



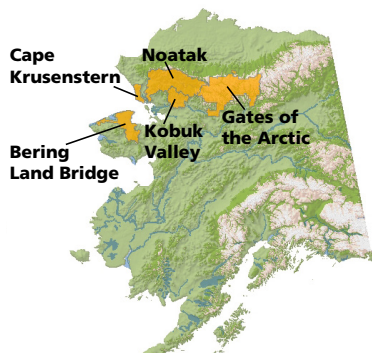
Bering Land Bridge N Pres. • Cape Krusenstern NM
Gates of the Arctic NP & Pres. • Kobuk Valley NP • Noatak N Pres.

March 2021

Fire Extent & Frequency Resource Brief

Aerial view of tundra fire burning in Noatak National Preserve. BLM-AFS Photo.

The Status of Fire Extent & Frequency in the Arctic Network



Map: Fire extent & frequency is being monitored in all 5 Arctic Network parks: Gates of the Arctic National Park and Preserve, Noatak National Preserve, Kobuk Valley National Park, Cape Krusenstern National Monument and Bering Land Bridge National Preserve.

Fire affects all 5 parks within the Arctic Network (ARCN). The first fires in the network were reported in 1956, although [charcoal records](#) date fires back to at least 6,000 years ago. Since 1956, 574 fires have occurred in ARCN parks, burning nearly 1.1 million acres. On average, these parks have a total of 8 fires per year and burn 16,000 acres annually. However, this varies widely between years. Some years, or period of years, there will be few to no fires and others will have 20 to 30, up to 50 fire starts per year, as observed in 2010.

Fire extent and frequency also varies geographically by park and over time (Figure 1). For example, fires occur most frequently in Noatak National Preserve with 232 fires and are the least common in Cape Krusenstern National Monument with only 12 fires (6 of which started in 2018). Noatak also has the most total area burned with over 550,000 acres. However, the largest fire on record for ARCN

burned 121,524 acres within the Bering Land Bridge National Preserve boundaries in 1977.

A Blast into the Past - New Improvements to Historical Fire Records in the Arctic:

Careful investigation of historical fire reports (from 1956 to 2020) and archived satellite imagery has led to significant improvements to both the official NPS fire records and the statewide Alaska Fire History – Perimeters (a geospatial database that includes mapped perimeters from 1940 to present). Fires reported within ARCN parks were verified against imagery to determine the most accurate point of origin, acres burned and mapped perimeter.

Through this process, 253 NPS historical fire records were improved and 137 perimeters were updated (Figure 2), including the discovery of 72 new perimeters. This amounted to a change of over 208,000 acres of area burned.

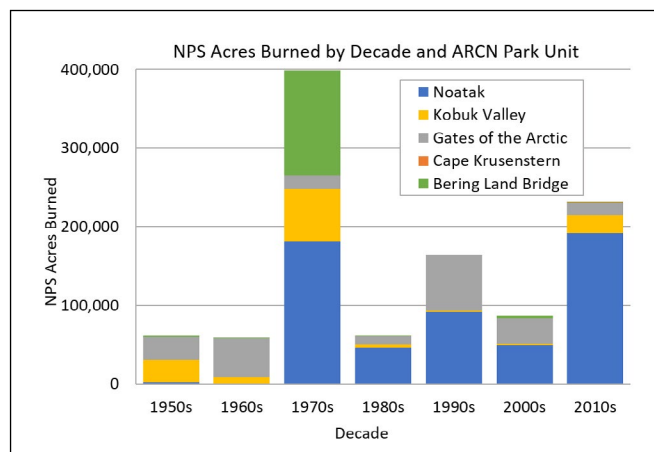


Image (above): Fire in Noatak N Pres. NPS Photo.

Figure 1 (left): National Park Service acres burned by decade and ARCN park unit from 1956-2020. The area burned varies between parks and varies over time.

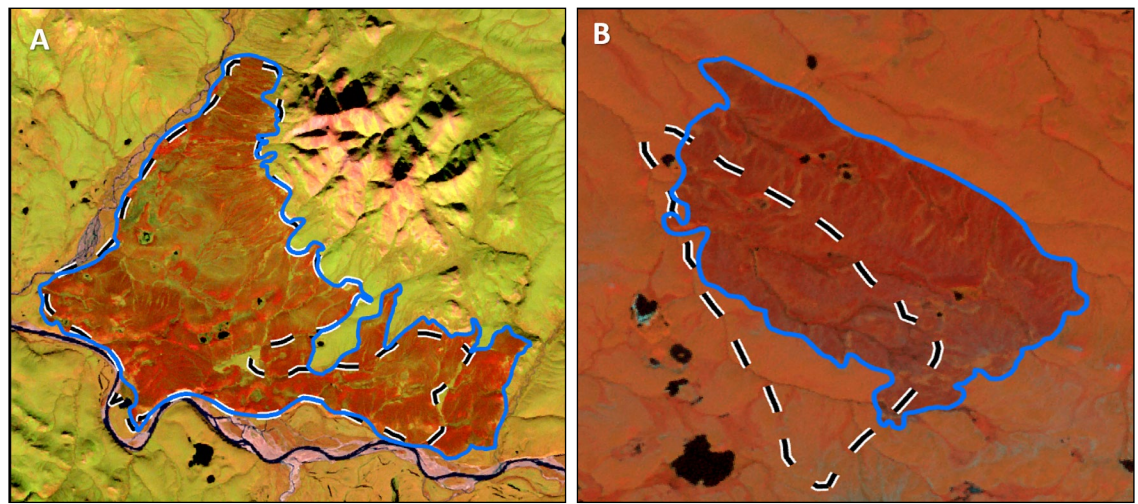


Figure 2: These images are two examples of how satellite imagery was used to update historic fire perimeters and the national reporting system. The black and white dashed line shows the original fire perimeter and the blue line shows the updated perimeter.

Why Monitoring Fire Is Important

Alaska is experiencing dramatic changes in climate including warmer temperatures, earlier snow melt and longer growing seasons – all factors that influence the pattern of fires on the landscape and their ecological effects over time (fire regimes). Such evidence suggests that fire regimes in northern regions, including ARCN, may also change rapidly with increasing numbers of fires and more area burned. Although the current trend

has remained relatively flat due to the annual variability of fire activity, we have observed an increase in the 10-year averages. Monitoring fires provides essential information used to determine: 1) long-term trends in frequency and area burned, 2) departures from the natural fire regime and 3) how parks may change in response to climate, vegetation changes, fuel moisture, ignition sources and other factors.

What We Want To Know About Fire Extent & Frequency

Fire extent and frequency is just one component of our fire monitoring activities. Our objectives for this component are to determine the variability and decadal-scale trends in:

- Fire frequency (number of fires/year).
- Average fire size
- Maximum fire size
- Total area affected by fire

How We Monitor Fire Extent & Frequency

When a fire occurs in a park, fire protection agencies in Alaska determine the fire location, map the perimeter and collect other information. National Park Service staff assist with monitoring and mapping active fires via aircraft or by using remotely sensed imagery.

This data is incorporated into two important fire history geospatial data layers: all reported fires (represented by points) and all mapped fire perimeters. At the end of each year, the data is summarized to look at trends in fire history across ARCN parks.

How Monitoring This Vital Sign Can Help Park Managers

Understanding fire regimes and how they are changing is essential for fire management planning, strategic decision making, evaluating risk, and determining ecological impacts. More information on the Fire Vital Sign

including fire frequency, extent, severity and fire effects in Arctic Network parks can be found at:

<https://www.nps.gov/im/arcn/fire.htm>

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