

Pingo Canadian Landmark

Memorandum of Agreement



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Pingo Working Committee**

**Written by:
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September 2001

Pingo Canadian Landmark Memorandum of Agreement

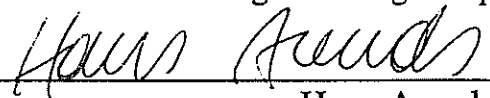
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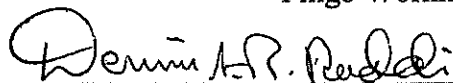
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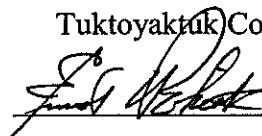
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1. Establishment of The Pingo Canadian Landmark

The Pingo Canadian Landmark site was identified as a Natural Site of Canadian Significance in 1978 and was proposed at that time for official status under the National Landmark Program. National Landmarks were originally envisioned to protect specific natural features considered to be outstanding, exceptional, unique or rare to this country. These natural features would most often be isolated entities and typically of scientific interest. However, the program was never implemented and the proposal for the Pingo site was neglected until the adoption of the *Western Arctic (Inuvialuit) Claims Settlement Act*, also known as the Inuvialuit Final Agreement (IFA). The IFA stipulated that the Landmark was to be managed under the National Parks Act in consultation with the Inuvialuit Land Administration and the people of Tuktoyaktuk, as a joint management regime (Section 7(73)).

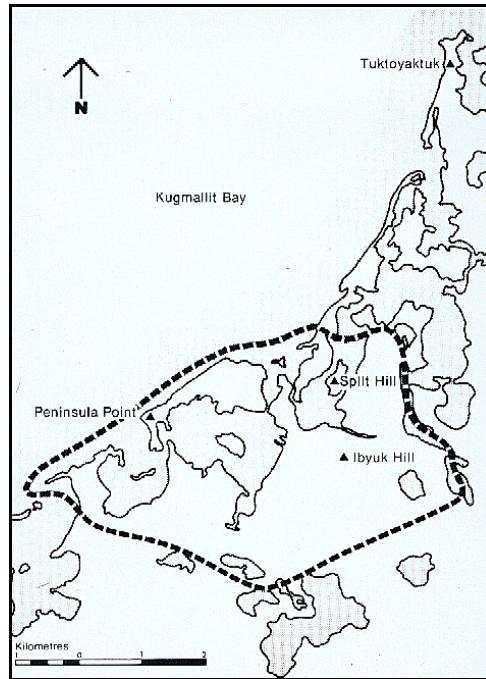
Since the early 1990's, Parks Canada and the Inuvialuit have been working to fulfill the requirement of the IFA, first through the establishment of the Pingo Joint Management Committee and then the Pingo Working Committee. Both groups have worked towards the establishment and development of the Pingo Canadian Landmark. The current Pingo Working Committee includes members from the Tuktoyaktuk Hunters and Trappers Committee, Tuktoyaktuk Community Corporation, Inuvialuit Land Administration, Hamlet of Tuktoyaktuk, and Parks Canada. The Pingo Canadian Landmark is cooperatively managed by Parks Canada and the above organizations. Where, in the management actions below, the text speaks of Parks Canada and its partners undertaking a management action, it should be understood that this is a short form, and that the partners include those organizations represented on the Pingo Working Committee.

2. Regional Setting

The Pingo Canadian Landmark is situated on the Tuktoyaktuk Peninsula. The peninsula is part of an old delta of the Mackenzie River that formed between 12,000 and 600,000 years ago in what is referred to in the geologic time chart as the Pleistocene Epoch. Its hummocky terrain of lake-strewn tundra contains approximately 1,450 conical pingos which project upward from the surrounding landscape in an area that includes the coastal plain of the Tuktoyaktuk Peninsula, Richards Island, and the south side of Husky Lakes.

The Pingo Canadian Landmark is located on the shore of Kugmallit Bay adjacent to the Hamlet of Tuktoyaktuk at approximately 69°23' N and 133°9' W. Tuktoyaktuk is located approximately 120 km northeast from Inuvik, Northwest Territories.

Map 1. Pingo Canadian Landmark and Surrounding Areas



3. Pingo Canadian Landmark Memorandum of Agreement

With only one landmark in Parks Canada, there is not an established system or process for managing the Pingo Canadian Landmark. While the *Canada National Parks Act* requires each national park to have a management plan it was decided in 2000 by the Director General West and North of Parks Canada that a Memorandum of Agreement be written between Parks Canada and the community of Tuktoyaktuk in place of a formal management plan. This Memorandum of Agreement reflects the policies and legislation of the Agency and was prepared in conjunction with the Pingo Working Committee and the community of Tuktoyaktuk.

4. Landmark Description and Purposes

4.1 Description

The Pingo Canadian Landmark encompasses 16.4 km² of land and water, including eight pingos which range in height from less than 5 m to Ibyuk Pingo at 49 m. Ibyuk and Split Pingo are the most prominent pingos in the Landmark site with Kilitkusiaq Pingo and Island Pingo being the third and fourth highest. Island Pingo, while not as tall as the other large pingos in the site, has a circumference which is slightly larger than either Ibyuk or Split Pingo. The four smaller pingos are unnamed.

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Other natural features within the landmark site which are significant in terms of research and visitor interest include the massive ground ice underlying the region and patterned ground features such as tundra polygons. The ground ice, along with several large ice wedges, can be viewed along the coastal bluffs northeast of Peninsula Point. These exposures have been identified as some of the best in the world.

4.2 Purposes

The Pingo Canadian Landmark was established in recognition of the special natural features of the Tuktoyaktuk Peninsula area and the opportunities available for people to appreciate, understand and enjoy the pingos and their environment. The purposes of the Pingo Canadian Landmark, as identified by the community of Tuktoyaktuk and Parks Canada, are:

1. To protect the special natural characteristics of the Landmark, including the pingos and the natural ecosystem of which they are a part.
2. To protect the cultural heritage associated with the Landmark and to ensure the continued traditional use of the area by the Inuvialuit.
3. To encourage visitor and local appreciation, understanding and enjoyment of the natural and cultural environment of the Landmark.
4. To encourage compatible visitor activity in the Landmark and the surrounding area and to manage those activities in the long-term interests of the Landmark's resources.

The direction outlined in the remainder of this Agreement falls under these four general purpose statements.

5. Users of the Pingo Canadian Landmark

5.1 Traditional Use

Inuvialuit have lived and traveled along the Arctic coast for generations. The Pingo Canadian Landmark has traditionally been utilized by the Inuvialuit for harvesting and it is an important fishing area for people in the region. Furthermore, the site has been associated with economic benefits for local residents especially during the summer tourist season.

5.2 Landmark Visitors

The Pingo Canadian Landmark attracts mainly day-use visitors who hike or canoe to the Landmark to view the pingos. Some of the most easily accessible pingos in Canada are located at the Landmark site. Visitors come to see Ibyuk Pingo, the largest pingo in Canada, and some of the best ice exposures found in the Canadian Arctic.

5.3 Scientific Researchers

The Pingo Canadian Landmark has also been the focus of nearly fifty years of pingo research which has led to the current theory of the origin and growth of pingos. Valuable knowledge about the region's ecosystem has been acquired through the study of the ecological features within the Landmark site. Monitoring work has also been done in the Landmark on the rates of coastal

erosion along the Arctic Ocean.

6. The Landmark Ecosystem

6.1 Climate

The Pingo Canadian Landmark lies within the marine tundra climatic zone. Due to the Landmark's proximity to Tuktoyaktuk, the climatic records of Tuktoyaktuk represent climate conditions of the Landmark. Based on 23 years of climate data the mean annual temperature is -12°C. While temperatures below 0°C can occur at any time during the year the coldest month is February. The Tuktoyaktuk region experiences a very short summer as there are only 3 months with a mean temperature greater than 0°C (June, July and August).

Annual precipitation in the Tuktoyaktuk area is largely controlled by the ice conditions in the Beaufort Sea. Mean annual precipitation is only 137 mm. Much of the annual precipitation falls during the summer and early fall (June - October) when the southern Beaufort Sea is free of ice. When there is open water in the southern Beaufort Sea the prevailing winds can obtain the moisture necessary for precipitation to occur. During the remainder of the year the sea ice extends to shore and monthly precipitation values are consistently low.

During the summer, fog is common along the coast, especially when the prevailing wind direction is from the north/northwest (i.e. onshore). Daily fog often occurs in the morning during the summer.

6.2 Permafrost

The combined effect of the low mean annual temperature and recent glaciations in the Tuktoyaktuk Peninsula has been the formation of a thick layer of permafrost. Since the mean annual air temperature in the area is -12°C there is permafrost found throughout the area. The permafrost in the Tuktoyaktuk Peninsula is greater than 500 metres in depth, and in excess of 50,000 years old. Although the Tuktoyaktuk Peninsula lies within the zone of continuous permafrost, like other areas of permafrost, the upper ground layer thaws each summer, creating the active layer.

One type of permafrost of particular interest in the Pingo Canadian Landmark is massive ground ice. One of the best exposures of massive ground ice in Canada is located along the bluffs near Peninsula Point. The average thickness of the massive ground ice found in the Landmark is approximately 17 metres.

6.3 Geology

The Tuktoyaktuk Peninsula area is part of the large Beaufort-Mackenzie sedimentary basin. This basin was, and still is a zone of sediment deposition for the Mackenzie River. The surficial material in this area is predominantly fine-to medium-grained sands deposited during the Pleistocene epoch, approximately 600,000 years ago. The sand layer averages more than 30 metres in thickness throughout the Tuktoyaktuk area. The sand layer in the Tuktoyaktuk region is capped at the surface by a layer of fine textured clay and silt which ranges between 1.2 to 7 metres in thickness. The soils which cover the sand and stony clay layer in the Landmark can be generally characterised as being very shallow, very wet, and deficient in nutrients. The soil forming process

in cold Arctic regions is very slow, and true soil development is usually limited to a thin organic-rich mat at the surface.

6.4 Landforms

In the Tuktoyaktuk Peninsula region the landscape is for the most part low, rarely rising higher than 60 metres above sea level. Approximately 30% of the land area in the Tuktoyaktuk region is covered by lakes. The flat low hummocky topography of the Landmark is only interrupted by the presence of the pingos, and the Peninsula Point bluffs.

In permafrost regions, a zone of unfrozen sediments is located under most lakes. In the Tuktoyaktuk peninsula there are unfrozen sediments under every lake in which the water depth is greater than the winter ice thickness. Pingos form when a lake drains and the water's insulating effect is removed and the lake sediments begin to freeze from the surface down. It is the expansion of this ice core which is believed to cause the upheaval of pingos. As the ice core grows, the pingo also grows in height and diameter until the overlying frozen sediments crack under the pressure. Once the summit of a pingo ruptures, the ice core is exposed to melting and the pingo begins to decay. Eventually all that remains of a decayed pingo is a crater lake. The time frame involved in the entire life cycle of a pingo is difficult to establish because of the interaction of many different processes. However, given that Ibyuk Pingo is approximately 1200 years old and on the verge of rupture, a maximum age of between 1000 and 2000 years may represent an approximate time frame.

6.5 Vegetation

The Landmark is located in the Southern Arctic ecozone, lying just north of the treeline and taiga plain. The vegetation found throughout the landmark is typical of tundra plant communities. Poorly drained low-centred polygons, which occur in several locations within the Landmark, contain a sedge community in the low depressed centre, with dwarf shrubs occurring on the raised polygonal ridges. The shrubs and plants found on the polygonal ridges and pingo side slopes include willow, crowberry, cranberry, Labrador tea, heath, dwarf birch, and cloudberry.

6.6 Mammals

The wildlife frequenting the Landmark are typical of the Tuktoyaktuk Peninsula. The region contains a variety of wildlife, including large land mammals such as caribou from the Bluenose West and Cape Bathurst herds, grizzly bear, polar bear, and wolf. Smaller land mammals such as the arctic fox, red fox and arctic ground squirrel are also common in the area. The relatively dry sandy slopes of pingos provide ideal denning sites for both fox species and the arctic ground squirrel.

6.7 Birds

The region contains important habitat for nesting and migrating birds, especially waterfowl. During late spring the area is a stopover site for migrating geese including brant, lesser snow geese and greater white-fronted geese. The area is also important habitat for tundra swans and loons. Ducks such as mallard, green-winged teal, king eider, common eider, and oldsquaw are common to the

area. Due to the coastal location of the Landmark, a variety of gull and shorebird species are common.

6.8 Fish

The fish found in the Landmark are similar to the Tuktoyaktuk harbour area. The shallow waters of the bays and coastal areas support a variety of fish species such as Pacific herring, rctic cisco, least cisco, burbot, broad whitefish, and inconnu.

7. Protecting The Natural Environment

As stated above, one of the purposes of the Pingo Canadian Landmark is “to protect the special natural characteristics of the Landmark, including the pingos and the natural ecosystem of which they are a part.” As there is no Landmark policy in the Parks Canada Agency, we drew upon the *Canada National Parks Act* for direction in dealing with ecological integrity of the site. The *Canada National Parks Act* states that “maintenance or restoration of ecological integrity, through the protection of natural resources and natural processes, shall be the first priority of the Minister when considering all aspects of the management of parks” (*Canada National Parks Act*, Section 8(2)). For the Pingo Canadian Landmark, this implies managing the Landmark ecosystem in such a way that ecological processes and components are protected for future generations. Achievement of this goal will be challenging due to the proximity of the community of Tuktoyaktuk to the Landmark; however, through the active participation and co-operation of individuals, community groups, government and non-governmental agencies this goal can be attained.

Management Action Parks Canada and its partners will endeavour to protect the natural environment of the Pingo Canadian Landmark through encouraging low impact land use, monitoring, and education and outreach.

Management Action Parks Canada and its partners will explore options for slowing the erosion of Ibyuk Pingo. Both traditional and scientific knowledge will be drawn upon.

Management Action Parks Canada and its partners will use the Inuvialuit Land Administration’s *Conduct of Operations* clause on pingos to help protect the pingos within the Landmark. This clause states that “no vehicle shall have access to any Pingo, including a zone of 100 metres (328 ft.) surrounding such Pingo” (Inuvialuit Land Administration Manual of Rules and Regulations, 19(8)).

7.1 Major Stressors Affecting the Pingo Canadian Landmark

Identifying and ranking the major stressors affecting the park environment is a part of assessing and maintaining a healthy environment in the Pingo Canadian Landmark. Activities or conditions are considered as stressors if they are known or suspected to be impacting the Landmark environment. The two main stressors for the Pingo Canadian Landmark are listed in Table 1.

Table 1. Top two stressors for the Pingo Canadian Landmark.

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Stressor	Status	Description	Action
Climate Change	Increasing	<ul style="list-style-type: none"> According to the literature, temperatures in this region appear to be increasing. Evidence in the region also shows increased coastal erosion and slumping. 	<ul style="list-style-type: none"> One automated weather station in Tuktoyaktuk in place for monitoring air temperature. Coastal erosion and permafrost monitoring undertaken in partnership with Geological Survey of Canada.
Human Disturbance	Increasing	<ul style="list-style-type: none"> Impacts on Ibyuk Pingo and surrounding areas, primarily related to vegetation trampling caused by ATV's, snow machines, and hiking. 	<ul style="list-style-type: none"> Vegetation monitored and educational posters put up in Inuvik and Tuktoyaktuk.

Of primary importance to the protection of ecological integrity within the Landmark is the protection of the structure of the pingos, particularly Ibyuk and Split pingos. It is imperative that protective measures be put in place to protect the pingos from human-induced impacts. The vegetation on the slopes of pingos insulates the soil thereby stabilizing the slopes. If the removal of vegetation exposes soil, the soil temperature will increase to the point where ice in the sediments will melt and the soil will slump. Soil slumping exposes more permafrost to warming and slumping. Eventually the ice core will be exposed and the pingo will collapse.

Ibyuk Pingo, while still growing very slowly, is showing signs of collapse. The presence of deep radial tension cracks and the thin layer of soil overlying the ice-core in the crater area all indicate that Ibyuk Pingo will inevitably experience an exposure of the massive ice core. Once this occurs the ice core will begin to melt and a slurry of material will slump down the sides of the pingo. Clearly, the protection of Ibyuk Pingo is very important to avoid accelerating its collapse beyond its natural state.

The Tuktoyaktuk Community Conservation Plan (Draft, March 1999) is a community-based planning document intended to provide guidance to all those with an interest in the Tuktoyaktuk planning area, which includes the Pingo Canadian Landmark. The Tuktoyaktuk Community Conservation Plan states that "no vehicle shall have access to any Pingo, including a zone of 100 metres surrounding such Pingo" (from the Inuvialuit Land Administration Manual of Rules and Regulations, 19(8)). Parks Canada will use this guideline to support its initiatives in the Landmark.

7.2 Monitoring and Research

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Implementing and maintaining an effective ecological monitoring program is an important management objective. Ecological monitoring must take place over the long term and go beyond the boundaries of the Landmark to be effective. Ideally, monitoring activities are inexpensive, require minimal training and expertise or involve expertise that is readily available, are ecologically significant, and should complement or supplement existing monitoring programs.

One of the recommendations from the Ecological Integrity Panel was to explicitly recognize monitoring as a tool for adaptive management and to integrate monitoring within the management accountability framework.

Management Action Parks Canada and its partners will monitor and report on the following components of the Pingo Canadian Landmark ecosystem on a long-term basis:

1. Climate in Tuktoyaktuk.
2. Elevational change of Split and Ibyuk pingos.
3. Change in vegetative cover on pingos and sensitive areas associated with visitor use and natural erosion.
4. Active layer thickness.
5. Approximate visitor numbers to the Landmark.

Information collected through the monitoring program will be reported annually where possible. Monitoring information will be shared with cooperative management agencies, and community-based organizations involved with the ecosystem management of the Landmark. Parks Canada will also expand or adapt the ecological monitoring program when required to meet the objectives of ecosystem management of the Pingo Canadian Landmark.

7.3 Information Management

Management Action Parks Canada will develop databases, metadata and GIS information for the monitoring program for the Pingo Canadian Landmark. This baseline information will be used to direct the protection, maintenance, and presentation of the Landmark ecosystem.

7.4 Traditional Knowledge

Local people, particularly elders, know a great deal about the region, its history, the land, environmental conditions, wildlife and habitats. Their information will be indispensable in understanding regional ecosystems and cultural histories. The IFA formally recognizes traditional knowledge in Section 14(5): "The relevant knowledge and experience of both the Inuvialuit and the scientific communities should be employed in order to achieve conservation." Parks Canada will involve local residents in the management of the Pingo Canadian Landmark by integrating them into the decision making process through the Pingo Working Committee and other cooperative management bodies.

Management Action Planning and management decisions for the Pingo Canadian Landmark will be based on the best available knowledge, including both scientific and traditional

knowledge.
Management Action The community of Tuktoyaktuk, and in particular elders, will be consulted on the best ways to monitor and protect pingos in the Landmark.

8. Cultural Resources

The Landmark is currently used by Tuktoyaktuk residents for hunting, fishing, berry picking, picnicking, tobogganing, and driftwood gathering. Trapping of fur bearers and the hunting of big game is not a frequent activity in the Landmark because of the plentiful populations throughout the greater region. The pingos in the Landmark are used to guide travelers returning to Tuktoyaktuk from the Arctic Ocean.

The Landmark is significant for goose and duck hunting, which is at a peak for a period of three to four weeks between late April and late June, depending on the timing of spring melt. During this short period waterfowl are hunted by Inuvialuit from Tuktoyaktuk who live in tents set up along the shore of the Landmark. The close proximity of the Landmark to the Hamlet makes it accessible to elders and is therefore important to them as a place where they can continue to hunt independently. The waters of the Landmark are also part of an important fishing area for the residents of Tuktoyaktuk. Inuvialuit traditional use of the area is protected through the Inuvialuit Final Agreement.

In July 2000, a cultural resource inventory was completed for the Landmark. The objective of this inventory was to document the physical evidence of human use of the area over time. This included heritage sites as well as those representing recent use. A small number of interviews were also conducted with elders from Tuktoyaktuk.

8.1 Sites of Significance

The cultural resource inventory of the Landmark found many interesting sites. These included traditional log graves, winter and spring campsites, hunting blinds, goose decoys, and other hunting features. Two features of particular archaeological and historical significance within the Landmark are also outlined in the report. They are a summer camp and corral established by reindeer herders and an old ice house.

The corral, and an associated camp were used within the last 40 years for a herd of approximately 1000 reindeer. The fence structure and trenching are still slightly visible. This site has interpretive potential for educating visitors about the Inuvialuit culture, the history of the importation of domesticated reindeer from Lapland via Alaska, and the introduction of reindeer husbandry practices to Inuvialuit in the area.

The ice house is located on top of the bluffs by Peninsula Point. Ice houses have traditionally been utilized by Inuvialuit to store meat and fish. The size of the characteristic square wooden opening to the ice house, and the presence of two ladders suggest that the ice house located on the bluffs was a large storage facility in its time. The ice house is no longer in use and has since melted out considerably. All that can be seen today is a pool of water inside the square wooden structure and the upper portion of the ladder.

8.2 Protecting Cultural Resources

The Pingo Canadian Landmark provides opportunities to protect and interpret the cultural heritage of Canada's Western Arctic. In the operation and management of the Landmark, Parks Canada recognizes Inuvialuit and pre-Inuvialuit heritage and presence in the Landmark and surrounding areas.

Management Action Parks Canada and its partners will conduct research into the ecology and past human use of the Landmark through in depth interviews, individual and group, with knowledgeable Inuvialuit elders and residents of Tuktoyaktuk. Stories about the Landmark and pingos will be recorded and shared with visitors.

Management Action Parks Canada and its partners will explore the option of further protecting archaeological sites (specifically grave sites and the reindeer corral) within the Landmark.

Management Action Parks Canada and its partners will notify private cabin owners that their cabins are within the Landmark and will also ensure that visitors are informed of any restrictions regarding access to where the private cabins are located.

Management Action Parks Canada and its partners will discourage the removal of any artifacts and natural resources by visitors through educational materials.

9. Public Education and Awareness

A primary objective of Parks Canada is to foster national identity through the protection and presentation of our heritage and to cultivate a society of environmental citizens committed to heritage protection. A key part of Parks Canada's mandate is to create environmental awareness among visitors to the Landmark. Parks Canada does this by providing opportunities to experience the Landmark as well as by providing educational information and programs. For the public to understand, appreciate, and fully enjoy the Pingo Canadian Landmark, they need to understand the Landmark's resources and their significance. A direct link exists between the interpretation program and protecting ecological integrity.

The Pingo Working Committee has produced numerous educational products over the past two years. These include an educational brochure in both English and French, a 3-dimensional model of Ibyuk Pingo, and numerous newsletters about the Landmark.

The objectives of the Pingo Canadian Landmark's public education and awareness strategy are:

- protection of ecological integrity
- to help visitors, local residents, and the Canadian public to recognize, respect, understand and appreciate the many aspects of the Pingo Canadian Landmark
- to promote visitation consistent with the purposes of the Landmark

The following audiences have been identified for the Pingo Canadian Landmark:

- Inuvialuit traditional users from Tuktoyaktuk
- Canadian and international day use visitors
- residents and students of Tuktoyaktuk, and
- researchers

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- Management Action* Parks Canada and its partners will develop a public education and awareness program. Priorities for this program have been identified by the Pingo Working Committee (see Appendix 1).
- Management Action* Parks Canada and its partners will communicate information to the public using various forms of media including brochures, the internet, posters, and school visits (see Appendix 1).
- Management Action* Parks Canada and its partners will provide interpretative material to visitors about the cultural resources found within the Landmark.
- Management Action* Parks Canada and its partners will explore the concept of producing a video/CD about the pingos.
- Management Action* Parks Canada and its partners will undertake community-based initiatives to promote appropriate use of the pingos (e.g. school programs, public programs for local residents) for the benefit of Tuktoyaktuk residents.

10. Visitor Activities Management

Access to the Pingo Canadian Landmark will be encouraged in a manner consistent with the Inuvialuit Final Agreement, *Canada National Parks Act* and Regulations, and National Park Policy and Directives. While access to the Pingo Canadian Landmark will be encouraged, sensitive landforms and resources demand that visitor access be controlled to avoid ecological impacts. Furthermore, access to certain areas of the Landmark may be restricted for public safety reasons. Inuvialuit beneficiaries will have continued use of and access to the Landmark to pursue their traditional lifestyle.

In July 2000, a report was done assessing the feasibility of providing visitor access to the Pingo Canadian Landmark. The objectives of this project were to investigate means of providing public access to the Landmark while minimizing the impact to the area. This report will be used as the basis from which the Pingo Working Committee will make decisions regarding visitor access to the Landmark.

- Management Action* Parks Canada and its partners will identify visitor routes in the Landmark which will minimize the amount of environmental impact to the fragile ground cover and pingos. Access to the Landmark by boat will be encouraged.
- Management Action* Parks Canada and its partners will develop guidelines for tour operators.
- Management Action* Parks Canada and its partners will encourage visitors to hire local tour guides to facilitate their visit to the Landmark.
- Management Action* Parks Canada and its partners will explore the concept of hiring a local Tuktoyaktuk resident to provide interpretation to visitors about the Landmark and also monitor access to the site.
- Management Action* Parks Canada and its partners will ensure that visitors are made aware of the fragility of the pingos and will educate visitors on ways to protect the pingos while visiting the Landmark.

10.1 Facilities Management

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- Management Action* Development of facilities and structures within the Landmark will only occur to protect the integrity of vegetation, pingos, or other permafrost features. All facilities and structures will be subject to an environmental impact assessment.
- Management Action* Parks Canada will remove the old trailer which is located within the boundary of the Pingo Canadian Landmark.
- Management Action* Parks Canada and its partners will work with the Hunters and Trapper Committee to monitor the cleanliness of spring camps within the Landmark.

10.2 Risk Assessment and Public Safety

The lack of communication systems in the Landmark, weather extremes, Parks Canada's limited search and rescue capabilities in the Landmark, challenging terrain, and the lack of shelters all pose potential hazards to the unprepared visitor. Parks Canada will:

- Management Action* consider public safety as an integral component of planning and delivery of programs.
- Management Action* place priority for service delivery on prevention, education, and information programs.
- Management Action* make best efforts to ensure that visitors are aware of the skills and preparation necessary to exercise self reliance and personal responsibility while visiting the Pingo Canadian Landmark.

10.3 Visitor Services and Facilities

Both Tuktoyaktuk and Inuvik provide tourism related facilities and services for visitors. The majority of the tourism related facilities are operated by the private sector. Facilities for the traveling public such as hotels, campsites, washrooms, and showers can be found in Tuktoyaktuk and Inuvik.

Most Landmark-specific public services and requests for information will be handled out of the Park office in Inuvik or The Hamlet of Tuktoyaktuk. Search and rescue operations will be managed out of the Parks Canada Inuvik office in conjunction with the Tuktoyaktuk RCMP.

11. Regional Integration

In the Inuvialuit Settlement Region, cooperation is the cornerstone of effective environmental management. The Pingo Canadian Landmark is a relatively small component of a much larger regional landscape. Its proximity to Tuktoyaktuk contributes to its being perceived as the 'backyard' of the community. It is therefore important to ensure that management and operation of the Landmark is coordinated with the efforts of a wide variety of agencies and interest groups within the region, particularly the community of Tuktoyaktuk.

In terms of cooperative management Parks Canada and its partners will:

- Management Action* Work on an ongoing basis through the Pingo Working Committee and directly with the Inuvialuit Game Council, the Fisheries Joint Management Committee, the

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Wildlife Management Advisory Council (NWT), and Northwest Territories Government in regional ecosystem management, interpretation, tourism, wildlife management and other matters of mutual interest;

Management Action Manage the Landmark in such a way as to make it an integral part of the community of Tuktoyaktuk and a continued source of subsistence resources and recreational opportunities for residents;

Management Action Manage the Landmark in ways which contribute to employment and economic benefits for the region.

12. Inuvialuit Priority for Site Business Licences and Contracts

Management Action In issuing any contract related to the establishment, operation, and management of the Landmark, Parks Canada will do so in accordance with the IFA (Section 7(76)).

Management Action In issuing any licences to operate a business in the Landmark, Parks Canada will do so in accordance with the IFA (Section 7(76)).

13. Environmental Assessment

The Landmark Memorandum of Agreement and all Parks Canada policies and activities will be screened and reviewed according to the Environmental Impact Screening and Review Process as set out in the IFA Chapter 11.

14. Implementing and Reviewing the Memorandum of Agreement

Parks Canada and the Pingo Working Committee are committed to ongoing cooperative management and public involvement. The implementation of this plan will be monitored by an annual review done by the Pingo Working Committee and facilitated by Parks Canada. It will review the previous year's progress in implementing the plan, set new priorities, and produce a brief status report that will be appended to this MOA. This status report will be shared with community organizations in Tuktoyaktuk (HTC, ILA, Hamlet, CC), the Inuvialuit Regional Corporation, and the Inuvialuit Game Council. This Memorandum of Agreement will be reviewed in its entirety every five years by the Pingo Working Committee, cooperative management agencies, and the public.

Management Action Parks Canada and its partners will develop a Terms of Reference for the Pingo Working Committee.

Pingo Canadian Landmark Memorandum of Agreement

15. Summary of Management Actions

Section of Plan	Management Action	Timeframe	Status
7. Protecting the Natural Environment	Parks Canada in cooperation its with partners will endeavour to protect the natural environment of the Pingo Canadian Landmark through encouraging low impact land use, monitoring, and education and outreach.	Ongoing	
7. Protecting the Natural Environment	Parks Canada in cooperation with its partners will explore options for slowing the erosion of lbyuk Pingo. Both traditional and scientific knowledge will be drawn upon.	Within 2 years	
7. Protecting the Natural Environment	Parks Canada in cooperation with its partners will use the Inuvialuit Land Administration's <i>Conduct of Operations</i> clause on pingos to help protect the pingos within the Landmark. This clause states that "no vehicle shall have access to any Pingo, including a zone of 100 metres (328 ft.) surrounding such Pingo" (Inuvialuit Land Administration Manual of Rules and Regulations, 19(8)).	Ongoing	
7.2 Monitoring and Research	Parks Canada will monitor and report on the following components of the Pingo Canadian Landmark ecosystem on a long-term basis: climate; elevational change of Split and lbyuk pingos; change in vegetative cover on pingos and sensitive areas associated with visitor use and natural erosion; active layer thickness; and approximate visitor numbers to the Landmark.	Ongoing	
7.3 Information Management	Parks Canada will develop databases, metadata and GIS information for the monitoring program for the Pingo Canadian Landmark. This baseline information will be used to direct the protection, maintenance, and presentation of the Landmark ecosystem.	Ongoing	
7.4 Traditional Knowledge	Parks Canada will base management decisions for the Pingo Canadian Landmark on the best available knowledge, including both scientific and traditional knowledge.	Ongoing	
7.4 Traditional Knowledge	The community of Tuktoyaktuk, and in particular elders, will be consulted on the best ways to monitor and protect pingos in the Landmark.	Ongoing	
8.2 Protecting Cultural Resources	Parks Canada will conduct research into the ecology and past human use of the Landmark through in depth interviews, individual and group, with knowledgeable Inuvialuit elders and residents of Tuktoyaktuk. Stories about the Landmark and pingos will be recorded and shared with visitors.	Within 3 years	
8.2 Protecting Cultural Resources	Parks Canada and its partners will explore the option of further protecting archaeological sites (specifically grave sites and the reindeer corral) within the Landmark.	Within 1 year	

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Section of Plan	Management Action	Timeframe	Status
8.2 Protecting Cultural Resources	Parks Canada and its partners will notify private cabin owners that their cabins are within the Landmark and will also ensure that visitors are informed of any restrictions regarding access to where the private cabins are located.	Within 1 year	
8.2 Protecting Cultural Resources	Parks Canada will discourage the removal of any artifacts and natural resources by visitors through the distribution of educational materials.	Ongoing	
9. Public Education and Awareness	Parks Canada and its partners will develop a public education and awareness program. Priorities for this program have been identified by the Pingo Working Committee (see Appendix 1).	Within 1 year	
9. Public Education and Awareness	Parks Canada and its partners will communicate information to the public using various forms of media including brochures, the internet, posters, and school visits (see Appendix 1).	Ongoing	
9. Public Education and Awareness	Parks Canada and its partners will provide interpretative material to visitors about the cultural resources within the Landmark.	Ongoing	
9. Public Education and Awareness	Parks Canada and its partners will explore the concept of producing a video/CD about the pingos.	Within 2 years	
9. Public Education and Awareness	Parks Canada and its partners will undertake community-based initiatives to promote appropriate use of the pingos (e.g. school programs, public programs for local residents) for the benefit of Tuktoyaktuk residents.	Ongoing	
10. Visitor Activities Management	Parks Canada and its partners will ensure that visitors are made aware of the fragility of the pingos and will educate visitors on ways to protect the pingos while visiting the Landmark.	Ongoing	
10. Visitor Activities Management	Parks Canada and its partners will identify visitor routes in the Landmark which will minimize the amount of environmental impact to the fragile ground cover and pingos. Access to the Landmark by boat will be encouraged.	Within 2 years	Report - July 2000
10. Visitor Activities Management	Parks Canada and its partners will develop guidelines for tour operators.	2001	
10. Visitor Activities Management	Parks Canada and its partners will encourage visitors to hire local tour guides to facilitate their visit to the Landmark.	Ongoing	
10. Visitor Activities Management	Parks Canada and its partners will explore the concept of hiring a local Tuktoyaktuk resident to provide interpretation to visitors about the Landmark and also monitor access to the site.	Within 1 year	

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Section of Plan	Management Action	Timeframe	Status
10.1 Facilities Management	The development of facilities and structures within the Landmark will only occur to protect the integrity of vegetation, pingos, or other permafrost features. All facilities and structures will be subject to an environmental impact assessment.	Ongoing	
10.1 Facilities Management	Parks Canada will remove the old trailer which is located within the boundary of the Pingo Canadian Landmark.	Within 3 years	
10.1 Facilities Management	Parks Canada and its partners will work with the Hunters and Trapper Committee to monitor the cleanliness of spring camps within the Landmark.	Ongoing	
10.2 Risk Assessment and Public Safety	Parks Canada will consider public safety as an integral component of planning and delivery of programs.	Ongoing	
10.2 Risk Assessment and Public Safety	Parks Canada will place priority for service delivery on prevention, education, and information programs.	Ongoing	
10.2 Risk Assessment and Public Safety	Parks Canada will make best efforts to ensure that visitors are aware of the skills and preparation necessary to exercise self-reliance and personal responsibility while visiting the Pingo Canadian Landmark.	Ongoing	
11. Regional Integration	Parks Canada will work on an ongoing basis through the Pingo Working Committee and directly with the Inuvialuit Game Council, the Fisheries Joint Management Committee, the Wildlife Management Advisory Council (NWT), and Northwest Territories Government in regional ecosystem management, interpretation, tourism, wildlife management and other matters of mutual interest.	Ongoing	
11. Regional Integration	Parks Canada will manage the Landmark in such a way as to make it an integral part of the community of Tuktoyaktuk and a continued source of subsistence resources and recreational opportunities for residents.	Ongoing	
11. Regional Integration	Parks Canada will manage the Landmark in ways which contribute to employment and economic benefits for the region.	Ongoing	
12. Inuvialuit Priority for Site Business Licences and Contracts	In issuing any contract related to the establishment, operation, and management of the Landmark, Parks Canada will do so in accordance with the IFA (Section 7(76)).	Ongoing	
12. Inuvialuit Priority for Site Business Licences and Contracts	In issuing any licences to operate a business in the Landmark, Parks Canada will do so in accordance with the IFA (Section 7(76)).	Ongoing	

Pingo Canadian Landmark Memorandum of Agreement

Section of Plan	Management Action	Timeframe	Status
14. Implementing and Reviewing the Memorandum of Agreement	Parks Canada and its partners will develop a Terms of Reference for the Pingo Working Committee.	Within 1 year	

Appendix 1

Pingo Canadian Landmark, List of Priorities Pingo Working Committee, February 9, 1999

On February 9th, 1999 the Pingo Working Committee consisting of Fred Wolki (Hunters and Trappers Committee), Dennis Raddi (Community Corporation), Hans Arends and Calvin Pokiak (Inuvialuit Land Administration), Paul Voudrach (Hamlet of Tuktoyaktuk), and Hillarie Zimmermann (Parks Canada) met to develop a list of priorities for the Pingo Canadian Landmark. That list follows.

It is important to note that the development of facilities and structures within the Landmark will only occur to protect the integrity of vegetation, pingos, or other permafrost features. All facilities and structures will be subject to an environmental impact assessment and the *Canada National Parks Act and Regulations*. Parks Canada and its partners are not bound by this list of priorities and any development will be subject to the current fiscal situation of Parks Canada and partners. It is recognized by Parks Canada and its partners that the items on the list and their priority ranking may change over time.

Interpretative Material

- Priority 1:* Educational brochure (*completed 1999*)
Priority 2: Off-site interpretative sign to be located at Tuktoyaktuk Visitors Centre
Priority 3: Three dimensional model of a pingo to be used as an educational tool and display (*completed 1999*)
Priority 4: Off-site interpretative sign to be located at either Inuvik or Tuktoyaktuk airport
Priority 5: A) On-site sign located at the Pingo Canadian Landmark
B) Promotional brochure
C) Web page

Facilities

- Priority 1:* Boat dock (location to be determined)
Priority 2: Walkway up Ibyuk Pingo with a viewing platform situated on top
Priority 3: Construction of either a trail or walkway from outside of Landmark to a specified location within the Landmark

Management

- Priority 1:* Finalization of Memorandum of Agreement.
Priority 2: Development of guidelines for tour operators and development of by-laws with HTC and ILA.

Program Activity Options

- ▶ Staffing associated with Landmark
- ▶ School Program