

Case Study

The Western Arctic Caribou Herd: The largest herd in Alaska

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Range and Ecosystem

The Western Arctic Caribou Herd (WAH) is a barren ground caribou herd that ranges throughout northwestern Alaska. This vast herd ranges over a 140,000 square-mile or (363,000 km²) area bounded by the Arctic Ocean, the lower Yukon River and the trans-Alaska pipeline. About 40 communities and 13,000 people are located within the range of the herd. For the people of these communities the herd is a vital link to cultural traditions, as well as a food staple for many families. The WAH herd moves seasonally over this large area, which has important implications on the ecology and subsistence patterns throughout the region from harvest to nutrient cycling.

In the spring, pregnant female caribou lead the migration to calving grounds located north of the Brooks Range. Calving then takes place in early June. The calving grounds offer a location where females encounter relatively few predators and which is close to insect relief terrain. The calves begin walking just hours after birth and quickly learn to follow their mothers during the herd's migration. Although precocious after birth, newborn calves still face many challenges. The survival rate of WAH calves through their first year varies annually and has ranged from roughly 23-68%. Sources of calf mortality include sickness, predators, becoming separated from their mother, and accidents.

The herd's summer range encompasses the calving grounds and consists of the Brooks Range and its foothills west of the trans-Alaska pipeline. For a short time during early summer WAH caribou form huge aggregations to help find relief from mosquitoes and other insects. The aggregation takes place in areas with winds that help keep the insects at bay. In the summer, the diet for these caribou includes grasses, sedges, and shrubs. Calves continue to grow on their mother's rich milk as well as from diverse and abundant vegetation.

Fall migration begins when temperatures cool and day length begins to change. Studies indicate that both temperature and day length play an important role in the timing of both fall and spring migration. Bulls compete fiercely with one another for females during mid October. The mating season for caribou is brief and the 'rut' for this herd is over by the end of October. Most of the herd migrates in the fall across the Noatak and Kobuk Rivers to wintering grounds that include the upper Kobuk and Koyukuk drainages, the Nulato Hills, and the eastern half of the Seward Peninsula. In most years some WAH caribou do not migrate and winter on the North Slope between Point Lay and Anaktuvuk Pass. The herd winters in the mountains, on ridge tops or on the tundra where the landscape has shallow snow depths allowing the caribou to dig down, using their hooves like shovels to find lichen to eat. Winter can be harsh on caribou, especially if freeze thaw cycles cause heavy crusts or ice to form on the ground which makes digging difficult. Fortunately, caribou are resilient creatures well adapted to life in the north thanks to their many physiological adaptations. Their hooves allow for efficient digging in the snow yet enable them to traverse steep, mountainous terrain or cross soft, swampy tundra; their fur consists of

hollow hair that effectively retains body heat; barren ground caribou also have sleek, compact bodies and small ears that reduce surface area and thus minimize heat loss.

Unique Characteristics

The WAH is the largest caribou herd in Alaska and one of the largest in the world. This herd last peaked around 2003 when it reached 490,000 caribou. At last count in 2009 this herd numbered approximately 401,000 caribou. Because of its tremendous size, the ecological importance of the WAH to Northwest Alaska is incalculable. Although they are important prey for wolves and bears, these caribou directly and indirectly impact the entire food web through nutrient cycling affecting organisms from bacteria to moose. WAH caribou have the ability to survive under harsh conditions, travel long miles, inhabit an array of ecosystems from the coast to the mountains, and tolerate extremely cold temperatures as well as hot, insect infested environments.

Cultural and Social Significance

The WAH herd is hunted by a variety of people throughout Northwest Alaska. The Inupaiq have relied on this herd for centuries to provide food, clothing, tools and shelter. Subsistence harvest patterns are primarily affected by seasonal movements and availability of caribou and also by traveling conditions for hunting. For example, Point Hope and North Slope villages harvest WAH caribou mainly during July and August while the WAH is on its summer range. In contrast, Shaktoolik and Unalakleet hunters primarily take WAH caribou during September through March. Harvest levels for villages along the Noatak and Kobuk Rivers are typically high during fall and spring migration periods, and also when caribou winter near those communities. Even so, caribou harvests all but cease during periods of freeze-up and breakup, when travel by boat or snow machine is difficult. Unlike many subsistence activities that are seasonally specific, subsistence hunting of caribou occurs whenever caribou are available and accessible.

People's reliance on WAH caribou has changed in relation to their availability. During times of abundance, people were able to survive quite well on the meat, hide, bones, and sinew of the caribou. During times of shortage, people relied more heavily on other game and fish, and had to travel much further to find caribou. When caribou became scarce, many communities were almost wiped out from exposure and starvation. Currently, caribou are still one of the main protein sources for people living in the range of the herd. In addition to their importance as a source of food, WAH caribou are also an important link between the indigenous peoples' past and present.

Historical and Current Status

Caribou abundance in northwest Alaska has varied substantially over the past 150 years. Although biologists have only been able to count caribou herds during the last 40 years, we know from historical records of early explorers that caribou almost disappeared from large portions of this area by the mid 19th century. Biologists first counted the WAH in 1970; at that time it, numbered about 242,000 caribou. The herd declined rapidly from 1970 to 1976 when it numbered only about 75,000 caribou. From 1976 through 1990 this herd grew about 13% annually to reach a population size of 416,000 caribou. From 1990 to 2003 the herd grew only 1-3% annually and peaked around 490,000 caribou. Since 2003 the WAH has declined and, as of 2009, numbered about 401,000 caribou.

Current and Future Concerns

The future of the WAH caribou depends largely on the land and the people who make decisions regarding large scale resource development and access to the herds range. Caribou are facing many changes. Climate change brings melting permafrost, expanding shrubs, decreasing lichen, increasing wildfires, and changes in temperature. Oil, gas, and mineral developments may bring roads, pipelines, powers lines, construction, and possible spills and contamination. The warming climate is also opening the arctic to an even greater expansion of resource exploration and development. Changes impacting the caribou, also impact the people who value and use caribou as a resource.

Management and Study

The foundation for management of the WAH depends largely on photocensus estimates of herd size. These censuses are conducted every 2-3 years. Additionally, composition surveys are conducted annually during the June calving period to determine how many calves are born and to delineate the calving area. Spring composition surveys are conducted the following spring to monitor calf survival through their first year of life. Fall sex and age composition surveys are conducted biennially to monitor proportions of bulls, cows and calves in the herd. Adult mortality is estimated annually. Distribution and movements of this herd are monitored through conventional and satellite telemetry. All of these activities are based on radio telemetry data. For the past thirty years, the Alaska Department of Fish and Game biologists have gone to a world famous caribou crossing location called Onion Portage on the Kobuk River to radio collar caribou. Since the early 1990s federal agency staff and students from schools within the range of the WAH, have accompanied department biologists to learn about caribou. As caribou swim the river, a boat drives alongside a chosen group where agency staff and students catch and hold an adult caribou and adorn it with a collar. Besides deploying collars, The Department gathers information regarding calf weights, body condition, and collects blood samples to detect antibodies that indicate exposure to disease. If the chosen caribou is a female with a calf, a second boat captures the calf to weigh it, assess sex and body condition and then release it near its mother. A third boat ensures that those caribou not being handled swim to the South side of the river to continue their migration. Using boats to capture caribou is quick and efficient, safer for caribou, uses no immobilization drugs, and is more widely accepted than aerial capture techniques used on other wildlife collaring projects. In-depth health assessments are conducted every 2-3 years to monitor the overall health of the animals.

Because the WAH traverse such a large area and impacts a variety of user groups, the need for co-management is important for the future of this herd. The Western Arctic Caribou Herd Working Group (WG) was established in 2003 as a way to help manage the herd. The WG includes subsistence users, other Alaska hunters, reindeer herders, hunting guides, transporters, conservationists, biologists, and natural resource managers. The group meets once or twice a year, with additional subcommittee meetings throughout the year, as specific needs arise. During meetings, biologists report on the current health and population status, range conditions, and other biological factors affecting the herd. Invited speaker's present information on topics that may impact the herd, such as climate, transportation, and public land use planning. Elders address the group, sharing knowledge passed down for generations. The group identifies concerns, requests information and advocates for actions that will conserve and benefit

the herd, including habitat studies or protections from the impacts of development. The group provides public information through its newsletter, *Caribou Trails*, and is working on a website that will help increase communications with the public.

The WAH is one of the last great herds of animals on earth. Conservation of this herd and its habitat is critical in maintaining the traditional practices of Northern people as well as for the health and productivity of the habitat in which they roam.