

Western toads, their migrations and mortalities in relation to the proposed Zincton Mountain Resort and London Ridge

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Figure 1: A Western toad “toadlet” in the snowy alpine habitat of London Ridge at about 2000m elevation on July 21, 2020, near the area of Zincton’s proposed large alpine lodge.

Summary

The proposed Zincton Mountain Resort is in direct conflict with a significant community effort to protect critical ecosystem functions in the Highway 31A corridor. The increase in highway and backcountry traffic, inevitable pollution generated by a permanent town site and construction of ski runs, chair lifts, hiking trails and a 50-bed alpine lodge would undermine seven years of collaborative effort to maintain the migrations of at risk Western toads (*Anaxyrus boreas*) from Fish Lake and surrounding wetlands to Whitewater Mountain and London Ridge. The conservation project has been a model of success for community members, biologists, businesses, NGO’s, the Ministry of Transportation and Infrastructure and the Regional District of Central Kootenay coming together to solve the problem of highway mortality of an at risk amphibian population. The project has cost roughly \$350,000 date, which includes community, NGO and government funding in addition to substantial community volunteer efforts. To compromise this successful amphibian/ecosystem conservation project in a wildlife corridor adjacent to a major provincial park would be an appalling setback in this time of biodiversity and climate crisis in British Columbia.

Western toads are provincially listed as yellow (apparently secure) and federally listed as Special Concern under the Species at Risk Act (SARA), Due to a lack of long term monitoring however it is not known how many populations still inhabit areas with good ecological integrity, or how many are being properly managed to reduce the risk of extirpation (B.C. Conservation Data Centre 2016). The 2016 provincial decision to move Western toads from BC’s blue list to yellow list of species at risk is considered short sighted by some biologists who are concerned about cumulative impacts of increasing development, habitat fragmentation, climate change effects and Chytrid fungus (*Batrachochytrium dendrobatidis*)

which has caused an “amphibian apocalypse” of sporadic decline in other species (Raffel et al. 2013). What is known is that populations in the Lower Mainland, Vancouver Island, and the U.S. have declined or been extirpated, and short-term declines of 10-30% have been incurred provincially (Wind and Dupuis 2002). However, the West Kootenay region including Fish Lake is still a significant breeding hot spot for the species with evidence that mitigation efforts may be restoring this population to former numbers.

Expected impacts of the proposed Zincton development on Western toads:

1. Increased highway mortality

In addition to toads found inhabiting the proposed Zincton Controlled Recreation Area (CRA), surveys in 2021 documented large numbers of breeding adult toads, including gravid females, between Zincton and Three Forks in the vicinity of private land slated to become the infrastructure of Zincton’s permanent town site. Significant adult toad crossings and highway mortalities were documented in the proposed Zincton private land base area, which covers about half of the 7 km of Highway 31A between Zincton and Three Forks. Of 30 night surveys in 2021, 320 live adult toads and 28 mortalities were found between Zincton and Three Forks. At least 16 out of 35 toads that were sexed were gravid females, or 16 that were noticeably gravid out of 26 females. Significant crossing and mortality in this area, including of gravid females, suggests Western toad breeding is likely occurring in the wetland/riparian areas along Seaton Creek within the proposed base area. These numbers represent toads that were obviously gravid, though others may have been. We have not yet witnessed toadlets in this area. Some adults migrating along the paved Three Forks-Zincton highway at night towards Bear and Fish Lakes suggests part of this population may be from the VWS Fish Lake toad study area.

The mortalities documented while implementing night time mitigation efforts in the adult migration season of 2021 suggest that the traffic increase posed by Zincton Resort would derail the mitigative effect of our efforts by substantially increasing highway mortality. Since toads like to migrate along lineal corridors, they will likely also utilize the proposed new paved access road up the mountain to Zincton Farm’s new town site and other roads used to service the proposed ski runs and the lodge on London Ridge. Mortality on these new roads should be considered cumulative to the existing mortality on Highway 31A and the predictable high traffic increase that this development will bring.

This would be a huge step backward for a laudable conservation project and all those involved.

Cascade’s Environmental Overview report states that road mortalities are unlikely to increase due to the utilization of a shuttle service. This is sheer speculation since our data suggests that Western toads will be frequenting the parking area and the new access roads to the village. The September 2021 Zincton formal proposal conservatively estimates that 143 parking stalls will be needed at the Three Forks base area, possibly including underground parking, to host at least 153 people riding in EV shuttles in a day, and 510 skiers that are expected to drive to the base area east of Three Forks in a day. Also, to access the EV shuttle to the new village many people will also be driving through the Western toad core area from the east along Highway 31A between Fish Lake and Three Forks.

Besides a significant increase in toad mortalities, this increase in traffic is also expected to bring a significant increase in wildlife collisions, putting wildlife populations and human lives at risk. Current, highway mortality mitigation efforts for Western toads and other amphibians are only partly successful due to numerous volunteers moving migrant toads at night and the Fish Lake rest stop migration fence saving thousands of toadlets from road mortality; however, numerous toadlets that cross Highway 31A from other breeding sites at Fish lake are still killed on the highway where mitigation such as fencing and highway overpasses is not practical.

2. Pollution of breeding sites

Harley claims the Highway 31A corridor is a “dying area” in need of reclamation due to mining that occurred in the late 1800’s, but Fish Lake would be unable to host a significant and healthy breeding population of Western toads if it were toxic. Fish Lake and the surrounding habitats have recovered over 100+ years, allowing a diversity of wildlife to flourish, including Western toads and other amphibian species that are sensitive to environmental pollution, such as Columbia spotted frogs (*Rana luteiventris*), Northwestern Pacific tree frogs (*Pseudacris regilla*) and Long toed salamanders (*Ambystoma macrodactylum*).

Pesticides, herbicides, road salt, industrial contamination and other environmental pollutants can be detrimental to amphibian populations, causing direct mortality and developmental deformities (Canadian Herpetological Society 2021). Frogs and toads are extremely sensitive indicators of environmental change due to the permeability of their skin, which can lead to increased bodily concentrations of pollutants (Armstrong 2011). There have been cases of amphibian species dying from air pollution alone. However, the biphasic lifecycle of Western toads leaves them vulnerable to a wider range of terrestrial, airborne and aquatic pollutants.

The unavoidable increase in contamination of natal waterbodies with oil, antifreeze, break dust, brake pad metal residuals, windshield washer fluid, and road salt at a minimum could have a detrimental effect on the Western toad population at Fish Lake and the breeding toads found crossing at the proposed Zincton base area. Additionally, road construction and other developments that will require bedrock cuts are likely



Figure 2: A Western toad “toadlet” from the 2019 hatch documented on June 12, 2020 by Peter Berkey at high elevation on the old London Ridge mining road near the proposed Zincton lodge.

to expose metaliferous bedrock common to this “ore belt” and cause the release of heavy metals such as lead, cadmium and zinc and others into natal waterbodies. These elements have negative impacts on amphibian growth, development and survival (Glooschenko et al. 1992; Brinkman 1998). Because of late maturity of females and infrequent reproduction, the ability of Western toad populations to recover from declines is limited (COSEWIC 2012). Therefore the precautionary principle should be applied to reduce the risk of potential high mortality events and this means protection of this regionally significant biodiversity corridor rather than development of a major resort.

3. Rearing habitat mortality

Conflicts with mountain bikers, hikers and skiers pose a threat to Western toads which utilize the CRA of Whitewater Mountain and London Ridge as both historical hibernation and rearing habitats for about 90% of their terrestrial life cycle. Life history characteristics of Western toads, including communal hibernation and migrations en masse to and from breeding sites would put the population at risk of habitat degradation, fragmentation, and increased human traffic in their terrestrial habitat (COSEWIC 2012).

Mountain biking is becoming a significant focus in conservation biology due to the influx of invasive species, erosion, wildlife conflicts and degradation of habitats through development of extensive trail networks caused by mountain biking. Because Western toads often utilize corridors such as trails, and have been found to utilize the same hibernation site more than once, mortality due to extensive trail use and loss of hibernation sites, such as course woody debris and leaf litter that can be damaged by off-road biking, may have a particular impact on populations (Wind 2021). It is predictable that large-scale skiing, biking and hiking will increase mortality in the Western toad's core habitat.

Of great concern is the consultant's suggestion to open the road access to the backcountry lodge via 4x4's and snowcats as this is predicted to cause mortality of migrant toadlets in multiple creek crossing areas.

Cascade Environmental proposes mitigating these threats by creating hibernation habitat when the ski runs and lifts are constructed but this in no way addresses the other habitat losses and mortality concerns such as those caused by construction and use of an access road to the new lodge and numerous other threats. Additionally, much is currently unknown about what Western toads require for hibernation, which limits the ability to mitigate impacts.

The Cascade report also erroneously states that the migration fencing installed to mitigate road mortalities at the Fish Lake Rest Stop limits Western toad access to the upland habitat of the proposed CRA. In fact, it does the opposite; it facilitates Western toad adults and juveniles migrating into the CRA where they have been found to disperse and even climb as high as 2270 m into the alpine on London Ridge. This documented migration event occurred in early spring of 2020, when toadlets from the previous year's hatch were found to have emerged from hibernation and continued their migration in the snow. Migrant toadlets were found dispersed across the core habitat face of London Ridge while hiking along the old London Ridge Mining road, as well along the alpine ridge in the vicinity of Zincton's proposed large lodge. Therefore there is evidence that the utilization of diverse and wide ranging habitats occurs over much of the year in the proposed CRA that would thus be seriously threatened by the Zincton development through direct mortality and potential loss of hibernation sites surrounding the lodge, ski runs and lifts.

Habitat loss, degradation, and fragmentation, including the intersection of habitats by roads pose significant risks near human population centres (COSEWIC 2012). The discovery of large numbers of breeding adult toads in the proposed Zincton base area suggests the proposed parking lot site and lower village site could also be significant population sinks during at least the adult toad breeding season, and could remove hibernation sites that may have been utilized for years (Wind 2021).

COSEWIC's Western toad Management Plan (2020) concludes that it is a high priority to secure regionally important breeding sites and terrestrial habitats by protecting areas from the impacts of development and intensive human use. By protecting breeding habitats and upland hibernation, foraging and dispersal habitats, co-occurring species also benefit. By failing to protect habitats for Western toads, multiple species are put at risk.

4. Degradation of riparian habitat

Of concern significant concern is the high level of human foot traffic, including visitors with dogs that would stop at the Fish Lake Rest Stop major breeding and staging area. At current levels of traffic there appear to be minimal conflicts with the staging area that was once a boat launch, although instances of visitors launching canoes through the staging toadlets have been documented. However a significant increase in traffic could be detrimental to masses of toadlets that congregate at the old boat launch site, particularly if off-leash dogs are allowed in the staging area.

Conclusion

The Fish and Bear Lakes Western toad conservation project not only supports a conservation model for the flow of wildlife required to maintain healthy ecosystems in the corridor between Goat Range and Kokanee Glacier Provincial Parks, but also provides educational opportunities that allow local children and visitors to engage in wildlife conservation and learn about their local environment. Many people have visited the corridor for decades for wildlife viewing opportunities, and parents bring their children to learn about the life cycles of Western toads. During spring to fall monitoring of Western toads and maintenance of the Fish Lake Rest Stop migration fence, on-site researchers engage in personalized public education opportunities with hundreds of visitors annually who overwhelmingly express support for the project. While David Harley's consultants suggest utilizing the project as mitigation for the damage that Zincton Resort would cause, the reality is that the impact of the resort on the Western toad population would likely far exceed the original impacts posed by traffic prior to the project's inception, causing permanent degradation of natal waterbodies and mountain habitats that are needed for breeding, migration, rearing and hibernation.

Final recommendation

Since many of the threats to the Fish Lake-Three Forks Western toad population posed by the large Zincton infrastructure developments on private and crown lands cannot be mitigated in the regional Goat Range-Kokanee Range conservation corridor designated by the higher level Kootenay-Boundary Land Use Plan, rather than allowing it to be over-developed at the peril of a significant loss of high biodiversity in a time of the global warming crisis.

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