

Preventing Predation of Livestock— Livestock Management for Coexistence with Large Carnivores

BY MATT BARNES

From both ranching and conservation perspectives, livestock predation by large carnivores has traditionally been seen as a problem with the carnivores as its cause. For instance, much of the work done to reduce livestock-carnivore conflict has focused on keeping carnivores physically separated from humans and livestock, and on developing tools to manage the carnivores. A more holistic view is that carnivores are an inherent and valuable part of the system, some livestock predation is inevitable, and the root cause of excessive livestock predation is that conventional management has made livestock easier than wild prey for predators.

The weak link in carnivore conservation is lack of human tolerance, and the weak link in tolerance may well be conflicts with livestock. Habitat includes both the resources (for carnivores, prey) and the *conditions* for a species' persistence. In the Northern Rockies, the large national parks and wilderness areas are relatively secure but insufficient habitat for large carnivores such as grizzly bears, wolves, and cougars. The working landscapes between these protected areas support prey animals, but may or may not be *available* habitat for carnivores, depending on human activities and tolerance. Although livestock-carnivore conflicts are a relatively minor source of livestock mortality overall, they can be locally significant, and they are a major concern for ranchers in the region, a major source of carnivore mortality, and of social polarization. Future gains in carnivore conservation will be largely on working landscapes.

We at Keystone Conservation believe that developing human tolerance for carnivores includes preventing or mitigating livestock depredations, and ideally occurs in the context of building both social and ecological resilience. This includes the ranching and broader conservation communities collaborating to improve rangeland health—the proper functioning of ecological processes—and thus the capacity of the land to produce biological diversity and ecosystem services, including forage for both wildlife and livestock. Ranchers generally seek a rural quality of life, with land-based livestock production. These utilitarian goals generally align with conservation goals, as they both rely on the same future resource base.

Overall, most carnivores are opportunistic, and most bears, wolves, and cougars remain focused on wild prey, even when livestock are nearby. But some individual predators do switch their focus to livestock, and if they do they are usually lethally controlled. Non-targeted lethal control is often ineffective at reducing livestock losses, because removal of individuals not focused on livestock opens up a place for other individuals that may be or become focused on livestock. We cannot expect to eliminate all depredations by preventing predators from switching from wild prey to livestock, but we may be able to keep them to a lower, opportunistic level.

The progressive livestock management practices often adopted by Holistic Management practitioners, especially planned grazing and herding with low-stress livestock handling, are partly based on the patterns of wild ungulate herds in the presence of their predators, and are an effort to partner with nature. These practices can improve rangeland health, livestock production, and ranch profitability. *Because these practices are based on predator-prey relationships, ranchers can also use them to coexist with native carnivores.*

Livestock Management Key

Conservation that recognizes humans as part of nature will be more effective, as human decisions now affect all ecosystems. Protectionist conservation strategies, which generally separate humans from the rest of nature, are necessary, but are insufficient to build resilience in social-ecological systems or foster harmonious coexistence between humans and wildlife. As a sub-field within wildlife conservation, coexistence is inherently bottom-up, practical, and collaborative, rather than top-down and regulatory; yet has emphasized approaches that keep carnivores physically separated from humans and livestock. Coexistence practitioners can become more effective by shifting their focus from the wild to the domestic animals—which



Electrified fladry is designed to deter wolves, but can also be used to contain cattle in temporary paddocks. Fladry works best for small areas and short times such as calving season. This calf was born in a fladry paddock on a summer grazing allotment.

are much more manageable.

In addition to an expansion of focus from carnivores to livestock, effective coexistence requires a parallel expansion from a focus on technological tools to developing management contexts in which those tools can be used more effectively. The most important tools are those that can be applied creatively and adaptively, and that can establish the context in which livestock-carnivore interactions occur and reduce the probability of interactions leading to depredations. For example, range riders or herders and livestock guarding animals are “tools” with inherent adaptability, but their effectiveness depends on the context in which they work.

None of the tools are very effective when livestock are scattered over large areas. Neither riders nor guarding animals can prevent isolated or distant animals from encountering or being killed by predators. Technological tools (e.g., fladry, light and noise devices) need to be in close association with the livestock, and as such are rarely used on extensively managed rangelands. Grazing at high stocking density creates a context in which all of the other tools can be used, by reducing the spatial scale at any one time to a manageable level.

Two weak links in terms of livestock vulnerability to predation can be identified in the seasonal cycle of livestock production in the Northern Rockies. Wolf predation of livestock

peaks during the summer when livestock are most spread out; and in some areas during calving season. These can be addressed with strategic management of grazing and breeding cycles.

Planned Grazing and Carnivores

On most of the world's rangelands outside of North America, fences are relatively rare, and livestock are herded daily. Nomadic and transhumant herders often camp with or near their livestock, while more sedentary livestock operations often involve returning the animals to the relative safety of the village at night. In Africa, where livestock cultures evolved with large carnivores, livestock are night-penned in kraals (corrals) intended to protect the livestock from lions and other predators; some of these kraals are mobile.

Grazing management that involves bunching livestock into a single cohesive herd, keeping that herd in a limited portion of the landscape at any one time and moving the herd across the landscape over time, rather than scattering the animals across the entire landscape, has the potential not only to improve land health and grazing capacity by changing diet selection patterns, but also to facilitate natural anti-predator behaviors such as herding-up and standing ground. The link between grazing management and anti-predator behavior has been suggested by Holistic Management practitioners, but has never been tested scientifically.

The herd almost certainly evolved in response to predation pressure; a predator is less likely to find prey when prey animals are grouped, and an individual reduces its chances of being taken when it is in a group. Large herds must move around the landscape to seek fresh forage and avoid fouled areas, and probably also to escape predators. Wild herds

such as bison are commonly thought to have massed in huge, dense herds. But the observations of the nineteenth-century buffalo hunters suggest a more nuanced picture: animals would spread out in smaller family groups in the absence of predators, but would form the large, dense herds under predation pressure.

Native Americans have called cattle "slow elk." This is somewhat ironic, because the deer family, not the cattle family, is the primary prey of North American large carnivores. For example, elk are most vulnerable to wolves when either isolated or running—and when cattle behave similarly, they are more likely to be killed. Generally, large carnivores are much less successful at killing bison than they are at killing elk or deer. Bison usually stand their ground in a tight herd, often with their calves in the middle. The natural behavior of cattle is probably more like that of bison, to which they are closely related and roughly similar in size.

However, livestock producers have generally bred and trained animals not to behave this way, largely unintentionally. This happens in many ways, including scattering animals across large areas, general handling stress, and only gathering animals into a herd for occasional husbandry practices. This negative reinforcement essentially teaches the animals to avoid bunching and pairing—the very behaviors that would protect them. Modern

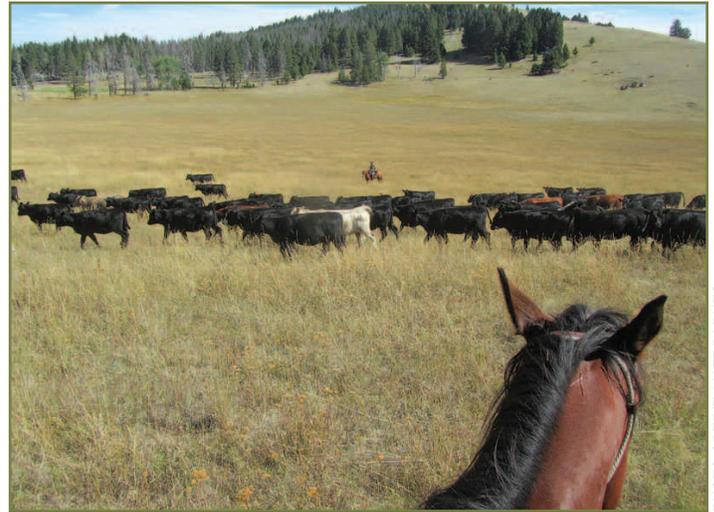


PHOTO CREDIT: MATT BARNES

Range riders herding using low-stress livestock handling to re-ignite the herd instinct, increase stock density, manage grazing distribution, and reduce vulnerability to predation.

cattle, in a behavioral sense, have indeed become "slow elk."

Livestock are most vulnerable to predation when scattered over large areas. Scattered individuals are more likely to run from predators, increasing their vulnerability. Intensifying grazing management such that livestock are bunched into a single cohesive herd, keeping that herd in a limited portion of the landscape at any one time, and moving the herd across the landscape over time—e.g., planned grazing—has the potential to reduce predation losses through safety in numbers. High stock density maximizes the probability that the entire herd will be alert to the presence of a predator, and facilitates anti-predator behavior such as standing ground and defending young. Individuals naive to predators may not exhibit these behaviors, but a dense and socially cohesive herd facilitates group learning. And in some cases, well-timed pasture movements within a grazing season can reduce the livestock-carnivore encounter rate by

reducing in the spatial overlap between livestock and wild prey, and by avoidance of seasonally high-risk areas, such as den and rendezvous sites.

There are many means to an end. The *management practice* of planned grazing, the overall strategy for affecting soil-plant-herbivore-carnivore interactions, is of primary importance. This management can be accomplished to varying degrees with *facilitating practices*: cross-fencing for planned grazing, and herding using low-



PHOTO CREDIT: MATT BARNES

Prior to herding, these cattle scattered themselves in small bunches, potentially vulnerable to predation. Riders used low-stress livestock handling to rekindle the herd instinct. This photo of cattle voluntarily remaining at high stock density was taken 24 hours after the riders stopped herding.

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stress livestock handling methods, as well as strategic placement of supplements and rotating access to water sources. These are means to an end, and to be effective, must be used creatively and adaptively, based on ecological and behavioral processes.

Synchronizing Breeding Cycles

The most vulnerable stage in the life cycle of both wild and domestic ungulates is young-of-the-year, especially the very young. Wild herbivores generally employ a strategy of predator satiation through synchronized birthing seasons, which maximize the adults' collective defense of young, and produce many more young than predators can kill—maximizing the proportion of young that grow beyond the most vulnerable age. Shortening livestock calving seasons may reduce the likelihood of predators switching their focus from wildlife to livestock. The timing of calving may affect predation, but also depends on other factors.

Many ranchers may have the ability to calve in low elevations where large carnivores are still uncommon, or where livestock can be kept on feed in small pastures close to ranch headquarters. This may only be practical with winter to early spring calving for ranchers who use higher elevation rangelands with higher carnivore density beginning in late spring to early summer. Winter calving may reduce losses to bears, which typically emerge from hibernation in March and April.

However, where large carnivores cannot be seasonally avoided, calving at the same time as wild ungulates in late spring (green-grass calving) may reduce losses. When the calving seasons are distinct and consecutive, predators can focus on livestock from the onset of calving to late spring, and then switch to wild calves and fawns. If all wild and domestic calves are born simultaneously, predators are more

likely to remain focused on wild ones.

For cattle, green-grass calving contributes to a shorter calving season, and more efficient use of forage in general, because it matches the physiological cycle of the cow to the forage cycle of the range. When these cycles are matched, cows are in better condition all year, come into first postpartum estrus sooner, and are more likely to breed successfully on the first attempt, allowing for a shorter breeding season and therefore a shorter calving season.

These factors may translate into significantly higher profits for green-grass calving. Later-born calves are younger at weaning, but tend to grow faster than their winter- or early-spring-born counterparts, so that they are not that much smaller by fall weaning time. Because the forage and cattle cycles are better matched, and because the calves are smaller, late calving allows more total cows and calves on the same forage base, and less winter feeding cost. More, smaller calves are more profitable than fewer, larger calves if the total weight of weaned calves is similar.

Ultimately, ranchers can apply many of the same management approaches that work for land health and livestock production to prevent conflicts with large carnivores. Livestock management, specifically holistic planned grazing, herding with low-stress livestock handling, and synchronized calving, can directly and synergistically reduce predation, while establishing a management context in which other predation-prevention practices and tools can be used more effectively. 🌱

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