

Forest Management in Western Toad Habitat in the Summit Lake Area

The Summit Lake area supports a regionally important population of western toads (*Anaxyrus boreas*) and, as such, has been the focus of recent management initiatives. Land use practices such as highway infrastructure, forestry operations, recreation and private land development influence local toad populations and habitat (MFLNRO, 2017).

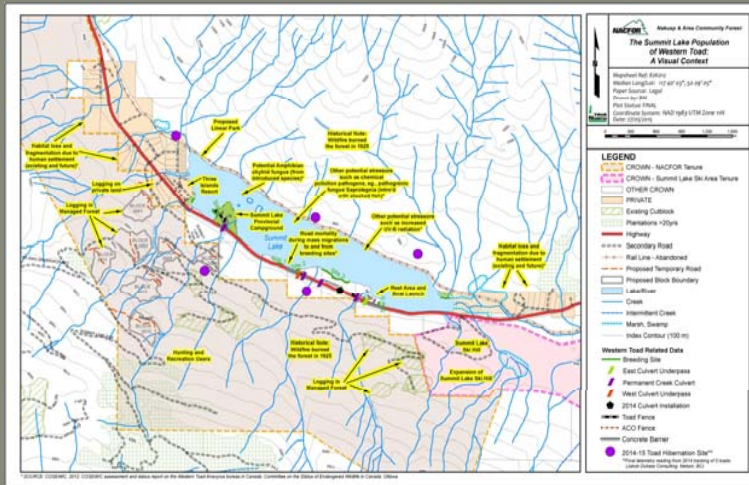


Figure 1. Western toad habitat in context with other activities in the Summit Lake Area

Western toads breed in Summit Lake but are predominantly terrestrial and inhabit a variety of upland forest types for foraging, security and overwintering.

The forests around Summit Lake have a long history of disturbance from both wildfire and logging that has created a mosaic of timber types, ages and densities.

These diverse forests adjacent to breeding areas provide suitable habitat for the Summit Lake western toad population.

A two kilometre management area has been established around Summit Lake to protect western toad habitat. Harvesting is temporarily deferred in a study area immediately adjacent to the lake until more information on the impacts of harvesting in this high value toad habitat is available. See Figure 2.

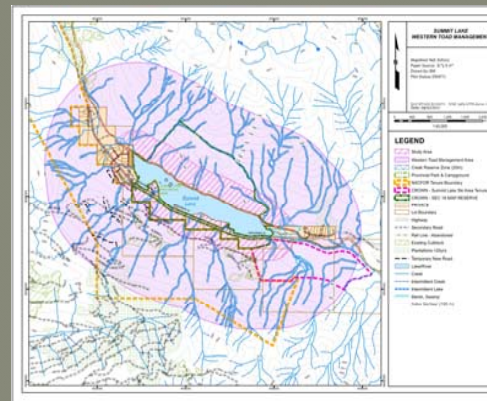


Figure 2. Summit Lake Western Toad Management Area including study area adjacent to the lake, land ownership and tenure areas



Juvenile toads (toadlets) on the move, August 2015



Example of mossy ghost coarse woody debris with cavities

Planning

Over the past several years, the NACFOR has been working with the Ministry of Forests, Lands, Natural Resource Operations and Rural Development and the Fish and Wildlife Compensation Program (FWCP) to develop best management practices and strategies that address some of the land use issues in the Summit Lake area (FLNRO, 2017).

Recommendations for forest operations include:

- Design cutblock size and spatial arrangement to enhance habitat diversity across the landscape
- Harvest on frozen ground with sufficient snowpack to protect habitat features
- Retain deciduous vegetation to provide cover for western toad roost sites
- Establish retention areas around high value habitat features (see Figure 3)
- Maintain structural complexity within cut blocks by retaining dispersed coarse woody debris and landing debris piles
- Retain mature coniferous wildlife trees for cone production to promote squirrel midden development which are used by western toads for overwintering and roost sites
- Protect riparian areas and maintain stream bank integrity
- Minimize permanent road construction and rehabilitate temporary road structures immediately following harvest

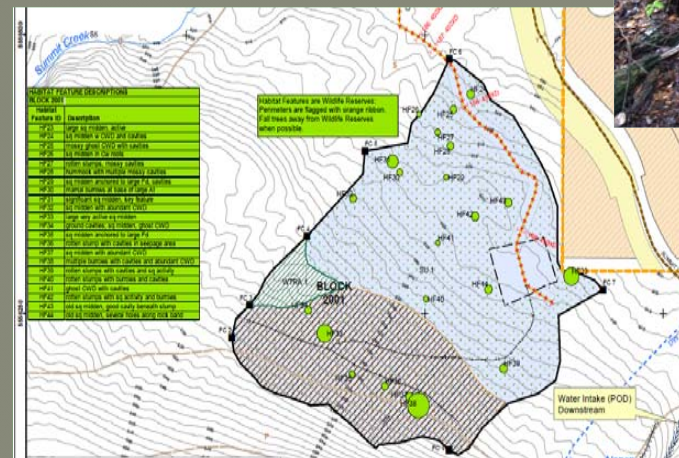


Figure 3. Micro-reserves established to protect high values habitat features in Block 2001. Features were ribboned in the field and georeferenced on maps to ensure they could be located during harvesting



Juvenile toads crossing under Highway 6 in tunnel constructed in 2014 as part of the FWCP Summit Lake Western Toad project

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Operations

- All blocks in the Summit Lake area were harvested during winter on a snowpack to protect hibernating toads and habitat features. Experienced supervisors and operators were instrumental in meeting the prescribed toad management plan. NACFOR's Environmental and Safety Management System was followed for all phases.
- Measurements were taken to record snow depth and density before and during harvesting to ensure sufficient snowpack.
- Random skidding was used where possible to reduce the likelihood of ground disturbance.
- Road construction was carried out during non-migration periods – generally following the adult migration from forested habitat to breeding areas and before migration of juvenile toads from the lake to the forest, or following hibernation. Telemetry data was used to determine the timing of hibernation.
- Monitoring for toad presence on roads was ongoing during log hauling, road construction, rehabilitation and maintenance. Road works and hauling were limited to daylight hours.
- Following harvesting, all temporary roads and landing were rehabilitated ('un-built') and will be planted to reduce the road density in the Summit Lake drainage.
- Debris piles were left intact in blocks with a low fire hazard and a 'toad hotel' was built in Block 2001 by burying debris and logs on the landing to provide overwintering and roost sites.
- Daytime surveys have been carried out since 2016 on Summit FSR to track toad presence and movement; this data is used to inform operational activities.



Block 2001 post-harvest showing micro-reserves and deciduous retention. Working closely with the logging crew is critical to achieve the desired prescription.



Field review of harvesting in Block 2001 with FLNRO Habitat Specialist and Resource Operations Manager, February 2018 – feller buncher operator explains cutting strategy to protect reserves



Adult western toad found on Block 2001, May 2017

Post Harvest

- Harvested blocks will be reforested in spring 2019 and 2020 with a mix of Douglas-fir, western larch, western red cedar and white pine. Some deciduous to be retained to provide stand diversity and leaf litter.
- To protect habitat features and toads, post-harvest site preparation treatments such as mounding and stump removal will not be carried out.
- Aerial photography of pre- and post-harvest conditions will allow NACFOR to evaluate and monitor harvest practices in western toad terrestrial habitat over time.
- Continue with operational research and field surveys to measure toad occurrence and habitat use in areas with forest development; this information will support research on the effects of logging in western toad habitat in the Summit Lake area.



Block 2001 aerial view of pre-harvest stand, road and landing development, February 2018



Block 2001 post-harvest aerial view of landing debris piles and micro-reserves, approximately 5 m²/hectare mature conifer and deciduous stems retained, intact debris piles will provide roost areas and hibernation sites

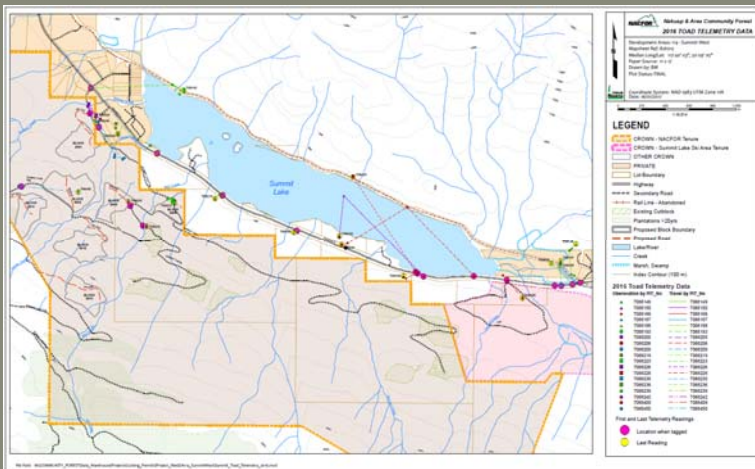


Figure 4. 2016 telemetry mapping showing movements of radio-tagged adult western toads (data provided by Jakob Dulisse, 2016)

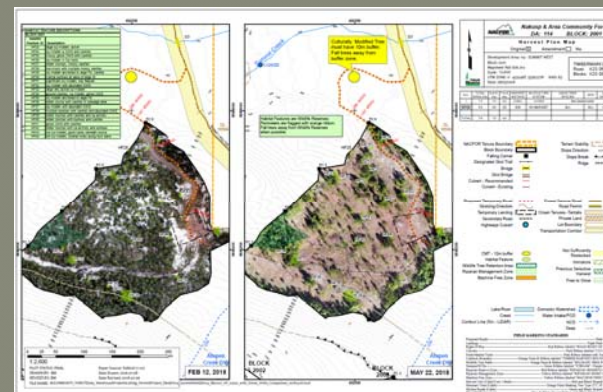


Figure 5. Block 2001 pre- and post-harvest orthomosaic with Wildlife Tree Retention Area and micro-reserves, May 2018