Manseau, M., J.Huot, and M. Crete. 1996. Effects of summer grazing by caribou on composition and productivity of vegetation: community and landscape level Journal of Ecology. 84(4):503–13.

Abstract Changes in demography and studies on physical condition of the Riviere George caribou Rangifer tarandus herd have suggested that its size may be primarily regulated by the amount of forage available on the summer range. 2 We therefore document the impact of grazing and trampling on composition and productivity of two plant communities, the shrub tundra and stands of dwarf birch, within this range. Ungrazed sites were rare, but four previously located small areas were used as control sites. 3 For the shrub tundra, the lichen mat was absent in grazed sites and ground previously occupied by lichens was either bare, covered by fragments of dead lichens and mosses or recolonized by early succession lichen species. Ground cover of shrubs not eaten by caribou was lower in grazed sites than in ungrazed sites, and coverage of graminoids, forage shrubs and forbs did not differ significantly between grazed and ungrazed sites. 4 In stands of dwarf birch grazed by caribou, ground cover and leaf biomass of Betula glandulosa was significantly lower than in ungrazed sites. 5 Productivity of forage plant species over the summer range was estimated at 22.5 g m^{-2} year^{-1} in an ungrazed condition compared to 10.3 g m^{-2} year^{-1} when grazed. 6 At the landscape level, caribou have fragmented the distribution of their food resource by reducing biomass of shrub tundra and stands of dwarf birch to a very low level. 7 The serious negative impact of migratory ungulates on plant productivity of their summer range may be explained by characteristics of the vegetation and the high carrying capacity of winter compared to summer ranges. Significant factors related to the vegetation are its low resilience and productivity and the absence of a response of vascular plants following removal of lichens.