Livestock and Snow Leopards: making room for competing users on the Tibetian Plateau

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As the world's highest contiguous region, the Tibetan Plateau is also one of its major rangeland ecosystems and a significant pastoral region for China. Since the Plateau is mostly too high for crop production, animal husbandry is the only possible agricultural production strategy and the majority of inhabitants are largely dependent upon livestock for their livelihood. In addition, the vast 2.5 million km² area supports an exceptional wild fauna, including a wide variety of ungulates from kiang (*Equus or Asinus kiang*), musk deer (*Moschus safanicus and M. chrysogaster)*, red deer (*Cervus elaphus)*, white-lipped deer (*C. albirostris*), wild yak (*Bos or Poephagus mutus*), Tibetan gazelle (*Procapra piticaudata*), Tibetan antelope (*Pantholops hodgsoni*), to blue sheep *(Pseudois nayaur)* and argali (*Ovis ammon hodgsoni*). Many of these species, especially blue sheep, are important prey for snow leopards (*Uncia uncia)* (Jackson and Ahlborn 1984, Schaller 1977). Small mammals, such as marmots (*Marmota* spp.), wooly hare (*Lepus oiostolus*) and pika (*Ochotona* spp.) provide valuable supplementary prey for snow leopards (Schaller et al. 1988).

Modernization, along with its improved access to services and markets, and the implementation of the "household responsibility system", are bringing significant changes to range-livestock production systems (Miller et al. 1992). Growing demand for livestock products exerts increasing pressure upon the Plateau's resources. Snow leopards and wolves are blamed for killing livestock, while some herdsmen and agricultural officials claim marmots and pikas deplete the forage base for livestock.

As a wide-ranging species with a relatively low density, large areas are needed to support even a few snow leopards. In Nepal, for example, Jackson and Ahlborn (1991) reported that as much as 65% of the country's snow leopard population may live outside the boundaries of its eight protected areas, which amount to about five percent of its total land area. Since snow leopards avoid open plains, many parts of the Plateau offer marginal habitat for this endangered species. With only three protected areas (Namcha Barwa Reserve and Qomolangma Nature Preserve in southern Tibet and the vast Chang Tang Reserve in northwestern Tibet), there is an urgent need to ensure the rest of the Plateau is developed in environmentally sound ways. Land-use and management practices permitting snow leopards to survive outside protected areas (albeit at low densities) may be essential in promoting viable populations. This will necessitate sustainable land management practices that meet people's needs as well as those of wildlife.

IMPORTANCE OF LIVESTOCK AND EFFECT OF RECENT AGRICULTURAL REFORMS

Pastoralism has been the prevalent land-use of the Tibetan Plateau for almost two thousand years and continues to thrive. Goldstein and Beall (1990) note that "Tibet's nomads represent one of the last great examples of the nomadic pastoral way of life once common in many regions of the world." Survival of Tibetan pastoralism indicates that the indigenous practices of animal selection, livestock management and grazing systems developed centuries ago are well-adapted strategies for converting forage from high-altitude, semiarid rangelands to milk, fiber and meat. There are approximately 40 million sheep and goats and 12 million yaks on the Plateau. While yaks epitomize Tibetan pastoralism, sheep are the most important economically in providing wool, milk, meat and hides. Despite the long history and importance of this range-livestock, ecosystem dynamics and the pastoralist's livestock production strategies are still poorly understood by development planners and range scientists.

In the last three decades, several factors have led to an intensification of livestock production. With the implementation of collectivization in the late 1950s and early 1960s, livestock ownership and the production decision-making process was transferred from the household to communes, and traditional systems of rangeland management that prevented overgrazing were abandoned (Clarke 1988, Ekvall 1968, Goldstein et al. 1990). Agricultural reforms introduced in the early 1980s eliminated the commune system, with individual households once again becoming the basic unit of livestock production in pastoral areas.

At the level of the individual pastoralist, the recent reforms and opening up of a market system have led to privatization of rangelands, increases in livestock numbers and productivity, and a corresponding rise in income for some herders (Shen 1991). There are many reports of rangeland degradation brought about through overstocking (Li 1990), but this has not occurred everywhere (Goldstein et al. 1990). Rangeland deterioration is most pronounced near settlements (Jackson 1992, Miller et al., 1992). Overstocking occurs due to several factors: (i) income opportunities for herders; (ii) limited private rangeland holdings; and (iii) enhanced herd survival due to improved veterinary services and livestock management. While herders have appreciated the need for supplemental winter feeding to see their herds

through severe winters, they still largely rely on rangelands for year-long grazing. The herders' reluctance to limit herds to what they know is the carrying capacity of the rangeland has resulted in cases of rangeland deterioration where privatization has taken over. The previous ecological balance, where livestock numbers were regulated by forage availability and the effects of disease, winter storms and drought, has been upset wherever such transitions to a market economy have taken root. Excessive profit motivation and the discontinuation of traditional range management practices are not conducive to sustainable use of these fragile rangelands.

According to the World Bank (1987), the share of the livestock sector in gross value of agricultural output in China is projected to rise from the present 15 percent to 25 percent by the year 2000. Ambitious targets have also been established for livestock production as a part of the government's efforts to boost meat consumption. The extensive grazing lands on the Tibetan Plateau are viewed as a potential source for meeting much of the large incremental meat and wool needs of future years.

SNOW LEOPARDS AND LIVESTOCK

The rapidly expanding human population, with its ever increasing demand for meat products, has already negatively affected wildlife populations on the Plateau. Wild ungulates, once numerous and widespread, have been reduced in abundance with the introduction of roads and meat hunting (Cai et al. 1990, Jackson 1991, Schaller et al. 1991). Pikas and marmots, thought to compete with livestock for grass, have been exterminated through rodent control programs. Herders are taking livestock farther into remote mountainous regions in search of grazing land, thereby causing increased disturbance to wildlife, competition for forage and degradation of habitat. This trend is expected to continue if action is not taken soon to control livestock numbers and to better manage range resources in important wildlife areas.

Livestock predation brings wildlife most visibly into conflict with pastoralists and government officials. Although wolves tend to be more significant predators of livestock, snow leopards exemplify the difficulty of equitably resolving this contentious issue. Snow leopards are listed as an endangered species. Given their extraordinary beauty and the aura of mystery, snow leopards command worldwide attention. Thus, conservationists in the developed world may find it difficult to sympathize with a herder who has killed one in defense of his livestock. While there is no easy solution, there are options available to us for alleviating such people-wildlife conflict.

It is very difficult to obtain reliable statistics on livestock depredation, for many herdsmen include losses resulting from disease, accident or other factors in that attributed to predators. Not surprisingly, snow leopards kill small ruminants like goats and sheep more frequently than large-bodied livestock like yaks. The annual loss of livestock to settlements of Tibet's Qomolangma Nature Preserve may range from none to as much as 9.5 percent of the herd in some "hotspots", but probably averages more like two percent or less (Jackson et al., 1992). While these losses are usually associated with on-going, sporadic and isolated events, many herders will recall the exceptional case in which dozens of animals are killed in a single night. For example, 107 sheep were lost near the Rongbuk Monastery in the Qomolangma Nature Preserve when a snow leopard entered a poorly constructed night-time enclosure in October, 1988 (Jackson 1991).

Although depredation patterns vary according to locality, habitat, predator species, and livestock herding patterns, most losses seem to occur in winter or in spring when livestock are weak or giving birth. While loss to snow leopards on the open plains is very rare, it is more common in hilly terrain broken with cliffs and rock outcrops. Apparently more animals are killed on the open pasture than in the safety of villages or encampments. Typically, they fall victim to a snow leopard hiding amongst the rocks, or after they have wandered away from the herd and become lost. Losses of sheep and goats are likely to be high when allowed to roam freely without a human guard. Shepherds are particularly vigilant when livestock are being grazed in known "depredation hotspots". Since snow leopards, lynx and wolves are more abundant in minimally disturbed areas, it is hardly surprising that pastoralists using pastures located in sparsely populated and remote regions suffer the most.

The availability of native prey may help prevent some loss of livestock. Schaller et al. (1988) reported that marmots are an important prey item for snow leopard inhabiting parts of Qinghai Province, along the northeastern edge of the Plateau. Here, marmots were found to comprise nearly half of the leopard's diet during the six months of the year that they were available. Thus, programs aimed at reducing marmot populations may inadvertently promote loss of livestock to wild predators instead. Livestock

losses appear to be greater in areas where blue sheep populations have been depleted. Depletion of prey has also been cited as a factor contributing to increased depredation in Mongolia (Schaller et al. 1992).

Until recently, authorities in many districts of the Tibet Autonomous Region operated predator control programs in which herders and farmers were offered cash for wolf (*Canis lupus*), red fox (*Vulpes vulpes*), lynx (*Lynx lynx*), and snow leopard pelts. Ammunition was distributed free or at heavily subsidized rates. Funding for the program accrued in part from the sales of raw or tanned furs for the manufacture of fox hats and snow leopard fur coats. The numbers of predators taken is indicated by pelt tallies for the last year of Shigatse Prefecture's (Tibetan Autonomous Region) predator control program, which operated in over 18 counties (160,000 km^2): 310 wolf, about 400 red fox, and 235 pelts from such animals as lynx, snow leopard, and even marmot (Jackson, unpubl. data). Shigatse's bounty program was recently terminated due to a decline in the number of furs, increased concern over endangered species, and because people were increasingly disposing of their wildlife products through the black market. One official estimated that less than 30 percent of the pelts were being turned over to the bureau managing the program. He noted that people would sell a fox pelt for 150 yuan on the free market, nearly three times the government rate. Similarly, the government paid only 20 yuan (US $3.83) for a wolf pelt, which can bring up to 100 yuan (ca. $20) on the open market. The bones of a snow leopard, used in traditional Chinese medicine, may bring more than US $300 on the black market (Jackson et al. 1992). The Tibetan Autonomous Region is reported to be enacting legislation to control hunting and the sale of furs and other wildlife parts.

The reduction or elimination of predators appears to have been accompanied by an increase in populations of pika and possibly also marmot. The agriculture bureau in Shigatse operates a pika poisoning program on approximately 360,000 ha of rangeland. Several officials, however, believe it has failed to remedy the problem. Recovery of predator populations could help restore the Tibetan Plateau's ecological balance and insure perpetuation of its full and unique complement of species.

OPPORTUNITIES FOR INTEGRATING WILDLIFE CONSERVATION AND LIVESTOCK DEVELOPMENT

Wildlife, livestock and pastoralists have coexisted on the Tibetan Plateau for thousands of years, producing complex interactions and relationships. The fact that viable pastoral cultures and wildlife remain to this day bears witness to the remarkable diversity and resilience of this highly unique ecosystem, as well as the sustainability of its resources if wisely used.

The best opportunity for integrating wildlife conservation with range-livestock development centers about the multiple-use concept, since wildlife is generally of secondary consideration on most rangelands (Figure 1). Multiple-use management practices, which require that an area be managed for both livestock and wildlife can help ensure viable populations of snow leopards, their prey and sustainable livestock use of rangelands on the Plateau. Managers employing this approach integrate wildlife management into the primary land-use schemes devoted to producing food, fiber and energy (Child et al. 1984). Wildlife and livestock grazing can co-exist well (Heady 1986) if grazing is regulated through proper management practices, usually by controlling the number of livestock allowed to graze a particular area, as well as the season and duration of grazing. Some North American range managers even feel that livestock can be used, when properly managed, as a tool to enhance some wildlife habitats (USDA 1990).

Maintaining healthy snow leopard populations requires that their prey species are well managed too. Wild ungulates, especially blue sheep, are an important prey item for snow leopard, although small rodents also constitute food in many areas, thereby helping to minimizing predation upon livestock. Studies to determine the distribution, status, and habitat requirements of the snow leopard and its major prey species are pre-conditions to establishing multiple-use management programs. Information is needed on numbers of animals, population trends, daily movements and seasonal migrations, size of home range, grazing behavior, food habits, forage requirements, and competition with livestock for forage. Greater knowledge of range ecology and livestock production practices is also an important prerequisite to developing effective wildlife management actions and policies.

Snow leopard status and distribution can be delineated by a combination of methods, from wide-ranging interviews of pastoralists and standardized field surveys in key areas, to detailed scientific studies by China's research institutions, aided by outside scientists knowledgeable on snow leopard and their prey. Prey species should be carefully censused within representative areas or significant habitats and the results extrapolated to other sites meeting established criteria. The resulting information can be used to identify

key snow leopard areas. Such data would be most useful in assessing the adequacy of the existing protected areas network, identifying new areas to fill gaps, and in developing intensive management programs for areas where conflicts with wildlife are occurring.

PRODUCTION AREAS	*PROTECTED AREAS*
Agricultural areas (Intensive Management)	Parks & Nature Reserves

FIGURE 1. A Resource Triad Land-use Planning Strategy for Integrating Livestock Development and Wildlife Conservation

Wildlife - livestock relationships are complex, and integrated management requires decisions as to which species and how many of each should be maintained in a particular area (Heady 1986). When wild ungulates and livestock are part of the same range ecosystem, management has to provide and maintain suitable habitat for both (Cook 1987). The major ecological principles involved in multiple-use grazing management are competition, carrying capacity, niche, plant-succession, diversity and stability (Teer 1986). In determining carrying capacity for example, wildlife needs must be considered along with those of livestock which represent the primary consumers of forage on most rangelands.

The botanical composition of major herbivore species' diet and its relationship to forage availability are important factors in establishing proper animal stocking levels for a given pasture (Kryst et al. 1984). Dietary information is essential to assess the role of the animals in the ecosystem: by identifying key forage plant species, the range manager establishes which plants should be emphasized in management practices. Food habit information is required to develop habitat management plans for wildlife, so that forage can be properly allocated (Cooperrider 1982).

Obtaining an understanding of range ecology in key snow leopard areas will require vegetation investigations to establish species composition, productivity, range condition and to estimate the carrying capacity for both wild ungulates and livestock. One of the purposes of these vegetation assessments should be to characterize and map the landscape in terms of the plant communities it supports. Given the ruggedness and remoteness of the snow leopard's habitat, remote sensing should be considered when classifying and mapping vegetation over large areas. Geographic Information Systems (GIS) software and personal computers could be used to compile spatial information on vegetation and wildlife habitat (Maguire et al. 1991). We have found, for example, that Large Format Camera photographs (which can be enlarged to a scale of 1:100,000) provide fairly inexpensive images useful to initially identify potential snow leopard or prey habitat. Landsat Thematic Mapper remotely sensed images, although expensive, have proven successful for identifying sedge meadow communities, an important habitat of the wild yak in the Wild Yak Valley of Qinghai Province. These could prove useful for identifying and classifying habitat of key snow leopard prey species such as blue sheep and argali (Miller unpubl. data).

Range managers need to develop a basic understanding of factors determining current vegetational composition, growth characteristics and forage values for ranges in different localities. Only then can the existing and potential productivity of each rangeland type be properly established, and an effective management plan developed for its sustainable use. The widespread lack of baseline data on forage resources is a major obstacle to managing prey species and livestock in areas of range overlap. Because livestock often occupy the same habitat, it is important to inventory and study livestock and their use of range resources. Managers should have information on livestock population trends, movements, grazing behavior and food habits, as well as herd parameters such as calving and lambing rates, female fertility, mortality rates, sex and age structure, and livestock product statistics. Goldschmidt (1981) felt that managers should examine how herd structure differs from the pastoralist's concept of an ideal herd, so that their decision-making process can be better appreciated.

Wildlife conservation cannot be considered without including the aspirations of the local people living in area: communities sharing the land must benefit from the presence of wildlife. To this end, we need to understand the long-term goals and daily needs of pastoralists. Successful development strategies and management plans are those which are socially and economically appropriate, as well as ecologically sensitive. The welfare of wildlife depends greatly upon attitudes of local people, and as many pastoralists

as possible must be involved in decision-making and empowered in resource management if conservation programs are to succeed over the long-haul. Therefore, wildlife management plans have to be carefully integrated with local conditions in order to sustain the economy of pastoral communities.

Depredation by snow leopards and other predators must be controlled and appropriate management strategies developed to reduce the economic impact of such loss. Failure to address loss of livestock may increase hunting pressures on snow leopard and lead to considerable local hostility toward the species (Oli 1992). Possible remedial actions range from the least desirable options of predator control or compensating each family for each loss incurred, to more sustainable strategies of improved daytime guarding and secure night-time corralling, as well as the protection of blue sheep, gazelle, marmot, and other natural prey populations (Table 1).

TABLE 1. Options for Reducing Livestock Predation by Snow Leopards and Other Wild Predators

* Conduct baseline surveys to identify key factors and depredation "hotspots"
* Avoid or minimize grazing in known "hotspots"
* Corral animals at night in secure enclosures
* Avoid leaving small-bodied and vulnerable livestock unattended on the open range
* Use dogs or better trained herders to guard herds
* Ensure lambing occurs within confinement
* Permit predator to complete its meal so that it doesn't have to kill immediately again
* Protect key prey species, including rodents
* Issue "one-time only" depredation permit to qualified herders
* Monetary compensation (cases of proven hardship)
* Compensate affected families with needed services (veterinary care, skills training, schools and other community services)
* Promote alternative forms of income in or near protected areas (e.g., tourism, commercial trading, jobs)

The North American experience with the coyote has clearly demonstrated that depredation cannot be entirely eliminated, even if stringent predator control programs are implemented. One approach would involve issuing a "one-time only" depredation permit to herders experiencing significant loss of livestock. However, it is very difficult to identify or track down the actual individual or individuals doing most of the damage. If implemented, predator control programs should only be directed at controlling populations of predators that are not listed as threatened or endangered species. Obviously, control programs are inappropriate in or near a boundary of a park or other protected area. An alternative strategy for key wildlife areas which are not in the protected areas network, would be to promote alternative sources of income generation, such as tourism and properly controlled trophy hunting programs.

Information is urgently needed to establish the extent of loss, identify the species responsible, determine which factors contribute most to depredation events, and to map depredation "hotspots". Such data must be gathered using consistent procedures and criteria (Jackson 1991, Wade and Bowns 1980).

It may be possible to provide alternative pastures within protected area buffer zones, so that herders can avoid grazing their animals in high-risk places (at least during seasons of most loss). Herding of sheep and goats by children should be avoided in known depredation "hotspots", since they tend to be far less vigilant than adults. The use of guard dogs has proved especially effective in deterring predation on many U.S. rangelands, and could also possibly be employed on the Tibetan Plateau. Tibetan mastiffs, the most common local breed, are used to guard night-time enclosures, but lack skills for daytime herding or guarding. Available data suggests that more sheep and goats are lost while foraging on the open range during the daytime than from night-time livestock enclosures. The latter loss occurs largely because animals are either not corralled at night, or because the enclosures are poorly built and therefore not

predator-proof. Pastoralists need to avoid leaving other predator-prone stock such as horses, juvenile yaks and cattle unattended in pastures, especially overnight.

The protection and enhancement of the snow leopard's natural prey base, including blue sheep, musk deer, marmot, and Tibetan snowcock populations, is equally important. This will require regulating livestock numbers and disturbance in important wildlife areas, such as lambing sites for Tibetan argali and blue sheep. To avoid habitat degradation by livestock the range resources need to be monitored. Permanent monitoring plans could generate data bases helpful to distinguishing between annual changes due to precipitation and long-term trends due to overstocking.

Changes in livestock production and rangeland condition need to be among the factors monitored. When monitoring detects stocking-rate induced declines in livestock productivity or range condition, or increases in soil erosion, measures must be taken to conserve the range resources pastoralists and wildlife depend upon. Rangeland degradation usually occurs when livestock is concentrated so that forage becomes the limiting factor in livestock production (Bartels et al. 1991). As a remedy, these authors suggest that it might be easier to assist some herders to leave a degrading area or enter into other income-generating opportunities, than trying to persuade all herders in the area to reduce their herd sizes. Efforts to avoid degrading concentrations of livestock might focus on managing household density, rather than controlling livestock density. Tourism development provides another mechanism to consider, for it offers other economic opportunities, thereby reducing the pastoralist's dependence on livestock for a livelihood. For example, it may be possible for some family members to be employed as park guards or guides for visiting tourists, and to ensure that the community receives a portion of entrance fees levied on visitors or concessionaires. Sport trophy hunting programs may also benefit herder communities (Cai et al. 1989).

New perspectives regarding the validity of carrying capacity as a management concept in pastoral areas are emerging. Bartels et al. (1991) note that in many livestock production systems in developing countries, it is almost impossible to accurately estimate carrying capacity, and that the concept is therefore not very meaningful in such circumstances. Ellis et al. (1991) noted that in many pastoral systems, carrying capacity is likely to change rapidly both within and between years. These authors concluded that this concept has value as an abstraction rather than a goal. Nevertheless, range managers still need to ensure that permanent degradation does not occur due to excessive stocking rates. Bartels et al. (1991) suggest an opportunistic approach be used basing the annual grazing strategy on that year's forage production instead of a conservative approach based on the "average estimated carrying capacity". This strategy would allow herders to better adjust the spatial variability of range forage, provide better distribution of livestock to forage and support more people. Westoby et al. (1989) offer forms of opportunistic management they term "catalogues of state" to take advantage of successional shifts due to drought and other hazards.

Other pastoral system specialists like Sandford (1983) have also embraced opportunism as a management approach for livestock production in arid zones. Basically, opportunism in this context means being prepared to respond rapidly to the potentialities and constraints presented, a strategy requiring high herd mobility and rapid destocking or restocking as forage conditions fluctuate. An aspect of opportunism which already exists in many subsistence pastoral systems is their reliance upon external resources such as trading or raiding: these have arisen partly because dependence upon livestock alone is precarious. Hence, the optimal strategy for pastoralists may be to routinely exploit range resources during "good times" but to capitalize on outside resources as the need arises. If this is so, then the most important development intervention for promoting pastoral survival may be that solidifying connections between the pastoral ecosystem and sources and sinks of external resources (Ellis et al. 1991). This means encouraging the movement of goods and livestock through trade or marketing systems, and external economics which can consume and distribute products to and from pastoral areas as they vary over time. By assisting in the movement of livestock and its products to markets, developers increase herders' income and access to goods, reducing their dependence upon the local environment. In some parts of Tibet this has resulted in reduced subsistence hunting of wildlife by herders (Goldstein and Beall 1990). Besides developing better markets for wildlife products, government could expand options for employment in tourism-related activities, thereby fortifying linkages between development and conservation.

There are many other ways in which range and livestock development programs can assist in maintaining healthy snow leopard populations and wildlife habitat, or help to change attitudes of local people toward wildlife. For example, provision of veterinary services to herders would help reduce livestock losses from snow leopard and wolf predation, since survivors of predation attacks may suffer relatively minor wounds but frequently succumb from infection (Schaller et al. 1992). Habitat

manipulation associated with improvement of degraded range rehabilitates wildlife habitat as well, helping to relieve pressures on key wildlife sites.

Protection and conservation of wildlife on the Tibetan Plateau requires an effective force of trained field biologists, wildlife managers and range resource managers. There is a need for substantial technical training, reorientation of staff to multiple-use management concepts and strengthening of institutions responsible for the management of wildlife and range resources. Finally, extension and conservation education programs targeted towards local people are needed for multiple land-use programs to be most effective.

Although large areas have been set aside as protected areas on the Plateau, there is still a need to identify gaps in the protected areas system and to extend protection to other significant wildlife areas. At the present, there is no wildlife reserve in western Qinghai Province despite the fact that the Kunlun Mountains were historically sacred to the Chinese (ancient Chinese texts speak of the Goddess Mother of the West dwelling somewhere in the Kunlun Shan), and that significant populations of wild yak, wild ass, Tibetan antelope, argali and blue sheep are still found in western Qinghai (Cai et al. 1990, Miller in press). The existing Chang Tang Reserve in the Tibetan Autonomous Region should, therefore, be extended to include the area south of the Qaidam Basin and west of the Golmud - Lhasa highway. This extension would include the Wild Yak Valley, which contains exceptional biodiversity as well as the unexplored Kokoshili Mountains and the headwaters of the Yangtze River.

CONCLUSIONS

The snow leopard and many of its major prey species have been reduced in number and distribution over the last thirty years. Most of the snow leopard's range on the Tibetan Plateau is being used to varying extent for livestock grazing. It is imperative that range and livestock sector policies are developed which optimize multiple uses for the Plateau's resources and give necessary attention to wildlife. Integrating wildlife conservation and livestock production requires more information be gathered on wildlife, habitat and pastoral production systems. Effective range policies need to be formulated that would encourage greater diversity of plants and animals on Tibetan rangelands. The survival of a keystone species like the snow leopard, as well as other wildlife, depends upon a system of well-managed protected areas, control of illegal hunting, management of prey species and sustainable livestock use of rangelands. This, in turn, requires full participation by local people in conservation programs, an effective wildlife conservation staff, and range resource managers who adopt a broader view of rangeland resources.

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FIGURE 1: A Resource Triad Land-use Planning Strategy for Integrating Livestock Development and Wildlife Conservation