



National Park Service Alaska Region Fire Ecology Annual Report Calendar Year 2025

Authors: Jennifer S. Mitchell¹, E. Fleur Nicklen², Sarah E. Stehn³ and Jennifer L. Barnes⁴



Jennifer Barnes on the fireline in Alaska's boreal forest. In November 2025, Jennifer retired after more than two decades of leading the NPS Fire Ecology Program.

¹Assistant Regional Fire Ecologist, Fairbanks Administrative Center

²Eastern Area Fire Management, Fire Ecologist, Fairbanks Administrative Center

³Western Area Fire Management, Fire Ecologist, Denali Headquarters

⁴Regional Fire Ecologist, Fairbanks Administrative Center

The National Park Service (NPS) Division of Fire and Aviation Management uses science and long-term monitoring to support adaptive fire management across park units. Policies and monitoring standards are outlined in Chapter 8 of [*Reference Manual 18*](#). The NPS Fire Ecology Program collects, analyzes, and interprets fire effects data to inform park managers' decisions and program evaluations. This annual report fulfills part of the program's reporting requirements but is not a comprehensive analysis of any NPS fire management activity. Additional interpretation is available in previous reports on at [NPS DataStore](#) or by contacting the report authors.

Contents

A. Summary.....	4
2025 Alaska Fire Season	6
Notable Fires in NPS Alaska, 2025	7
B. Monitoring Results and Management Implications.....	9
Hazard Fuels Treatment Monitoring.....	9
Denali Frontcountry Fuel Reduction and Pile Burn (DENA)	9
Wildfire Monitoring	12
Riley Fire Burn Severity & Emergency Stabilization (DENA).....	12
Chakina-Steamboat Wildfire Monitoring (WRST).....	14
Andrew Cr/Ben Cr Wildfire Monitoring (YUCH).....	17
C. Research, Planning, and Communication	19
Research Support.....	19
Research Project Highlights.....	20
Long-Term Fire History in the Denali Front Country (DENA)	20
Pile Burning Effects on Boreal Soils (DENA)	21
Wildfire Effects on Lakes (YUCH).....	22
Scientist-in-Parks (SIP) Mentorship	23
Planning and Compliance	24
Outreach and Communicating Results.....	24
Committee Service and Interagency Collaboration	24
Educational Outreach	25
Reports and Informal Publications	26
Data Management	26
D. Future Direction	27

E. References, Links, and Additional Reading	28
Informal Fire Ecology Briefs and Program Reports (Available Upon Request)	28
New Public-Facing Fire Ecology Stories and Media (2025).....	28
Protocol and Dataset References.....	28
Appendix A. Staffing and Accomplishments	29
NPS Alaska Fire Ecology Program Structure	29
2025 Program Staff Focus Areas	30
Jennifer Barnes’ Retirement.....	33
Appendix B. History of Fire Effects Monitoring Plots	35

A. Summary

This annual report summarizes 2025 projects and activities conducted by the Alaska National Park Service (NPS) Interior Region 11 Fire Ecology Program. The Fire Ecology Program provides science-based information to support land and fire managers by advancing understanding of fire-adapted ecosystems, promoting natural fire as an ecological process, and offering adaptive feedback for fuels treatments.

Early in the year, fire ecologists welcomed five Scientist-in-Park members who developed outreach materials, improved fire statistics reporting, and strengthened data quality and longevity. Other winter work included fuels treatment planning, cadre-ships, training, youth outreach, interagency coordination, and summer hiring. In late spring, the team welcomed five seasonal biological technicians, three returning for their third year.

The team measured 160 plots across six projects and three park units (Table 1), while supporting fire operations during a moderately active fire season (Table 2, Figures 2 & 3). Cross-program integration and workflow improvements continued to support effective monitoring. Staff contributed 158 days to fire assignments in 2025, supporting suppression operations in Alaska and the Lower 48. Staff also assisted local modules with prescribed pile burns and fuels thinning projects. Fire ecologists offered local and regional decision support through fire behavior modeling, WFDSS and IFTDSS.

The end of the season marked new beginnings for two beloved fire ecology personnel. After three seasons with the Alaska program, Mariana Perez accepted a permanent Assistant Lead Fire Effects Monitor position at Zion National Park. And marking a significant transition for the program, Jennifer Barnes retired after more than two decades of leadership. Jennifer helped build and sustain the Alaska NPS Fire Ecology Program into a nationally respected model for long-term fire effects monitoring, applied science, and integration with fire management. Her work shaped how fire ecology is practiced across Alaska parks, from foundational monitoring protocols to mentorship of generations of fire ecologists and technicians. A fuller reflection on Jennifer's career and contributions is provided in Appendix A.



Figure 1. Jennifer Barnes during early fieldwork in her fire ecology career.

Table 1. Fire ecology monitoring conducted in 2025 across Alaska NPS units, summarizing active projects, plot types, project duration, and both annual and cumulative plot totals.

Park	Monitoring Unit	Plot Type	Years Data Collected (start-end)	Plots Measured in 2025	Total Plots
Denali	Frontcountry Hazard Fuels Reduction	Hazard Fuels (HZF)	2003-2025	13	80
Denali	Spruce Bark Beetle Fuels	Fuels Assessment	2024-2025	42	92
Denali	Riley Cr Fire Effects	Post-Burn CBI	2025-2025	37	37
Yukon-Charley	Ben Cr/Andrew Cr Fire	Pre- and Post-Fire Effects	2008-2025	28	28
Wrangell-St. Elias	Chakina/Steamboat Fire Effects	Pre- and Post-Fire Effects	1997-2025	3	12
Wrangell-St. Elias	Chakina/Steamboat Fire Effects	Wildland Fire Effects	2009-2025	37	37
				160	247

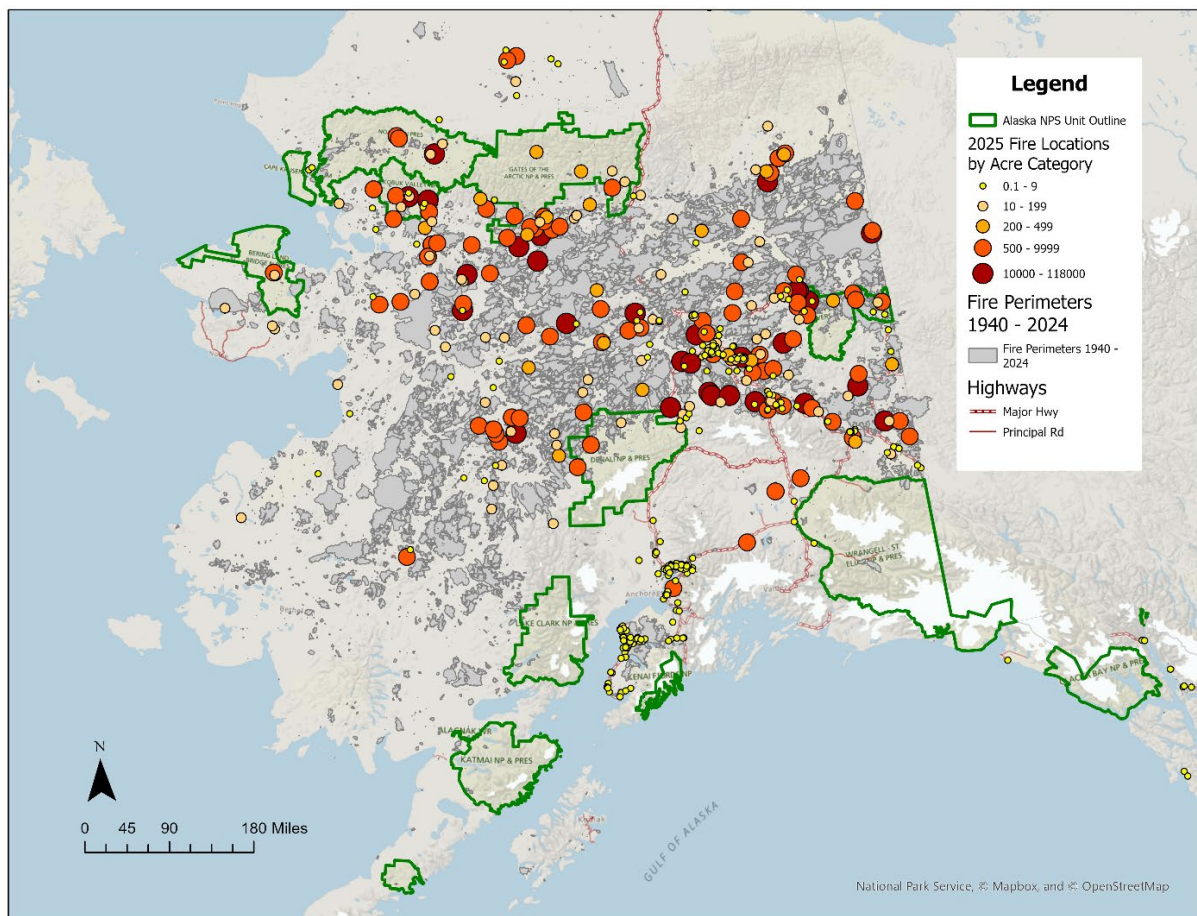


Figure 2. Distribution of 2025 wildfires across Alaska, with fire locations scaled by size and overlaid on historical fire perimeters to highlight how the season fits within Alaska's long-term fire landscape.

2025 Alaska Fire Season

Statewide, the 2025 fire season was active but not extreme. Alaska recorded 464 wildfires and 1,007,220 acres burned—above the long-term median yet far below the multi-million-acre seasons of 2019 and 2022 (AICC 2025 Fire Numbers). Activity peaked in June and July, then declined with cooler, wetter conditions, shifting management toward monitoring and supporting natural fire roles.

NPS Alaska also saw an above average, but not extreme, 2025 fire season, with 37 wildfires burning 74,364 acres, nearly twice the long-term average number of fires and acres burned (Figure 2, Table 2). Gates of the Arctic, Kobuk Valley, and Yukon–Charley Rivers led the season with nine fires each, and Kobuk Valley recorded the most NPS acres burned. The Takoma Fire in Yukon–Charley Rivers and the Sikik Fire in Noatak were the major events of the year and together accounted for more than 26,000 NPS acres. Excluding the human-caused fire in Sitka National Historical Park in January, fire activity stretched from early late May to mid-July, with a compressed 51-day ignition window and a 130-day season duration overall (Figure 3).

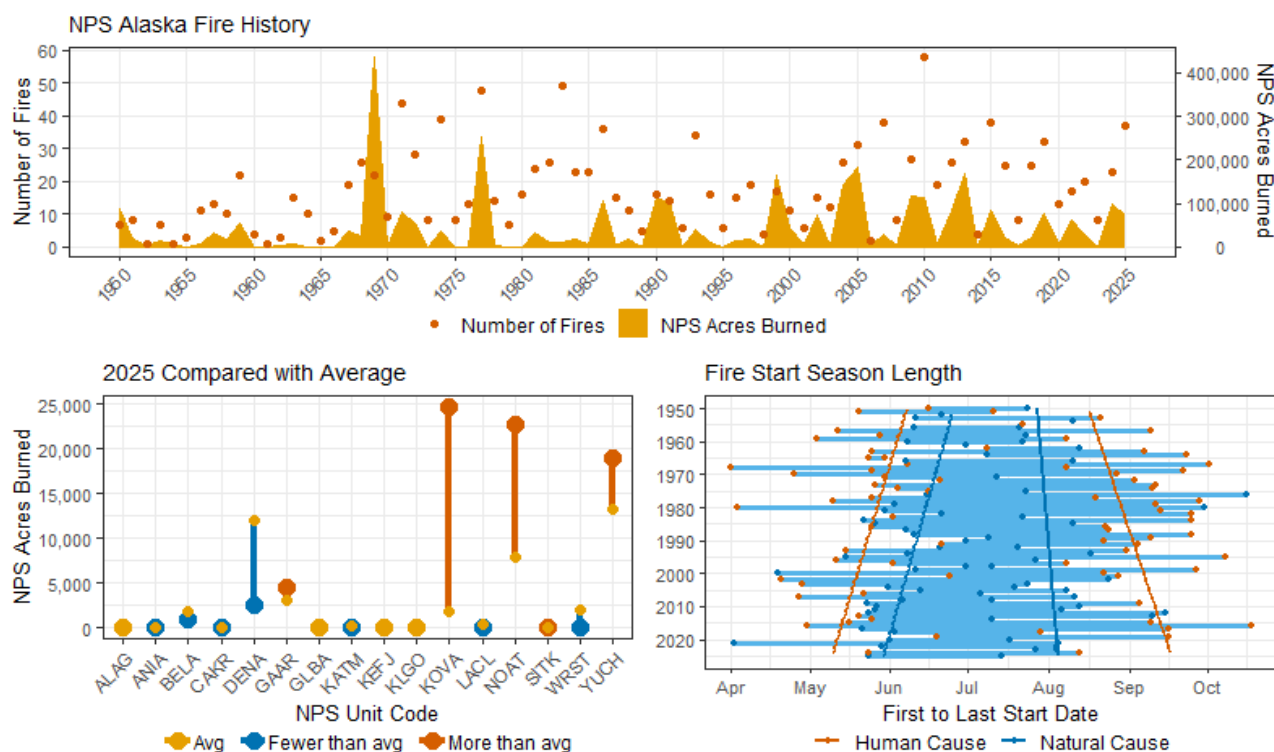


Figure 3. Top: Annual number of fires in Alaska NPS units and total NPS-managed acres burned (1950–2025). Bottom left: Acres burned in each Alaska NPS unit in 2025 compared to the unit’s 1950–2024 annual mean. Bottom right: Start dates of first and last reported fires within Alaska NPS units, color-coded by fire cause (human or natural). Trendlines are for the first and last start dates grouped by cause. Fire start dates include only those after March 1.

Table 2. Wildfire activity, fuels treatment, and prescribed fire (i.e., pile burning) implementation across Alaska NPS units during the 2025 fire season.

NPS Unit	Number of Wildfires ¹	Total Acres Burned ¹	Number of Wildfires Started on NPS Lands	Acres Burned on NPS Lands	Acres of Fuels Treated	RX Burning in the Park
Alagnak Wild River	0	0	0	0	0	No
Aniakchak	0	0	0	0	0	No
Bering Land Bridge	2	990	2	990	0	No
Cape Krusenstern	0	0	0	0	0	No
Denali	2	2,588	2	2,588	41	Yes
Gates of the Arctic	9	9,578	6	4,482	2	No
Glacier Bay	0	0	0	0	0	No
Katmai	0	0	0	0	0	No
Kenai Fjords	0	0	0	0	0	No
Klondike Gold Rush	0	0	0	0	0	No
Kobuk Valley	9	32,699	8	24,648	0	No
Lake Clark	0	0	0	0	0	No
Noatak	5	22,729	5	22,729	0	No
Sitka	1	0.2	1	0.5	0	No
Wrangell-St. Elias	0	0	0	0	6	No
Yukon-Charley Rivers	9	28,873	5	18,927	0	No
Total	37	97,457	29	74,365	49	-

¹Value is total number of fires and acres of all wildfires that burned NPS managed lands or started within the boundaries of the park unit. NPS boundaries include inholdings of land not owned or managed by NPS.

Notable Fires in NPS Alaska, 2025

Noatak – Tundra Reburns – Aniralik Fire

The Aniralik fire started on June 19 and ultimately joined the New Cottonwood fire to burn a total of 7,946 acres. The Aniralik Lake area, located between the Noatak and Nimiuktuk Rivers in Noatak National Preserve, has burned three times over the last 25 years. Past monitoring efforts by the Alaska NPS Fire Ecology program in 2003 (Cottonwood Bar fire) and 2011 (Lake Tutusirok fire) resulted in vegetation monitoring and burn severity plots at 13 locations within the 2025 perimeter creating opportunity for additional study at un-burned, twice-burned, and thrice-burned field sites. Tundra fires often burn into the organic soil material which can impact vegetation succession and have the potential to release ancient, stored carbon. These plots, if resampled, offer opportunity to study the impacts of shortened fire return intervals in tundra ecosystems.

Kobuk Valley - Subarctic Wildfires - the Goldrun Complex

The Goldrun Complex demonstrated how quickly lightning ignitions can spread in Northwest Alaska's tundra-spruce landscapes under very dry midsummer conditions. Nine fires ignited July 6–9 and expanded rapidly across tundra, scrub, and spruce while the Kavet Creek RAWS recorded

extreme fuel dryness. Rain after July 20 slowed growth, shifting management to resource assessment. The complex burned riparian habitats, lowland boreal forests, and caribou migration areas within Kobuk Valley National Park, offering opportunities to study postfire response in diverse ecosystems (Figure 4). Much of the area was designated or eligible wilderness; natural fires drive vegetation change and habitat renewal. NPS Alaska Fire Planner, Sarah Hayes, contributed to Goldrun Complex 2025 Resource



Figure 4. Aerial view of active wildfire within the Goldrun Complex in Kobuk Valley National Park, highlighting fire spread along riparian corridors within tundra–spruce landscapes during extreme midsummer dryness. *Photo: Alaska Fire Service.*

Advisor (READ) Report which provides a comprehensive overview of resource issues associated with this fire complex (available on request).

Gates of the Arctic – Arctic Subalpine Wildfires - Redstar and Michigan Fires

The Redstar (AKTAD-000248) and Michigan (AKTAD-000247) fires, discovered June 20 in Gates of the Arctic, burned about 20 miles apart in the same Brooks Range watershed. They affected tundra, shrublands, and sparse spruce in a subalpine zone with limited prior study. Redstar burned ~170 acres before being declared out August 26; Michigan reached ~1,534 acres. Remote imagery shows varied burn severity across diverse fuels and topography.

Because no formal fire effects studies have been conducted in Gates of the Arctic, these two fires present an important opportunity to assess burn severity and begin establishing long-term monitoring of postfire successional recovery in subalpine environments and potential connections to current studies of hydrological change underway in the Arctic ([Rusting of Wild and Scenic Rivers in Alaska Arctic National Parks \(U.S. National Park Service\)](#)). These baseline assessments would help fill a geographic and ecological gap in Alaska's fire effects datasets and support future understanding of fire-driven change in the Brooks Range.

B. Monitoring Results and Management Implications

Results from in-house monitoring, together with published research, are used by the Fire Ecology Program to provide feedback to the NPS Fire Management Program and interagency partners on management activities and the ecological effects of wildfire. Since 2001, the Alaska Regional Fire Ecology Program has established more than 1,000 monitoring sites across Alaska NPS units (Table B-1; Figure B-1 and B-2). A list of fuels treatment and fire effects monitoring plots established or revisited in 2025 is provided in Table 1.

Monitoring projects conducted across Alaska NPS units in 2025 addressed fuels treatment effectiveness and extent of impact, wildfire effects, and long-term ecological change, with Table 3 summarizing management objectives and results for the Denali Frontcountry hazard fuels project and subsequent sections describing project outcomes.

Table 3. 2025 Management objectives and monitoring results

Monitoring Unit	Management Objective	Monitoring Results (w/level of certainty)	Progress Towards Meeting Objectives
Denali Frontcountry Hazard Fuels Reduction	258 spruce/acre (e.g., 10 ft crown spacing assuming 1.5 ft crown radius)	- Stem density = 490 spruce/acre; crown spacing = 7 ft 80% confidence 440-540 spruce/acre; n = 26 plots.	- Mean stem density was reduced by 68% during first treatment. - Crown spacing increased by 64% (from 2.5 to 7 ft). The objective of 10 ft crown spacing was met at 8% of plots.
	>6 ft ladder fuel height	- Excluding stems < 5 cm in diameter, mean height to dead ladder fuels = 4.2 ft 80% confidence 3.9-4.5 ft; n = 26 plots.	- Height to ladder fuels increased by 80% during first treatment. - The objective of 6 ft ladder fuel heights on spruce was met at 15% of plots.
	20% retention of understory spruce (<10 cm dbh)	23% of understory spruce were retained across all plots (n = 26).	The objective of 20% retention of understory spruce was met at 57% of plots and in 3 of 5 treatment areas.

Hazard Fuels Treatment Monitoring

Fuels reduction projects are monitored by Fire Ecology staff to ensure that work meets project objectives and limits unintended outcomes. By monitoring over the short- and long-term, local staff and NPS managers gain perspective on the effectiveness and ecological effects of fuels reduction actions.

Denali Frontcountry Fuel Reduction and Pile Burn (DENA)

Western Area Fire Management and Denali National Park and Preserve are engaged in a multi-year effort to expand the footprint of previous “FireWise” fuel treatments - historically focused on fuel reduction within 100 ft of at-risk structures - to a broader swath of the Denali front country. This expanded approach is designed to protect high-value park infrastructure in one of the nation’s most iconic national parks by improving defensible space along critical ingress and egress routes, around

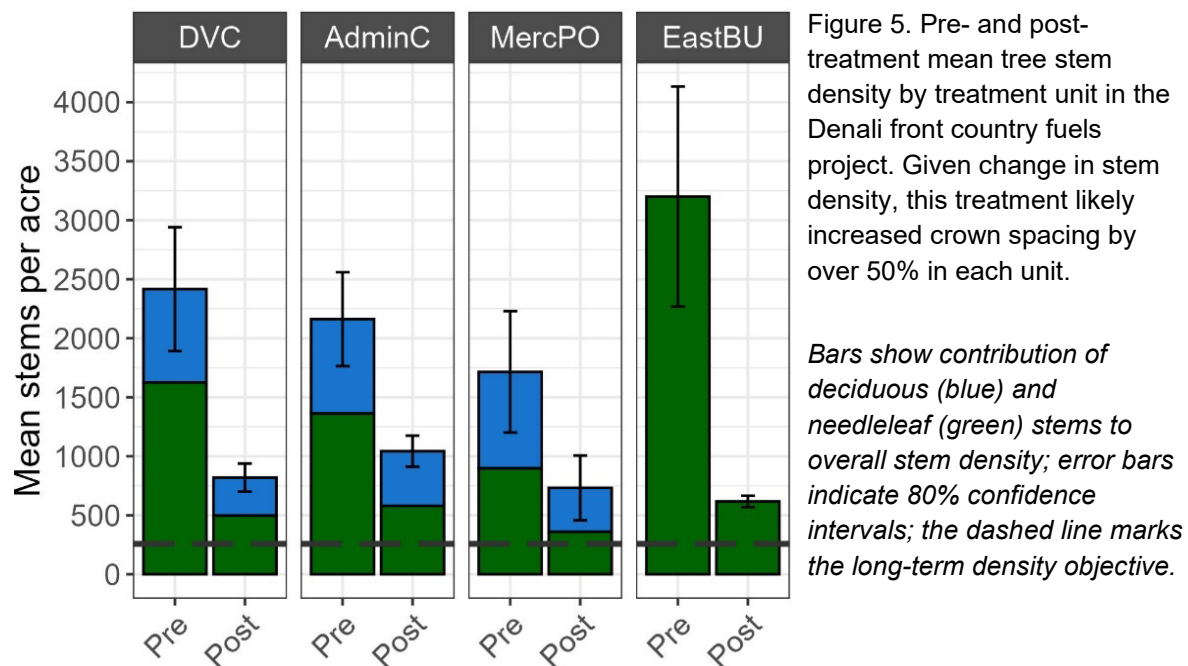
operational safety zones, and adjacent to developed areas that support visitor access and park operations.

To ensure treatments meet fuel reduction objectives and limit unintended consequences, monitoring efforts are in place to track the outcomes. Results summarized below draw from previously installed monitoring plots in active treatment units (Table 1). Monitoring units correspond to operational fuel treatment areas (shaded fuel breaks) within the Denali frontcountry, adjacent to high-value NPS infrastructure at the Denali Visitor Center (DVC), Admin Camp (AdminC), Mercantile and Post Office (MercPO) and east of the Buildings and Utilities office and workshop areas (EastBU). Due to unit proximity and for ease of presentation, some units are combined for analysis. Plot monitoring and results reporting proceeds in pace with fuel treatments.

Fuel Reduction Objectives

By 2025, pre- and post-treatment monitoring had been conducted at 26 plots associated with post-2023 thinning projects. Overall, fuel reduction objectives have not been met in the first round of treatment, but significant progress has been made.

Crews removed a mean of 1,070 spruce stems per acre. With 41 acres of treatment in 2025, that is an estimated 40,000 spruce stems. Crown spacing was increased by 64% but is still less than the prescribed amount (Table 3, Figure 5). Similarly, ladder fuels were reduced, but trimming work remains to reach the management objective of a 6ft ladder fuel height (Table 3).



There is intention behind not meeting the treatment objectives in the first treatment. Removal of too many trees too fast could result in extensive windthrow. A period of ‘forest hardening’ after one treatment is considered a more practical approach.

Resource Objectives

Due to an ongoing infestation of the native spruce beetle (*Dendroctonus rufipennis*), fuels crews were directed to retain young spruce likely to survive the current outbreak. This objective is intended to preserve forest status at sites over the longer term. Overall, the retention objective was met, with a retention of ~23% of trees < 10 cm in diameter (Table 3). At two of five cut units (the Mercantile and Post Office) this target was not met, but note that these units were cut in 2022, before the direction to retain young spruce was advised.

Post-Pile Monitoring (Pile Density & Tree Damage)

After piling is complete, but before burning, the WAFM Fire Ecology team performs an additional monitoring stage (“post-pile monitoring”) to gain a better understanding of pile density and how that effects plot-level vegetation over time. This may help decide when or where it may be better to produce fewer large piles vs. more small piles. Preliminary comparison of pile density indicated, not surprisingly, that forests with more vegetation of small size classes (i.e., EastBU) produced a higher pile density of small volume piles (Table 4).

Table 4. Preliminary comparison of pile density, pile volume and tree damage (any amount of torch or scorch) across two treatment units with the Denali front country Fuels Reduction projects. Mean density and volume values include 80% confidence intervals calculated across plots and piles measured in each unit.

Treatment Unit	# Plots, Piles, Trees Measured	Pile Density (piles/acre)	Mean Pile Volume (ft ³)	% Trees Missing or Dead	% of Trees Damaged	Mean Damage Height (m)
MercPO	2, 8, 15	20 ± 16	322 ± 53	6	40	6.4
EastBU	3, 19, 33	32 ± 13	246 ± 115	9	55	3.9

After treatment is complete, and all piles are burned, the team goes back again to assess tree damage or mortality associated with the pile-burning phase of treatment (Table 4). Higher mortality and damage were observed at the EastBU unit as compared to the MercPO units. As treatment progresses in the front country, and sample size of post-pile monitoring increases, this dataset will become increasingly valuable.

Management Implications

Initial thinning and pile-burn treatments made substantial progress toward fuel reduction objectives, supporting continuation of a phased, multi-entry approach that allows for forest hardening and reduced windthrow risk. Follow-up treatments should prioritize units where crown spacing, ladder fuel height, or pile-related tree damage indicate a need for additional thinning or adjustment of pile size and density.

Wildfire Monitoring

Riley Fire Burn Severity & Emergency Stabilization (DENA)

In 2024, Denali experienced the first notable front country fire in 20 years. The Riley Fire burned 436 acres through mixed spruce and deciduous forest, transitioning upslope through dense alder and into tundra. A burned area recovery (BAER) team was ordered and documented a need for emergency stabilization of cultural and natural resources within the Riley Fire perimeter in 2025.

Objectives of 2025 monitoring work at Riley included (1) verify ground-based burn severity (CBI) in comparison to remotely sensed burn severity; (2) assess initial 1-year post-fire effects including establishment of invasives; and (3) provide meaningful fire ecology educational experiences to work groups.

All objectives were met at the Riley Fire this year, with data recorded at 37 plots (Table 1)., 13 populations of invasives identified and treated, and near 30 people accompanying fire ecology staff to experience fire impacts firsthand (Figure 6, Figure 19). An accomplishment report on 2025 BAER activities is available on request.

Preliminary comparison of field-derived CBI ratings to remotely sensed values indicate relative concurrence with some interesting patterns. Sites classified with pre-fire vegetation of closed tall scrub exhibited the lowest burn severity, while open needleleaf forest had the highest burn severity.

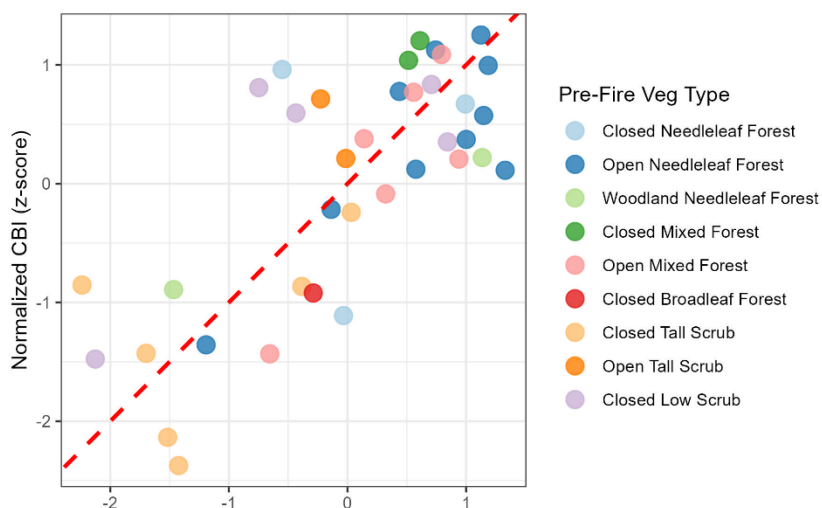


Figure 7. A comparison of field- and satellite-derived measures of burn severity in the Riley Fire. If dNBR perfectly predicted CBI, values would align along the red-dashed line. In plots below the line, dNBR under-predicted field-validated CBI (i.e., in the open needleleaf forest class).



Figure 6. Fire effects technicians Hannah Albers and Paige Paulsen conduct post-fire burn severity in the Riley Fire and celebrate their mushroom finds.

Satellite-derived dNBR seemed to under-predict field-measured severity in the open needleleaf forest and over-predict field-measured severity in open tall scrub. These initial post-burn estimates will be integral to further monitoring of vegetation recovery in the Riley fire.

Management Implications

One-year post-fire monitoring at the Riley Fire confirms the value of ground-based burn severity (CBI) for interpreting fire effects across a subset of Denali front country vegetation types.

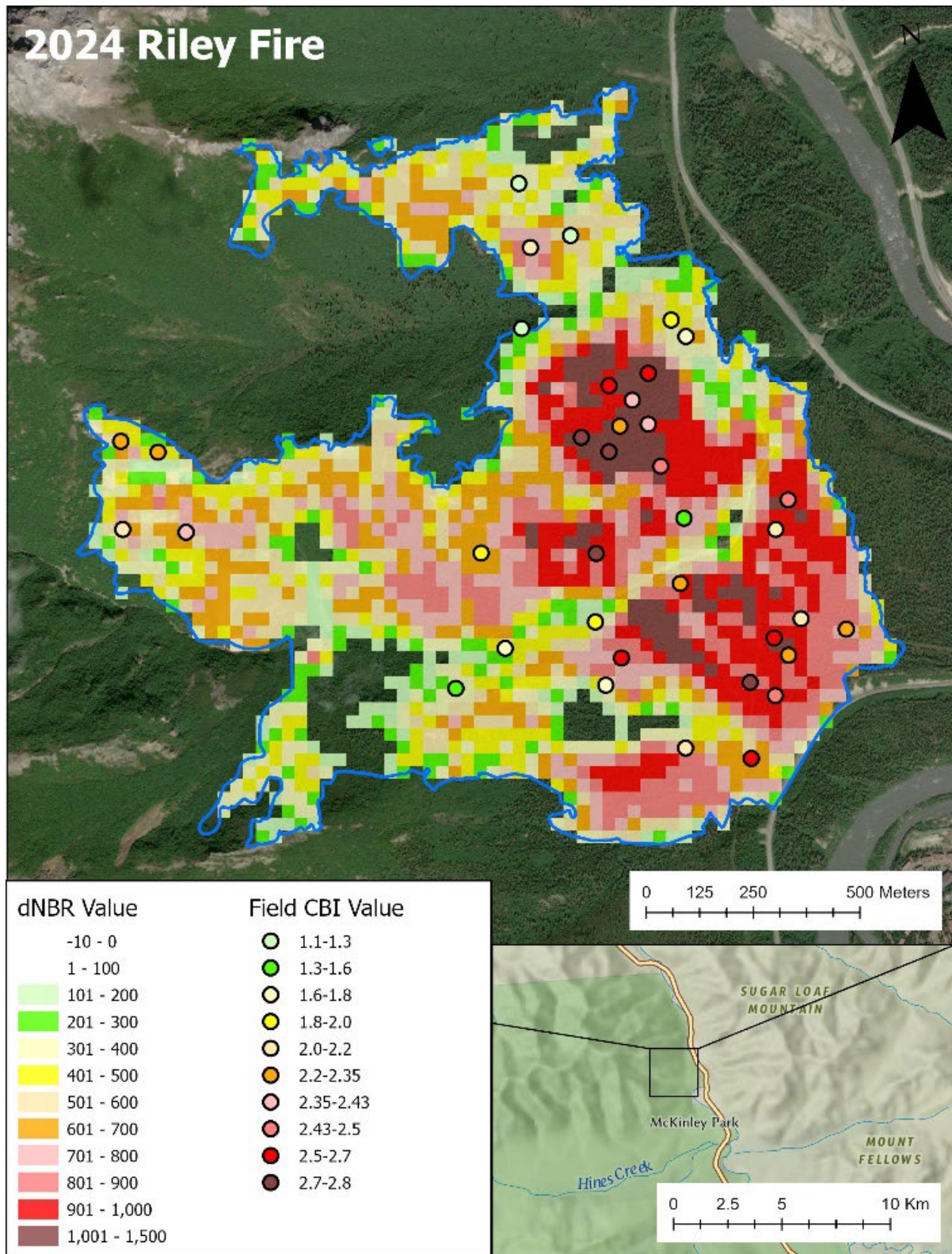


Figure 8. Spatial comparison of satellite-derived burn severity (dNBR) and ground-based burn severity (field CBI) across the Riley Fire, illustrating patterns of fire effects observed on the ground relative to remote sensing estimates.

Chakina-Steamboat Wildfire Monitoring (WRST)

The purpose of this long-term monitoring study is to compare post-fire ecological changes in areas that burned once with changes in areas that burned twice in short succession in a boreal forest region known for relatively long fire return intervals. This area provides a unique opportunity to study the ecological effects of shortened reburning intervals.



Figure 9. The same monitoring plot one year (left) and nine years (right) after burning for a second time, illustrating changes in vegetation structure following two fires that occurred seven years apart—an uncommon sequence in much of Alaska, where wildfire is typically infrequent. Early post-fire ground cover, including dominance by *Ceratodon* moss, reflects short-term recovery processes that influence subsequent vegetation development.

Following an initial delay in June of 2025—when our helicopter was reassigned due to increasing fire activity after one day of fieldwork—we successfully returned to the Chakina-Steamboat fire scars in early August and completed the planned sampling of 40 plots (example plot shown in Figure 9, Table 1). In 2024, our efforts focused on soil-related parameters, including the collection of soil samples for fungal community analysis. During 2025, we concentrated on vegetation metrics and additionally collected seedling roots for assessment of symbiotic fungal association (Figure 10). Approximately half of the sampled plots experienced a single burn in 2009, while the remainder burned twice, in 2009 and 2016.

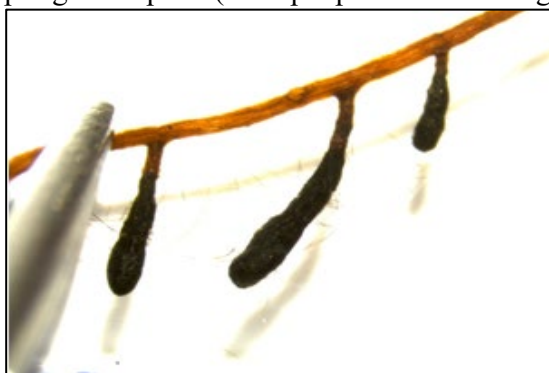


Figure 10. Image of seedling root tips showing symbiotic colonization by mycorrhizal fungi. Every excavated seedling had colonized root tips, indicating that the fungal partnerships critical for seedling nutrient uptake and survival in post-fire boreal soils are already re-establishing.

Although analyses are ongoing, preliminary results for seedling and sapling densities reveal distinct patterns between plots burned once and those burned twice. Seedling densities differ substantially: once-burned plots support higher densities of black spruce and aspen seedlings per

acre compared to twice-burned plots (Figure 11a). In contrast, sapling densities are similar across burn histories, dominated by aspen in both cases, with a few black and white spruce individuals in once-burned plots reaching DBH size (Figure 11b).

A plausible explanation for this pattern—similar sapling density but divergent seedling density—relates to differences in organic layer consumption during fire. Twice-burned plots lost most of the organic mat, exposing mineral soil that was rapidly colonized by the moss *Ceratodon purpureus* (visible as the reddish-brown ground cover in Figure 9). This moss forms a dense layer that likely inhibits further seedling establishment beyond the initial post-fire cohort. Conversely, once-burned plots retained substantial organic material, providing a more favorable substrate for ongoing seedling germination. The strong aspen seedling cohort in these plots is somewhat unexpected, as aspen typically germinates more successfully on mineral soil.

Management Implications

Long-term monitoring reveals that shortened reburn intervals can alter post-fire regeneration pathways by increasing organic layer loss and promoting early dominance by disturbance-adapted mosses. These results help managers anticipate altered recovery trajectories in reburned areas and reinforce the value of continued monitoring to inform expectations for forest recovery and resilience.

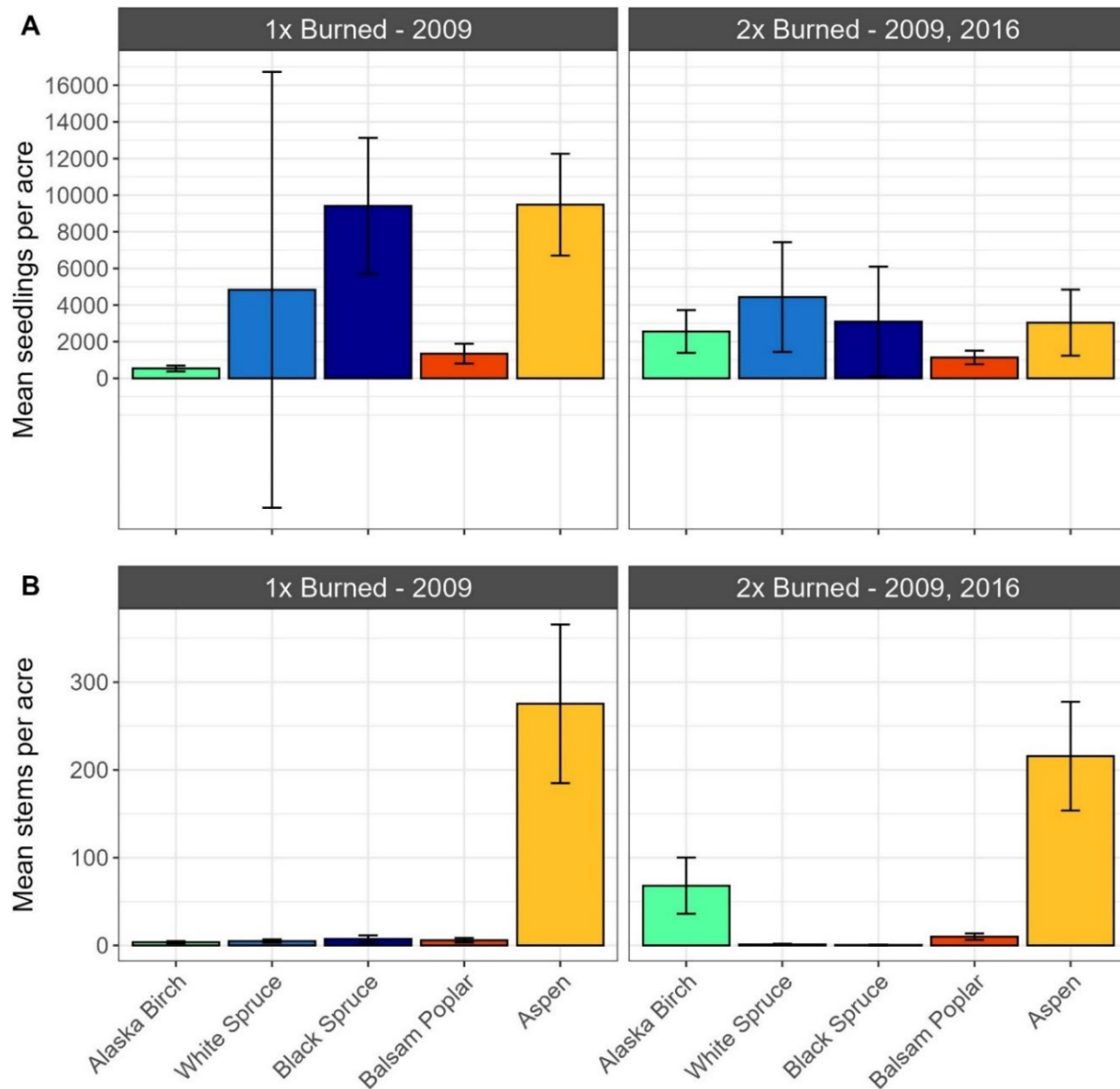


Figure 11. Comparison of live seedling (A) and sapling (B) density between once- and twice-burned plots in the Chakina–Steamboat wildfire study area. Strong differences in seedling density, but similar sapling densities, point to post-fire substrate conditions, rather than time since fire alone, as an important control on regeneration following repeated burning.

Andrew Cr/Ben Cr Wildfire Monitoring (YUCH)

We revisited vegetation monitoring plots that are part of the Central Alaska Network Inventory and Monitoring Program. These plots were originally established in 2008 and subsequently burned in 2018. In 2019, the Fire Ecology team collaborated with the I&M team to remeasure the plots one-year post-fire. During the 2025 field season, a joint Fire Ecology and I&M team resampled 28 plots located along the Yukon River in Yukon-Charley Rivers National Preserve (Table 1). Nine of these plots were part of the original 2008 sampling; one remained unburned, while the others burned at varying severities.



Figure 12. Photo series from the Andrew Creek/Ben Creek wildfire monitoring site showing conditions before fire (2008; left), one year after the 2018 wildfire (2019; middle), and seven years after fire (2025; right). The sequence illustrates how wildfire initiates long-lasting changes in forest composition and structure, including a shift away from dense black spruce toward deciduous regrowth at higher burn severities

Prior to the fire, these sites supported dense black spruce forest (Figure 12, photo left) with a shallow active layer (<30 cm; Figure 13, green bar) overlying permafrost. Analysis of the 2025 vegetation data is ongoing, but initial observations indicate substantial regrowth of Alaska birch in plots that experienced higher burn severity.

Active layer thickness—the depth of seasonal thaw above permafrost—continues to increase in burned areas (Figure 13), elevating the potential for talik formation (perennially unfrozen soil layers within permafrost zones). In contrast, active layer depths at nearby control sites have remained relatively stable over the same period. Field observations also indicate ongoing permafrost degradation, including exposed ground ice within local drainages.

Monitoring plots affected by the 2018 Andrew Creek fire, along with one unburned control plot, were equipped with temperature sensors installed 10 cm below the mineral soil layer to track post-

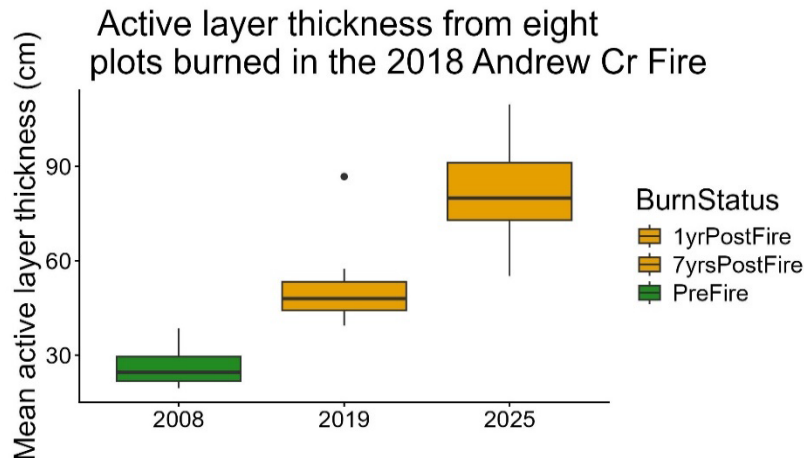


Figure 13. Active layer thickness measured in eight plots before fire (2008) and one and seven years after the 2018 Andrew Creek Fire (2019 and 2025), showing deeper seasonal thaw persisting in burned areas over time.

fire soil temperature changes. Mean annual soil temperatures in burned plots remain higher than those in the control plot starting two years post fire, although this difference appears to have stabilized (Figure 14). Notably, burned plots exceeded the 0 °C threshold in 2022, likely due to the insulating effect of an unusually heavy snowpack that winter.

The control plot also exhibited a marked increase in mean annual soil temperature beginning in 2022.

Crossing the freezing threshold is a critical indicator of ongoing permafrost thaw ([Crossing the Zero-Degree Threshold \(U.S. National Park Service\)](#)).

Management Implications

Wildfire effects at Yukon-Charley Rivers National Preserve include persistent changes in vegetation, permafrost, and hydrology that may affect ground stability along the Yukon River corridor. These changes combined with a changing climate may alter fire regimes and thus, fire frequency and severity which will impact fire management practices.

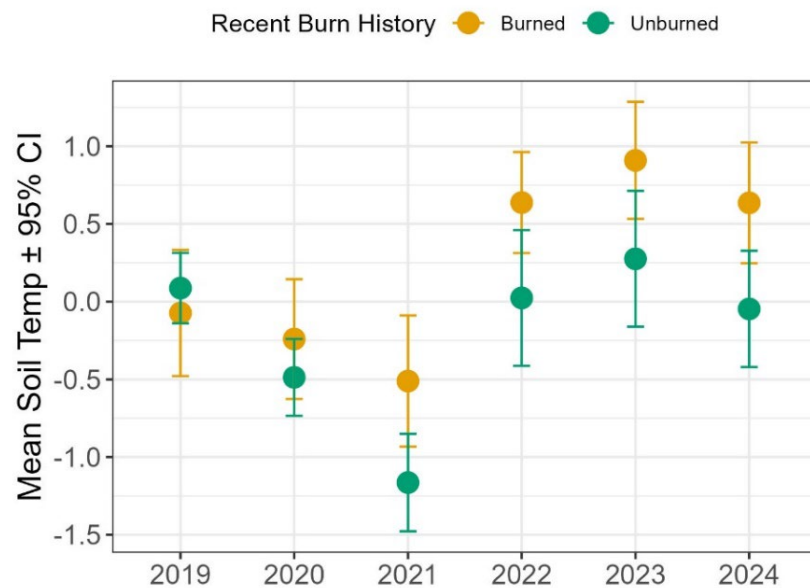


Figure 14. Mean annual soil temperature ($\pm 95\%$ CI) from eight burned plots and one unburned control plot. Temperatures were recorded hourly and summarized as annual means, showing consistently warmer soil conditions in burned areas following wildfire.

C. Research, Planning, and Communication

Research Support

In 2025, fire ecology research support focused on securing targeted funding and providing administrative, field, and logistical assistance for priority projects aligned with park fire management needs (Table 5).

Table 5. Research proposals, funding outcomes, and fire ecology research support by park, 2025.

Park	Research needs identified in FMP?	# Proposals Submitted in 2025	# Proposals Funded in 2025	# Research Projects Supported in 2025
Denali	Yes	0	2	3
Wrangell-St. Elias	Yes	0	1	1
Multi-Park	n/a	0	0	0

Denali National Park and Preserve

- Alaska Geographic Direct Support funds requested and awarded to support moving fire ecology data toward management dialog.
- NRAC funds secured through a CESU agreement with William and Mary University (M. Chipman) to assess fire history.
- Research projects supported:
 - Administrative, field, and logistical assistance for *Pile Burning Effects on Boreal Soils* (Northern Arizona University, M. Behrens).
 - Administrative, field, and logistical assistance for *Ecosystem Engineers: Insect Diversity Amongst Fuels Changed by Spruce Beetle* (U.S. Geological Survey / University of Alaska Fairbanks, R. Burner and D. Sikes).
 - Field assistance provided to the Alaska Department of Forestry (J. Moan) to maintain spruce beetle trapping effort within the park.

Wrangell–St. Elias National Park and Preserve

- Research reserve fund supported investigations into the role of post-fire root-associated fungi in forest regeneration (collaboration with Amherst College, R. Hewitt).

Multi-Park

- SCC funding secured for FY 2026–2028 to add a new dendrometer sensor network to six existing NPS weather stations to precisely link white spruce phenology, high-resolution growth dynamics, and drought stress to weather conditions (collaboration with NPS I&M climate monitoring).

Research Project Highlights

The following project highlights are a showcase of research, planning, and communication efforts completed or advanced in 2025. Together, these examples reflect the Fire Ecology Program's commitment to applied science, strong partnerships, and translating fire ecology information into tools and insights that support management, operations, and public understanding.

Long-Term Fire History in the Denali Front Country (DENA)

Completed Research

In Alaska's boreal forests, fires are typically stand-replacing, meaning fire scars on living trees are rarely preserved. As a result, lake sediments and peat deposits provide some of the only practical ways to reconstruct fire history over centuries to millennia in this region. Field research led by Dr. Nancy Bigelow (University of Alaska Fairbanks) in 2023 and 2024 and funded through the NPS Research Reserve Fund instigated the first phase of a longer-term effort to understand fire patterns in the Denali Front Country over timeframes that extend beyond modern fire records.



Figure 15. Spruce needles isolated from peat deposits and submitted for radiocarbon dating as part of long-term fire history reconstruction in the Denali Front Country.

Analyses in 2025 focused on radiocarbon dating of a peat monolith collected just south of Cantwell in fall 2024. The monolith preserved organic material from the last ~5,000 years, with the upper portion capturing the past 2,000 years in greater detail. Analyses examined charcoal (as an indicator of past fire activity), spruce needles (reflecting local spruce presence), and insect remains that may be associated with beetle activity (Figure 15). Results suggest that some periods of elevated charcoal in the peat broadly overlap with fire episodes identified from nearby lake sediment cores, extending the known fire history for the region. Although clear relationships among fire activity, spruce abundance, and beetle remains were not evident, the work establishes an important baseline and material for future studies. Annual reports summarizing Dr. Bigelow's work are available upon request.

Upcoming Research

Building on this foundation, a 2025 service-wide comprehensive call funded research effort led by Dr. Melissa Chipman (William & Mary University) will begin in 2026. The work will expand lake coring to additional sites in Denali Front Country, with the goal of collating these initial records and extending fire history reconstructions back approximately 7,000–10,000 years. In addition, there is potential for future work to explore complementary approaches for detecting past beetle activity, including whether DNA-based methods applied to peat or lake sediments could augment traditional insect identification.

Management Implications

Together, this work provides managers with a much longer-term perspective on the range of fire conditions that have occurred naturally in the region, helping place recent fire activity and proposed fuels treatments within a broader historical context.

Pile Burning Effects on Boreal Soils (DENA)

Graduate student Matt Behrens (Northern Arizona University) defended his master's thesis "Fire's Footprint: Understanding Soil Heating & Fire Effects in Denali's Prescribed Pile Burns in November 2025, a culmination of several years' effort. Matt was a seasonal fire effects monitor at Denali in 2022 and returned in spring of 2024 to begin his research. He worked closely with Alaska Western Area Fire Management and DENA staff to develop research questions, design and execute the experiment, and stay grounded in management relevant outcomes to ensure results were directly applicable to fuels treatment planning and implementation. The study evaluated soil heating, organic layer consumption, nutrient response, and carbon emissions associated with operational pile burning. Data collected and compared across spring and fall burn periods, and across varying pile size and composition.

Results showed that pile burn effects are highly localized and remain confined to the footprint of the piled material. Pre-burn organic layer depth was the primary control on soil heat exposure and the depth of organic soil consumption, though season of burn influenced outcomes. Spring burns conducted over frozen soils resulted in less soil heating, less organic matter consumption, and lower carbon emissions than fall burns (Figure 15). Pile size did not influence burn depth, but pile composition did- with proportion of larger size-class fuels (i.e., log rounds) generating deeper burn depths. Overall carbon emissions from pile burning were substantially lower than those associated with typical boreal wildfires.



Figure 16. When pile burning in spring, thoroughly frozen soils buffer heat penetration from reaching deeper soil layers. Photo by M. Behrens

The study provides valuable information for land managers to consider when conducting pile burn operations. Focused on "operational levers", results are put into a decision-making space wherein land managers could alter operational actions (i.e., pile composition or season of burn) to achieve desired results while limiting impacts to soils, permafrost, and cultural resources. The completed study also established a well-documented set of pile burn footprints that will support future monitoring of vegetation recovery and soil response. A research brief summarizing the work is available upon request.

Management Implications

These findings support refinement of pile burning prescriptions to better align operational decisions with resource protection objectives.

Wildfire Effects on Lakes (YUCH)

The Eastern Area Fire Management program partnered with, and partially funded, the YUGA aquatic ecologist to sample water chemistry, carbon age, methane emissions, and littoral vegetation in 70 lakes across YUCH, spanning a gradient of time since fire. Wildfire combined with a warming climate is driving profound, cascading changes in permafrost-underlain watersheds of interior and northern Alaska ([The rippling effects of a warming climate and wildfire on lakes in northern Alaska](#)).

These shifts have the potential to alter lake chemistry and the communities of plants, insects, and waterfowl that depend on

these systems. This collaboration leveraged the expertise of a park aquatic ecologist to capture wildfire impacts beyond what our vegetation-based protocols can measure. Radiocarbon age results indicate lakes near recent fire scars contain substantially older carbon (Figure 17), suggesting that permafrost-stored carbon is being mobilized and released—changes that may restructure lake food webs.

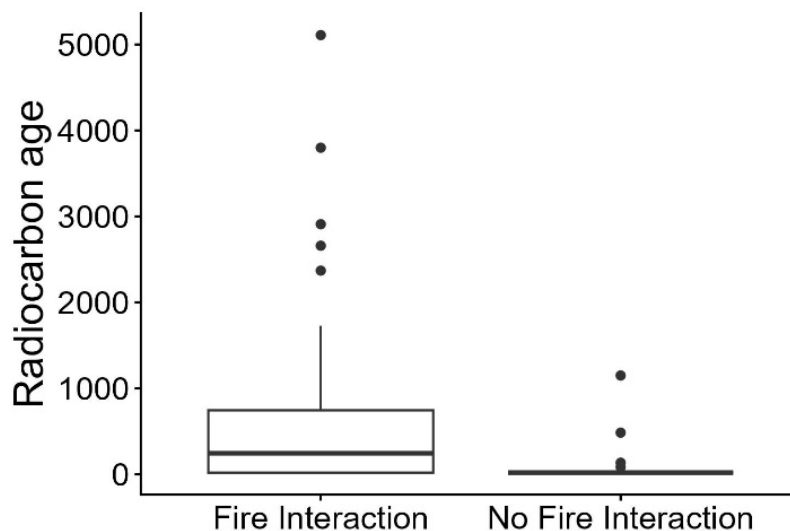


Figure 17. Radiocarbon ages of carbon in 34 lakes across Yukon–Charley Rivers National Preserve, comparing lakes with recent wildfire interaction (within the last 60 years) to lakes without nearby fire interaction, highlighting differences in carbon sources associated with wildfire-affected landscapes.

Management Implications

Results underscore the importance of considering post-fire effects on lakes and aquatic food webs when managing subsistence resources and wildlife in Yukon-Charley Rivers National Preserve. Changes in lake chemistry and carbon dynamics have the potential to influence aquatic productivity and the species that support subsistence use and wildlife populations.

Scientist-in-Parks (SIP) Mentorship

During the winter of 2024–25, five Scientist-in-Parks (SIP) servicemembers were hired to advance priority projects under guidance of NPS Alaska fire ecologists. Collectively, these internships substantially expanded program capacity and produced durable products that support management and reporting.

Living with Fire Website Redesign

Joseph Norvilas, (Denali National Park and Preserve) collaborated closely with interpretive staff and the Regional Fire Communications specialist to expand and improve fire management web content ([Living With Fire - Denali National Park & Preserve \(U.S. National Park Service\)](#)). Joseph created video products highlighting current fire ecology research and significantly expanded the reach, clarity, and relevance of fire ecology information available to managers, partners, and the public.

Forest Disturbance Outreach & Engagement

Mariana Perez (Denali National Park and Preserve) led an effort to gather fire ecology and forest disturbance information in a new way using her artistic talents to illustrate [Spruce Beetle in Denali - Denali National Park & Preserve \(U.S. National Park Service\)](#), Figure 18). She also led the planning and implementation of a new community-science opportunity. Simple stands were set up along three popular front country trails to allow people to easily contribute photos taken to the [Denali National Park & Preserve Chronolog](#) – a tool that lets communities create and explore time lapse photos of natural places. Overall, between May and September 2025, visitors contributed 870 photos.

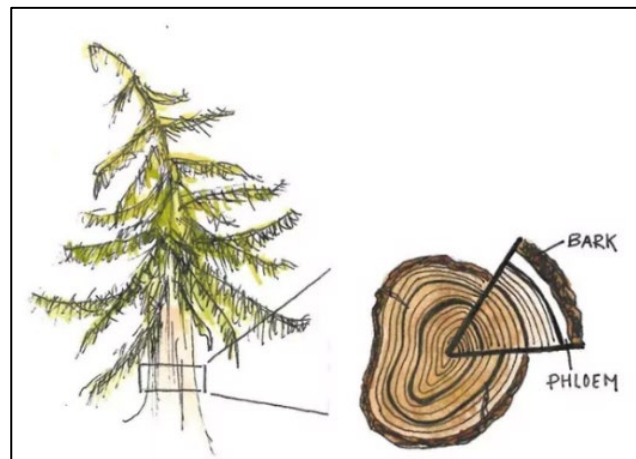


Figure 18. An illustration by SIP and fire effects technician Mariana Perez, created as a part of new forest disturbance web content.

FFI to Fire Modeling Data Input

Sarah Martin (Denali National Park and Preserve) conducted extensive QA/QC and synthesis of Fire Effects Monitoring data, transforming field-collected FFI datasets into defensible, stand-level metrics suitable for fire behavior and effects modeling. By integrating multiple protocols into unified outputs, this work strengthened the empirical foundation for fire modeling and improved the direct application of monitoring data to decision support.

Automated Fire Statistics Reporting

Megan Tomerlin (Fairbanks) advanced the development of automated workflows for visualizing and reporting wildland fire statistics, fire history, and seasonal trends. These efforts improved efficiency, consistency, and reproducibility of reporting products used in annual reports, fire management plans, and Arctic Network I&M reporting, reducing manual effort while improving analytical transparency.

Fire Ecology Data Archiving

Georgia Houde (Fairbanks) led major advances in fire ecology data archiving and spatial documentation, organizing and archiving Alaska Fire Ecology Program datasets for long-term access and reuse. This work included statewide mapping of more than 1,700 fire ecology plot locations, preparation of annual report maps, and archiving project data and summaries to support future synthesis and transparency.

Planning and Compliance

The Fire Ecology Program is actively involved in fire management planning and monitoring guidance across Alaska parks. The Assistant Fire Ecologist provided targeted technical support on specific sections of Fire Management Plans for KEFJ, GLBA, and KLGO.

In 2025, the Alaska Fire Ecology Program developed the Monitoring Plan component of the *NPS Alaska Fire and Fuels Monitoring Program Manual*, establishing a program-level framework for fire and fuels monitoring across Alaska parks. Building on foundational work by Jennifer Barnes and Jennifer Hrobak, the Monitoring Plan reflects years of monitoring experience and refinement and improves clarity, consistency, and flexibility in how monitoring is planned and documented.

This effort consolidated monitoring goals, scheduling guidance, and documentation practices that were previously distributed across multiple circular plot protocol documents into a single, cohesive framework. While neither the Monitoring Plan nor the Field Protocols were finalized in 2025, both were substantially developed and are expected to be completed and implemented in early 2026.

Outreach and Communicating Results

Committee Service and Interagency Collaboration

Active participation in interagency committees and formal working groups strengthens Alaska's capacity to align fire research, management, and policy across organizations. Through these efforts, National Park Service (NPS) Alaska Fire Ecology priorities are integrated with regional and national fire management strategies.

NPS Alaska Fire Ecology supports statewide applied fire science through active involvement in the Alaska Interagency Fire Research, Development, and Application Committee (FRDAC) of the Alaska Wildland Fire Coordinating Group. In 2025, the Assistant Regional Fire Ecologist chaired FRDAC and led an interagency survey to identify research needs and guide Joint Fire Science Program priorities. In 2026, the Eastern Area Fire Ecologist will serve as FRDAC Vice Chair. Additional AWFCG engagement includes participation in the Fire Modeling and Analysis Committee (FMAC) and the Invasive Species Committee.

Program staff also participate in a broad set of NPS, interagency, and research coordination groups that support science delivery and management applications. These include the Alaska Fire Science Consortium Advisory Board, Fire Weather Predictability Services (FiWEPS), the Alaska Geospatial Council Vegetation Working Group, coordination with Alaska LANDFIRE partners, the NPS Arctic Network Technical Committee, NPS Resource Advisor regional coordination, AKR Regional Post-

Fire and Burned Area Emergency Response (BAER) coordination, the Natural Resources Advisory Committee, the NPS Fire Ecology Regional Ecologist Group, the NPS National Fire Ecology Group, the Alaska Interagency Fire Ecology Group, and multiple researcher working groups supporting ongoing fire ecology and fire effects research.

Educational Outreach

- WAFM Ecologist led a 3-day Boreal Forest Ecology course through Alaska Geographic (10 participants). They also led one day of the Project Learning Tree Fire Ecology course engaging 10 teachers with a Riley Fire field visit.
- EAFM Ecologist taught the weather station and climate monitoring portion of a week-long immersive teacher workshop.
- EAFM and Asst. Regional Ecologists volunteered with the annual “Wilderness Trek” at the Fairbanks Alaska Public Lands Information Center, wilderness training for 4th graders.
- Asst. Regional Ecologist gave a fire ecology presentation to the 5th graders at Boreal Sun Charter School in Fairbanks.
- WAFM Ecologist collaborated with the local 9th graders in a three-part classroom and field investigation exploring (1) how the land recovers from fire and (2) how we can prepare the land for fire. Students collected data on post-fire recovery during a fall field trip (Figure 19).
- WAFM Ecologist participated as part of the Wildland Fire Apprentice Advanced Academy cadre for the Intro to Fuels course at two deliveries.



Figure 19. Tri- Valley School 9th graders measured fire effects at both coniferous-dominated and deciduous-dominated forest sites in plots designed to be revisited each school year. At left, a student uses a Cruzal to estimate basal area of tree species. At right, a student counts seedlings by species.

Reports and Informal Publications

In 2025, the Alaska Region Fire Ecology Program focused on production of practical communication products and summaries that support park operations, management decisions, and public understanding of fire in Alaska's landscapes. A list of informal publications, web content, and reports generated in 2025 is found in Section E. AKR success stories were not developed in 2025 due to a shift in communications emphasis from the national level or above.

Data Management

In 2025, all field data were entered into FFI, a program used to collect, store, and analyze ecological information for fire effects and monitoring projects. This was the second year that the program used a single, consolidated FFI database across all projects, rather than maintaining separate databases by regional area or by project. During 2025, the program continued focus on identifying and documenting known data quality issues with potential to affect data analysis efficiency or scope. Identified issues with species duplication and monitoring status inconsistencies were resolved.

D. Future Direction

Data Collection

In DENA, proposed work focuses on front country fuels treatment monitoring and selected long-term post-fire plot remeasurements. Additional projects under consideration include post-fire assessment and monitoring in NOAT, including revisiting Racine plots, fuels treatment monitoring at Brooks Camp in KATM, fuels reduction monitoring in WRST, post-fire assessments in GAAR, and legacy plot remeasurements in DENA. Several projects remain contingent on final funding, staffing, and logistics and may be phased or deferred.

Data Management

Future data management work will focus on cleaning up existing datasets and making fire effects information easier to access, understand, and use. Addressing known legacy issues and improving organization and documentation will help ensure data can be readily summarized, shared, and applied to support management decisions.

Data Analyses

In late fall 2025, the Fire Ecology Program selected two Scientists in Parks servicemembers to support a project focused on integrating field fuel moisture and winter weather data to improve understanding of spring conditions in Alaska. The work will support development of practical, user-oriented tools and guidance for staff. Both service members are expected to begin in February 2026. These servicemembers' positions are supported by the National Fire Ecology program climate futures project.

Planning Work

The full *Monitoring Plan and Field Protocols Manual* is expected to be finalized and rolled out in early 2026, providing a comprehensive, region-wide framework to guide fire and fuels monitoring into the future. The Monitoring Plan is intended for reference in park Fire Management Plans advising the general premise under which monitoring may be instigated but notably places the onus of critical monitoring strategies to be defined in project-specific Project Monitoring Plans. In 2026, full implementation of Project Monitoring Plans for the most important and complex projects will be prioritized, with input sought from the Alaska fire management team.

Staff Development

Future efforts will focus on improving and maintaining core competencies consistent with RM-18 standards and strengthening redundancy within the team to allow for adequate balance and resiliency. Building fire behavior analytical skills and fire modeling capacity will remain priorities to support fire management and planning needs. Central to these efforts is maintaining continuity as a closely knit fire ecology team that works collaboratively across parks, zones, and with interagency partners. Looking ahead, the Fire Ecology Program also anticipates adjusting to the formation of the U.S. Wildland Fire Service. While significant organizational changes are expected, the program remains committed to maintaining strong working relationships, supporting staff through transition, and continuing to deliver high-quality fire ecology science in support of park management.

E. References, Links, and Additional Reading

Informal Fire Ecology Related Briefs and Program Reports (Available Upon Request)

Pile Burning Research Brief: A four-page research brief targeted directly to fire and park managers summarizing the collaborative research graduate student Matt Behrens (Northern Arizona University) on the effects of pile burning on boreal soils.

Annual Wildfire Summary Briefing: A two-page region-wide overview of 2025 wildfire occurrence, area burned, and seasonal fire patterns.

AK Fuel Moisture Data in FEMS Review: Synopsis of fuel moisture data contributed by NPS Fire Ecology and other programs in AK. Summary of sampling effort and trends.

Riley Fire BAER Accomplishment Report: A five-page progress report on emergency stabilization work completed within the 2024 Riley Fire.

Peat Monolith Coring Report: *What Is the Natural Regime of Fires and Spruce Beetle Infestation in the Denali Front Country? Informing Fuels Treatments and Fire Management Plans.* A summary of 2025 activities and results from fire history study by Dr. Nancy Bigelow (UAF).

Goldrun Complex 2025 Resource Advisor (READ) Report: Documentation of resource protection actions during the Goldrun Complex in Kobuk Valley National Park; prepared by Jess Toubman and Sarah Hayes, with additional Resource Advisor Brendan Doucet (WEAR Archaeologist).

New Public-Facing Fire Ecology Stories and Media (2025)

- [Spruce Beetle in Denali - Denali National Park & Preserve \(U.S. National Park Service\)](#)
- [Living With Fire - Denali National Park & Preserve \(U.S. National Park Service\)](#)
- [Research to Support Fire Management - Video \(U.S. National Park Service\)](#)
- [Fuels Project Planning - Video \(U.S. National Park Service\)](#)
- [Prescribed Burn Project - Video \(U.S. National Park Service\)](#)
- [Fire Recovery - Photo Gallery \(U.S. National Park Service\)](#)
- [Alaska Wildland Fire Ecology - Photo Gallery \(U.S. National Park Service\)](#)

Protocol and Dataset References

- Mcmillan JM, Stehn S, Nicklen E. 2025. NPS Alaska FFI Fire Effects Monitoring Data. National Park Service. <https://irma.nps.gov/DataStore/Reference/Profile/2316477>
- Plot Monitoring Protocol, Version 1.0. Alaska Fire Management – Fire Ecology Program. National Park Service, Fairbanks, Alaska. <https://irma.nps.gov/DataStore/Reference/Profile/2272265>

Appendix A. Staffing and Accomplishments

NPS Alaska Fire Ecology Program Structure

In the NPS Alaska Fire Ecology Program, permanent staff work across three “zones” encompassing several park units each. Although each ecologist tracks monitoring needs within their distinct zone, integration of operations and sharing of seasonal staff resources has proven essential given the scale of Alaska’s 58 million acres of park land and the logistical complexity of field missions. A brief description of each zone is provided below.

Coastal Area Fire Management

The Coastal Area Fire Management Program, comprised of Alaska Region fire staff in Anchorage and Fairbanks who serve both regional and park-level roles, oversees fire management responsibilities in Aniakchak National Monument (ANIA), Glacier Bay National Park and Preserve (GLBA), Katmai National Park and Preserve (KATM), Kenai Fjords National Park (KEFJ), Klondike Gold Rush National Historical Park (KLGO), and Sitka National Historical Park (SITK).

Eastern Area Fire Management (EAFM)

The Eastern Area Fire Management Program, based in Fairbanks, oversees fire management responsibilities in Yukon–Charley Rivers National Preserve (YUCH), Gates of the Arctic National Park and Preserve (GAAR), and Wrangell–St. Elias National Park and Preserve (WRST).

Western Area Fire Management (WAFM)

The Western Area Fire Management Program, based in Denali National Park and Preserve (DENA), oversees fire management responsibilities in DENA, Bering Land Bridge National Preserve (BELA), Cape Krusenstern National Monument (CAKR), Kobuk Valley National Park (KOVA), Noatak National Preserve (NOAT), and Lake Clark National Park and Preserve (LACL).



Figure 20. Fire effects technicians and newly qualified FAL3-Qs Sarah Martin and Mariana Perez assigned to the NPS Alaska Range Suppression Module during an early July wildfire near Circle, Alaska.

2025 Program Staff Focus Areas

Table A-3. Fire Effects Crew 2025 Accomplishments/Focus Areas

Ecologist and Monitors	Position	Appointment Length	Training and Development
Jennifer Barnes	Regional Fire Ecologist	PFT	Not reported, retired Nov. 2025
Jennifer Mitchell	Asst. Regional Fire Ecologist	PFT	M-410, CAN290, Helicopter Mgr. Refresher, ATR training
Fleur Nicklen	Fire Ecologist Eastern Area	PFT	S-290, CAN290, RT-372, N9059, A-200, A-309, A-311, M-3
Sarah Stehn	Fire Ecologist Western Area	PFT	S-290, CAN290, ICS-300, Crucial Conv., Oper. Leadership for Sup., WFA; Instructor: WFAP
Chris Kopek	Lead Fire Effects Monitor	PSF - 18 pp (2/23-11/1)	Midwest Rx Support, WFA, MOCC; Instructor: RT130; HECM-Q
Mariana Perez	WAFM Fire Effects Tech.	Temp - 10.5 pp (4/6-8/30)	L-280, WFA, S-211; FAL3-Q, FEMO-T
Sarah Martin	WAFM Fire Effects Tech.	Temp - 15.5 pp (4/6-10/25)	S-271, WFA, S-211; FAL3-Q, HECM-T, FEMO-T
Olivia Lawrence	EAFM Fire Effects Tech.	Temp - 14 pp (4/20-10/31)	HECM qual.
Hannah Albers	EAFM Fire Effects Tech.	Temp - 13.5 pp (5/5-11/7)	A-100, S-130, S-190
Paige Paulsen	EAFM Fire Effects Tech.	Temp - 11 pp (5/5-10/04)	A-100

Table A-2. Fire Ecologist 2025 Accomplishments/Focus Areas

Category	AKRO % Time	AKRO Asst. % Time	EAFM % Time	WAFM % Time	Accomplishments and/or areas of activities
Planning	10	20	15	6	Time spent on monitoring plan or burn plan development and review.
Presentations/ reports	10	8	8	6	Scientific meetings, project presentations, education for park staff, public, etc.
Meetings/task groups	20	20	8	8	Time spent in park meetings or visits and on regional, national, and interagency committees or work groups.
Wildfire assignments	20	0	0	0	Time spent working as operational fire personnel on prescribed fire or wildfires.
Prescribed fire/fuels treatment projects	0	0	0	2	Time spent working as operational fire personnel on prescribed fire or fuels treatment projects.
Research	8	10	8	12	Preparation of funding proposals, agreements, research reviews, coordination with researchers.
Field work/data collection	0	5	18	20	Collection of field data, preparing for field work, travel to plot locations
Data management	5	15	18	20	Entering data from paper to FFI database, managing data in FFI, preparing and archiving data, and conducting QAQC
Data analysis	5	5	5	5	Data analyses, including data summaries and statistical tests and exploratory graphics
Supervision/ admin tasks	10	5	15	10	Hiring, supervision, payroll, travel authorization/vouchers, purchasing, etc.
Training	5	10	5	9	Estimated amount of time spent in training.
Miscellaneous	7	2	0	2	Assistance to other work groups or other duties not as above.

Table A-3. Fire Effects Crew 2025 Accomplishments/Focus Areas

Category	Lead % Time	Crew % Time	Notes
Data collection	15	22	Estimated amount of time spent collecting plot data; includes any preparation time and travel time to local plot locations
Wildfire assignments	22	18	Types of assignments: FFT1, FFT2, RXB3, FAL3-T, HECM-T, ENGB
Prescribed fire/fuels treatment projects	18	8	Assisting with non-fire fuels projects (mechanical fuel reduction using chainsaws) and prescribed fire (burn piles)
Travel out-of-park for plot or project work	10	7	Include <u>travel time only</u> for distant, multi-day plot/project work requiring a travel authorization (Note: include data collection or project time associated with these trips in the plot or project categories above)
Data entry/management	10	18	Estimated amount of time spent entering data from paper to FFI database, managing data in FFI, preparing or archiving data, and/or conducting quality control activities
Data analysis	0	2	Time spent assisting Fire Ecologists in data analysis tasks
Administrative activities	8	8	Payroll, travel authorization/voucher, etc., crew lead tasks
Training	15	15	In-park and NPS/interagency training in classroom, webinar, or self-guided form
Miscellaneous	2	2	Assisting other work groups/projects

Jennifer Barnes' Retirement

In late 2025, after more than two decades of leadership of the Alaska Fire Ecology Program, Jennifer Barnes retired. Jennifer's brilliance as a scientist, her generosity as a mentor, and her deep passion for fire ecology shaped the program and the people within it. Her career and contributions were celebrated with a well-attended and joyful retirement gathering (Figure 21) that reflected the strong relationships she built across the program and the broader fire community.



Figure 21. Kelly Kane, AKR Fire Management Officer, presents an arrowhead to Jennifer during her retirement party, with master of ceremonies and Weather Specialist Heidi Strader keeps the program lively.

To reflect on Jennifer's contributions, staff collaborated on a summary of data records in FFI. The Alaska portion of the FFI monitoring database spans 38 years of fieldwork across 9 parks and 29 study areas (projects). From 1973 to 2025, fire ecology staff, collaborators, and/or assistants visited 1,445 monitoring locations on 1,706 sampling dates, including 388 plot revisits - some tracked over eight timesteps.

Jennifer personally visited 441 sites on 181 individual sampling dates, representing 47% of all sites and 52% of all dates wherein field work occurred during her tenure. This stands as 31% of all sites and 11% of all sampling efforts currently archived in the FFI database. The FFI database shows that over 164 personnel have been involved with fuels and fire effects monitoring in Alaska, 94 of them (57%) sharing valuable time in the field with Jennifer herself.

She has authored and co-authored approximately 25 science-based publications, with total citations topping 1,500. She has given hundreds of presentations to audiences ranging from teachers in training, National Fire Program representatives, Inter-agency Alaska partners, and park management leaders - many of which are archived on the national Fire Research and Management Exchange System Resource Catalog (FRAMES), all of which curate valuable stories on fire management in Alaska. She has served as chair, vice chair, and member of interagency committees, as cadre of

several National Wildfire Coordinating Group (NWGC) courses, and as a trusted colleague lending her voice and experience to fire management efforts across Alaska and beyond. While she has stepped away from her formal role, Jennifer remains an active and valued member of the Alaska fire community.

Appendix B. History of Fire Effects Monitoring Plots

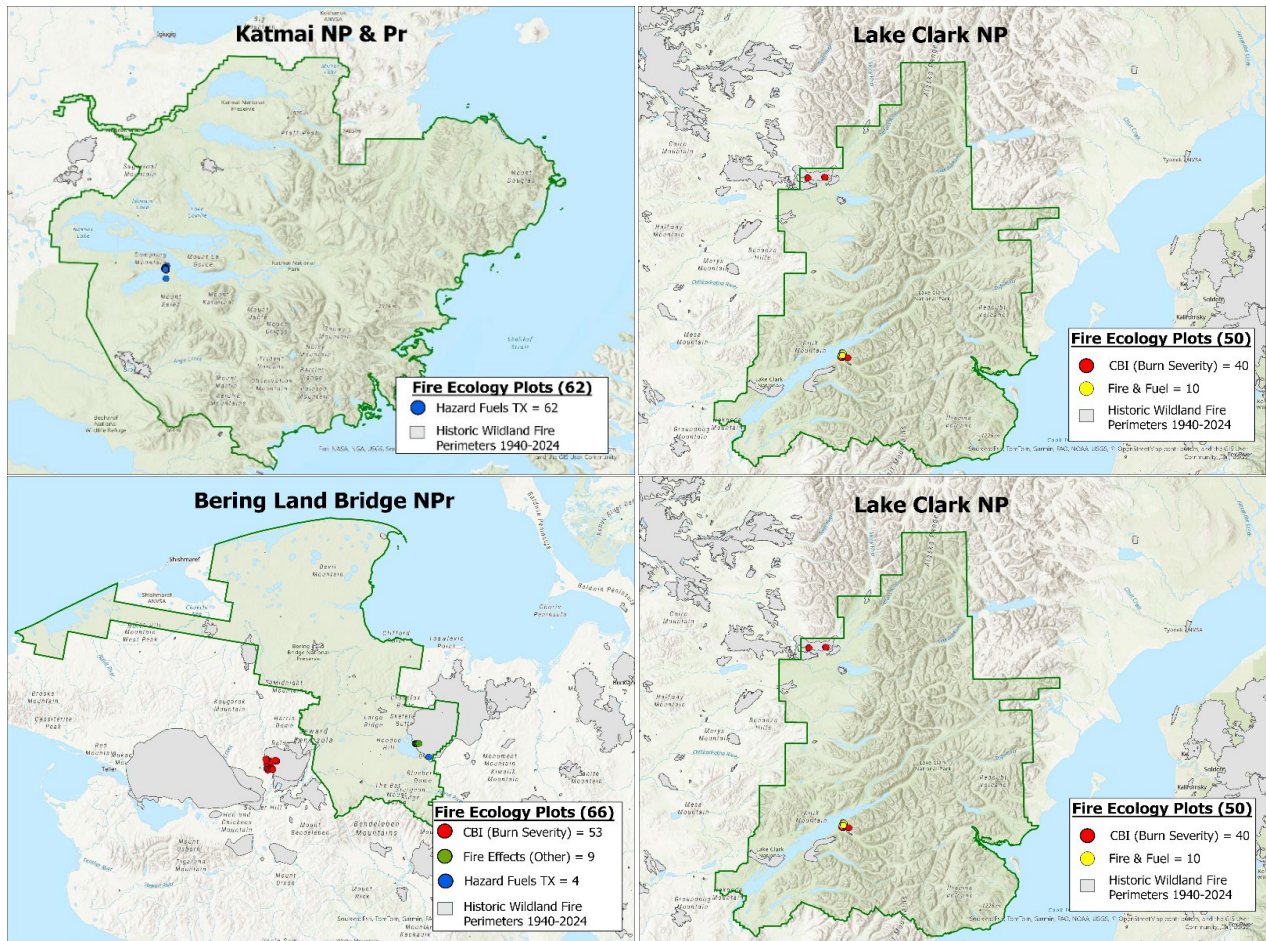


Figure B-1. Distribution of fire and fuels monitoring sites visited since 2001 across Alaska NPS units, categorized by monitoring type, including hazard fuels treatments, wildfire effects monitoring, burn severity (CBI), and other fire effects assessment efforts.

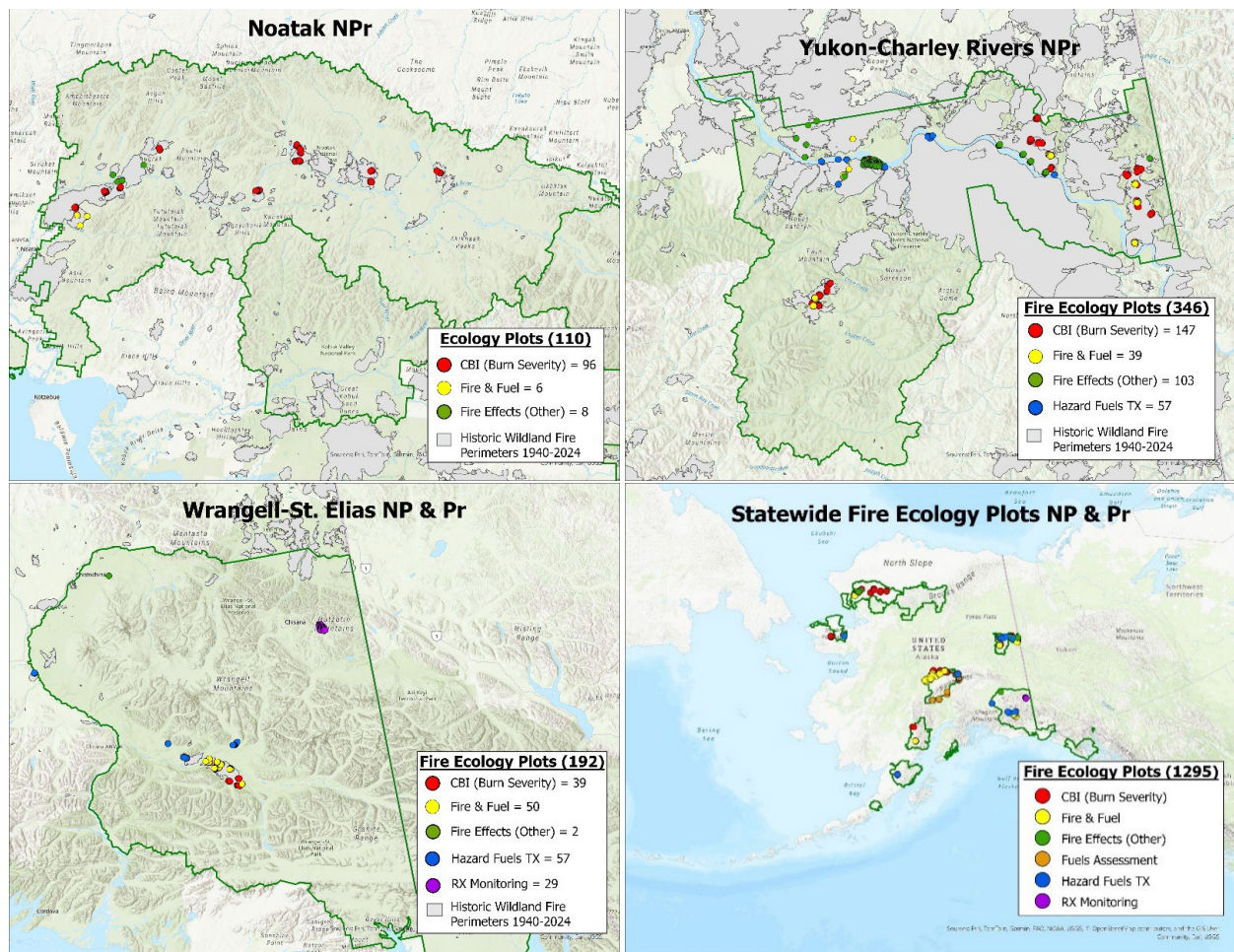


Figure B-2. Distribution of fire and fuels monitoring sites visited since 2001 across Alaska NPS units, categorized by monitoring type, including hazard fuels treatments, wildfire effects monitoring, burn severity (CBI), and other fire effects assessment efforts.

Table B-1. All fire effects plots established to date by the NPS Alaska Region Fire Ecology Program since the mid-1980s.

Park	Monitoring Unit	Plot Type	Years Data Collected (start-end)	Total Plots
Bering Land Bridge	1977 Fire Racine Plots	Racine Long Term Monitoring	1978-2019	8
Bering Land Bridge	Fairhaven Ditch Cabins- TX	AKR Hazard Fuels	2012	4
Bering Land Bridge	2002 Mile Post 85 Fire	CBI & Cover	2003	53
Denali	Headquarters – TX (HQ-HZF)	AKR Hazard Fuels	2003-2025	28
Denali	FY21 Fuels TX	AKR Fire & Fuels	2021-2025	23
Denali	Frontcountry Fuels TX (FC-TX)	AKR Fire & Fuels	2023-2024	15
Denali	DENA-TLS Fuels Assessment	AKR Fire & Fuels	2022-2025	22
Denali	DENA-FCPILES	Other	2023	8
Denali	SBB-Fuels	AKR Fire & Fuels & CAKN Veg (mod.)	2024, 2025	92
Denali	DENA-VDM	AKR Fire & Fuels	2005-2011	43
Denali	2000-2001 Fires CBI	CBI	2002	84
Denali	2001 Landcover-CBI & Reburns	AKR Fire & Fuels	2007, 2016	55
Denali	2009 CAKN Bear Cr Fire	CBI & Cover	2010	28
Denali	2013 CAKN Beaver Log Fire	CBI & Cover	2014	13
Denali	2013 CAKN Toklat River East Fire	CBI & Cover	2014	25
Denali	2024 Riley Fire	CBI & Cover	2025	37
Katmai	Brooks Camp	AKR Fire & Fuels	2022	31
Katmai	Brooks Camp	Pile Burn Monitoring	2023	102
Lake Clark	2013 Currant Cr Fire	CBI & Cover	2014	43
Lake Clark	2013 Currant Cr Fire	AKR Fire & Fuels	2014-2015	10
Lake Clark	2013 Kristin Cr Fire	CBI & Cover	2014	7
Noatak	2002 Fires – Cottonwood/Uyon	CBI & Cover	2003	40
Noatak	2010 Fires	CBI & Cover	2011	34
Noatak	2004 Uvgoon Fire	AKR Fire & Fuels Plots	2004-2013	6
Noatak	2012 Uvgoon/ Kungiakrok Fires	CBI & Cover	2013	22
Noatak	1977 Fires Racine Plots	Racine Plots	1982-2017	8
Wrangell-St. Elias	Carl Cr RX	AKR Carl Cr	2010	29
Wrangell-St. Elias	2009 Chakina Fire	CBI & Cover	2009-2010	57
Wrangell-St. Elias	2009 Chakina/2016 Steamboat Fires – Reburns	CBI, AKR Fire & Fuels	2010-2025	49

Park	Monitoring Unit	Plot Type	Years Data Collected (start-end)	Total Plots
Wrangell-St. Elias	Chokosna Hazard Fuels Plots – TX	AKR Hazard Fuels	2009-2010	13
Wrangell-St. Elias	WRST Headquarters TX	AKR Hazard Fuels	2009-2021	19
Wrangell-St. Elias	Fire Effects – Paired Plots Revisit	AKR Paired Plots	2006	2
Wrangell-St. Elias	McCarthy University Subdivision TX	AKR Hazard Fuels	2011-2023	27
Wrangell-St. Elias	McCarthy Road Allotments	AKR Hazard Fuels	2023	13
Yukon-Charley	1999 Witch Fire	Fire Effects (Other)	2001	15
Yukon-Charley	Fire Effects – Paired Plots Revisit	AKR Paired Plots		5
Yukon-Charley	1999 Fires Landcover-CBI	CBI	2001	119
Yukon-Charley	1999 Fires Landcover-CBI	CBI, AKR Fire & Fuels	2014	31
Yukon-Charley	2005 Backcountry Cabins – TX	AKR Hazard Fuels	2005-2020	42
Yukon-Charley	2018 Andrew Creek Fire-Aerial Assessment	Inventory – aerial assessment (Other)	2019	80
Yukon-Charley	2018 Andrew Cr Fire	CBI & CAKN Vegetation	2008-2025	28
Yukon-Charley	Biederman Allotment/Clearcut	AKR Hazard Fuels Plots	2023	15
Yukon-Charley	2004 Woodchopper/ Edwards Cr Fires	AKR Fire & Fuels Plots	2004-2018	8
Total				1314

All monitoring data listed has been entered the FFI database except (1) ~2000-2003 CBI plots and (2) fire effects projects conducted prior to 2005.