

## **Quantifying Riparian Stand Composition and Ecological Effectiveness at Landscape scale Based on Remote Sensing**

### **Overview**

Extensive monitoring is a critical component of the monitoring strategy recognized in the HCP and incorporated into the Settlement Agreement projects. Extensive monitoring documents the current status and predicts future trends of key indicators of resource conditions on a statewide scale (i.e., the yardstick for assessing overall changes across the state). Extensive monitoring is one of three elements of the FFR monitoring strategy which includes effectiveness monitoring (measures effectiveness of a particular prescription to achieve selected performance targets) and intensive monitoring (measures the cumulative ecological effect of all forest practices in a watershed). Without Extensive monitoring, there is no landscape scale inventory of the extent to which all forest practices prescriptions are realized on the ground – this would create a significant gap in our knowledge of FFR and HCP implementation.

During the past year, RSAG has discussed potential alternative approaches for extensive monitoring. Concern over the cost and utility of extensive monitoring for stream temperature has prompted some caucuses to suggest elimination of all extensive monitoring projects.

As an alternative to the current extensive monitoring strategy, Policy proposes developing a modified approach based on remote sensing. Policy will determine whether this approach provides a quantitative baseline inventory of riparian stand composition on FFR lands that is accurate, repeatable, and spatially representative of individual basins and the forested landscape. This remote sensing project would have two phases: an initial pilot study to develop and assess remote sensing protocols for a subsequent statewide assessment. Based on Policy's review and approval, a second phase would implement the protocol across private forest lands in Washington. This process will provide a foundation for Policy to consider in determining what approach will be utilized for extensive vegetation sampling. The pilot will clarify the level of data resolution, cost, and potential limitations of the data. Both phases will be reflected in the CMER Master Program with funding at a \$400,000 level spread over 3-4 years.

## **Pilot Study and Implementation Phase**

**Pilot study:** A pilot study would assess remote-sensing data to develop the best stand categorization method, determine a cost-effective imagery source, define ecologically meaningful vegetation strata, and ground-truth. The pilot will evaluate data needs, costs, and data resolution/limitations. The pilot's objective would be to develop, evaluate, and recommend a technical approach for categorizing and quantifying riparian vegetation composition and condition on private forest lands in the state. More specific questions could include:

- What riparian vegetation categories can be reliably detected that results from application of all FP rules (e.g., shrubs/seedlings, saplings, pole, mature), density (e.g., sparse, dense), dominant composition (e.g., conifer, deciduous, mixed)?
- What is the current vegetation condition by stream type (e.g., S, F, Np, N, bull trout overlay), timber zone, and landownership?

The pilot may include tasks listed below (and others as needed).

- Identify appropriate study locations
- Identify imagery appropriate for work
- Develop algorithms for stand categorization
- Validate (ground-truth) vegetation classifications
- Select metrics and develop approach for quantifying vegetation types. Metrics should include quantification of the actual length, width, and acreage of buffers and stream adjacent timber retention.
- Prepare report with recommendations on imagery, stand categories, findings of validation, estimated cost to expand study to landscape scale.
- Provide project products (e.g., GIS layers, excel summary)

**Implementation Phase:** Pending review of the pilot findings and Policy approval, the second phase of the project would be to implement the protocol across the state on private lands.