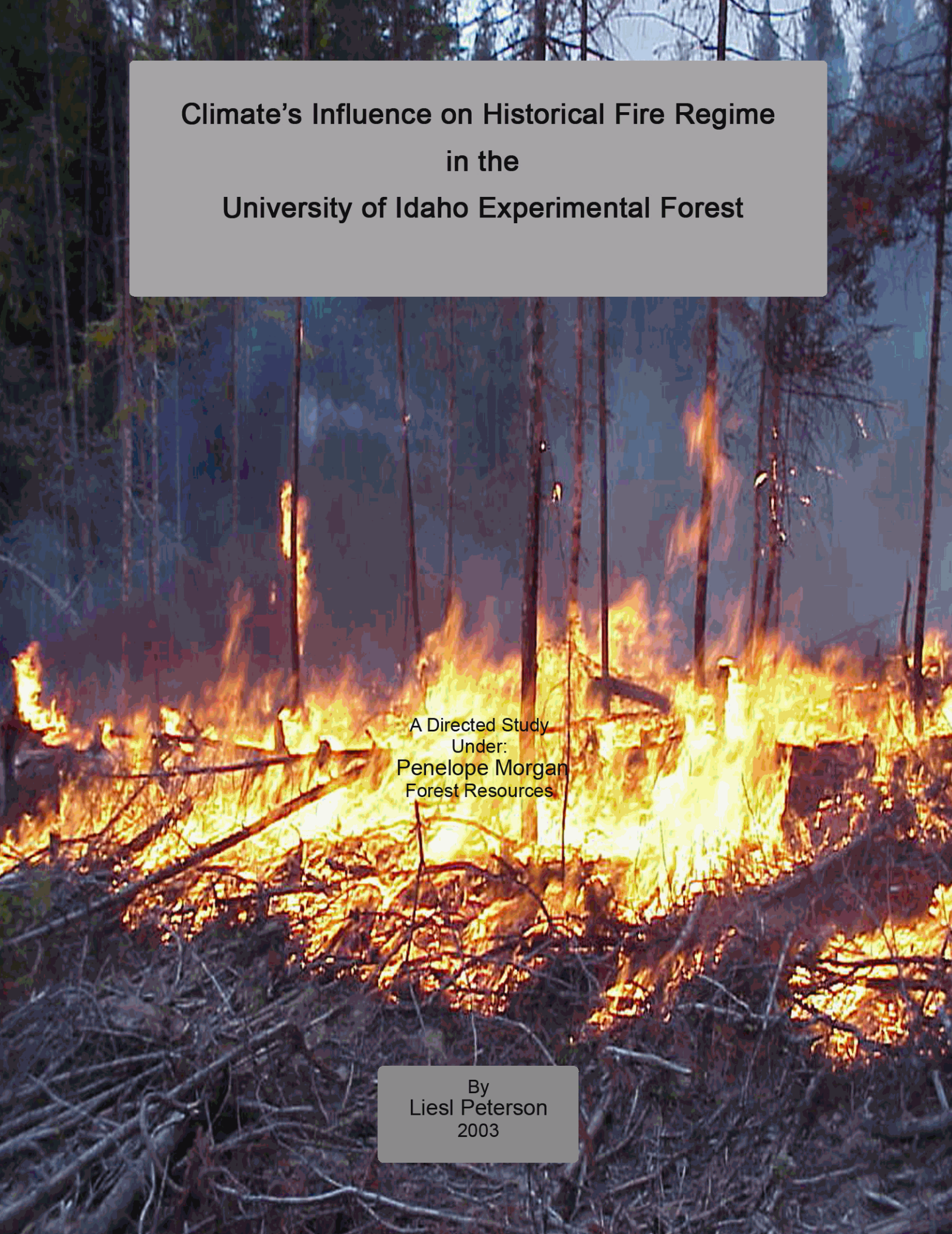
Climate's Influence on Historical Fire Regime in the University of Idaho Experimental Forest



A Directed Study
Under:
Penelope Morgan
Forest Resources

By
Liesl Peterson
2003

Climate's influence on historical fire regime in the University of Idaho Experimental Forest

Abstract: In this undergraduate senior thesis project, Liesl Peterson is investigating the fire history of the University of Idaho Experimental Forest and exploring climate as an important factor in this history. Liesl is crossdating fire-scarred samples from recently logged stumps and older stumps to determine fire years on two sites in the U of I Forest. These two sites, the south-facing slopes of Basalt Hill and Leef's Hill, are approximately 4 km apart and each in a different Experimental Forest Unit. The fire histories for the sites will be compared to one another to determine notable "fire years" in this area. These synchronous fire events will then be compared to historical drought data to determine the correlation between major fire years and drought in this area. The results of this study will hopefully aid the Experimental Forest managers with their decisions regarding fire management, such as fuels management, prescribed burn frequency, and fire suppression. The data from this project will also be incorporated into a much larger study by Penelope Morgan and Emily Heyerdahl investigating climate as a fire driver in the Northern Rockies.

Methods: Each selected stump is sampled by taking one or several cookies from it using a chainsaw. The cookies are sometimes in pieces after sawing and are glued together with subfloor adhesive. Sample surfaces sometimes require flattening with a hand planer before sanding with my trusty Makita belt sander, starting with a course 40 grit belt, then working up through 80, 120, 220, 320, and a very fine 400 grit. The resulting surface is shiny and almost glass-like, a necessity for seeing the structure of each cell under a binocular microscope. The microscope is used to count rings and determine ring-width patterns which are then matched, or cross-dated, with the patterns in established local tree ring chronologies. This is critical for all samples to assure that no years are missed due to missing rings or are incorrectly added due to false rings. Samples for which the outer ring date is unknown, such as those from stumps cut earlier in the 20th Century, are dated using this cross-dating method. Tree ring width patterns are also determined using a measuring machine. This computer-microscope combination measures the width of each ring in millimeters. These measurements can then be used to determine patterns for crossdating. Once calendar dates are assigned to each year on the sample, fire scars are given a year and often a season (based on location in the earlywood, latewood, or dormant period of the annual ring in which the scar is found). Fire years are then entered into FHX2, a computer program that compiles the data from each scarred section to plot the fire history of each site.

Project Title: Climate drivers of fire & fuel in the Northern Rockies: Past, present & future

Principal Investigators:

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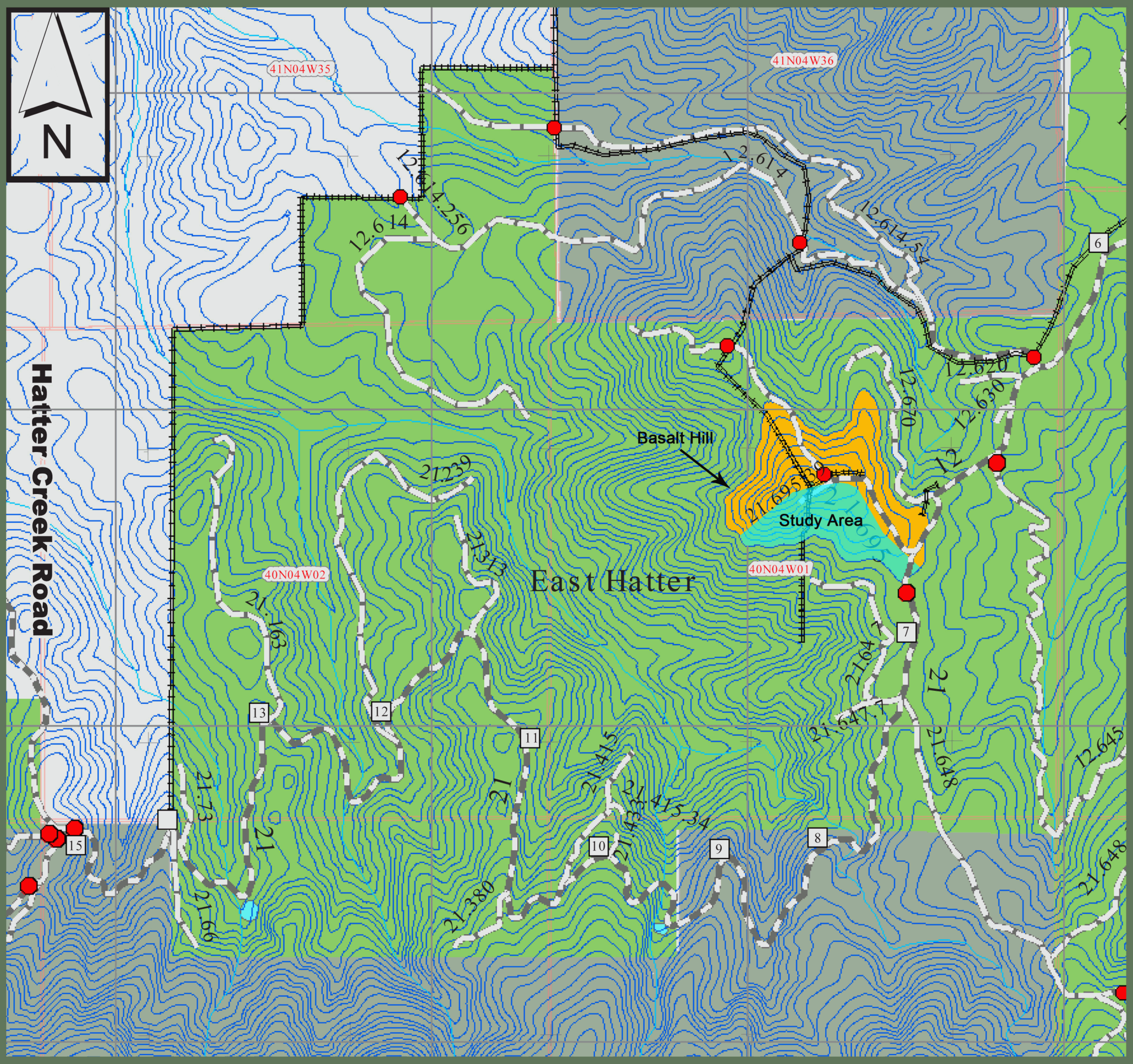
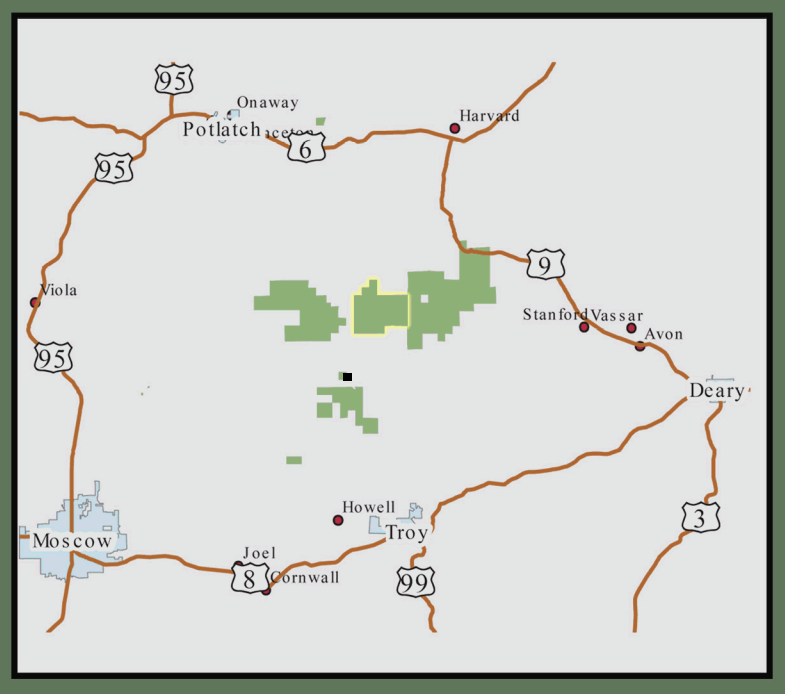
Total Value of In-Kind and Financial Contributions: **$246,122**

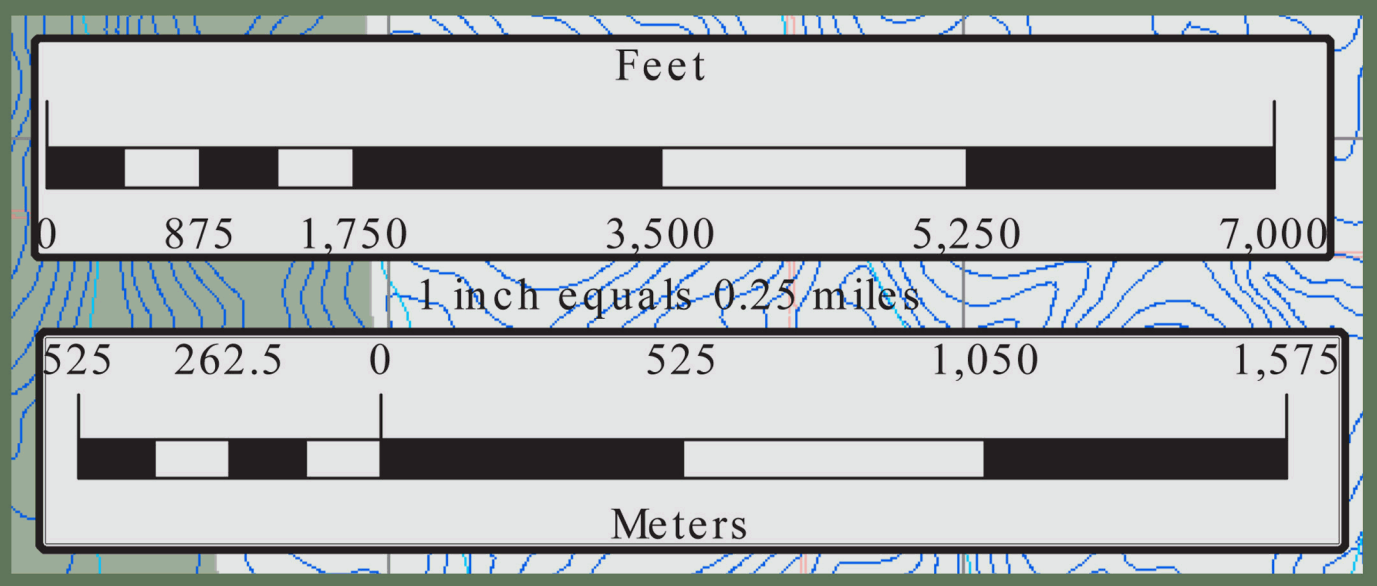
Abstract: This is a 3-year research project to identify the climate drivers of regional fire and fuel dynamics in the Northern Rockies in the past, present, and future. We will focus on those years in which many fires occur across the entire region. We identify such years in the past from fire scars on trees, stumps and logs from at least 15 different sites, and from maps of area burned for large fires on at least 11 National Forests across the region. The fire histories that have previously been reconstructed in the Northern Rockies were not crossdated, and so cannot be used to elucidate the climate forcing of fire at the annual time scales that are critical for fire management. In spite of their potential for identifying synchronous and extensive regional fire years, fire atlases have not yet been used to assess regional fire-climate relationships. We will use the simulation model LANDSUM to evaluate the degree to which fuels management has influenced fire extent during modern regional fire years, and simulate the future consequences of fuels management. Our results will be summarized by fire regime condition class. We will submit 5 manuscripts to refereed journals and educate two M.S. graduate students. To ensure that our results are useful to fire managers, we will present our results at four to six meetings and two workshops with managers. Increasingly, it is possible to predict climate for future fire seasons, so our information will help fire managers anticipate when fire management must focus primarily on fire suppression versus fuel management, and where such fuel management is likely to affect fire behavior during future regional fire years. This project is funded by the Joint Fire Sciences Program (http://jfsp.nifc.gov/), a fuels and fire research program cosponsored by the US Dept. of Agriculture and the US Dept. of Interior agencies.



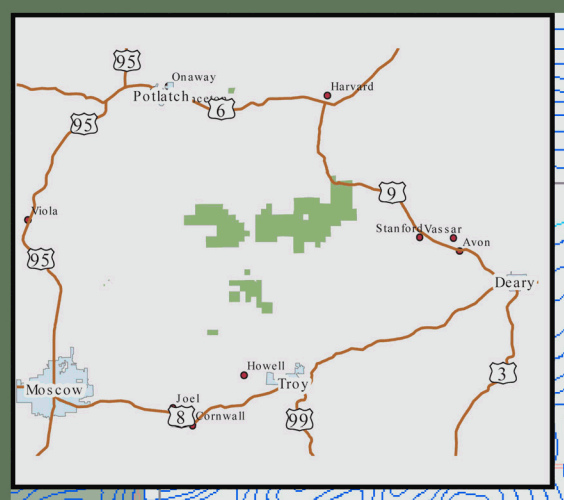


UI Experimental Forest Administrative Map 2004

- 6-Meter Contours
- Running Surface Water
- Fencelines
- Railroad Grade
- Forest Gravel Road
- County Paved Road
- County Gravel Road
- County Dirt Road
- State Road
- Public Land Survey System
- Forest Gates
- CB Mile Markers
- Cattleguards
- Fire Ponds
- University of Idaho Experimental Forest
- Bennett Lumber Products
- Potlatch Corporation
- City of Troy Forest



East Hatter Creek UnIt



Leef's Hill

Study Area

N

Flat Creek

Bennett Lumber Products

Feet

0 875 1,750 3,500 5,250 7,000

1 inch equals 0.25 miles

525 262.5 0 525 1,050 1,575

Meters

Flat Creek Unit

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- City of Troy Forest

Location of Complete Research:

Author & Title: Peterson, Lisle

Climate's Influence on Historical Fire Regime in the University of Idaho Experimental Forest(2003)

University of Idaho Library:

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Department- Forest Resources

Note: This was an undergraduate, directed study under Professor Penelope Morgan, Forest Resources.