



[Photo: Sonora Resort]

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Author's note: You may quote from this report provided you accurately reflect what is said and name the author. Keep in mind that I am continuing further research on the environmental impacts of the Zincton Proposal and that this report will be up-dated from time to time. This report will also be sent before June 22, 2020 to Kelly Northcott, Project Lead, Mountain and Resorts Branch, BC Provincial Government

EXPERT ENVIRONMENTAL REVIEW SHOWS ZINCTON'S MAJOR BACKCOUNTRY COMMERCIAL TOWN & 4-SEASON RESORT PROPOSAL WILL CAUSE MAJOR AND SERIOUS POPULATION DECLINES OF THE SELKIRK GRIZZLY BEAR, WOLVERINES, MOUNTAIN GOATS & NEGATIVELY IMPACT WESTERN TOADS AND OTHER SPECIES OF CONCERN/AT RISK

Reviewers RPBio. Expertise:

This expert review is based on my 40 years experience as a registered provincial biologist (RPBio.) in the province of British Columbia with extensive experience in environmental impact reviews including the proposed Jumbo Glacier ski resort, the Nancy Raine Green proposed Cayoosh ski development, Whistler-Blackcomb, proposed Moran dam, Gas Arctic pipeline, Syncrude tar sands and other projects. I have carried out grizzly bear (*Ursus arctos*) habitat assessments and mountain goat (*Oreamnos americanus*) surveys within the applicant's area (including

designing a grizzly bear viewing trail with Ministry of Forests in Whitewater Creek) and also head a major six-year western toad (*Anaxyrus boreas*) study in the same area in Highway 31A corridor. I have also designed bear-people conflict mitigation plans for the ski resort of Whistler and many other areas including a number of provincial parks. I am well apprised of the conflicts and impact on bears of large-scale commercial recreational developments. I have also carried out five years of research on mountain goats as well as designed a grizzly bear-wolverine (*Gulo gulo luscus*) GIS winter den habitat model for Kakwa Provincial Park.

Previous to the applicant's purchase of the private land, I also looked at bear habitats and small wetlands in the area of the benchlands now proposed for the large Zincton Resort town site.

Conclusions

For this environmental impact assessment I used the following resident animals as umbrella and indicator species: grizzly bear (Blue-listed by BC, Special Concern COSEWIC and SARA), wolverine (Blue-listed by BC, Special Concern by COSEWIC and SARA), mountain goat (Blue-listed by BC. No list by COSEWIC and SARA) and western toad (Yellow listed by BC, Special Concern COSEWIC and SARA). I concluded that major adverse and long-term environmental impacts on these species would result if the province approves the Zincton application. Also, based on my experience, most of these impacts cannot be effectively mitigated even though such claims and promises may be made should the proposal go to an environmental review stage.

Major and critical seasonal habitats for all of the four umbrella/indicator species occur in varying degrees in the Zincton applicant's area, including some in the private land component proposed for a large town. These values are both of local and regional significance. Given the very large scale of the proposal described by the proponent to be *bigger than Whistler-Blackcomb combined* with a major town site with a daily population nearly three times greater than nearby New Denver and catering to 1,550 skiers per day with a capacity for 1,750 guests daily on an all-season basis, if allowed the development will create a mortality "population sink" (i.e. sink hole) for grizzly bears. This will have a major negative impact by leading to population declines and fragmentation. Combined with much increased traffic on Highway 31A from the resort, one of the major cumulative effects

of the development will be to sever the main connectivity spine of the north-south Central Selkirk grizzly bear corridor between the Goat and the Kokanee Ranges. This will fragment Central Selkirk's grizzly bears into isolated enclaves, causing genetic isolation of smaller, fragmented populations to the south vital to recovery of grizzly bears on the U.S. side. Grizzly bears in the proponent's area include an estimated 5-10% of white-phased individuals, which could reflect a rare type of genetic uniqueness and endemism (VWS 2000); also of spiritual significance to the Sinixt First People.

For the wolverine, research has found the Selkirk range north of the Highway 31A has the highest density of wolverines relative to other ranges studied in the West Kootenays. Studies have shown that most parks in BC are too small to protect population cores due to the species' wide ranging foraging strategies. Protection of large refugia free of human intrusion is essential to their long-term existence. Cumulative effects of Zincton would include a high potential for the same north-south fragmentation effect of the population as predicted for grizzly bears in combination with loss of female winter denning habitat from backcountry winter recreation and associated access and a mountain lodge development. This will cause population declines of this already threatened species. Declines of mountain goats may already be occurring from uncontrolled and unmonitored commercial tenured heli-skiing in the Whitewater range, which will only be exacerbated by the high-end, high use Zincton plans for that area. The locally and regionally significant western toad population and current highway 31A mitigation efforts at Fish-Bear Lakes (current costs of \$165,000) would be placed in jeopardy from increased Zincton traffic mortality and mortality from mountain biking trails in upland terrestrial habitats. A host of species at risk not identified in the applicant's documents also occur in the proposal area and will also likely suffer some adverse impacts from the excessive human development and backcountry over-use being proposed in this largely wilderness setting. For example, adjacent Goat Range Park is potentially used by at least 41 "listed species" including ten that are red-listed.

In other words the Zincton Proposal, if approved, will have significant, irreversible and adverse environmental impacts on a range of species of local, regional and even provincial significance such as the white-phased grizzly bear.

Therefore, based on my own technical review using local knowledge, overall

habitat information and the scientific literature, the proponent's claims that *the proposed area does not contain any at-risk terrestrial species, or any ungulates or ungulate habitat* and there will be *Limited Environmental Impact...and no environmental values that would prohibit development* are categorically erroneous and misleading. This is of great concern when such misleading claims are used in professional documents intended for the government and the public to review as part of a time-consuming public input decision-making process. In my professional opinion these proponent's statements have biased the input process giving the public a very false impression of low environmental impact and lack of species/wildlife concern.

This application should be refused based on obvious and significant adverse and irreversible environmental impacts on key focal species with very high local and regional habitat values in the applicant's area including grizzly bear, wolverine, mountain goat and western toad. The Three Forks – Kaslo Highway 31 A is already over-subscribed to commercial backcountry recreation (with further applications pending) with hotspot conflicts with local public users. A recent internal report done for Recreation Sites and Trails BC (RSTBC) rated commercial backcountry tenure areas North and South of Hwy 31 as high conflict hotspots (ALCES 2019). The province is already spending a large amount of taxpayer's dollars for RSTBC to hire a coordinator and hold meetings to try to resolve the conflicts.

Meanwhile, nothing is being done by the province to protect very high value wildlife habitats in the same area. During the Kootenay-Boundary Land Use Plan (1992-1997) scientists/conservation groups expressed strong concerns about impacts on wildlife of commercial tenures and public backcountry recreation in the region and requested an overall strategic plan that would include zoning of core grizzly bear, wolverine, mountain goat and other significant wildlife and species-at-risk habitats off-limits from commercial recreation tenures, including refugia for species at risk. This never happened resulting, in my opinion, in a current over-subscribing of commercial recreation tenures in the Kaslo-New Denver Highway 31A corridor with an already unacceptable level of cumulative effects on wildlife.

For example, although the legal mechanism under the provincial Forest and Range Practices Act for protection of habitat in the form of Wildlife Habitat Areas (WHAs) for "Identified Wildlife" such as the grizzly bear and wolverine, the province has been totally negligent for not setting aside

adequate WHAs as well as legal Ungulate Winter Range (UWR) for mountain goats in the Highway 31A corridor. (Previously the western toad also qualified for Identified Wildlife but has since been down-listed from blue listed to yellow listed = Species of Concern).

It should be noted by the province that the current high recreational use of the area is based in part on maintaining the area's abundant wildlife such as for viewing including grizzly bears, mountain goats and tens of thousands of toadlets using the migration fence through the Fish Lake rest stop. This, in turn, is dependent upon the wilderness condition surrounding Highway 31A, which is already suffering ongoing fragmentation by logging roads in addition to existing residential and lodge facilities. Displacement and fragmentation of quality grizzly bear, wolverine and mountain goat habitats has already occurred from high-end vehicle-facilitated downhill mountain biking by Retallack Resort in the Jackson Basin subalpine and alpine to the south of Highway 31A.

Well-established wildlife and species at risk values of local, regional and even provincial significance (e.g. white-phased grizzly bears) are so high in the Zincton applicant's area, in my professional opinion, that instead of the province continuing to sell off these high ecological values for permanent and highly damaging recreation commercialization during a global climatic crisis, the province should be protecting all of London Ridge, Kane Creek, Goat Creek and Whitewater Creek from any further commercial development and reviewing the cumulative effects of the existing tenures.

A conditional withdrawal from disposition for adventure tourism applications in an area of over 900,000 hectares to the east of the Zincton proposal has been advised due to an increase in conflicts between public and commercial recreationists. Local recreationists have expressed concerns of feeling "bullied" out of their regular recreation areas by commercial operators in the region. The same high level of conflicts with the high value the public places on areas like the Whitewater Trail will occur if Zincton is approved, and will be considered by many a betrayal of public trust.

The Zincton proposal area also has high values to the Sinixt Nation including their spiritual regard for the rare white-phased grizzly found in the region including adjacent Goat Range Provincial Park (VWS 2000) as well as traditional food gathering sites (huckleberries, wild potato, glacier lily corms. etc.).

I am recommending that adequate Wildlife Habitat Areas (WHAs) such as have been created elsewhere in the province for the grizzly bear and wolverine, as well as Ungulate Winter Ranges (UWRs) for mountain goats, be designated in the Highway 31A corridor as soon as possible.

1.0 SUMMARY TECHNICAL ANALYSIS OF FOUR UMBRELLA/FOCAL SPECIES

1.0 Scope of the proposal

Detailed site plans such as the Zincton Resort town site lay-out and development, staff housing areas, gondola and chair lifts, ski runs, hiking and mountain bike trails, large lodge at Whitewater Peak and other developments have obviously been prepared by the proponent but were not provided to the public to allow them to more accurately review the scope and scale of this industrial-level commercial recreation proposal. This allows the proponent to down-play the social and environmental impacts by lack of detail.

The development, described as “*Project is bigger than Whistler-Blackcomb combined*” includes not a “village” but involves a major town with a daily population and infrastructure development nearly **three times greater than the population of nearby New Denver**: 1,550 skiers per day and a capacity for 1,750 guests daily for all-season. This is the equivalent of the Lake Louise townsite (popn. 2,000) in Banff National Park. This means that on any given day, winter and summer at peak seasonal use there will be 1550-1750 people recreating at the facilities provided including the vast network of hiking and mountain biking trails. Some of this high usage is at a Whistler-scale backcountry use equivalent.

1.1 Environmental Implications

1.1.1 The Zincton Resort townsite

I have been fortunate to have spent some time on the logged benchlands of the proposed Zincton town site not too long after the large property was logged and prior to the Valhalla Pure owner purchasing it. This included making observations of wildlife habitat and use. While not in mountain goat habitat, the townsite benchlands are situated at low-moderate elevations with moderate value grizzly and black bear habitats for the early summer and fall

seasons, and low for the spring. Former logging has enhanced huckleberry and other bear food production. A number of small wetlands (some ephemeral) also occur that would be of value to the Western Toad, Pacific Chorus Frog and probably several other amphibian and reptile species.

The 4-5 km of riparian strip along the Seaton Creek trout stream owned by the proponents is high quality for both bear species, beaver and other wildlife and bird species and we have documented numbers of migrant western toads on the highway in the spring that most likely breed in the ponds along the creek.

The Zincton Resort townsite is on a high value bear and other wildlife travel corridor as well as a cross-valley corridor between Kane and Seaton Creeks as well as a ridgeline travel corridor between Kane and Seaton Creeks. It is also proximal to very high quality spring-summer avalanche path and fall huckleberry habitats in Kane Creek.

A town of such a large scale will, as with Whistler, include numerous artificial habitats that will attract some bears, such as green lawns, landscaping plants, ski runs and chairlifts planted with grasses and other vegetation; while displacing those bears that are warier of humans. The large groomed ski runs and chair lifts at Whistler and Lake Louise attract a large number of black bears. The Zincton development will require a large amount of daily human foods for over 1,550 people requiring a major waste management system that will be difficult to manage so that it does not result in bear-people conflicts and associated grizzly and black bear mortality.

Using my extensive bear studies of Whistler as an example, even with a food and garbage system designed to be bear-proof, a level of sometimes high bear-people conflicts still occur (McCrary 2004, 2005, 2007). This can also be expected at the Zincton Resort leading to periodic unacceptable levels of “control” mortality to both black and grizzly bears. (Relevant townsite bear conflict issues such as at Retallack Resort and in the village of New Denver are documented in Paquet and McCrary 2012).

I have also known bears to travel along the highway corridor during berry shortages, from Bear Lake to New Denver, so it is obvious that some black and grizzly bears displaced by the new townsite and associated high levels of backcountry recreation in high quality bear habitats will also show up in New Denver as well as rural residences, additive to an already existing level

of conflicts – especially during low berry years.

Developing a major town in this remote, moderate value wildlife habitat area and high bear/wildlife connectivity corridor will thus result in serious bear-human and other conflicts that will be detrimental to grizzly bears and other species.

Although there are differences, a classic example of the predicted negative mortality impacts on grizzly bears by Zincton is the Lake Louise townsite development in one of our protected national parks, Banff. A detailed study of grizzly bear mortalities found that Lake Louise was one of the three major source areas of grizzly bear deaths in and around Banff National Park. Lake Louise stood out as having the highest number of mortality events (Nielsen et al. 2004. Hererro 2005). Considering that Parks Canada has one of the most stringent wildlife attractant management programs in western Canada with strong attractant laws and a warden service to monitor and enforce (far superior to what the province has) the results of this study are revealing, if not shocking, as to what will happen with the Zincton townsite. According to a 2004 Vancouver Sun article *Jewel of the Rockies most lethal site for grizzlies* the cause was the high overlap of high numbers of visitors with very high grizzly bear habitat areas such as extensive buffalo berry patches (Vancouver Sun. 2004). The head researcher, Scott Nielsen felt that “Mortality rates in many sites are simply way too high to expect long-term persistence of grizzly bears.”(Dey 2004).

Zincton Applicant’s Backcountry Crown Land Proposed Tenure Area

Grizzly bears

The grizzly bear is a good indicator species for ecosystem functioning and health. Paquet (pers. comm.) analyzed niche overlap for 410 terrestrial vertebrates in the Central Canadian Rockies and found that by protecting the habitat needs of the grizzly bear, Canada lynx, and grey wolf, 98% of other species such as the wolverine would also be protected. For Banff National Park, the grizzly bear is considered by scientists to be the premier indicator of the health of the terrestrial ecosystem (Banff-Bow Valley Study. 1996).

The Zincton proposal lies within the Grizzly Bear Central Selkirk Population Unit (GPBU) with an estimated population of 188 bears in 2012. (In my opinion and that of other bear biologists this number may be quite optimistic

from what in reality would exist on the ground). Gene flow in this GBPU is critical to the recovery and genetic viability to threatened grizzly bears in the South Selkirks GBPU where very low numbers are estimated.

A grizzly bear core habitat and connectivity map (Proctor et al. 2018) shows the area of the Selkirks proposed for the Zincton resort has important areas of high core grizzly habitat along with important mountain range-valley connectivity. My own long-term grizzly bear field surveys in Kane and Whitewater creeks (for the BC Forest Service Recreation branch) and on London Ridge confirm the high quality core grizzly habitats that were mapped with computer modeling by Proctor et al. (2018).

Up to nine grizzly bears have been observed in extensive huckleberry patches high on London Ridge in one day and six in Whitewater Creek (W. McCrory. *In File*). During the active berry season grizzly bears tend to concentrate in and near productive huckleberry patches (Proctor et al. 2017).

Observations by myself and others of grizzly bears using spring riparian habitats and avalanche paths in Seaton and upper Kaslo Creeks or moving through Zincton Pass confirm the Highway 31A corridor as still being an important north-south Selkirk linkage zone.

In addition, my preliminary den map review found that the higher elevation alpine/subalpine areas within Zincton's crown land tenure proposal on London Ridge and Whitewater Creeks and possibly the head of Goat Creek all meet the modeling criteria for potentially important grizzly bear and wolverine winter den habitats (McCrory and Cross 2005). The map model was previously developed for a snowmobile impact study for Kakwa Provincial Park. [GIS analyst Baden Cross is currently developing a two species winter den map model for the Zincton proposal using the same parameters. The map and results will be added to this report at a later date.]

I previously located one winter grizzly bear den in the alpine headwaters of Whitewater Creek.

For my impact assessment I relied on numerous wildlife impact studies I have carried out on a variety of human developments including extensive black bear habitat and corridor assessments at Whistler-Blackcomb and the proposed Cayoosh ski resort (McCrory *In File*) in the South Coastal mountains. As well I assisted with and peer-reviewed Dr. Horejsi's grizzly

bear cumulative effects study of the proposed Jumbo Glacier ski development (Horejsi 2000). The cumulative effects predicted for Zincton are very similar to the large threat to grizzly bears identified in the above-mentioned impact studies of Cayoosh and Jumbo (See also Proctor et al. 2012). These are as follows:

- Direct loss of feeding habitats and displacement of warier grizzly bears from many high quality grizzly habitats within a 0.3-0.5 km Zone of Disturbance such as from the proposed 24-bed lodge on Whitewater Peak, new access roads, and the large network of proposed trails. Various studies have documented the displacement from important habitats of grizzly bears by hiking and other outdoor recreation activities (Kasworm and Manley 1990, Mace and Waller 1998, Craighead and McCrory 2018, Mattson 2019). Mountain biking is another sport that displaces grizzly bears and/or causes serious close encounters that can lead to injury or mortality to bears from collisions and defense-of-life situations (Quinn and Chernoff 2010, Servheen 2020, McCrory 2004, 2005, Dr. B. Horejsi, pers. comm.). These conflicts can impact overall population survival (Fortin et al. 2016) and this is expected to be the outcome for Zincton.
- Habituation of less wary bears to feeding on ski hill green-up and berry areas and proposed Whitewater Peak backcountry lodge leading to bear-people conflicts and control mortality, particularly related to the high level of human garbage and other foodstuffs. This includes also the previously mentioned bear mortality predicted from the various food attractants in the proposed Zincton townsite that will lure in grizzly (and black) bears.
- Loss of important high elevation grizzly bear den habitat including potential mortality to over-wintering grizzly bears and newborn young displaced by den disturbance. Both grizzly bears and wolverines commonly locate their winter dens in alpine/subalpine areas and give birth to their young over the winter. Studies have shown that grizzlies could abandon their winter dens if disturbed by human activity including skiers (McCrory and Cross 2005, Fortin et al. 2016, Ministry of Environment and Climate Change Strategy, Ecosystems Branch. 2018).

- Loss of connectivity and population fragmentation. According to a conservation review by Proctor et al. (2012) that included the Central Selkirk grizzly bear population: *Several small populations ... throughout the trans-border area have immediate conservation concern. These fragmented units are immediately adjacent to a more secure unit in the central Purcell-Selkirk area that represents a regional core or source population ... To allow fragmentation of the larger Purcell Central/Selkirk-Central subpopulation could inhibit the long-term sustainability of bears across the region.* Zincton is such a large proposal that loss of connectivity will generally be widespread but with more concentrated impacts expected in Goat Creek Pass from the new 24-bed Zincton lodge proposed on Whitewater Peak and on Highway 31A because of much increased traffic caused by Zincton. This in turn will lead to increased grizzly bear highway mortality and displacement from critical valley bottom avalanche paths and riparian habitats. The end result is that the development will sever the main connectivity spine of the north-south Central Selkirk grizzly bear corridor between the Goat and the Kokanee Ranges. This will fragment Central Selkirks grizzly bears, currently an “anchor population”, into isolated enclaves. This in turn will also cause genetic isolation of smaller, fragmented populations to the south vital to recovery of threatened grizzly bears south of Kootenay Lake extending to the U.S. side. This negative impact is very similar to that predicted by Dr. M. Proctor for the Purcell grizzly bears if the Jumbo Glacier ski resort development went ahead (Narwhal. 2014.)

Based on my review, it is safe to say the net overall effect on grizzly bears from the private land Zincton town development and large backcountry lodge in Goat Creek watershed when combined with a significantly increased level of backcountry conflict on the hiking and mountain bike trails in high quality grizzly bear habitats will lead to periodic mortality in some years. The loss of one or two mother grizzlies annually from sudden encounters with backcountry users or associated food/garbage issues combined with lowered survival rates of young (due to habitat displacement) will in my opinion lead to this commercial development becoming a “population source/sink” (i.e. sink hole) that threatens the population viability and very survival of the Central Selkirk grizzly bears, including in Goat Range Provincial Park. BC grizzly bears are already provincially blue-listed (i.e. threatened).

Wolverine

The whole Zincton proposal area should at this point be considered within the occupied home ranges of wolverines as well as inclusive of a major north-south Selkirk connectivity for the mainland subspecies of the wolverine, which is provincially blue-listed. I have observed wolverines in Kane Creek as well as tracks in winter to the south of Highway 31A.

According to the provincial fact sheet on wolverines: *Availability of resident and maternal den sites can be a limiting factor. Dens are usually at the base of a hollow tree, in boulder clusters or in snow tunnels (in winter). Core areas of well-distributed, interconnected and seasonally important habitats based on home range sizes (which can range up to 10,000 hectares for males and 5,000 for females) and migration/dispersal capabilities are required across large landscape units. Dispersal can range up to several hundred kilometers.....Wolverine is particularly sensitive to disturbance from motorized backcountry recreational activities, which increase as backcountry areas become opened up after logging or similar industrial activities occur. Loss of connectivity, foraging and denning features...in formerly “wilderness” areas may contribute to conservation issues.* (https://ibis.geog.ubc.ca/biodiversity/factsheets/pdf/Gulo_gulo.pdf).

Female wolverines typically make snow dens in high elevation cirques and give birth to their young in these natal dens and then leave their young in maternal dens while they range abroad in search of food. Studies have shown that wolverines may abandon their winter dens if disturbed by human activity including backcountry skiers (McCrorry and Cross 2005. See also Fortin et al. 2016, Kortello et al. 2019 and Heinemyer et al. 2019).

According to Kootenay wolverine researcher A. Kortello (pers. comm.) “We detected wolverine at our bait station in Kane creek, as well as having subsequent track observations in the area. We also had a site at London Ridge also but did not get a wolverine there.In general though, the Selkirk range north of the Kaslo-New Denver highway had the highest density of wolverine relative to other ranges we sampled in the West Kootenays.”

Predictable cumulative impacts of a development the size and scale of the Zincton development would include:

- Backcountry ski activities in winter will cause natal and maternal den abandonment, which can lead to a reduced survival rate of young, particularly where a mother with newborn would be involved (See a review by McCrory and Cross 2005. Also Heinemyer et al. 2019). Such impacts are probably already occurring with Stellar having a winter heli-ski tenure on London Ridge and on Whitewater Ridge and in Whitewater Creek, both high elevation areas that fit our winter den habitat model (McCrory and Cross 2005).
- Loss of connectivity across highway 31A due to higher traffic levels and human activity along the corridor. According to Kortello (pers. comm.): “Evidence suggests that this quiet high elevation highway is currently not a barrier to wolverine movement, but wolverine do avoid crossing high traffic roads (Austin, 1998). We don’t know where the threshold of avoidance for wolverine is, although for other carnivores research suggests active avoidance starts somewhere 2000-5000 vehicles per day (Alexander et al, 2006). So there is risk for this development to fragment and isolate populations to the south.”

Mountain goats

The Zincton Resort application area includes what I have observed in the Whitewater Range in the field to be important mountain goat winter and summer range based on my detailed mapping of mountain goat winter range in the Selkirks in Glacier and Mt. Revelstoke National Parks (McCrory 1979). This would involve herds that also range inside Goat Range Provincial Park.

This occupied mountain goat habitat includes the area where a Zincton large alpine all-season lodge and new hiking and biking trails are proposed. Mountain goats are often viewed from the existing Whitewater grizzly bear viewing trail developed for public use by the Valhalla Wilderness Society. Reductions of mountain goat sightings in the past decade suggest that impacts from Stellar’s heli-skiing may be affecting winter survival.

Currently the province is planning on mapping mountain goat winter range capability and as a result no Ungulate Winter Ranges (UWRs) have been established as they have for the Cariboo Region. The province should have implemented UWR designations for mountain goats in the Kootenays years

ago, including the Whitewater range that abuts Goat Range Park, prior to the province issuing commercial recreation tenures in the area including high impact heli-skiing.

My own five years of mountain goat research in our BC mountain national parks and a literature review show that mountain goats are extremely sensitive to human disturbance including hiking activities but in particular helicopter-aircraft disturbance (McCroory 2005. See also Wilson and Shackleton 2001 and Cote 1996).

I predict the following impacts will occur from the Zincton development that would be cumulative to apparent negative impacts from existing commercial backcountry tenures:

- If the Zincton development proceeds the Whitewater trail will be taken over by commercial use and mountain goats will be heavily impacted such as by the lodge, mountain climbers and other all-season uses.
- Winter skiing, all-season mountain climbing, hiking and mountain biking in the Whitewater Range by Zincton clients will lead to habitat displacement, injuries and mortality and other impacts on mountain goats already stressed by unregulated helicopter access for two backcountry tenures (Stellar and Retallack).
- These impacts of Zincton on mountain goats will likely cause winter range abandonment and associated mortality outside Goat Range Park that will also impact herds that move in and out of the park.
- Since mountain goats are a source of winter food for wolverines (Kortello et al. 2019), wolverine survival will also be impacted.

Western toads

Western toads were recently down-listed provincially from blue category (Threatened) to yellow (Species of Concern). Our six years of western toad research at Fish Lake suggest this breeding population may be both regionally and provincially significant. The province is currently doing a genetic study, which may find the Fish Lake-London Ridge subpopulation is a distinct subspecies or mountain ecotype.

The Fish Lake toads whose main terrestrial habitats include London Ridge and Goat Creek have been threatened with gradual extinction from increasing Highway 31A traffic.

I head the on-going six-year study of western toads at Fish and Bear Lakes in order to attempt to mitigate mortality to migrating adults and toadlets from Highway 31A traffic (McCrary and Mahr. 2015). We estimate several thousand adults come down from their winter hibernation habitat on the London Ridge Mountain annually to breed in Fish Lake, and hundreds of thousands of their offspring as tiny toadlets migrate back up the mountain in the summer and fall to hibernate, including using Goat Creek as a migration route. After toadlets first winter of hibernation, they live on the mountain for the next 4-6 years it takes to mature into adults before they return to Fish Lake come spring only to breed and then migrate back up London Ridge mountain. The mountain is thus their main home for nearly all of their life time.

Although we are unsure of their winter hibernation sites on London Ridge, adult toads will move up to 10-12 km from their natal lake including in the alpine and thus fairly large numbers of adults can be expected to frequent areas of summer and fall hiking and mountain bike trails planned on London ridge by the Zincton development. Some adults also likely come from the opposite of the valley to breed in Fish Lake.

Following are the predicted impacts from the Zincton development:

- Mortality to toads is expected to increase considerably as a result of the Zincton development on London Ridge and in the Whitewater Range because of the following:
 - a). Adults and older juveniles like to roost along hiking and biking trails and in particular with fast-moving mountain bikes will sustain some backcountry mortality.
 - b). The proposed access road to the proposed Zincton backcountry lodge at the head of Goat Creek will cause both adult and juvenile mortality from traffic since it will be in a major toad migration route.
 - c). The significant increase in spring-fall traffic on Highway 31A related to 1,750 clients/day at the Zincton Town would most likely have a serious, negative cumulative impact on the survival of migrating toads and toadlets on the north side of Fish Lake, especially

as we are a long way from enough safe toad crossing infrastructures being installed in cooperation with the Ministry of Transportation and Infrastructure (MOTI). Such mortality from high traffic volumes would be additive to that already occurring and could threaten the survival of this toad population.

- This significant increase in adult and juvenile toad mortality expected from the Zincton development jeopardizes the \$165,000 western toad highway mortality mitigation study at Fish Lake.
- Additionally, increased adult toad mortality is expected from Zincton's increased traffic volumes where Highway 31 A passes through Zincton's private land along Seaton Creek. Small numbers of migrating toads have been observed on the highway here in the spring.

Overall, the Zincton development could push a regionally and provincially significant western toad population, already in trouble, over the edge.

In addition to the four focal species highlighted here, the highway 31A corridor and resort proposal area provide habitat for a diversity of other important species characteristic of the inland rainforest ecosystem that is becoming increasingly fragmented. In my professional opinion it is in the highest interest of the province and the people of British Columbia to preserve these natural values above all other interests.

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