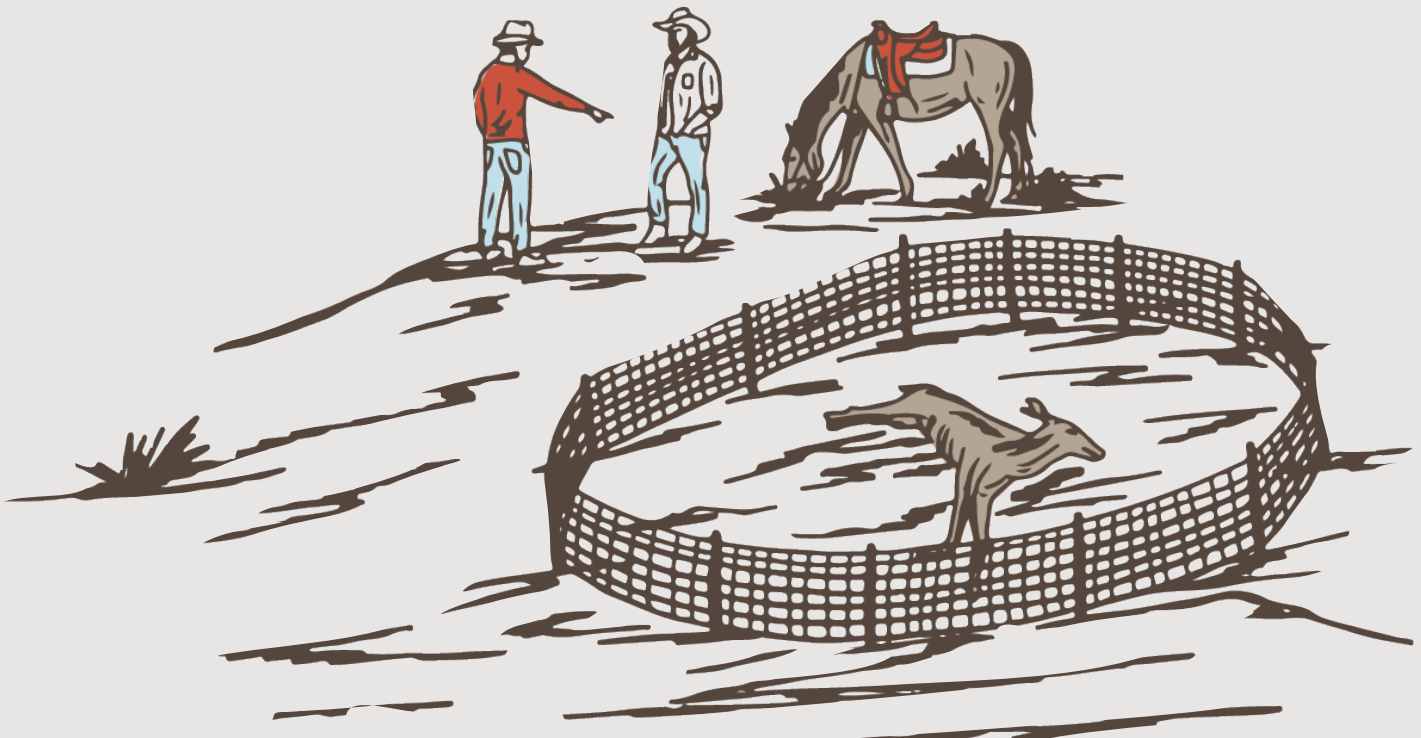


CARCASS

MANAGEMENT

PRODUCER TOOL KIT



**COW
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2021-2024

CARCASS MANAGEMENT PRODUCER TOOL KIT



Across the West, carcass management is increasingly recognized as an important part of systems-based livestock and predator conflict prevention efforts and for its role in increasing human safety on the landscape.

A main component of predator-livestock conflict mitigation is reducing the availability of attractants on the landscape; in this case, animal carcasses and bone piles. Carcass management for livestock-carnivore conflict mitigation focuses on securing or removing carcasses and bone piles that can bring predators within close proximity to livestock, thereby increasing the potential for depredation. In addition to the goal of reducing livestock conflict with large carnivores, other benefits of carcass management include human safety considerations in areas with grizzly bear presence, protecting water quality, prevention of pathogen transmission, and other benefits including avoidance of attracting scavengers such as ravens that could injure or depredate livestock. There are four main components of carcass management:

Finding and securing a carcass:

The first component to carcass management involves locating a carcass. In situations where the carcass cannot be removed immediately, it can be temporarily secured on-site with mesh electric fencing so that it is not available for scavenging by bears or wolves.

Temporary or permanent on-ranch facilities:

Temporary on-ranch facilities, including secure, fenced enclosures, can be used during times of greater need for carcass removal (calving, for example), or installed permanently in the form of an on-site carcass composting facility.

Transportation:

Transportation, either centralized through a third-party group or by a producer, relocates carcasses to a secure facility. Regulations for transporting carcasses vary by state.

Community carcass management facility:

Community carcass management facilities most often take the form of a carcass composting site, an established county landfill that accepts carcasses, or a fenced garbage transfer site. Carcass composting sites, often run by a community group or a collaboration of county and state agencies, offer secure, enclosed locations to convert disposed carcasses into soil through the process of composting.

In an effort to support producers in incorporating carcass management as a tool to reduce livestock-carnivore conflicts, this document draws from three years of shared learning including meetings amongst landowners, livestock producers, wildlife biologists, partner organizations, Tribes, and federal and state agencies. It includes the Principles of Predation Risk Management to support planning, a step-by-step process for implementation and adaptation of carcass management, and case studies that highlight the differences in implementation based on local needs and lessons learned through the process of applying the practice. This document represents both knowledge and experience gained on the land through carnivore-livestock conflict management and research into the effectiveness of carcass management in various contexts.

Finding and securing a carcass:

The first component to carcass management involves locating a carcass. In situations where the carcass cannot be removed immediately, it can be temporarily secured on-site with mesh electric fencing so that it is not available for scavenging by bears or wolves. In areas with grizzly bear presence, use extreme caution when approaching a carcass. Always be aware of your surroundings and carry bear spray (at a minimum) for personal protection.

Temporary or permanent on-ranch facilities:

This option can be used during times of greater need for carcass removal (calving, for example), or installed permanently in the form of an on-site carcass composting facility. If heavy equipment is available, a dump trailer or other temporary structure can be used to hold carcasses prior to transporting to a community facility provided the location of the dump trailer will not create an attractant that will bring grizzly bears close to humans or livestock. In areas where grizzly bears are not present on the landscape, on-site burial of carcasses and bone piles on private ground is an option. If producers choose to bury carcasses and bone piles it is important to consult with local biologists on best practices for burial.

Transportation:

Transportation, either centralized through a third-party group or by a producer, is required to relocate carcasses to a facility. Regulations for transporting carcasses will vary by state.



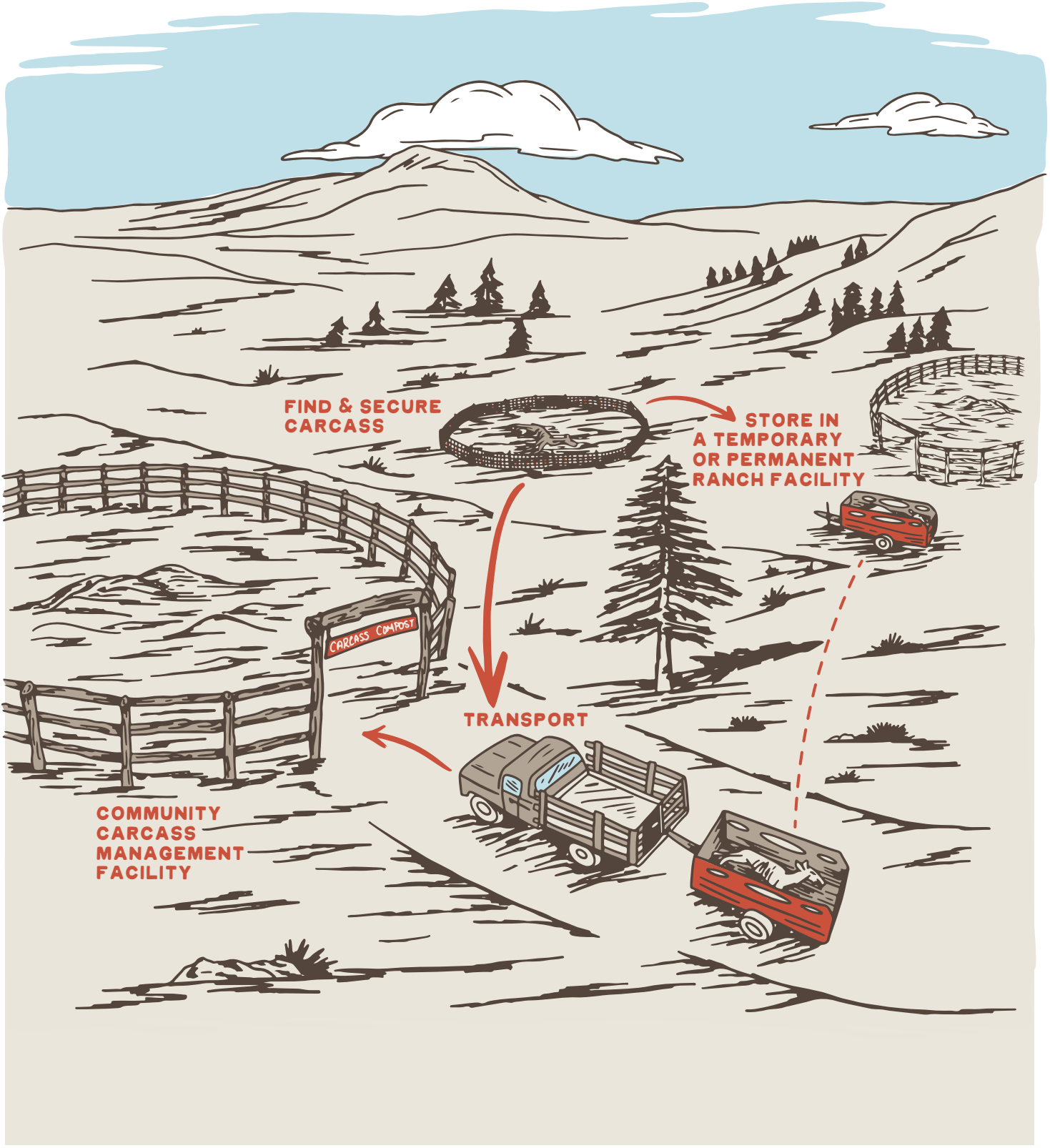
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In an effort to support producers in incorporating carcass management as a tool to reduce livestock-wildlife conflicts, this document draws from three years of shared learning including meetings amongst landowners, livestock producers, wildlife biologists, partner organizations, Tribes, and federal and state agencies. It includes a step-by-step process to support planning, implementation and adaptation of carcass management, and case studies that highlight the differences in implementation based on local needs and lessons learned through the process of applying the practice. This document represents both knowledge and experience gained on the land through carnivore-livestock conflict management and research into the effectiveness of carcass management in various contexts.

Range riding can be performed by owners or staff of livestock operations, through contractors with community-based organizations such as landowner-led conservation groups and other NGOs, or by state and federal wildlife management agency staff. Although we use the title “range rider,” cowboys, herders, ranch hands, other livestock managers, and even non-livestock managing staff can all serve as range riders. It’s critical to note that whoever assumes the role of a range rider goes above traditional duties to minimize predation risk regardless of additional capacity and resources.

This toolkit includes a step-by-step process to support the planning, implementation, and adaptive management of range riding programs. We also provide example case studies that highlight lessons learned by ranches and place-based organizations. This toolkit draws from three years of shared learning across landowners, livestock producers, wildlife biologists, partner organizations, researchers, tribes, and federal and state agencies. It represents decades of knowledge and lived experience across the West gained through carnivore-livestock conflict management and research.





MADISON VALLEY RANCLANDS GROUP

Carcass and Disposal Program

The Madison Valley Ranchlands Group has been managing a carcass composting site and pickup program since 2018, one that is experiencing continued support and participation since its inception. “It’s been increasing every year, which means that ranchers are buying into the program, and that it works,” said Linda Owens, Project Director of the Madison Valley Ranchlands group.

Many producers in this area are experiencing a rise in livestock-predator conflict associated with expanding grizzly bear and wolf populations. This program was created in an attempt to mitigate predator conflict and focuses on being as “rancher friendly” as possible.

“We’re trying not to put any more burden on (the ranchers) for dealing with the conflict that is starting to occur because of increasing carnivore populations and scavengers,” Owens explains. The project offers a carcass pickup service available to ranchers in the surrounding areas, covering over 70 linear miles.

Finding and Securing Carcasses: In the Madison Valley, producers are responsible for finding and securing carcasses prior to calling in for

pickup. If the carcass happens to be the result of a depredation, the Madison Valley Ranchlands Group has a handy saddlebag kit that includes depredation investigation information, and directions to secure the carcass with flagging and electric fencing when in open rangeland contexts. Further, a USDA Wildlife Services Range Rider who works a subset of national forest allotments among other duties, provides extra capacity out on the landscape to spot and secure depredations or deadstock.

Temporary or Permanent On-Ranch Facilities: Due to the readily available community-run carcass management program, temporary or permanent on ranch facilities are not widely utilized in the valley except for the larger ranches that have their own compost sites.

Transportation: Linda Owens is on-call with a winch-outfitted dump trailer to pick up any deadstock, whether it be a steer, horse, donkey or otherwise. The trailer was purchased using grant monies and Linda uses her personal 1 Ton truck to pull the trailer. Producers are also encouraged to bring their carcasses to the facility if they have the time and

“We’re trying not to put any more burden on (the ranchers) for dealing with the conflict that is starting to occur because of increasing carnivore populations and scavengers.” Linda Owens

means to do so. This encourages producers to see the facility first hand and the process used to compost animal carcasses.

Community Carcass Management Facility:

For many years, the project struggled to find a location to construct a carcass composting facility, but after years of challenges with permitting and red tape on county and state lands, a local rancher offered to host the carcass composting site on his own private property. The landowner and Madison Valley Ranchlands Group, a nonprofit supporting Montana’s ranches and rangelands, with the help of other local and federal partners, now run and maintain the site. The two-acre facility, enclosed by a high-voltage fence, is designed to be large enough to include compost bunkers for wildlife carcasses (roadkill, etc.), but the program currently only accepts livestock carcasses due to regulations set forth by their county Health Board and MVRG’s DEQ Management Plan. Though the program mostly receives cattle and horses, the site has also composted carcasses of chickens, pigs, goats, and sheep.

When a carcass arrives at the facility, it is placed on a layer of wood chips, covered with straw, old hay and manure, and then a layer of topsoil, which seals and maintains moisture in the pile. The site is in a strong wind corridor which dries the compost pile out if not covered by the topsoil. An estimated 10 cubic yards

of materials (i.e. wood chips, straw, manure, topsoil) is required per large carcass for proper composting. The Madison Valley Ranchlands Group works with producers, and non-ag businesses in the area to collect old straw, hay, manure, wood chips and other materials that can be used in the composting process. This reduces the cost of the composting materials.

To promote breakdown of the remains, the managers keep the compost piles at about 130 degrees Fahrenheit. At this temperature, generally, in about 90 days, not much is left of the carcass except larger bones, which go back into the composting cycle. Finished compost samples are sent for testing twice yearly for disease and chemical analysis, which must be filed with the state DEQ. The finished, approved compost material is appropriate for use on hay fields, pasture land, and in reclamation projects.

The managers keep detailed records of every aspect of the process (animals collected, materials used, mileage driven for pickup, time spent carrying out the program, etc.). “Right now, it’s costing us about \$200 to \$250 per carcass,” said Owens, “and that includes picking them up, placing them in the pile, mixing the pile, and the turning and screening of the final product.” MVRG uses a spreadsheet developed by Heart of the Rockies to track costs which includes rancher time per carcass to remove it from their land.





Road Kill & Conflict Reduction in Wallowa, Oregon

At the end of 2009 there were fourteen known wolves in Oregon, four in a remote area far from people and a pack of ten that were visiting a valley supporting a host of livestock operations. In February 2010, the Oregon Department of Fish and Wildlife placed a GPS collar on the breeding male of the pack. The locations from the newly radio-collared wolf showed that he and the pack were spending the majority of their time at or near the location of four long-term bone piles in and on the edge of the valley. In these locations, there was a higher concentration of livestock and a lower concentration of elk and deer due to the presence of an elk fence.

As the wolves spent most of the winter at the constantly replenished carcass piles, they became increasingly comfortable moving into the valley at night, and by May the pack started depredating livestock. In order to address this challenge, livestock producers worked with local Oregon Department of Fish and Wildlife biologists to identify bone piles that were serving as attractants, and either buried them or hauled them to the local dump.

In order to incentivize this practice, the county began a program that waived dumping fees for live-

stock producers who used their own time and funds to transport carcasses to the dump site. Even though the county was not able to cover the producer's time or the equipment to transport the carcasses, or pursue a carcass composting site because it was cost-prohibitive at the time, this program has experienced continued use. In the winter of 2023, there were 50 carcasses deposited at the local dump over a 30-day period, and 11 deposited on a single day in April 2023.

Removing the bone piles had an immediate and continued effect in reducing wolf-livestock conflict in the valley. The following winter in 2011, wolves changed their behavior and land use dramatically, transitioning to an area where thousands of elk winter (with virtually no livestock). That pack of wolves, and the next two packs that occupied the same denning area, no longer visited the valley. While many variables changed over time (weather, wolf packs, etc), the only major difference between winter 2010-2011 and winters 2011-2023 is the removal of attractants as ranchers offered their time and equipment to transport deadstock quickly and efficiently to a no-cost centralized site.



PRINCIPLES FOR PREDATION RISK MANAGEMENT

A diverse group of stakeholders, guided by the direct experience of livestock producers, contributed to the development of Principles for Predation Risk Management. Serving as a guide rather than a prescriptive checklist, the following steps can be used to inform the use of carcass management as a tool to reduce wildlife-livestock conflicts and support rangelands:

- 1. Know your context - inventory resources and assess risk**
- 2. Identify your goals and objectives, along with problems and opportunities**
- 3. Context-specific implementation, based on items 1 and 2**
- 4. Communicate for success**
- 5. Integrate emerging strategies and complementary technology**
- 6. Continue to assess risk, evaluate outcomes and adapt activities**

Step 1: Know Your Context

Understanding the variables that contribute to predation risk is essential. The Risk Assessment Framework (#1-5, below) is a way to evaluate risk of predation through examining land-use. Some areas sustain have more intensive human/livestock use, such as homesteads and calving or weaning pastures; some areas are shared between livestock and predators, including large pastures/allotments; and other areas have sustain more intensive emphasis on carnivore sustainability, like wilderness areas and national parks predator activity. Predator/livestock overlap is time and space dependent: when evaluating wolf-livestock conflict risk, consider den locations of carnivores, travel corridors for both carnivores and livestock, and other important spatial and temporal factors (e.g., wolf rendezvous sites or livestock bedding grounds). Evaluating the landscape in this way can inform decisions about the location and intensity of application for conflict prevention practices, including carcass management. This framework provides logical steps to identify areas of risk on the property. Please see the "Risk Assessment Framework" for a comprehensive guide for this step of the framework.

The Risk Assessment Framework

- 1. SPECIES:** Type and population density of predators, history of depredation events, type, age class, and health of livestock alter the level of risk, as does the abundance, vulnerability, and diversity of non-livestock prey.
- 2. PLACE:** Each site or region has a unique set of abiotic and biotic conditions influencing predation risk (e.g., topography, canopy cover/density, water sources, forage availability, climate)
- 3. TIME:** Conflict or predation risk happens in a temporal setting and changes over time based on habitat use and livestock/grazing management, based on annual life cycles of wildlife and annual production cycles of livestock or other agriculture crops.
- 4. DISTURBANCE:** events whose effects may strongly influence wildlife populations, behavior, and ecosystem dynamics and therefore impact predation risk (e.g., snow, drought, fire, recreation, lethal control)
- 5. LANDSCAPE/LAND USE:** the size, shape, and spatial relationships of habitat patches and livestock pastures on a ranch or in a region affect ecosystem

function, community dynamics and predation risk, along with the ability to implement certain strategies (e.g. road access)

These five factors were adapted from Dale et al. 2000. Ecological Principles and Guidelines for Managing the Use of Land, a report of the Ecological Society of America Committee on Land Use

Step 2: Know your goals

The first step to creating a carcass management program is determining the objectives of your program. Who will the program serve? What materials and funding will it require? What local permits or permissions may be required? The path that you take to create the program will depend on whether carcass disposal is community-wide or for one or a handful of ranchers, local availability of disposal sites, and community resources. For example, community-wide programs may require carcass pickup (truck, trailer, winch), an approved and permitted disposal site, funding for the labor and equipment required, and, most importantly, widespread interest in using the program. Local or small-scale disposal may be accomplished through creating a shared site, burial (where appropriate), or disposal at a local landfill.

Step 3: Context-specific application

Carcass management is an adaptable tool that can support conflict reduction in a wide variety of contexts. From small acreage calving pastures to large open rangeland settings, the four components of carcass management, finding and securing a carcass, temporary or permanent on-ranch facilities, and transportation and community carcass management facility can be implemented to match the appropriate setting.

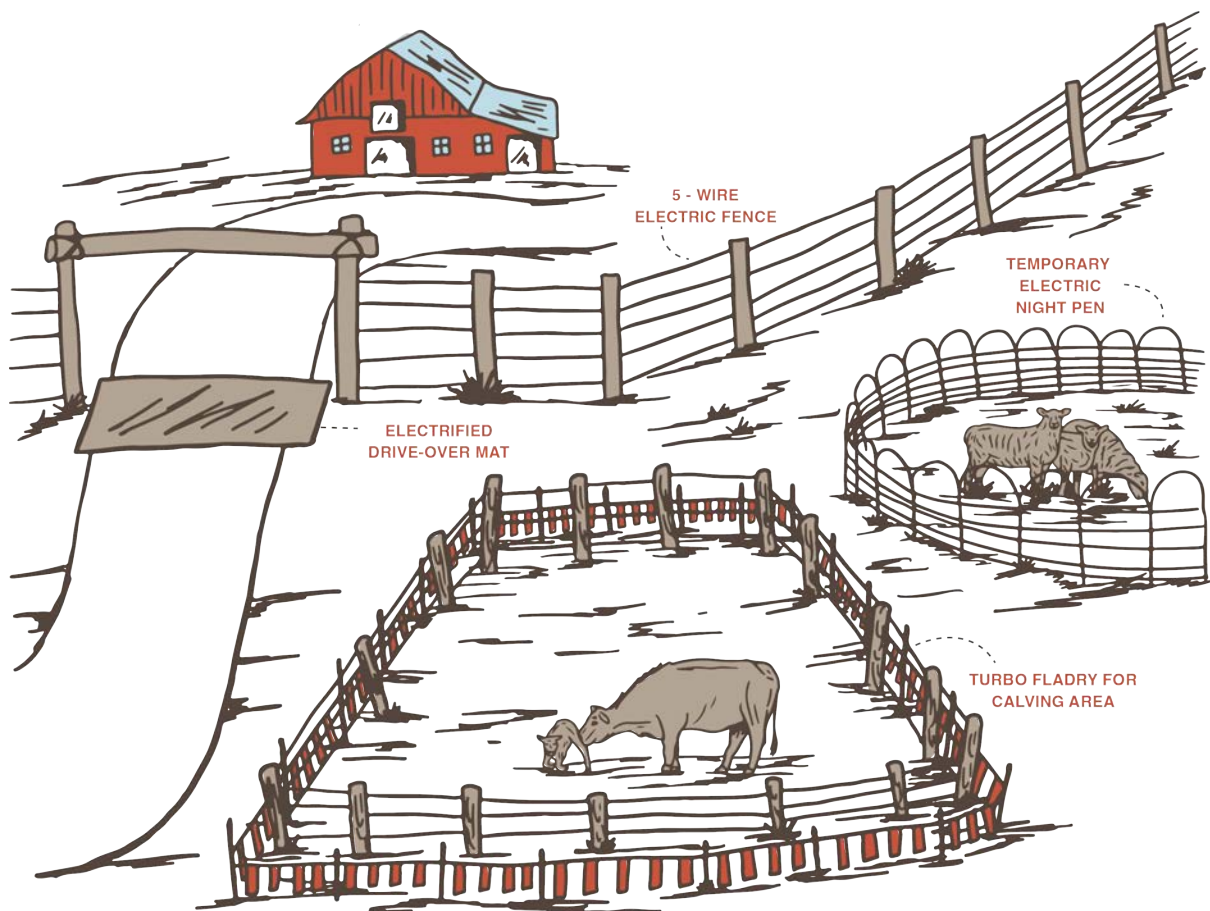
Carcass removal may be accomplished through a community scale response if available, and to be most effective, a carcass management program should include a vast majority of ranching operations in the target geography, in addition to wildlife carcasses if possible. Wildlife carcasses can include clearing carcasses caused by vehicle collision on road ways and wildlife remains during and after hunting season. If a community scale response is not currently available, producers may wish to secure and/or transport carcasses, or work to bury carcasses on their property at proper depth.

Carcass management programs may offer different combinations of securing carcasses, on-farm facilities, transportation, and community composting/disposal. Developing a community carcass composting site often requires partnerships, materials, and ongoing maintenance for greatest effect. The following section provides considerations for each context-specific implementation of each or a combination of these components.

Finding and securing a carcass: In smaller acreage settings, such as pastures adjacent to the farmstead or calving pens, locating and securing (temporarily preventing scavenging of a carcass) is less challenging and may be accomplished using a pickup truck or heavy machinery. While deceased livestock in corrals or calving barns may be easier to locate and secure, determining the location of deadstock on open range is more challenging and may be contingent on terrain roughness, extent of tree cover, proximity to roadways, and frequency of livestock monitoring. These landscape characteristics also impact the ability to transport the carcass to a more secure location, as areas unreachable by pickup-truck or heavy machinery may make burial or removal impossible. In these areas cases, land managers should be aware of the presence of

attractants, and match their response to scale of risk. (meaning the proximity of the carcass to livestock), as it is critical that tools for carcass removal are practical for the location.

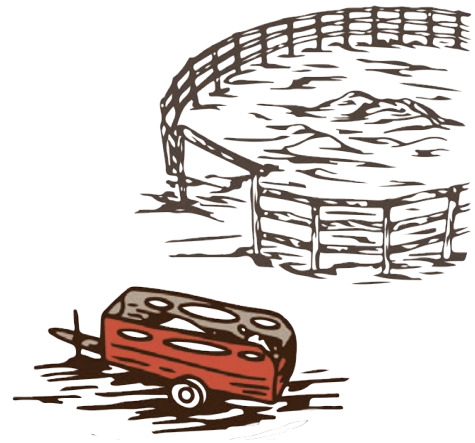
If feasible, moving a carcass from an area of high livestock use to an area of low livestock use can reduce the risk of conflict between livestock and scavengers. If accessible, a carcass on open range can be dragged away from areas of high livestock use (water or salt) to reduce the risk of conflict with livestock by increasing the distance between the carcass and livestock. In some situations, it may be easier to move the livestock away from the carcass instead of moving the carcass. This can be a temporary move to prevent conflict while grizzlies or wolves are actively scavenging to decrease the risk while the scavengers are present. Range riders can be helpful in finding carcasses, securing them using a temporary electrified mesh fence, and working with the livestock producer to determine next steps for the carcass, whether that is a depredation investigation, removal, or another action. Securing a carcass to prevent further scavenging allows for wildlife agencies to conduct a depredation investigation and increases the chance that the event can be confirmed as a depredation allowing for producer compensa-



tion in most states. If the area is too remote or if there is not capacity in the wildlife agencies to complete a depredation investigation in a timely manner, photographic documentation of the carcass and surrounding area is accepted by some wildlife agencies, and temporary mesh electrified fencing can be used if available. In some circumstances, no action may be necessary as the carcass is far enough away from livestock or structures where it would not be an added risk.

Together with securing fresh carcasses, it is also necessary to remove older bone piles that can act as attractants. In some situations where bone piles are not easily accessible or it is not feasible to remove them, burning of bone piles can reduce or remove the attraction.

It is important to remember that not all carcasses or bone piles need to be removed in all situations: the proximity of the carcass to livestock, homesteads, areas of high rates of travel by humans or livestock, recreation, and the operation as a whole must be considered. Carcasses located a distance from current livestock use may not increase the risk of conflict with livestock, and therefore carcasses that are in locations that do not increase risk of conflict with livestock (far from active livestock operations, open range pastures after livestock have been removed for the year) may not need to be removed. However, it is important to consider the presence of medication in the carcass and how those drugs could affect water quality and scavenging animals. In some situations, a carcass can be broken down to expedite scavenging and removal by birds, or dynamite can be used if the carcass is not accessible or is near recreational trails. In Montana, the USFS will assist in using dynamite as a carcass management tool in certain cases. In areas where recreation is common, there are serious human safety concerns with humans coming too close to scavenging grizzly bears. If carcasses will be left above-ground away from livestock, it is important to scatter carcasses randomly across the landscape to avoid creating an established feeding ground for scavengers. If this method of carcass management is implemented, it is important to be aware of where carcasses are placed and communication with neighboring operations is recommended to support communication surrounding large carnivore travel on the landscape. All dead livestock in areas where livestock will be wintered or calved-out should be removed year-round to keep wolves and grizzlies from becoming comfortable/or/spending time in valleys or near ranch facilities.



Temporary or permanent on-ranch facilities: If there is an off-site location available (composting facility, landfill or transfer station), it may only be necessary to store carcasses securely for a short period of time. In this case, dump trailers, enclosures with electrified fences, or other secure but temporary facilities may be used/pursued. While carcass management is most effective when organized at a landscape scale, in many circumstances livestock producers will not have access to adequate community resources. Under this circumstance, operations may consider more permanent secure on-ranch facilities to house, and/or compost carcasses.

The location of the dump trailer on the ranch for temporarily securing a carcass must be considered carefully to avoid attracting large carnivores to human infrastructure. Burying carcasses can be an appropriate method of carcass management, especially for areas without current grizzly bear populations. However, it is important to consider the depth of burial to prevent scavengers from returning to dig up the carcass, and local restrictions and conditions should be considered before burial. In the absence of a centralized carcass management facility, a landowner may work to establish their own carcass composting or management site on private land, for their own use and access.

Transportation: Often, the final destination of the carcass is a substantial distance from ranches. This requires either producer labor, time, and infrastructure to transport a carcass using a truck or a community-run carcass pickup program whereby a dump trailer or modified pickup truck with a winch and driver are on-call to pick up carcasses.

Transportation options depend on resources available and proximity to a community carcass management facility. While it is possible for producers to haul their own carcasses to landfill or composting sites,



some may not have the time or infrastructure/vehicles to make this possible. Community-run carcass pickup programs can help ease this burden. In some circumstances, a driver will be on-call solely during calving season for pickup. In other circumstances, a driver may respond to calls year round. If available a producer may haul carcasses to drop-off sites to ease the burden of hauling them long distances, often the biggest driver in the creation of multiple carcass collection or composting sites.

New Mexico, for example, requires a brand inspection prior to transporting the carcass, and it is important to be aware of similar regulations in other states.

Community Carcass Management Facility: In considering whether to construct a carcass composting facility, an inventory of community resources is an important first step. Established landfills and trash transfer sites may offer immediate opportunities for securing attractants. Where a carcass composting site is not established, or soon to be established, dump sites or transfer stations can offer immediate capacity to support community-scale carcass management programs. Though, these sites sometimes do not take carcasses, can be cost-prohibitive, or may not accommodate a community-run carcass transportation/pickup program that anonymously picks up and deposits deadstock. A carcass composting facility should be considered if ranches are not in close proximity to a landfill site, and for purposes of supporting community water quality, and streamlining program delivery. To aid this effort, the following section offers a list of information for supporting exploration and applications of carcass composting facilities. This list has been adapted from the Prairie City Oregon Composting Facility Operations and Maintenance Manual published by ODOT in December of 2019.

- **Permitting and Composting Plan:** Permits must be in place as required by the regulatory bodies, whether that be the Department of Environmental Quality (DEQ) or the local land use authorities. Often, the state department of transportation maintenance office can offer support through the permitting process. In some states, DEQ does not require a composting permit if you compost less than 20 tons of feedstock annually. Composting permits often include a thorough compost site and operation plan. This plan consists of a guidance document as well as additional documents including maps, property descriptions, site plans, and written descriptions of composting details or activities not provided in the operation plan.
- **Location:** The site should be located in a well-drained site with little to no slope, at least 300 feet from waterways and wetlands and not within a floodplain. While an isolated site is best, if near other residences, it is screened and obstructed from view with consideration of prevailing wind directions, though odor and scavengers can be significantly limited with best management practices.
- **Components and Construction:** Sites require a paved surface (asphalt, concrete, or compacted asphalt). Composting bins are most often constructed on top of the paved surface with walls made from Jersey barriers. The number of bins and size of paved surface will depend on the number of carcasses to be composted but four bins on a 50 ft. square pad (approx.) will be typical for small composting operations. Bin width is often 20x 20 ft, but should be at least twice the width of the blade or bucket on the equipment you'll be using. The site should be enclosed with proper fencing to exclude scavengers.

- **Bulking Agents:** Wood chips, straw, sawdust or compost can be used as a bulking agent, as each of these components has a high C:N ratio, and has a large enough particle size to allow for air flow, but not so large that it cools the pile. Sawdust can be eroded by wind, though placing wood chips on the exterior can help mitigate material loss.
- **Equipment required:** The following is material necessary for composting: Bulking material (finished compost, woodchips, sawdust, straw, or combination of materials);, tTall chain link fence with barbed wire top surrounding the facility;;, Llarge chain link gates;;, sStarter compost material;;, 3-4-foot probe thermometer;;, suSupply of water (. Wwhere there is no water access, a water tank with a hose set up so you can spray the pile and/or bulking material) is an option;;, lLoader, jJersey barrier (or equivalent) for constructing bins.;;, aAsphalt, or concrete, or asphalt grindings to make a hard base surface for the bins;;, lLatex or vinyl gloves for handling material; and cComposting logbook or log sheets to record composting data and activities.
- **Wildlife Disease Considerations:** In areas where Chronic Wasting Disease (CWD) is prevalent and carcass composting sites accept wild game carcasses, it is important to consider that the prions that cause CWD do not break down in the composting process. If a facility accepts wildlife carcasses in addition to livestock carcasses, the wildlife compost must be kept separate from the livestock compost, and the equipment used to tend the compost must be separate as well. For example, in Montana, it is required that wildlife carcasses be composted separately from livestock carcasses. Additionally, it is important to consider appropriate use of the finished compost product to prevent spread of CWD.

Step 4. Partnerships and Communication are key for Success

Producers involved in community carcass management facilities report that partnerships are vital and beneficial at many levels: they help keep the cost down, increase public acceptance and involvement which ties the community together, and keep producer interest and involvement in reducing landscape attractants is high. At the local level, place-based collaborative groups can play a crucial role in coordinating carcass management programs across communities. These groups engage with landowners through workshops and one-on-one meetings, and support mutually learning about conflict prevention techniques. They also offer technical assistance and cost-sharing programs to help alleviate the financial burden associated with implementing and maintaining these practices. Furthermore, place-based collaborative groups provide a structured platform for building trust and cooperation with state and federal agencies, as well as nonprofit organizations, which can offer additional technical and financial support for conflict prevention efforts.

Public acceptance and stakeholder involvement ties rural communities together, and nonprofits, state and federal agencies and universities can be important technical and funding partners. Trust, buy-in, and ongoing communication between landowners, neighbors, ranch employees, agency personnel, non-profit staff and funders are necessary for success. In the case of carcass drop off locations, producers often worry about the appearance of negligent husbandry if they are using the site frequently. Anonymous pick ups and drop offs can be an important way to increase producer use of the site, and maintaining trust and anonymity of producers is critical for success. Removing ear tags from livestock and adding wood panels to the sides of the dump trailer can improve anonymity.

Step 6. Adapt activities based on changing risks and opportunities

It is important to continually evaluate risk over space and time by monitoring livestock and predator use of the landscape including any seasonal changes in use or behavior, and effort to remove carcasses should increase proportional to depredation risk. Removing carcasses that are in close proximity to livestock prior to wolves recolonizing an area may help prevent wolves from coming into contact with livestock in the first place. It is important to recognize that changing range conditions or added disturbances may require altering or adding new goals to address. This may require shifting how, when and where practices are implemented for increased effectiveness. As risk increases the activities and intensity of conflict prevention effort should increase. In times of greater need, calving or severe weather for example, efforts to continually remove carcasses from the landscape and place them in a secure location increases. For example: due to weather conditions, access to remote locations, and timing of calving, it may be more useful to utilize a community carcass management site seasonally in the winter and spring.

To evaluate how risk changes over time, consider predator population density, the annual life cycle of wildlife, including the nutritional needs of predators and abundance of prey, the production cycle of livestock, and how these cycles overlap. Match the incorporation of risk management activities with times of greatest predator activity and food needs, livestock vulnerability and carcass availability/presence on the landscape, among other factors.

Additionally, those who participate and manage conflict management programs should seek to streamline the phases of carcass management for participants. Whether resources are lacking to secure carcasses, trust has not yet been established with a carcass pickup driver, or producers lack time or resources to drop off at a centralized location, the community or individuals participating can work to address barriers in implementation. In some circumstances, lack of knowledge of a carcass management program can be a significant barrier to wide-spread community adoption. Place-based groups such as stockgrowers groups, or landowner led collaboratives can offer an important medium for sharing information on carcass management programs.



Step 5. Integrate emerging strategies and complementary technology

Practitioners and producers with experience running carcass management programs stress the importance of knowledge sharing and communication with other program managers to support constant learning and refinement. This exchange of knowledge in the past has supported producers and producer groups in innovating both the process of carcass management and some of components that can lead to a successful and streamlined program. For example, carcass composting sites in Iowa and Minnesota have employed a natural enzyme called Boost that can significantly expedite the carcass decomposition process, an enzyme that is now being evaluated for use by a number of composting sites in the West. In Southwestern Montana, a producer is working with a conflict reduction specialist to innovate carcass composting storage containers that can be placed throughout communities to reduce drive times. Managers and producers may also think about complementary tools to support an emerging, or established program. While Range riding is not an innovation, employing riders in the same landscape supported by carcass management programs can assist land managers by alerting them to the presence of carcasses and carrying temporary fencing to prevent further scavenging prior to agency investigation and/or removing the carcass.



Road Kill & Conflict Reduction

Carcass Composting in Prairie City, Oregon

Know your context: Prairie City sits in the center of the pastured, peak rimmed John Day Valley. As a high desert ranching and timber harvest community, with increasing recreation and expanding predator populations, the City together with the Oregon Department of Transportation (ODOT) started a carcass composting site to maintain values important to the community.

Identify your goals: Prairie City's program has two purposes: reducing wildlife-vehicle collisions and minimizing wolf-livestock conflicts. The community depends on tourism, notably an influx of cyclists to the region's open places and wild spaces in the warmer months.

"We teamed up with the Oregon Department of Transportation to dispose of the carcasses caused by vehicle strikes on the highway", shared Chris Camarena, the site manager. "We are three hours from everywhere in this valley, but Highway 26 is a main corridor for cyclists, motorcyclists and tourist travel."

Wildlife carcasses are seen as problematic to the aesthetic value of the roadways. Through removing and composting carcasses from highways, vehicle

collisions with scavengers such as coyotes, black bears and raptors were significantly reduced.

Managers of this program see opportunities to expand the use of this facility to address an increasing concern in the region: wolf-livestock conflicts. As wolves expand in population, managers see an opportunity to expand the utility of the composting site for use by livestock producers seeking to secure attractants and reduce conflicts.

Context-Specific Implementation: The site, a 200' by 200' concrete pad enclosed with a chain link fence topped with barbed wire to deter wildlife, is located outside of city limits on county land at the wastewater treatment plant. It is well-drained with minimal slope, is over 300 feet from waterways and wetlands, and 100 feet away from the property boundary.

The composting substrate is made up of finished compost, wood chips, sawdust, straw or a combination of these materials, and the cells are separated by Jersey barriers. Materials required to run the site include a hay probe to monitor temperature and moisture content, water to prevent combustion delivered through a garden hose hooked up to a ten

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thousand gallon water tank, and a front-end loader to place carcasses and mix the compost.

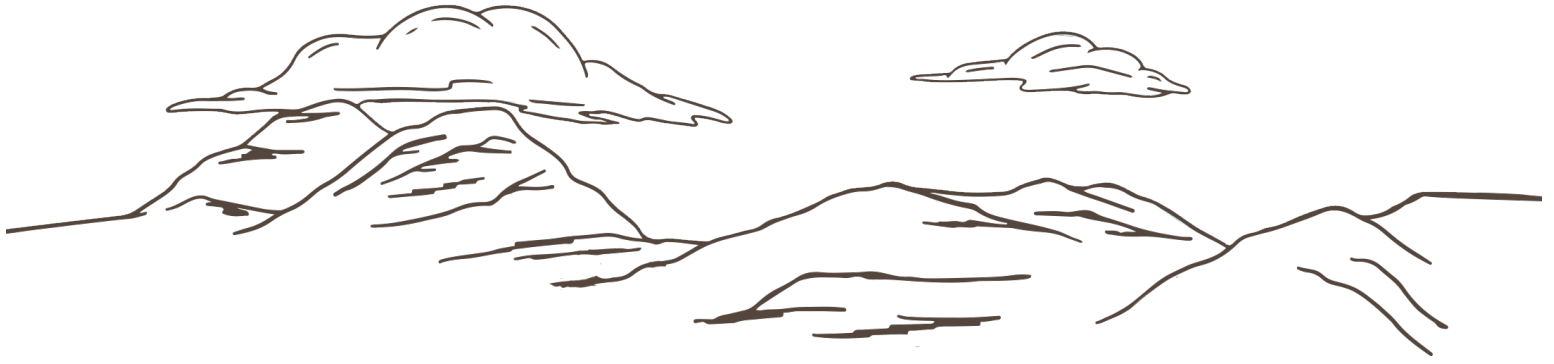
“365 days a year,” the manager explains, “a city employee monitors and logs the temperature and moisture of the compost. Every carcass that is dropped off is recorded. The employee will irrigate the compost if the internal temperature is above 140 to prevent fire from spontaneous combustion. The frequency of turning the piles is determined by appearance of the compost and internal temperature”.

Communicate for Success: Initially funded by ODOT, and now used by the Oregon Department of Fish and Wildlife, ODOT, and the city of Prairie City, the site has strengthened inter-agency partnerships. “We have to promote working together: I support teamwork and partnerships, and I make it visible,” said Camarena. “I like to say we ‘fly the flag to promote partnerships’ every chance we get. This project would not have been possible without partnerships and they are how we will sustain into the future.”

Integrate emerging strategies and complementary technologies: The site is the first carcass composting facility in Oregon that is a collaborative effort with agencies to manage wildlife carcasses and to accommodate livestock carcasses. In order to reduce any potential spread of wildlife disease, composting is done on-site. This prevents the risk of spreading CWD (not yet detected in Oregon). This is one of the primary benefits according to ODFW: Potential pathogens from roadkill wildlife are contained, regulated, and composted.

Continue to assess risk, evaluate outcomes and adapt activities: As wolves increase in population in central Oregon, Camarena and other associated agencies are focussing efforts to make the site and carcass pickup program more producer friendly. While the site does not offer opportunities for carcass pickup, there is no fee for dropping off livestock carcasses. As demand increases the site has expanded from 6 to 8 cells, and partners are evaluating whether to offer carcass pickup opportunities in the future.





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CARCASS MANAGEMENT Producer Tool Kit



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