Elliot State Research Forest

Research Platform Brief

With increasing global demand for forest products and influences from a changing climate, it will be critical to find ways to provide essential forest products without compromising global forest biodiversity, carbon sequestration, and ecosystem services. The Elliot State Forest has a high potential for carbon sequestration and production of wood products and provides habitat for multiple threatened or endangered species. The size, location, and multiple values that define the Elliot State Forest make it an ideal place for studying how best to achieve broad-scale conservation goals and mitigate climate change while also providing forest products for a growing world population. An Elliot State Research Forest (ESRF) presents a unique opportunity to create a center for scientific exploration of sustainable forest management.

Guiding Principles for Research

The following guiding principles are the foundation for establishing a long-term research program that remains focused and relevant to the overarching vision set forth by the Oregon State Land Board.

• **Research:** Management of the ESRF will advance and sustain science-based research that does not introduce statistical bias.

• **Enduring:** The overarching research question for the ESRF should aim to remain relevant across many years, generations, and social, economic, and environmental contexts.

• **At Scale:** An overarching research question, research design, and long-term monitoring on the ESRF should leverage the unique opportunity the forest offers for experiments at large spatial and long temporal scales.

• **Tailored to the Landscape:** The overarching research question will guide the research design and tailor to the forest based on existing biological, physical, social, and economic conditions.

• **Practical, Relevant, and Collaborative:** The Land Grant mission of Oregon State University and the Elliot’s history as a public forest requires research to be relevant to forest management issues and challenges facing Oregonians.

Triad Research Design

The goal of research on the Elliot State Research Forest is to investigate existing and new land management strategies, exploring the benefits and tradeoffs associated with different types of forest management at a landscape scale. This will be accomplished through a “triad design” which utilizes the size of the Elliot State Forest to test the benefits and tradeoffs of **intensive** or production-oriented management, unmanaged forest **reserves**, as well as more novel land management practices that fall between these endpoints, called “**extensive**” forest management. The triad design varies the amount and spatial arrangement of each of the aforementioned stand level management practices while holding wood supply constant.

Descriptions of intended Intensive, Extensive, Reserve land management protocols can be found here: forestry.oregonstate.edu/elliott-state-forest.

Landscape Level Design

The ESRF is divided into sub watersheds that are 400-2,000 acres in size. The 66 sub watersheds across the ESRF are designated to one of two watersheds, the Conservation Research Watersheds (CRW), shown in green, or Management Research Watershed (MRW).

Sub watersheds within MRW, made up of the eastern ~45,000 acres, will be allocated to one of four different “triad treatments” described more fully below (shown as a mosaic of light green, pink, orange and light blue. Figure 1).

The sub watersheds in the CRW would be set aside into reserve status, representing the largest contiguous reserve on the Oregon coast at 34,139 acres and protecting critical habitat for endangered species like the Spotted Owl and Marbled Murrelet. It also acts as a control for the smaller stand level reserves that are a part of the MRW.

**TRIAD TREATMENTS**

Sub watersheds in the MRW will be assigned to one of four “triad treatments” that designate the proportion of **stand level** land management practices (intensive, extensive, or forest in reserve) which are called “research treatments”.

The four triad treatments can be conceptualized as existing along a continuum with varying amounts forest in a given sub watershed in intensive, extensive, and reserve in order to achieve constant wood supply (figure 2). The two end points (represented by the blue and orange dots) are structured under the premise that as forest management intensifies, it will increase the amount of forest in that could be managed in reserve status while maintaining a stable output of wood supply.
A sub watershed allocated to the “Intensive” Triad Treatment (light green dot in figure 1) 50% of the watershed would be managed intensively for wood production, allowing 50% of the watershed to be put in reserve.

On the other end of the spectrum, no part of a sub watershed in an “Extensive” Triad Treatment (yellow dot), would be managed intensively (clearcutting and rapid replanting of plantations), the entire sub watershed would be treated using extensive forest management practices that mimic natural disturbances such as windstorms. This less intensive management approach does not set aside land for reserve. A sub watershed in this allocation would achieve roughly the same amount of wood supply as one in the “Intensive” Triad Treatment.

The Triad Treatments in between these two endpoints (pink and light blue dots) are designed to vary the proportion of stand level treatments (intensive, extensive, reserve) within a single watershed as outlined in figure 2. Within the triad design, we will incorporate a set of Riparian Conservation Areas (RCAs) that will play a crucial role in integrating aquatic and land management practices.

**RESEARCH NESTED WITHIN THE TRIAD DESIGN**

Although the unifying ‘grand vision’ for the ESRF is the question of how to meet society’s wood demands while maintaining biodiversity, carbon sequestration and other social and ecological processes, there are numerous opportunities for research and collaborations to be nested with the Triad design. Potential key areas of research include biodiversity and conservation (Marbled Murrelet, Spotted Owl, Coho), climate change adaptation,
disturbances such as landslides and fires, water quality, issues of fragmentation and connectivity, and socio-economic and cultural impacts. A full list of potential research project and collaborations can be found at forestry.oregonstate.edu/elliott-state-forest.

The Triad Research Design

- Creates the largest forest reserve on the Oregon Coast.
- Allows for various types of management in order to test and examine our understanding of the best ways to manage forest lands to provide for multiple social, conservation and economic objectives.
- Allows for public access, recreation, educational partnerships, and local economic benefit – all in the context of research on issues of importance to Oregon and the Northwest.

The fundamental aspiration for an ESRF is to create an experimental design that is inherently flexible and broadly applicable, capable of testing basic knowledge and providing solutions to the challenges presented by our growing climate and sustainability crises.

Right: Old growth forest in Jerry Phillips Reserve. Signs in the grove age these trees at 250 years old. This photo is illustrative of the potential for the upwards of 60% of the proposed ESRF that will be in reserve. These forests will be managed for conservation, over time adding to the amount of older forest in the Oregon Coast Range.

Right: Photo taken from the top of Dean Mountain in the Elliott State Forest. The clear cut on the right side of the photo is illustrative of intensive, production oriented, harvest treatments that would be conducted under the current research design in parts of the ESRF.

Right: Photo of a stand in the Elliott State Forest that include a diversity of age classes. This photo is illustrative of the types of complex forest that would be generated through extensive harvest treatments in an Elliott State Research Photo.