

LONG-TERM ECOSYSTEM PRODUCTIVITY

INTEGRATED RESEARCH SITE



CASCADE CENTER *for* ECOSYSTEM MANAGEMENT

background

Concerns expressed by scientists, managers and citizens about the potential impact of management activities on long-term productivity led to formation of the Long-Term Ecosystem Productivity (LTEP) research program in 1990. A major component of the LTEP program is a network of sites, termed Integrated Research Sites, where field experiments are currently being installed. The Isolation Block site on the Blue River Ranger District of the Willamette National Forest is one of four sites in the Pacific Northwest where a common experimental design is being applied. Other sites are located on the Siskiyou National Forest and on the Olympic Experimental Forest of the Washington Department of Natural Resources. Sites are distributed across substantially different ecosystems in the region so that general patterns can be distinguished from site-specific relationships. A team of Science Advisors and Site Managers screen research proposals and develop measurement protocols.

Many important questions concerning long-term productivity were evaluated to develop the experimental design. Two general hypotheses were thought to have a continuing, long-term effect on forest development and productivity, and could be addressed in a large, stand-scale field experiment. The first of these states that early- and late-successional species affect productivity differently than do mid-seral species. Modern plantation management has sharply reduced the time that early- and late-seral species occupy the land relative to historical patterns. The second general hypothesis is that removal of organic matter from a stand affects long-term productivity. Concerns about potential negative effects of organic matter removal on nutrient supply, soil structure, and wildlife lie behind this hypothesis.

the study

The study is designed to evaluate how to sustain long-term ecosystem function and productivity by examining the interrelationships among species composition, soil properties and organic matter over several rotations. The treatments will be assessed and compared in many ways by scientists and resource managers representing biological, physical, economic and social sciences. Vegetation, wildlife, soils, special forest products, climate, economics, public perception, and social concerns will be examined.

SUCCESSIONAL TREATMENTS

Early Seral



Mid Seral



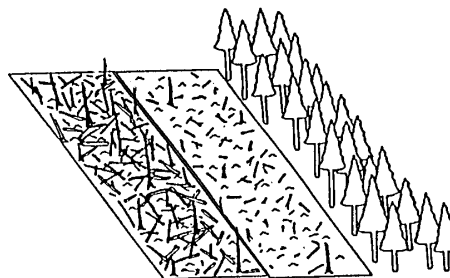
Late Seral



Natural (Control)



ORGANIC MATTER TREATMENTS



H.J. ANDREWS FOREST

ECOSYSTEM RESEARCH

EDUCATION

ADAPTIVE MANAGEMENT

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LONG-TERM ECOSYSTEM PRODUCTIVITY

Three replications of four whole plot treatments will establish a range of ecological conditions with differing species composition and abundance. Treatments are accomplished through promotion or retention of 1) early-seral species 2) mid-seral species 3) late-seral species and structure, and 4) through no intervention, allowing natural succession to occur. The resultant differing guilds of plant species that dominate these stands are assumed to uniquely influence soil and aerial environments and thus ecosystem function and productivity.

Each whole plot treatment is further divided into two subplot treatments to examine the effects of organic matter inputs on soil properties, nutrient cycling, and subsequent fiber production. Treatments are accomplished by leaving either a low or a high level of organic inputs after harvest, scaled as a percentage of current standing biomass.

Within each subplot, a centrally located mensuration plot is used for non-destructive sampling to assess stand-level response. Where feasible, the boundaries of each 1.5 hectare mensuration plot are located at least 30 m from a subplot boundary to allow for adequate above-ground buffering. A 25 m measurement grid is established in each mensuration plot. The area outside each mensuration plot is available for small plot studies and small-scale destructive sampling.

pretreatment

Trees in the Isolation Block site are generally 70-85 years old. A set of core measurements have been gathered according to a standardized protocol used for the entire network of Integrated Research Sites. These detailed measurements include vegetation, soils, organic matter levels, and a photographic record designed to help measure people's perceptions of these treatments. In addition to the common set of regional core measurements, pretreatment sampling for birds, small mammals, and amphibians has been accomplished.

status

The Willamette National Forest Plan was amended in 1991 to formally establish the Isolation Block as an Integrated Research Site. Subsequently, the Northwest Forest Plan placed this area into the Central Cascades Adaptive Management Area. A timber sale to implement the experiment was sold in 1995 (13.5 mmbf) and harvest was completed in 1997. Re-establishment of measurement grids and permanent sample plots were installed following harvest. Post-treatment measurements have begun and will be recorded according to a measurement schedule for the 200-year life of the experiment.

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