Prospective Findings Report for
Scoping an Extensive Riparian Vegetation Monitoring Implementation Pilot Project
RSAG Draft
September 12, 2018

1. **Does the study inform a rule, numeric target, performance target, or resource objective?**

   No, the study does not inform any specific rule, numeric target, performance target, or resource objective.

2. **Does the study inform the Forest Practices Rules, the Forest Practices Board Manual guidelines, or Schedules L-1 or L-2?**

   Yes, this study will provide the framework for implementing a statewide status and trends monitoring (i.e., extensive monitoring) program to measure the short and long-term condition of riparian forests managed under the forest practices rules. Status and trends monitoring is part of the Extensive Monitoring Program in the 2017 CMER Work Plan.

3. **Was the study carried out pursuant to CMER scientific protocols (i.e., study design, peer review)?**

   No. However, scoping the Remote Sensing Pilot project followed Cooperative Monitoring Evaluation and Research (CMER) protocol and standards manual guidelines (e.g., internal review), but was not submitted for Independent Scientific Peer Review (ISPR). CMER decided to defer ISPR because the pilot study findings (remote sensing tools) will be evaluated by ISPR when, and if, Timber Fish and Wildlife Policy (Policy) and the Forest Practices Board (Board) decide to fund the proposed future state-wide riparian vegetation monitoring component of the CMER's Extensive Riparian Vegetation Status and Trends Monitoring Program.

4. **What does the study tell us? What does the study not tell us?**

   What does the study tell us?

   The riparian status and trends project began with a literature synthesis on remote sensing tools available for evaluating forest cover. The Extensive Riparian Vegetation Monitoring-Remote Sensing Pilot Study (Remote Sensing Pilot) was conducted at the request of Policy and funded by the Board. The first Remote Sensing Pilot study compared and contrasted different remote sensing products, methods and techniques and evaluated their capacity for measuring site-specific riparian forest stand conditions. The first Remote Sensing Pilot recommended this follow-up Implementation Pilot Study (Implementation Pilot) that would further inform the feasibility of conducting an Extensive Riparian Vegetation Monitoring project on a state wide basis.

   The first Remote Sensing Pilot study evaluated the relative effectiveness, accuracy, and

cost of using LIDAR and aerial imagery to assess riparian stand conditions. The study developed, evaluated, and recommended a suite of remote sensing tools that could potentially be implemented for a yet to be proposed future state-wide riparian vegetation monitoring project. The Remote Sensing Pilot Study recommended that the Implementation Pilot Study Scoping Document have four deliverables:

- identify the availability of LIDAR for forestlands in Washington State covered by the forest practices rules and determine the forest types whose study would further inform the development of a state-wide extensive riparian vegetation monitoring study that evaluates status and trends
- identify FP HCP lands in Washington State that have multiple years of LIDAR coverage
- evaluate the different forest metrics that should be collected if an implementation pilot study is conducted
- evaluate specific field protocols that should be used to collect data for the Implementation Pilot project

The Remote Sensing Pilot study informed CMER and Policy that LIDAR was the most effective tool for identifying riparian forest stand conditions used in developing watershed-scale models proposed for future riparian extensive monitoring. Although LIDAR is an effective tool, its limited availability now and into the future suggests the need to have new technologies integrated into the study design. The Implementation Pilot will further refine these findings and provide recommendations on a way forward. This scoping document is the first step in the process.

The Remote Sensing Pilot study tells us that there are two areas in the state that should be considered for the Implementation Pilot. Watersheds in the Northeast Region and the Northwest Coast Region of Washington State are the two best places to conduct the Implementation Pilot. These regions are sufficiently different from the Mashel Watershed, which was studied in the first Remote Sensing Pilot, and including them will inform how well the interpretive models can be applied across different regions in Washington State. This will help to determine the amount of personnel effort (field and office) and associated overall project costs required to develop and implement an Extensive Riparian Vegetation Status and Trends Monitoring Program throughout Washington State forestlands. If only one region can be studied for budgetary reasons, the study should be conducted in the Northeast Region. The study discusses the costs and benefits of the following alternatives:

- Develop one study site in Northeastern Washington for a cost of between $400,000 and $600,000. This will take two years.
- Develop one study site in Northwest Coast Washington for a cost of between $400,000 and $600,000. This will take two years.
- Develop two studies site in Northeastern Washington and Northwest Coast Washington for a cost of between $800,000 and $1,200,000. This will take two years.

The Remote Sensing Pilot study identifies the metrics that should be collected in the Implementation Pilot and recommends a suite of field protocols which could be used for collecting the data.

What does the study not tell us?

The Implementation Pilot did not identify a specific watershed in the two regions that it recommended for the Implementation Pilot. The Implementation Pilot scoping document cannot specify in advance the ultimate number of watersheds that will need to be studied to support moving forward with a state wide study.

5. What is the relationship between this study and any others that may be planned, underway, or recently completed?

Extensive Riparian Vegetation Monitoring has the potential to provide the spatial context for better understanding the distribution of riparian stand conditions across a highly variable landscape. This may also further inform Policy and the Board about other CMER studies that test the effects and validation of forest practices rules on FP HCP lands. A state wide extensive monitoring program for riparian vegetation could have informed or be informed by the Westside Type F Riparian Prescription Effectiveness and Extensive Riparian Status and Trends Temperature Monitoring projects which are studies that are in process or completed.

The Remote Sensing Pilot study was the remote sensing tool development phase of the Extensive Riparian Vegetation Monitoring Program and it was completed in June 2017. It was based on a literature synthesis that was completed in November 2015. The first phase was the first Remote Sensing Pilot study, carried out in the Mashel watershed, which evaluated the relative effectiveness, accuracy, and cost of using LIDAR and aerial imagery to assess riparian stand conditions. The Implementation Pilot Study would further refine a study design that was articulated in the literature synthesis and evaluated in the first Remote Sensing Pilot.

The next phase of this program is designed to conduct an implementation pilot that will address the practicability and feasibility of the application of remote sensing at a state level. The Implementation Pilot study would:

- evaluate the remote sensing tool's performance in different riparian forest types by region
- evaluate tool performance for assessing riparian stand condition change over time, and
- identify the optimum suite of tools and metrics (cost effectiveness, accuracy) for conducting state-wide riparian status and trend monitoring

Although LIDAR is a very powerful tool, other technologies, such as stereo satellite or aerial imaging and new developments in analyzing these data sources should continue to be followed as a potential alternative for long-term monitoring in place of multi-date LIDAR data. These data could be used to compare and monitor the trends in the

riparian forest conditions once a LIDAR-based baseline has been established. Extensive Riparian Vegetation Monitoring is a long-term undertaking and will require a long term budget strategy that funds the ongoing monitoring (e.g. annually or periodic survey) well into the future.

6. **What is the scientific basis that underlies the rule, numeric target, performance target, or resource objective that the study informs? How much of an incremental gain in understanding do the study results represent?**

   Extensive monitoring is one component of three distinct monitoring programs (Effectiveness, Extensive, and Validation monitoring) outlined in the 2017 CMER work plan for assessing the overall effectiveness of the forest practice rules and status and trends in riparian stand conditions over time. Extensive monitoring is a population-scale assessment of the status and trends of riparian stand conditions where forest practices rules have been applied on forestlands. Four areas for extensive monitoring are outlined in the 2017 CMER work plan: stream temperature and riparian stand characteristics; barriers to fish passage; forest roads, and mass wasting.

   As stated in the 2017 CMER work plan, "Extensive monitoring programs evaluate the current status of key watershed input processes and habitat condition indicators across FP HCP lands, and document trends in these indicators over time as the forest practices prescriptions are applied across the landscape. Extensive monitoring provides a statewide, landscape-scale assessment of the effectiveness of forest practices rules to attain specific performance targets on FP HCP lands. Extensive monitoring is designed to provide report-card-type measures of rule effectiveness (i.e., to what extent are FP HCP performance targets and resource condition objectives being achieved on a landscape scale over time). These measures can then be used to determine the degree to which progress is meeting expectations."