

TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE WYOMING SOIL CONSERVATION SERVICE

Biology No. 105

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Subject: ELK*

General

The elk (Cervus elaphus) is a common ungulate and occurs in many habitats in mountainous areas, including forests, parks, and meadows.

Food Requirements

Elk show little specialization in their feeding habits. In a literature review of elk food habits, one study listed 159 forbs, 59 grasses, and 95 shrubs as elk forage and categorized them according to their relative value. The elk's winter diet is mainly grasses and or shrubs, depending on availability; fall and spring diets are composed primarily of grasses; and forbs are important in the summer. Another stated that food habits of wild ungulates vary with the succulence and relative availability of plant species.

One study found that grasses were the main component of the elk's diet in Colorado during all seasons except winter when browse made up 56.9 percent of the diet. Overmature oakbrush (Quercus gambelii) 10 to 14 feet (3.0 to 4.3 m) tall in densities exceeding 51 percent tended to physically prohibit elk from entering and feeding.



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*Information taken from Ecoregion M3113 Handbook and Habitat Suitability Index Models, Wildlife Species Narratives (literature searches), U.S. Fish and Wildlife Service, various dates between 1978-1984.

In the Blue Mountains of Washington and Oregon, some forage is produced in thickly forested areas, but it is often of lower quality and in lesser quantities than that growing in natural and manmade openings and in forested areas that do not qualify as cover (see cover requirements section). Forage areas should have no point farther than 600 feet (183 m) from cover to insure maximum use by elk.

Water Requirements

In western Montana, areas near water were highly attractive to elk. In the Missouri River Breaks of north-central Montana, most of the elk observed during spring and fall were within 0.75 mile (1.2 km) of a known water source with the greatest numbers observed between 0.25 and 0.75 mile (0.4 to 1.2 km) from water. Use on areas farther than 1 mile (1.6 km) from water was minor at all times

Cover Requirements

Elk require hiding and thermal cover. Hiding cover is defined as vegetation, alone or in combination with topography that hides 90 percent of an elk from human view at a "sight distance" of 200 feet (61 m). Patches of hiding cover 600 to 1200 feet (183 to 366 m) in diameter insure that elk in the interior of the stand are securely hidden and are able to make maximum use of the area. Thermal cover is best provided by a canopy closure of 70 percent or more. The optimal size of thermal cover areas on spring-fall range was estimated to be 30 to 60 acres (12 to 24 ha). Areas smaller than 30 acres cannot accommodate elk herds and areas larger than 60 acres will not be used to the maximum potential.

Reproductive Requirements

In the Blue Mountains, calving grounds were on gentle slopes (less than 15 percent) with hiding cover for cows and newborn calves, succulent forage for lactating cows, and free water nearby. Not all areas fitting this description are calving grounds. Potential calving areas should be examined in early summer for evidence of use.

Special Habitat Requirements

In western Montana, one study found that approximately 50 percent of the elk observed were on slopes steeper than 10 degrees, but less than 1 percent were observed on slopes greater than 45 degrees.

In Colorado, another study found that during winter elk preferred south-facing slopes due to lesser snow depths and increased food availability. Snow depths greater than 15.8 inches (40 cm) caused elk to move to areas with less snow. In areas of snow depth between 15.8 and 27.6 inches (40 to 70 cm), the elk diet switched from forbs and grasses to browse. Only 5 percent of the elk observed were in snow exceeding 27.6 inches (70 cm) in depth.

Interspersion Requirements

The maximum possible use of an area by elk in the Blue Mountains occurred where there was a ratio of 40 percent cover (20 percent hiding, 10 percent thermal, and 10 percent hiding or thermal) to 60 percent forage areas.

In the Madison River Drainage in Yellowstone National Park, the home range of a nonmigratory elk herd varied according to season. In spring, the home range varied from 1.7 to 2.4 sq. miles (4.4 to 6.1 km²); in summer from 1.2 to 6.5 sq. miles (3.1 to 16.6 km²); in fall from 2.0 to 6.4 sq. miles (5.2 to 16.4 km²); and in winter the home range varied from 0.1 to 1.5 sq. miles (0.26 to 3.8 km²). Except during late summer and fall, elk seldom traveled more than 1 mile (1.6 km) during any 24-hour period.

Special Considerations

In general, elk are migratory, descending from their high elevation summer ranges to lower elevations for the winter. This altitudinal migration is usually triggered by the onset of bad weather, especially snow. One study stated that elk are creatures of habit, using the same winter and summer ranges, as well as routes between them, year after year. Another study found that young calves appeared to learn seasonal range locations and movements from the mother cows. In Montana, it was found that the composition of winter and summer populations were independent of one another and that the elk probably migrated individually to winter and summer ranges. However, some animals used the same migration routes between ranges both in spring and fall, and many individuals were found on the same summer range in consecutive years.

One study stated that the site of the winter range determined the population size for this species. Winter ranges are critical to elk populations as there are usually more animals per unit area than on spring-fall ranges. Winter ranges are scarce and intensively used and are, therefore, more sensitive to change. Elk losses may occur during severe weather on winter range in poor condition.

In general, roads adversely affect elk use of adjacent habitat. The type of road, quality of vegetative cover, and exposure of adjacent slopes were all found to influence the reduction of habitat use. In southeastern Washington, it was found that elk use increased 44 percent from the road edge to 0.1 mile (0.2 km) away, 25 percent between 0.1 and 0.2 mile (0.2 and 0.4 km) away, and was unchanged between 0.2 and 0.5 mile (0.4 and 0.8 km) away from all road classes. Main roads, which were improved main routes of travel with constant maintenance, had the greatest impact on elk use of adjacent areas. Primitive roads, which were unimproved, and seldom or never maintained in fair to poor condition had the least. In Wyoming, it was found that roads with moving traffic did not greatly affect elk activity, especially beyond 300 yards (274.3 m). When people engaged in out-of-vehicle activities such as camping, fishing, picnicking, and logging, however, the elk stayed at least 0.5 mile (0.8 km) away. One study found that elk use was reduced in meadows adjacent to roads and variably reduced in open forests next to roads. In Montana, another study found that where dense cover (forest canopy closure greater than 75 percent) occurred adjacent to the road, no consistent increase in elk use was noted beyond 0.6 mile (1.0 km) from the road. Where the vegetation was open

forest, elk use virtually stabilized beyond 0.9 mile (1.4 k) from the road. In an area without trees, elk use increased even at a distance of 1.5 miles (2.4 km) from the road.

In Washington, west and south aspects, which were more intensively used by elk, suffered the most reduction in use in the presence of roads. Roads on east aspects caused only minimal reductions in big game use.