirmation. This might include blood spilled or sprayed at a nearby attack site or other evidence of an attack or struggle. There may also be nearby remains of other animals for which there is still sufficient evidence to confirm predation, allowing reasonable inference of confirmed wolf predation on an animal that has been largely consumed.

This definition is from the Department's Wolf Conservation and Management Plan. In practice, 96 percent of the confirmed wolf depredations in the last 3 years have included hemorrhaging as the factor that led to that determination. The Department will continue to use the factor of hemorrhaging (along with other supporting factors) for determinations of a confirmed wolf depredation. (See **Section 5** for more information on factors.) Also, only trained WDFW staff make the final determination in depredation investigations.

Depredation means any death or injury of livestock caused by a carnivore.

Dispersal generally refers to the natural movement of an animal from one area to another area outside its natal territory.

Incremental removal refers to a period of active wolf removal (or attempt to remove wolves) followed by a period of evaluation. If, during this evaluation period, wolf depredations continue, the Department may resume removal of additional wolves from the pack as part of the continuation of a series of periods of active removal and periods of evaluation.

Livestock means cattle, pigs, horses, mules, sheep, llamas, goats, donkeys, alpacas, guarding animals, and herding dogs (this definition is derived from WDFW's wolf plan and WAC 220-440-020).

Proactive deterrence measure refers to an action taken to discourage wolf depredation that has been in place long enough prior to a confirmed wolf depredation that the local WDFW Wildlife Conflict Specialist can be confident that it had time to be effective. In most situations, the measures will have been in place for at least one week. The WDFW Conflict Specialist and the livestock producer will determine which techniques are best suited for the specific livestock operation and have the best chance to reduce the likelihood of wolf depredations on livestock.

Probable wolf depredation means there is sufficient evidence to suggest that the cause of death or injury to livestock was a wolf, but not enough evidence to clearly confirm that the depredation could only be caused by a wolf. A number of factors can help in reaching a conclusion, including (1) recently confirmed predation by wolves in the same or nearby area, and (2) evidence (e.g., telemetry monitoring data, sightings, howling, fresh tracks, etc.) to suggest that wolves may have been in the area when the

depredation occurred. These factors, and possibly others, will be considered in the investigator's best professional judgment.

This definition is from the Department's Wolf Conservation and Management Plan. In probable wolf depredations, WDFW's practice in conducting investigations is such that there is a reasonably high likelihood that the depredation was caused by a wolf, but evidence of hemorrhaging was lacking (See **Section 5** for an explanation of all the factors that go into making a probable determination and how these are distinguished from non-wolf predation or non-predation causes of death). Only trained WDFW staff make the final determination in depredation investigations.

Responsive deterrence measure means a deterrent measure put into place after a confirmed or probable wolf depredation has occurred. The WDFW Conflict Specialist and the livestock producer will determine which techniques are best suited for the specific livestock operation and have the best chance to reduce the likelihood of future depredations.

Wildlife conflict specialists are WDFW staff members who are responsible for working with local livestock producers to implement deterrence measures designed to reduce the probability of wolf-livestock conflict. Wildlife conflict specialists are the primary contact and staff that respond to and conduct depredation investigations.

Section 3. Expectations for deterrence measures

The Wolf Conservation and Management plan states that "any wolf-livestock management program should manage conflicts in a way that gives livestock owners experiencing losses the tools to minimize losses" without jeopardizing recovery efforts. (See WDFW's wolf plan, page 85.) The wolf plan then instructs the Department to work with livestock owners to incorporate non-lethal deterrent strategies (e.g., range riders, electric fladry) into their business practices (specific strategies are discussed in **Section 4**).

The Department envisions a future where livestock producers and their communities work individually and collaboratively to reduce the potential for wolf-livestock conflict, develop innovative solutions, and advance efforts to coexist with wolves while preserving the economic viability and character of Washington's agricultural communities. To facilitate that, experience shows the best approach for expanded use of voluntary proactive deterrence measures is fostering relationships between independent producers and local Wildlife Conflict Specialists, and building receptivity through respectful mutual learning and collaboration. Research also supports the proposition that individuals who feel autonomous and competent are more likely to support and participate in conservation activities (Decaro and Stokes 2008; Dedeurwaerdere et al., 2016). Recent trends in Washington indicate that recognizing and supporting livestock producer's cultural independence leads to the increase the use of applicable proactive measures (Fig. 2)

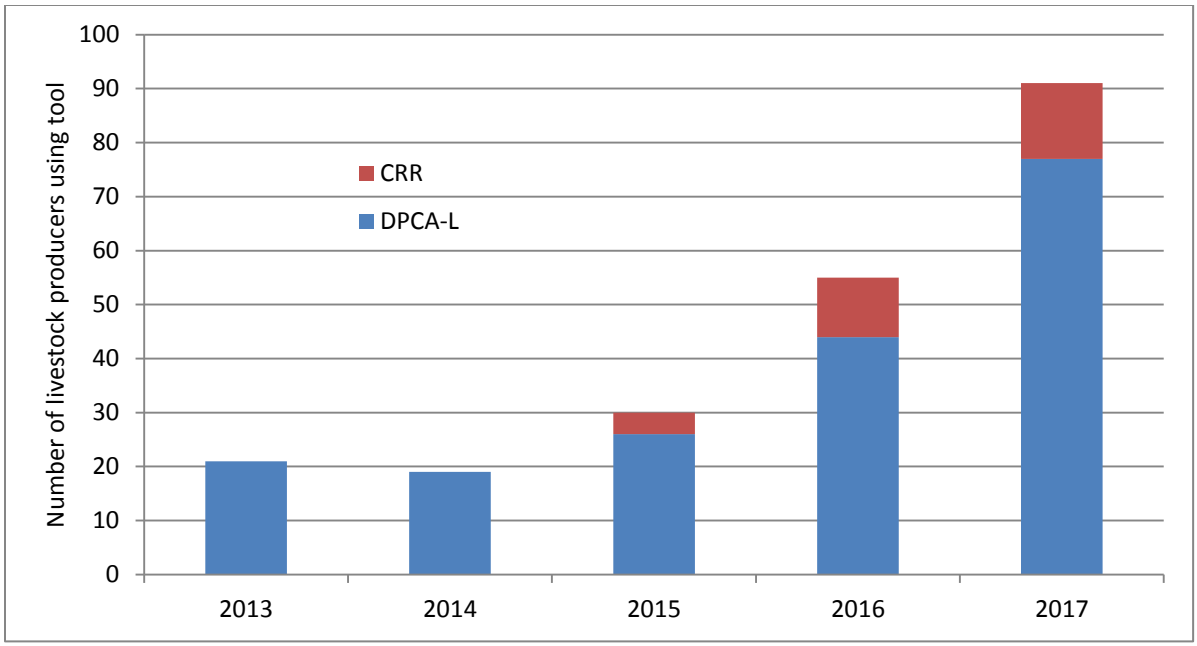

Figure 2. Trend in use of WDFW's damage prevention cooperative agreements for livestock (DPCA-Ls) and contract range riders (CRR) for northeast Washington, the Blue Mountains, and Okanogan from 2013 to 2017.

WDFW's role is to:

- Implement the wolf plan to ensure recovery of wolves in Washington State and reduce wolf-livestock conflict.
- Collaborate with livestock producers on the implementation of deterrence measures;
- Provide information on wolf behavior, pack dynamics, population status, etc.;
- Foster mutual learning to build knowledge, trust, and respect;
- Support and promote expansion of use of deterrence measures that follow best management practices and provide high applicability for specific operations and landscapes;
- Facilitate and provide technical assistance to livestock producers and rural communities;
- Support increased receptivity to best management practices in proactive deterrence measures;
- Provide local communities with interim resources for deterrence measures; and
- Recognize that adjusting to wolves on the landscape and expanded use of proactive deterrence measures across all of Washington will be an ongoing process.

Within this context, livestock producers are expected to proactively implement at least two (2) deterrence measures with concurrence from the local WDFW Wildlife Conflict Specialist. The Department's expectation is that livestock producers and the local WDFW Wildlife Conflict Specialist work in collaboration to identify and plan the proactive deployment of the best suited deterrence measures; local Wildlife Conflict Specialists are available throughout the year to work with livestock producers. The proactive deterrence measures must be in place a sufficient amount of time prior to a wolf depredation. The local WDFW Wildlife Conflict Specialist will carefully consider the amount of time

necessary for deterrence measures to have had an opportunity to be effective. In most situations, the measures will have been in place for at least one week. Several example deterrence measures with associated expectations for deployment are listed in **Section 4**.

Following a confirmed or probable wolf depredation, the local Wildlife Conflict Specialist will work with the livestock producer to assess the local on-the-ground conditions and risk to determine which responsive deterrence measures should be employed (i.e., which techniques are best suited for the specific livestock operation, have the best chance to reduce the likelihood of future depredations, and are the most feasible). The local Wildlife Conflict Specialists will guide or facilitate the implementation of the responsive deterrence measures by increasing the frequency of engagement with the affected producer(s), deploying additional deterrence measures, and coordinating with producers and other government agencies. The local Wildlife Conflict Specialist will evaluate the timing of de-escalation or lengthier deployment of responsive deterrence measures contingent upon wolf behavior, pack size, pack structure, landscape conditions and the proximity of livestock. Wildlife Conflict Specialists will attempt to manage the use of responsive deterrence measures consistently across packs and regions of the state.

Influencing pack behavior to reduce the potential for recurrent depredations is challenging, especially on allotment-type operations where livestock are dispersed on large landscapes that overlap with a wolf pack territory. In these situations, the Department recommends regular human presence (including range riders, sheep herders, livestock producer employees and family members) around livestock. Regular human presence aids in early detection of sick or injured livestock, monitoring of livestock behavior, and identifying signs of wolf-livestock conflict. As such, WDFW is working to help facilitate human presence as a proactive deterrence measure in priority areas with individual producers and community-based organizations to:

- Build receptivity and encourage regular human presence around livestock;
- Improve and facilitate opportunities for increased and improved technical capacity in human presence; and
- Secure and provide resources (financial and technical), as available, to jump-start individual and collective efforts of strategic, applicable, and best practices in human presence.

Section 4. Example deterrence measures

This section provides common deterrence measures used to reduce the potential for wolf depredations on livestock. It was developed from a review of the scientific literature on these or other deterrence measures. The literature review can be found on the Department's website at http://wdfw.wa.gov/conservation/gray_wolf/livestock/wolf_livestock_conflict_avoidance_literature_review_11_2014_final_submitted_version.pdf (Western Wildlife Outreach 2014).

Additional resources describing non-lethal methods can be found at:

- http://wdfw.wa.gov/conservation/gray_wolf/livestock/
- http://www.dfw.state.or.us/Wolves/non-lethal_methods.asp

- http://wp.peopleandcarnivores.com/wp-content/uploads/2017/03/WolfResourcesGuide.pdf
- http://www.defenders.org/publications/livestock_and_wolves.pdf

The tools best suited for a particular livestock operation will depend on many factors associated with the operation, such as the species of livestock, number of livestock, terrain, landscape conditions, and time of year.

The Department's expectation is that livestock producers and the local WDFW Wildlife Conflict Specialist will work in collaboration to identify and plan the proactive deployment of the best suited deterrence measures. Local Wildlife Conflict Specialists are available throughout the year to work with livestock producers so the measures can be implemented a sufficient amount of time prior to when a wolf depredation is more likely to occur. In most situations, the measures will have been in place for at least one week. Also, there may be strategies on the timing and duration of particular deterrence measures, or deterrence measures may be periodically changed or varied to increase their effectiveness.

The efficacy of some of these deterrence measures is not limited to influencing the behavior of wolves. Depending on how the deterrence measures are deployed, they may also influence the behavior of livestock and further reduce the potential for recurrent depredations.

1. Human Presence
   - Engage regular human presence (e.g., range riders, ranch employees, family members, or sheep herders) to protect livestock by patrolling the vicinity occupied by livestock on a daily or near-daily basis.
   - Human presence includes monitoring livestock, protecting calving/lambing areas, and using scare devices to deter wolves from approaching livestock.
   - Individuals providing regular human presence communicate frequently with the livestock producer and WDFW about issues including livestock depredations, grazing rotations, and wolf activity. They must be able to accurately identify wolves and wolf sign, and have livestock avoid known den and rendezvous sites.
   - Range riders and sheep herders who sign a sensitive-data sharing agreement may monitor the location of radio-collared wolves.

2. Monitoring Livestock
   - Watch for changes in livestock behavior, condition, and reproductive status.
   - If practical and feasible, remove sick or injured livestock from pastures within a wolf territory.
   - Notify the livestock owner and/or WDFW of any dead livestock immediately.
   - Manage livestock distribution to optimize human deterrence and monitoring capability while minimizing wolf-livestock conflict.

3. Protecting Calving/Lambing Areas
   - If practical and feasible, establish calving or lambing areas away from areas occupied by wolves and/or in pastures near ranch houses to provide for easier and more frequent livestock checks and intervention, when necessary.
   - Use protective fencing, fladry, or sheds around calving or lambing areas.
   - Keep the area clean of livestock carcasses.

4. Avoiding Den and Rendezvous Sites
    - Identify areas of concentrated wolf sign that might be an indication of an active den or rendezvous site.
    - Work with WDFW Conflict Specialists prior to grazing season to evaluate the potential for overlap and develop a plan to avoid these areas if the current or potential grazing area overlaps with active den or rendezvous sites.
    - Work with WDFW and the appropriate land management organization to seek time-based and/or geographical separation of livestock and wolves, such as alternative grazing areas, change in route, or delayed turn-out dates.
    - Increase vigilance and time spent guarding livestock in pastures with active den and rendezvous sites in the vicinity.
    - Incorporate strategies to reduce the likelihood of a depredation based on the specific circumstance of the situation (e.g., use of range riders to move grazing livestock out of the high risk areas, place watering sites or mineral blocks to localize livestock to a desired area away from active and known denning or rendezvous sites).

5. Using Scare Devices
    - Coordinate with WDFW to develop a hazing strategy to frighten wolves away from livestock. This might include installing light and noise devices, such as propane cannons, fox lights, radio-activated guard (RAG) systems that alert the range rider/herder to the presence of wolves by emitting flashing lights and loud sounds when a radio-collared wolf approaches the area.

6. Guardian or Herding Dogs
    - Guardian dogs are used to alert on-site personnel (herders or range riders) of predator presence and to protect livestock.
    - Specific dog breeds and training are required to have effective livestock guardian and herding dogs.
    - Guardian dogs and herding dogs are used in conjunction with daily human presence.
    - For sheep, guardian dogs and herding dogs may live with the herd to provide protection 24 hours a day, seven days a week.
    - Guarding and herding dog owners are trained in effective use of dogs specific to wolf-livestock situations.

7. Strategic Carcass Sanitation

    The objective of carcass sanitation is to prevent wolves from being attracted to livestock carcasses in areas frequented by livestock (corral, salt areas, calving pens, etc.) to reduce the potential for wolf-livestock interactions. As such, sanitation is targeted at areas around active and adjacent pastures in close proximity to livestock. Producers (or their family and/or employees) are expected to secure their own livestock carcasses. Example ways to secure carcasses include:

    - Create a temporary carcass disposal site on a grazing pasture that is secured so as to not be an attractant.
    - Use fladry or electrified turbofladry around a carcass until it decomposes or until it can be removed from the area.

- Bury or burn the carcass consistent with state law, county or city ordinances, and the land management agency's guidelines.
- Work with WDFW to create a permanent carcass disposal site on private property.
- Use predator-resistant fencing as a permanent barrier around a boneyard or carcass pit on private property.
- Develop a composting site consistent with state law, county, and city ordinances.

8. Permanent and Portable Fencing (fladry, electrified turbofladry, calf panels)
    - Use predator-resistant or electric fencing as a permanent or temporary barrier to confine livestock and deter predators.
    - Create night pens under open grazing conditions.
    - Confine a sick or injured animal until it can be transported off range.
    - Confine calves born on an allotment under a fall calving operation.
    - Use fladry or electrified turbofladry around livestock as a temporary deterrent to wolves.
    - Protect a carcass until a depredation investigation can be conducted.

9. Delay Turnout to Forested/Upland Grazing Pastures
    - Turnout when livestock calves reach at least 200 lbs (e.g., early calving so calves are older and heavier at turn-out).
    - Turnout after wild ungulates are born (approximately mid-June).

10. Coordination with Landowner

    Coordination between livestock producer and landowner on potential steps to reduce the likelihood of wolf-livestock conflict, such as:

    - Timing of turn-out.
    - Grazing areas and restricted areas.
    - Pasture/allotment rotation.
    - Sanitation.
    - Water and mineral block sites.
    - And other annual allotment plan instructions related to wolf-livestock interactions.

Section 5. Depredation investigations

Suspected wolf depredations on livestock are reported to the WDFW by the livestock owner (or their family members or employees), local law enforcement, or by other local entities. Department staff respond to these reports usually within 24 hours after a report is made. The reported incident site is treated as a crime scene in order to preserve the physical evidence. The investigation is conducted by a two-person WDFW team (in most situations) with training and experience in wolf depredation investigations. WDFW may coordinate with local law enforcement (as agreed to with local law enforcement agencies) to be present at the investigation to facilitate mutual learning. In areas where wolves are listed under the Federal ESA, WDFW will coordinate with the USFWS on the findings from depredation investigations and seek agreement on the determination of the investigation. WDFW may

seek input from other non-WDFW experts. However, the final determination of the investigation will be made by the WDFW staff members who conducted the investigation.

Each investigation is unique based on habitat, time of year, and location of the incident. While performing the depredation investigation, WDFW staff use many different factors to determine if a carnivore(s) was involved in the livestock injury or mortality. These factors could include (but are not limited to) documenting the characteristics of or the presence and/or absence of:

1. The disposition and age class of the livestock;
2. The site where the incident occurred;
3. Animal sign (tracks, scat, hair) at the scene, particularly from wild carnivores;
4. Other species of wildlife in the area, particularly other carnivores (collared and uncollared);
5. Sign of a chase and/or struggle (e.g., tracks in substrate, drag marks);
6. Presence of tissue trauma and hemorrhaging with bite wounds;
7. Blood indicating livestock was alive during attack (can include dried or fresh blood);
8. A scattered or buried carcass in the event of a livestock mortality;
9. Evidence of scavenging (indicating the wildlife associated with said scavenging);
10. Wildlife bedding locations near the scene;
11. Witness accounts;
12. Producer accounts;
13. Any evidence of attack or scavenging present on the hide;
14. Bite wounds associated with attack on a live animal versus scavenging;
15. Location of bite wounds;
16. Presence of broken bones, and;

Based on the factors and physical evidence documented during the investigation, the Department staff who conducted the investigation makes the final determination. In some situations, staff may seek input from individuals or a subset of WDFW staff that did not participate in the investigation. WDFW staff who participated in the investigation may also reach out to non-WDFW experts for further review of the investigation, however the final determination and rationale will be made by WDFW who participated in the investigation.

Once a depredation investigation has been completed (which may take up to 48 hours), the WDFW staff that conducted the investigation make a determination based on classifications from the Wolf Conservation and Management Plan. The classification of the final determination includes 1) confirmed wolf depredation, 2) probable wolf depredation, 3) confirmed non-wild wolf depredation, 4) unconfirmed depredation, 5) non-depredation, or 6) unconfirmed cause of injury or death. Please see **Table 1** and the Department's document, "Livestock injury and mortality investigation: A reference guide for WDFW field personnel" for more information on the investigation process, principles, and factors and physical evidence (online at http://wdfw.wa.gov/publications/01581/wdfw01581.pdf).

In an investigation, the level of certainty in the determination of the cause of an injury or mortality of livestock is critically important. As such, the Department will include a description of the "factors" that

were and/or were not present and how they contributed to the final determination in the written narrative in the depredation investigation report (See **Section 8** for information communicated to the public).

When a determination of "probable wolf depredation" is made, the factors and physical evidence that distinguish it from non-wolf predation and non-predator determinations will be documented. Examples of those distinguishing factors include sign of struggle, blood at the scene, broken branches, trampled grass, or bite marks characteristic of wolves on remaining portions of the carcass (e.g. bite marks on the tail bone). In addition, other factors must be present that allow for a reasonable ability to rule out other predators, such as the pattern of the attack that is more characteristic of wolves than other predators. When factors are absent that allow for the ability to determine if another predator was responsible, or if it cannot be determined whether or not the animal died from non-predation causes, then the incident would be an "unconfirmed depredation" or "unconfirmed cause of injury or death". Alternatively, if evidence suggests another predator, the classification would be "confirmed non-wild wolf depredation", or if it was clear that the animal died from something other than predation, the death would be classified "non-predation." In probable wolf depredations, WDFW's practice in conducting investigations is such that there is a reasonably high likelihood that the depredation was caused by a wolf, but evidence of hemorrhaging is lacking. Also, for one probable wolf depredation to be included in a pattern of confirmed wolf depredations (see **Section 6**), it must be on the same time scale, with similar periods of times between depredations, as the confirmed wolf depredations, and in the same area of overlap of wolves and livestock as the confirmed wolf depredations.

Table 1. WDFW classifications for investigation on reported injured or dead livestock.

Classification	Definition from the Wolf Conservation and Management Plan	Principles for determination
Confirmed Wolf Depredation	There is reasonable physical evidence that a wolf caused the death or injury of livestock. Primary confirmation would include bite marks and associated subcutaneous hemorrhaging and tissue damage, indicating that the wolf attacked a live animal, as opposed to simply feeding on an already dead animal. Spacing between canine tooth punctures, location of bite marks on the carcass, feeding patterns on the carcass, fresh tracks, scat, and hairs rubbed off on fences or brush, and/or eyewitness accounts of the attack may help identify the specific species or individual responsible for the depredation. Wolf predation might also be confirmed in the absence of bite marks and associated hemorrhaging (i.e., if much of the carcass has already been consumed by a predator or scavengers) if there is other physical evidence to provide confirmation. This might include blood spilled or sprayed at a nearby attack site or other evidence of an attack or struggle. There may also be nearby remains of other animals for which there is still sufficient evidence to confirm predation, allowing reasonable inference of confirmed wolf predation on an animal that has been largely consumed.	• Multiple factors documented at scene consistent with an attack by a wolf. • Often includes attack signature consistent with a wolf (see http://wdfw.wa.gov/publications/01581/wdfw01581.pdf) • Includes subcutaneous hemorrhaging. In practice, 96% of the confirmed wolf depredations in the last 3 years have included hemorrhaging as the factor that led to that determination. The Department will continue to use the factor of hemorrhaging (along with other supporting factors) for determinations of confirmed wolf depredation.
Probable Wolf Depredation	There is sufficient evidence to suggest that the cause of death or injury to livestock was a wolf, but not enough evidence to clearly confirm that the depredation could only be caused by a wolf. A number of factors can help in reaching a conclusion, including (1) recently confirmed predation by wolves in the same or nearby area, and (2) evidence (e.g., telemetry monitoring data, sightings, howling, fresh tracks, etc.) to suggest that wolves may have been in the area when the depredation occurred. These factors, and possibly others, will be considered in the investigator's best professional judgment.	• Multiple factors documented at scene consistent with an attack by a wolf. • Physical evidence and factors at scene consistent with "confirmed wolf depredation", except scene is lacking the presence of subcutaneous hemorrhaging. • Factors must be present that allow for a reasonable ability to rule out other predators and non-predation causes of death.
Confirmed Non-Wild	There is clear evidence that the depredation was caused by another species (coyote, black bear, cougar, bobcat, domestic	• Multiple factors documented at scene consistent with an attack by another wildlife species.

Wolf Depredation	dog), a wolf hybrid, or a pet wolf.	• Often includes attack signature consistent with specific carnivore (see http://wdfw.wa.gov/publications/01581/wdfw01581.pdf) • Includes subcutaneous hemorrhaging or other factors that provide physical evidence the livestock was alive when attacked by another species .
Unconfirmed Depredation	Any depredation where the predator responsible cannot be determined.	• Single or multiple factors documented at scene consistent with an attack by a predator, but the predator responsible cannot be determined. • May include subcutaneous hemorrhaging (or other factors that provide the same scrutiny of physical evidence the livestock was alive when attacked by a predator). • May include factors from multiple predators (including wolf), but predator responsible for attack cannot be discerned with physical evidence and factors.
Non-Depredation	There is clear evidence that the animal died from or was injured by something other than a predator (e.g. disease, inclement weather, or poisonous plants). This determination may be made even in instances where the carcass was subsequently scavenged by wolves.	• Factors and physical evidence indicating livestock was injured or died from something other than a predator.
Unconfirmed cause of injury or death	There is no clear evidence as to what caused the depredation of the animal.	• There is no clear evidence at the scene as to what caused the injury or death of the livestock.

Section 6. Lethal removal criteria

The Department's Wolf Conservation and Management Plan indicates that "lethal removal may be used to stop repeated depredations if it is documented that livestock have clearly been killed by wolves, non-lethal methods have been tried but failed to resolve the conflict, depredations are likely to continue, and there is no evidence of intentional feeding or unnatural attraction of wolves by the livestock owner" (See WDFW wolf plan, page 88).

The Department considers the use of lethal removal only in areas of the state where the Department has full management authority for wolves. As noted in **Section 1**, USFWS is currently the lead agency for managing wolves in the western two-thirds of the state. The purpose of lethal removal is to change pack behavior to reduce the potential for recurrent depredations while continuing to promote wolf recovery. The strategy is to attempt to change pack behavior by removing a minimum but sufficient number of wolves before that behavior is reinforced by additional depredations on livestock.

There are a number of variables and complexities related to implementing lethal removal, including the history and pattern of depredations, recovery objectives within a region, estimated pack size (total number, number of adults and pups), the number and timing of depredations, classification of depredations, current year and previous year circumstances, use of deterrence measures (including appropriateness and timing), time of year, and type of livestock.

The Department may consider lethal removal of wolves to attempt to change pack behavior to reduce the potential for recurrent depredations while continuing to promote wolf recovery when all the following criteria are met:

1. Department has documented at least 3 depredation events within a 30-day rolling window of time, or at least 4 depredation events within a 10-month rolling window of time. Stipulations include:

    - At least 1 of the depredation events is a confirmed wolf kill of livestock.
    - One (1) of the depredation events may be a probable wolf depredation if it is a part of a pattern of confirmed wolf depredations (i.e., the probable wolf depredation is on the same time scale, with similar periods of times between depredations, as the confirmed wolf depredations, and in the same area of overlap of wolves and livestock as the confirmed wolf depredations).

2. At least two (2) proactive deterrence measures and responsive deterrence measures have been implemented and failed to meet the goal of influencing/changing pack behavior to reduce the potential for recurrent wolf depredations on livestock. Stipulations include:

    - If proactive deterrence measures are not in place a sufficient amount of time prior to the wolf depredations the Department will only consider lethal removal at a higher number of wolf depredation events and after deterrence measures have been tried and failed at resolving the conflict.

3. WDFW expects depredations to continue (e.g., deterrence measures have not changed pack behavior, and overlap between wolves and livestock is expected to continue in near future),

4. The Department has documented the use of appropriate deterrence measures and notified the public of wolf activities in a timely manner as outlined in **Section 8***,* and

5. The lethal removal of wolves is not expected to harm the wolf population's ability to reach recovery objectives statewide or within individual wolf recovery regions.

For depredations on large livestock (i.e., cattle, horses, mules, and donkeys), each depredated livestock equals one "event," unless there is evidence in the investigation that supports multiple livestock in one event (e.g., physical proximity of livestock, reconstructive evidence). For depredations on small livestock (i.e., sheep, pigs, llamas, goats, and alpacas) there may be one or more livestock in one depredation event.

Guarding and herding dogs are also included in the definition of small livestock if, based on the investigation by Department staff, the dog was actively guarding or herding its assigned livestock herd when it was killed by one or more wolves. The same is true for guarding and herding dogs injured by wolves, provided there was one or more confirmed wolf depredations to the other livestock species in the assigned herd, indicating that the dog's injury as part of a pattern of depredations in the assigned herd.

Management approaches for addressing wolf-livestock conflict are based, in part, on the status of wolves within wolf recovery regions and statewide to ensure recovery or long-term sustainability of wolf populations. See appendix G and H in the state's Wolf Conservation and Management plan and Maletzke et al. 2015 for an analysis of anticipated impacts of periodic wolf removal on the status of wolves within wolf recovery regions and statewide.

The decision to implement or not implement lethal removal of wolves is made by the Director.

Section 7. Implementation of lethal removal of wolves

The objective of lethal removal is to change pack behavior to reduce the potential for recurrent depredations while continuing to promote wolf recovery. WDFW's approach is incremental removal, which has periods of active removals or attempts to remove wolves, followed by periods of evaluation.

Periods of an active removal or attempts to actively remove may vary in length of time based on factors such as the number of wolves to remove, the ruggedness of the terrain, the removal method(s) used, and resource availability (e.g., contracted helicopter vendor availability). In most situations, a period of attempting active removal will be two-weeks or less. If no wolves are removed during a period of attempted incremental removal, a period of evaluation will still occur to determine any shifts in the behavior of the pack; the act of attempting to lethally remove wolves may result in meeting the goal of changing the behavior of the pack (Harper et al. 2008).

This protocol recognizes that periods of evaluation are needed to determine if the lethal removal effort met the goal of changing pack behavior. The duration of a period of evaluation will vary in length and is largely based on the depredation behavior of wolves. If there is a documented wolf depredation(s) after a period of active removal, the Department may initiate another lethal removal action, depending on the estimated date of the depredation incident related to the previous period of active removal. As such, the period of evaluation will typically be a minimum of a week unless the pattern of depredations resumes.

The evaluation period may also serve to allow the pack to re-group and possibly allow the next incremental effort to be more effective. Because wolves quickly learn to avoid aircraft and traps (whether used for capture or lethal removal); the extended use of some methods may reduce their efficacy. During evaluation periods, deterrence measures will be re-instituted.

If the Department initiates the lethal removal of wolves, the first incremental removal action will be to remove or attempt to remove 1-2 wolves, followed by an evaluation of the situation to see if the goal of changing pack behavior was met. If depredations continue, the Department may remove additional wolves in the subsequent period(s) of active removal. Under an incremental removal approach, WDFW does not explicitly set as a desired outcome of the removal of the entire pack; however, the removal of the entire pack may occur as a result of repeated incremental removals. In situations such as a relatively small pack, the loss of the pack could potentially occur in two removal attempts (i.e., removal periods). In packs where the lethal removal of wolves is a concern for the recovery of wolves, the number of wolves to remove may be reduced in number or removals may not occur.

The Department will use methods that lethally remove wolves in a humane manner consistent with state and federal laws (e.g., trap types and sizes, trap check requirements, potential impacts to non-target species, etc.). The objective in terms of methodology is to use the best method available that balances human safety, humaneness to wolves, swift completion of the removal, weather, efficacy, and cost. Likely options include shooting from a helicopter, trapping, and shooting from the ground. All methods for removal are consistent with those used by other states and federal jurisdictions. Removal methods are evaluated collaboratively by our wildlife biologists and veterinarian and are consistent with the American Veterinarian Medical Association (AVMA) standards.

Section 8. Communication with public

The Department will notify the public when a confirmed or probable wolf depredation occurs. The notice will include the date the depredation occurred, the name of the wolf pack, what proactive and responsive deterrence measures are deployed (including when they were deployed and information on how the Department assessed the suitability of the measures), and the rationale for the Department's classification of the depredation (i.e., confirmed or probable). This information will be provided in narrative form for each reported wolf depredation and posted on the Department's website. In addition to notifying the public about wolf depredations, the Department will also notify the public when a wolf

pack has met the criteria for consideration of lethal removal and will include the Director's decision to remove or not remove wolves along with the rationale for that decision. This notice will occur prior to any lethal removal action.

The Department will also provide a monthly update about ongoing activities related to wolf conservation and management. These updates will also be posted on the Department's website and will include items such as:

- Known wolf occurrence areas (i.e., packs and non-dispersing lone wolves wearing an active radio collar) including updates to wolf pack maps on the WDFW website.
- Wolf collaring activities.
- Known wolf mortalities.
- WDFW field staff wolf-related work activities.
- WDFW outreach and information, including visual media of wolf related activities and wolves in Washington.
- Relevant information on wolf ecology, terms used, and coexistence measures.
- WDFW activities related to implementation of deterrence measures.
- A narrative of all reported wolf livestock depredation investigations
- For a wolf pack with confirmed or probable wolf depredations, a narrative about the chronology of events including details about which proactive and responsive deterrence measures were deployed.
- WDFW annual wolf report and other wolf related reports or WDFW wolf publications.

To ensure the safety of livestock producers, members of the public, and WDFW personnel, the Department will identify the pack in which the removal will occur, but will not disclose the specific location of the removal, the number of wolves to remove, days of operation, or the method of removal until the end of the grazing season. Once a removal operation has begun, the Department will update the public weekly on the number of wolves removed. Department will provide a final report to the public on any lethal removal action after the operation has concluded.

All wolf related notices and updates will be available on the Department's website at http://wdfw.wa.gov/conservation/gray_wolf/. Any member of the public can request to be notified by email about new updates by signing up for an email notification at http://wdfw.wa.gov/conservation/gray_wolf/email_notices.html.

Section 9. Literature Cited

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Appendix B

Depredation Investigations

WDFW Injury/Mortality Investigation Report Form

Database record #: XX **IRF reference #:** XX

Date report received: 09-21-2016 **Date investigated**: 09-21-2016

WDFW personnel: Natural Resource Worker [redacted], Private Lands and Wildlife Conflict Supervisor [redacted] and Sgt. [redacted]

Summarize initial report:

On 09-21-2016, Private Lands and Wildlife Conflict Supervisor [redacted], Natural Resource Worker [redacted], Sgt. [redacted] and a member from the Stevens County Sheriff's Office responded to a wolf/livestock depredation call in NE Stevens County. The area is within the USFS Smackout Grazing Allotment. This is also the home range of the Smackout wolf pack. Contact was made with the range rider who discovered the 6 month old Charolais calf carcass. The calf carcass was discovered using recent GPS locations from a collared wolf in the Smackout wolf pack. The Charolias heifer had been killed within the past 24 hours. The bones and hide were somewhat intact and the meat was completely scavenged. There was no other predator sign in the immediate area. Wolf tracks and scat were also discovered at the kill site. A complete filed investigation was conducted on the Charolais calf remains.

Location of incident:

Smackout Grazing Allotment, in Stevens County.

Incident GPS coordinates (Lat/Long): N48.81392.W117.56180

Datum: WGS84 **GPS coordinates are**: ■ Actual ☐ Approximate

Land status: ■ USFS ☐ BLM ☐ State ☐ Private ☐ Other:

Type of pasture/enclosure incident occurred in and estimated distance to nearest occupied structure?
The area the Charolais calf was discovered in is thick brush and timber. The outer area consists of small sparsely vegetated clearings with a natural meadow within a 100yards. The nearest occupied dwelling is approximately 3 miles.

General cover classification: ☐ Open/Rangeland ■ Brush ■ Lightly forested ■ Heavily forested

Are attractants present near location of incident?
No attractants.

Affected animal(s) and status:
One 6 month old Charolais calf. Deceased

Site description/physical evidence present:
The Charolais calf was discovered in thick brush and timber. Present at the kill site were wolf tracks and scat. GPS locations from a collared member of the Smackout wolf pack were also present at the scene. During the investigation strong signals from the collared member of the Smackout wolf pack were picked up on a WDFW receiver. There were no signs of any other predators or scavengers (ravens or turkey vultures) discovered near the kill site.

Description and location of injuries:
The injuries to the calf were the result of a signature style wolf attack. The injuries were bite lacerations to both armpit areas, both sides of the groin, the utter, the under belly, both shoulder points, the right achilles, the left side of the jaw and the head and neck. All bite lacerations showed signs of oxygenation, indicating the calf was alive during the attack.

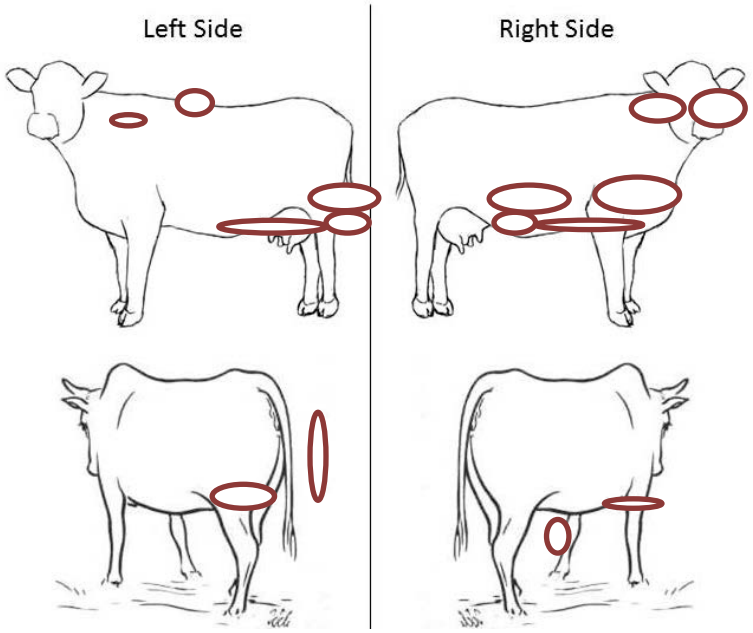


Figure 1. XX

Source of injuries. ☐ Black bear ☐ Cougar ■ Wolf ☐ Dom canine ☐ Structural ☐ Unknown
(check one) ☐ Grizzly bear ☐ Bobcat ☐ Coyote ☐ Unk predator ☐ Other _____

Injury/mortality classification: Confirmed

Classification justification:
The injuries to the calf were the result of a signature style wolf attack. The injuries were bite lacerations to both armpit areas, both sides of the groin, the utter, the under belly, both shoulder points, the right achilles, the left side of the jaw and the head and neck. All bite lacerations showed signs of oxygenation, indicating the calf was alive during the attack. Present at the kill site were wolf tracks and scat. GPS locations from a collared member of the Smackout wolf pack were also present at the scene. During the investigation strong signals from the collared member of the Smackout wolf pack were picked up on a WDFW receiver. There were no signs of any other predators or scavengers (ravens or turkey vultures) discovered near the kill site. In 2015, the Smackout wolf pack has a prior confirmed calf depredation in the same USFS Smackout Grazing Allotment.

Photograph No 1. Shows Charolais calf when first discovered in brush and timber thicket.

Photograph No 2. Shows wolf bite lacerations to the right achilles of Charolais calf.

Photograph No 3. Shows wolf bite lacerations to the shaved achilles area of Charolais calf.

Photograph No 4. Shows wolf bite lacerations to the utter area, right and left under belly and inner groin areas of the Charolais calf.

Photograph No 5. Shows wolf bite lacerations to the shaved utter area, under belly and inner groin of the Charolais calf.

Photograph No 6. Shows the shaved areas in Photographs 4 & 5 from a different view angle.

Photograph No 7. Shows the Charolais calf with an oxygenated wolf bite laceration to the left hamstring area.

Photograph No 8. Shows wolf bite lacerations to the right armpit area of the Charolais calf.

Photograph No 9. Shows wolf bite lacerations to the shaved area of the Charolais calf's right armpit area.

Photograph No 10. Shows wolf bite lacerations to the right side of the neck of the Charolais calf.

Photograph No 11. Shows wolf bite lacerations on the shaved area of the Charolais calf's right side of the neck.

Photograph No 12. Shows the wolf bite lacerations to the neck and throat area of the Charolais calf.

Photograph No 13. Shows wolf bite lacerations to the under belly of the Charolais calf.

Photograph No 14. Shows wolf track near Charolais calf kill site.

Photograph No 15. Shows wolf track near Charolais calf kill site.

Photograph No 16. Shows wolf scat near Charolais calf kill site.

Photograph No 17. Shows wolf scat near

WDFW Injury/Mortality Investigation Report Form

Database record #: 2016-09-28MillCreek_calf **IRF reference #:** XX

Date report received: 09-28-2016 **Date investigated**: 09-28-2016

WDFW Personnel: Natural Resource Worker [redacted]

Summarize initial report:
On 09-28-2016, Natural Resource Worker [redacted] and a member from the Stevens County Sheriff's Office, responded to a call of a dead cow discovered on the USFS South Fork Mill Creek Grazing Allotment, located in Stevens County. The grazing allotment is within the Smackout wolf pack home range. The 800 pound Charolais calf was discovered on 09-25-2016, in an open meadow that is part of the South Fork Mill Creek Grazing Allotment. The meadow is an enclosed portion of the allotment and is approximately 200 acres. The USFS South Fork Mill Creek Grazing Allotment itself is a 45,000 acre allotment. The Charolais calf had intact skeletal remains with a small portion of hide attached to the remains. The calf appeared to have been deceased for at least two weeks. The deceased calf was discovered during a routine inspection of the cattle. A field investigation was conducted on the calf remains. Due to the close proximity to the public road, a metal detector was used to scan the skeletal remains and the rumen for any evidence of a bullet. Nothing was detected. The remains of the calf were transported from the grazing allotment and placed in the WDFW compost facility.

Location of incident:
USFS South Fork Mill Creek Grazing Allotment, in Stevens County.

Incident GPS coordinates (Lat/Long): N48.60933/W117.66060

Datum: WGS84 **GPS coordinates are**: ■ Actual ☐ Approximate

Land status: ■ USFS ☐ BLM ☐ State ☐ Private ☐ Other:

Type of pasture/enclosure incident occurred in and estimated distance to nearest occupied structure?
The 200 acre enclosure that the Charolais calf was discovered in is a mixture of open meadows and lightly to heavily forested portions. The forest floor is covered in places with a thick undergrowth of brush. The enclosure is surrounded by a four strand barbed wire fence. The nearest residence is a ½ mile away.

General cover classification: ■ Open/Rangeland ■ Brush ■ Lightly forested ■ Heavily forested

Are attractants present near location of incident?
No known attractants in the area.

Affected animal(s) and status: (1) nine month old Charolais calf, deceased.

Site description/physical evidence present:
The Charolais calf was discovered in in a natural meadow. The closest cover was approximately 100 yards away. The rumen was located and considered a place of expiration. The intact skeletal remains had been dragged 50 feet down a slight decline in the terrain from the rumen. Present at the scene were wolf tracks. The tracks appeared to be from two separate wolves. GPS locations placed two members from the Smackout wolf pack 2-3 miles from the calf remains the night before (09-27-2016) at 5pm and 9pm. Also noted at the scene were coyote sign (tracks and scat) and evidence that turkey vultures. Due to the time frame from the calf's death to discovery, an area of attack was not discovered.

Description and location of injuries:
The only remains from the Charolais calf were skeletal remains with the two front shoulders and legs missing. A small portion of the hide remained on the upper left side of the calf. Bite lacerations were discovered on the tail. The bite lacerations were from the head of the tail towards the end. The bite lacerations and locations are consistent with that of a signature style wolf attack. Bite lacerations were also discovered on the left neck area of the Charolais calf. The lacerations and location are also consistent with a signature style wolf attack. The remainder of the calf was completely scavenged.

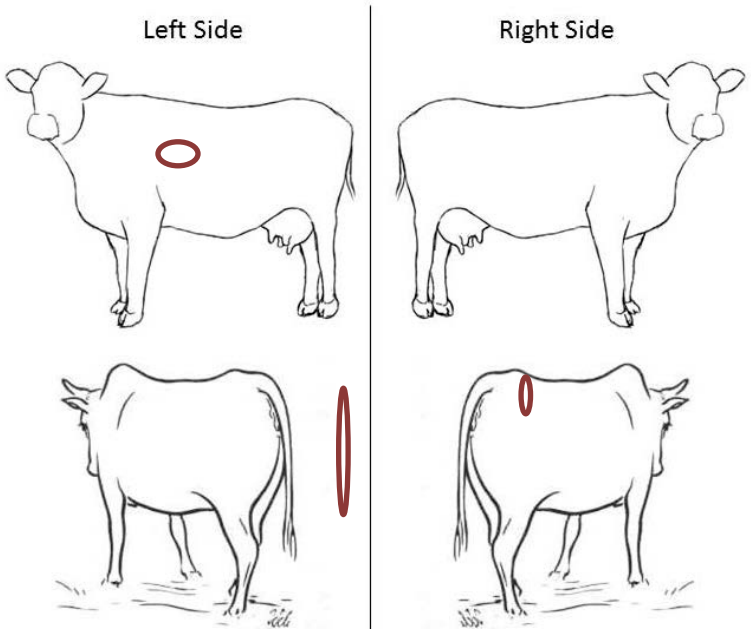


Figure 1. Location of injuries sustained by a calf in Stevens County.

Source of injuries. ☐ Black bear ☐ Cougar ■ Wolf ☐ Dom canine ☐ Structural ☐ Unknown

(check one) ☐ Grizzly bear ☐ Bobcat ☐ Coyote ☐ Unk predator ☐ Other _____

Injury/mortality classification: Probable Wolf Depredation

Classification justification:
The 800 pound Charolais calf appeared to be deceased for at least two weeks. Intact skeletal remains were present with a small portion of the hide still attached to the remains. Present on the calf's tail was evidence of bite lacerations consistent with a signature style wolf attack. Also discovered on the calf's hide were bite lacerations to the neck area consistent with a signature style wolf attack. The bite locations are also consistent with a signature style wolf attack. Periodic GPS locations place collared members of the Smackout wolf pack within the 45,000 acre USFS South Fork Mill Creek Grazing Allotment. GPS locations were also present the night before the investigation was conducted. Wolf tracks were discovered at the site of the calf remains. The producer has not had a livestock mortality for several years on this same grazing allotment. Any other evidence had been scavenged. The actual location of this attack cannot be determined due to the time frame and intermittent weather conditions. This same signature style of attack during the 2016 summer grazing season has been consistent with numerous wolf/livestock depredation events that have been investigated on multiple grazing allotments in Stevens and Ferry Counties. Attached are additional photographs of a recently confirmed depredation event involving the Smackout wolf pack. The photographs will show similar bite lacerations and location depicting the size, width and depth on both carcasses. The additional photographs were taken less than 24 hours after the attack.

Photograph No. 1 Shows the skeletal remains of the 800 pound Charolais calf.

Photograph No 2. Shows the opposite angle of the Charolais calf skeletal remains.

Photograph No 3. Shows the remaining hide and tail of the Charolais calf.

Photograph No 4. Shows the shaved wolf bite lacerations to the left neck area on the Charolais calf.

Photograph No 5. Shows a close-up of the shaved neck area on the Charolais calf.

Photograph No 6. Shows several wolf bite lacerations to the Charolais calf's tail.

Photograph No 7. Shows a slightly different angle of several wolf bite lacerations to the Charolais calf's tail.

Photograph No 8. Shows a 41/2” wolf track near the Charolais calf carcass.

Photograph No 9. Shows a 5” wolf track near the Charolais calf carcass.

Photograph No 10. Shows wolf bite lacerations to a 9 month old Charolais calf. Confirmed mortality less than 24 hours old, on 09-21-2016. These bite lacerations are similar in size, width and depth to the calf's hide during an attack as shown in Photographs 4 & 5 above. This photograph is near the belly area.

Photograph No 11. Shows wolf bite lacerations to a 9 month old Charolais calf. Confirmed mortality less than 24 hours old, on 09-21-2016. These bite lacerations are similar in size, width and depth to the calf's hide during an attack as shown in Photographs 4 & 5 above. This photograph is near the left arm pit area.

Photograph No 12. Shows wolf bite lacerations to a 9 month old Charolais calf. Confirmed mortality less than 24 hours old, on 09-21-2016. These bite lacerations are similar in size, width and depth to the calf's hide during an attack as shown in Photographs 4 & 5 above. This photograph is near the neck area.

WDFW Injury/Mortality Investigation Report Form

Database record #: 2016-09-29Aladdin_calf **IRF reference #:** XX

Date report received: 09-29-2016 **Date investigated**: 09-29-2016

WDFW personnel: Natural Resource Worker [redacted] and Conflict Biologist [redacted].

Summarize initial report:
On 09-29-2016, Natural Resource Worker Weatherman**,** Conflict Specialist Earl and a member from the Stevens County Sheriff's office responded to an injured calf call on [redacted], located in Stevens County. The area is within the home range of the Smackout wolf pack. In the late evening hours of 09-28-2016 and early morning hours of 09-29-2016, area range riders were monitoring three collared members from the Smackout wolf pack. The range riders followed transmitted signals to the 290 acre private section of land. That information was shared with a second shift of range riders who started at 07:30am on 09-29-2016. Those range riders arrived at the field and could hear a minimum of three wolves vocalizing along the eastern edge of the pasture. Within a short period of time the range riders discovered an injured 550lb Angus calf in an adjacent field separated by a four strand barbed wire fence. A visual inspection was conducted in the field and a decision was made to haul the injured calf off of the allotment. The calf was taken to a private area just outside of Colville. There a complete examination was conducted on the injured Angus calf with a battery powered shaver.

Location of incident:
Aladdin Road, located in Stevens County.

Incident GPS coordinates (Lat/Long): [redacted]

Datum: WGS84 **GPS coordinates are**: ■ Actual ☐ Approximate

Land status: ☐ USFS ☐ BLM ☐ State ■ Private ☐ Other:

Type of pasture/enclosure incident occurred in and estimated distance to nearest occupied structure?
The area the Angus calf was in is a 290 acre private section of land. Half of the land is pasture and the other half is timbered. There is a mixture of lightly and heavily forested areas with scattered brush along the forest floor. There is one barn located within the pasture. The area is enclosed with a four strand barbed wire fence. The nearest occupied residence is a ¼ mile away.

General cover classification: ☐ Open/Rangeland ■ Brush ■ Lightly forested ■ Heavily forested

Are attractants present near location of incident?
There are no attractants.

Affected animal(s) and status: One Angus calf, injured.

Site description/physical evidence present:
The Angus calf was discovered outside of the 290 acre pasture. No actual attack site was discovered. Physical evidence consisted of actual vocalization of a minimum of three members from the Smackout wolf pack just prior to the discovery of the injured Angus calf. GPS/VHF locations and transmitted signals of collared members from the Smackout wolf pack placed those members in the 290 acre pasture during the suspected time of the attack.

Description and location of injuries:
The Angus calf suffered two types of injuries. The right hamstring, upper right rear leg, inside right rear leg, outer right rear leg, point of right shoulder, lower right shoulder, right side of neck, point of left shoulder and lower left rear leg had bite lacerations consistent with a signature style wolf attack. The secondary injuries to the Angus calf were lacerations to the upper right and upper left shoulder areas consistent with structural contact. In this case, the four stand barbed wire fence. These injuries showed a constant parallel pattern consistent with a barbed wire fence. Those injuries were located above the point of both shoulders and continuing towards the top of the back.

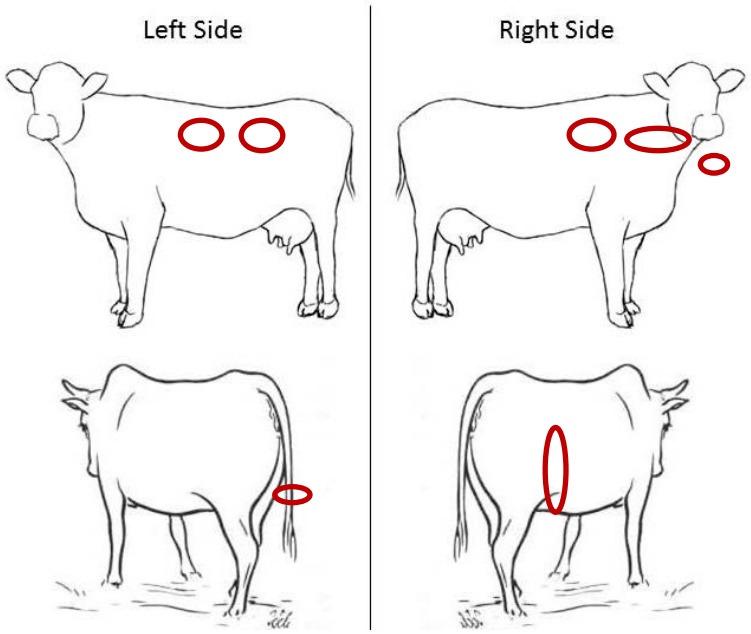


Figure 1. Location of injuries sustained by an Angus calf in Stevens County.

Source of injuries. ☐ Black bear ☐ Cougar ■ Wolf ☐ Dom canine ■ Structural ☐ Unknown

(check one) ☐ Grizzly bear ☐ Bobcat ☐ Coyote ☐ Unk predator ☐ Other _____

Injury/mortality classification: Confirmed Wolf Depredation

Classification justification:

The Angus calf had bite lacerations to the right hamstring, upper right rear leg, inside right rear leg, outer right rear leg, point of right shoulder, lower right shoulder, right side of neck, point of left shoulder and lower left rear leg consistent with a signature style wolf attack. Three collared members from the Smackout wolf pack were monitored at the field where the calf was attacked during the early morning hours of 09-29-2016. Just after daylight on 09-29-2016, a minimum of three wolves were heard howling in the same field by a second group of range riders. GPS satellite locations placed the three collared members along the same fence line where the Angus calf was discovered for more than 6 hours. During the 2016 grazing season, the Smackout wolf pack is responsible for two previous depredation events. The first was a confirmed mortality on a 550lb Charolais only eight days prior in a USFS Grazing Allotment. The second was an adult Charolais cow carcass discovered within their home range and ruled probable. The Smackout wolf pack was also responsible for a confirmed depredation event where a calf was injured in the fall of 2015.

Photograph No 1. Shows wolf bite lacerations to the right hamstring, upper right rear leg, and outer right rear leg and the outer left rear leg, after being shaved. Swelling was also noticed on the right rear leg.

Photograph No 2. Shows wolf bite lacerations the outer right rear leg of the Angus calf, after being shaved.

Photograph No 3. Shows a close-up of the wolf bite lacerations to the left hamstring and the outer right rear leg, after being shaved.

Photograph No 4. Shows a close-up of wolf bite lacerations to the outer right rear leg of the Angus calf, after being shaved.

Photograph No 5. Shows a close-up of wolf bite lacerations to the outer right rear leg of the Angus calf, being shaved.

Photograph No 6. Shows a close-up of wolf bite lacerations/punctures to the point of the right shoulder of the Angus calf, after being shaved. Horizontal injuries from the point of the shoulder upwards to the back are consistent with barbed wire contact.

Photograph No 7. Shows a close-up of wolf bite lacerations to the lower right front leg, after being shaved.

Photograph No 8. Shows wolf bite lacerations/punctures to the point of the right shoulder from a different angle, after being shaved.

Photograph No 9. Shows a close-up of wolf bite lacerations/punctures to the right neck area of the Angus calf, after being shaved.

Photograph No 10. Shows the shaved left shoulder of the Angus calf. Horizontal injuries from the point of the shoulder upwards to the back is consistent with barbed wire contact.

Photograph No 11. Shows the shaved left rib area of the Angus calf. Horizontal injuries along the left side is consistent with barbed wire contact.

Photograph No 12. Shows wolf bite lacerations to the outer left rear leg of the Angus calf after being shaved.

WDFW Injury/Mortality Investigation Report Form

Database record #: 2017-07-18SmackoutPack_calf_confirmed

Date report received: 07-18-2017, 9:50 **Date investigated**: 07-18-2017, 14:23

WDFW personnel: [redacted]

Summarize initial report: On July 18, 2017 a producer in Stevens County contacted WDFW about three injured calves found by their hired range rider that morning. The three calves had been located in a pasture with daily range riding activity. The producer has been reporting activity from the Smackout wolf pack since the beginning of June. Two representatives from the Sheriff's office, the producer, the producer's range rider, a representative from the Forest Service, and WDFW responded to the scene.

Location of incident: Stevens County

Incident GPS coordinates (Lat/Long): 48.80658, -117.58472

Datum: WGS84 **GPS coordinates are**: ■ Actual ☐ Approximate

Land status: ■ USFS ☐ BLM ☐ State ☐ Private ☐ Other:

Type of pasture/enclosure incident occurred in and estimated distance to nearest occupied structure? The immediate area consisted of open range with multiple fenced pastures. The nearest occupied structure was approximately 700 feet away.

General cover classification: ■ Open/Rangeland ■ Brush ☐ Lightly forested ☐ Heavily forested

Are attractants present near location of incident? There were no known attractants present.

Affected animal(s) and status: Approximately five month old calf. Injured.

Site description/physical evidence present:
The fenced pasture where the calves were located consisted of mostly grass. The creek banks and cow scat was examined for any tracks. No carnivore sign was discovered.

Description and location of injuries:

Three calves were collected by the producer to be examined (Figure 1-6). Two calves (17 and 89) both limped on their front right legs, but no signs of a depredation were noted.

Calf 110 had a total of three locations that were examined. The right ear was noted to have two wounds, one that passed through the pinna completely (Figure 1, 3). The rear left leg had two distinct bite lacerations extending down into the dermal layer of tissue just below the hock (Figure 1, 4). The third injury examined consisted of a severe wound located near the flank that

continued into the viscera. The wound was approximately 5" long x 4" wide (Figure 1, 2, 5, 6). Several bite lacerations were also noted around the wound on the flank (Figure 1, 6).

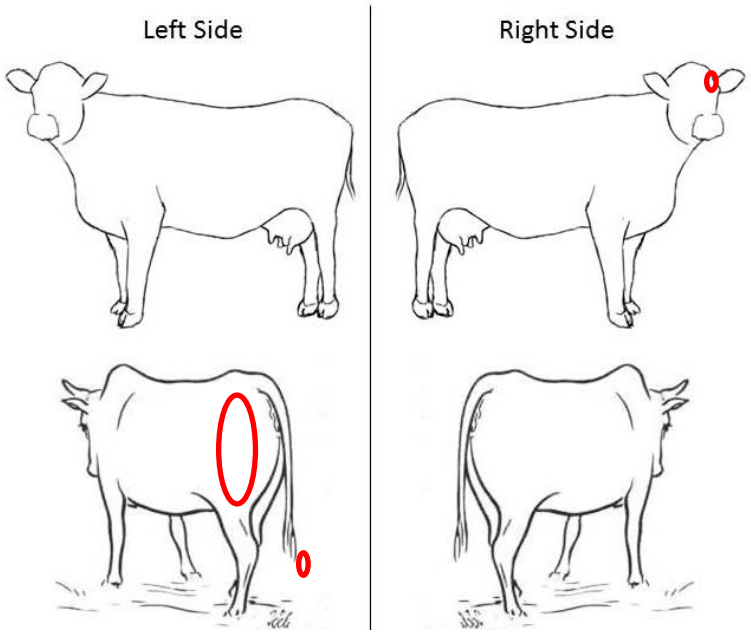


Figure 1. Locations of injuries to a calf discovered in Stevens County on July 18, 2017.

Source of injuries: ☐ Black bear ☐ Cougar ■ Wolf ☐ Dom canine ☐ Structural ☐ Unknown

(check one) ☐ Grizzly bear ☐ Bobcat ☐ Coyote ☐ Unk predator ☐ Other _____

Injury/mortality classification: Confirmed Wolf Depredation (one calf) and Non-Depredation (two calves)

Classification justification: After a thorough investigation of the scene and a field necropsy of the injuries to the calves, one incident is classified as a confirmed wolf depredation (calf 110) and two other calves (17 and 89) are classified as non-depredations.

For the confirmed wolf depredation, the combination of evidence at the scene (recent reports of wolves in the act of attacking calves and VHF signals from a Smackout wolf collar on 7/18), injuries on the calf (hemorrhaging with bite wounds on the left rear leg and left flank), recent wolf collar location data, and a legal lethal take at the end of June 2017 clearly indicate a wolf depredation on calf 110. Wolf GPS collar data indicated that two Smackout Pack wolves were within one mile of the pasture for the last 60 days on a frequent basis. Both collars (and other non-collared wolves) have been observed in the pasture and in the act of attacking calves at the end of June.

For the two non-depredations (calf 17 and 89), both animals were examined and there were no external injuries that could be associated with a depredation. After the examination, the producer suspected the calves may have been trampled.

Figure 2. Injuries discovered on a calf in Stevens County on July 18, 2017.

Figure 3. Right ear injury on a calf in Stevens County discovered on July 18, 2017.

Figure 4. Rear left leg injury on a calf in Stevens County discovered on July 18, 2017.


Figure 5. Left flank injury on a calf in Stevens County discovered on July 18, 2017.

Figure 6. Left flank injury on a calf after being shaved in Stevens County discovered on July 18, 2017.

WDFW Injury/Mortality Investigation Report Form

Database record #: XX **IRF reference #:** XX

Date report received: 07-22-2017 **Date investigated**: 07-22-2017

WDFW personnel: [redacted]

Summarize initial report: On July 22, 2017, WDFW Personnel were notified of an injured calf on private ground in Stevens County. The producer noticed that his cattle were out of his 40 acre enclosure and discovered the injured Angus calf while gathering the cattle. The cattle had been pushed through the electric fence portion of the pasture. A representative from the Stevens County Sheriff's Office also responded. The private property lies within the home range of the Smackout Wolf Pack.

Location of incident: Stevens County.

Incident GPS coordinates (Lat/Long): [redacted]

Datum: WGS84 **GPS coordinates are**: ■ Actual ☐ Approximate

Land status: ☐ USFS ☐ BLM ☐ State ■ Private ☐ Other:

Type of pasture/enclosure incident occurred in and estimated distance to nearest occupied structure? The 40 acre fenced pasture has three sides of 4 strand barbed wire and one side with an active single wire electric fence. The nearest occupied dwelling is approximately 200 yards away.

General cover classification: ■ Open/Rangeland ■ Brush ■ Lightly forested ☐ Heavily forested

Are attractants present near location of incident? There are no known attractants in the area.

Affected animal(s) and status: 5 week old Black Angus calf. Injured.

Site description/physical evidence present: The area consists of older dwellings, open grazing and timber along the creek. Bear activity was discovered outside of the electric fence. WDFW GPS collar data from two collared members of the Smackout Wolf Pack placed them in close proximity to the pasture ground on July 19, 2017.

Description and location of injuries: The Angus calf had one severe bite laceration and bite puncture wound to the inside left rear leg. This wound was approximately 4" in length. There was visible hemorrhaging around the larger wound. There were other bite puncture wounds and bite lacerations to the inside left rear leg, lower left hamstring, the lower front left leg, and bite puncture wounds to the lower right leg. The injuries appeared to be 2-3 days old, due to the age of the maggots and dead skin around the larger wound.

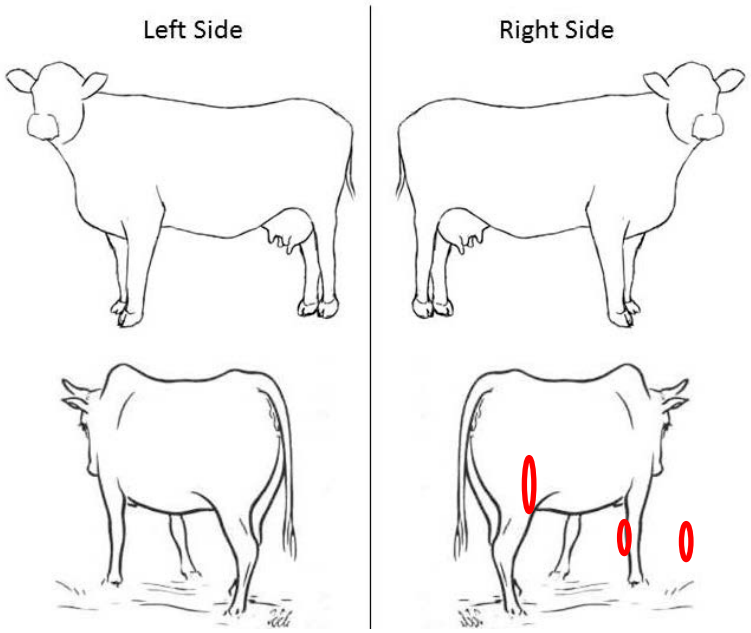


Figure 1. XX

Source of injuries. ☐ Black bear ☐ Cougar ■ Wolf ☐ Dom canine ☐ Structural ☐ Unknown

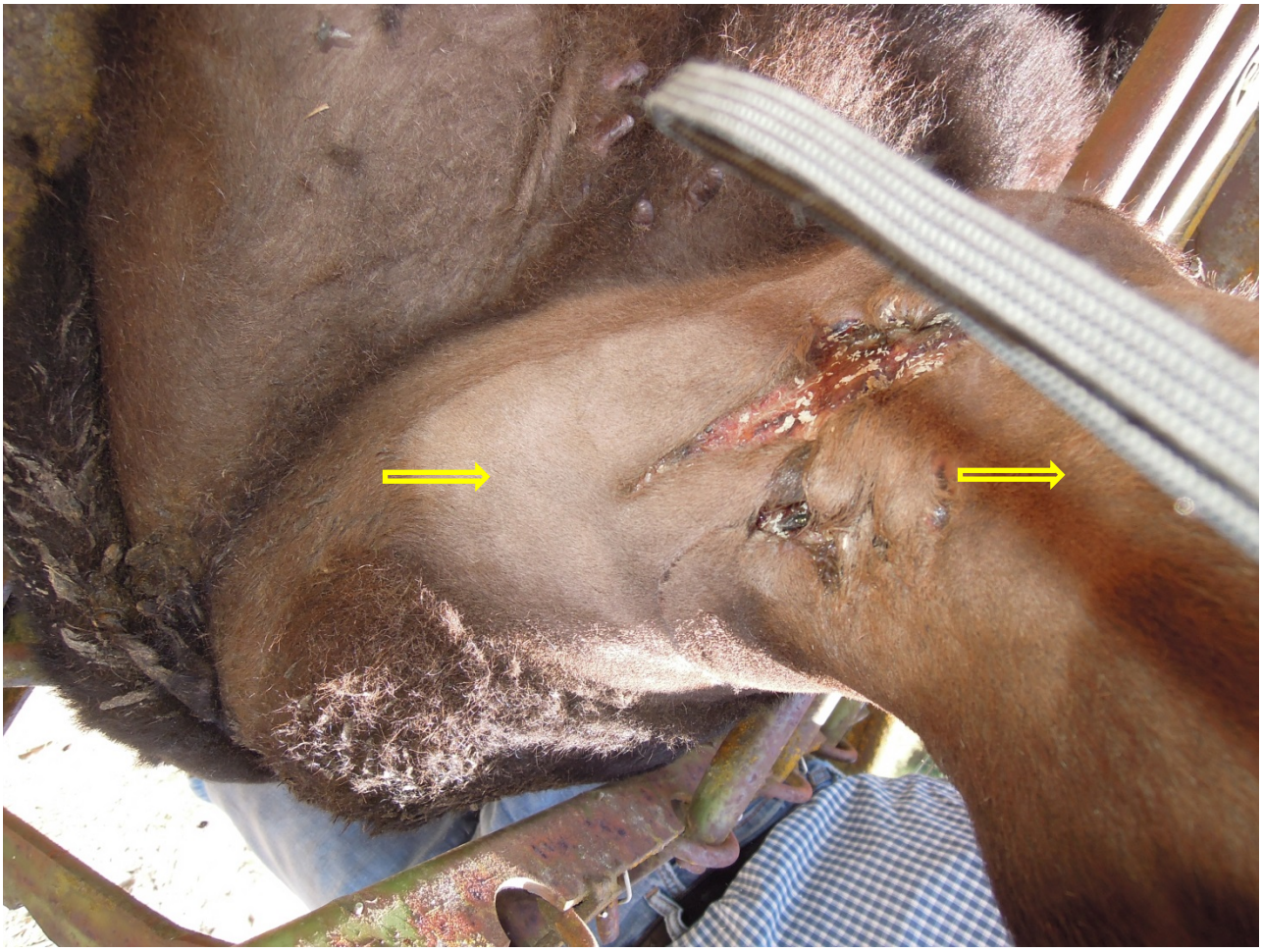
(check one) ☐ Grizzly bear ☐ Bobcat ☐ Coyote ☐ Unk predator ☐ Other _____

Injury/mortality classification: Confirmed Wolf Depredation.

Classification justification: A complete physical examination was conducted on the injured Angus calf. The results of the field examination shows a severe bite laceration and bite puncture wound to the inside left leg with hemorrhaging to the under lying tissue. Also noted in the examination were other bite lacerations and bite puncture wounds to the inside left rear leg, the lower left hamstring, the lower left front leg and the lower right front leg. All of the noted injuries and locations are consistent with a signature style wolf attack. WDFW GPS collar data place two collared members from the Smackout Wolf Pack in close proximity during the time frame associated with the age of the injuries to the Angus calf. The Smackout Wolf Pack has history dating back to 2015, involved in confirmed livestock depredation events. The latest, a confirmed depredation on 07-18-2017, approximately 3 miles away.

Photograph No 1. Shows the large bite laceration to the inner left leg of the Angus calf.

Photograph No 2. Shows a shaved close up of photograph No 1.



Photograph No 3. Shows the shaved lower left leg and left hamstring with bite lacerations and puncture wounds on the Angus calf. The arrows indicate hemorrhaging to the under lying tissue.

Photograph No 4. Shows two bite puncture wounds to the lower hamstring on the Angus calf.

Photograph No 5. Shows a bite laceration to the lower left front leg on the Angus calf.

Photograph No 6. Shows a bite puncture wound to the lower right front leg on the Angus calf.

Photograph No 7. Shows a bite puncture wound inside of the large laceration of the inner left leg on the Angus calf.