The Role of Fire in Northern Circumpolar Ecosystems
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CHAPTER 11

The Effects of Fire in Black Spruce Ecosystems of Alaska and Northern Canada

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ABSTRACT

Fire in the black spruce ecosystem of northern Canada and Alaska is characterized by large and frequent fires that usually kill the overstorey trees and most, if not all, of the vegetation aboveground. Most species within the black spruce ecosystem show adaptations to fire, and black spruce stands are usually perpetuated by fire. Depending on the site, revegetation follows one of two primary patterns, although under some conditions there may be intervening stages of birch, aspen, or lodgepole pine. In general, the succession on dry sites develops as open lichen woodland with a nearly continuous cover of fruticose lichens. On moist sites, the development is that of a closed forest with a forest floor dominated by dense feathermosses and with a buildup of an organic mat. The final or climax vegetation that develops depends on site and climate and may vary from treeless bogs through feathermoss types to open lichen woodlands. In some areas, balsam fir replaces the black spruce. Fire reduces the organic layer on the forest floor and causes higher soil temperatures, an increase in available nutrients, and an increase in productivity for a period following the fire.