

Data Submitted (UTC 11): 4/20/2020 7:00:00 AM

First name: Ace

Last name: Hess

Organization: Backcountry Hunters and Anglers

Title:

Comments: Mr. Zach Peterson Forest Planner, Nez Perce-Clearwater National Forests United States Forest Service 903 3rd St Kamiah, ID 83536 Dear Mr. Peterson, On behalf of the Idaho chapter of Backcountry Hunters and Anglers, I appreciate the opportunity to provide comments on the Nez Perce-Clearwater Draft Environmental Impact Statement. Backcountry Hunters & Anglers (BHA) is the voice for our wild public lands, waters and wildlife. We seek to ensure North America's outdoor heritage of hunting and fishing in a natural setting through education and work on behalf of fish, wildlife and wild places. With more than 250,000 members and supporters and chapters in 45 states, two Canadian provinces and one territory, BHA is the fastest growing hunting and fishing organization in the country. In Idaho, over 2,400 public land and water advocates have officially joined our ranks as dues paying members. Below are comments specific to resource management objectives identified in the DEIS. Big Game Winter Range and Migration Corridors [bullet] The forest should work closely with IDFG to adequately map migration routes and winter ranges on the forest through the use of GPS technology. [bullet] Prioritize invasive species treatments and native plant restoration in critical big game winter range. [bullet] Continually monitor important migration routes and winter ranges on the forest. Ensure that impacts to these areas have been addressed and mitigated in future decisions (recreation, road and trail construction, timber harvest, invasive species) [bullet] Consider the expected increase in both motorized and non-motorized recreation during the life of the plan and how the ability of wildlife to access their seasonal habitat will be impacted. [bullet] Work with private land owners, adjacent forests, BLM and state land managers, Idaho Transportation Department, NGO's and other stakeholders to maintain and improve large scale habitat permeability for big game animals. [bullet] Increasing motorized use on critical winter ranges, especially against the recommendations of IDFG, is strongly discouraged by BHA. [bullet] We support the intent of FW-GDL-WLMU-03 which states [ldquo]In order to reduce disturbance to wintering big game, management activities should be reduced or minimized in big game winter range between December 1st and March 15th.[rdquo] We recommend moving the end of the closure date to late April or early May, dependent on habitat type and elevation. Late winter-early spring is the most difficult time on big game. [ldquo]Winter weakens, spring kills[rdquo].

Recommended Wilderness The wild and rugged landscape of the Nez Perce-Clearwater contains a portion of the largest continuous block of roadless country in the lower 48. Since before the formation of the forest, hunters and anglers have sought out these remote areas for their challenge, solitude and beauty along with the abundant fish and wildlife resources they support. Decision makers should acknowledge the ecological, economic and intrinsic values these wild areas provide. Goods and services provided by these landscapes include: watershed protection, intact native plant communities, abundant wildlife habitat, connectivity and security, potential for unconfined recreation and solitude. [bullet] Incorporate directives in the final plan that maintain the physical and ecological values of recommended wilderness and prohibit any activities that may reduce a recommended area's wilderness designation potential. [bullet] Active fish and wildlife management in recommended wilderness is necessary for the effective management of these resources by the state of Idaho. BHA supports MA2-SUIT-RWILD-21, which states: [ldquo]Administrative uses (e.g., research, monitoring, aircraft landing including unmanned aircraft) related to management responsibilities, including by other federal and state agencies in coordination with the Nez Perce-Clearwater[rdquo] is suitable in recommended wilderness. [bullet] We also support the goal: MA1-GL-WILD-03, which states the Forests will cooperate with the Idaho Department of Fish and Game and the U.S. Fish and Wildlife Service to manage fish and wildlife resources within designated wilderness while protecting the wilderness character as required by the Wilderness Act and each wilderness area's enabling legislation. We encourage decision makers to strongly consider this goal when determining management direction for mountain goat habitat in the Great Burn recommended wilderness. The Great Burn This rugged sub-alpine environment is highly regarded by hunters and anglers for its pristine remote basins, elk, mule deer, black bear and mountain goat habitat. [bullet] The Black Lead and Hoodoo Pass areas are currently managed as recommended wilderness in [rsquo]87 plans. [bullet] According to the Forest Service's 2018 wilderness evaluation study, over 40% of the area consists of ecological types that are currently

underrepresented in the National Wilderness Preservation System.[bull] The portion of the Great Burn on the Lolo Forest is currently recommended Wilderness.[bull] Opening these areas up to over snow vehicles could affect wolverine habitat and has the potential to significantly impact mountain goats on their winter range. Mountain goats are limited to isolated windblown habitat during winter. Displacement to less desirable habitat due to disturbance significantly reduces survival rates for goats, particularly young of the year. [bull] The technological advances and capabilities of over snow vehicles today allow them to access steep, rugged, remote terrain favored by mtn. goats. These advances in equipment are expected to continue improving throughout the life of the forest plan. [bull] According to IDFG, illegal snowmobile use is currently impacting mtn. goat habitat in these areas and rewarding this use would be irresponsible. IDFG has also recommended that the FS limit motorized winter recreation in this area due to current impacts to goat populations. Please see additional supplemental information regarding mountain goats. Mallard-Larkins The Mallard Larkins Recommended Wilderness has long been a backcountry destination for hunters and anglers. This area has been recognized for its wild character and wilderness values for decades. The high rugged alpine environments of the Mallard-Larkins roadless area also contain critical mountain goat habitat. The area spans a portion of both the Idaho Panhandle and Nez Perce-Clearwater National Forests, sharing a 33-mile boundary, creating a continuous area of solitude and primitive recreation encompassing approximately 255,700 acres. The Idaho Panhandle National Forest has already recommended the Mallard-Larkins are for wilderness. NPCNF's inclusion of this recommendation to the final plan would complement the Idaho Panhandle NF actions. Bighorn-Weitas The Bighorn-Weitas Recommended Wilderness is the largest roadless tract in the National Forest. The rugged lower elevation mixed conifer grass and brush provide critical winter range for elk and mule deer. It contains pristine cold-water streams that support abundant native fish, like Cayuse Creek, that are prized by anglers. BHA supports these areas being managed as Recommended Wilderness under the new forest plan. Fisheries/Watershed Health-The Nez Perce-Clearwater NF provides excellent opportunities for anglers in search of native fish in pristine, cold water environments. As noted in the DEIS the NPCNF has [ldquo]riparian stream habitats ranging to highly disturbed with varying degrees of impaired function[rdquo]. Additionally, the NPCNF [ldquo]supports a significant percentage of remaining spawning and rearing habitats accessible to anadromous fish in the Snake River basin[rdquo] and 15% of available spawning habitat in the Columbia River Basin. The Nez Perce-Clearwater National Forest is host to a large portion of occupied habitat for spring/summer Chinook, fall Chinook, steelhead, Westslope cutthroat trout, bull trout and other native aquatic species. With spring/summer/fall chinook being listed as threatened under the Endangered Species Act in 1992, steelhead in 1997 and bull trout in 1998 the NPCNF plays a critical role in the perpetuation of these species not only in Idaho but the Columbia River Basin and the Pacific Northwest. Because these fish are confined to specific, limited environments, protection of their watersheds and habitats are especially important. The listed anadromous species have adapted to this region for thousands of years; they are a part of Idaho's culture, social, economic and angling heritage. Below are additions and management recommendations we would like to see incorporated into plan components. [bull] Support strong protective stream buffers along all perennial rivers and streams as found and recommended in the Northwest Forest Plan (USDS, 1994) with PACFISH and INFISH Biological Opinions.[bull] Incorporate language in the final Forest Plan that maintains the 1998 PACFISH and INFISH Biological Opinions required all streams within the range of Endangered Species Act -listed steelhead be considered [ldquo]PRIORITY[rdquo] watersheds.[bull] Utilize guidelines for streams identified in the Conservation Watershed Network that move the PACFISH/INFISH guidelines forward by emphasizing restoration of degraded aquatic habitats while continuing to mitigate impacts of projects on public lands. [bull] Include objectives in the final plan that will restore native and migratory anadromous salmonids to their historic range and reconnect isolated populations occurring in headwater streams.[bull] Recommend identifying any watershed that is not meeting desired conditions as a priority watershed, unlike the current proposal, identifying only three drainages.[bull] Incorporate in the final plan components for RMZs as proposed in the Draft Forest Plan. The plan components for RMZs are critically important, particularly in watersheds inhabited or used by candidate, threatened and endangered fish.[bull] The final plan should limit management activities within riparian management zones to only those that maintain or restore connectivity, function, composition and structure by including a standard to that effect. There should also be an objective specific to acres of riparian habitat restored [bull] [ldquo]FW-OBJ-RMZ-01. Improve 300 to 700 acres of riparian habitat. Improvements can be actions such as road obliteration, riparian planting, reconnecting

floodplains by removing road prisms or berms, etc. every 5 years. We support this restoration objective, but suggest that given the importance of riparian ecosystems, the higher end target be included in the final plan. The following streams have been identified for their high ecological and recreational values: Meadow Creek (East and West) - This stream has the greatest diversity of salmon, steelhead, trout and char species in the Rocky Mountains. North Fk. Clearwater - This is a premier Westslope cutthroat and bull trout fishery. 26 potential dam sites have been identified above Dworshak Dam. South Fk. Clearwater River - Contains B run steelhead that are highly prized by anglers. 11 dam sites have been proposed. Kelly Creek - Kelly Creek is a world-renowned cutthroat trout fishery that deserves protection. Fish Creek and Hungery Creek - Contain some of the best remaining wild steelhead habitat in the Clearwater basin. We recommend including these streams as suitable Wild and Scenic Rivers. Timber Harvest - Timber harvest, along with other treatment methods, is a necessary tool to provide forest products, support rural economies and accomplish forest health objectives. Direct and indirect impacts from timber harvest have the potential to adversely impact fish habitat, water quality, wildlife security and wilderness values. Achieving harvest objectives should not adversely impact other valid uses of the forest. Timber harvest can be a useful tool to improve big game habitat when applied appropriately. Prioritize timber harvest where big game habitat improvement is the primary objective. Timber harvest is necessary to meet the socio-economic needs of local communities as described in FW-DC-TBR-02. Invasive species prevention, inventory, treatment and monitoring should be an integral part of all timber sales. Winter logging should be implemented with an adequate buffer for big game winter range. Streamside and riparian buffers and quantifiable sediment monitoring should be required for all timber harvest operations. Estimated sediment yields in watersheds with lands identified as suitable for timber production would be most useful. Projected sediment yields across alternatives should then be compared to existing and desired aquatic conditions. We support MA2 and MA3-DC-FOR-10, which calls for maintaining current levels or increasing old growth, depending on the vegetation type. To align with FW-DC-WLMU-04 and to support declining moose herds in the region. Consider the cumulative impact of land management actions on adjacent non-forest lands when determining the appropriate harvest unit size for wildlife habitat security and connectivity. For example, agricultural activities and high levels of harvest on private timber lands in the Dworshak zone have negatively impacted elk, white-tailed deer, and moose populations in this area by reducing security cover and winter habitat according to recent IDFG management plans. BHA agrees with utilizing timber management to return forest stands to desired conditions while minimizing impacts to wildlife, fisheries, invasive species and wilderness values. Timber management actions under the No Action alternative (50-60 mmbf) do not put the forest on a trajectory to meet desired conditions for forest health, wildlife habitat and biodiversity. Alternatives calling for outputs near or above the sustainable yield of 241 mbf could potentially impact watershed health, wildlife security and productive fisheries. These harvest levels also have the potential for creating a boom and bust cycle, which in turn can negatively impact local economies. Fire Management - The fires of 1910 created vast stands of grasses and brush that helped create the famed Clearwater elk herd. Decades of aggressive fire suppression and selective logging practices followed by agency restrictions that limited the ability of the forest to apply treatments at scales that would mimic natural disturbance have resulted in forest conditions that are highly departed from desired conditions, particularly for big game habitat. Habitat conditions are a primary factor for elk populations that are below Idaho Fish and Game management objectives. According to the National Insect and Disease Risk Assessment, 65 percent of the Nez Perce-Clearwater, excluding wilderness and roadless areas, are at risk of wildfire, insects and disease. BHA recognizes the need for large scale disturbances to restore a diverse range of species and structure to the forest. Prescribed fire, timber harvest and managed natural fire can be used to meet these objectives. Utilize natural ignitions for resource benefit in the spring and fall that have very low potential for high rates of spread or severity. BHA strongly supports the use of prescribed fire and managed natural fire to achieve forest health objectives by improving wildlife habitat, increasing biodiversity and reducing the risk of catastrophic wildfire. Impacts to recreation, invasive species, public health, commercial timber and watershed health should be strongly considered when implementing this management tool. Increased acreage for prescribed fire under alternatives Y and Z may not be socially, logistically or financially feasible. With 40% of forested communities being closed canopy, single story stands with species composition and stand structure greatly outside the Natural Range of Variability, significant disturbances are needed across the forest. Apply management objectives that increase the composition of shrubs and early seral

grasses and forbs in critical elk and mule deer habitat while maintaining adequate cover for thermal refugia and concealment. [bull] Bighorn sheep habitat along the Salmon River Canyon has been heavily impacted by frequent fires and invasive species since the previous forest plan. The forest should consider the impacts to bunchgrass and mountain mahogany communities as well as the potential for invasive species when planning for the managed use of natural fire or prescribed fire in this area. [bull] Resiliency of the landscape and the potential for invasive species should be considered during fire suppression activities and when planning for the use of natural or prescribed fire. [bull] Managed natural fire and prescribed fire should be utilized to improve aspen stands where applicable. Invasive Species Invasive species are the greatest threat to biodiversity, wildlife habitat and ecosystem function on the forest. Spotted knapweed, rush skeletonweed, yellow starthistle and hawkweed in particular have displaced native vegetation on critical big game habitats. Lower, hotter, drier elevations on the forest are especially susceptible to weed invasion and rampant unchecked spread will continue without drastic changes in management and funding. Prized bighorn sheep herds along the Salmon River breaks and Hells Canyon are continuing to lose habitat to invasive annual grasses, rush skeletonweed and yellow starthistle. Frequent fires in these rugged environments have converted native bunch grasses and shrubs to invasive annual grasslands with a perennial weed overstory. The current plan calls for a total of 630 acres of weed treatment per decade between the two forests. The assessment identified over 400,000 acres of weed infestations! For this reason, the No Action alternative is not a realistic option to meet objectives for forest health. The 6,000 acres of annual treatments proposed in the draft plan in relation to the inherent exponential growth of invasive species will not meet desired goals for forest health. Furthermore, plan direction that increases timber harvest, motorized recreation, road construction and the use of prescribed and natural fire will increase the likelihood of invasive species expansion on the forest. Prevention of weed infestations along with an early detection/rapid response policy in the 500,000 acres of the forest identified as [ldquo]weed free[rddquo] should be a high priority. Increased timber production, motorized recreation and use of natural or prescribed fire in these areas significantly increases the potential to introduce invasive species. [bull] Goals and Strategies for invasive species management outlined in the draft plan are ineffective and incomplete in addressing specific management direction. [bull] Invasive species treatments (chemical, manual, biological) in recommended and designated wilderness should not only be allowed but encouraged. We support MA2-SUIT-RWILD-20. [bull] Management guidelines should be in place to mitigate the impacts of invasive species from increased timber harvest and motorized recreation. [bull] Desired Condition FW-DC-INV-01 states: [ldquo]Invasive weeds comprise less than five percent of the plant species composition across the Nez Perce-Clearwater. No new invasive weed species become established in any of the plant communities on the Nez Perce-Clearwater.[rddquo] This strategy is not quantifiable, realistic or attainable. Plant species composition data can only be collected in specific sites and then be extrapolated over a large area. Invasive species in particular cannot be quantified accurately in this manner to provide managers with a realistic species composition forest-wide. [bull] No establishment of new weed species over the life of the plan is not realistic. Numerous invasive plant species have become established and have infested significant acreage in the last 30 years. Management direction in the draft plan does not differ drastically enough from the status quo that has led to the current conditions. [bull] Strictly enforce the use of certified weed free forage. Patrols should be implemented during high use periods in weed free areas to monitor trailheads and other backcountry portals for compliance. [bull] Heavy equipment used for road maintenance, timber harvest or fire suppression activities should be cleaned of all weed seed and material potentially carrying seed prior to working on the forest. [bull] Utilize native species, when and where appropriate, for revegetation actions. [bull] Prioritize weed treatments in critical big game winter range along with restoration actions to restore native vegetation. Road Maintenance/Travel Management [bull] To improve access to the forest, we support alternatives that call for increased road maintenance and improvement, provided that maintenance is prioritized to mitigate potential erosion impacts. [bull] Slopes with a high hazard rating or roads on slopes prone to mass wasting and sediment transport to streams should be prioritized for maintenance and mitigation. [bull] If road maintenance is required due to repeated landslides or erosion events, re-routing or closure/rehabilitation of that route should be considered. [bull] Roads constructed for timber harvest should be considered for decommissioning. If left open, consider implementing seasonal closures related to hunting seasons or big game winter range. [bull] Post-harvest road closures and rehabilitation should be implemented in a way that decreases the likelihood of erosion into streams, invasive species spread, as well as illegal motorized use. [bull] Road construction, maintenance or

improvement on steep, granitic soils should be highly evaluated for potential to contribute sediment to nearby streams, particularly fish bearing streams. [bull] We support MA2-GDL-ELK-01. To maximize elk habitat, use and avoid fragmenting large areas of elk habitat that is currently not accessible by motorized access. New motorized trails open to the public should not be authorized unless adjacent areas of 5000 acres or larger can be maintained without motorized access. The location of new motorized trails should avoid areas of high or moderate nutrition potential when possible.[bull] Adequate riparian buffers and Best Management Practices for construction and maintenance should be in place to minimize fine sediment transport to fish spawning habitat. [bull] Decommission or eliminate redundant or unnecessary roads in priority watersheds identified as critical habitat for native salmonids or where impacts to water quality and aquatic habitat are occurring, especially where such roads overlap with native and migratory salmonids.[bull] Unauthorized routes have become a significant problem on National Forest lands throughout the west. These routes should be prioritized for decommissioning, effectively signed, patrolled and enforced.Thank You,Ace HessBackcountry Hunters and AnglersHigh Divide and Idaho Chapter CoordinatorMountain Goat supplemental Information:From the Idaho Department of Fish and Game Idaho Mountain Goat Management Plan 2019-2024:[ldquo]Availability of high-quality habitat limits mountain goat distribution in Idaho. Most threats impacting mountain goats are direct threats to their habitat or indirect threats that cause them to leave preferred habitat[hellip]. Mountain goats are susceptible to disturbance by recreational activities, both motorized and non-motorized, and may abandon preferred, high quality areas because of disturbance (pg. iv).[rdquo][ldquo]The mountain goat is recognized as a Species of Greatest Conservation Need, priority Tier 3, in the Idaho State Wildlife Action Plan. The Action Plan is the state[rsquo]s guiding document for managing and conserving wildlife before they become too rare and costly to protect (pg 2).[rdquo][ldquo]Winter ranges are composed of cliffs and high alpine ridges where deep snow does not accumulate, thus providing access to winter forage. Because physical characteristics are more important than vegetative characteristics, habitat generally cannot be treated to produce quality winter habitat. This situation makes management and conservation of quality winter range crucial to maintaining current populations and distribution of mountain goats in Idaho (pg. 5).[rdquo][ldquo]Most mountain goat habitat in Idaho occurs on lands managed by the United States Forest Service (USFS). Management of USFS lands provides opportunities for multiple uses where appropriate. However, conflicting interests compete for land that currently provides quality habitat for mountain goat populations. Disturbance and development of mountain goat habitat will result in few mountain goats in Idaho (pg 5).[rdquo][ldquo]Winter habitat is most vulnerable (in terms of carrying capacity and food resources) because mountain goats concentrate into smaller areas during winter (pg. 5).[rdquo][ldquo]High-quality mountain goat habitat includes a combination of cliffs, steep slopes, and alpine ridges. Additionally, to support healthy mountain goat populations, this terrain must also be remote, in suitable climates, and relatively free from disturbance. Conservation of existing quality mountain goat habitat should be one of the highest priorities for managers. Specifically, proactively managing access and travel will be critical to protecting mountain goat populations[hellip]. Because mountain goat habitats are scattered throughout Idaho, migration and dispersal corridors should be documented and conserved (pg. 12).[rdquo][ldquo]Maintaining migration corridors and landscapes permeable to individual movements increases effective population size, genetic diversity, and adaptive potential, while providing movement routes for mountain goats to respond to climate change (pg 19).[rdquo]Regarding the Black Snow Population Management Unit, which includes the Mallard-Larkins and Bitterroot Divide landscapes:[ldquo][hellip]however, the eastern portion of the PMU showed a substantial decline (in mountain goat numbers) from the previous survey (pg. 34)[rdquo][ldquo]There are concerns with increasing snowmobile and snow bike access to mountain goat habitat in both the western part of GMU 9 and the eastern portion of GMU 10 (pg. 34).[rdquo][ldquo]Strategy [ndash] Work with Idaho Panhandle and Nez Perce [ndash] Clearwater national forests to minimize potential impact of motorized and non-motorized recreation on mountain goats (pg. 34).[rdquo]From the Statewide Mountain Goat FY2018 report, Clearwater Region:[ldquo]Additionally in 2010, a survey was conducted in the old Blacklead hunt area (S.F. Kelly Creek to Williams Creek (GMU 10) and Boulder Creek/Crooked Fork (GMU 12)) where 47 goats were observed. This was repeated in 2017 as well. Only 7 mountain goats were observed but extensive tracks from illegal snowmobiles and snow bikes were observed all over the mountain goat winter range (pg. 16).[rdquo] [ldquo]Additional effort needs to be put into figuring out where the upper Kelly Creek mountain goat population is wintering. Currently the Department is asking the USFS to put more effort in enforcing the winter off road travel in Kelly Creek. This needs to include an

effort on the Montana side of the State line as that is where most of these winter travelers are coming from. Failure to get a handle on this issue might jeopardize this population (pg. 17)

From the Environmental Assessment, Over-snow Vehicle Travel Management in the Northern Portion of the Fairfield Ranger District, Fairfield Ranger District, Sawtooth National Forest, January 2017:

In order to lessen the increase of potential disturbance effects to mountain goats, lynx, and wolverine denning in the upper headwaters of the upper South Fork Boise River and Big Smoky Creek areas resulting from increased over-snow vehicle recreation, the District would implement a new over-snow vehicle closure in those areas (pg.3).

Add protection from disturbance for wintering mountain goats, lynx, and wolverine denning in a portion of the headwater area of the South Fork of the Boise River and Big Smoky Creek drainages by closing the area to over-snow vehicle use (pg.18).

Based on discussions with personnel from the Idaho Department of Fish and Game it was determined that it would be important to add the headwaters areas of Big Smoky Creek to the proposed new closure in order to protect wintering mountain goats (pg. 24).

Disturbance that cause mountain goats to flee in the wintertime can have negative consequences to individuals, and repeated disturbances to small populations can have negative effects to the population (pg. 36).

While mountain goats can become habituated to predictable, continuous noise, they are disturbed by sudden, unpredictable stimuli. Both snowmobiles and helicopters can affect mountain goat behavior, depending upon the proximity and duration of the disturbance.

Due to increases in technology of over-snow vehicles, their increasing popularity and increasing over-snow vehicle users seeking extreme terrain, it is foreseeable that the use of the upper South Fork area would likely increase (pg. 37).

(Sawtooth Forest Plan)

Objectives 0640 (and 0834) Provide winter habitat security for mountain goats and reproductive denning habitat security for wolverine in the headwaters area (and headwater tributary areas) of the South Fork Boise River by minimizing disturbance from winter recreation activities. Standards 0667 (and 0867) Restrict or modify winter recreation activities where conflicts exist with mountain goats and/or wolverine. (pg. 38)

The new proposed over-snow vehicle closure area was developed to protect mountain goats from disturbance by over-snow vehicles (pg 39).

Technology is permitting over-snow vehicles to access areas previously not possible, and this trend is expected to continue. the proximity with which over-snow vehicles can go to habitats puts mountain goats at risk of disturbance (pg. 42).

From Mountain Goats. Ecology, Behavior, and Conservation of an Alpine Ungulate. Marco Festa-Bianchet and Steeve D. Cote. Island Press, 2008:

Conservation of mountain goats faces two related challenges: their habitat must be protected and they must continue to use available habitat. Because mountain goats are highly intolerant of human activities, their conservation requires protection from human intrusions. Otherwise, goats may not use available habitat forms of motorized access can also affect their behavior, increasing movement rate, decreasing foraging time, and in extreme cases lead to habitat abandonment. Intense recreational use of their habitat, especially with motorized access, is incompatible with mountain goat conservation. The expansion of industrial activities and motorized recreation into mountain goat habitat is a major concern for the conservation of this species (pg.216).

The conservation of mountain goats rests on the protection of their habitat and on the prevention of harassment, particularly from helicopters and motorized vehicles (pg. 218).

From Mountain Goats and Winter Recreation, BV (Bulkley Valley) Outdoor Recreation Society, Nov 2011:

Forty years ago, snowmobiles were underpowered and unable to reach goat winter terrain. Since then, improvements in engine power, traction and suspensions enable snowmobiles to climb onto ridges and rocky summits at or above the preferred home range of mountain goats in winter, disrupting the goats in their feeding corridor.

Mountain goats conserve energy in winter by restricting their travel. The winter feeding area for a herd of goats may be as small as 8 hectares. The food value of dry grasses and lichens in winter is low so goats depend on body fat accumulated in summer and autumn to survive winter. Loss of body fat in late winter can result in starvation and mortality can exceed 50% of the herd in a severe winter.

The high speed and noise of snowmobiles prevents goats from becoming habituated to the machines.

Frequent snowmobile traffic can disrupt the goats from feeding or bedding down in the narrow feeding corridor. The goats may stay in the cliffs nearby where feed may be scarce and lower quality. Or the goats may choose to abandon their home range and move to a new feeding area. Any extended travel in deep snow to a new feeding area involves increased energy output and a reduction of stored body fat necessary for survival until spring. Travel can also expose the goats to avalanche hazards

and a greater risk of predation. Each year, snowmobiles travel to more remote areas. We anticipate that the use of snowmobiles within prime mountain goat habitat on high ridges will steadily increase in the coming decade, along with extensive displacement of mountain goats.