bers may eat more than ruminants because of differing digestive physiology. Segregating use by different animals is difficult in common grazing allotments. In Wyoming Red Desert studies, bunch grasses and palatable shrubs received the heaviest use. Rhizomatous grasses were used much less and forbs were used rarely.

Vegetation Trend
Changes in range (ecological condition) due to feral horses have not been documented even though changes undoubtedly have occurred. Based on feral horse diets, however, a shift in vegetative composition toward unpalatable shrubby species would be expected, given excessive numbers of horses. In many areas these kinds of changes may have already occurred due to grazing by other species. Under current management with control of numbers and locations where horses occur, vegetation changes except on a local basis are unlikely.

Watershed Condition
Watershed condition as affected by feral horses has received little attention. Studies of grazing distribution and habitat selection indicate use of much larger areas than livestock. A more dispersed impact on upland watershed condition is suggested. Concentration near water as with livestock can cause local damage to vegetation. Pawing and rolling in pond margins appears to be characteristic of horses and may affect other users. In general, horse impact on watershed is probably similar to effects of other large hoofed animals. Generally, significant impacts on watershed conditions have been only noticeable at high animal densities.

SUMMARY
The greatest impact of feral horse grazing would generally be on the grass component of selected habitats. Selected habitats vary seasonally but generally contain higher proportions of grass than others available. Horses travel over and use large areas. Utilization and other impacts will be more dispersed than cattle but proportional to numbers and forage availability. Ecological condition of ranges could decline to communities dominated by unpalatable shrubs with heavy use. Watershed conditions should not change except under heavy use resulting in reduced ground cover, soil disturbance and compaction.

POTENTIAL COMPETITIVE INTERACTIONS BETWEEN FERAL HORSES AND OTHER GRAZING ANIMALS

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ABSTRACT
This paper discusses the potential for competition between feral horses and the major domestic and native grazing animals on western U.S. ranges. Habitat selection and dietary composition for each animal is noted. Potential for competition may exist between animals that consume large amounts of grass and at least seasonally occupy open foothill or grass and grass-shrub habitats. Cattle, domestic sheep, elk, and bighorn sheep were most likely to interact negatively with horses.

Of the controversies associated with feral horses on western rangelands, one generating considerable emotion is the potential for competition with other users of rangeland. While interactions among animals may involve behavior, competition between grazing animals largely involves food supplies. The essential elements of competition involve use by two animal species of the same habitats and foods, although not necessarily at the same time. The common use of resources must result in reduced nutritional levels, reduced birth or survival rates, and consequently, lower population levels for one or both species. These latter conditions are rarely met or at least are rarely obvious. To evaluate the potential for competition two species must be examined with respect to habitat use and dietary composition overlap and resources must be in short supply relative to animal numbers. This report compares the feral horse and several common western range grazing animals with respect to habitat use and dietary composition. Habitat use and diets of animals across the West will vary due to differences in local habitat and food availability therefore more or less potential for competition may exist in local situations.

POTENTIAL INTERACTIONS
Horse habitat use may be seasonally variable depending on water availability and snow cover. Habitats used include rougher topography. Selected habitats will generally have
high proportions of grasses compared to others available at the time of selection. Diets of horses generally contain high proportions of, or are exclusively grass although a few palatable shrubs may make up 20-40% in some areas.

Cattle are perhaps the most common grazer on western rangeland. Cattle typically prefer relatively level topography close to water. They will selectively use habitats with the highest quality and quantity of available forage. Wintering areas generally have minimal snow cover or cattle will be fed supplemental forage. Cattle diets are predominantly grasses but may be seasonally high in forbs or shrubs if available. Dietary overlap with horses in the same area in Wyoming was 54% in spring and 70-90% in winter. High habitat overlap with horses occurs in spring and summer. Horses will use most areas used by cattle but cattle seldom use all areas used by horses.

Domestic sheep use a variety of terrain even when unherded. Low water requirements allow use of areas relatively far from water especially in winter. Herding probably increases the variety of habitats used and distances traveled away from water. Sheep diets are seasonally quite variable consisting of grasses, forbs and shrubs. Sheep are opportunistic relative to availability and quality of forages. Sheep could seasonally adjust diets to accommodate horse grazing but horses, because of their selectivity for grass, could make only limited adjustment to sheep use.

Mule deer characteristically occupy topographically diverse habitats that are shrubby or wooded. Minimal use is made of open grassy habitats except perhaps in early spring. Diets ordinarily consist of forbs and shrubs except for new growth grasses if available in fall and early spring. Mule deer and horses could be complementary on the same range because of low dietary overlap.

Pronghorn antelope occupy plains with mixed shrub-grass-forb plant communities in areas with their highest populations. Diets are generally high in shrubs and forbs if available. Grass is probably only used in early spring as new growth begins. Horses and antelope could have a complementary relationship. They have habitat overlap but low dietary overlap on common ranges in Wyoming.

Elk occupy wooded mountains and alpine to subalpine meadows in summer and open foothills in winter. Diets are high in grass year round but elk may use forbs when abundant and shrubs when snow covers other forages. The highest likelihood of overlap with horses would be on wintering habitats, however, some potential for overlap occurs year round in Wyoming's Red Desert.

Rocky Mountain bighorn sheep occupy open alpine and subalpine areas in summer and winter in open grassy valleys and foothills. Sheep diets are high in grasses with shrubs being used only when snow prevents use of other areas. A high potential for overlap with horses would exist on winter-spring ranges.

Moose generally use wooded riparian areas in the western states. Diets are predominantly shrubs in winter and aquatic and wetland vegetation in summer. Little potential for overlap exists although wild horses and moose occur in the same region in western Wyoming.

Potential competitive interactions with horses could occur with other animals that occupy foothills or plains with predominantly grass or grass-shrub vegetation and consume relatively large amounts of grass. The major animal species meeting these criteria are cattle, domestic sheep, elk, and bighorn sheep. Larger numbers of any two species increase the chance of negative interaction even for species with relatively low overlap under less crowded conditions. Overlap between horses and cattle has been shown to increase at higher stocking density.