[Photo: Sonora Resort]

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June 24, 2020

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

June 22, 2020 Submission to Mountain Resorts Branch - Prepared by Wayne P. McCrory, RPBio. Wildlife biologist

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 has was also sent on June 23, 2020 to Kelly Northcott, Project Lead, Mountain and Resorts Branch, BC Provincial Government*

June 22, 2019

Kelly Northcott
Mountain Resorts Branch
Min. of Forests, Lands, Natural Resource Operations
#510-175 Second Avenue
Kamloops, BC, V2C 5W1
Phone: (250) 312 7235

RE: ATTACHED - PROFESSIONAL REVIEW OF IMPACTS ON WILDLIFE, INCLUDING CUMULATIVE EFFECTS CONSIDERATIONS, OF PROPOSED ZINCTON RESORT EOI - USING FOUR FOCAL/UMBRELLA SPECIES: GRIZZLY, WOLVERINE, MOUNTAIN GOAT & WESTERN TOAD

Dear Mr. Northcott:

Please find attached my professional environmental impact review of the Zincton Resort proposal clearly documenting why I am opposed to government's approval of the proponent's application.

My expert review is based on my extensive years experience as a former research biologist with the Canadian Wildlife Service and Renewable Resources Consulting Ltd., a wildlife contractor for Parks Canada and BC Parks, and as a registered provincial biologist (RPBio) in the province of British Columbia. I have had 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 habitat assessments and mountain goat 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 study in the same area in the 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.

Further, I am well apprised of the conflicts and impacts on bears of large-scale commercial recreational developments, including Lake Louise and Kananaskis Country, Alberta. In the latter area I carried out three years of grizzly bear habitat research, including addressing trail/backcountry design to mitigate grizzly bear encounters that included no facilities being constructed in some high value grizzly areas. I have also carried out five years of research on mountain goats in BC's mountain national parks, as well as designed a GIS grizzly bear-wolverine winter den habitat capability model for Kakwa Provincial Park.

Although my review was done on short notice I stand by my findings, conclusions, and recommendations as being scientifically sound.

I am also a long-time resident in the Slocan Valley and therefore have a deep personal community concern and interest in opposing this development proposal.

Respectfully,

Wayne P. McCrory, RPBio.
Wildlife Biologist

[Photo: Sonora Resort]

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June 22, 2020

Prepared by Wayne P. McCrory, RPBio. Wildlife biologist

PROFESSIONAL REVIEW OF IMPACTS ON WILDLIFE, INCLUDING CUMULATIVE EFFECTS CONSIDERATIONS OF PROPOSED ZINCTON RESORT EOI USING FOUR FOCAL/UMBRELLA SPECIES: GRIZZLY BEAR, WOLVERINE, MOUNTAIN GOAT, AND WESTERN TOAD

Reviewer's 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 habitat assessments and mountain goat 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 study in the same area in the 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 impacts on bears of large-scale commercial recreational developments. I have also carried out five

years of research on mountain goats in BC's mountain national parks as well as designed a GIS grizzly bear-wolverine winter den habitat capability model for Kakwa Provincial Park.

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

The author and two grand daughters viewing grizzly bears on the Whitewater grizzly bear viewing trail, 2007.

Conclusions

For this environmental impact assessment, I used the following resident animals as umbrella and indicator species: grizzly bear (*Ursus arctos*: Blue-listed by BC, Special Concern COSEWIC and SARA), wolverine (*Gulo gulo luscus*: Blue-listed by BC, Special Concern by COSEWIC and SARA), mountain goat (*Oreamnos* americanus: Blue-listed by BC. No list by COSEWIC and SARA), and western toad (*Anaxyrus boreas*: 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. I am also convinced, based on my review and submissions to your agency by other independent biological experts, that there is already enough weight of evidence on the direct and cumulative negative effects of the Zincton proposal that it should be turned down now and not go to an environmental review stage.

Major and critical seasonal habitats for all four of the umbrella/indicator species occur to varying degrees in the Zincton applicant's area, including some in the private land component proposed for a large town. These values are of local and regional, if not provincial, significance.

Given the very large scale of the proposal, which is described by the proponent to be *bigger than Whistler-Blackcomb combined* with a major townsite 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., sinkhole, mortality sink, or effective death trap) for grizzly bears. The overall impact will lead to population declines and fragmentation. Along with much-increased traffic on Highway 31A from the resort, one of the major cumulative effects of the development will also 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 that are vital to recovery of grizzly bears on the US 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), and are also of spiritual significance to the Sinixt First People.

For wolverines, research has found that the Selkirk Range north of 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 are essential to their long-term existence. Cumulative effects of Zincton would include a high potential for the same north-south fragmentation effect of the wolverine population as predicted for grizzly bears, as well as loss of female winter denning habitat due to backcountry winter recreation and associated access and a mountain lodge development. These will cause population declines of this already threatened species.

Declines of mountain goats may already be occurring because of 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 Highway 31A traffic mortality and expected mortality from mountain biking trails in upland terrestrial toad habitats.

Further, 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 Provincial 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-phase 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 statements have biased the input process and give the public a very false impression of low environmental impact and lack of species/ wildlife concern.

Recommendations

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. Additionally the weight of biological evidence submitted to your agency by various professional biologists on the negative, adverse environmental impacts is such that the proposal should NOT go to an environmental review process stage.

The Three Forks – Kaslo Highway 31 A is already over-subscribed to commercial backcountry recreation (with further applications pending) including 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 fair amount of taxpayer's dollars for RSTBC to hire a coordinator and hold meetings to try to resolve the conflicts.

Meanwhile, absolutely nothing has been or is being done by the province to protect very high value wildlife habitats, including a number of species at risk, 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 professional opinion, a current unacceptable level of cumulative effects on wildlife in the Kaslo-New Denver corridor already occurring prior to the Zincton proposal.

For example, although the legal mechanism for types of habitat protection exists through the Forest and Range Practices Act, the province has been totally negligent for not setting aside adequate Wildlife Habitat Areas (WHAs) and other protection measures in the Highway 31A corridor to protect certain "Identified Wildlife". This includes but is not limited to grizzly bears, wolverines and mountain goats. (Previously the western toad also qualified for Identified Wildlife but has since been down-listed to a Species of Concern).

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 selling 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 places like the Whitewater Trail will occur if Zincton is approved and will be considered by many a betrayal of public trust.

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.

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

TECHNICAL REVIEW - FOUR UMBRELLA/FOCAL SPECIES

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 has facilitated the proponent efforts to deliberately downplay the obvious social and environmental negative 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 near equivalent of the Lake Louise townsite (pop. 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 thus at a Whistler-scale backcountry use equivalent.

Environmental Implications

The Zincton Resort townsite

The proposed townsite on private land is about the equivalent of Lake Louise townsite (pop. 2,000) in Banff National Park.

I have been fortunate to spend some time on the logged benchlands of the proposed Zincton townsite 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 with the private land 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 also on a high value bear and other wildlife London Ridgeline travel corridor as well as a cross-valley corridor between valley 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 large number of bears. It 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 not result in bear-people conflicts and associated grizzly and black bear mortality.

Using my extensive bear studies in 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 (McCrory 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 McCrory 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. As noted previously, the townsite population for Zincton is similar to that of Lake Louise townsite (pop. 2,000). 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 actually stood out as having the highest mortality events (Nielsen et al. 2004. Herrero 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 on the high levels of Lake Louise grizzly bear mortality levels the article *Jewel of the Rockies most lethal site for grizzlies* states that 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).

These are my major concerns for wildlife impacts of the private land town site. Now to address the additive impacts of the crown land tenure application area that is as rich in wildlife and biodiversity as any areas in our mountain national parks.

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.) analysed 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 (GBPU) 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 trails branch) and on London Ridge confirm the high quality core grizzly habitats that were mapped with computer modeling by Proctor et al. (2018).

During the active berry season grizzly bears tend to concentrate in and near productive huckleberry patches (Proctor et al. 2017). 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*).

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 about May of 2010 I also recorded a subadult white-phased grizzly bear in the wetlands just east of Fish Lake. We have also mapped two grizzly bear mark trees in the Zincton Pass at Fish Lake that based on my research are indicative of bear travel corridors and two years ago an adult grizzly was reported travelling along the shore of Fish Lake.

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 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

developed for a snowmobile impact study for Kakwa Provincial Park. I previously located one winter grizzly bear den in the alpine headwaters of Whitewater Creek.

The cumulative effects on wildlife and species at risk predicted for Zincton are very similar to the large threat to grizzly bears identified in the above-mentioned impact studies of the now cancelled Cayoosh ski development in the South Coastal Mountains (McCrory *In File*) and Jumbo (Horejsi 2000. See also Proctor el 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 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 (Servheen 2020. McCrory 2004, 2005. Dr. B. Horejsi, pers. comm.).

- Escalation of grizzly bear-human encounters leading to injuries to both bears and people and causing bear defense-of-life and control kills, particularly from the extensive network of high-use mountain bike and hiking trails in prime habitats and travel corridors planned for Zincton (See Mattson 2019. Quinn and Chernoff 2010. Servheen 2020. McCrory 2004, 2005. Dr. B. Horejsi, pers. comm.). As noted previously, high levels of grizzly bear human encounters at Lake Louise are one of the recognized threats to the survival of the Banff National Park grizzly population. (Nielsen et al. 2004. Herrero 2005). These conflicts can impact overall population survival (Fortin et al. 2016). This I predict will be the outcome for Selkirk grizzly bears if the Zincton proposal is approved.

- Historic grizzly bear-human encounters in the same area during the early mining days should be a forewarning of over-laying high levels of human activity in such a significant core area for grizzly bears as London Ridge. In 1921, local miner Buster Pengally and his father had a close encounter with a grizzly bear on London Ridge while hiking over the mountain to look at the Panama mine there. Buster also recalled that some years after the big 1910 fire that swept the area that a miner was badly mauled by a grizzly on the Panama mine on the south side of London ridge. The miner was finally able to save himself by killing the bear with his axe (W. McCrory interview notes, January 10, 1982. *In file*).

- Habituation of less warier 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:

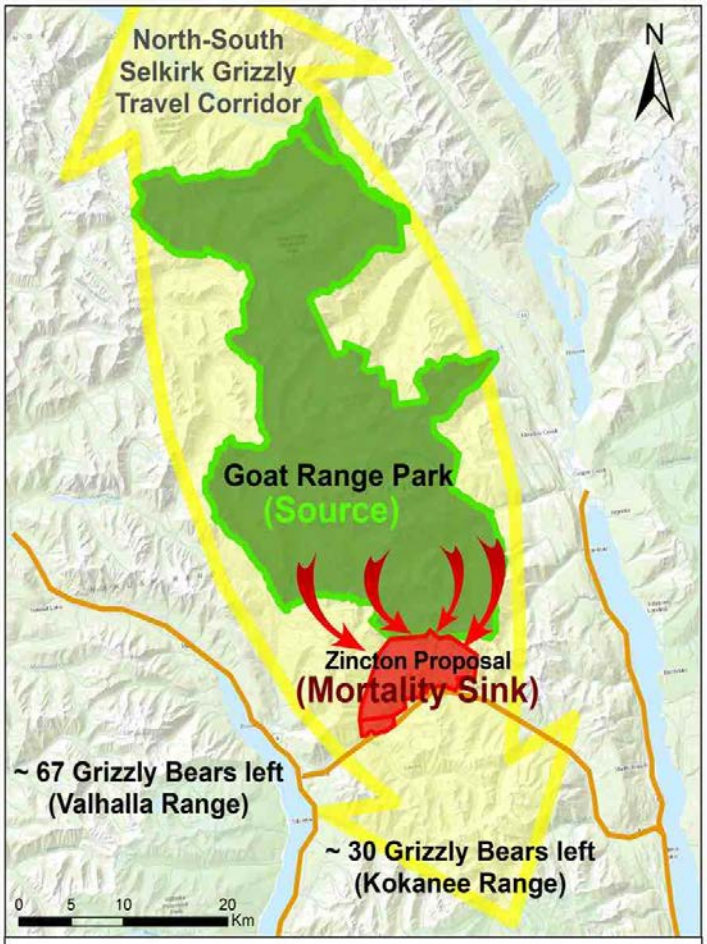
  > *Several small populations … throughout the trans-border area have immediate conservation concern. These fragmented units are immediately adjacent to a more secure unit in the central Purcell-Selkirk area that represents a regional core or source population … to allow fragmentation of the larger Purcell Central/Selkirk-Central subpopulation could inhibit the long-term sustainability of bears across the region.*

  Zincton is such a large proposal that, combined with much increased traffic on Highway 31A causing grizzly bear mortality and displacement from critical valley bottom avalanche paths and riparian habitats, 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, causing 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.

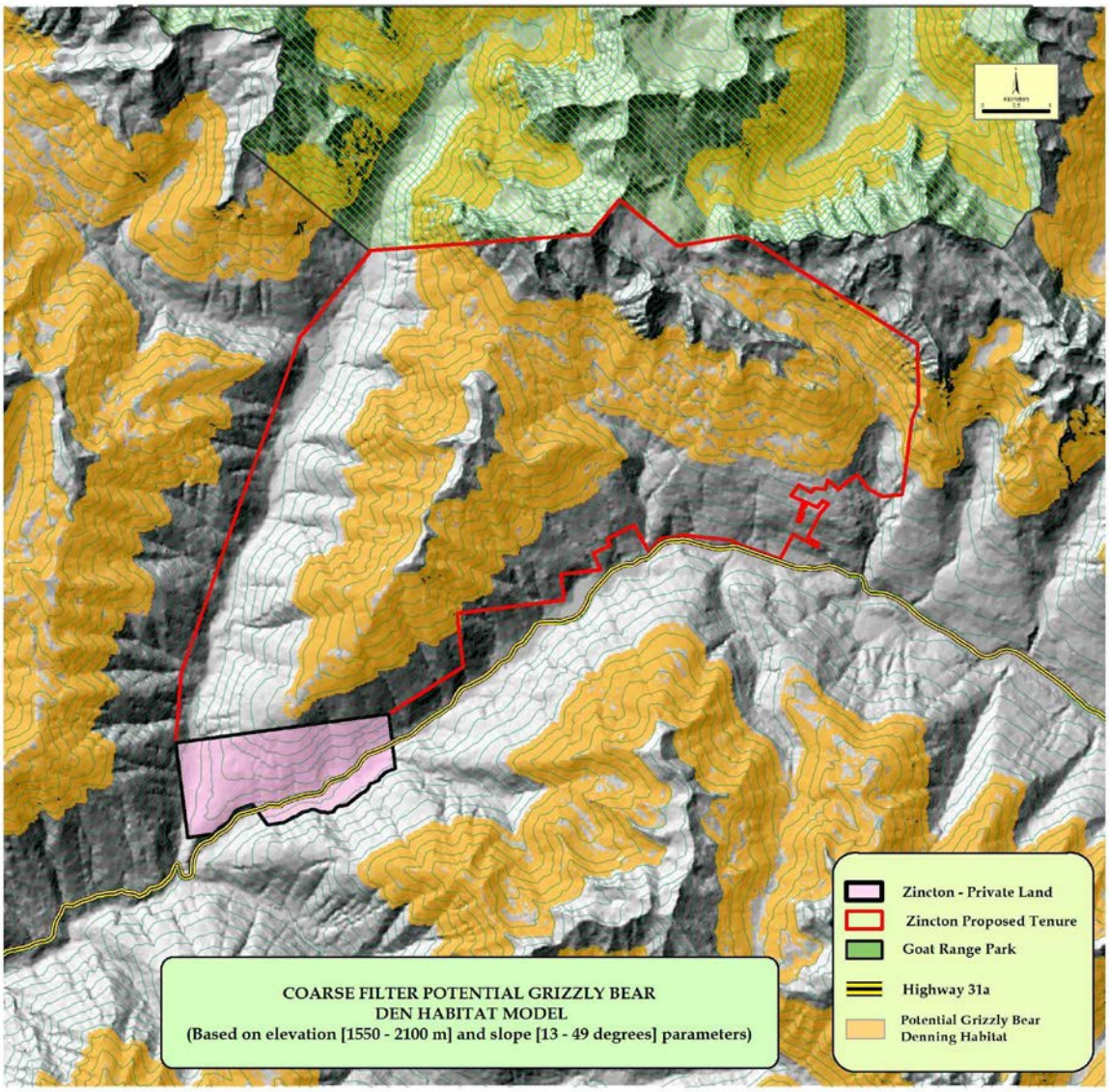
Overall, the potential loss of one or two or more grizzly bears annually, particularly mother grizzlies annually from sudden encounters with backcountry users or associated food/garbage issues combined with likely lowered survival rates of some young (due to habitat displacement) will in my opinion lead to this commercial development becoming a "population source/sink situation" (Doak 1995). Literally translated you might call the

Zincton development as a grizzly bear “sink hole” or “death trap” - constantly drawing off a supply of grizzly bears from the adjacent Goat Range Provincial Park (i.e. source). Such a situation will threaten the population viability and very survival of the Central Selkirk grizzly bears including those whose core habitat is Goat Range Provincial Park. Scientists have come to recognized that a long-duration source-sink structure is consistent with a genetic study that shows severely diminished genetic heterozygosity among bears residing in sink areas (Mikle et al. (2016).



Zincton Development will Cause High Level of Grizzly Conflicts/ Mortality (Sink) Draining Bears from Goat Range Park (Source).

VWS 17/06/2020 NAD_1983_BC_Environment_Albers



Grizzly bears den at high elevations in underground tunnels they excavate with their long claws into alpine slopes or at the heads of avalanche chutes at higher elevations. They also use caves - an old mine tunnel in Jackson Basin, across from London Ridge, was used as a grizzly den. This map shows the areas where grizzly bear are most likely to den, revealing a high overlap with Zincton's proposal and a high potential for winter recreation causing some denning grizzlies to abandon their dens.

Wolverine

The whole Zincton proposal area should at this point be considered within the occupied home ranges of a number of male and female wolverines, as well as inclusive of a major north-south Selkirk connectivity for the mainland subspecies of the wolverine, which is provincially Blue-listed (Threatened). 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).

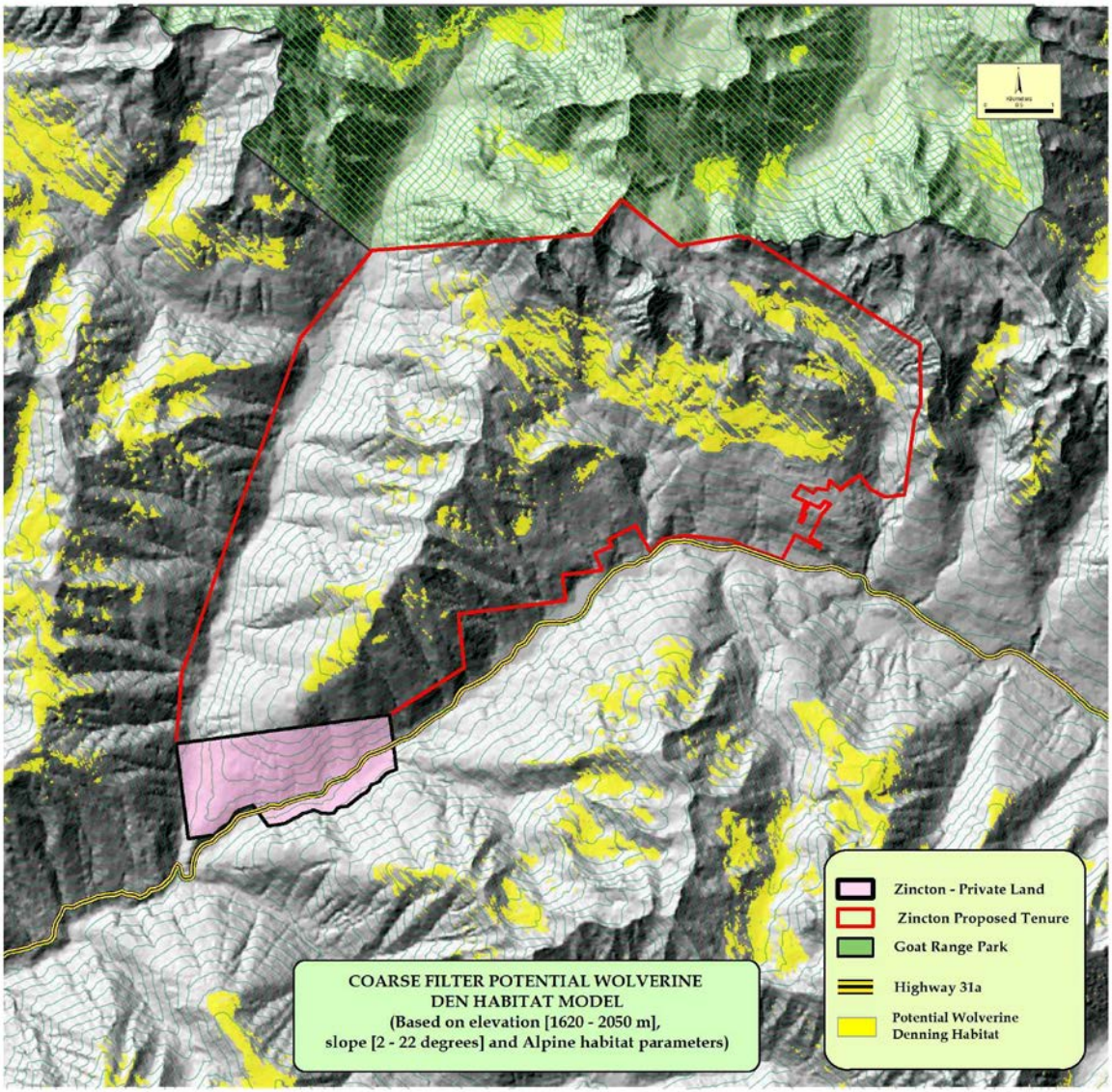
Female wolverines typically make snow dens in high elevation cirques and talus slopes give birth to their young in these natal dens and then leave their young in maternal dens while they range abroad in search of food. Studies have shown that wolverines may abandon their winter dens if disturbed by human activity including backcountry skiers (McCrory 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 in 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, 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 in Whitewater Creek, both high elevation areas that fit our winter den habitat model (McCrory and Cross 2005) as per the attached map.

- 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 suggest 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."



Female wolverines use winter snow dens in the high country as safe havens to birth and rear their young starting in February. Dens are dug though deep snow into talus slopes and other sites, such as cirques with woody debris, above and below tree line. This model shows the Zincton proposal encompasses large habitats (yellow) where wolverines would potentially den, causing them to abandon them from winter ski and other outdoor activities with potential population survival consequences for the long-term.

Mountain goats

Currently, the province only recently prepared a mountain goat winter range capability map for the region but has not conducted any official mountain goat winter range surveys and more detailed habitat maps for the Selkirk Mountain Range (Crombie, pers. comm.). They have thus lagged far behind in designating official Ungulate Winter Range (UWR) for the species as “Identified Wildlife” that would protect such critical mountain goat habitats from forestry operations but not from commercial and public recreation and other impacts.

However, in reality the provincial government is primarily negligent in designating the mountain goat as “threatened” (i.e. blue listed) but at the same time issued multiple commercial recreation tenures in the Highway 31 A corridor including several heli-ski operations without any consideration whatsoever of the cumulative effects on obvious and well-known goat all-season habitats in the area.

For my assessment of the potential and cumulative impacts of the Zincton proposal on mountain goats I was able to obtain permission to use a mountain goat winter range capability map model done for the Kootenays (Crombie 2020). While the FLNROD-sponsored map is not yet considered “official” mountain goat winter range (Crombie pers. comm.) and requires ground-truthing, it does in my opinion reflect where most mountain goats could be found in winter based on the goat locations myself and others have observed in the Whitewater Range; as well as based on my personal knowledge of mountain goat winter range from my own detailed field mapping of mountain goat winter range in the Selkirks in Glacier and Mt. Revelstoke National Parks (McCrory 1979). Many of the goats that range in the Whitewater area would involve herds that also range inside Goat Range Provincial Park.

This occupied mountain goat habitats includes the area where a Zincton large alpine all-season backcountry 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 Steller’s heli-skiing may already be affecting winter survival.

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 (McCrory 2005. See also Wilson and Shackleton 2001 and Cote 1996).

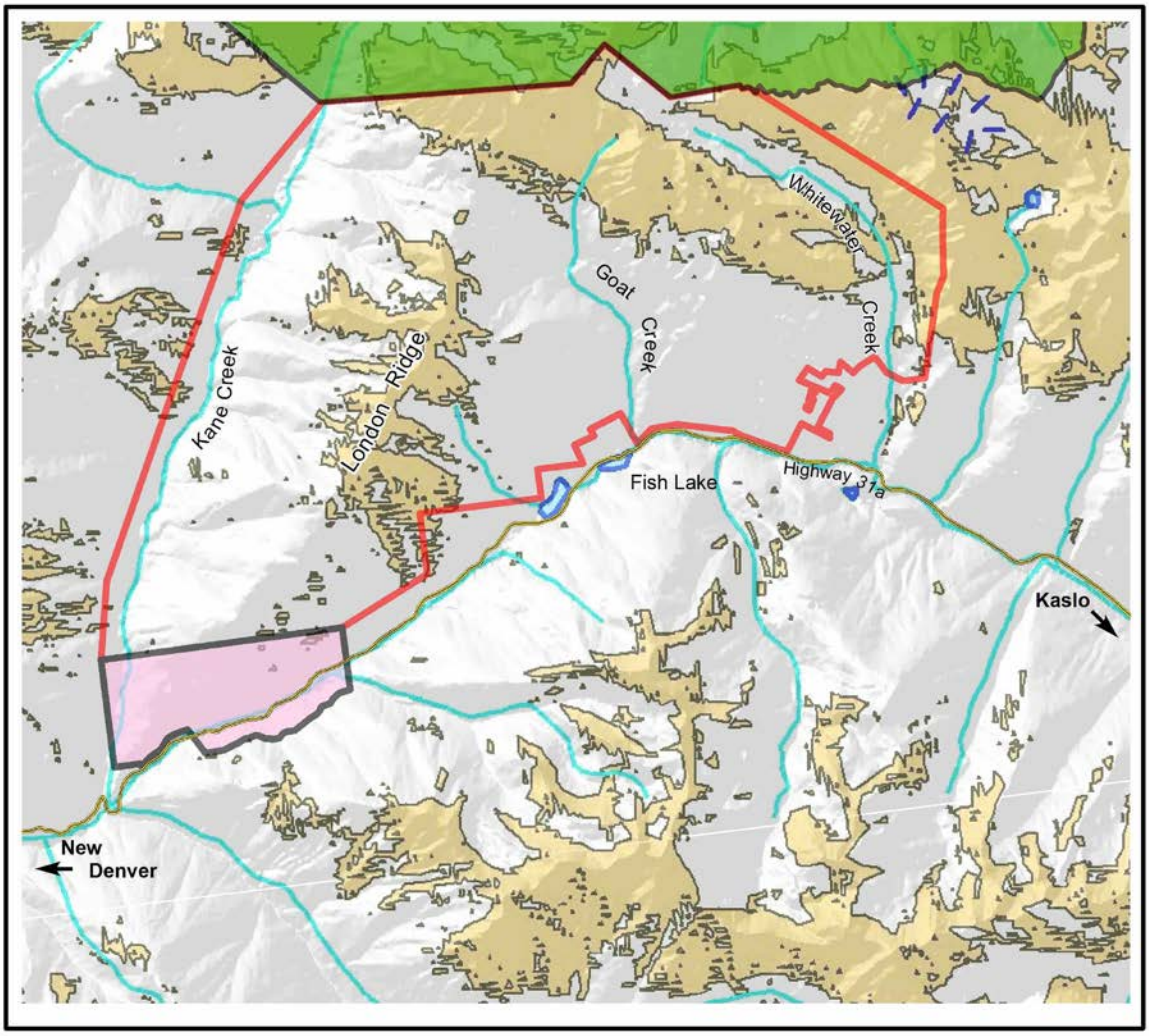
I predict the following impacts will occur form the Zincton development that would be cumulative to apparent negative impacts from existing commercial backcountry tenures:

- If 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 and all-season mountain climbing and 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 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 could also be impacted.



Potential Mountain Goat *(Oreamnos americanus)* Winter Range in the Zincton Mountain Resort Proposal

NAD 1983 BC Environment Albers
Cartography 19/06/2020
Valhalla Wilderness Society

Crombie, Merle. 2020. Mountain goat winter range modelling and delineation in the Rocky Mountain Forest District. FLNROD

Legend

- Zincton - Private Land
- Zincton Proposed Tenure
- Goat Range Park
- Highway 31a
- Potential Mountain Goat Winter Range

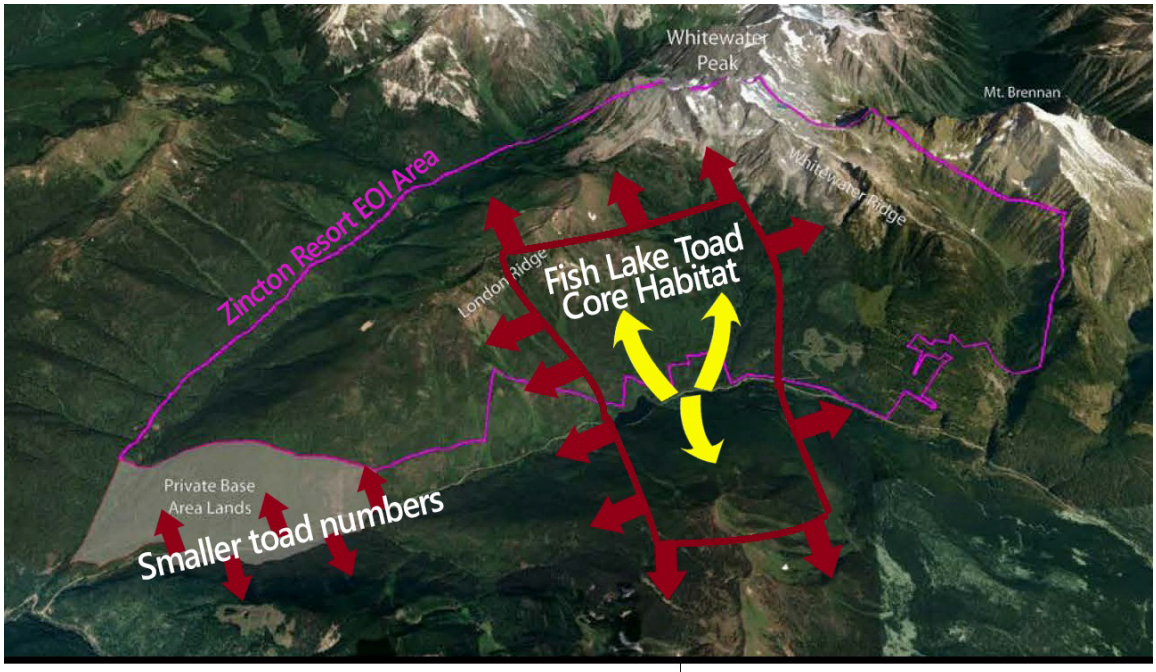
Western toad

Although I disagree, Western toads were recently down-listed provincially from Blue-listed category (Threatened) to Yellow-listed (Species of Concern). Six years of Western toad research at Fish Lake done under the sponsorship of the Valhalla Wilderness Society 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 actually head the ongoing 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 mortality (McCrory and Mahr 2015). We estimate that several thousand adults come off their winter hibernation habitat in the spring from their London Ridge-Goat Creek mountain core toad habitat annually to breed in Fish Lake. As a result, by summer, hundreds of thousands of toadlets begin their fall migration trek back up the mountain to hibernate, including using Goat Creek as a migration route. New evidence indicates for some toadlets this upwards migration continues the next spring and early summer. Although we are unsure of their winter hibernation sites on London Ridge, adult toads move up to 10-12 km from their natal lakes, 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.

The maps below show an approximation of a 2 km zone from the main breeding area of Fish Lake as *core terrestrial habitat*? This is based on my approximate delineation of this at nearby Summit Lake (McCrory 2016). For amphibians *core terrestrial habitat* is defined as: *the spatial delineation of 95% of the population that encompasses terrestrial foraging, breeding, and overwintering habitats rather than buffers* (Crawford and Semlitsch 2007).

Within the past week, Fish Lake toad researchers have started tracking adults living on London Ridge Mountain and a continuing toadlet migration up to 5,000 feet (snow level). These are toad lets that started migrating up the mountain last fall, hibernated, and are now continuing to higher elevations where they will spend the next 4-5 years growing in to adults before returning to Fish Lake to breed and repeat an ancient cycle that has been going on in the area for likely thousands of years. Following is a glimpse of the adults (A) and toadlets (T) documented last week on London Ridge Mountain within Zincton's proposed tenure application area. We don't want new roads, ski runs, hiking and mountain bike trails here!



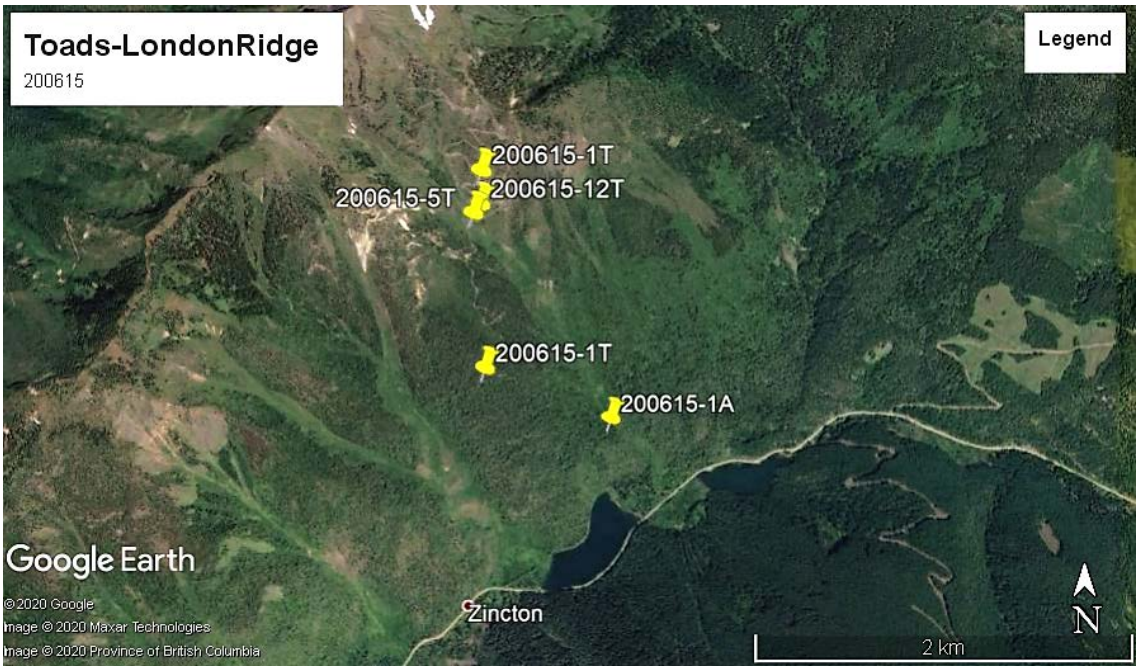
Approximate Toad Migration Routes, Core Terrestrial Habitat & Adult Dispersal Estimates of Regionally & Provincially Significant Fish Lake Western Toad Population.

VWS 18/06/2020 NAD 1983 BC Environment Albers

Fish Lake Approx. Toad Core Terrestrial Habitat for 95% of Population.

Toadlet Migration Corridors (tens of thousands)

Adult Toad Dispersal up to 10km from Fish Lake



Adult toad (A) and toadlets (T) documented on London Ridge Mountain June 15, 2020 surveys. Toadlets from last fall are continuing their upward migration.

Following are the predicable impacts of the Zincton development on Western toads:

- 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.

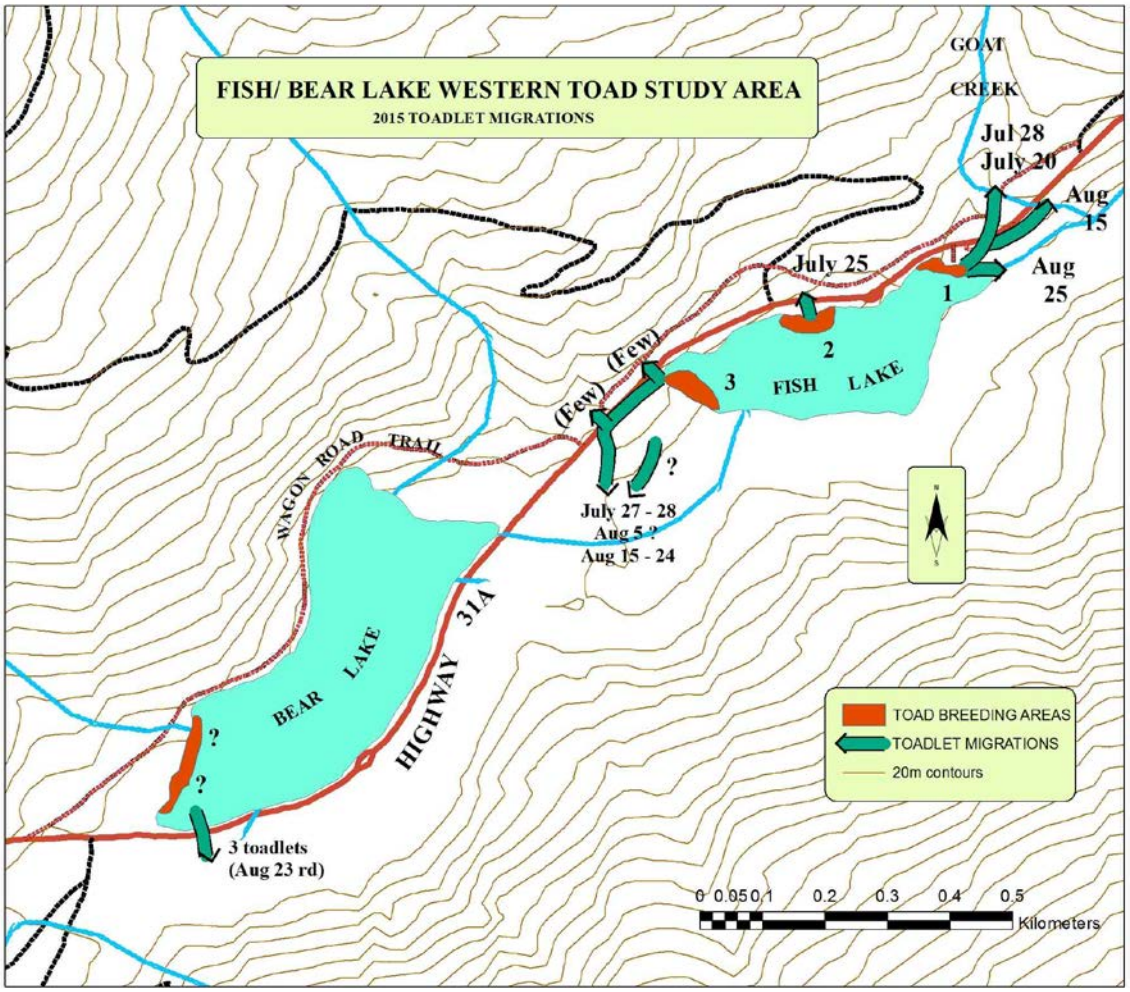
  c). The significant increase in spring-fall traffic on Highway 31A related to 1550 clients/day at the Zincton Town would most likely have a serious, negative cumulative impact on the survival of migrating toads and toadlets on the north side of Fish Lake, especially as we are a long way from enough safe 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 increased traffic volumes where Highway 31 A passes through Zincton 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 and struggling to recover with the help of the VWS Fish Lake highway toad mortality mitigation efforts, over the edge.

Toadlets using Valhalla Wilderness Society's migration fence at Fish Lake Rest Stop that intercepts them from crossing busy Highway 31A and directing them under a nearby highway bridge to their upland migration corridor along Goat Creek. In 2018, we estimated 20,000 toadlets used the fence in one day during the peak time, and annual migration would number in the hundreds of thousands.



Fish/Bear lake Western toad Valhalla Wilderness Society study area showing some migration routes (green arrows) used by toadlets to leave their wetland/lake birthing areas, with an estimated hundreds of thousands moving up London Ridge Mountain to spend their mature lives.

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END