

Grizzlies, Routes, Roads and How to Measure Disturbance

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Grizzly bears once roamed Alberta's expansive prairies, with plenty of habitat and prey to sustain them. Now, their historical ranges have shrunk drastically, with only a mere fraction of the population remaining on Alberta's public lands.

The "threatened" species-at-risk designation of grizzly bears within Alberta is the ultimate result of a series of unfortunate events. Some might say that the bears were in the wrong place at the wrong time – a justification offered to deflect attention from the fact that our patterns of settlement and behaviour have dramatically influenced the predicament grizzlies find themselves in.

In reality then, the blame lies with us. Grizzly bear populations within Alberta declined primarily due to human-bear conflicts. Bear mortality increased over the years due to poaching, misidentification (i.e., "I thought it was a black bear"), collisions, or active removal of "problem bears" from areas frequented often by bears and people. The common denominator amongst all of these mortalities is the lack of secure habitat; bears are running out of space and this is largely due to the ever-increasing network of trails and roads. This network incrementally fragments more and more of Alberta's wilderness.

The negative impact of wilderness access on bears is not a new revelation. Literature has repeatedly demonstrated that roads not only have a direct footprint on ecosystems, but also facilitate human access into wilderness areas that were previously inaccessible, and therefore, "secure" for wildlife.

A meta-analysis released in July 2018 (Petterson, McLellan, Stenhouse, Mowat, Lamb,

Boyce) reviewed existing scientific literature on the relationship between grizzly bears, human motorized access, and the efficacy of motorized access control as a conservation measure in Alberta and British Columbia. While circumstances vary between provinces, the evidence made it blatantly clear that motorized access into grizzly bear habitat damages the survivability of the species.

The scientific literature analyzed in the review identified a wide range of impacts to grizzly bears from human motorized access. It placed particular emphasis on improving female grizzly bear survival to increase population trends, with successful conservation efforts focusing on roads. Roads were shown to influence grizzly bear habitat use and avoidance, home range selection, and population fragmentation. Roads within grizzly bear habitat limit access to important food sources and can even displace bears entirely from a "home" area. Safe migration for bears within and between habitat areas is also severely compromised by roads. They have the capacity even to restrict movement entirely, ultimately isolating regional populations from each other.

Given that motorized access has such a large negative effect on grizzly populations, the obvious solution is to manage access – but how? The review notes that much of the literature supports minimal to no linear disturbance if possible, or an open road density threshold, usually noted as a limit on kilometre of road per square kilometre of area (km/km²). While circumstances vary depending on location, no universal open road density threshold exists; however, much of the literature reviewed adheres to the magic number

of 0.6km/km². Above this threshold, the overall viability of grizzly bear populations is seen to decrease. Areas with high road densities are likely to become population sinks – habitats where grizzly bear death rates exceed birth rates.

In order to maximize the efficiency of motorized access control as a grizzly bear conservation strategy, the review suggests taking measures if any of the following conditions are met:

- 1) Roads exist in the highest quality grizzly bear habitats, or in areas with population limiting energy rich food resources (salmon, berries, etc);
- 2) Open road densities exceed 0.6 km/km²;
- 3) Less than least 60 percent of the unit's area is secure habitat (i.e. > 500 m from an open road in patch sizes of at least 10 km² to facilitate grizzly bear movement).

So, have managers in Alberta and British Columbia integrated this concept into their conservation objectives? The review details how the two provinces have adopted different management strategies.

With the exception of several local initiatives, the province of British Columbia currently does not manage for road density across the province. The province assesses the conservation status of grizzly bears by means of Grizzly Bear Population Units (GBPU), with each unit being approximately 13,500km² in size. The review found that motorized access controls are most effective when extensively monitored and when they are integrated on a smaller scale represen-

tative of multiple female grizzly bear ranges within a larger GBPU.

In Alberta, the current Alberta Grizzly Bear Recovery Plan Draft (2016) outlines a series of seven Grizzly Bear Management Areas (BMAs) which have a mean size of 24,762 km², and are established to manage grizzly bear populations. This draft sets road densities for the Grizzly Bear Watershed Units (GBWUs) that are found in each BMA. GBWUs are approximately 500km² in size and typically include several overlapping female home ranges. This approach was intended to partition road density management across the larger BMAs.

In addition to this, Alberta has developed a habitat-structured access management system by subdividing BMAs into two habitat zones, the Recovery and Support Zones. The Recovery zone is then further delineated according to habitat quality and security: Core and Secondary habitat. Core grizzly bear habitat offers high habitat quality and security while Secondary habitat either connects Core areas or buffers them from areas with higher human activity. Alberta's recovery plan draft establishes open road densities for the Grizzly Bear Watershed Units within BMAs as <0.6km/km² for Core habitat, and <0.75km/km² in the Secondary habitat.

Although the concept of mitigating human motorized access has been integrated into Alberta's grizzly bear recovery plans, this review explores why Alberta hasn't been successful to date. The review points out that there is uncertainty over what is considered an open, closed, or restricted access road, and what vehicles can travel on them in Alberta's Recovery Plan. Recreational trails for off-highway vehicle (OHV) use exist in these Core and Secondary areas, and are not included in the open road density calculations, despite the fact they still disturb grizzly bears. By not considering these trails in road density thresholds, we inadequately depict the level of human access and disturbance in the Recovery zones, and therefore the efficacy of motorized access control on grizzly bear conservation.

The review also notes that the current motorized access thresholds for open road

density in both zones are already exceeded in many GBWUs, with some research suggesting the threshold of $\leq 0.75\text{km/km}^2$ is associated with sink habitats for wildlife populations.

Readers may remember that Alberta's first Grizzly Bear Recovery Plan (2008), modeled after Montana's approach, also set motorized access thresholds at a limit 0.6 km/km². But, that threshold applied to routes, not roads. That difference is crucial. The 2008 draft defines routes as: "Roads and trails that receive motorized use (*including seismic lines*)." (my emphasis) The 2008 definition included more than just roads. The 2008 draft further solidifies this interpretation of human motorized access by stating that: "lower open route densities should reduce rates of human bear interactions and ultimately reduce rates of human-cause mortality" (Alberta 2008). This alternative definition of route is much more indicative of the current access issue contributing to declining grizzly bear populations in Alberta, and could actually facilitate meaningful recovery strategies.

This debate about open roads versus open routes thresholds notwithstanding, neither Recovery Plan sets clear motorized access thresholds for grizzly bears that are legally enforceable or implemented. Thresholds, set through the law and enforced by officials, have been key to successfully recovering the

species in Montana.

Erin Sexton, a biologist from the University of Montana, underlined the importance of legal obligations to species recovery in a *Desmog* news release earlier this year. She stated that the key difference between Canadian and American conservation strategies was that "when critical habitat is designated in the U.S., industrial activity is essentially off the table." Sexton claimed that no new roads have been built in the national forests of the transboundary Flathead area of Northern Montana, the area in which she works, for "decades" due to this legal protection of grizzly bear habitat.

While both Alberta and British Columbia seem to recognize that grizzly bear conservation hinges strongly on managing human motorized access, managers in the two provinces are implementing this concept into current recovery strategies in different ways and will likely depict their success or failure. If our network of roads continues to grow, large expanses of secure habitat for grizzly bears will become increasingly rare. We need conservation efforts with legal enforcement that allow a refuge for bears, places that are out of the reach of humans. If we can't make this an urgent priority now, eventually we will leave no other options for grizzly bears. No place will be a safe place. 🐻

Featured Artist Helen Jull



Crinoid fossil tile
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