



Plant Life

The vegetation of ANWR is characterized as tundra, which literally means barren land. Yet, contradictory to its name, there is much diversity in the types of plants growing in ANWR. The tundra plants are usually less than 1 foot high. Tall plants are restricted to the southern slopes of ANWR. The tundra plants belong to five main groups, namely, 1) lichens, 2) mosses, 3) grasses and grass-like herbs including many sedges and willows, 4) cushion plants and 5) dwarf shrubs. (Patrick D. Baird, 1964) Among them, the first three types are particularly important in providing the herbivores with nutrition and calving ground, nutrient cycle, maintenance of permafrost and a lot more essential functions in the arctic ecosystem. Sedges, willows, mosses and lichens would be discussed in greater details.

Arctic vegetation

Introduction

The type of vegetation in Arctic National Wildlife Refuge (ANWR) is mainly characterized as “tundra”, meaning barren land. Contradictory to its literal name, vegetation on the arctic tundra is highly diverse. The types of vegetation found depends on numerous factors such as the terrain, local climate, permafrost and active layer depths, precipitation and water availability and drainage, nutrient availability and cycling. The shrub tundras are dominated by deciduous vascular plants. Slightly warmer soil temperatures, deeper thaw, and more rapid nitrogen mineralization associated with the high water flow rate in water track and river bar localities cause denser canopies and higher total foliar nitrogen.

The differences in canopy structure between the graminoid-dominated wetland tundras and the mixed tussock tundra communities are probably related to drainage characteristics and their effects on nutrient availability. The highly heterogeneous nature of the heath sites is probably determined by their different degrees of exposure on ridge and hill tops. Microtopography affects the growth and structure of heath, with sheltered hollows causing denser vegetation and ridge tops causing sparse canopies. (Shaver et al., 1996)

The arctic coastal tundra consists of thaw lakes and wetlands near the Beaufort Sea coast and along river deltas. The foothills tundra, a transition between this and the Brooks Range, is dominated by sedge tussock (*Eriophorum vaginatum*), which provides the lush, new growth needed to feed caribou calves and energize staging snow geese. Riparian areas have willow shrubs that are important nesting habitat for migratory birds. (World Wide Fund for Nature, 2000)

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The tundra plants belong to five main groups:

1. Lichens, either on rocks or in mats on the ground
2. Bryophytes (commonly known as mosses)
3. Grasses and grass-like herbs, including mainly sedges and willows
4. Cushion plants
5. Dwarf shrubs

(Patrick D. Baird, 1964; Janet C. Jorgenson, Peter C. Joria, and David C. Douglas, 2002)

In ANWR, the following four types of plants are particularly important:

1. Sedges, especially tussock cottongrass
2. Willows, especially diamond-leaf willows
3. Mosses, especially *Sphagnum* spp.
4. Lichens, of various types

The first two is highly nutritious for herbivores to feed on as a food source, particularly during growing seasons, while latter two help maintain the ecosystems in other ways and provide food during winter.

Reference:

1. Williams, M.; Rastetter, E. (1999). Vegetation characteristics and primary productivity along an arctic transect: implication for scaling-up. *Journal of Ecology* 1999, 87: 885-898.
2. World Wide Fund for Nature. (2000). Protection of the Arctic National Wildlife Refuge: Key to Managing one of the World's Most Biologically Valuable Ecoregions, the Arctic Coastal Tundra, http://www.worldwildlife.org/arctic-refuge/anwr_position.pdf
3. Janet C. Jorgenson, Peter C. Joria, and David C. Douglas. (2002). Arctic Refuge Coastal Plain Terrestrial Wildlife Research Summaries. <http://www.absc.usgs.gov/1002/section2.htm>
4. Patrick D. Baird. (1964). *The Polar World*.

