



July 12, 2023

Judith E. Bittner
Office of History & Archaeology Atwood Building
550 West 7th Avenue Suite 1310
Anchorage, AK 99501

Subject: Section 106 initiating consultation and requesting review of proposed finding of “no adverse effect” with conditions imposed to avoid adverse effects on historic properties for NSF project: LTER: Changing Disturbances, Ecological Legacies, and the Future of the Alaskan Boreal Forest (Principal Investigator (PI) Michelle Mack #2224776)

Dear Ms. Bittner:

The National Science Foundation (NSF) is initiating consultation pursuant to Section 106 of the National Historic Preservation Act with the State Historic Preservation Officer (SHPO) regarding its 2023-2029 funding of University of Alaska Fairbanks proposed research LTER: Changing Disturbances, Ecological Legacies, and the Future of the Alaskan Boreal Forest. Principal Investigator (PI) Dr. Michelle Mack and Co-PIs Drs. Jeremy Jones, Christa Mulder, Teresa Hollingsworth, and Todd Brinkman propose to conduct research on the boreal forests of interior Alaska through long-term monitoring of changes in ecosystem carbon cycling in response to permafrost thaw and ground subsidence (thermokarst) development. This research will contribute to a body of work monitoring permafrost and associated ecosystem carbon cycling processes. The proposed research includes soil and permafrost thaw depth measurements, soil harvesting, and soil coring at sites that have been disturbed by wildfire within the last three years, an undertaking with the potential to cause effects on historic properties per 36 CFR 800.3 of the regulations of the Advisory Council on Historic Preservation. The NSF proposes a finding of “no adverse effect” with conditions imposed to avoid adverse effects on historic properties and requests the SHPO’s review, and if appropriate, concurrence with this finding.

Area of Potential Effect (APE)

Most project locations are in the vicinity of Fairbanks, Alaska, extending as far north as Minto, Alaska, and as far west as Toklat, Alaska. The APE includes 27 discontinuous locations where soil coring and sampling will occur. There are two work types associated with the project, including those titled LTER Overwintering Fires and LTER Wetlands. At the LTER Overwintering Fires project locations, three (3) soil cores will be placed within each 100-meter diameter discontinuous project area of potential effects (APE). Therefore, a total of 36 soil coring locations will occur within the 12 LTER Overwinter Fires project locations. At the LTER Wetlands project locations, three (3) soil cores will be placed within each 200-meter diameter discontinuous project APE. Therefore, depending on wetlands conditions, a maximum of 45 soil coring locations will occur within the 15 LTER Wetlands project locations. In total there would be a maximum of 81 cores within the approximately 0.2 mile² APE.

Project Description



Battelle Arctic Teaming Partners

The fieldwork goals for this project are to collect soil samples, tree and shrub inventories, plant cover, measure soil organic layer and permafrost thaw depths, and establish permanent transects for future non-destructive resurveys. Field sites have all been disturbed by wildfires within three years of sampling. All ground disturbing work will be limited to one year of sampling.

Sampling sites are classified by 1) LTER Overwintering Fire sites, these coordinates indicate the start of a 30 m transect that will have 3 cores along it; and 2) LTER Wetland, these coordinates are in the middle of the wetland feature. The sampling will begin on the shore of the lake or collapse bog/fen and extend 30 m from the shore or stable ground into the terrestrial environment.

All sites will be accessed via helicopter by a research team of 3 people maximum, and researchers will walk from the helicopter landing to the GPS location. At each site, researchers will lay out a 30 m linear transect at each site. They will travel out and back along the transect approximately three person times. They will set packs and gear near the 0 m end of the transect. Each of the following steps will be carried out by one person:

- Take GPS measurement at 0 m, roll out tape to 30 m along compass bearing, take GPS measurement at 20 m. Return along transect inventorying trees and shrubs along transect in 30 x 2 m belt.
- Start at 0 m end of transect and measure residual organic soil depth and permafrost thaw depth at 3 m intervals along the transect for a total of 10 residual soil and thaw depth measurements per transect. Residual soil depth measurements consist of slicing a small (5 cm long) slash into the organic soil layer and probing, by hand, for the organic-mineral soil interface, which is determined by texture, and measuring the distance from the surface to the interface. Permafrost thaw depth measurements consist of sliding a long, 2 cm dia metal probe into the ground until it hits the ice surface, removing the probe, and measuring the distance from the surface of the moss to the surface of the ice.
- At three randomly chosen locations along the transect (i.e., a subset of the soil profiles examined above), researchers will destructively harvest soil using a 6.8 cm diameter and 30 or 50 cm long hand-made “twist core” with serrated blade on the coring end and inserting it with serrated cutting blade into the organic soil layer until it reaches the organic-mineral interface, removing the corer, extruding the organic soil, and then reinserting the corer into the same hole and coring to 10 cm deep in the mineral soil (or to the permafrost surface, if less than 10 cm) as measured by the depth from the organic-mineral interface into the mineral soil. The mineral soil core will be removed and extruded. Both cores will be placed on ice and returned to the laboratory.
- Start at 0 end of transect and estimate plant % cover at 3 m intervals. Return to 0 m away from transect.
- Transects will be permanently marked for future non-destructive resurveys. Transect markers will be either wood stakes, benchmarks, or pin flags with anchors.

Identification of Historic Properties

On June 20, 2023, Stantec Archaeologist Mackenzie Hughes M.S. RPA conducted a search of the Alaska Heritage Resource Survey (AHRS) database. The record search was conducted within the boundaries of 27 semi-discontinuous project locations where project related work is proposed. The locational information for each of the 27 project locations is provided in Table 1 below.

Stantec identified no previously recorded archaeological resources that intersect with any of the 27 project locations. There are previously recorded archaeological resources located within one mile of four project locations. At WoodRiver 1 and WoodRiver 2, there is a precontact archaeological district (FAI-00337) located within one mile, 0.25 miles S from WoodRiver 1 and 0.3-miles SE from WoodRiver 2. At Riordan 4, there is a historic-era trail (LIV-00556) located 0.94 miles E. At Myers Smith 1, there is a precontact lithic scatter (FAI-02084) located 0.33 miles W.

Two of the resources located within one mile of the project locations (FAI-00337 and LIV-00556) have been determined eligible for listing on the National Register of Historic Places (NRHP) with State Historic Preservation Officer (SHPO) and Agency concurrence. The third site located within one mile of the project locations (FAI-02084) is unevaluated for NRHP eligibility.

Table 1. Proposed Project Locations

Work Type	Location Name	General Location	Center Latitude	Center Longitude	Findings	Nearest Resource
LTER Overwintering Fires	Toklat 1	E of Toklat, AK	64°27'38.46"N	150°14'28.78"W	Negative	1.8 miles W-SW
LTER Overwintering Fires	Toklat 2	E of Toklat, AK	64°27'8.13"N	150°13'46.44"W	Negative	2.2 miles W
LTER Overwintering Fires	Holdoverm and Caribou 1	NW of Nenana, AK	64°48'54.00"N	149°43'45.68"W	Negative	1.7 miles NE
LTER Overwintering Fires	Holdoverm and Caribou 2	NW of Nenana, AK	64°47'36.85"N	149°44'3.37"W	Negative	2.7 miles NW
LTER Overwintering Fires	CrescentIsland and EastKantishna 1	N of Nenana, AK	64°53'7.99"N	149°20'21.24"W	Negative	2.6 miles N
LTER Overwintering Fires	CrescentIsland and EastKantishna 2	W-NW of Nenana, AK	64°40'44.28"N	149°58'29.89"W	Negative	10.6 miles S-SE
LTER Overwintering Fires	WoodRiver 1	S-SW of Fairbanks, AK	64°27'36.76"N	148° 8'7.84"W	Negative	1,326 feet S
LTER Overwintering Fires	WoodRiver 2	S-SW of Fairbanks, AK	64°27'32.11"N	148° 8'24.65"W	Negative	1,600 feet SE
LTER Overwintering Fires	Unique5 1	S of Fairbanks, AK	64°30'26.82"N	147°56'40.99"W	Negative	2.4 miles E
LTER Overwintering Fires	Unique5 2	S of Fairbanks, AK	64°30'13.97"N	147°57'17.89"W	Negative	2.7 miles E
LTER Overwintering Fires	Bonnefield 1	S of Fairbanks, AK	64°32'57.66"N	147°43'25.21"W	Negative	3.7 miles W
LTER Overwintering Fires	Bonnefield 2	S of Fairbanks, AK	64°32'59.37"N	147°43'16.19"W	Negative	3.7 miles W
LTER Wetlands	Stolpmann 1	NE of Stevens Village, AK	66°13'19.56"N	146°39'44.78"W	Negative	3.5 miles NE
LTER Wetlands	Stolpmann 2	NE of Stevens Village, AK	66°16'33.60"N	148°21'3.60"W	Negative	6.15 miles S
LTER Wetlands	Stolpmann 3	NE of Stevens Village, AK	66° 8'47.62"N	148°51'23.26"W	Negative	8 miles SW
LTER Wetlands	Stolpmann 4	NE of Stevens Village, AK	66°20'17.38"N	148°16'11.86"W	Negative	7.8 miles SE
LTER Wetlands	Stolpmann 5	NE of Stevens Village, AK	66°27'41.08"N	147°55'29.93"W	Negative	11.1 miles S
LTER Wetlands	Riordan 1	E of Minto, AK	65° 4'19.43"N	148°49'42.75"W	Negative	2.6 miles E

LTER Wetlands	Riordan 2	E of Minto, AK	65°10'47.88"N	148°56'40.79"W	Negative	6.2 miles E-SE
LTER Wetlands	Riordan 3	E of Minto, AK	65°10'40.18"N	148°50'28.36"W	Negative	3.3 miles SE
LTER Wetlands	Riordan 4	E of Minto, AK	65° 3'56.55"N	148°45'57.12"W	Negative	5000 feet E
LTER Wetlands	Riordan 5	E of Minto, AK	65° 7'33.59"N	149°10'40.21"W	Negative	4.9 miles SE and 4.9 miles NW
LTER Wetlands	Douglas 1	SW of Fairbanks, AK	64°38'36.77"N	148°17'50.96"W	Negative	1.02 miles SE
LTER Wetlands	Douglas 2	SW of Fairbanks, AK	64°42'55.78"N	148° 0'40.18"W	Negative	2.03 miles N
LTER Wetlands	Myers Smith 1	SW of Fairbanks, AK	64°37'48.00"N	148°16'12.00"W	Negative	1,730 feet W
LTER Wetlands	Yoshikawa 1	SW of Fairbanks, AK	64°42'0.00"N	148° 5'60.00"W	Negative	2.8 miles N
LTER Wetlands	Jorgenson 1	S of Fairbanks, AK	64°37'48.00"N	147°41'60.00"W	Negative	3.1 miles W

Finding of Effects and Conditions to Avoid Adverse Effects

The ground disturbance associated with this proposal is limited to soil depth measurements and coring at 27 sites for a total of 270 soil depth measurements and 81 soil cores across an area of approximately 0.2 miles². Stantec identified no previously recorded archaeological resources that intersect with any of the 27 project locations. NSF recognizes that only a small portion of the state has been surveyed for cultural resources, and therefore there is still a possibility of encountering both reported and previously unidentified cultural resources. To mitigate for the unlikely event that the undertaking would encounter cultural resources, the research team will be provided the Battelle ARO Inadvertent Discovery of Historical, Archaeological, or Cultural Resources Plan (Attachment!1) that includes guidance on identifying cultural resources in the field, avoidance measures, and reporting and notification instructions.

Due to the conditions above imposed to avoid adverse effects to historic properties, the NSF proposes a finding of "no adverse effects" pursuant to 36 CFR §800.5 (b).

We look forward to receiving the SHPO response to this request. If you require any additional information, please do not hesitate to contact the undersigned.

Sincerely,



Catherine Morris (she/her)
Environmental Science Planner
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Attachments: Attachment 1: Battelle ARO Inadvertent Discovery of Historical, Archaeological, or Cultural Resources Plan