Implications and Possible Solutions For Mountain Bike Trails In Kokanee Creek Provincial Park.

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1.0 INTRODUCTION

The popularity of mountain bike riding has been steadily increasing since the introduction of the mountain bike in the 1980's (Mosedale, 2003). With the introduction of a sport such a mountain biking, controversy usually follows. In the case of mountain bikes the main issue of controversy is the building of illegal trails on private and public lands. Land managers are now faced with new sets of concerns such as liability, public safety and environmental impacts. These new concerns are issues that the managers of Kokanee Creek Provincial Park are being faced with in regards to two mountain bike trails that run through sections of the park.

Kokanee Creek Provincial Park is located nineteen kilometers, North East of the city of Nelson on highway 3A. The park was established in 1955 and is two hundred and sixty hectares in size. It offers front country camping opportunities along with easy access to moderate hiking and walking trails. The park is a popular destination for campers and outdoor recreation enthusiasts from around the world, as well as being a popular recreation area for locals (Figure 1.0) (BC Ministry of Environment, 2003).

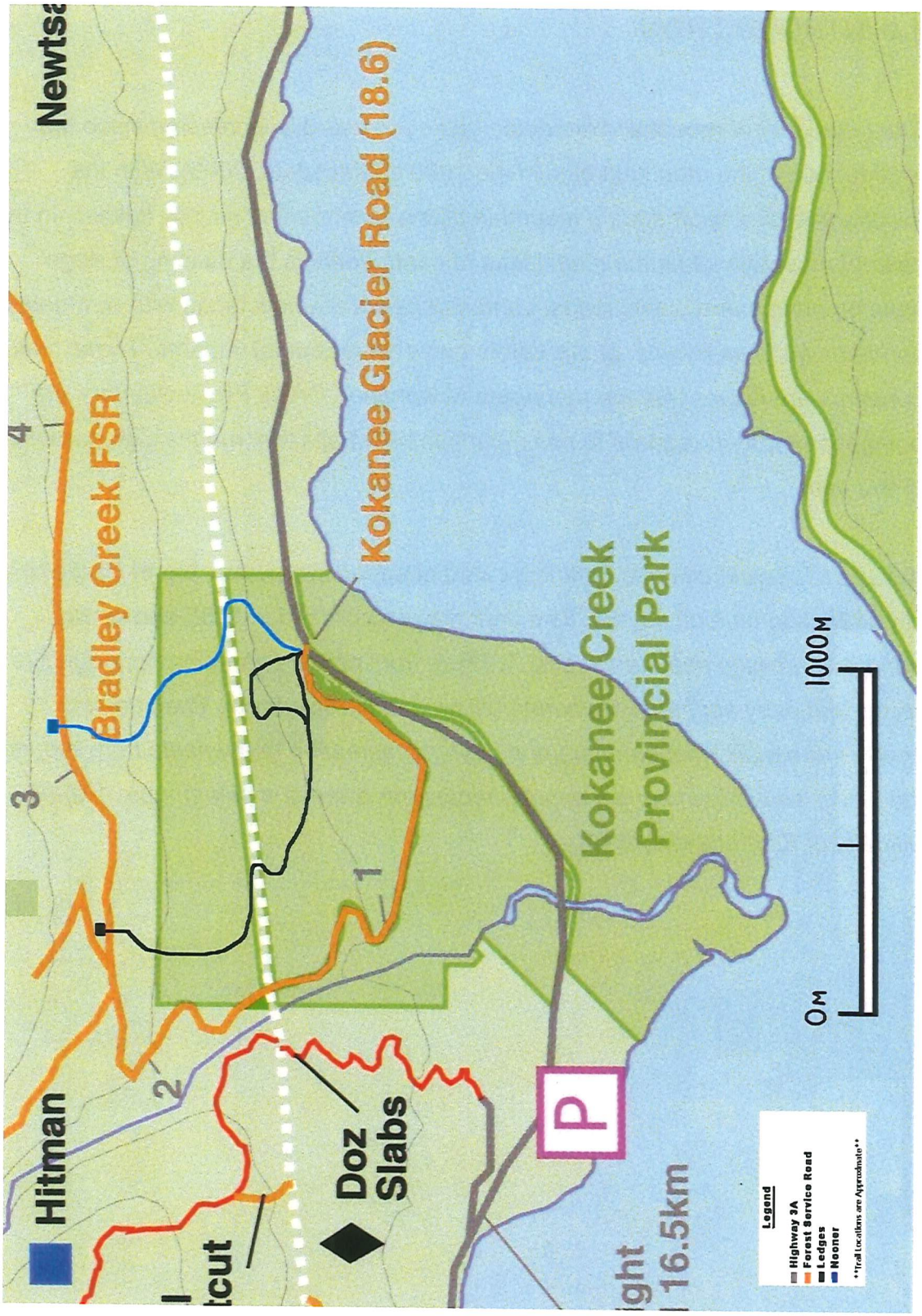

Figure 1.0: Map of Trails (Ledges and Nooner) within Kokanee Creek Provincial Park.

The primary role of Kokanee Creek Provincial Park is to protect the remnant forest, riparian, lake, wetland and creek ecosystems of the area. There are few areas left in this part of British Columbia with such high natural diversity. The secondary role of the park is to provide and maintain a major holiday destination as well as to provide year round recreational opportunities in the West Kootenay area (BC Ministry of Environment, 2003).

British Columbia Parks has expressed concern over the construction and use of two unauthorized mountain bike trails, named "Ledges" (Figure 2.0) and "Nooner" (Figure 2.1), both of which have sections that are located within the park's boundaries Parks has attempted to de-activate these trails. Parks has also attempted to put up signage stating that the trails are closed to mountain biking (MacKillop, 2005). Neither of these methods have deterred mountain bikers from using the trails.

The location of these trails is one of the reasons that they are so widely used by Nelson area riders. Both trails are on a low elevation, south facing slope. They are some of the only trails in the area that can be ridden during the mid to late spring (MacKillop, 2005).

Figure 2.0: Technical Trail Feature on Ledges (Bridge).

Figure 2.1: Technical Trail Feature on Nooner (Log ride).

The exact date that these two trails where built is unknown. It is believed that they were built between 1998 and 2000. Up until the spring of 2005, when the Recreation, Fish and Wildlife Technology students from Selkirk College dismantled sections of the two trails, little effort by BC Parks was undertaken to dismantle the trails. With current staffing levels, BC Parks has not had the personnel needed to undertake such a large job (Harlow, 2006).

The three main concerns that BC Parks has expressed concern over are:

- Spread of noxious weeds,
- Conflicts with other park users,
- The trails are built in trespass (Harlow, 2006).

BC Parks is worried that mountain bikes will move the noxious weeds into parts of the park in which they are not yet a problem. Conflicts with other user groups are always a concern with land managers. The fact that these trails are built in trespass is an issue that violates the Park Act (Section 13: The Parks Act).

At this time the management plan for Kokanee Creek Provincial Park does not include any plans for the facilitation or retention of any mountain bike trails in this

park. Currently bicycles must keep to the roadways within the park. The outcome of this research will help to determine whether or not mountain bike trails can conform to the management goals of the park.

2.0 Methodology

2.1 Survey

In order to gain an understanding of the users of the two trails, Ledges and Nooner in Kokanee Creek Provincial Park, a survey of the local mountain bike club was conducted. The goal of the survey was to gain a better understanding of people's perceptions in regards to Ledges and Nooner and the issues that surround them. The survey focused on local mountain bike riders in the Nelson area and addressed the following main issues:

- Awareness of the mountain bike trails in Kokanee Creek Provincial Park,
- Skill level,
- Primary reason for riding these trails,
- Awareness of the issues surrounding the spread of noxious weeds, and
- Other user groups being allowed to utilize the mountain bike trails.

With the data that was received from this survey, it is my intention to gain a better understanding of the insight that the local mountain bike riders have in regards to their sport of choice as well as their understanding of issues surrounding mountain bike trails that are within BC Parks.

The survey was distributed to approximately 220 mountain bikers throughout the Nelson area. The survey was sent out to the Nelson Cycling Club Society (NCC) membership on February 9, 2006 and closed on February 28, 2006. 200 people were reached by sending out an online survey through the NCC membership in

an email newsletter, and the other 20 people were reached through individual emails and from the survey being forwarded to non-member riders by the NCC membership.

The data that was collected was summarized as percentages of responses.

The survey consisted of 15 questions. The questions were made up of multiple choice answer questions, yes or no answer questions as well as questions allowing the respondent to state their opinions or expertise on issues of concern. (Appendix 1: Survey).

2.2 Trail Standards

Field Work

On January 8th and March 19th, 2006, two inventories were completed to compare the technical trail features located on the two mountain bike trails in Kokanee Creek Provincial Park. Both trails were mapped and all technical trail features in and out of the park were recorded. The constructed features were measured for comparison to the Whistler Trail Standards Guidebook (DeBoer, 2001).

In doing this comparison, each structure was measured for the following:

- Height over ground
    - Measured at the highest point, standing on the feature using a carpenter's tape
- Drop height
    - Measured using a carpenter's tape from the end of the feature on a 90 degree angle to the ground
- Rung spacing and overhang

    - Were given a "YES" or "NO", as to whether they were acceptable or not according to the Whistler Trail Standards
- Feature length, width
    - Measured with a 50 meter Eslon tape from the obvious start and end of the feature
    - The width was taken at the narrowest point, as in the Whistler Trail Standards
- Diameter
    - Was determined by using a diameter tape on the most representative part of the feature ("log ride")
- Feature Type
    - Features were labelled by general terms used within the bike community (i.e. "Log ride", "Teeter Totter)

Photographic documentation was also conducted using a digital camera.

The following agency's guidebooks and field work were used to compare and analyze the current state of the two trails present in the park:

- IMBA (International Mountain Bicycling Association)
- Whistler Trail Standards Guidebook

A meeting with the Area Supervisor, Dan Harlow, and Area Ranger, Kevin Giles, was also conducted to discuss the current trail situation, perceived impacts and trail management.

2.3 Wildlife

Field Wildlife Traverse (Trails)

The wildlife field data used for this paper was collected on January 21st, 2006. The data was collected by one student walking from the top of the trail to the base on both Ledges and Nooner.

During the trail traverse, the student measured 2 meters on either side of the trail, for the entire length of both trails using a 50 meter Eslon tape to record any wildlife sign. These included scat, tracks, visible denning sites and squirrel middens. While traversing the trails, the student was also recording viewed individuals, as well as vocal sounds. The purpose of this traverse was to get an initial idea of what animals were readily utilizing the trails and surrounding area.

A traverse of about 50 meters on both the north and south sides of Kokanee Creek was conducted to observe any resident riverbank/stream residents that might be present. No individuals were observed at that time.

Pandion Ecological Ltd. (1998) compiled a wildlife species list for the park.

2.4 Noxious Weeds

Credible scientific research on the subject of mountain biking and its impacts with regards to noxious weeds is limited. There has been little research done specifically on the topic of whether or not mountain biking has more or less of an impact on the spread of weeds than other user types of recreation in British Columbia's protected areas (Sprung).

It is for this reason that the majority of research done on this topic deals with the subject on a broader view; correlation and extrapolation of reviewed literature

allowed for some conclusions to be made that indicate some possible courses of action for land manager's to take when dealing with mountain bikes in weed infested areas.

Research was done to discover the impacts that mountain biking may have on the vegetation and soils of areas with trails. Reviewing of available literature and discussion with BC Parks staff provided the information needed.

A literature review of information on the ecology of the three noxious weed species that pose the largest threat to Kokanee Creek Park was done to gather information on these weed species. Personal communications with Juliet Craig, the area coordinator and subject matter expert for the local noxious weeds research and management initiative, were conducted.

A literature review was also completed to gather information on management possibilities for noxious weed problems, including information on models for managing weeds to potential herbicides specific to the weed species that pose a threat to the park.

2.5 Legislation

All information gathered for this section was collected from internet sources as well as from Selkirk Library sources.

3.0 Results

3.1 Survey

The response to the survey was 25% (56 responses out of a survey of approx. 220). Of the 56 responses, 52 people had ridden the trail in Kokanee Creek

Provincial Park (92% of respondents). The four "no" responses skipped the rest of the questions in the survey.

When asked about the number of times per season people ride the two trails, 50% (27 respondents) ride the trails 1 to 5 times in a single season, with spring being the season that they would ride there the most. Of the two trails within the park 63.5% (n=33) have no preference to which trail that they ride. 43.4% (n=23) of the respondents consider themselves to be "advanced" in their mountain bike riding skill levels. The main reason that people (37.7% of the respondents) ride Ledges and Nooner is because of the lack of snow in the shoulder season (spring and fall).

When asked about the spread of invasive weeds throughout the park via mud and dirt on bikes, 71.4% (n=40) of the people surveyed do not seem to have considered the issue.

When asked about the issue of other user groups having access to the two mountain bike trails (i.e.: dog walkers and hikers), 61.5% (n=32) of people surveyed say that they don't mind sharing the trails. Whereas, 19.2% of people think that the trails should be exclusively for mountain bike use.

In regards to issues that BC Parks feel are associated with mountain biking, (transporting of invasive plant species, liability of BC Parks, placing nails in live trees, wildlife disturbance, soil erosion, conflicts between different user groups and the use of un-authorized trails), 70.4% of the respondents (n=38) agree that some of the concerns exist and that they need to be addressed. Only 9.3% of the people (n=5) don't think that any of the concerns are valid or they don't care.

The final question in the survey allowed people to identify ways that may address the concerns mentioned in the previous question. 64% of the respondents (n=35)

identified ways to address these concerns. Some of the underlying themes in the received responses are as follows:

- Place signage to inform and educate people on the issues surrounding the trails, i.e.: invasive weeds, soil erosion and the placing of nails in live trees.
- That the spread of invasive weeds throughout the park via mountain biking is a perceived non-issue, or no more of an issue than the spread of invasive weeds via hikers and dog walkers.
- That liability will not be an issue to BC Parks if the local cycling club manages the trails to international standards.
- That parks are in place for the enjoyment of all user groups.

3.2 Trail Standards

Ground Height

The Whistler Trail Standards state that the height of a feature should be relevant to its corresponding width and stability.

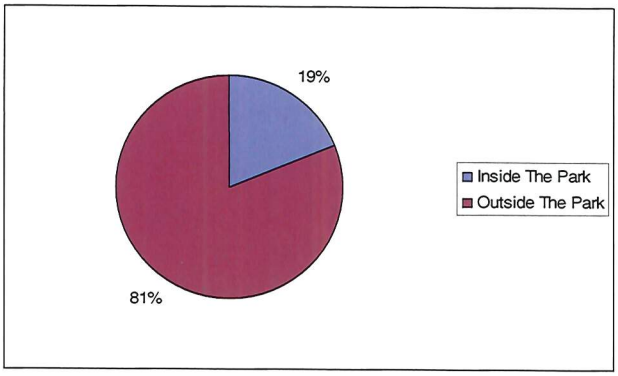

Figure 3.0: Proportion of features on Nooner inside and outside the park boundaries.

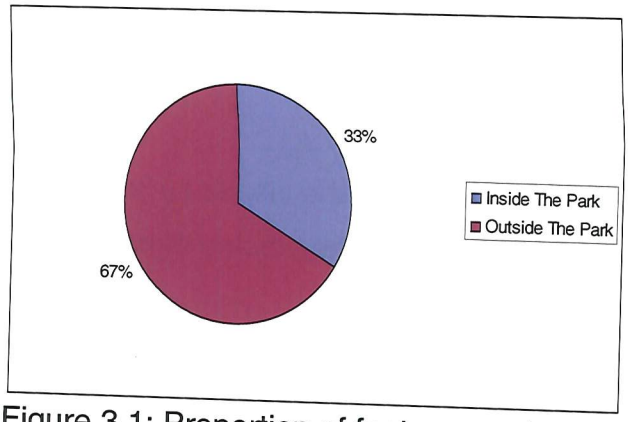

Figure 3.1: Proportion of features on Ledges inside and outside the park boundaries.

Three of the sixteen features on Nooner were within the park boundaries. All three of these features met the standard for ground height (Figure 3.0).

Three out of the nine features on Ledges were within the park boundaries. All three of these features met the standard for ground height (Figure 3.1).

Feature Width

In the Whistler Trail Standards guidebook, the width of the feature corresponds to its height off the ground. For example, a width of 30 cm is expected for a bridge 120 cm off the ground. An equation can be applied to this:

"10 cm of width for every 40 cm of height.

There are sixteen features located on Nooner and three are within the park. Two of those three meet the standard for feature width.

There are nine features located on Ledges and three are within the park. Only one of the three meet the standard for feature width.

Rung Spacing

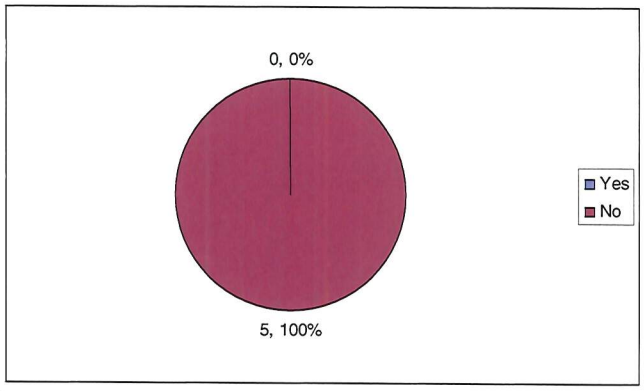

Figure 4.0: Acceptability of rung spacing on Nooner.

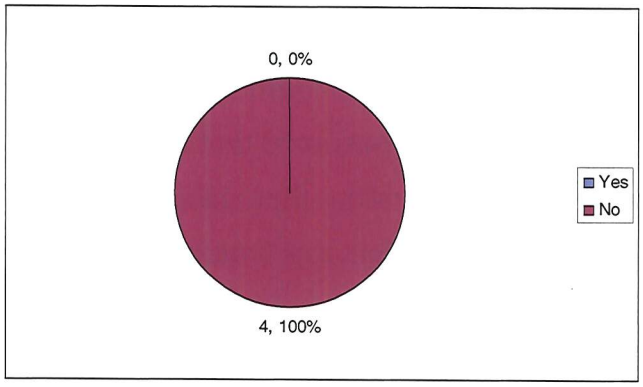

Figure 4.1: Acceptability of rung spacing on Ledges.

Feature Overhang

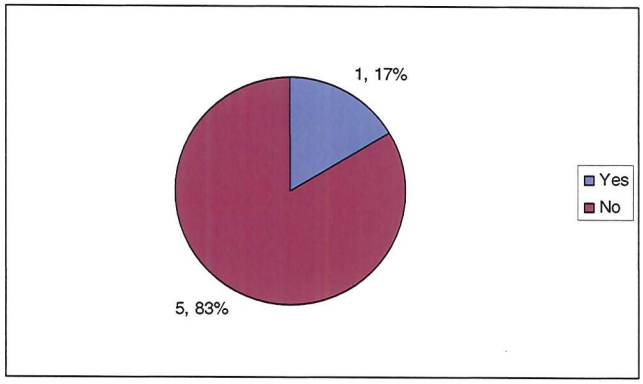

Figure 5.0: Acceptability of overhang available on Nooner.

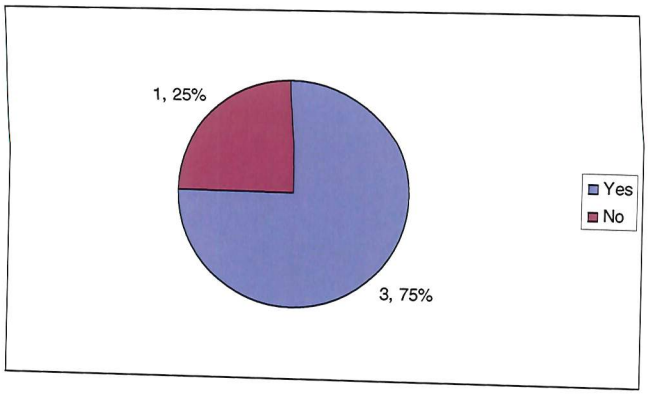

Figure 5.1: Acceptability of overhang available on Ledges.

Feature Length

The length of a feature is not an issue in the Whistler Standards, as it does not dictate the skill of the rider which utilizes it. It can be assumed that longer features would be located on more advanced trails, rather than subjecting beginners to strenuous log rides or continuous technical trail features.

Feature Type

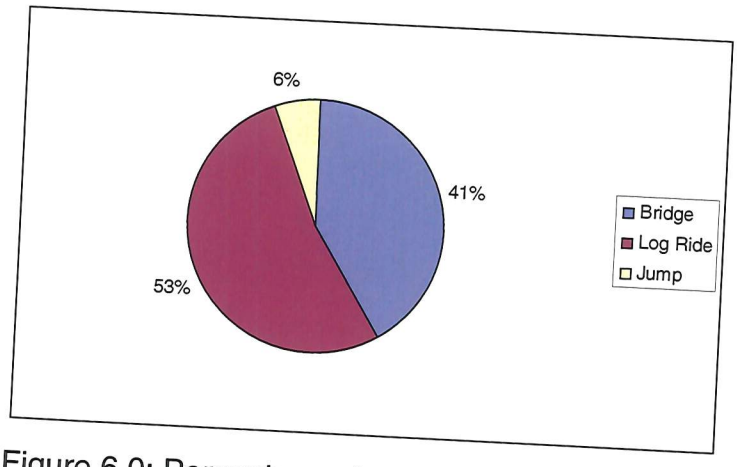

Figure 6.0: Percentage of each feature type on Nooner.

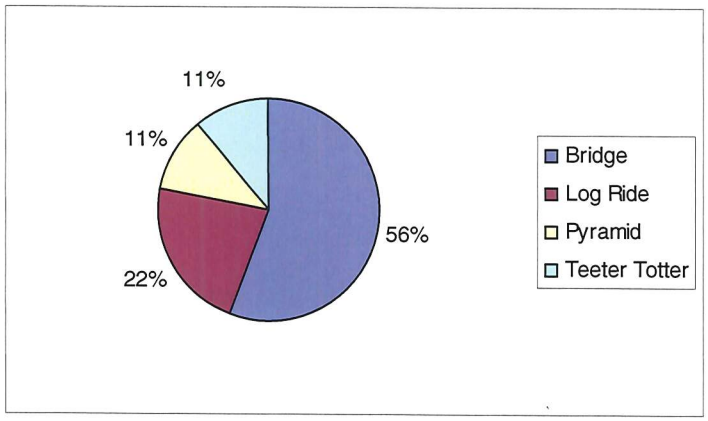

Figure 6.1: Percentage of each feature type on Ledges.

Log Rides

Log rides are judged solely on their tread width. The surface width should be two times the side of the normal tire tread width.

All of the log rides present on both trails met this standard.

There is no formal surface-type standard set by the Whistler Trail Standards manual. The log ride features located on both trails either had a chainsaw "cross cut" pattern for surface grip or were wrapped with chicken wire or log wrap.

Drop Height/Fall Zone

Only one feature on Ledges was observed for drop height. The fall zone should be cleared of potential dangers to a min. of 1m on all sides of the technical trail feature and up to 30cm high and 1.5m on both sides for technical trail feature 30cm and higher. The height is measured vertically to the lowest point within 1.0m adjacent to technical trail feature.

Trail Type

Both trails fall under the Type IV category trail, listed as:

- plan as unsurfaced one-way trail

- provides 30-50cm width tread on native soil
- some sometimes rough terrain
- clear width to 1m
- clear height to 2.4m

These two trails are also listed as "LOW PRIORITY" trails according to the Whistler Trail Standards manual (DeBoer, 2001).

Table 1.0: Measurements for each trail feature on Nooner.

Stunt #	Ground Height	Stunt Width	Overhang	Rung Spacing	Feature Length	Stunt Type	Diameter	Drop Height
1	0.4 m	45 cm	No	No	3.3m	Bridge	~	~
2	1.1m	30 cm	~	~	17.2m	Log Ride	47cm	~
3	2.5m	25 cm	~	~	35.5m	Log Ride	53cm	~
4	0.7m	70 cm	No	No	3.4m	Bridge	~	~
5	1.1m	22 cm	~	~	45.6m	Log Ride	43.5cm	1.45m
6	0.50m	48 cm	No	No	3.1m	Bridge	~	~
7	0.56m	30 cm	~	~	2.3m	Jump	~	~
8	0.74m	47 cm	No	No	4.8m	Bridge	~	~
9	0.45m	43 cm	No	No	2.5m	Bridge	~	~
10	0.46m	26 cm	~	~	6.3m	Log Ride	~	0.65m
11	0.85m	27 cm	~	~	4.9m	Log Ride	~	~
12	0.43m	48 cm	Yes	No	2.5m	Bridge	~	~
13	0.60m	20 cm	~	~	17.0m	Log Ride	~	~
14	1.53m	23.0 cm	~	~	3.6m	Log Ride	48cm	1.55m
14B	1.1m	132cm	~	~	26.6m	Bridge	~	~
15	1.6m	27cm	~	~	15.9m	Log Ride	38cm	0.78m
16	1.39m	29cm	~	~	16.1m	Log Ride	67.5cm	~

**Numbers 14, 14B, 15 and 16 were located within the park boundaries.

Table 1.1: Measurements for each trail feature on Ledges

Stunt #	Ground Height	Stunt Width	Overhang	Rung Spacing	Feature Length	Stunt Type	Diameter	Drop Height
1	1.65m	33cm	"	"	8.3m	Bridge	"	"
2	0.65m	20cm	"	"	3.6m	Teeter Totter	"	"
3	0.85m	15cm	"	"	4.7m	Pyramid	"	"
4	0.85m	65cm	Yes	No	2.7m	Bridge	"	"
5	0.7m	25cm	Yes	No	5.9m	Bridge	"	"
6	2.85m	25cm	Yes	No	14m	Bridge + Run	"	"
7	1.15m	30cm	"	"	17.5m	Log Ride	67.5cm	"
8	0.75m	30cm	No	No	3.4m	Bridge	"	"
9	2.2m	35cm	"	"	37.5m	Log Ride	76.5cm	"

**Numbers 7, 8 and 9 were located within the park boundaries.

3.3 Wildlife

Rock and Large Woody Debris (LWD)

Kokanee Creek Park was fully inventoried for flora and fauna species. This inventory concluded that an average 25% (Figures 8.0 and 9.0) of each species type in the park utilizes rock ledges and LWD for their everyday activities. These include movement through the forest, forage for food and denning/resting sites. Also, among these species, there are 7 known red listed species and 5 blue listed species (Holt et al, 1998) (Figure 7.0). The two mountain bike trails in the park encompass large sections of rocky "rollers", as well as lengthy log rides.

Stream and Riverbank

The two trails of interest at Kokanee Creek Provincial Park were both constructed in the drainages surrounding Kokanee Creek (Figure 1.0).

The trails both pass over and through small creeks, sometimes with no bridge present or one that is in disrepair.

An average of 27% of the total wildlife inventoried in the park are streambank users (Figures 8.0, 9.0). Of the 27%, there are five red listed species, six blue and one yellow listed riverbank user (Figures 7.0). There are also four fish species present in Kokanee Creek, with two of them being red listed and two blue (Holt et al, 1998) (Figure 7.0).

Understory Brush/Shrubs

Thirty percent of the bird species and seven percent of the amphibian/reptile species present use the understory vegetation in some way (Holt et al, 1998) (Figure 8.0).

Wildlife Trees

The dense canopy of the ICHdw (Interior Cedar-Hemlock dry-warm) is comprised of veteran, large canopy trees which are commonly used by small mammal and bird cavity nesters. Fifty percent of the bird species and 19% of the small mammals (Figure 8.0) found in Kokanee Creek Provincial Park are primary or secondary cavity nesters. Cavities are usually found in dead-standing wildlife trees or on sections of veteran trees with little or no branches, hampering access by predators. Some technical features created at Kokanee Creek Provincial Park, require nails and supports to be constructed on live and dead timber, which may house one or more cavity nesting individuals (Holt et al, 1998).

Constructed / Natural Wildlife Trails

In the field portion of the research, various wildlife trails were observed, bisecting the constructed mountain bike trails (Table 2.0). Both ungulate and small species use these trails and were observed using the constructed trails also.

Table 2.0: Wildlife traverse data of the trails Ledges and Nooner on January 21, 2006.

Distance (m)	Trail Name	Sign
0-100m	Ledges	Mule Deer, Common Grouse
100-200m	Ledges	N/A**
200-300m	Ledges	Mule Deer
300-400m	Ledges	Downy Woodpecker
400-500m	Ledges	Common Grouse
600-700m	Ledges	Mule Deer, Common Grouse, Squirrel
700-800m	Ledges	Whitetail Deer
800-900m	Ledges	Mule Deer
900-1000m	Ledges	N/A
1100-1200m	Ledges	Mule Deer

Distance (m)	Trail Name	Sign
0-100m	Nooner	Mule Deer
100-200m	Nooner	Squirrel
200-300m	Nooner	Mule Deer
300-400m	Nooner	Common Grouse
400-500m	Nooner	N/A
600-700m	Nooner	N/A

** N/A = No signs were detected at that time on the traverse

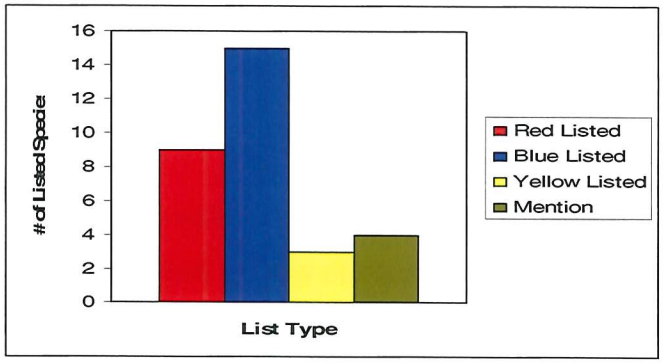

Figure 7.0: Listed species per type within Kokanee Creek Provincial Park (Nelson Naturalists (1997), Pandion Ecological Inventory (1998)).

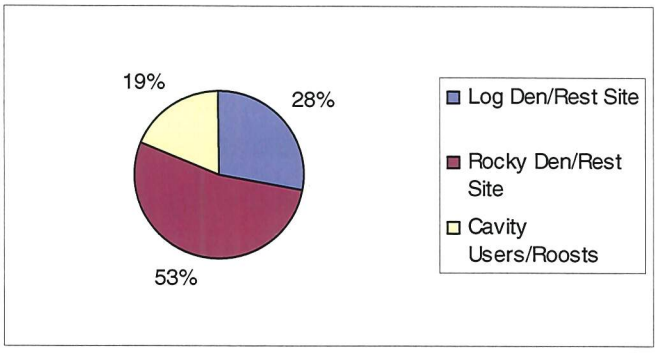

Figure 8.0: Potential areas of impact on mammal species by mountain bikers.

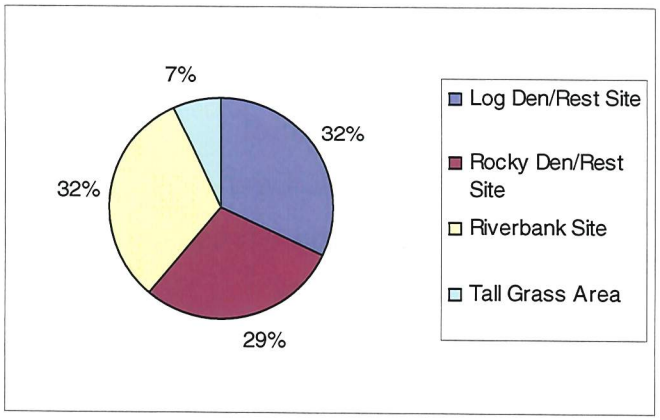

Figure 9.0: Potential areas of impact on amphibian/reptile species by mountain bikers.

3.4 Noxious Weeds

Kokanee Creek Provincial Park conducted an invasive weed survey in 2002 to determine the composition and intensity levels of noxious weeds within the park. The survey concluded that the following species were present in the park:

Mouse Eared Hawkweed, Spotted Knapweed, Scotch Broom, Canada Thistle, Common Tansy, Common Burdock, Hoary Alyssum, St John's Wort, Japanese Knotweed, Black Locust, Himalayan Blackberry, and Bull Thistle (Craig et al, 2002 as found in Utzig, 2003).

Interviews were conducted with Dan Harlow, the area representative for BC Parks, as well as Kevin Giles, a ranger within the park to discuss the presence of these weeds. The major species of concern out of all of the species present were Mouse Eared Hawkweed and Spotted Knapweed.

3.5 Legislation

Occupiers Liability Act

Under this act an "Occupier", is anyone who is in physical possession of a given area, or has responsibility for and control over the condition of that area, and the activities conducted on those premises. (Section 1: The Occupiers Liability Act).

This act determines the levels of care a land owner is expected to take in order to protect people (and their property) who may enter onto the premises (Section 2: The Occupier Liability Act).

Any occupier of a premises must take duty of care under all circumstances that people and their property will be reasonably safe. Duty of care refers to the condition of the premises, activities on the premises, and the actions of third parties on the premises. Occupiers are exempt from their duty of care to persons who willingly assume risks on a property, the only thing occupiers need do in such a case is ensure they do not create a danger with the intention of inflicting harm to the person, or damage to the persons property, or secondly act with reckless disregard to the safety of the person or the integrity of that persons property (Section 3: Occupiers Liability Act).

People trespassing in an area while committing an offence, or even with the intention of committing an offence, willingly assume all risks. In this case, not creating hazards or recklessly disregarding safety of those entering onto a property is the occupier's only duty (Section 3: Occupiers Liability Act).

Those entering onto trails for the purpose of recreational activity are deemed to have willingly assumed all associated risks. Occupiers of such premises are only subject to the duty of care (*subsection 3: which stated that an occupier has no duty of care to a person in respect of risks willingly assumed by that person other than a duty not to create a danger with intent to do harm to the person or damage to the person's property, or act with reckless disregard to the safety of the person or the integrity of the person's property.*) if the person who enters is

trespassing, or if their purpose for being there is for recreational activity. The occupier however in the case of people using trails for recreational activity must not accept money for the use of those trails. If money is taken for the use of trails in respect to users of the trails engaging in recreational activity, a higher standard is demanded of occupiers to ensure that risk in using the trails is minimized. (Section 3: Occupiers Liability Act). In the case of a camper using the trails who has paid a fee to use camping facilities in the area, the occupier's duty of care does not change, as the fee paid by the camper is only for the use of park camping facilities, not the trails which are available to the public free of charge.

The Negligence Act

This act states that, if by the fault of two or more people, damage is caused to one or more of them; the liability to make good the damages is in the proportion to their degree to which each person was at fault. (Section 1: The Negligence Act). In the off chance that it is not possible to establish the level of responsibility for both parties then the liability is distributed equally amongst the effected parties. Nothing under section one of this act entitles anyone liable for damages or loss to which the person actually contributed no fault. (Section 1: The Negligence Act).

Under this act, the awarding of damage, or loss, is governed by things such as the fact that damage or loss sustained by each person must be expressed in dollars, the degree to which each person was at fault must be confirmed and expressed as a percent of the total fault and persons sustaining loss or damages are entitled to recover from those responsible for any loss or damages. The percentage of the loss or damage sustained which corresponds to the degree of fault of that other person. (Section 2: The Negligence Act).

Unless otherwise directed by the courts, liability for costs of parties to every action is in the same proportion as their respective liability to make good the

damages or loss. If between two people, one is entitled to a judgment for an excess of damages or loss, and the other to a judgment for an excess of costs, there is a further set off of the respective amounts and judgment must be given accordingly. (Section 3: The Negligence Act).

Damage or loss contributed to by the fault of two or more persons must have the degree of responsibility determined by the court for each person involved. Except in the case of section five of this act, if two or more people are found at fault, they are jointly liable for the person suffering damages or loss and are liable to contribute and indemnify each other in the degree to which they have been respectively found to be at fault. (Section 4: The Negligence Act).

The remainder of this act deals with the fault and distribution of fault between married couples or the deceased with the exception of section eight of this act. Information on the remainder of this act was excluded as it didn't seem relevant to the situation at Kokanee Creek Park. Some useful information can be found in section eight of this act, where it states that this act applies to all cases where damage is caused by a persons actions, even if the person had the opportunity to avoid the consequences of said actions, but negligently or carelessly failed to do so.

The Parks Act

Under this act, the minister has jurisdiction over the rights, property and interests of the government in parks and recreation areas. Also they have jurisdiction over the natural resources within parks and protected areas, including wildlife and their habitats. The minister is also responsible for the preservation, development, use, and maintenance of parks or recreation areas, along with any natural resources that may exist in or on them. The minister also has jurisdiction over the regulation, and control of private individuals in the use or exploitation of parks recreation areas. The minister's control extends not only over natural resources

within parks or recreation areas, but it extends over human activities in these areas, along with the behavior or conduct in parks. (Section 3: Parks Act.).

Sections 9 and 9.1 are relevant to this, however section 9 is repetitive, and in essence simply states that the minister can not allow the modification, destruction, disturbance etc. of natural resources within a park, unless it is deemed that doing so would somehow benefit the park in a way that maintains park values. Section 9.1 states that nothing within sections 8 or 9 prevent a park use permit from being issued for an activity related to resort or tourism development, so long as in the ministers opinion such activities do not prove detrimental to the recreational values of the park involved. (Sections 9, 9.1: The Parks Act.).

Section twelve (subsections three and four) states that no one must engage in any activity that will restrict, prevent, or inhibit use of a park for its intended purpose. No one may carry on any work or improvement or any industrial or commercial enterprise on any recreation area (Section 12: The Parks Act).

No one may construct, erect, install, or place any structure, improvement, or work of any nature in a park, except if under the authority of a valid park use permit (Section 13: The Parks Act).

Officers monitoring parks may be given the right to impound vehicles of any type on any trail or road system within the park

The Wildlife Act

Section seven of this act states that people are committing an offence when wildlife habitat is altered, destroyed or damaged. Also in this section, the minister is able to issue orders preventing people from altering vegetation, or disturbing wildlife in a wildlife management area, a critical wildlife area or a wildlife sanctuary. (Section 7 The Wildlife Act.)

4.0 Analysis and Discussion

4.1 Survey

Reasons people ride Ledges and Nooner.

The survey responses, 25% of the estimated 220 surveys circulated, only covers a portion of the known mountain bike riders in the Nelson Area. This gives a one sided opinion to the issues that are under review regarding the two mountain bike trails that are within Kokanee Creek Provincial Park. In order to get a better understanding of the user groups that uses this area of Kokanee Creek Provincial Park, a survey of the local residents should also take place.

Of the 56 people that responded to the survey 52 people have ridden the two trails in Kokanee Creek Provincial Park to some extent. With the majority of the people that ride the trail during the year, 37.7% of trail users ride these trails because they are some of the only south facing trails in the area and lose the snow cover earlier in the season than any other trails in the Nelson area (MacKillop, 2005).

Environmental Issues

"Like any outdoor recreation participants, *mountain bike riders will have impacts* on the environmental conditions present, including the soils, vegetation, water, and wildlife." (Cessford, 1995)

Environmental issues are a huge concern in parks. With the creation of these mountain bike trails, BC Parks is faced with a new set of challenges regarding the maintenance of the natural environment of this Park. The issues addressed in the survey focused on invasive weed transport, placing nails in live trees, wildlife disturbance and soil erosion.

Because the spreading of invasive weeds is an issue to BC Parks, the survey asked if people realized that this was a threat to the area. Of the people surveyed only 23.0% have ever considered invasive weeds to be an issue. The other 77.0% of the people felt that this was not an issue or they never considered it to be an issue. In the comments in question 15 people stated their opinions quite clearly regarding the threat of invasive weeds. The main idea behind the majority of the comments posted was to place signs to educate people that come and recreate in this area. People also felt that mountain bikes are a small problem when it comes to the spread of invasive weeds. They felt that hikers, dog walkers, vehicles driving on the Forest Service Road that cuts through the park and wildlife are as much to blame for the transporting of invasive weeds throughout the park.

Placing nails in live trees in order to build stunts is a practice that is not upheld by the various organizations that regulate the building of mountain bike trails (DeBoer, 2001). One of the respondents to the survey claims that there are no nails in live trees on any of the trails in question and another respondent to the survey states that in a park setting this is only an issue to the health of the trees and is not a harvesting concern.

Soil erosion is the heart of many controversies. Some respondents to the survey claim that mountain bike riding has just as much, or less, of an impact on soil erosion as hiking does. Depending on the soil conditions (wet or dry) the impacts from mountain biking will vary. The skill of the rider is a large factor to the amount of soil erosion that is caused (Mosedale, 2003). Of the 52 people that responded to the survey 43.4% claim to be advanced riders, 28.3% claim to be expert riders and 26.4% claim to be intermediate riders. This shows that if you link the information from Mosedale to the skill level of the riders that are using the trails at Kokanee Creek Provincial Park the impacts on soil erosion should be minimal. Cessford (1995) found that damage from foot traffic (hiking and walking) causes a shearing action that is important in the deformation of wet soils. Cessford

(1995) also stated that where skidding by mountain bikes does not occur the damage to the soils is likely to be less than damage caused by footsteps.

Conflict

Anywhere that there are more than one user groups in an area there is going to be conflicts. A survey of state park directors in the United States showed that 77% of the respondents reported conflicts of some sort between mountain bike riders and other users (Schuett, 1997). In Kokanee Creek Provincial Park there are several different user groups that utilize the area in which these two trails are locate. Mountain bike riders, dog walkers and hikers use the area year round because of the lack of snow in the shoulder season. In winter months that have enough snow there is a designated cross country ski trail that runs along the bottom part of Ledges. Hikers and dog walkers have been known to use Ledges and Nooner as well. When asked in the survey about multiple user groups on these trails, the majority of respondents (61.5%) think that other user groups should be able to use the trails. 19.2% of the people surveyed stated that they feel the mountain bike trails should be exclusively used for mountain bike riding. In question 15 people that felt the trails should be exclusively used for mountain bike riding stated that it was dangerous to have other user groups on these trails.

4.2 Trail Standards

Ground Height

According to the Whistler Trail Standards, the height off the ground isn't officially considered by DeBoer (2001). When the feature is built, the height off the ground must be relevant to its width, type and support material. The relative height equation is 10cm of width for every 40cm of height, as stated in the results section.

On Nooner, 12 out of 17 features are acceptable within these limits, leaving five features unacceptable in nature.

The features on Ledges had relatively the same results, with five out of nine being acceptable, leaving four in an unacceptable state.

Overall, 65% of the features passed for an acceptable ground to width ratio. This is not a very convincing average, since these features dictate the outcome of feature usage (ie. biker falling three meters off a narrow stunt).

These results are conceivably unacceptable for Kokanee Creek Provincial Park and all of its associated user groups.

Overall, the trails did not meet the ground height standards set by the Whistler Trail Standards manual. Further construction is needed to bring the unacceptable features up to standard.

Feature Width

Overall, the trails did not meet the feature width standards set by the Whistler Trail Standards manual. Further construction is needed to bring the unacceptable features up to standard.

Rung Spacing

There are 17 features on Nooner, 62% of which were not observed for rung spacing and 38% which didn't pass as acceptable. On Ledges, nine features were observed in total, with 56% not being observed at all and 44% being listed as unacceptable.

These results mean that more than a quarter of the features on Nooner and almost half of the features on Ledges are not acceptable for presence on public

land, as they are governed by the ability of a child or dog to walk on them without slipping a leg or foot through the rungs.

Overall, the trails did not meet the rung spacing standards set by the Whistler Trail Standards manual. Further construction is needed to bring the unacceptable features up to standard.

Trail Type

Both trails fell under the Type IV classification of the Whistler Trail Standards manual. Minor improvement may be considered to better the condition of each trail.

Feature Overhang

These findings are more encouraging than the rung spacing aspect of the feature evaluations, as they are closer to meeting the utilized standard set of the Whistler Trail Standards guidebook. However, the majority of the features were again lacking uniformity in the building products used for construction (misshapen wood pieces, etc.).

In the case of decking overhang, features on both Ledges and Nooner had a certain amount of acceptable constructed features, with a greater amount of unacceptable features.

On Nooner, 35% of the features were observed, with 6% of those found to be acceptable and 29% not acceptable. Ledges saw 44% of the features observed, with 33% being acceptable and 11% found to be quite unacceptable.

Drop Height

When observed, these features appeared to be utilized safely by recent users; however, they do not meet the utilized standards set by the Whistler Standards guidebook. In creating a bridge to a run-out, the height should be measured vertically to the lowest trail point within 1 meter surrounding the run-out. The drop heights measured on both trails did not appear to be acceptable, bearing in mind the above equation.

Feature Length

In the Whistler Trail Standards, feature length is not illustrated as a safety issue, but rather related to the skill level of the riders and class of the trail.

The average feature lengths for Ledges and Nooner were 11 and 12 meters, with the shortest being 2.3 and the longest being 45.6 meters. This variation in lengths, it opens up the feature classification to range from Level 3 to Level 5 (DeBoer, 2001), therefore ranking the area, both trails included, Advanced to Expert.

Feature Type

The feature types for both trails range from small 2 x 4 wooden jumps over logs, to small bridged creek crossings, to 46 meter log rides (Figure 6.0, 6.1). Each trail presents a variety of these features, in no certain order. The features are spaced relatively evenly apart along each trail, with rocky single-track connecting them. It is known that both dogs and children frequent this area, and the potential for injury is there with the presence of these unacceptable features. It should also be noted that most of these features were lacking building product uniformity.

The trails Ledges and Nooner were constructed with no guidelines in mind. It could be assumed that those who constructed both trails, had experience in trail and feature construction, which resulted in the "close-to-spec" turnout of the majority of the stunts on each trail.

Diameter

Although the diameter was not listed as an evaluation aspect of the Whistler Trail standards, measurements were taken to analyze the type of timber being utilized for log ride features on the trails.

4.3 Wildlife

Rock and LWD

More than a quarter of each species type present in the park utilizes these natural forest features. These features are used daily by their respective user types, and with the introduction of mountain bikes, their normal movement patterns would be interrupted. Not only are these features used for movement and forage purposes, they are used as daily resting spots.

For example, lynx and bobcat, both present in the park, (Holt et al, 1998) require up to 2 hours of resting time per day in the summer. If mountain bikers are moving down the trail at high speeds, producing very little noise, they may startle or even strike a resting animal. There have been no reported cases of this type of incident.

Large log rides are also utilized within the park (Table 1.0, 1.1). These are typically forage and movement routes for small and medium sized mammals in the park. In the Pandion inventory (1998), it is stated that when common movement routs for wildlife are obstructed, they will tend to cease usage of that route and choose another.

Stream and Riverbank

The stream and riverbank regions of the park are not as much of an issue as the log rides and rock ledges encountered on the two trails. The trails both cross small stream beds at various points along the trails (Holt et al, 1998).

Some amphibious, reptilian and small mammal species have been found to utilize the underside of constructed features in the forest (bridges, altered log rides) as resting areas, primarily in the summer months (Holt et al, 1998).

During the field portion of the research, it did not appear that the trails were impacting the different streams they were crossing, and both trails are a safe distance from the main channel of Kokanee Creek. None of the creeks that were bisected by the trails appeared to be fish bearing. This does not mean that the introduction of sediments by trail users would not be detrimental to outflow region fish populations and other species in the Kokanee Creek delta area.

Understory Brush/Shrubs

Kokanee Creek is within the Interior Cedar Hemlock dry warm (ICHdw) zone (BEC classification), specifically the 01a and 01b site series (G.F. Utzig et al – 2003) which consists of veteran Cw and Hw with sparse Falsebox (*Pachistima myrsinites*) and Oregon Grape (*Mahonia aquifolium).* This type of understory doesn't typically cater to the brush and understory users, although 21% of the inventoried wildlife use the understory shrubs and brush (Holt et al, 1998). The primary clearing of low brush to create the trail would have impacted the ground-level users. However, from the research conducted in the field, it doesn't appear that either of the trails are impacting the understory user types.

Wildlife Trees

Compared to some other mountain bike trails in the South Columbia Mountains, Ledges and Nooner don't utilize vertically challenging features that might require creating structures high up in the surrounding trees. This is beneficial to the cavity nesters/users in the area, as they are probably not impeded by the creation of the two trails. One possible impact they might experience, is vibration of their trees by hammers or chainsaws when maintenance is conducted on features connected to their trees.

Constructed / Natural Wildlife Trails

The introduction of the two mountain bike trails appears to benefit the local wildlife, primarily the ungulate and large mammal species. During the field research, various ungulate, small and large mammal prints and sign were observed, which implies that both the trails created by the wildlife and the mountain bike trails are vital walking corridors between forest stands. However, the chance for wildlife conflict is present, as it is on all the trails in the park. Very few instances of conflicts with wildlife have been reported (Holt et al, 1998), with no recent data concluding injury or death by human or animal during a trail conflict.

4.4 Noxious Weeds

Soil Impacts

Mountain biking, as with other forms of recreation, has impacts on the environment. These impacts can affect the soil qualities of an area. Soil moving from the forces generated during a mountain bike ride along a trail creates a gap in the continuity of the vegetative community. These disturbance areas are quickly taken over by quick growing noxious weed species.

Trails are constantly being disturbed. Noxious weeds, because of their voracity and tenacious ability to grow in such conditions, have a much better opportunity

to take root or spread in areas of high use and disturbance than other natural vegetation. Natural vegetation takes longer to become established and is quite vulnerable in the early stages of development.

Ecology of Noxious Weed Species of Concern in Kokanee Creek Park

The weed species in question in Kokanee Creek Park are some of the most alarming species of noxious weeds. The sheer amount of seeds that Spotted Knapweed produces as well as the tenacity of Mouse Eared Hawkweed creates quite a problem for land managers in the park.

Mouse Eared Hawkweed

Scientific Name: *Hieracium pilosella*

Description: Mouse Eared Hawkweed, or Yellow Hawkweed as it is also known as, is a perennial flowering noxious weed that has yellow flower heads in a compact, flat-topped cluster, each head approximately 1cm across. The plant flowers from June to September. The stems on Yellow Hawkweed are hairy and can grow up to 50cm in height (Ontario, 2001).

Habitat: Yellow Hawkweed grows in BC at low to mid elevations, usually on open areas such as pastures, meadows, clearings, roadsides, and disturbed sites. It is well adapted to well drained, coarse textured soils (MoA Guide to Weeds, 2002).

Life Cycle: Mouse Eared Hawkweed are perennial plants that form rosettes in spring and early summer. They spread primarily by stolons. Plants flower in June-July and quickly produce seed. Rhizomes

over-winter to produce new plants the following year (MoA Guide to Weeds, 2002).

Seed Dispersal: Seeds believed to be spread primarily be recreationists, pack animals and hay. Although seeds are plumed, they are not widely dispersed by wind.

Figure 10.0: Mouse Eared Hawkweed Rosette.

Spotted Knapweed

Scientific Name: *Centauria spp.*

Description: Knapweed has flower heads that are broadly urn shaped, 1.5-2.0 cm tall, solitary or in clusters of 2-3 at the end of the branches. The heads contain two different types of flowers: ray flowers around the edges surrounding tubular disk flowers. The ray flowers are white, rose-purple or lavender (MoA Guide to Weeds, 2002).

Habitat: Knapweed is found on grasslands, shrub lands, and dry open forests at low to mid elevations. It grows in pastures, along roadsides, and on disturbed sites in both rural and urban environments. Knapweed does not usually occur on cultivated lands as the plant cannot tolerate excessive moisture (MoA Guide to Weeds, 2002).

Life Cycle: Usually regarded as a biennial. However, some plants may stay as a rosette for many years depending on

environmental conditions. Flower buds form in early June with flowering to occur in July. Seeds are produced by mid-August (MoA Guide to Weeds, 2002).

Seed Dispersal: A single plant can produce up to 18,000 seeds and these seeds may remain dormant in the seed bank for many years. Seeds are dispersed by the parent plant in the wind; however, mature plants can also break off and become tumble weeds. Livestock, wildlife, and humans also disperse the seeds.

Figure 11.0: Knapweed Rosette.

The trails that exist in the park have not been inventoried specifically for noxious weeds. Because of the nature of trails, the park managers are concerned about the spread of these specific noxious weed species in these areas. If noxious weeds did get established on these trails they would be able to rapidly spread into other, more sensitive, areas of the park.

The seed dispersal methods for these two noxious weeds allow us to assume that users of the park may transport the seeds to other areas. All users, including mountain biker riders, could theoretically transport seeds and other parts of these plants to other areas of the park in their spokes, tires, boots and clothing. It is for this reason that management decisions for the trails with regards to mountain biker riders and other users will have to consider implementing strategies to counter the potential transport of seeds or other reproductive structures of the noxious weeds.

Management Plan for Noxious Weeds

One of the major concerns that Parks staff had was the fact that mountain bikes could possibly transport noxious weed seeds into new areas of the park. This is a definite possibility and to fully address this issue a successful and sustainable weed control program must be embedded in management for the park.

Discussions with rangers in the park indicate that several techniques have been attempted to control noxious weeds within the park over the last several years. Mechanical removal, lethal fertilization, fire, and solar radiation treatments were applied to the weeds of concern. However, these attempts at controlling the weeds have yet been unsuccessful (Harlow, 2006).

Due to time and personnel constraints, focus along the mountain biking trails for weeds is limited and weeds are looked at from the entire park's perspective. The implementation of a plan outlined in "Seven Steps to Manage your Weeds" would be very beneficial for the entire park (Ministry of Agriculture, 2002). If the major concern of parks is the spreading noxious weeds by mountain bike riders, then identifying areas where bikes are used and areas of concerns for weeds should be completed. Detailed descriptions of how to accomplish this can be found in the guide.

4.5 Legislation

The Occupiers Liability Act in our case can be interpreted to basically just say that BC Parks managers need to maintain upkeep of "established" trail systems in order to maintain safe use of park facilities by those who are the prime focus of the parks management plan (hikers). In the case of Kokanee Creek Park, BC Parks is the occupier of the land. People who engage in any recreational activity willingly assume all risks under The Occupiers Liability Act, and the fact that the

trails are constructed illegally simply serves to further relieve BC Parks from standard duty of care. This being the case, park managers only have to ensure that they don't deliberately make any attempts to harm bikers or their property. Also by posting signage warning of the hazardous nature of the trails, or that explains that the trails are not endorsed by the park, then the managers have done all they legally need to by not recklessly disregarding the safety of people that might use those trails. In cases that are brought before a judge where someone has been injured on another person's property, most judges make judgment in favor of the occupier. One example is a case that occurred in Richmond B.C., a man was walking on public property during a rain storm, the rainy conditions were so severe he was forced to shield his eyes, with his eyes shielded the man continued to walk, blind to a street sign that was placed there to guide vehicle traffic. The man walked into the sign and maintained a concussion, after receiving this injury he proceeded to sue the city. The judge in this case decided that the man was at fault, as he had supposedly assumed all risks that may have been associated with walking across that area when he stepped out of his vehicle (Tweedale, 1999).

The Negligence Act provides an understanding of what parks would be facing if someone were to kill or injure themselves on their property. As mountain bikers are considered to be in trespass anyway it could be seen as somewhat difficult for parks to act negligently. However, all it would take would be for the managers to forget to install some signage for a year or two and it could be seen as acting with reckless disregard towards mountain bikers. In the off chance that there was an injury on parks property and there was no signage posted warning of the hazardous nature of the trails, then it could very well become necessary to establish levels of fault between parks managers, and the injured party.

The Parks Act provides a detailed look at exactly what obstacles there are when it comes to installing something new into a park. This act outlines the idea of preservation of a given area for a specific purpose or a host of specific purposes.

Stated within this act is the fact that modification of a park in any way without a proper park use permit is an offence. It may be possible to argue that the mountain bike trails should be left where they are if managers could be convinced that leaving these mountain bike trails would somehow ensure the preservation of the park. One way the managers may be able to be convinced to see the presence of the trails as being beneficial to the integrity of the park would be to establish that the user base for the trails is going to continually increase; therefore, restricting use of the trails will become increasingly difficult, and if these trails are closed down, cyclists may attempt to find new areas within the park to use for riding. Should mountain bikers begin to use other areas of the park for riding, new trails would become established, leaving the old trail system recovering, and resulting in a whole new system of trails that may be detrimental to the ecological integrity of the park. If managers insist on closing the trails, it is stated within this act that officers in charge of monitoring parks may be given the right to impound vehicles of any kind on any road or trail system within the park. It may be possible to consider ticketing users of the mountain bike trails, simply to get the point across that those trails are illegal and managers do not want people using them. News of a few impounded mountain bikes and fines being issued would spread quickly throughout the biking community and would likely reduce the mountain bike traffic levels within the park.

In regards to wildlife disturbance resulting from bicycling, the Wildlife Act states that is an offence to disturb wildlife in a management area, a critical wildlife area or a wildlife sanctuary. Also under this act it is an offence to alter, destroy or damage wildlife habitat. In the case of Kokanee Creek Provincial Park the illegal trails have potentially altered wildlife habitat, and cycling along trails could result in some level of disturbance to wildlife surrounding the trails; however, it could be argued that cycling has a lower impact on wildlife than hiking does as bikers are quieter than hikers, and are not present in wildlife habitat for a great a duration as hikers.

5.0 Recommendations

The research for this project was completed with the hope that it may help BC Parks come to some sort of management solution regarding the two mountain bike trails located within Kokanee Creek Provincial Park. The research has covered some of the major issues that park managers were concerned about, namely liability, noxious weeds and trails in trespass. With these issues kept in mind, Parks must make a final decision into the fate of Ledges and Nooner.

If Parks is willing to allow these trails to remain within Kokanee Creek Provincial Park, then they will need to follow some basic rules to manage for impacts. Parks cannot afford to do nothing about these trails. Doing nothing would remove any duty of care that they have been following up to this point in time and would create a wide variety of liability issues. The Ad Hoc approach is one that does not address the issue of mountain bike trails within a protected area. If Parks were to address each issue as they were to arise then they should have removed both trails as soon as they found out they existed in the park. Parks could also deal with these trails by limiting use. Limiting use would minimize impacts created by mountain bike riders and hikers using the area. In order to limit use a study would have to be done to determine the carrying capacity of the trail system. This would require more personnel than Parks has available in the area. Another way impacts can be managed is to implement permanent plots that can be used to monitor environmental impacts caused by mountain bikes over the long term. These backcountry recreation impact monitoring (BRIM) plots also require parks personnel to set up and monitor, but not as much personnel time would be required.

Once a monitoring plan is in place, then Parks will have made some headway in allowing the existence of these two trails. Parks should now follow the nine steps that Mosedale recommends land managers follow when dealing with mountain bike trails (2003).

- Step one: Communicate with the mountain biking community.

  An agreement with the Nelson Cycling Club Society would allow a local organization to take control of the proper maintenance and general upkeep of the two trails. They could bring all the features that are currently on the trails up to standards that would be acceptable to BC Parks.

- Step two: Educate residents and the seasonal population.

  Signage should be placed at the parking area as well at the sections of the trails where they enter into the park. These signs should state the issues that Parks are concerned about. The signage in the parking area should have all current issues as well as have information about the park, the trails and the wildlife of the area.

- Step three: Monitor recreational trends.

  In order to get all the relevant information regarding the users of the trails and surrounding area surveys should be conducted every couple of years. These surveys would help to determine if there are any conflicts between user groups, if the users are from the local area or from further abroad and what type of use is the most prominent in the area. Parks should also conduct periodic visits to the two trails to count the number of users.

- Step four: Use science to support management actions.

  All decisions that are made in the park should have scientific research to go with them. If the trails are to be removed, then it should be proven that the trails could pose a direct threat to the issues that Parks are concerned with, like the transportation of noxious weeds. If the trails are to remain then it also should be proven that the trails will not cause any permanent damage to the parks ecosystem. Permanent BRIM plots would assist Parks.

- Step five: Use adaptive management and the precautionary principle.

These should be used if scientific research is not available and allows Parks to learn about issues as they arise. All experiments that take place must be followed with monitoring plans.

- Step six: Establish sacrifice areas.

  The two current mountain bike trails could be used as sacrifice areas. These areas could be used to supply data to the other provincial parks with similar user issues throughout BC. If BC Parks only want to use one of the trails as a sacrifice area, then a census of the mountain bike riders that use the area should be conducted to ensure full cooperation.

- Step seven: Manage general human use.

  With the concern over the certain red and blue listed wildlife that are found within the park, Parks should limit human use to certain areas that minimize impact to these species. Human use should also be limited to areas that have already been developed in order to stop further degradation of park lands. Parks could use this rule to stop further development of mountain bike trails. Signage and enforcement would be necessary.

- Step eight: Limit development in wildlife corridors.

  Development in wildlife corridors should always be kept to a minimum. It was noted that wildlife seem to benefit from development of trails. Ungulates and various small and large mammal species appeared to be utilizing Ledges and Nooner as travel corridors (Stickney, 2006). There is a possibility of mountain bike riders having conflicts with the wildlife on the trails but Holt et al (1998) noted that there have been very few of these instances in the history of mountain biking. Sensitivity of the species that will be directly affected by the trails should be taken into consideration.

- Step nine: Collaborate with neighboring managers.

  Only the lower portions of Ledges and Nooner are within the boundaries of Kokanee Creek Park. If Parks decide to allow the

trails to remain, then there should be an agreement made with the Ministry of Forests as the upper parts of both trails are on crown land. If an agreement with the Ministry of Forests is reached then it could be possible to allow only single track in the park so that mountain bike riders could finish their ride without having to navigate any technical trail features.

These steps are suggestions that, if followed, should be used in conjunction with proven land management policies.

6.0 Conclusion

The mission of BC Parks is to "protect representative and special natural places within the Province's Protected Areas System for world class conservation, outdoor recreation, education and scientific study" (Ministry of Environment, 2001). This mission states that parks are to be managed for outdoor recreation as well as for scientific study. With mountain biking being one of the increasing recreation opportunities of choice, parks should allow mountain biking in certain parks. This would also allow researchers an opportunity to study the potential impacts caused by mountain biking.

In order for BC Parks to formally address the issues surrounding these two trails, Ledges and Nooner, within Kokanee Creek Provincial Park, park managers will have to decide whether or not they are willing to allow the trails to stay within park boundaries. Whatever decision they make there are many factors to consider with each.

If the trails are to remain within the park there will have to be a stewardship agreement with one of the local cycling clubs. The Nelson Cycling Club already has a trail stewardship agreement with Parks branch over the trails that exist within the West Arm Wilderness Area. These trails are managed by Parks but maintained by the Nelson Cycling Club (MacKillop, 2006). A similar agreement

made for Kokanee Creek Provincial Park would be a giant step towards legitimizing these two trails. Maintenance will need to take place as both trails are in major need of repair in order to bring them up to standards that would be acceptable to the Nelson Cycling Club and BC Parks.

When it comes to liability, BC Parks must ensure duty of care at all times. If duty of care is taken, then BC Parks should not have any issues with liability. An agreement with the local cycling club would ensure that liability would fall to the club and not onto BC Parks.

If parks are to manage for noxious weeds they will have to do so using several different methods. In order to minimize the spread of noxious weeds, a washing station in the parking area would be an ideal way to ensure mountain bike riders remove any "hitchhikers" from their bikes. The washing station in place at the Mount Work (Hartland landfill) mountain bike park in Victoria is constantly used by area users. Signage in the parking area with detailed information regarding the species of concern and ways to minimize the spread of these species is another way to reduce their spread throughout the park. Mechanical controls, hand pulling, as well as biotic controls should happen on an annual basis to help reduce the spread, or establishment, of these weed species in certain areas of the park.

I believe that BC Parks are for the use of the people of British Columbia. I also realize that there are many issues faced by parks managers as they try to ensure that the integrity of our parks system is maintained to the highest standards. Based on the research done for this paper, I feel that the footprint left by the two trails in question, Ledges and Nooner, is already as big as it will get. I realize that these trails were built in trespass, but if BC Parks was going to remove them they should have removed them as soon as they were built, while the footprint was being created.

7.0 References

CDC, British Columbia. 2001 .Ecosystems Branch. Conservation Data Center. Ministry of Environment. Accessed March 7, 2006 from: http://www.env.gov.bc.ca/cdc/

Cessford, G. 1995. Off-Road Impacts of Mountain Bikes. Science and Research Series, 92.

Craig, Juliet. (2006). Personal Communication.

DeBoer A. 2001. Whistler Trail Standards. Environmental and Technical Trail Features. Accessed March 1, 2006 from: http://www.whistlercycling.org/pdf/trail-standards.pdf.

Harlow, Dan. (2006) Personal Communication.

Holt, Rachel F., Korol, J. Burke, Machmer, Marlene M. 1998.Kokanee Creek Provincial Park: Inventory and Management." Pandion Ecological Research Ltd. (1998)

MacKillop, D. 2005. Riding a fine line: The social, environmental and economic impacts of mountain biking in the Nelson area. A report to the Nelson Cycling Club Society.

BC Ministry of Agriculture, Food, and Fisheries. 2002. Guide to Weeds in British Columbia. Victoria, BC: Ministry of Agriculture, Food, and Fisheries. Accessed February 21, 2006 from: www.weedsbc.ca

BC Ministry of Agriculture, Food, and Fisheries. 2002. Seven Steps to Managing Your Weeds: A Manual For Integrated Weed Management in British

Columbia. Victoria, BC: Ministry of Agriculture, Food, and Fisheries. Accessed February, 21, 2006 from: www.weedsbc.ca

BC Ministry of Environment. 2003. Kokanee Creek Provincial Park: Purpose Statement and Zoning Plan. Victoria, BC: Ministry of Environment. Accessed March23, 2006 from: http://www.env.gov.bc.ca/bcparks/planning/mgmtplns/kokancrk/kokancrk_ps.pdf

BC Ministry of Environment. 2001. Welcome to BC Parks. Victoria, BC: Ministry of Environment. Accessed April 2, 2006 from: http://www.env.gov.bc.ca/bcparks/index.html

Mosedale, J. 2003. Planning for Appropriate Recreation Activities in Mountain Environments: Mountain Biking in the Canadian Rocky Mountains. FES Outstanding Graduate Student Paper Series, 7(5):p. 1-114.

Queen's Printer, 2004. The Negligence Act, Accessed January 19, 2006 from: http://www.qp.gov.bc.ca/statreg/stat/N/96333_01.htm

Queen's Printer, 2004. The Occupiers Liability Act, Accessed January 19, 2006 from: http://www.qp.gov.bc.ca/statreg/stat/O/96337_01.htm

Queen's Printer, 2004. The Parks Act, Accessed February 15, 2006 from: http://www.qp.gov.bc.ca/statreg/stat/P/96344_01.htm

Queen's Printer, 2004. The Wildlife Act, Accessed February 22, 2006 from: http://www.qp.gov.bc.ca/statreg/stat/W/96488_01.htm

Schuett, M. 1997. State Park Directors' Perceptions of Mountain Biking. Environmental Management, 21(2):p. 239-246.

Sprung, G. (n.d.). Natural Resource Impacts of Mountain Biking: A summary of scientific studies that compare mountain biking to other forms of trail travel. Accessed February 21, 2006, from www.imba.com/resources/science.html

Tweedale, R. Harold Timothy Bush and the City of Richmond. 15 Dec. 1999. Office of the Chief Judge, Provincial Court of British Columbia. Accessed April 3, 2006,from: http://www.provincialcourt.bc.ca/judgmentdatabase/jdbresults.asp?target=occupiers+liability+act%2C+injury&CiScope=%2FJudgments%2F&RecordsPerPage=10&Order=Rank.

Utzig, G.F., Ag, P. and Scott-May, C. 2003. Development of Ecological Conservation Objectives and Strategies for Protected Areas. Kutenai Nature Investigations Ltd.

Appendix 1

1. Kokanee Creek Provincial Park - Mountain Bike Trails User Survey

1. Have you ridden the mountain bike trails (either Ledges or Nooner) at Kokanee Creek Provincial Park?

		Response Percent	Response Total
Yes (Please continue to Question # 2)		**92.9%**	**52**
No (Thank-you for your time. Your survey is now complete.)		7.1%	4
	Total Respondents		**56**
	(skipped this question)		0

2. Before taking this survey, were you aware that sections of the trails Ledges and Nooner, were located within Kokanee Creek Provincial Park?

		Response Percent	Response Total
Yes		**92.5%**	**49**
No		7.5%	4
	Total Respondents		**53**
	(skipped this question)		3

3. On average, how many times do you ride the mountain bike trails at Kokanee Creek Provincial Park in a season?

		Response Percent	Response Total
1-5 times		**52.8%**	**28**
6-10 times		15.1%	8
11-15 times		13.2%	7

16+ times		18.9%	10
		Total Respondents	**53**
		(skipped this question)	3

4. In the following seasons, how often do you ride these trails?

	1-5	6-10	11+	N/A	Response Average
Spring	**73% (35)**	17% (8)	8% (4)	2% (1)	**1.34**
Summer	**60% (27)**	18% (8)	16% (7)	7% (3)	**1.52**
Fall	**70% (30)**	16% (7)	12% (5)	2% (1)	**1.40**
Winter	**45% (9)**	10% (2)	5% (1)	40% (8)	**1.33**
				Total Respondents	**53**
				(skipped this question)	3

5. Which trail do you prefer to ride?

		Response Percent	Response Total
Ledges		15.4%	8
Nooner		21.2%	11
Either		**63.5%**	**33**
		Total Respondents	**52**
		(skipped this question)	4

6. What is your skill level as a rider?

		Response Percent	Response Total
Beginner		1.9%	1
Intermediate		26.4%	14
Advanced		**43.4%**	**23**
Expert		28.3%	15
		Total Respondents	**53**

(skipped this question)	3

7. What is your primary reason for riding the trails (Ledges, Nooner)?

		Response Percent	Response Total
Ease of access		18.9%	10
Quality of stunts		9.4%	5
Aesthetics of riding in a park		11.3%	6
Lack of snow/shoulder season access		**37.7%**	**20**
View Other (please specify)		22.6%	12
	Total Respondents		**53**
	(skipped this question)		3

8. Please select the one that best describes your mode of experiencing these trails

		Response Percent	Response Total
Self-guided		**92.5%**	**49**
Commercially guided (eg. transportation to the trailhead)		3.8%	2
Organized rides (eg. cycling club, university)		3.8%	2
Other (please specify)		0%	0
	Total Respondents		**53**
	(skipped this question)		3

9. Have you considered the spread of invasive plant species via mud and dirt on your bike/tires from daily rides?

		Response Percent	Response Total
Yes (Go to # 10)		22.6%	12
No (Go to # 11)		**77.4%**	**41**

Total Respondents	**53**
(skipped this question)	3

10. If so, how often do you wash your bike?

		Response Percent	Response Total
After approx. every ride		36%	9
After approx. 5 rides		**56%**	**14**
After approx. 10 or more rides		8%	2
	Total Respondents		**25**
	(skipped this question)		31

11. When you ride, what is the average party size?

		Response Percent	Response Total
1-2 people		18.9%	10
2-4 people		**73.6%**	**39**
4-6 people		5.7%	3
6+ people		1.9%	1
	Total Respondents		**53**
	(skipped this question)		3

12. How do you feel about multiple user types on the mountain bike trails (ie. hikers, dog walkers)?

		Response Percent	Response Total
Other users should be allowed to utilize the trails		**61.5%**	**32**
Trails should be exclusively for mountain		19.2%	10

biking			
I don't care		19.2%	10
	Total Respondents		**52**
	(skipped this question)		4

13. Would you be willing to volunteer your time to conduct annual trail maintenance?

		Response Percent	Response Total
Yes		**96.2%**	**51**
No		3.8%	2
	Total Respondents		**53**
	(skipped this question)		3

14. There are a few issues associated with mountain biking in provincial parks. At Kokanee Creek Provincial Park, some concerns related to the two given mountain bike trails include: -Introduction/Transport of Invasive Plant Species -Liability of BC Parks (re: maintaining technical trail features) -Placing nails in live trees -Ecological Impacts: > Wildlife Disturbance > Soil erosion -Conflicts between different user groups -Use of un-authorized trails (ie. trails were built without permission) PLEASE INDICATE TO WHAT DEGREE YOU SHARE THESE CONCERNS:

		Response Percent	Response Total
Agree - that these concerns exist and need to be addressed (Go to # 15)		20.4%	11
Agree - that some of the concerns exist and need to be addressed (Go to # 15)		**70.4%**	**38**
Don't agree that these are valid concerns		3.7%	2

Don't know		0%	0
Don't care		5.6%	3
	Total Respondents		**54**
	(skipped this question)		2

15. Please identify any ways to address the concerns that you share from Question # 14.		
View	**Total Respondents**	**35**
	(skipped this question)	21

What is your primary reason for riding the trails (Ledges, Nooner)?	
1.	they are really fun trails for riders of all abilities
2.	with a biking club.
3.	locationin proximity to nute sac, ride it afterwards cause they're fun
4.	They are great trails.
5.	Done in conjunction with Hitman
6.	Nice flowing trails. You don't have to do any unusual abrupt braking. Beautiful scenery. Nice climb for fitness purposes.
7.	Quality of the trails, the natural technical sections and the park surroundings.
8.	it's fun
9.	All of the above. These trails are awesome. They are low maintenace and low impact to the enviroment.
10.	all round enjoyment
11.	All of the above.
12.	Access, Location, Quality of Trails, and the fact that it gets boring riding the same trails; I ride these trails along with many other trails. I like variety.

Please identify any ways to address the concerns that you share from Question # 14.	
1.	If trails are able to be labeled properly we could alleviate some conflict between user groups.
2.	I believe mountain bikers do no more damage to the landscape than hikers. I believe liability is a non-issue. Not one mountain biker in BC has ever sued a land manager. I beleive in the context of the park that the impact from these two trails is minimal. I believe the spread of invasive plant species is not specific to mountain bikers. Do you have hikers wash their boots before going hiking? I believe parks are there to promote human interaction with the environment, cycling is a wonderful way to do this.
3.	1. Share knowledge of the problem of invasive plant secies and how to prevent it (bike washing) 2. create group to maintain trails, and give it publicity 3. For the conficts between the user groups of the trails, hikers should be notified by a sign that these trails are mountain biking trails, and be forewarned that there will be mountain bikers on the trail if they wish to use it.
4.	regular maintenance, rider education (in what weather conditions/time of year is it inappropriate to ride as it would conflict with wildlife/and or cause additional soil disturbance.)
5.	Have public meeting occur between Parks and local cycling club. Discuss issues, decide on solutions.
6.	Signage
7.	these trail do need some maintenance
8.	Aside from washing bikes.... I think we should attemp to liason with other organized user groups to set up a standard of care and maintainance. For instance yeilding to hikers and/or equestrians. Those not part of organized groups should be given as much respect and leeway as possible in order to improve relations with all users both within the park and trails in general. I believe our biggest problem is the public perception that mountainbikers are careless and self serving with no respect for others or the environment. Unfortunetly this is legitimate as I have seen teen and twenty something bikers; ride past hikers without slowing, forcing them into the bush, scare horses, smoking drugs in the middle of trails regardless of children and hikers present, as well as drinking and throwing their cans/bottles into the bush. We have to take out what we bring in and if possible leave things better than we found them.
9.	Information/education. BC parks shouldn't be liable for the stunts. I don't like the idea of nails in trees. (don't use nails in trees)
10.	The Nelson Cycling Club and Parks should collaborate on a mgt plan for trails including public education and trail maintenence. Any new trails in the park should be identified as part of this plan. There should be no building of unauthorized trails, however, Parks should also realize that a park is a multiple use resource and that it is possible for the above concerns to be met if we all get organized.
11.	designate and legitimize a few trails and sign them appropriately. Work with the NCC club on awareness issues and run maintenance programs thru the NCC
12.	-For invasive plant species I think that education through signage etc. would be a good way to get the message to people who ride. -Liability is a hard one, maybe there could be a partnership of sorts to combine a local group with parks who could maintain the trails. I think that anyone who is riding the trail should do so at own risk. Maybe signage saying that people who ride the trails cannot hold parks liable. It is such a hard thing to control that I think safety should be in the hands of the rider. As long as the trails are amintained ie:local cycle group, then this idea might work. -Nails in trees, in the case of a park setting is really only a concern for the well-being of the trees, not from a harvesting perspective. I think that some sort of regulation should be emplaced to ensure that further damage to trees in the area is reduced, being a protective area and all. -Ecological impacts are quite significant in

	my mind. Perhaps a monitoring program could be emplaced so that the local maintenance crew could determine whether impacts are being spread etc. I think that this is a responsibility that needs to be taken seriously, especially in a park, and by monitoring the trails benefits will also be gained by better understanding the progretion of the trail condition. -Conflicts between user groups is also a huge issue. On one hand a feel that everyone should have free rights to the trails in question, however, from a safety standpoint it maybe a wiser decision to seperate users by designating nearby trails in the area to soley hikers while keeping trails like Nooner and Ledges strictly bikers. -Then there is the use of unauthorized trails. Is the condoning the building of trails without permission? Well to be honest itis something that can't be controled. Be it crown land or parks, there simply isn't enough funding to maintain a high level of survelance in these settings. Illegal trails will be built, used and enjoyed. The thing is that it is a much better idea to take these trails and create some kind of structure around them ie: maintaining them, regulating use, because then you can have more control over their impacts. Not to say that every trail should be "looked over", its just that those which are easy to access and popular should have some type of monitoring properties. Thats why it is such a good idea to create some kind of partnership agreement to help look after and monitor the trails at Kokanee for future riders and the surrounding environment.
13.	In the overall context, the impact of these localized trails within several kilometers of a major highway are minimal. There are many bigger issues - like stop Jumbo. There is a benefit in allowing humans to enjoying playing outside, appreciate the outdoors through the process, and share that with others. I would bet that most mountain bikers have a smaller ecological footprint than the average person due to their love of the outdoors.
14.	Animals walk all over the place. They have the ability to introduce invasive plant species. Where you see a mountain bike trail, animals walked on and off that trail before there was a mountain bike trail, and they continue to do so after a mountain bike trail exists. Plant material and wildlife fecal matter is being moved all over the place, all the time by animals. People spend alot of money on bikes these days. They keep their bikes clean, or as an alternative, they spend alot of money at mountain bike shops. Soil erosion must be monitored. When required, maintain or re-route a trail to deal with soil erosion. Regarding different user groups...no one user group owns a trail, unless a specific trail has been given approval for a specific use by a government agency. We all have to learn to co-exist on trails. That being said, keep your head up for those who move faster on a trail than you do. I am most concerned about horses, they seriously disturb the surface they walk on. Placing nails in live trees...not good. There has to be a better way to support a technical trail feature. Such trail features should be anchored in a different manner. There are other ways do do this. Liability of BC Parks...BC Parks should become partnered with local bike clubs. Bike clubs can take ownership and maintain bike trails, as well as maintaining technical trail features. Wildlife disturbance...hikers, hunters, ATVers, loggers, miners, dirtbikers, resort developers, subdivision developers, highways (ie Coquihalla), low flying helicopters, low flying airplanes, families on weekend picnics, mountain bikers, runners, walkers, couples making out, all disturb wildlife. That's what humans do. Think about our encroachment with developing our cities/towns/villages. Mountain bikes are not that loud, and are not absolutely stealth like either. Animals do smell and hear us coming, which is why we don't run into them all the time. They get out of our way before we see them. This is not without exception, however. Occasionally, they do get surprised by us and run. Trails were built without permission...yes, this is true. We should look at ways to get trails built with permission. If a trail is built without permission, it should be assessed and put through a process such as what is occuring right now with these trails. I applaud BC Parks for taking the time to do what they are doing. Looking at any trail, assess what pleasure local people get out of it, what tourists get out of it (which brings revenue into our community, potential investors, and potential future residents as trails for some people are part of a package a community offers). Also, assess what environmental impact exists, and before closing a trail, how could the trail be altered with help from a local mountain bike club to make it better. Closing a trail because it was introduced without approval is reacting without thought.
15.	-Introduction/Transport of Invasive Plant Species Encourage people to wash their bikes, boots, dogs, horses etc after each trip. -Liability of BC Parks (re: maintaining technical trail features) This is a political issue and should not stop people enjoying their provincial parks, their way. -Placing nails in live trees This could be addressed via better trail building

	guidance, perhaps organized by local groups/clubs. -Ecological Impacts: * Wildlife Disturbance * Soil erosion Studies have shown that riding a bike does not impact the soil any more than hikers or horses riders. Reference current North Shore (Vancouver) recreational study. -Conflicts between different user groups There is no need to dictate which group can use which trails. ALL user groups should respect ALL other user groups when sharing the trails. -Use of un-authorized trails (ie. trails were built without permission) All user groups should be encouraged to enjoy their Provincial Parks.
16.	Long-term disturbance will be rectified by nature's ability to adapt and altar itself.
17.	Mountain bikers are as much of a problem as cars that use the ROAD that goes throught the park and dogs and hikers are. The amount of area that riders cover is very small compared to the other users of the park, including the wildlife. If you think about it deer are a problem when it comes to the problem of moving weeds around.
18.	1) Invasive plant species ARE an issue, as it is proven that they can be transported in mud, spokes, etc. on mountain bikes, rail cars, vehicles. The spread of invasive species is an issue in the park, and should be dealt with 2)With proper cooperation between govt and the bike community, liability could be dropped as a problem. 3/4)Impact on the trail/wildlife is obviously going to be a problem, but as with #2, proper governing of the trails could prevent large impacts 5) There technically shouldnt be any conflict, if the signs state that the bike trails are present, and hiking should be kept to the designated trails 6) Same as #3
19.	I feel that these trails have been in the park for a long time now. If BC Parks did not want to allow these trails to exsist then they should have dealt with them sooner. I think that if parks wants to remove these trails then they need to do it properly and remove everything, post proper signage, and monitor the trail usage.
20.	- during trail maintenance weeds could be pulled - signage vis a vis liability (this is Canada we don't sue people for our own clumsiness), ensure that stunts are well maintained
21.	These trails have been in the park for many years, there hasn't been a change in the ground or the visible enviromental impact. The only creek on these trails is very small and was protected by a small wooden bridge crossing until the park warden took down the existing small bridge. Within one day the sides of the creek had eroded immencly because of it. Thanks
22.	1)I have never thought about introduction of plant species from my tires. can parks show me proof of this? doubt it. What about the thousands of cars that drive up the road in the park? They must do this too? doubt they will get their road closed 2)Liability is defineately a legitimate reason for parks to want to stop the riding. Too bad there are a few idiots who ride, who will sue someone for their actions they refuse to take responsiblity for.The same (most likely American)dumasses who sue because they weren't told that coffee is hot. 3)I have personally maintained these trails for several years and there are no nails in live trees on the sections of ledges or nooner that lie within the park 4)Ecological impacts? If parks is going to spend money on pulling some boards, that are nailed into blowndown trees(like they did last summer), wouldn't that money have been better spent on cleaning up the loads of garbage that idiots and potgrowers have thrown over the west bank of the road for years. This garbage lies in the park, in the riparion zone adjacent to kokanee creek. Isnt wildlife bothered more by this garbage, than a foot-wide ribbon of dirt? What about the logging and poorly done prescribed burns done directly adjacent to the park too? If you would walk these trails in the winter, you will see LOTS of animal tracks in the snow, the bike trails could easily be confused for game paths. Isnt a clear path a benefit to animals? and I doubt a practically silent bike affects wildlife the same way loud, dust-creating tourist vechicles and logging trucks do. Soil erosion is non-exisent here. Has happened on last steep on ledges but was fixed long ago 5)Conflict with other trail user groups is not an issue because these trails were made by bikers for biking and are not that fun to hike in the first place. There are hiking trails in the park too, and if you have ever seen the upper hiking trail that leads out of the 0km parking lot, you will see LOTS of damage. I will admit that this damage is due to hikers, AND bikers using this trail for uphill access to ledges and nooner. but I guarantee bikers like myself would jump in to rememdy the problem of damage being done in the areas of standing water puddles if asked and given permission to do so. Would the hikers and dog-walkers do that? I wouldnt hold my breath. NCC has a monthly trail day that LOTS

	of bikers show up for. Well sorry for the rant, but other than agreeing with the very small liability possibility, the other concerns seem more like anti-biking whining from parks. Instead of worrying about the impact of a little skinny singletrack of dirt that has been quitely minded by bikers for years, tell parks to worry about all that f@#$ing garbage thrown off the road side instead. Whoops got carried away, THANKS for reading though! Peace!
23.	-Signage to educate mnt bikers about invasive species. -Maintenance agreements with Cycling Club to ensure trails are looked after - at this stage, there is no guarantee that maintenance will occur, yet hundreds of riders use the trails. With an agreement, trail maintenance will occur, and the same number of people will ride the trails. -Historic land clearing and fire suppression are likely the most significant ecological impacts, not recreational users. Dog walkers likely have a higher impact on the ecology than riders. -Wildlife impacts are likely minimal since these trails cover a very small area and do not appear to overlap with rare or otherwise focal species. A wildlife habitat suitability and/or habitat use study could be conducted in the area of the trails (by NCC volunteers) to determine the real potential for wildlife disturbance. -With a maintenance agreement, proper drainage structures (water bars, landscape fabric, and other "technilogical advances") could be put in place in areas of concern. Under the present circumstances, riding continues, but improved maintenance does not. -At this stage I am not aware of any conflicts with other trail users. Since these trails were established by mountain bikers, they do not have a legacy of hikers or horseback users who will are angry about bikers. Conflicts between users are not an issue at this time. -In terms of the "illegal" nature of the trails, this is an issue with virtually every trail (that doesn't have a stewardship agreement) in the province. The BC government needs to recognize that mountain biking is a well established sport (which they have in their tourism promotion sector, but not in their land management policies). Trying to keep it "underground" by refusing to recognize established trails will not promote environmentally sustainable trail building and maintenance practices. Once some trails are sanctioned, it will be easier to discourage continued trail building on unsanctioned lands - there could be a process.
24.	Transport of Invasive Plant Species? Really? I live 10 km from there - it's not like I'm transporting anything to a significantly diverse ecosystem where there would be serious impact. If it's going to happen the wind could blow it, or it could be carried by a hikers shoe. Liability - get volunteers to help maintain trails - and further, elderly hikers could as easily twist an ankle than I could on my bike. There has to be insurance in place anyways as it is being used by the public for hiking. Maybe charge a seasons pass of $5 for mountain bikers and/or a daily sign in - with a big liability clause to the users (same as skiing) Ecological impacts - the club has assisted on trail maintenance days on Paper Bag - members are more than willing to help to minimize the impact. Conflicts - your choice - either put up a notice that trails are multi-use and then people are aware that others are entitled to use them, or else segregate the trails by user group. Use of un-authorized trails - lets work together and ensure the trails are up to snuff and make the existing trails authorized, rather than going in with chainsaws.
25.	biking isn't going away. It is best to embrace the sport and work with bikers to ensure it is managed accordingly.
26.	education about invasive plant species and the use of nails in live trees
27.	With proper building most of the concerns are nulled. As far as invasive species are concerned, I'm not a biologist but it seems more likely that mud from logging trucks going up the road, seeds in dog fur, and mud on hiking boots are at least as likey to introduce invasive species. Yet all of these activities take place in the park or very close. When was the last time someone was sued in the Nelson area because of mountain biking?
28.	1. Volunteer resources to be directed toward the elimination of invasive species on or near the trails 2. ? - Ridiculous that this exists. Without knowing the legal implication...signage? 3. Post the concerns at the trail head (stating that any kind of development incl. must be sanctioned by the Club or BC Parks. 4. Wildlife disturbance will always exist, but the trails are far from pristine. Erosion - through volunteer work, incl. minmizing impact in other areas as compensation (like Fisheries and Oceans requirement of restorative work when someone shreds their waterfront). 5. Conflict - it's public, plus I assume that the trails are used less

	by hikers and as long as everyone is respectful, issues should not arise. 6. See 3.
29.	1. have a hose at the bottom of the trails to wash bikes 2. people are going to ride bikes there and if you accept it and advertise the park as a bike friendly camp ground with trails close by, then you can hire someone to maintain the trails. thus lowering soil erosion and other ecological impacts 3. there is a ton of ecological impact already in that immediate area (a large road going to the glacier parking lot and a huge clear cut) so this wildlife disturbance should not be a large concern to many 4. the conflict between user groups will always be a challenge because you are dealing with peoples emotions and this is the hardest to deal with. 5. cut down all unathorized trails, simple. then no one will want to build
30.	I don't think the invasive plant issue is a key concern, but signage could help address it. The technical features in the park have been removed and have not been re-built by riders. The nail issue should not be an issue if further stunt building does not occur. I ride there more than anyone and have never disturbed any wildlife - on rare occasions I have seen deer or coyotes. Soil erosion is not an issue as the trails are well established. I have not seen any erosion in the 6 years I have been riding there. The riders stick to Nooner and Ledges, the hikers stick to the hiking trails. I think the only issues arise when non-locals do not know where the biking trails are. No new trails have been built in many years, riders understand that there are sensitivities. One other issue is that of how riders contribute to the enjoyment of the park by everyone. Whenever I am in the park I have a folding saw and work to ensure that the hiking and biking trails are clear of deadfall and branches that might snag a hiker or biker.
31.	Update Park Use Plan to include Mtn Biking as appropriate recreation. Enter into agreement with club or volunteers to maintain trails and address issues
32.	BC parks and the local government or whoever manages crown land should encourage the building and maintainence of trails in certain areas of there land. Then they can manage construction techniques and can limit the ecological impact the trails are having. However there's no point in doing this if they're going to be riddiculous about building techniques, requiring expensive materials or features such as handrail over certain heights as un-autorized trails will continue to be built elsewhere.
33.	I think that ecological impacts are an important issuse. Having multiple users on the same trail is unsafe, mountain bikers (downhillers) ride fast and hard and don't expect someone to be walking up the trail. Building trails without permission is not the smartest thing, I think that alot of these issues can be resolve by forming a bike club and conducting regular trail maintence, and controlling how and where trails should go.
34.	Parks needs to identify the issues that it sees to be the problems. If an organized club gets involved they could be responsible to minimize any adverse effects on the park as well as maintain the trails to set standards.
35.	By allowing mountain biking in the park, then trail maintenance agreements can be