



NATIONAL CONSERVATION LANDS

Alaska
2021: Annual Manager's Report

Steese

National Conservation Area



Map



Cover: Rocky tors, formed by weathering and frost wedging, tower above a tundra ridge in the Steese National Conservation Area. BLM photo by Craig McCaa.

Introduction

The 1.22-million-acre Steese National Conservation Area (NCA) was designated by Congress through the Alaska National Interest Lands Conservation Act (ANILCA) in 1980 to protect its outstanding values, particularly Birch Creek and important caribou habitat.

ANILCA section 401(a) establishes the NCA to provide for the immediate and future protection of these lands within the framework of multiple use and sustained yield for the maintenance of environmental quality. Birch Creek was also designated by Congress through ANILCA as wild pursuant to the Wild and Scenic Rivers Act. Birch Creek Wild and Scenic River (WSR) is 126 miles long with 77 miles flowing through the south unit of the Steese NCA.

Accomplishments

In fiscal year (FY) 2021 there was positive response to public outreach, organizations, and agencies to repair and reclaim off-highway vehicle (OHV) damage to the Pinnell Mountain National Recreation Trail (NRT). This outreach resulted in successful partnerships, great turnout for volunteer workdays, and successful efforts to repair, rebuild, and protect the trail from OHV use during busy caribou hunts.

Eastern Interior Field Office (EIFO) worked with Fairbanks District Office, Central Yukon Field Office, and other Bureau of Land Management (BLM) offices to manage and maintain recreation sites through very high use numbers during fall and winter caribou hunts.

The EIFO worked with the State of Alaska Department of Natural Resources to plan access routes for OHV's during the fall caribou hunt to minimize future impacts to the Pinnell Mountain NRT.

A Government Performance and Results Act survey (GPRA) to gauge recreation Visitor Satisfaction was completed in FY2021.

EIFO published a Draft Environmental Analysis for the Travel and Transportation Management Plan (TTMP) and held virtual public meetings. EIFO also worked collaboratively with the State of Alaska to develop the TTMP.

In cooperation with the National Weather Service (NWS) the BLM hydrology staff continued operation and maintenance of a stream gage station at Birch Creek WSR Mile

0, BLM wayside area Steese Highway MP94, documenting streamflow and providing real-time water levels to the public for planning recreation float trips.

The EIFO water and aquatic resources staff worked cooperatively with the U.S. Geological Survey (USGS) to operate a stream gage at Birch Creek WSR Mile 126, upstream of the Birch Creek Bridge at Steese Highway MP147, documenting streamflow and providing water level, air temperature, and precipitation data to the public.

Seasonal water quality parameters were monitored at stream gage stations at WSR Mile 0 and Mile 126 using automated water quality meters during ice-free conditions, June-September.

Helicopter flyover missions were utilized to collect video and photograph documentation of aquatic habitat conditions.

The EIFO completed the draft Steese TTMP in July of 2021 and has received public and agency comment. EIFO is currently working to address those comments and expects to publish the final TTMP in FY2022.

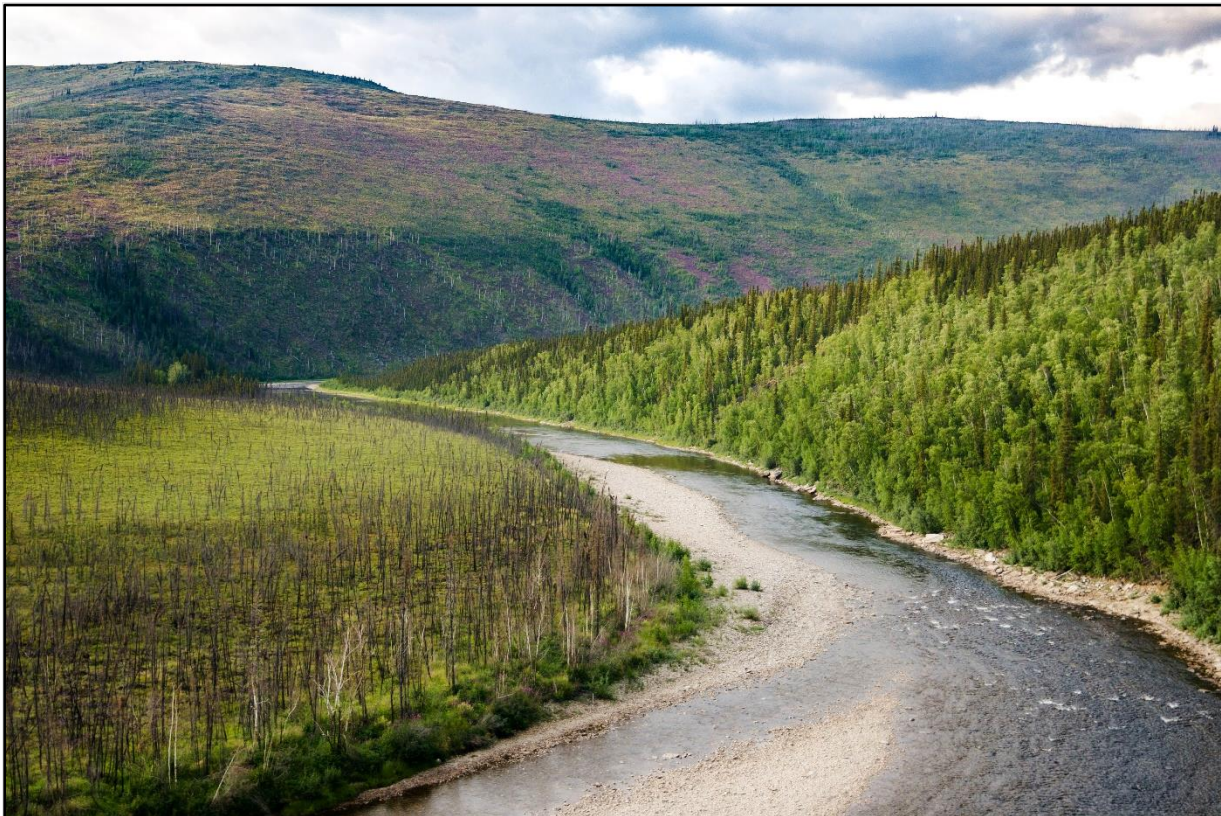


Figure 1. Scenic view of a bend in Birch Creek Wild and Scenic River. BLM photo by Craig McCaa.

Challenges

This year BLM responded to the OHV damage on the non-motorized Pinnell Mountain NRT that occurred during the Fortymile caribou hunt in the fall of 2020. To educate users and prevent similar impacts in the future, BLM launched an outreach campaign that included two new digital maps and map handouts that Park Rangers shared with hunters in the field. BLM solicited input from interested stakeholders and State partners to facilitate communication and develop a collaborative strategy moving forward. During the summer 2021, the BLM worked with stakeholders and other partners to restore damaged sections of the trail and install boundary markers and fencing to protect the trail during future hunts.

Effective restoration methods in tundra ecosystems is an area where EIFO staff and regional scientists are attempting to learn more about repairing damage to this fragile environment. Plants in high alpine tundra ecosystems are typically slow growing. Lichen which are important to caribou as a winter food source typically grow less than 1 mm per year. It will likely take multiple decades to restore native vegetation to the areas that have been impacted. In an effort to understand effectiveness in restoration efforts of the habitat adjacent to the Pinnell Mountain NRT, EIFO has developed partnerships in 2021 with the University of Alaska and Salcha-Delta Soil and Water Conservation District (SWCD). These partnerships are covered in more detail under the Partnership section of this report.

Water and aquatic resources work in FY2021 was limited due primarily to staff vacancies and the need to focus on other priorities.

On August 24, 2018, the State of Alaska provided notice to the BLM of its intent to file a quiet title action to the submerged lands of Birch Creek WSR, designated by the BLM as non-navigable waters. The State of Alaska is asserting that title to these lands passed to Alaska at statehood based on the equal footing doctrine, the Submerged Lands Act, and the Alaska Statehood Act. A similar case, previously filed by the State of Alaska for portions of the Fortymile WSR, is currently working its way through the judicial system with the Department of Justice. Judicial navigability findings from the Fortymile WSR case, expected in FY2022, could have impacts to future management of rivers on Federally Administered Lands in Alaska.



Figure 2. Two caribou standing on a hill in alpine tundra with fall colors in the background. BLM photo by Jim Herriges.

Visitors

Visitation in the Steese NCA decreased from last year's high visitor numbers, with an estimated 36,454 visits and 138,122 visitor days in FY2021 according to data from BLM's Recreation Management Information System. Many Steese NCA visitors stay on the highway and enjoy the scenery from waysides during short visits. Others leave the highway to enjoy the NCA's undeveloped areas, where visitors generally stay a few days to a week. The reduction in visitation this year was likely due to lower in-state tourism as more residents traveled out of state when COVID-19 travel restrictions were eased.

The Steese NCA has become a prime destination for hunters seeking caribou, moose, sheep, bear, gamebirds, and waterfowl. Winter hunting and trapping are also common activities throughout the Steese NCA. The NCA sees its highest levels of visitation during the fall big-game hunts that attract hunters from many parts of the state and from around

the world. This year, BLM launched a hunter access outreach and education program that included contacting hunters near the highway to promote knowledge of the NCA and OHV limitations. Patrolling the FY2021 caribou hunts along the Steese Highway, BLM staff made 530 outreach contacts.

This year, the NCA successfully administered GPRA surveys to evaluate visitor satisfaction and comply with the Act. The results showed that 86% of visitors were satisfied with the NCA. Many who were dissatisfied, commented on OHV impacts and suggested more law enforcement was needed during hunts to improve the site.



Figure 3. Public outreach along the Pinnell Mountain National Recreation Trail during hunting season. August 2021. BLM photo by Teri Balsler.

Partnerships

This year EIFO enlisted both formal and informal partnerships to respond to the damages from OHVs to the non-motorized Pinnell Mountain NRT that occurred during the August 2020 Fortymile caribou hunt. Starting in late fall 2020 a stakeholder group met four times to address the trail impacts. The group was instrumental in facilitating communication with user groups and recruiting volunteers for trail work events. The Student Conservation Association provided an AmeriCorps Youth trail crew for three weeks during the summer to restore drainage along the trail and build 0.5mile of plank walk corridor. In order to understand successful techniques to restore Alpine tundra habitats impacted by OHVs, EIFO developed partnerships with the University of Alaska and the Salcha-Delta SWCD to restore the habitat and monitor the effectiveness of this work.

The Salcha-Delta SWCD helped repair the tundra and began monitoring vegetation changes to measure success of reclamation measures as well of natural recovery of vegetation. Photo-points and vegetation cover transects were established.

The University of Alaska, Fairbanks Geophysical Institute has installed temperature loggers at multiple depths to monitor changes in soil temperature through time along areas in the PMT that were disturbed by OHVs. High-resolution baseline imagery was collected with a drone, allowing a ground surface profile to be developed which can be used to monitor subsidence caused by permafrost degradation. Results from these studies will be presented in future reports.

The EIFO water and aquatic resources staff worked closely with the USGS Water Resource Division, NWS's River Forecast Center, and Alaska Department of Environmental Conservation (ADEC) to inventory stream flow and monitor water quality and meteorological conditions in the Steese NCA. These collaborative working relationships benefit all cooperating agencies through data sharing and coordinated field logistics, significantly reducing individual agency costs for field-travel and equipment.

BLM collaborated with Alaska Department of Fish and Game (ADFG) and Yukon Environment to monitor Fortymile caribou distribution and movements (through satellite GPS collars), population condition and trend (including survival, parturition, animal condition, herd composition, and census). We established a new Cooperative Agreement to assist ADFG to facilitate those efforts and joined ADFG biologists in the field during the fall hunt to monitor harvest and collect biological samples from harvested animals. Results from this work are being used to manage the State of Alaska Caribou hunt and the Federal Subsistence Fortymile caribou hunt.

Science

Per Section 110 of National Historic Preservation Act (NHPA), the EIFO conducted proactive fieldwork along Birch Creek WSR, conducting a helicopter reconnaissance of the river for suitable exposures in which to conduct future paleoenvironmental analyses. The crew included Dr. Robin Mills (EIFO Archaeologist) and Dr. Nancy H. Bigelow (Alaska Quaternary Center, University of Alaska Fairbanks, paleoenvironmental analyst). The objective was to locate localities having high potential to preserve a record dating at least to 10,000 years ago, i.e., the Late Pleistocene / Holocene boundary. Eastern interior Alaska has relatively few analyzed paleoenvironmental sites and nearly none that date to the initial peopling of the region about 14,000 years ago. The project's goal is to better understand the timing and characteristics of palaeobotanical and paleofaunal changes at this boundary. Several eroding peat exposures along the river were noted, and the largest one (field ID: 21NHB-003) was chosen for on-the-ground investigation and sampling. The exposure provides three meters of well-preserved peat with layers of moss, graminoids, and wood overly frozen silt. A sample collected at the base of the peat was submitted for radiocarbon dating, which returned a date of 6948-6752 2σ cal BP (Beta-601802), not the circa 10,000 BP goal. The project next needs to assess whether to further investigate this site or to continue searching for potentially older exposures.



Figure 4. View of a river bend with permafrost melting causing the bank to slough into the river. BLM photo by Robin Mills.



Figure 5. Close up view of stream bank sloughing into the river. Photo used with permission by Nancy Bigelow, University of Alaska Fairbanks.

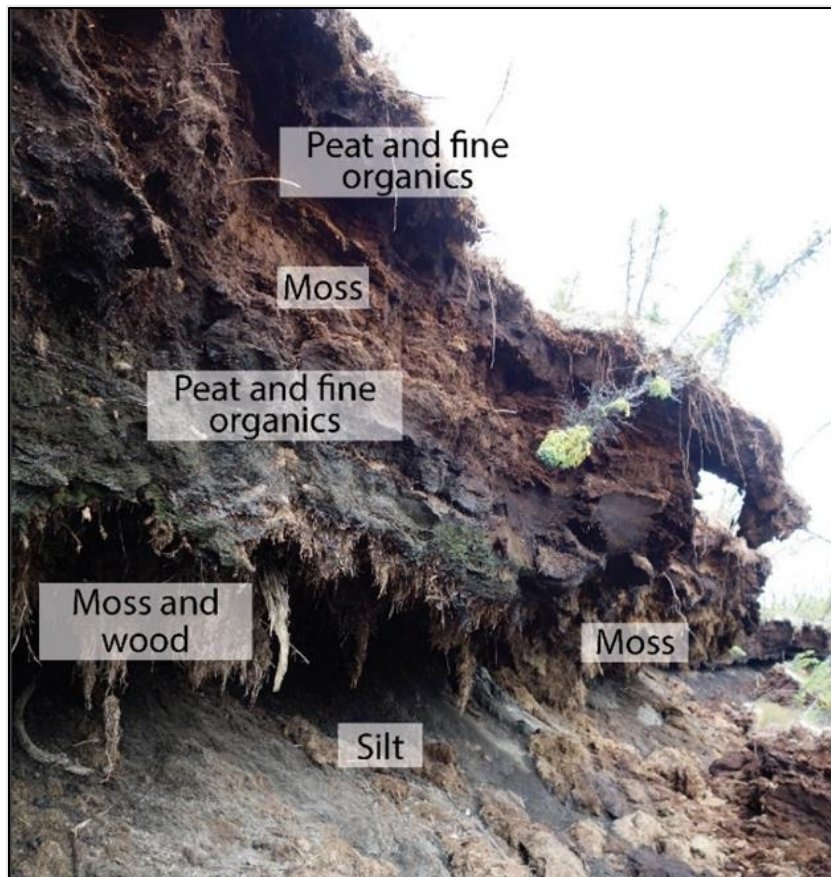


Figure 6. Close up view of bank with a description of different soil horizons. From top to bottom peat and fine organics, moss, peat and fine organics, moss and wood, moss and silt. BLM photo by Robin Mills.

Birch Creek WSR flows through the south unit of the Steese NCA and encompasses most of the headwaters of this clear-water tributary to the Yukon River. It is managed to protect and enhance the river's water quality and free flowing condition.

In cooperation with the USGS and NWS, the BLM utilizes stream gage stations to document water levels on Birch Creek WSR providing real-time data to the public for planning recreational boating trips as well as monitoring flood hazards for public safety. The BLM continues to work with ADEC to better understand the extent to which natural versus anthropogenic sources contribute to elevated turbidity levels in Birch Creek WSR during high-water events. Erosion from land features disturbed by past mining activity in the upper Birch Creek WSR basin have been identified by ADEC as source areas contributing to increased turbidity, while the BLM has recently noted accelerated erosion in areas due to warmer annual temperatures resulting in instability and erosion of permafrost soils, which also contribute to elevated turbidity levels during high-water events.

In FY2021 the EIFO water and aquatics staff monitored daily stream flow and water quality at the upstream (WSR Mile-0) and downstream extent (WSR Mile-126) of Birch Creek WSR utilizing automated stream gage stations and automated multi-parameter water quality meters. Water quality varied between fair and good throughout the 2021 open-water season, June-September, and water levels were stable except for low-water levels through much of July.

For the 2021 open-water season water quality at stream gage station WSR Mile-0 is rated as good based on meeting all ADEC standards for drinking water except for elevated turbidity levels which occurred periodically in late August during storm events. The ADEC turbidity standard for drinking water is "may not exceed" five (5) nephelometric turbidity units (NTU) and for aquaculture (fisheries) is "may not exceed" twenty-five (25) NTU above natural conditions. A series of storms occurred in late August resulting in high-flows, August 16-18, August 20-22, and August 25-28 where recorded daily mean turbidity values varied from 5 to 15 NTU, exceeding the ADEC drinking water standard a total of ten days. For the 2021 open-water season, median recorded turbidity was less than 0.5 NTU.

For the 2021 open-water season water quality is rated as fair at the WSR Mile-126 stream gage because the series of storms that occurred in late August resulted in periods of high-flows where recorded turbidity values were elevated to a greater extent and longer duration than at the WSR Mile-0 stream gage station. Daily mean turbidity values varied from 5 to 25 NTU, exceeding the ADEC drinking water standard a total of twenty-two days and exceeding the aquaculture standard of 25 NTU on one day. For the 2021 open-water season, median recorded turbidity was 4 NTU at stream gage station WSR Mile-126 indicating background turbidity levels at WSR Mile-126 are elevated compared to the background turbidity levels (< 0.5 NTU) recorded at stream gage station WSR Mile-0 for the same period of record.

Water quality and quantity data are archived in the AQUARIUS time-series database on the BLM Alaska State Office server.

EIFO continued collaboration with University of Montana to understand caribou and their use of the landscape through a Cooperative Agreement, in collaboration with ADFG, Yukon Environment, and National Park Service (NPS) partners. Three more publications resulted from these collaborations, with additional analyses in process:

- “Critical summer foraging tradeoffs in a subarctic ungulate.” 2021. Libby Ehlers, Gabrielle Coulombe, Jim Herriges, Torsten Bentzen, Michael Suitor, Kyle Joly, Mark Hebblewhite <https://doi.org/10.1002/ece3.8349>
- “Increasing Fire Frequency and Severity Will Increase Habitat Loss for a Boreal Forest Indicator Species.” 2022. Palm, Eric C., Michael J. Suitor, Kyle Joly, Jim D. Herriges, Alicia P. Kelly, Dave Hervieux, Kelsey L. M. Russell, Torsten W. Bentzen, Nicholas C. Larter, and Mark Hebblewhite. *Ecological Applications* e2549. <https://doi.org/10.1002/eap.2549>
- “Mapping tundra ecosystem plant functional type cover, height and aboveground biomass in Alaska and northwest Canada using unmanned aerial vehicles.” *Accepted*. *Arctic Science*. Orndahl, Kathleen; Ehlers, Libby; Herriges, Jim; Pernick, Rachel; Hebblewhite, Mark; Goetz, Scott.

Climate Impacts

Thawing Permafrost

Much of Interior Alaska is underlain by discontinuous permafrost—frozen ground with highly variable ice content that restricts water drainage and strongly influences landscape water balance as well as the design and maintenance of infrastructure. Permafrost thaw results in the settling and/or slumping of soil and is one of the serious impacts of a warming climate in Alaska.

Increased surface erosion associated with thawing permafrost and melting ground ice results in thermokarst development in low gradient areas and increased thermal erosion on hill slopes. Detachments of seasonally thawed permafrost hill-slope areas and accelerated erosion of ice-rich river embankments are evident in the lower reaches of Birch Creek WSR. Figures 7 through 11.



Figure 7. Helicopter flyover photograph of lower Birch Creek Wild and Scenic River showing accelerated erosion of permafrost bank, lower Birch Creek Wild and Scenic River corridor, September 09, 2021. View is upstream. BLM photo by Ben Kennedy.



Figure 8. Streamside photograph showing unstable embankment, melting permafrost area, lower Birch Creek Wild and Scenic River. BLM photo by Teri Balsler.



Figure 9. Helicopter flyover photograph of coarse debris alluvial fan, Birch Creek Wild and Scenic River, September 08, 2021. View is downstream. Stressors periodically contributing to Birch Creek turbidity levels include debris slides, active and abandoned placer-mined areas as well as soil instability and erosion associated with wildfires and melting permafrost. BLM photo by Ben Kennedy.



Figure 10. Steese NCA seasonal ranger paddles up for a closer look at the exposed ice lens on Birch Creek Wild and Scenic River. July 2020. BLM photo by Teri Balsler.



Figure 11. Streamside photograph showing unstable embankment, melting permafrost area, lower Birch Creek Wild and Scenic River, June 2020. BLM photo by Robin Mills, BLM

Climate Resiliency

There are no long-term climate data for the Steese NCA. However, as discussed in Wendler and Shulski¹ (2009), global climate change is observed to be magnified in the polar regions, including Interior Alaska, because these areas are more sensitive to change, mainly due to the snow albedo feedback, which is an example of a positive feedback mechanism. Warming in this area leads to a reduction of snow and ice cover, which is highly reflective to solar energy and the exposure of more of the darker underlying surface with lower albedo (reflectivity). This causes more absorption of solar energy and a further warming of the surface and a snow and ice retreat.

Wendler and Shulski (2009) reported most of the warming in Interior Alaska since 1976 has occurred in winter, approximately 8 degrees Fahrenheit (F), and spring, about 5 degrees F, with the least amount of change in autumn (0.2 degrees F). They also found precipitation decreased in Interior Alaska by about 11 percent, which they noted is not statistically significant; however, it was a somewhat counter-intuitive result, as warmer air can hold more water vapor.

EIFO is currently working to finalize the TTMP for the Steese NCA. During preparations of this plan different alternatives were developed that balanced providing access to the public and minimizing landscape fragmentation. Implementation of this plan is expected to minimize landscape fragmentation within the unit by changing some management areas from limited to cross country with weight and width restrictions travel to restricting travel to designated routes with weight and width restrictions.

The Steese NCA is situated in close proximity to other public lands managed by the US Fish and Wildlife Service and the National Park Service. Yukon Flats National Wildlife Refuge is to the north of the Steese NCA and Yukon-Charley National Park and the Fortymile Wild and Scenic River is to the east. The BLM White Mountains National Recreation Area (WMNRA) is to the west of the Northern Steese unit. The WMNRA is not part of the National Landscape Conservation System, however it is a large swath of land that is mostly undisturbed west of the Steese NCA and contains the Beaver Creek WSR. Managing the Steese NCA as part of the larger landscape provides connectivity for the flora and fauna that make up the Northern Boreal ecosystem, provides greater ecosystem services and allows more options for transition to a sustainable state under future climate conditions.

¹ Wendler, G. & Shulski, Martha. (2009). *A Century of Climate Change for Fairbanks, Alaska*. ARCTIC. 62. 10.14430/arctic149.

Social and Environmental Justice

In FY2021 BLM worked with ADFG and NPS to provide additional opportunities for Federally qualified subsistence users to hunt caribou on public lands. The field office manager set the Federal fall subsistence hunt for Fortymile and White Mountains caribou to open nine days earlier than the State of Alaska general season and allow two caribou to be taken (vs. one under State regulations). This allowed additional harvest opportunities to rural communities impacted by salmon harvest closures on the Yukon River.

Events

In February 2021, the Yukon Quest International Sled Dog Race, couldn't utilize the traditional course across the US-Canada border due to COVID-19 travel restrictions. Instead, the course was modified, shortening the race to 300 miles. The course started in Fairbanks, Alaska passing through the Steese NCA and Birch Creek WSR to the Yukon River, finishing in the community of Central, Alaska. Checkpoints along the course provide rest, safety, and welfare checks for dogs and mushers. BLM sites along the Steese Highway and in Central are important for the success of the event and the safety of the competitors.

During summer 2021 EIFO hosted four volunteer trail work events on the Pinnell Mountain NRT. At events that commemorated the Pinnell Mountain NRT's 50th Anniversary and National Trails Day, volunteers worked with BLM to level ruts, build plank walk trail corridor to lessen wet area impacts, install signs, and build fencing. Local groups such as Interior Alaska Trails and Parks Foundation, Resident Hunters of Alaska, Backcountry Hunters and Anglers, and local hiking groups helped recruit volunteers and make the volunteer events a success.



Figure 12. Three volunteers building a fence in the vicinity of Pinnell Mountain National Recreation Trail. BLM photo by Teri Balsler.



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<https://www.flickr.com/photos/blmalaska/albums/72157662274586342>

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