

CAVE MANAGEMENT GUIDELINES FOR WESTERN MOUNTAIN NATIONAL PARKS OF CANADA September 2005

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Abstract

At least 12 of 41 national parks in Canada have caves. A group of six parks in western Canada are preparing to adopt cave management guidelines using a three-tier classification system to manage access. Class 1 caves are access by application — highest resource value, not for recreation, each visit must add knowledge or give net benefit to the cave. Class 2 caves are access by permit — recreational use allowed, some management concerns, education/orientation possible during permit process. Class 3 caves have unrestricted public access — few or no management concerns, no permit required.

In order to determine which class each known cave sits in, three sets of factors are considered; (a) cave resources, (b) surface resources, and (c) accident and rescue potential.

Cave exploration in the western Canadian mountain national parks began in the 1960s. This current access policy has been influenced by the remote rugged nature of the landscape and the need to work with speleological groups to explore and document park features. A change in park staff awareness of the resource has contributed greater exchange of information and opportunities for cavers to gain access and the park to know more about its resources.

1.0 Setting

These guidelines pertain to six national parks located in the western Cordillera of Canada, in the provinces of Alberta and British Columbia. Four of the parks, Jasper, Banff, Yoho, and Kootenay form a contiguous block in the Rocky Mountains between latitudes 53 degrees 30 minutes north and 50 degrees 30 minutes north. The remaining two Parks, Glacier and Mount Revelstoke, are located further west in the Selkirk Mountains. In general, these parks range in altitude above sea level from 1,000 meters to just below 4,000 meters. Depending upon elevation and aspect, the terrain can be

covered by snow from late September to June. Glaciers and icefields are present in all parks. All parks are predominately covered by conifer forests. The treeline is approximately 2,100 meters.

2.0 Background

Although the majority of the combined area of these parks (24,600 square kilometres) features carbonate bedrock, approximately only 100 caves have been discovered. Prior to the 1960s when systemic searching for caves began, very few caves were reported or well known. Interest in the national park system of Canada began (1885) with the European

discovery of a cave associated with a hot spring in what is now Banff National Park. Presently the cave is managed as a national historic site, Cave and Basin. The other notable except was Nakimu Caves in Glacier National Park. Discovered in 1902, the caves were soon developed into the only true show cave in Canada's national park system. In 1935 the show cave was closed, mainly due to dwindling tourist interest as the result of changed surface access and infrastructure.

Since the late 1960s, the search for and exploration of caves in this group of six national parks has been primarily conducted by McMaster University karst research group and more recently the Alberta Speleological Society. The most significant cave explored is Castleguard Cave in northern Banff National Park. Surveyed to 20 kilometers, Castleguard is the longest cave in Canada and the only known cave under an icefield with numerous passages choked with glacial ice.

In 1975, an Order in Council was passed that made the first specific mention of caves with regard to regulation. Section 34A read; "*Except with the permission of the Superintendent, no person shall enter any cave in a National Park*" The 1978 revision of the National Parks Act modified the regulation to its present wording (see 7.2 legislation).

Rick Kunelius, Park Warden from Banff National Park, authored a report about caving in the late 1980s, *Caving - No. 15, A Background Paper for the Four Mountain Parks Planning Program*. Kunelius wrote a frank report that highlighted the unsatisfactory situation, for both cavers and park resource managers, that existed at the time. He suggested a three-tier classification system with some similarities to this present proposal.

At the same time, interest in national park caves had waned after most easily accessible and obvious caves had been explored and surveyed. Other areas of the Canadian Rocky Mountains, outside national parks, with much higher density of caves, focused the attention of the Alberta Speleological Society. Still, there has been an on-going interest in access to Castleguard Cave. In 2004 the publishing of a cave guidebook that included many of the caves found in the six national parks raised awareness but so far not an interest in park caves.

3.0 Current Situation

The National Park General Regulations; section 8, reads, *Except where it is indicated by a notice posted by the superintendent at the entrance to a cave that entry therein is permitted, no person shall enter any cave in a Park without the permission, in writing, of the superintendent*. Cavers have lobbied for the revocation of the regulation based on the argument that their activity has been unfairly singled out and they wish to be treated the same as hikers or climbers.

Realistically, revoking section 8 will not happen for a number of reasons. Nationally, there are management issues and concerns beyond the scope of recreational caving. Some coastal parks have native burial sites in sea caves, others have long ago closed mines (the national park definition of cave: *any subterranean cavern or area, either natural or man-made*), some have bat hibernaculums and most parks with solution caves have some fragile speleothems or other significant features worth protection. The national park mandate, as stated in its act, reads that parks; *shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations*.

Therefore, regulations such as section 8 will remain and be used as required. However, there are ways of administering the regulation so as to restrict access only for those caves where there are resource protection and or public safety concerns. Because of the wide range of resource management and public safety concerns across a national system of 41 parks, the proposed access management guidelines presented here apply only to the following western mountain national parks: Jasper, Banff, Kootenay, Yoho, Glacier, and Mount Revelstoke. This is a group of parks with a similar cave exploration history and surface landscape. The access guidelines presented here were circulated to executive members of the Alberta Speleological Society and the British Columbia Speleological Federation, Canadian cave/karst consultants and a U.S. National Park Service ecologist several years ago. Their feedback was considered and incorporated, where possible, into the draft presented here.

4.0 Introduction

The task of developing cave management

guidelines was first directed towards the caves of Jasper National Park then expanded to include the neighboring National Parks of Banff, Kootenay, Yoho, Glacier, and Mount Revelstoke. Although not prominent or numerous, caves are special natural resources that are worthy of specific management guidelines.

5.0 Park Management Plan Background

Park management plans, both current and the recent past, (1988 era) of the four mountain parks block (Jasper, Banff, Yoho, and Kootenay) and Glacier/Revelstoke National Parks were reviewed for direct reference to cave management. These highlights are presented in Appendix I. These plans recognize caving as a legitimate activity for the purposes of exploration and recreation. The 1988 Jasper Park Management Plan suggested the classification of formations as a means of managing resource protection and public safety concerns. Possibly what was meant was the classification of caves based upon the fragility of their resources and the physical difficulties for people to move through them?

6.0 Current Knowledge of Resource

In 1992 Jon Rollins completed a very useful inventory of known caves in the southern Canadian Rockies as part of his masters degree of Environmental Design from the University of Calgary, *Management Considerations for Caves and Related Karst Features in the Southern Canadian Rockies*. The masters degree project received financial assistance from Parks Canada. In the 13 years since his original inventory, other caves within National Park boundaries have been located or documented. Rollins' inventory was a combination of site visits, literature review, and interviews. The level of detail he provided in the inventory varies, but needs to be expanded to better meet the park's requirements.

The current level of exploration of new caves and documentation of unreported ones appears to be averaging out to about one or slightly less per year in Jasper National Park. The discoveries are being made by local cavers and park staff (who are becoming more aware of the significance of caves). With improved relations between cavers and park staff, it is now possible for an information exchange

about new resources to take place. In the past this dialogue would not have been possible due to perceived and actual adversarial positions.

The size (length and depth) of known caves in the mountain national parks, with the exception of Castleguard and Nakimu Caves, are all relatively small compared to other areas of the Canadian Rockies or Vancouver Island. However, national park caves do include a number of significant features or resources such as bat hibernaculums, ice caves, sulphuric acid formed caves, bone beds, and many types of formations (draperies, evaporites, flowstone, helictites, moonmilk, stalactites, stalagmites). Many of the known caves in national parks are situated in remote backcountry locations, some several hours to multiple days travel from the road.

7.0 Cave Management is People Management

Under the present mandates of National Parks in Canada, cave management is about managing people who enter caves or whose actions outside may effect caves or neighbouring surface resources. The principal cave management goal for National Parks will be conservative use of cave resources balancing protection and conservation against understanding, appreciation, and use.

7.1 Purposes of Legitimate Cave Visitation

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|------------|---|
| Public | <ul style="list-style-type: none"> • Exploration in conjunction with detailed survey, map production, and resource inventory, as well as a written report of new knowledge gained from the exploration. • Research related to resources found within • Recreation, appreciation, and enjoyment of the cave resource in a non-consumptive way |
| Park staff | <ul style="list-style-type: none"> • Orientation of known caves for the purpose of understanding the significance of resources present • Exploration and survey • Resource inventory • Monitoring the impacts of visitation and research • Restoration or rehabilitation of man |

caused impacts

- Assessing and mitigating safety issues
- Prepare interpretive material
- Lead public interpretive tours

7.2 Cave Management Strategies

To implement the cave management goal, a combination of strategies will be used, these include:

Isolation - Keep the caves isolated (remote) by restricting the use of mechanized transportation for access, route trails away from caves where possible, and restrict new developments away from caves.

Information Management - Do not publicize specific cave locations or access trails. This should be interpreted as a philosophy of not actively disseminating information but does not preclude off-site interpretation.

Diversions - Redirect potential users to less sensitive caves either inside National Parks or to other caves in neighbouring provinces.

Education - Educate the general public about the value of caves and karst. Educate cave users about cave conservation ethics, information sources, and speleological organizations.

Legislation - Use the National Park Act and Regulations to control access and user actions when necessary. Examples include the General Regulations; section 8, *Except where it is indicated by a notice posted by the superintendent at the entrance to a cave that entry therein is permitted, no person shall enter any cave in a Park without the permission, in writing, of the superintendent.* section 10, *No person shall remove, deface, damage or destroy any flora or natural objects in a Park except in accordance with a permit issued under subsection 11(1) or 12(1).*

Related to wildlife protection, use the Wildlife Regulations; section 4(1) *Except as otherwise provided in these Regulations, no person shall (a) hunt, disturb, hold in captivity or destroy any wildlife within, or remove any wildlife from, a park; (e) disturb or destroy a nest lair, den or beaver house or dam in a park;*

Resource Inventory - Keep up-to-date information on karst and cave resources by sharing information with speleological organizations and park staff.

Ecosystem Approach - Ensure the hydro-geological catchment of a karst or cave resource is un-

derstood before a new development is considered in the area.

Monitoring and Evaluation - Acquire baseline data and periodically monitor the short and long term effects of human impact on cave resources is essential for evaluating the success or failure of these guidelines.

8.0 Cave Classification

The purpose of a cave classification system is to assist with management decisions related to the protection of natural cave environments and providing public access. The classification system must be understandable to both resource managers and the public. A three-tier classification is proposed for western mountain National Parks. The factors to be considered will include: (A) the cave resources, (B) the surface resources, (C) accident and rescue implications

8.1 Cave Resources

The resources contained in a cave will vary widely from one cave to another. Consideration shall be given to:

- uniqueness of speleothems, secondary deposits or other notable resources
- fragility of speleothems, secondary deposits or other notable resources
- abundance of speleothems, secondary deposits or other notable resources
- susceptibility of cave fauna to disturbance
- potential to contain scientific value

8.2 Surface Resources

The surface resources surrounding a cave, including its entrance, may be impacted by visitation. The considerations for these resources shall be:

- susceptibility of flora or fauna to disturbance
- uniqueness of flora or fauna
- potential for users to attract more interest to a cave by creating a trail or obvious track to a cave

8.3 Accident and Rescue Implications

The consequences of an accident in a cave are:

negative effects on cave resources, rescue costs to tax payers, and negative media exposure. The considerations regarding accidents and rescues shall be:

- potential in-cave hazards
- seriousness and difficulty to complete an in-cave rescue
- access logistics to reach the cave entrance
- potential damage to cave resources by carrying out a rescue

Using these consideration factors, a three-tier cave management classification will be:

8.4 Class 1—Access by Application

Caves of highest resource value, significant disturbance potential to surface resources, serious consequences of an accident, and/or a combination of these factors. These caves are not for recreational purposes; visits must add to the knowledge base and or give net benefit to the cave. These caves will require detailed management actions and or screening of users by an application process. Monitoring of user activity and resource impairment will be required. Education and orientation of users is possible by direct contact during application process. Legitimate visitation purposes could include new exploration or survey, map production, resource inventory, rehabilitation or restoration, or bonafide scientific research. Applicants should typically submit a written proposal. Approval may require one to three months depending upon the complexity of the access proposal.

Few caves will have this designation, a well known example is Castleguard Cave.

8.5 Class 2—Access by Permit

Caves having some management concerns regarding their internal resources, surfaces resources, or accident potential. These caves will require a straight-forward access permit, for example a special/restricted activity permit. Recreational use is allowed. Monitoring of user activity and resource impairment may be required. Education and orientation of users is possible by direct contact during permit process. Approval may require one day to a week depending upon season and staff workload.

Most of the caves will have this designation. Seasonal restrictions for bat hibernaculums will elevate winter access to Class 1.

8.6 Class 3—Unrestricted Public Access

Caves having few or no management concerns regarding their resources, surfaces resources or accident potential. These caves will be open to the public without a permit. Monitoring will be carried out on an infrequent basis. To work with the intent of General Regulations, section 8 (*Except where it is indicated by a notice posted by the superintendent at the entrance to a cave that entry therein is permitted, no person shall enter any cave in a Park without the permission, in writing, of the superintendent.*), it is proposed that a public notice from the Superintendent would list the caves in this class and give a blanket permit to the public for access. The notice would be kept at the park administration, trail, and warden offices. This list would not be advertised or marketed. The list would be made available upon request by the public.

Some caves, typically those which are small, with few speleothems and minimal safety/rescue concerns will be open to everyone.

8.7 Determination of Cave Management Classification

Each park cave or group of caves needs to be assessed regarding its in-cave resources, surface resources, and rescue implications. If there is little or no information about a particular cave then its default classification shall be Class 2 until there is enough known about it to use the proposed rating scheme.

Initially, in an earlier draft, a numerical rating system was developed to objectively score each cave in order that consistent and defensible application of the classification system be made. Of all the comments received during first round of consultation, many respondents highlighted the difficulty of truly creating an objective rating scheme by trying to put numbers to difficult-to-quantify resources. Instead, the previously listed Factors To Consider For Determining Cave Access Classification will be used as a checklist when determining which access class a cave will be placed in.

If cavers wish to carry out a reconnaissance trip to check an area for new prospects and enter discovered finds, this will be possible. Unless there are access restrictions for all park users (fire hazard, bear closure, avalanche control, trail or campground

quotas, bivi restrictions, and the like), access can be provided similar to the conditions of Class 2 caves. The important message is communication. In the past there have been misunderstandings and poor communication between cavers and Parks Canada. This opportunity to comment on these guidelines is hopefully an example of a positive change. User input to this proposed cave access policy change is desired.

The classification of a cave can change with new information available about the cave resources, user activity or surface resources. In a large cave there is the possibility that different parts of it can be designated to different classes.

9.0 User Activities

Once access has been secured to any cave, important user ethics that need to be followed to ensure sustainable use of the cave. The Leave No Trace (www.lnt.org) organization has recently (1998) produced a booklet in their skills and ethics series devoted to caving. This booklet summarizes many common concerns cave managers will want users to be aware of. Until there is a Canadian equivalent, this should be the standard handout to cavers upon first contact. There is something to learn or

refresh everyone's memory in the booklet.

Cautionary information about cave specific resources that require or justify special mention should be attached to the permit. The level of detail and important conservation messages stressed to the user will be determined by park and the resources at risk.

Author Biographical Sketch

Greg Horne is a Park Warden in Jasper National Park, Alberta, Canada. His primary job responsibilities are related to backcountry management and patrol. For the past decade he has been involved with cave management issues primarily in Jasper National Park and Castleguard Cave in neighbouring Banff National Park. As well, he has drafted a cave classification and management system for six mountain parks of western Canada. He has been Parks Canada's representative to liaison with the Alberta Speleological Society. He has advised Nahanni National Park Reserve (Northwest Territories, Canada) regarding potential park expansion into the Nahanni North Karst area. Personal interest in cave exploration has taken him to Australia, Bolivia, and Mexico.

APPENDIX I

Jasper

The Jasper National Park Management Plan of November 1988 gave public direction as to how caving will be treated. Under the section titled Recreational Activities caving is discussed as follows:

Arrangements for authorization to enter caves, protection of significant resource features, and public safety will be assured through cooperative efforts with recognized speleological organizations. The park service will cooperate with recognized speleological organizations to complete a preliminary inventory and classification of cave formations. The Canadian Parks Service will then prepare management guidelines which will identify the requirements for the protection of specific cave formations.

Discussion:

Caving is not a particularly popular activity. There are few known accessible cave formations in Jasper. The cooperation of recognized speleological organizations is the only practical manner in which knowledge of these karst features can be obtained. At the same time, restrictions and controls are necessary because of the fragility of many karst features and to ensure that public safety requirements are met. These can be established only on completion of a proper inventory and classification of specific cave formations.

The proposed arrangements will achieve the resource protection requirements by controlling access to caves once they are known, while providing the park superintendent with discretion to permit responsible organizations to enter specific caves. The cooperative approach taken in the preliminary exploration of the Snaring Karst System is an example of how the Parks Service and speleological organizations can work together to better understand and manage the park's resources.

The Jasper National Park Management Plan Concept (January 29, 1999) gives brief mention of cave management in section 5.0 A Place for People - Visitor Services and Facilities:

Review the park cave management policy to better match management action with the necessary level of resource protection.

The Jasper National Park Management Plan (May 2000) expands on the previous statement

in section 5.0 A Place for People, Effective Human Use Management 5.6.3.17: *Review the park's cave management policy to ensure proper resource protection. In some cases current restrictions are not necessary for resource protection or public safety. As a result, the requirement for permits is often ignored. A new policy would only require permits where there are resource or public safety concerns.*

This statement hints of the cave classification system later proposed in this document.

Banff

The November 1988 Banff National Park Management Plan, Recreational Activities 4.3.T uses the same introduction as the 1988 Jasper plan regarding caving. The discussion is slightly different and reads:

Banff contains several well-known cave systems in Mount Castleguard and Sulphur Mountain. Restrictions and controls are necessary because of the fragility of many karst features and to ensure public safety requirements are met. The proposed arrangements will achieve the resource protection requirements by controlling access to known caves.

There are also a number of caves in the park which have not been documented. The cooperation of recognized speleological organizations is the only practical manner in which knowledge about these features can be obtained. These organizations have not always found Parks Service officials to be cooperative in authorizing entry into caves. The proposed arrangements would provide the park superintendent with the discretion to permit responsible organizations to enter caves.

The Banff National Park Management Plan (April 1997) makes two direct references to caves. In the section A Place for Nature, 3.7 Geology and Landforms, 3.7.2 key action states: *Provide special protection measures for internationally and nationally significant features and landforms such as the Castleguard Caves, the Middle Springs hot springs, and important fossil beds.*

The second reference is in Park Zoning, 10.2 Zone 1 - Special Preservation, Castleguard Cave System and Meadows Zone 1 Area: *The Castleguard Cave System is a karst system that is internationally recognized for its physical development,*

diversity of features, and rare and unique fauna. At more than 16 km, it is the longest cave in Canada and the second deepest cave in the country. The entire Castleguard Cave System contains a notable variety of special features including stalagmites and stalactites, precipitates of gypsum, hydromagnesite and rare cave minerals. The Castleguard area not only contains significant surficial karst features but is also an outstanding example of pristine alpine vegetation.

Castleguard is actually now about 20 kilometers surveyed length but has dropped in depth ranking to about 5th or 6th deepest.

Yoho

The November 1988 Yoho National Park Management Plan uses the same introduction in 4.3 Recreational Activities for caving as Jasper and Banff. The discussion reads differently:

There few known cave formations in Yoho and caving is not a popular activity. The number of cavers operating in the mountain parks is low, and Yoho does not receive a large proportion of this use. The activity is therefore of minor management concern. Reports from cavers help the park to discover and understand Yoho's underground resources.

Use will be monitored through permits and caving reports, in cooperation with recognized speleological organizations. It is not expected that caving will increase to the point where additional management actions are required.

In the current draft Yoho National Park Management Plan brief mention is made to caves under 3.0 A Place for Nature, 3.8.3.1 key actions: *Provide special protection for the Burgess Shale fossil sites and the Ice River Igneous Complex and caves.* The next key action, 2, could be interpreted to relate to caves and speleological organizations as well: *With other interested parties, assess the park's understanding of its geological resources; determine research priorities.*

Kootenay

The November 1988 Kootenay National Park Management Plan uses the same introduction in 4.3 Recreational Activities for caving as Jasper, Banff and Yoho. The discussion reads differently:

There are no known caves in the park, although no systematic investigations have been undertaken. The cooperation of recognized speleological organiza-

tions is the only practical manner in which knowledge about these features can be obtained. At the same time, restrictions and controls are necessary because of the fragility of many karst features and to ensure public safety requirements are met. These can established only on completion of a proper inventory and classification of specific caves.

The proposed arrangements will achieve the resource protection requirements by controlling access to caves once they become known, while providing the park superintendent with the discretion to permit responsible organizations to enter specific caves.

In the current draft Kootenay National Park Management Plan, using the exact same wording as the Yoho draft, brief mention is made to caves under 3.0 A Place for Nature, 3.8.3.1 key actions: *Provide special protection for the Burgess Shale fossil sites and the Ice River Igneous Complex and caves.* The next key action, 2, could be interpreted to relate to caves and speleological organizations as well: *With other interested parties, assess the park's understanding of its geological resources; determine research priorities.* This is assumed to be an editorial slip regarding citing Yoho specific geological features.

As a point of interest, there are at least 11 known caves in Kootenay, one known of as early as 1977 and numerous as of 1987 and 1988. Several are described as having impressive formations, pits and active stream passages. The first known find, in a Canadian cave, of the mineral Attapulgitite is in a Kootenay Cave.

Glacier and Revelstoke

The 1995 Mount Revelstoke and Glacier National Parks Park Management Plan speaks about caves in section 5.3, Land Use Zoning Plan Glacier National Park:

Zone I - Special Preservation

The Nakimu Caves System was identified as a site encompassing features of exceptional regional significance in the 1984 Regional Analysis of Natural Region Four. The Nakimu Caves are one of the most extensive cave systems known in British Columbia, and at over five km of passages, are second only to the Castleguard Caves in Alberta. Located in the Cougar Valley, the system consists of three small upstream caves and a main cave. Visible at the surface are sink-

holes, springs, a dry valley and an unroofed cavern. Features found inside the caves include waterfalls, plunge pools, stalactite grottoes, moonmilk and seasonal and permanent ice deposits. Surface vegetation near the caves is also of special interest due to the presence of calcicole plant species. Calcicoles are rare in the Selkirk Mountains due to the limited occurrence of limestone parent material and calcareous soils.

Nakimu Caves are designated a Zone I area due to their significant karst features, and represent less than 1% of the park.

Several other potential Zone I areas exist but require further investigation. For example, the 1984 Regional analysis of Natural Region Four identified the Mount Tupper cave system as a potentially exceptional feature. The cave system begins with two sinkholes, one of which carries meltwater from the East Tupper Glacier. Subterranean passages at the upper end of the system are narrow and silted. Glacier water disappears here to re-emerge 500 metres below.

The next mention about caves is under section 7.2, The Park Visitor Groups - Adventure Recreationists: *Adventure recreationists are those visitors who participate in adventure activities that enable them to challenge the natural environment on its own terms in order to appreciate, understand and enjoy the parks wilderness character. Important elements of the experience sought are opportunities for persona challenge, risk, adventure, accomplishment, solitude and skill development in a rugged and primitive setting. The range of activities these individuals undertake include ski touring, mountaineering, climbing, caving,, backcountry hiking, kayaking rafting, canoeing and horseback riding. Minimal basic park facilities are required by this group.*

Section 7.3, Visitor Experience Opportunities, states: *The visitor experiences that are in keeping with the parks market niche of a "wilderness experience" and will be provided within RNP/GNP are: - caving [plus ten other traditional activities].*