

Agency: Department of Natural Resources**Project Title:****Project Type:** Planning and Research

BAK LAP: Upgrade Forest Research Installations for Wood Biomass Energy, Products, Science Education

State Funding Requested: \$1,700,000
One-Time Need

House District: Fairbanks Areawide (7-11)

Brief Project Description:

Boreal Alaska - Learning, Adaptation, Production (BAK LAP) - Updating state forest research installations to define best management practices to meet new forest product demands, particularly wood biomass energy. Concurrently implement Project OneTree Alaska for teaching K-12 math and science concepts by developing full-scale forest field facilities and project-based curriculum.

Funding Plan:

Total Project Cost:	\$2,166,486
Funding Already Secured:	(\$466,486)
FY2013 State Funding Request:	<u>(\$1,700,000)</u>
Project Deficit:	\$0

Funding Details:

PHASE I - Establishment and initial survival: \$488,454 (\$395,454 State of Alaska capital appropriations in 1983, 84, 85, 86 and 90).

PHASE II - Survival and early growth: \$200,000 (USGS revegetation scientist, 75% of time for 4 yrs).

PHASE III - Proof of concept: Relocation, georegistration, and canopy closure: \$367,438 (USGS and UAF)

Detailed Project Description and Justification:

This is a proposal for a \$1.7 million capital appropriation from the Alaska Legislature to the Alaska Department of Natural Resources, Division of Forestry, to be contracted to the Agricultural and Forestry Experiment Station, University of Alaska Fairbanks. The purpose of the "Boreal Alaska Learning, Adaptation, and Production" (BAK LAP) project is to:

1. Upgrade Alaska forest research facilities, to improve the value of Alaska's forests in meeting the rapidly expanding demand for wood energy biomass in a changing environment, and to
2. Bring the forest into classrooms to teach basic subjects in a broader and deeper way with real world examples, and to serve Alaskan communities by making products from local forest resources and training community members as citizen scientists.

Project Description

BAK LAP will be carried out by two principal developments:

• Updating and repurposing state forest research installations and establishing species trials. This upgrade will define and verify management techniques that best meet new forest product demands, particularly wood biomass energy, despite a shifting environment.

• Integrating and implementing OneTree Alaska in K-12 classrooms and common garden trials. OneTree Alaska expands Alaska's K-12 standards-based science curriculum through collaborations among K-12 schools, the University of Alaska, and rural and urban communities with hands-on science learning and entrepreneurial skill development.

Research and Adaptation Facilities. The upgrades to state forest research installations will consist of new measurements, geo-referencing, permanent markings, and database development on a network of plots and stands previously established by state capital appropriations in the 1980s. The state of Alaska is principally responsible for providing these forestry facilities in boreal Alaska because the federal government terminated its main forestry research lab and program twenty years ago. Species and management practices that were appropriate for the circumstances of decades ago when the installations were established have not been verified for the new products and environment of today. Collecting these measurements and conducting evaluations will provide the basis for defining best management practices for the new products, especially biomass, in today's shifting environment. These facilities are essential to achieve local self-reliance in energy production using wood biomass and to avoid forest management practices likely to fail in Alaska's changing environment.

Education and Outreach Infrastructure. OneTree Alaska was originally designed as a short-term community outreach effort to demonstrate the diversity of products that could be produced from a single birch tree, and has become a much acclaimed partnership for teaching integrative K-12 curriculum. In OneTree Alaska, students learn by making products from forest resources and participating as citizen scientists in common garden (tests or trials of trees) research efforts. The real-world experiences of working with trees and making products from them engages students and produces superior learning and retention of math and science skills, an area where Alaska educational outcomes are lagging. The demonstration phase of OneTree Alaska, which employs best educational practices for science and math, has generated a great deal of interest from communities, school districts, teachers and researchers. BAK LAP represents the next step in development of a full-scale set of facilities and project-based curriculum, aligned with federal and state science standards, and designed to meet 21st century workforce needs. BAK LAP was conceived as the perfect opportunity to address two critical state needs in one integrated project.

Budget

BAK LAP is a program to integrate researchers, educators, and forest managers with local forest using communities and biomass energy production. BAK LAP will be implemented in two components (1) Research and Adaptation (RAD) and (2) Education and Outreach (EOR). Both components involve direct interactions and linkages among schools, forest managers, and scientists. The BAK LAP program is based on a four-year time horizon. The budget is front-end loaded to rapidly identify best management practices from state forest research facilities for wood energy biomass and to broaden the impacts of OneTree Alaska's science education and entrepreneurial programs.

The appropriation to DNR will support a contract with the University of Alaska Fairbanks' (UAF) Agricultural and Forestry Experiment Station, which has a long history of establishing forest research facilities with DNR. The Experiment Station is responsible for data collection and analysis for a network of state forest research facilities including forest growth and yield, regeneration, and forest health. OneTree Alaska has been developed and implemented through UAF's School of Natural Resources and Agricultural Sciences and collaborations with numerous educators and volunteers. Once the state of Alaska funds the basic support for these facilities and measurements, a number of state priority needs will be met. In addition, this appropriation will establish a strong platform for obtaining larger, competitively funded education and research grants that will use and expand the basic work and facilities.

BAK LAP will be led by Dr. Glenn Juday (Professor of Forest Ecology UAF), who directed the successful Rosie Creek Fire Research project funded by a previous state capital appropriation in cooperation with DNR. The EOR and RAD components will be managed by Drs. Janice Dawe and Thomas A. Grant III, respectively. The BAK LAP appropriation request totals \$1,710,810, approximately equally divided between the EOR and RAD components. As a contract with a state agency, state regulations provide for a 25% indirect cost recovery for UAF.

Personnel items include RAD work led by the Research and Adaptation Scientist and the following support staff: Forest Products Scientist, Tree Ring Specialist, two summer field technicians, and one graduate student in forest measurements. The EOR work component includes a OneTree Alaska Program Director and the following support staff: Project Manager, two Lead Educators, and limited salary support for an Art Director, two Curriculum Development Co-Leads, Lead Trainer for summer teacher institute, and a Data Management Specialist. BAK LAP work will be performed on state-owned forest lands, in schools, and the University of Alaska Fairbanks. The travel budget provides support for on-site work at schools, collecting data at research facilities, meetings with state officials, and presenting results at scientific meetings. Services and supplies include classroom rental fees and insurance, research and tree measurement instruments, plot markers and aerial imagery, and hiring consultants with expertise in forest products.

Project Timeline:

Year 1 (FY 2013) - 40%

Year 2 (FY 2014) - 25%

Year 3 (FY 2015) - 25%

Year 4 (FY 2016) - 10%

Entity Responsible for the Ongoing Operation and Maintenance of this Project:

UAF, Alaska Division of Forestry, school districts

Grant Recipient Contact Information:

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Has this project been through a public review process at the local level and is it a community priority? Yes No



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TODD POAGE, SUPERINTENDENT

February 3, 2012

Honorable Legislators
Alaska State Capitol
Juneau, AK 99801-1182

Dear Honorable Legislators,

I am writing this letter to ask for your support of UAF's Boreal Alaska – Learning, Adaptation, and Production (BAK LAP) capital proposal. This is an appropriation to DNR for work through the University of Alaska Fairbanks.

As the superintendent of the Alaska Gateway School District, I have witnessed the excitement and support for the installation of Tok School's woody biomass boiler. Heating Tok School with hazardous biomass from local forests has reduced operating costs and the possibility of nearby forest fires, which reduces potential fire fighting costs. Recently, the school district also began producing electricity by retrofitting the boiler to create steam and utilizing a low speed turbine. However, there are important questions about wood procurement and how much wood can be sustainably produced to keep facilities such as our operating over the long term.

The BAK LAP project is designed to show how to make state forest management sustainable while meeting the rapidly expanding demand for heat and electricity. Alaskans want to be responsible, independent citizens with local solutions to energy issues that promote the use of Alaska's forests. We need the answers that BAK LAP will provide thru this study. BAK LAP is also designed to teach students how to harvest and make forest products and work as citizen scientists in the forest. This hands-on approach makes school more relevant, improves learning, and makes the K-12 curriculum a better match to meet the needs of a 21st century workforce.

As an educator, I cannot overstate the importance of engaging children in relevant learning. The OneTree Alaska component of BAK LAP is a successful education and outreach program. It will be conducted as a key part of the forest research and management work to involve children in the use and oversight of our natural resources. BAK LAP will also produce a standards-based curriculum for teachers that include an institute offered during the summer. These curriculum and training activities are just the low-cost approaches that will assist schools in improving math and science programs and can be applied throughout the state.

I believe the BAK LAP program addresses high priority needs of the state: energy and education. The program takes the unique approach of integrating research with education to make it relevant and interesting for everyone. This collaborative approach to addressing high-energy costs and educational improvement are essential for our schools and should be funded by the state.

Respectfully,

Todd Poage,
Superintendent

"EDUCATING ALL STUDENTS TO REACH THEIR FULL POTENTIAL AS RESPONSIBLE CITIZENS."

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