quickNotes
the information note of fRI Research

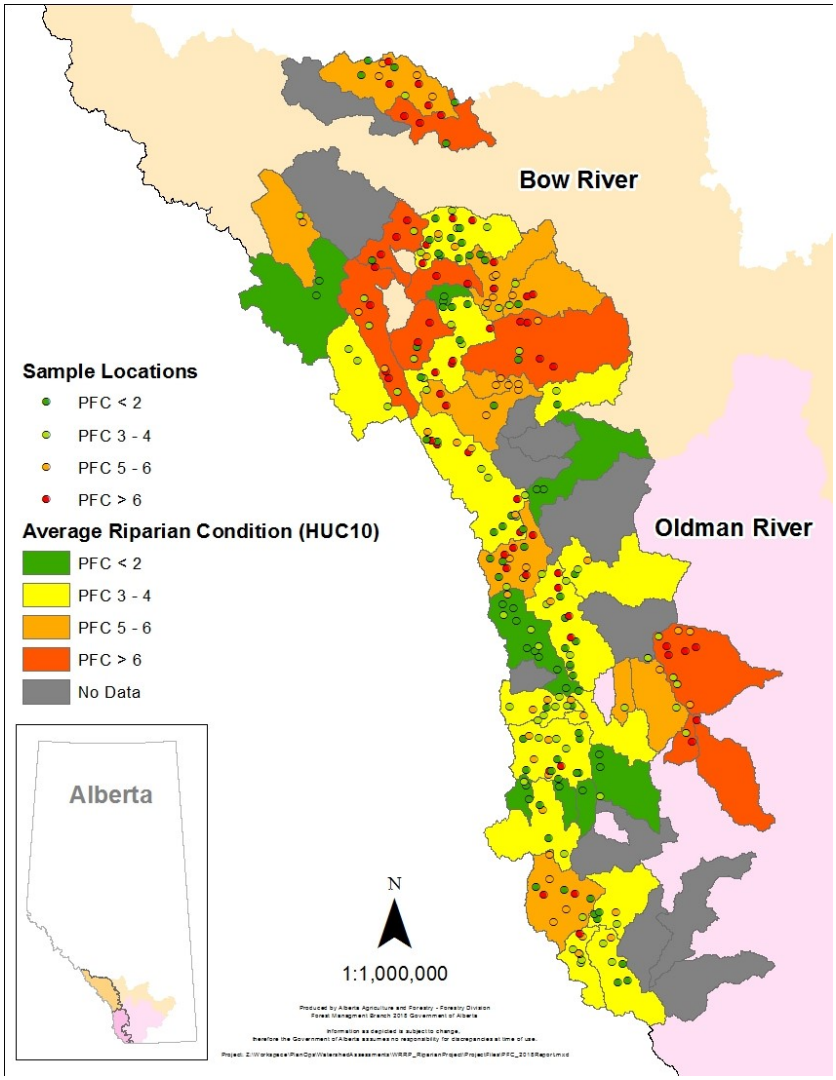
fRI Research
Informing Land & Resource Management

Caitlin Tomaszewski

2018: Riparian Assessments

Update on the Water Program's Progress on the Watershed Resiliency and Restoration Project

Riparian health can be defined by how well physical processes function and interact to withstand (resistance) and recover (resiliency) from disturbance. Riparian assessments are an important tool for environmental monitoring and management and are used to describe the condition of streams and their adjacent lands by documenting physical attributes associated with stream channels, vegetation, soils, and land use activities.



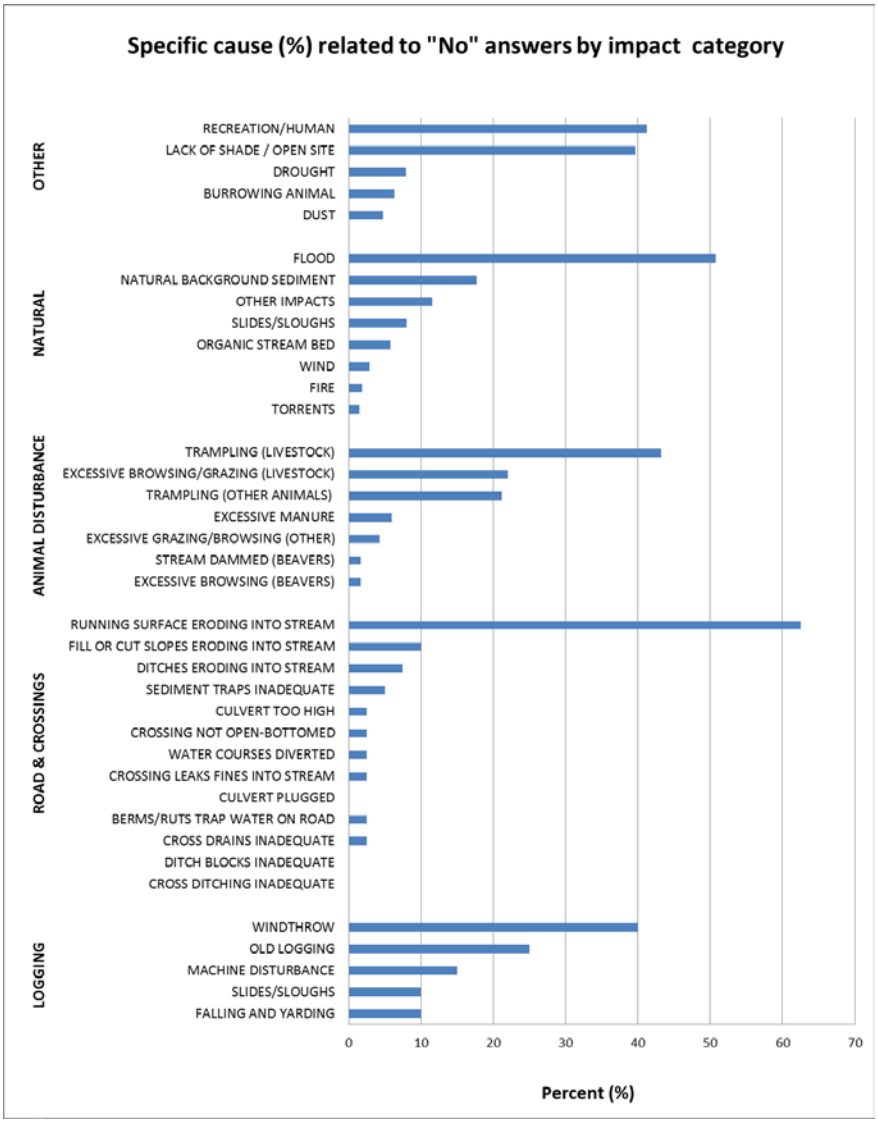
Study area. Higher PFC scores indicate poorer condition.

In 2015, the fRI Research Water Program and the Alberta Government undertook a 3-year project to understand riparian conditions across the forested public lands of the Bow and Oldman headwaters. This project, under the Watershed Restoration and Resiliency Program (WRRP), will help identify areas where watershed restoration and riparian rehabilitation would be likely to increase resilience to floods and droughts. Specifically, it has four primary objectives: describe the condition of riparian areas across the south-east slopes of Alberta, explore ecologically relevant thresholds that define riparian condition, identify the primary causes associated with riparian decline from both natural and human factors, and develop a predictive model which can be used for management and mitigation of riparian area in the Eastern Slopes.

For more information on this or other Water Program publications, please contact: Axel Anderson.
Tel.: (780) 492 – 4371, Email: aanderson@friresearch.ca or visit wp.friresearch.ca

Project Progress

Over the 3 years of study, 312 riparian assessments were completed in the Bow and Oldman watersheds. Riparian condition across the study area was spatially variable and on average was rated “functional but at high risk”. Riparian condition differed between the Oldman and Bow and across smaller sub-watersheds. Analysis indicates significant differences between reference (least disturbed) and non-reference sites, suggesting thresholds are appropriate to distinguish between natural and human factors contributing to riparian condition. Primary characteristics related to riparian decline were: structure of riparian vegetation, bank stability, compacted ground, bare soils, and in-stream fine sediments. The largest natural factor associated with poor conditions was the flood of 2013. Human factors included grazing/livestock, erosion from roads/trails, and recreation.



Frequency of factors reducing riparian condition.

Further Directions

This project successfully evaluated riparian condition across the Bow and Oldman headwaters, and attributed conditions to specific natural and anthropogenic factors. The next steps are an extensive analysis to determine if thresholds suggested by the FREP protocol are appropriate for Alberta streams, and building a predictive model using the most important riparian parameters and PFC score. Our findings highlight the large natural range of variation in riparian condition across the Bow and Oldman headwaters, the majority of which was affected by the 2013 flood and previous high flow events. This high natural variability makes it challenging to separate out human influences on our riparian areas, but study results indicate that our assessment method is appropriate for east slopes watersheds, and that riparian assessments can identify issues and prioritize restoration or management. This work shows great potential to improve overall watershed health and function.

Acknowledgements

This project is supported through grants under the Alberta Environment and Parks WRRP and the Federal Department of Fisheries and Oceans Species At Risk Program. Alberta Agriculture and Forestry provided in-kind support in the form of meals and accommodation for staff at wildfire bases, salaried employee time for supervision and training, and basic field equipment.

For more information on this or other Water Program Publications, please contact Axel Anderson.
Tel.: (780) 492 – 4371, Email: aanderson@friresearch.ca or visit wp.friresearch.ca