

Request to Conduct Research on the Bartlett Experimental Forest

Our review process has two deadlines to submit proposed work – April 1 and October 1. We try to get approvals back within a month. Providing a complete set of information will facilitate the review process. Be as specific as possible regarding your potential sampling locations and methods.

I. Investigator(s) Name(s), Affiliation(s), E-mail address, and if you've worked at BEF: add additional lines if necessary -- * is a required field

<u>Name</u> *	<u>Affiliation</u> *	<u>E-mail address</u> *	Prior BEF work* (<u>y/n</u>)
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II. Proposal Information -- you can also attach a short proposal summary with this form

Title:*

Major hypotheses:*

Funding sources (please indicate both pending or currently available sources):*

Proposed study start date:*

Estimated duration of study:*

III. Type of system involved/work proposed: Please address items a-c:

a. System (check all that apply):

Terrestrial Aquatic Watershed Atmosphere Other

b. Type of work proposed:

Large-scale manipulation (e.g., compartment/watershed treatment of vegetation/site)

Small-scale manipulation (e.g., plot level treatment of vegetation/site)

Large/small-scale non-manipulative measurements

Type of sampling proposed:

* Non-destructive sampling

* Destructive sampling

* Long-term monitoring

* Other

c. Key words – check any descriptors that apply to your proposal:

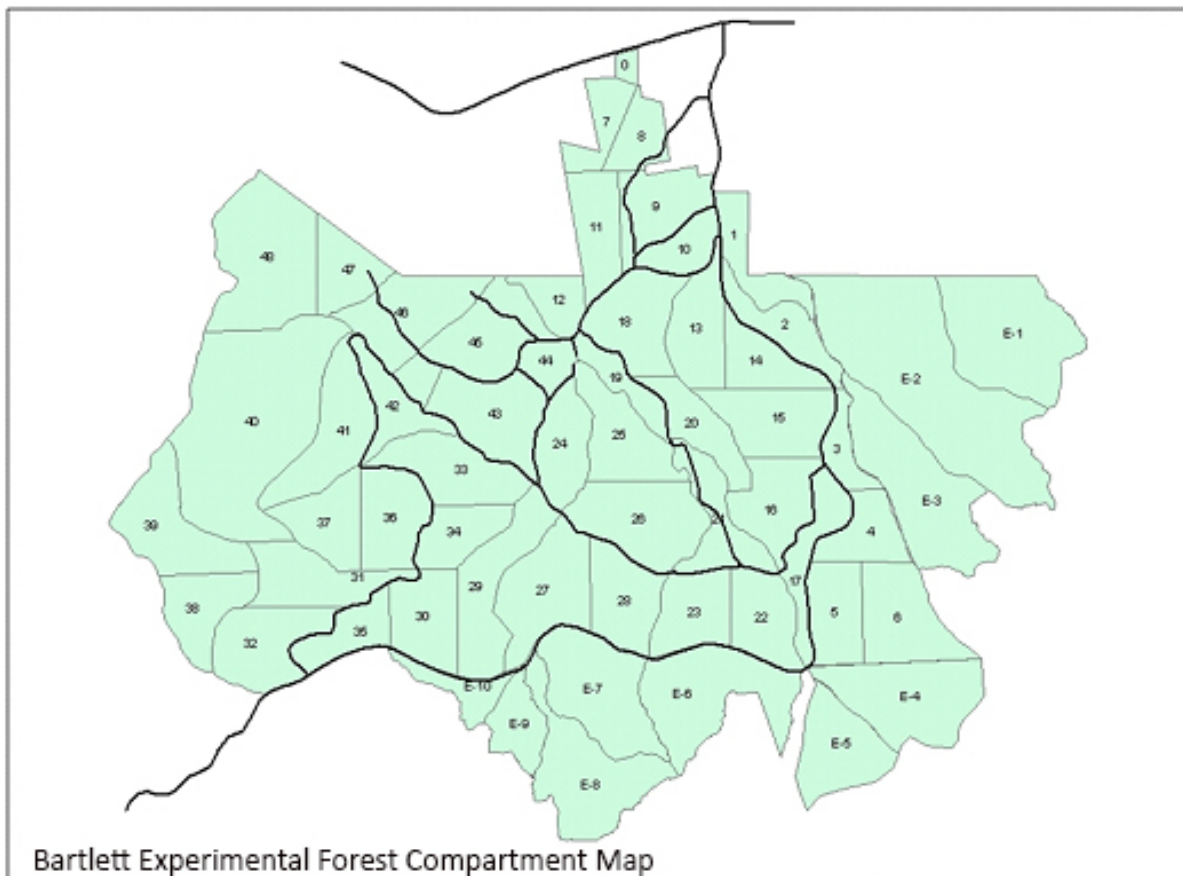
Forestry	Hydrology	Community ecology	Autecology
Wildlife	Remote Sensing	Population biology	Physical ecology
Soils	Physics	Biogeochemistry	Other
Chemistry	Geology	Ecosystem ecology	

List the types of organisms or substances you intend to study (e.g., trees, amphibians, mammals, soils, calcium, etc): *

IV. In which Bartlett compartments would you like to work?*

Have you discussed these sites with either Bill Leak/Mariko Yamasaki?*

If so, when?



V. What Bartlett ongoing research or publications are related to your proposed research?*

VI. Proposal abstract (or a brief description of your proposed research attached to this form): *

VII. Proposed field methods and sampling procedures with sufficient information to determine potential disturbance and sampling impacts

VIII. Safety-The USFS is committed to increasing safety awareness among its employees and research cooperators.

The WMNF and the Bartlett Experimental Forest occur on rugged terrain with severe weather patterns throughout the year and appropriate preparations are necessary prior to engaging in field work. Please provide us with a description of your safety guidelines for personnel working in both the field and in the lab. For example, your check in/check out procedures, job hazard analysis, relevant training, safety equipment.

Special considerations – If the proposed research involves potentially hazardous techniques (e.g., shotgun sampling, tree/tower climbing) provide specific information about the techniques and materials, including justifications for use, potential problems and concerns, and any statements on necessary precautions and safety factors that will be utilized in the process.

Some degree of NEPA assessment on the part of the researcher will be required for any of the following manipulative treatments that use contaminating materials (e.g., isotopes, introduced plants or animals, fertilizers, insecticides, and herbicides). At a minimum, a scoping letter describing the proposed experiment will be sent to all BEF abutters and WMNF for comment and a letter to the file as a categorical exclusion will be needed. A determination of the degree and extent of assessment required will be made at the time of the proposal by the Project Leader. See this link for more information: <http://www.fs.fed.us/emc/nepa/>

Research Stipulations: If you are granted permission to work at BEF: (1) any plots you establish within compartments will need to be geo-referenced with plot centers and corners identified; and a plot data file will need to be provided as soon as possible for our records; and (2) all researchers will be required to remove all field sampling material and equipment from plots and laboratory site at the conclusion of their work. All GIS data shall be in the following format:

Projection – NH State Plane, NAD83 Ft.

Coordinates – Decimal Degrees

E-mail or mail this form to:

Mariko Yamasaki, Silviculture/Wildlife Team Leader
U. S. Forest Service, Northern Research Station
Forest Sciences Lab
271 Mast Road
Durham, NH 03824
Email: myamasaki@fs.fed.us

NEPA requirements have been reviewed and approved as follows:

This project can proceed without further assessment.

This manipulative project can proceed as a categorical exclusion after completing a scoping letter to the public and a letter to the file.

This manipulative project will require further environmental assessment work before approval.

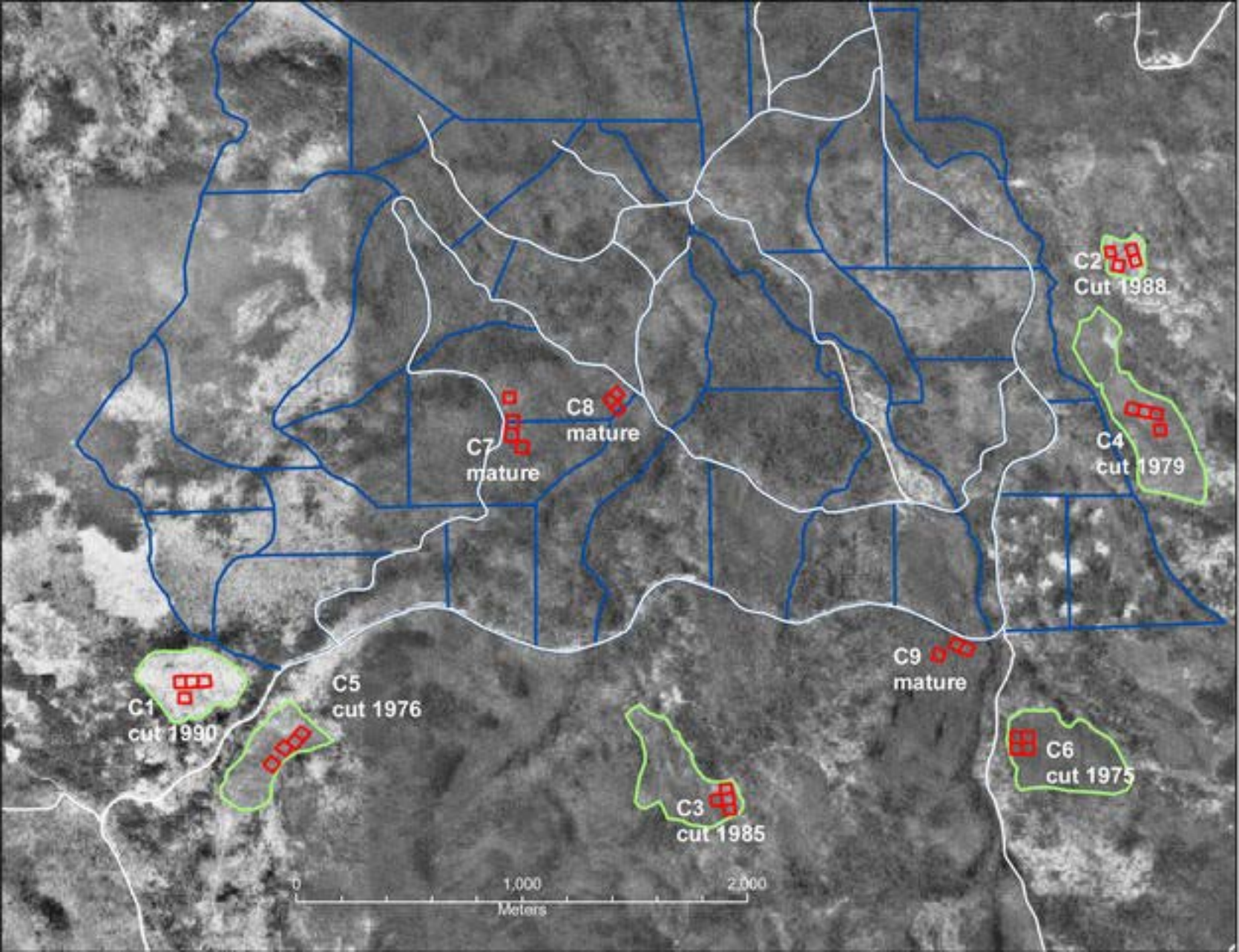
Approved by:

Project Leader

Date

Table 1. List of MELNHE stands proposed for inclusion in this study, the USFS designation for each plot, its age in 2021, and coordinates.

Site	USFS Designation	Age in 2021	Elevation (m)	Aspect	GIS Coordinates
C1	Davis Brook West Timber Sale	31	570	flat to SE	C1-1: 44.042824,-71.320720 C1-2: 44.042538,-71.321201 C1-3: 44.041931,-71.321822 C1-4: 44.042574,-71.321958
C2	Saco RD Cmpt 51	29	340	NE	C2-1: 44.059038,-71.269333 C2-2: 44.059480,-71.268800 C2-3: 44.059813,-71.269119 C2-4: 44.059526,-71.269901
C3	Saco RD Cmpt 52 stand 17	41	590	NNE	C3-1: 44.038185,-71.291325 C3-2: 44.037742,-71.291219 C3-3: 44.037665,-71.291834 C3-4: 44.037222,-71.291729
C4	Saco RD Cmpt 52 stand 8	43	410	NE	C4-1: 44.053436,-71.268748 C4-2: 44.053117,-71.268069 C4-3: 44.053147,-71.267087 C4-4: 44.052826,-71.266443
C5	no stand # on map	45	550	flat to NW	C5-1: 44.039193,-71.316669 C5-2: 44.039836,-71.315839 C5-3: 44.040121,-71.315342 C5-4: 44.040463,-71.314936
C6	Saco RD Cmpt 51 stand 6	46	460	NNW	C6-1: 44.040352,-71.275200 C6-2: 44.039902,-71.275202 C6-3: 44.040350,-71.274576 C6-4: 44.039900,-71.274579
C7	BEF cmpt 33/34	mature	440	ENE	C7-1: 44.052278,-71.302577 C7-2: 44.052730,-71.303198 C7-3: 44.053180,-71.303195 C7-4: 44.053908,-71.303122
C8	BEF cmpt 33/29	mature	330	NE	C8-1: 44.054080,-71.297186 C8-2: 44.053793,-71.297666 C8-3: 44.053333,-71.297457 C8-4: 44.054807,-71.299769
C9	Saco RD Cmpt 52 stand ?	mature	440	NE	C9-1: 44.043814,-71.278167 C9-2: 44.043933,-71.278769 C9-3: 44.043340,-71.279463 C9-4: 44.044128,-71.279415



Methods

Study Site

Tree cores will be collected in the N, P, N+P, and control plots in Bartlett stands C3, C6, and C8. Cores will also be collected in the Ca plot of stand C8. Stands C3 and C6 are mid-aged and characterized as a mix of northeastern hardwood species such as red maple (*Acer rubrum* L.), pin cherry (*Prunus pensylvanica* L.f.), yellow birch (*Betula alleghaniensis* Britt.), white birch (*B. papyrifera* Marsh.), sugar maple (*Acer saccharum* Marsh.), and American beech (*Fagus grandifolia* L.), while mature stand C8 is characterized by dominance in sugar maple and American beech. Trees will be cored in the buffer regions of each plot.

Data Collection and Transport

For this pilot study, red maple, pin cherry, yellow birch, white birch, sugar maple, and American beech will be sampled in the 10-m buffer region of the MELNHE plots. Trees that are closer to the treatment plot will be prioritized. Three trees of each species per treatment will be used for this pilot study, for a total of 78 trees (72 trees in total for the NxP factorial plots, plus three beech and three sugar maple trees in the C8 calcium plot).

The outer 10 cm of wood will be taken using a 5.15 mm (0.2 inch) diameter increment borer to assess wood formation of hardwood species in the past twenty years. Cores will be placed in clear plastic twin wall alveolar sheets of thickness 5/16 in (approximately 7.94 mm), 20 cm length, and 10 cm width; these dimensions yield 9 cells for use in X-ray CT scanning.

Plate number (from 1-13), cell number (1-9), stand, plot number (1-4), species, tree tag number (if available), and diameter at breast height (cm) will be written directly on the cell with permanent marker (in this exact order), and the ends of the alveolar cells will be sealed shut

using masking tape to keep cores in place during transit. After fieldwork, the plastic alveolar plates with tree cores will be immediately placed in a refrigerator to prevent fungal development.

Upon returning to Syracuse, cores will be oven dried at 100°C directly in the plastic alveolar plates for 24 hours to reduce risk of fungal infection while shipping to France, and to ensure moisture content of the wood cores are standardized for use in X-ray CT. The two openings at the ends of the plastic sheets will be sealed off with masking tape. Thirteen sheets will be stacked and taped together to a height of approximately 10.3 cm, to not exceed the maximum height of 10.5 cm required for X-ray CT scanning of ring width and average wood density (see Kerfriden et al., in review).

References:

Kerfriden, B., Jean-Daniel, B., & Jean-Michel, L. (2020). *Variations in temperate forest biomass ratio along three environmental gradients are dominated by interspecific differences in wood density* [Preprint]. In Review. <https://doi.org/10.21203/rs.3.rs-27539/v1>