

# Riparian Function Literature Review and Annotated Bibliography

## Answers to Six Questions from the CMER / Policy Interaction Framework Document

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Approved by CMER on: **Insert Date**

Presented by the: **RSAG**

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### Type of Product in Review:

**Prospective Answers:**  Charter  Scoping Document  Study Design

**Retrospective:**  Completed Pilot/Study Phase  Completed Final Study Report

**Brief Description:** This literature review focuses on the response of riparian functions following harvest in forests adjacent to rivers and streams.

1. Does the study inform a rule, numeric target, Performance Target, or Resource Objective?

No. However the literature review can inform future CMER riparian studies that are currently being or have yet to be scoped.

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

No.

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

No. TFW Policy directed this literature review for CMER to conduct. The project did not go through a scoping phase or ISPR. CMER however did develop the questions of interests in response to TFW Policy's request.

4. What does the study tell us?

The literature review summarized key riparian functions, and related physical processes, and provided a review to support recommendations for future research. The riparian functions specified in the FPHCP include "large woody debris recruitment, sediment filtration, stream bank stability, shade, litterfall and nutrients, in addition to other processes important to riparian and aquatic systems." (FPHCP, 2006).

This literature review addressed specific questions (listed below) and identified appropriate variables and associated metrics that can be used to quantify and assess timber harvest effects on the riparian functions.

1. What are the effects of timber harvest intensities and extent on the riparian functions, with an emphasis on the five key functions listed above, in comparison to conditions before harvest?
  - a. What are the effects of thinning (intensity, extent) on the riparian functions, over the short and long-term compared to untreated stands?
  - b. How do buffer widths and adjacent upland timber harvest prescriptions influence impacts of riparian thinning treatments?
  - c. What are the effects of clearcut gaps in riparian stands (intensity, extent) on the riparian functions, over the short and long-term, compared to untreated stands
  - d. How do buffer widths and upland timber harvest influence impacts of clearcut gaps treatments?

- e. What are the effects of any combinations of the above treatments?
- 2. How and to what degree do specific site conditions (e.g., topography, channel width and orientation, riparian stand age and composition) influence the response of the riparian functions?
- 3. What is the frequency of weather-related effects (e.g., windthrow, ice storms, excessive heat, flood and drought events) on riparian areas? What are the weather-related effects (positive and negative) on the riparian functions, and how are they distinguished from harvest effects? How do these effects differ between treated and untreated riparian forests?
- 4. How do various treatments within riparian buffers relate to forest health and resilience to fire, disease, and other forest disturbances?
- 5. How do the functions provided by riparian stands change over time (e.g., large woody debris recruitment from farther away from the stream)?
- 6. Are there feedback mechanisms (e.g., microclimate changes within the riparian buffer) related to forest management that affect the recovery rates of riparian functions?
- 7. What major data gaps and uncertainties exist relative to effects of timber harvest (both riparian and adjacent upland) on the riparian functions?

What does the study not tell us?

The study was initially intended to be a literature synthesis, which when done appropriately can inform the degree to which riparian rules may be effective at meeting resource objectives. However, the report as completed aligned more to the definition of a literature review than a literature synthesis. As such, it does not directly inform the level of effectiveness of the current riparian rules.

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

This literature review adds to the compilation of literature reviews previously conducted by and available to CMER. Examples of other literature reviews include Wetlands, salvage logging, glacial and non-glacial deep-seated landslides, unstable slopes, etc. CMER is currently working on three studies that will inform the level of effectiveness of riparian rules meeting resource objectives and performance targets (Schedule L-1) – Eastside Type Np Riparian Effectiveness, Riparian Characteristics and Shade, and (yet to be scoped) Type F Experimental.

If TFW Policy still wants answers to additional questions about riparian functions outside the scope of this literature review on buffer effectiveness that are not currently in the CMER workplan, then TFW Policy should provide CMER with the relevant adaptive management questions that will enable CMER to scope out options that will provide technical information to help answer those questions. A follow-up literature synthesis can be one of the options CMER presents to TFW Policy as part of that scoping process.

- 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?

NA – see answer to question 2.