Interim Wildlife Guidelines for Commercial Backcountry Recreation in British Columbia

Chapter 6

SOURCES OF HUMAN-CAUSED DISTURBANCE

Mt. Assiniboine Provincial Park
Photo: Wayne Stetski

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Interim Wildlife Guidelines for Commercial Recreation: SOURCES OF HUMAN-CAUSED DISTURBANCE

Introduction

Bringing visitors into the back-country is not without impacts. Both the presence of humans, and the means used to transport them into back-country environments, has an influence on wildlife and plant communities

Commercial recreation operators have the obligation to reduce their impact on the environment in which they bring guests and visitors. By behaving in a responsible manner, the guests will have an experience they will want to tell others about, the operator will have a continuous source of marketable opportunities, and wildlife will have the habitat that they need to flourish.

The material in these guidelines comes from two reports: *Access Management In British Columbia: A Provincial Overview (2001)*, available at http://wlapwww.gov.bc.ca/habitat/AccessReport(v6).pdf, and *Discussion Paper: Wildlife and Commercial Backcountry Recreation in British Columbia: Assessment of Impacts and Interim Guidelines for Mitigation*, available at http://wlapwww.gov.bc.ca/wld/pub/wcbrbc/harper_final_report_200007.pdf.

Roads

The physical nature of roads creates direct impacts on habitat, wildlife, and fisheries. Indirect effects are a result of encounters with people who travel into the backcountry on roads. Roads also increase the spatial extent of other activities by providing additional access to people exploring backcountry areas on off-road vehicles or with boats, bicycles, horses, skis, or on foot.

Effects of roads on wildlife can be classified into 2 categories: direct effects caused by the physical presence of a road (i.e., habitat loss, habitat fragmentation, barriers to movement), and indirect effects, caused by interactions with people travelling on roads.(i.e., collisions, hunting, poaching, animal control measures, harassment). Few species appear to be immune to the effects of roads. Species such as grizzly bears are particularly susceptible to road effects because of their low reproductive rates and the mortalities that inevitably result from confrontations with humans who travel into bear habitat on backcountry roads. Roads and access management are consistently cited as major factors influencing human-caused grizzly bear deaths.

Black bears, grizzly bears, and wolverines can also be displaced from areas near roads. Black bears avoid crossing roads with high traffic volumes, and may alter the location of their home ranges in response to high road densities.

Road crossings of bobcats are inversely related to traffic volumes. Cougars may avoid crossing improved dirt and hard surface roads. Wolves are generally restricted to landscapes with low road densities

Gray wolves suffer from the increase in human contact that accompanies road access. Most wolf mortalities are caused by humans, and most occur near roads. Increasing road densities are correlated with declining wolf populations

Roads are an important source of direct mortality for ungulates, including mountain caribou, mountain goats, bighorn sheep, moose, and deer species. Elk and deer avoid areas near roads, and avoidance increases with increasing traffic volumes

Smaller animals such as reptiles and amphibians typically suffer high rates of mortality as a result of roads, particularly those that actively use roads for heating and cooling, or species that commonly move

between wetland and upland habitats. Declines in the abundance of amphibians have been linked to road densities and traffic rates.

A large number of bird species avoid nesting, or suffer lower reproductive success, near roads. Roads fragment wildlife habitat, affecting movements and dispersal of several species.

Off-Road Access

Off-road access can be categorized as non-motorized (e.g. hiking, skiing, biking, horseback riding), all terrain vehicles (OHV's; including motorcycles), and snowmobiles. Most of the concern about off-road access has been related to motorized traffic; however, non-motorized impacts can be similar where traffic volumes are large. In general, the impacts of off-road access are much less than those created by a road network because roads create a greater (and often permanent) physical disturbance that conveys greater numbers of people engaged in a wider range of activities into the backcountry. However, off-road access can create extensive impacts that are spread widely on the landscape

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Off-road access results in habitat modifications through disturbances to vegetation and soil, and through changes to microclimates. Impacts are greatest in alpine, bog, and arid areas. Wet-soil areas are at greatest risk of trampling by human foot traffic. Trampling can lead to plant community changes and can create favourable environments for invasion by exotic species.

Horses are more destructive to trails than humans on foot, and motorcycles are more destructive than horses on upslopes. The soil compaction, vegetation damage, and changes in community structure associated with ATV use can last decades or centuries. The habitat changes associated with off-road access create favourable environments for weed invasions, the seeds for which are carried by OHV's or in hay for horses.

Snowmobiling in wetland areas can effect the distribution and abundance of wetland vegetation. Compacting of snow by snowmobiles in any habitat lowers temperatures under the snow and reduces the over-winter survival of plants and soil microbes. In addition, compacting reduces the water-holding capacity of snow, leading to greater peak flows in spring.

Hunting is an obvious impact on wildlife that is facilitated by off-road access to the backcountry. Poaching often follows hunting; for example, hunters shoot wolves misidentified as dogs or coyotes, or they intentionally kill wolves. A major study reviewed the effects of non-consumptive outdoor recreation on wildlife and found them to be overwhelmingly negative. Many of the impacts are indirect; for example, domestic dogs accompanying humans into the backcountry can be significant vectors of disease for gray wolves.

The zone of influence of a hiking a trail may extend up to 100 m. Hikers can disrupt the normal behaviour of a variety of wildlife species. Harassment of ungulates can lead to increased metabolism, resulting in illness, reproductive costs, and death. Many studies have documented the displacement of ungulates from preferred habitat by recreation-related activities. Deer, moose, and elk react to cross-country skiers. Wolves and black bears may abandon dens disturbed by humans. In addition, habituation can be a serious problem with many wildlife species near hiking trails, particularly species that are dangerous to humans such as grizzly bears. Grizzly bears respond more strongly to humans on foot than to regular motorized traffic to which they have habituated.

Additional impacts occur when humans are on OHV's (Off-highway vehicles). Numerous studies have documented negative effects of OHV's on ungulates. OHV use along riparian banks and through wetlands may impact semi-aquatic mammals such as beavers, mink,

river otters, and muskrats.

The effects of snowmobiles on wildlife depend on how machines are operated and on the characteristics of snow cover and underlying habitats. Snowmobiles pack snow and reduce its insulating value, thus affecting the under-snow environment for small mammal. Snowmobile use on ice in winter may effect semi-aquatic mammals. Snowmobile trails can enhance the winter mobility of deer however, they also increase the mobility of predators such as wolves. Deer avoid trails frequented by snowmobiles, and increase their movements in response to relatively light traffic.

Water Access

Water access involves both motorized (e.g. propeller-driven and jet boats) and nonmotorized (e.g. canoes, kayaks) activities. Very few studies have addressed the effects of water access activities on habitats common in British Columbia; however, results of some studies from other jurisdictions are relevant.

Motorboats are associated with a number of impacts on aquatic habitats, including: shoreline erosion, water pollution, sediment resuspension, increased turbulence and turbidity, and damage to aquatic plants. Non-motorized boating can also be associated with high levels of aquatic pollution, mostly from related human activities. Boating and angling are significant vectors of exotic weed distribution

The general effect of water access on wildlife is related to the increase in human activity in backcountry areas that comes with the access opportunities. These effects range from increases in hunting pressure and harassment of wildlife, to vegetation changes. Some wildlife species are particularly susceptible to disturbances from boating activities, such as the harlequin duck, which nests in low densities on fast-flowing wilderness streams and rivers Studies have repeatedly shown that nesting harlequin ducks are disturbed by the presence of humans, and that breeding densities decline with increases in recreational activities such as whitewater rafting. Common loon and ospreys are also considered to be sensitive to disturbance on and near water.

The most obvious effect of water access on fish is an increase in mortality associated with increased fishing pressure. In addition, boats or wading anglers may cause areas to be abandoned by fish or may reduce the breeding success of fish populations by driving guarding males off nests. Effects in shallow water are more severe than in deeper water.

Up to 30% of fuel used in two-stroke marine engines is discharged unburned into water. The effect of these discharges on aquatic organisms is poorly understood; however, there is compelling evidence that fish populations are affected by pollution associated with two-stroke engines.

Air Access

Access to the backcountry by helicopter or fixed wing aircraft falls into 2 categories: overflights and flights involving landings. Obviously, the potential for impacts is greater when aircraft land. Impacts of overflights are generally restricted to harassment of wildlife. The effects of helicopter and floatplane landings on terrestrial and aquatic habitats are minimal.

The effect of air access on fisheries is generally restricted to the effect of increased fishing pressure that accompanies access into otherwise inaccessible areas. In British Columbia, these areas include high elevation lakes that have low natural productivity and are sensitive to fishing pressure.

Hunting pressure increases in remote areas where aircraft are used to

discharge hunters. Impacts of landings and overflights on wildlife are otherwise restricted to harassment. Landings generate more harassment events than overflights because aircraft make closer approaches to animals.

The response of ungulates to aircraft has been widely studied. Of particular management concern in British Columbia is the effect of overflights on mountain caribou and mountain goats. Overflights of caribou in Labrador by military aircraft have been shown to reduce calving success. No studies have yet linked demographic declines of mountain goats with aircraft overflights; rather, most studies have measured short-term behavioural reactions. Other ungulates have demonstrated varying responses to overflights by different aircraft, including: bighorn sheep, mule deer, and white-tailed deer. Effects of overflights on other wildlife species occurring in British Columbia are poorly documented.

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	Road	Off-road	Water	Air
Access Related Activities	• industrial traffic • cars/trucks • off-road vehicles • non-motorized traffic	• ATVs • snowmachines • non-motorized traffic	• motorized watercraft • non- motorized watercraft traffic	• helicopters • fixed-wing aircraft
Habitat Impacts	• direct habitat loss • habitat fragmentation • reduced habitat effectiveness • loss of forest interior habitat conditions • human-induced fire • invasion by nonnative species • damage to soils & vegetation • spread of insects & disease	• invasion by non-native plants and animals • erosion and change in soil properties • human-induced fire • damage to soils and vegetation • spread of insects and disease	• biological invasions • riparian and wetland impacts • fuel deposits and spills	• industrial activities • fuel deposits and spills
Wildlife Impacts	• species displacement • barriers to movement and dispersal • reduced habitat use • harassment/poaching • reduced reproductive success • population fragmentation • hunting pressure • human/wildlife conflicts • problem wildlife control • habitat loss	• species displacement • barriers to movement and dispersal • reduced habitat use • harassment • poaching • reduced reproductive success • population fragmentation • hunting pressure • human/wildlife conflicts • problem wildlife control	• harassment • habitat avoidance • hunting pressure • poaching • animal control	• harassment • poaching
Fisheries Impacts	• sedimentation and altered stream flows • debris flows and landslides • introduce exotic species • restricted passages water quality • fishing pressure • riparian and wetland impacts	• sedimentation • fishing pressure • riparian and wetland impacts • stream bed and stream channel disturbances • introduce of exotic species	• water quality • fishing pressure • disturbance • fuel deposits and spills	• fishing pressure • fuel deposits and spills

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Aircraft

Aircraft are used for a variety of commercial recreation activities, primarily for transportation to remote sites, but also for sightseeing and wildlife viewing. In some areas, helicopter access for the purposes of photography (production of feature films, documentaries, magazines, etc.) can be significant. For the purposes of this Guideline, aircraft are defined to include fixed-wing airplanes, helicopters, ultra light personal aircraft, hang-gliders, and balloons.

Potential recreational activities that employ the use of aircraft include:

- Helicopter access to remote locations
- Helicopter air tours
- Heli-skiing
- Heli-snowmobiling
- Heli-hiking
- Heli-biking
- Heli-fishing
- Heli-mountaineering
- Fixed-wing access to remote air-strips
- Fixed-wing air tours
- Fixed-wing glacier landings
- Floatplane landings on rivers, lakes, and marine waterbodies
- Ultra-light personal aircraft and para-glider flying
- Hang-gliding
- Hot air ballooning

Since aircraft disturbance of wildlife is primarily a function of how close and loud the aircraft is, helicopters are more disturbing than fixed-wing aircraft, which are more disturbing than ultra-light personal aircraft, hang-gliders, and balloons. Since ultra-light personal aircraft, hang-gliders, and balloons are quieter and slower, for the most part they should have relatively low impacts on wildlife.

Like other impacts, aircraft disturbance of wildlife becomes a serious issue when frequency of aircraft disturbance is high. Methods of mitigating the potential impacts of aircraft use on wildlife resources include:

- Restricting aircraft numbers, including spatial zoning,
- Ensuring and promoting more responsible behaviour of pilots,
- Scheduling aircraft traffic through site-specific habitat closures during breeding, nesting, denning and other sensitive periods,
- Encouraging aircraft with quieter engines to reduce harassment of wildlife.

Snowmobiles

Various types of snowmobiles are used for a variety of commercial recreation activities, including transportation to remote sites, and general touring and sightseeing. For the purposes of these Guidelines, snowmobiles are defined to include both personal snowmobiles and larger multi-person snow-cats.

Potential recreational activities that employ the use of snowmobiles include:

- Snowmobile access to remote locations
- Snowmobile tours
- Snow-cat skiing

In general, snowmobilers tend to ride at locations or higher elevations where there is more snow, so the impacts on ungulates that are intolerant of deeper snows, like. bighorn sheep and deer, are sometimes less than on species that tolerate higher snow depths, like caribou and moose. However, even those species intolerant of deeper snow depths can be effected by snowmobiles. Species like Caribou and Wolverine are at particularly high risk in areas with widespread

alpine snowmobiling.

Packed trails established by snowmobile traffic moving through relatively deep snows separating low elevation winter ranges provide easy predator access routes between these winter ranges.

There is a great deal of low elevation snowmobile activity levels in most of the Province; not all snowmobilers seek out the deep snows found at higher elevation. In addition,

Potential impacts on wildlife from snowmobiling traffic include:

- Changes in animal behaviour, including abandonment of preferred habitat and distribution pattern changes,
- Additional stress from snowmobile disturbance, that potentially leads to decreased survival rates,
- Creation of packed trails into ungulate wintering areas, which can promote predator access to populations not displaced by the snowmobile activity,
- Damage to vulnerable soils and vegetation,
- The degradation of air and water quality due to dirty exhaust emissions from two-stroke engines. There is the potential of deposition of emissions in the snow pack and alteration of the water chemistry of streams and rivers due to hydrocarbons from incomplete fuel combustion.

Recent advances in the power and performance of snowmobiles means that even intermediate "sledders" can potentially access remote and rugged areas. Today's high-performance snowmobiles have engines that can generate more than 170 horsepower. Some US studies show the sport of snowmobiling growing at 20 percent a year.

Methods of mitigating the potential impacts of snowmobile use on wildlife resources include:

- Restricting snowmobile numbers,
- Ensuring and promoting more responsible behaviour of snowmobile operators,
- Seasonal closures of sensitive areas,
- Scheduling snowmobile traffic through site-specific habitat closures during breeding, nesting, denning and other sensitive periods,
- Scheduling snowmobile traffic to ensure snow cover is sufficient to prevent damage to vegetation,
- Encouraging cleaner snowmobile engines to reduce water and air pollution, and
- Encouraging quieter snowmobile engines to reduce harassment of wildlife.

Off-Highway Vehicles (OHVs)

Various types of motorized, off-highway vehicles are used for commercial recreational activities, including transportation to remote sites, and general touring and sightseeing. For the purposes of these Guidelines, off-highway vehicles are defined to include both personal all-terrain vehicles (ATVs) such as quads and trail bikes, as well as the larger four-wheel drive cars and trucks that are capable of transporting a number of individuals and their equipment.

Potential recreational activities that employ the use of OHVs include:

- OHV access to remote locations
- OHV touring

Similar to snowmobiles, technological advances have made it possible for OHVs to reach more and more remote terrain. Problems occur when OHVs stray from designated roads and paths and create their own trails, resulting in degradation of soil, water and vegetation. This is particularly problematic in sensitive habitats such as wetlands, grasslands and alpine/subalpine ecosystems. Increasing

use of OHV's also increases the potential for disturbing wildlife because their movements are not as predictable. Of major concern in some areas is the potential for OHV operations to inadvertently spread noxious weeds into new habitats.

The impacts of OHV on public lands in the United States are becoming bigger issues than they were a few years ago. For example, in Colorado, the U.S. Bureau of Land Management (BLM) has determined that a huge increase in ATVs, mountain bikes, sport utility vehicles (SUVs) and other four-wheel-drive vehicles since the 1980s has sliced up meadows, honeycombed mountainsides and crisscrossed open range in the 688,000 ha Grand Mesa, Uncompahgre and Gunnison National Forests of Colorado.

Methods of mitigating the potential impacts of OHVs use on wildlife resources include:

- Restricting OHV numbers, including zoning or area closures/restrictions, in sensitive areas,
- Ensure more responsible behaviour of OHV operators,
- Scheduling OHV traffic through site-specific habitat closures during breeding, nesting, denning and other sensitive periods, and
- Encouraging quieter OHV engines to reduce harassment of wildlife.

Personal Motorized Watercraft (PWC,) Jet Boats and Other High-Powered Boats

Various types of personal motorized watercraft (PWCs) are used for commercial recreation activities. Personal motorized watercraft (PWCs) are small vessels, usually less than 5 meters, which use an inboard motor to power a water jet pump for propulsion. Persons sitting, standing, or kneeling on the vessel operate them. Designed for speed and manoeuvrability, they are commonly referred to as jet skis, waverunners, wavejammers, wetjets, sea-doos, wetbikes, and surf jets.

Many personal watercrafts are powered by two stroke engines that cause significant air and water pollution. Jet skis are so polluting that the exhaust emissions from two hours of PWC operation is equivalent to the emissions from a 1998 passenger car operated for more than 100,000 miles. According to studies cited by the U.S. Environmental Protection Agency, two-stroke engines, like those used in PWCs, discharge 25 to 30 percent of their fuel unburned into the water. This type of pollution has the potential to have significant detrimental effects on aquatic species.

Methods of mitigating the potential impacts of PWCs and Jet Boats use on wildlife resources include:

- Restricting PWV and jet boat numbers in specific areas,
- Ensuring and promoting more responsible behaviour of PWV and jet boat operators,
- Scheduling PWV and jet boat traffic through site-specific habitat closures during breeding, nesting, denning and other sensitive periods, and
- Encouraging quieter PWV and jet boat engines to reduce harassment of wildlife.

Suggested ways of mitigating noise impacts of jet boats include:

- Eliminate the practice of returning river rafters to the original launch site by jet boat.
- Discourage boating in critical bird habitat during the peak months of July and August and redistribute the load to either before nesting or after the young birds have left the net and are no longer vulnerable.
- Reduce boat launchings and party sizes for both outfitter and private parties to reduce the vegetation damage along the river. Assign trip quotas to professional outfitters.

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Mountain Bikes

The growth in mountain biking has resulted in environmental impacts in the back country. A variety of studies have indicated that trail erosion, soil compaction, trail widening and vegetation damage can occur but they can be avoided or minimised with appropriate trail siting, design and management.

Many studies note that the extent and severity of the physical impacts varied with soil characteristics, slope and climate as well as users.
Suggested ways of mitigating impacts of mountain biking include:

- maintaining a firm trail surface
- avoiding trail widening
- minimising erosion
- ensure good trail placement, design and management.
- Ensure appropriate soils that can withstand the impacts created by mountain bikes
- Avoid of steep downhill sections, especially if the trail is shared with walkers. Where steep downhills cannot be avoided or are desired, erosion prevention measures (e.g. water bars) should be included at the planning stage.
- Consideration should be given to the inclusion of curves, which could reduce the steepness of a slope and effectively reduce its length.

Backcountry Skiing

The numbers of backcountry skiers have grown 16 percent since the last White River National Forest plan was adopted, and backcountry ski huts have more than quadrupled. At the same time, some forest carnivores have been pushed to the brink of extinction. The Forest Service's response is a new "primary zoning" to protect animals such as wolverines and Canada lynx.

That primary zoning of 116,000 acres would reduce snowmobile terrain and might also quash more backcountry ski huts. At the very least, any new trails would have to be balanced by the abandonment of existing trails.

Rock Climbing

For the most part, rock climbing and mountaineering does not present a significant threat to wildlife, unless these activities occur in the same area as bird or bat nesting or roosting sites, or near ungulate winter ranges or natal areas. Mitigation of these impacts typically involves timing constraints on rock climbing activities.

On the Stawamus Chief (near Squamish), particular rock-climbing routes are closed by BC Parks from February to the end of July, allowing nesting Peregrine Falcons to successfully fledge their young. This is program is actively assisted by the climbing community in the Squamish area.

Climbers and others using cliff faces and their immediate environment need to be aware of the needs of cliff-dwelling animals.