

Parks Canada BioBlitz – Sirmilik National Park

Final Report
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NWRT Project Number: 5-17-01

Project Title: Parks Canada BioBlitz – Sirmilik National Park

Project Leader: Maryse Mahy



Figure 1: Participants observe and discuss plant species during the Sirmilik National Park BioBlitz. Photo: C. Elverum, Parks Canada

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Summary

BioBlitz events bring together community members and experts for an intensive survey of a particular area. They provide a species inventory for that area and are an opportunity to explore and document biodiversity in our ecosystems, and to learn about the species around us.

To mark Canada 150, Parks Canada and BioBlitz Canada held BioBlitz events across the country. The Sirmilik National Park BioBlitz was the most northern event and the only one held in Nunavut. Funding for this project was provided by Parks Canada (National BioBlitz Program and Nunavut Field Unit) and the Nunavut Wildlife Management Board (Nunavut Wildlife Research Trust).

The goal of the Sirmilik National Park BioBlitz was to improve our understanding and provide baseline information regarding the terrestrial ecosystem in an area of the park that has been largely unstudied. This BioBlitz was unique in that it combined both western scientific survey methods and Inuit Qaujimagatuqangit (Inuit knowledge). The information gathered will help contribute to park species lists, and to ongoing efforts to reflect Inuit Qaujimagatuqangit in the park's ecological integrity monitoring program.

From 5-8 July 2017, thirteen participants traveled by helicopter to Paquet Bay, also called Nanuqsiutitalik or “place of polar bears” in Inuktitut. Nanuqsiutitalik is in the Oliver Sound area of Sirmilik National Park (Figure 3). Participants included:

- Six Parks Canada staff (Maryse Mahy, Rosie Smith, Colleen Murchison, Carey Elverum, Brian Koonoo, Randy Quaraq)
- Three members of the Sirmilik National Park Pond Inlet Inuit Knowledge Working Group (Elijah Panipakoocho – Chair, Moses Koonark, Lindsey Qanguq – Youth Member)
- One member of the Sirmilik National Park Joint Park Management Committee (Leah Kalluk)
- Two scientific researchers (Gilles Gauthier from Université Laval, Dominique Berteaux from Université du Québec à Rimouski)
- One English-Inuktitut interpreter (Malachi Arreak)



Figure 2: Participants in the Sirmilik National Park BioBlitz.
Photo: Parks Canada

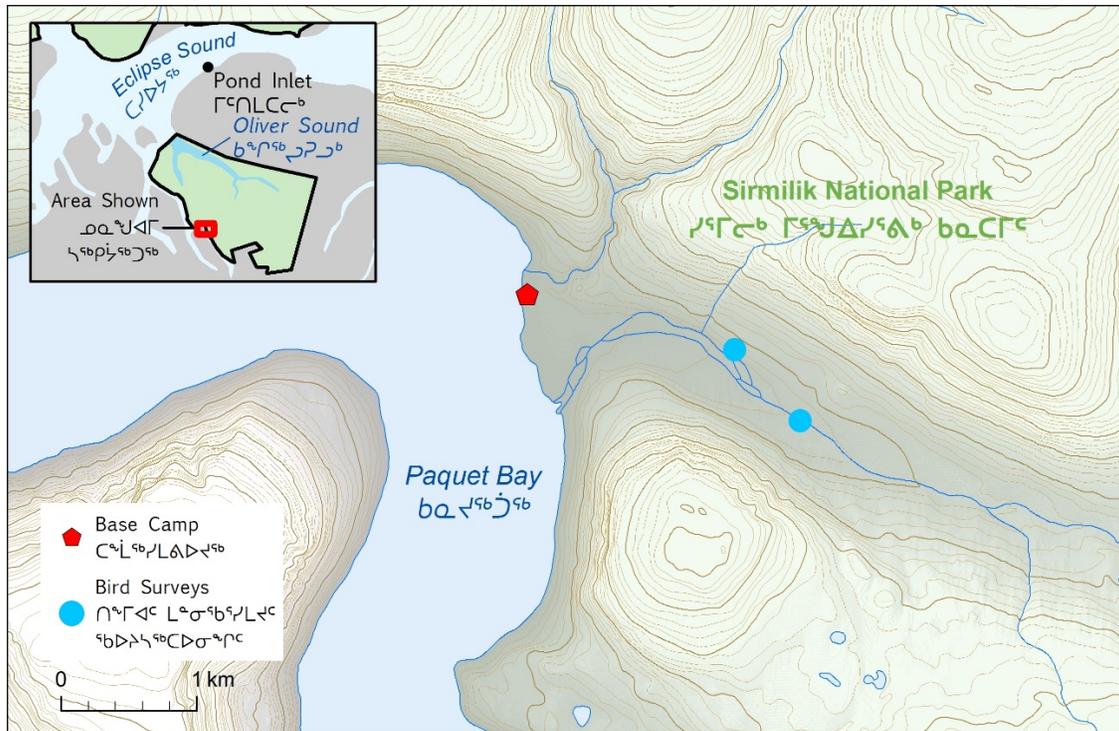


Figure 3: Map of Sirmilik National Park BioBlitz study area, 2017



Figure 4: BioBlitz Base Camp, at Nanuqsiutitalik/Paquet Bay. Photo: Maryse Mahy, Parks Canada

Participants established a Base Camp at Nanuqsiutitalik, where they camped for the duration of the BioBlitz.

The original plan was for the team to travel by helicopter to other areas of Paquet Bay and Oliver Sound, and to bring youth as day participants into the park. However, due to unforeseen difficulties, a helicopter was not available for each day of the survey as originally planned, so the BioBlitz was limited to the Base Camp and surrounding area and day participants were unable to attend the event.

However, the overnight participants were successful in conducting several key surveys:

- Breeding bird surveys, as part of a larger Canadian Wildlife Service program
- Insect trapping, including a malaise trap and bee bowls (pollinator pan traps)
- Inventory of plant and animal species
- Inuit Qaujimagajutuqangit about the plants and animals observed

Several cultural sites, including a polar bear trap and sodhouses were also visited during the event. Stories and descriptions by the Inuit elders about these sites set the context for the BioBlitz and helped demonstrate the importance of Nanuqsiutitalik to Inuit and the strong connection, historic and current, between Inuit and the land in this area.

Following the BioBlitz, in February 2018, a series of workshops were held in Pond Inlet. Two days were spent reviewing the Inuit Qaujimagatuqangit shared during the BioBlitz, to ensure the information was recorded correctly and allowing knowledge holders to expand and add information. Participants included Parks Canada staff (Rosie Smith and Maryse Mahy), Inuit Knowledge Working Group members (Elijah Panipakoocho, Paniloo Sangoya, and Elizabeth Quassa – new Youth Member for 2018), and interpreters (Malachi Arreak and Abraham Kublu). This group, as well as Moses Koonark, the other Inuit Knowledge Group member, also held a workshop with eight youth from the community of Pond Inlet, who had not been able to attend the main BioBlitz event. During the workshop with the youth, elders shared their knowledge on the different species observed during the BioBlitz.



Figure 5: Elijah Panipakoocho, Chair of the Sirmilik National Park Pond Inlet Inuit Knowledge Working Group, discussing a cultural site. Photo: L. Qanguq

Importance for Inuit of Nanuqsiutitalik



Figure 6: Elijah Panipakoocho demonstrating the use of a stone polar bear trap. Photo: L. Qanguq

Nanuqsiutitalik means “place of polar bears” in Inuktitut, and there is a rock polar bear trap located there (Figure 1). The Oliver Sound area of the park would always have caribou in the past, so the Inuit of Pond Inlet decided to include the area as part of Sirmilik National Park.

Nanuqsiutitalik is in a sheltered and warm location, so there are different and larger plants growing there than in the surrounding areas or near Pond Inlet. The area is an important berry-picking place. The whole slope along Paquet Bay has blueberries. It is usually women who gather berries. They have specific family spots they go to, usually on slopes facing the sun where there are bigger berries.

Project Objectives

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Materials and Methods

From 5-8 July 2017, thirteen participants traveled by helicopter to Paquet Bay, also called Nanuqsiutitalik or “place of polar bears” in Inuktitut. Nanuqsiutitalik is in the Oliver Sound area of Sirmilik National Park (Figure 3). Participants included:

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One English-Inuktitut interpreter (Malachi Arreak)

Inuit knowledge

Inuit knowledge holders shared their knowledge of the Paquet Bay / Nanuqsiutitalik area of the park with participants to the meeting. Inuit knowledge holders had previously reviewed and signed a consent form to share their knowledge with Parks Canada as part of efforts to include Inuit knowledge in monitoring the park's ecological integrity.

Key questions were asked by Parks Canada staff to guide the discussion:

1. Why is this site important to visit?
2. What do you pay attention to on the land in this area of the park?
3. What are the main plants and animals that you see here?
4. Can you share what you know about an animal or plant – are they normally found in large numbers in the area?
 - a. Ask specifically about caribou
5. Does it change from year to year or between seasons?

6. Have you observed any changes in abundance, distribution, movement, behaviour, or size?
7. Are there animals or plants that you used to see, that you do not see anymore?
8. Have you been observing any new species that are not typical for this area, such as plant or animal species usually found further south?

The information shared by knowledge holders was recorded with audio and video recorders as well as through written notes. The knowledge shared was reviewed for accuracy at a subsequent meeting in February 2018. Some participants were unavailable and the knowledge they shared will need to be confirmed in the future, before it can be included in reports.

Arctic PRISM breeding bird surveys

The breeding bird surveys conducted during the BioBlitz were part of the Arctic Program for Regional and Shorebird Monitoring (Arctic PRISM), run by the Canadian Wildlife Service. The Canadian Wildlife Service selected survey sites in the area, measuring 400 m by 300 m. Observers walked along transects through these plots, spaced 25 m apart, and recorded bird observations throughout the area. Data was also recorded on the type of habitat found in the plots.

Insect survey

Two types of insect traps were installed during the BioBlitz event. One was a malaise trap, which looks like a modified tent. When insects fly into the side of the tent, their instinct is to climb upwards. When they reach the top, they fall into a container of preserving liquid and are then collected. The malaise trap was installed from 5-8 July 2017.



Figure 7: Malaise trap, set up near the BioBlitz Base Camp. Photo: C. Murchison, Parks Canada



Figure 8: Inuit Knowledge Working Group youth member Lindsey Qanguq checks if any insects have been captured in a pan trap. Photo: M. Mahy, Parks Canada

Thirty pan traps were also installed from 6-8 July 2017. These traps are plastic bowls in three colours: blue, white, and yellow. Pollinating insects are attracted to the bowls, thinking that they are flowers. The bowls were laid out level with the ground surface, alternating colours and spaced 5 m apart. They were filled with water and a drop of dish soap to lower the surface tension. This means that when insects land in the bowl, they sink instead of floating on the water surface. At the end of the BioBlitz, the insects were strained out of the bowls and collected for processing and identification.

Results and Discussion

Plants



Figure 9: Plant species observed during the BioBlitz. Photo: C. Murchison, Parks Canada

Introduction on Inuit Qaujimagatuqangit of Plants

Traditionally, Inuit women hold greater knowledge of plants. While men would be hunting, the women would stay closer to the home, sewing and making other items for the family, and this gave them the opportunity to gather and learn about the plant species.

The Inuit diet would change throughout the summer, based on plants and when they were growing. There are early, mid-season, and late-season plants. They would start by eating mountain sorrel in the spring, which is one of the first edible plants to sprout. The first sprouts in the spring were greatly welcomed, because it signified that winter was over. Early July is when the plant leaves are nice and plump and they would be added to seal soup. If it looked like there was not enough for everyone to eat, then roots were also collected and included with the seal and the leaves. Later on, berries and other plants would start to ripen.

Inuit would walk on established caribou paths so they would avoid walking on vegetation, because you never knew when you might need those plants for survival, whether for eating or for other uses. This is also why it's important for Inuit to not eat or take too much, to conserve resources for times of need.

Plant survey and Inuit Qaujimagatuqangit

On 6 July 2017, a plant walk was held as part of the BioBlitz, where observers identified plants and knowledge holders shared their knowledge about the species observed. Sixteen plant species were observed during this session:

Willow, Salix sp., suputiit, ᓄᓂᓄᓄ

The name suputiit refers to the willow catkins when they have hair or fuzz growing on them. Willows are called uqaujaq before they develop the fur, which means “like a tongue”.



Figure 12: Two willow catkins. The one on the right is sweeter and preferred (as food). Photo: C. Elverum, Parks Canada

The catkins are eaten as a vegetable before they grow fur. The white or greenish ones are preferred because they are sweeter than the red ones, but the red ones are also edible. Catkins are still edible once they grow fur, but they are bitter and have started to dry out, so they are not usually eaten. At this point, they are used as a fire starter with flint. The catkins can also be used for indigestion or stomach ache, and are best when mixed with blubber and other plants.

It is thought that when the willow catkins start to grow fur, it means the bull caribou are starting to get back fat and are good for harvesting.



Figure 13: These willow catkins are still edible, but they are about to grow fur. Photo: C. Murchison, Parks Canada



Figure 8: These willow catkins are delicious! Photo: C. Elverum, Parks Canada

In the next valley over (Tuniit, outside the park), where it is warmer and more sheltered, the willows and birches grow up to 8-10 feet tall. They grow straight up there, instead of crawling on the ground, so they were collected and used for harpoons.

Dwarf fireweed, *Chamerion latifolium*, *paunnat*, <D>°Q°c

Dwarf fireweed grows close to rivers and other water sources. If eaten when fresh, it will make your mouth dry out. It is better to dry it and use it to make tea.



Figure 9: Dwarf fireweed (*Chamerion latifolium*). Photo: R. Smith, Parks Canada

Ferns, *Dryopteris fragrans*, *uipuuq*, D>D>°b

The Inuktitut name *uipuuq* refers to the spiral fiddlehead shape of the fern when it starts to grow. The ferns smell good, like perfume. There are more ferns in Nanuqsiutitalik than in other areas, because it is warmer and more sheltered.



Figure 10: Fragrant fern (*Dryopteris fragrans*). Photo: C. Murchison, Parks Canada

Mountain sorrel, *Oxyria digyna*, *qunguliit*, ᓄᓄᓄᓄᓄᓄ

The red stem of sorrel is called *naqa*, and the leaf is called *kulaq*. The whole sorrel plant can be eaten like spinach early in the season, before it gets too woody. The leaves can also be crushed and added to soup to give meat sweetness and flavour, and sorrel can be used to make tea.

Sorrel grows larger where there is a lot of sand, and sorrel, along with purple saxifrage, is one of the first colonizers of disturbed, sandy areas.

Caribou, geese, and Arctic hare will eat mountain sorrel. If you eat the Arctic hare intestines, they taste like sorrel.



Figure 11: Flower and leaves of mountain sorrel (*Oxyria digyna*). Photo: C. Elverum, Parks Canada



Figure 20: Sirmilik National Park Joint Park Management Committee member, Leah Kalluk, discussing the uses of *Sphagnum* moss. Photo: R. Smith, Parks Canada

Sphagnum moss, *Sphagnum* sp., *augjuq* or *mannuq*, ᓄᓄᓄᓄᓄᓄ or ᓄᓄᓄᓄᓄᓄ

Dried sphagnum moss is mixed with willow hairs or cotton grass and used as a wick for a qulliq (oil lamp) to keep warm. Willow cannot be used alone and must be mixed with the moss. The moss and willow hairs are arranged in a lattice pattern to form the wick. Moss that is drying and white on top is selected. It is turned upside down to let it dry more, and when it is dry it is cut horizontally (lengthwise) into smaller pieces. It is put on top of blubber or seal skin and burned. The moss becomes saturated with the oil and can burn for a long time.

Sphagnum moss was also used to keep a fire overnight. Damp moss was lit and then put into a pot to smoulder, and used to start a fire the next day.

Moss is also good for stomach problems and heartburn. For ulcers, moss is dried and then ground into a powder along with *suptiit* (willow). It is then mixed with some water so it is easier to swallow.

Alpine bistort or Inuit peanuts, Bistorta vivipara, tuqtaq,
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This plant grows in wet areas and the roots form tubers, called Inuit peanuts. They can be eaten, and the plant is also eaten by geese.



Figure 22: Inuit Knowledge Working Group member Moses Koonark shows the tuber that gives Inuit peanut its name. Photo: R. Smith, Parks Canada



Labrador tea, Rhododendron tomentosum, kingmingaq,
ᑭᖅᑭᖅᑭᖅ

This plant can be used to make tea. It prefers warmer areas, so it is not commonly found near Pond Inlet.

Figure 23: Labrador tea (*Rhododendron tomentosum*). Photo: C. Elverum, Parks Canada



Common cotton grass, Eriophorum angustifolium, pualunnguat, >٭٭٭٭٭

When the cotton grass turns white, the caribou are turning white.

Cotton grass can be used as a wick in a qulliq (oil lamp), either on its own or mixed with sphagnum moss.

Figure 24: Common cotton grass (*Eriophorum angustifolium*).
Photo: R. Smith, Parks Canada

Caribou moss or caribou lichen, Cladonia rangiferina

Other common lichens are mirnaq, which has white spots and is eaten by caribou, and tirraujait, which is a rock lichen and is slippery and black in colour.

Caribou sniff lichens to find the ones that are the most edible. They particularly like caribou moss. There is not much caribou moss in Nanuqsiutitalik because it has already been eaten, but more is found at higher elevations. The lichen found in the stomachs of caribou is green in the spring



Figure 25: Elijah Panipakoocho pointing to caribou moss. Photo: C. Elverum, Parks Canada

when the snow melts, and is black later on in the year. When they move to the mountaintops, you can

now, even though Inuit were hunting more than they currently do, in order to feed themselves and their dogs. Inuit believe that if wildlife aren't used properly and respectfully, they move away.

Hides from animals harvested in the fall make the best winter clothing. When a hunter harvested an animal to make winter clothing, they would measure and carefully cut and skin the animal based on directions given to them by the women who were going to do the sewing. They also had to ensure that the hides were stored properly so they wouldn't dry out or stiffen and they would still be supple by the time they returned to camp.

Inuit used to be encouraged to get wild animals as pets, so they could learn about their behaviour.

There were several warnings related to birds, such as if you keep killing birds for no reason, then you will not be able to hear their songs when you are older. Or if you do not listen to your parents, then you will not be able to hear birds sing.

The names of the animals were passed down through string games. There are some species that Inuit had not seen before, but because of these games they knew the names when they did see them.

Albino animals are considered to be children of the weather. If you kill an albino animal, there will be bad weather for many days.

Arctic PRISM breeding bird surveys

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Two survey sites were visited during the Sirmilik National Park BioBlitz (Figure 3). The plots were in dry, hilly areas that were mostly covered in small shrubs, as well as boulder fields (Figure 26).



Figure 28: Photo of habitat in bird survey plot SIR29D. Photo: D. Berteaux

A total of 59 bird observations were made (Table 1), including males, females, birds of unknown sex, juveniles, and probable nests. A probable nest means that one bird or a pair of birds was observed, and their behaviour indicated that they were tending to a nest nearby. Three species were observed: snow buntings (*Plectrophenax nivalis*, **qauluqtaat**, ᖃᑲᑲᑦᑲᑦ), Lapland longspurs (*Calcarius lapponicus*, **qinniqaat**, ᖃᑲᑲᑦᑲᑦ), and American pipits (*Anthus rubescens*, **inguiqsajut**, ᐃᑦᑲᑲᑦᑲᑦ), which refers to the way the bird's tail goes up and down, like the action of copulating).



Figure 29: Juvenile snow bunting (above) and adult Lapland longspur (below), observed during the bird surveys. Photos: C. Murchison, Parks Canada

Table 1: Summary of bird observations from Arctic PRISM breeding bird surveys

Site	Species	Probable nests	Males	Females	Unknown	Juveniles
SIR29A	Snow bunting	1	4	6	2	2
	American pipit				15	
	Lapland longspur	1	2	1		
SIR29D	Snow bunting	1	11			
	American pipit				12	
	Lapland longspur		1			

Insects

The insects from the two types of traps, as well as several insects collected by participants, were sorted into different groups. Altogether, 276 insects were collected (Table 2). The insects were sent to experts for identification, except for the spiders and flies, for which experts have not yet been found to identify the species. Identifications of insects completed by experts so far are in Table 3.

Table 2: Number of each group of invertebrates collected during the Sirmilik National Park BioBlitz

Type	Number
Spiders	20
Bumblebees	6
Wasps	10
Butterflies	4
Moths	40
Beetles	3
Flies	193

Table 3: List of insects identified by experts to date

Insect type	Latin name	Common name	Identified by	Number	Comments
Butterfly	<i>Boloria chariclea</i>	Arctic Fritillary	Gary Anweiler, Strickland Entomological Museum	2	See photo in Figure 31
Butterfly	<i>Colias palaeno</i>	Clouded Yellow Sulfur	Ross Layberry	2	See photo in Figure 32
Wasp	<i>Dolichovespula albida</i>		James Carpenter, American Museum of Natural History	1	These large wasps are social, and live together like honeybees or bumblebees. See photo in Figure 30.
Wasp	<i>Agathis</i> sp.		Jose Fernandez, Canadian National Collection of Insects	1 Female	
Wasp	<i>Praon</i> sp.		Jose Fernandez, Canadian National Collection of Insects	3 Females	
Wasp	<i>Microplitis</i> sp. near <i>lugubris</i>		Jose Fernandez, Canadian National Collection of Insects	1 Female	
Wasp	<i>Alloxysta</i> sp.		John Huber, Canadian National Collection of Insects	1 Female	
Wasp	<i>Diadegma</i> sp.		Andrew Bennett, Canadian National Collection of Insects	1 Male	These wasps lay their eggs inside caterpillars. When the eggs hatch, the young eat the caterpillar.
Wasp	<i>Mesochorus</i> sp.		Andrew Bennett, Canadian National Collection of Insects	1 Male	These wasps are parasites of wasps and flies which are also parasites
Wasp	<i>Exochus pullatus</i>		Andrew Bennett, Canadian National Collection of Insects	1 Female	These wasps lay their eggs inside caterpillars. When the eggs hatch, the young eat the caterpillar.

Moth	<i>Syngnapha parilis</i>		Chris Schmidt, Canadian National Collection of Insects	4 adults	
Moth	Tortricidae family	Leaf roller moth	Chris Schmidt, Canadian National Collection of Insects	13 adults	Leaf roller moths make nests of rolled leaves when they are caterpillars
Moth	<i>Loxostege ephippialis</i>		Chris Schmidt, Canadian National Collection of Insects	12 adults	
Beetle	<i>Amara alpina</i>		Henri Goulet, Canadian National Collection of Insects	1	
Beetle	<i>Pterostichus arcticola</i>		Henri Goulet, Canadian National Collection of Insects	2	
Bumblebee	<i>Bombus natvigi</i>	Cuckoo bumblebee	Packer Lab (York University) and the Biodiversity Institute of Ontario (University of Guelph)	1	Cuckoo bees lay their eggs in the nests of other bees. When the eggs hatch, they eat the pollen gathered by the host bee, and sometimes eat the host as well



Figure 12: *Dolichovespula albida*, a large species of wasp, captured by one of the participants. Photo: Packer Lab, York University



Figure 13: Arctic fritillary butterfly (*Boloria chariclea*) on caribou lichen. Photo: C. Murchison, Parks Canada



Figure 14: Clouded yellow sulfur (*Colias palaeno*) on dwarf fireweed.
Photo: C. Murchison, Parks Canada

Animals observed and Inuit Qaujimagatuqangit

Spiders, Arachnida, aasivait, ᐱᐣᐱᐣᐣ

Larger spiders are usually females carrying eggs on their bellies. When the young spiders hatch, they eat their mother and then disperse.

Some spiders do not have a web. Instead, they have a silk strand that flies around in the wind. Insects hit the strand and the spider pulls them down to eat them.

Bumblebees, Bombus sp., iguttait, ᐱᐣᐣᐣᐣᐣ

In Nanuqsiutitalik, there are bumblebee honey caches. The honey is green in colour instead of golden, but is just as delicious as the honey bought in a store. The honeycomb can be used as sugar.

To find a bumblebee nest, people need to look for a steep area with lots of rocks. The best time to look is at the end of July and in August, after the flowers have produced their nectar. If young bees are seen, then there is honey. After the first freeze, the bees hibernate and the nest can be dug up. Smoke from heather can also be used to get the bees to leave the nest.

One species of bumblebee captured during the BioBlitz was identified as *Bombus natvigi* (Table 3). A second species of bumblebee was found during the BioBlitz and is confusing the experts. It was sent away for DNA analysis, and they are still trying to determine its species.

Gyrfalcons, Falco rusticolus, kiggavik, ᐣᐣᐣᐣᐣᐣᐣ

There are more gyrfalcons in the Nanuqsiutitalik area than there are peregrine falcons. They prefer cliffs, and the area has more cliffs than other nearby areas. Gyrfalcons are strong predators, and will prey on any species of bird. Some Inuit have even seen them catching snow geese.

Canada goose, Branta canadensis, nirliit, ᐣᐣᐣᐣᐣᐣᐣ

There are two types of Canada goose; the larger is nirliq and the smaller is nirlijuk or cackling goose in English. One goose of the larger type was observed during the Bioblitz.

Canada geese migrate to north Baffin before the snow geese, and their eggs are more yellow and larger than snow goose eggs. At the time of the BioBlitz, there were many older signs of goose activity, but only one was seen during the event. It was noted that the geese probably left early, because the ground was drier than normal that year (2017) and the sedges had not grown as much.

*Red-throated loon, *Gavia stellata*, qaqsauq, ᑭᑭᑭᑭᑭᑭ*

When they are flying, red-throated loons make a sound like “qaq qaq qaq qaq”. They also make a certain call when they land on a lake. For many Inuit, hearing that sound means that you’re going to lose one of your relatives.

It is important not to chase or disturb loons, because they dive under the water and can puncture a qajaq with their beaks.

*Eider ducks, *Somateria sp.*, mitiit, ᐃᐃᐃᐃ*

Eider ducks start to arrive in north Baffin in mid-April. As soon as they lay eggs, the males disappear and the females stay to look after the young. In the fall, when the ice forms, you mostly see female eider ducks.



Figure 15: An eider duck spotted near the BioBlitz Base Camp. Photo: C. Murchison, Parks Canada

*Polar bear, *Ursus maritimus*, nanuq, ᐃᐃᐃᐃᐃᐃ*

A polar bear was observed by an Inuk elder from the helicopter over Oliver Sound while traveling to Nanuqiutitalik.

Before, polar bears did not spend much time in Eclipse Sound or in the fiords near Pond Inlet, but in recent years there have been many polar bears hunting seal pups in the fiords. Some have observed smaller numbers of seal pups, due to the polar bears hunting them. In the past, caches were safe because there were only a few bears in the area, but now bears are raiding food caches.

A polar bear trap is located near the base camp site in Nanuqiutitalik. It is similar to the stone traps used to catch foxes, but larger. It is made out of rocks, and when in use there would be a rope connected between bait at the far end of the trap and a rock door. When the polar bear entered the trap and took the bait, the rock door would close behind it and the bear would not be able to turn around or leave. There would be small openings on the sides of the trap, just large enough for a spear so the hunters could hit the bear’s heart and kill it.

Polar bear skin would be used in igloos, with the fur facing the snow and bedding on top. It is waterproof and doesn’t collect moisture, unlike newer materials. Polar bear skin could also be used for the bottom of kamiiks (boots), with the fur facing forward so you wouldn’t slip. This would make it smooth for walking on the ice, so you wouldn’t make any noise when hunting seals.

The top layer of bear claws is usually black. If it is white, then it means the bear is very fierce and aggressive.

The fat of a bear is not too oily, so you can eat more of it than other mammals. It can also be used as lamp fuel.

Additional animal observations

An additional six animal species were observed:

- Arctic char, *Salvelinus alpinus*, **iqaluit**, ᐃᑦᑲᐅᐃᑦ
- Glaucous gull, *Larus hyperboreus*, **naujaq**, ᐱᐅᐭᑦᑲᑦ
- Red-breasted merganser, *Mergus serrator*, **kajjiqtuuq**, ᑲᑦᐭᑦᑲᑦᑲᑦ
- King eider, *Somateria spectabilis*
- Arctic hare, *Lepus arcticus*, **ukaliq**, ᐅᑲᑦᑲᑦ
- Sandhill crane, *Grus canadensis*, **tatiggaq**, ᑕᑲᑦᑲᑦ



Figure 16: Glaucous gull (*Larus hyperboreus*). Photo: C. Murchison, Parks Canada

Signs of animals observed and Inuit Qaujimagatuqangit

Raven, Corvus corvax, tulugaq, ᑕᑕᑲᑦᑲᑦ

Pieces of wood used by a raven to make a nest were observed during the BioBlitz. Ravens use branches on the outside and twigs on the inside of their nests. They are well constructed and are difficult to break apart. They need to be well-insulated, because they start nesting in late winter when temperatures can still reach -20°C. They overwinter in north Baffin and lay their eggs around early April. The young ravens are already flying by June.

One Inuk elder, Elijah Panipakoocho, once had a raven as a pet. It was a small chick when he found it. It wanted to eat at the same time every morning, very early, and was very loud and persistent. Its name was Piku and it could understand basic commands, like “Piku, come”.

Ravens will help each other, like a team or pack. One raven was observed near Clyde River with a broken beak, and the other ravens would feed it. If two dogs are tied and there is meat between them, one raven will tease the dogs, just out of reach, and distract them so the other ravens can eat. Then they will trade places.

Even if you cannot see a dead seal under the ice, the ravens know it is there. They will chip away at the ice to get to the seal to eat it. They know when you are hunting for polar bears and will look for a bear, so you can follow the raven to find a bear. Then they will scavenge the leftovers.

Snowy owl, Bubo scandiacus, ukpik, ᐅᑲᑦᐱᑦᑲᑦ

Snowy owl feathers were observed.

Owls fly very low and fast when they are hunting, and you can't hear them when they are flying. Their eyesight is very strong, like binoculars, and they can see lemmings from far away.

Owls do not just subsist on lemmings – they will eat lots of other animals, like ptarmigan. Even ravens are afraid of snowy owls, and ravens are not afraid of any other animals. Foxes are also afraid of owls, so snow geese like to nest near where the owls are because the foxes are nervous to go there.

If there is a snowy owl nest, you will see lots of dead lemmings nearby. They can be very dangerous when they are protecting their eggs and chicks.

- 4 Parks Canada staff (Marie-Andrée Vaillancourt, Jamie Enook, Justin Milton, Jonathan Pitseolak)



Figure 19: A group of happy BioBlitz Day Camp participants with their quadrats, Pond Inlet. Photo: Parks Canada

During the day camps, youth placed quadrats (square frames measuring 1 m by 1 m) on the ground, and identified all the plants inside the frame with the help of Parks Canada staff. They recorded their observations and shared what they had seen with an Inuk elder, Gamailie Kilukishak. Gamailie then shared his knowledge on those species and other observations of plants and animals in the area.

The workshops were well attended and enjoyed by the youth, with many participants returning each day.

Comments from Inuit participants

Sirmilik National Park is managed cooperatively with Inuit. There are therefore ongoing opportunities for Inuit to contribute to provide input to Parks Canada on activities that take place in the park.

The project and proposed methods were presented to the Joint Inuit-Government Sirmilik Joint Park Management Committee (JPMC) for its review as part of the Parks Canada research permitting process. The JPMC expressed its support for the project.

Project planning, implementation and reporting was conducted with advice from the Sirmilik National Park Pond Inlet Inuit Knowledge Working Group (IKWG), whose members are all Inuit. Meeting notes were kept on the participation of the IKWG in planning and implementing the project, with a focus on the Inuit knowledge component of the project. Below is a summary of key information that was discussed during these meetings.

How Inuit were Inuit involved in the development of the methods

On February 23, 2017, the IKWG provided input on the method for the Inuit knowledge component of the project:

- IKWG members made recommendations on sites that should be visited.
- IKWG members recommended that they all participate in the project on the land and that they would prefer to camp overnight. They suggested alternates in the event that they are not available for unforeseen circumstances.
- Parks Canada staff asked about the method for recording Inuit knowledge. IKWG members suggested that part of the day on the land can be a discussion and planning for the day and discuss field trips; they also noted that elders can also tell legends.

On May 17, 2017, the IKWG and Parks Canada staff discussed the logistical details of the project (number of participants, dates, helicopter travel, camping, food). Parks Canada staff asked for recommendations on how to share Inuit knowledge during the project. The IKWG members indicated that they would have a better idea when they are on site.

On June 21, 2017, the IKWG and Parks Canada staff discussed further details on the project:

- Parks Canada staff presented a proposed agenda for the Inuit knowledge component of the project, as well as draft discussion questions that would be asked of knowledge holders. The questions focus on plants and animals, since that is Parks Canada's priority during the BioBlitz event. IKWG members recommended that during the event Parks Canada staff take the lead with asking questions on-site and with scheduling and flight information, and that the IKWG members share their knowledge on the discussion topics, and that the IKWG members can take the lead to explain the history of the area.
- IKWG identified topic on which they would like to focus: How ice movement has changed, snow geese have migrated to different areas, and some birds that have never been in the area before are now arriving.
- The IKWG was asked if they would prefer to stay as one group for the event, or be divided into two groups in order to visit more locations. The group agreed to be divided into two groups with an IKWG leading each group and Parks Canada staff providing support to each group. The youth member of the IKWG offered to take pictures and recordings on site, while the elders share their knowledge.

Comments provided by Inuit participants in the project

During the event in the park, the schedule was changed dramatically due to helicopter issues preventing youth participants from traveling into the park for the two main days of the event. This also meant that participants camping inside the park were unable to visit sites other than those within walking distance of the Base Camp. Although disappointed that they could not visit other locations or share knowledge with local youth, everyone able to attend was incredibly understanding of these challenges and very flexible and happy to work with organizers to conduct surveys and share knowledge around the Base Camp location.

On July 8, 2017, at the end of the field component of the project, all participants, including IKWG participants, expressed their gratitude for the opportunity to participate in the project despite the logistical challenges.

On July 9, 2017, the youth member of the IKWG posted a thank you note on social media in Pond Inlet, thanking Parks Canada for the time spent in the park with elders and Parks Canada staff as part of the project.

On February 10, 2018, a meeting was organized between Parks Canada, youth and the IKWG, to share the results of the science and Inuit knowledge components of the project. Parks Canada staff presented the science component of the project and Elders share knowledge they wished to share about the park and its wildlife. IKWG and youth expressed their appreciation for that meeting. One elder from the IKWG stressed that such meetings should be happening annually, preferably on the land.

DRAFT Report by Inuit participants

(Final 'Report by Inuit participants' to be submitted to NWMB following review by the participant)

Comments were provided by Elijah Panipakoocho, Chair of the Sirmilik National Park Pond Inlet Inuit Knowledge Working Group, during a meeting (via conference call) with the project leader. During the call, the project leader recorded Elijah's answers as they were translated by an interpreter, who was with Elijah during the call. It was not possible to arrange a follow-up meeting with Elijah, to review the transcript of his comments to ensure they were recorded accurately, in time for the submission of the final report. Once Elijah has reviewed the transcript, a final version of the 'Report by Inuit participants' will be submitted to NWMB.

Elijah Panipakoocho participated in planning the project, in activities on the land and in reviewing Inuit knowledge recorded during the project:

1. Were you involved in the development of the methods? If so, do you feel that your input was considered and applied?

Elijah Panipakoocho: "I am very proud of Parks Canada that the things he suggested be changed were changed right away, really liked project that happened, very proud of it."

2. Do you think that the methods of the project were appropriate for the purpose? If not, how could they be improved?

Elijah Panipakoocho: "All the methods used very well. The only issue was the helicopter issue which could have improved a lot of things to transport people in and out."

3. Did the project effectively incorporate Inuit Qaujimajatuqangit? If not, how could it be improved?

Elijah Panipakoocho: "The only issue was that the youth participants who were supposed to come to Nanuqsuititalik were not there, so the main issue was transportation by helicopter, so youth were not there to learn and use Inuit knowledge."

4. Were the methods undertaken in the project respectful of wildlife? Would you change anything about the methods of the project?

Elijah Panipakoocho: "Yes." (No comment)

5. Were you involved in the analysis and interpretation of the project's results? If so, do you feel that your input was considered and applied?

Elijah Panipakoocho: "Since I finally see the report in hand, and going through this very quickly, yes, the interpretation is there, once I get a chance to review the whole document, I might have more things to say or edited, but I like the report."

6. How do you think that the results of the project could best be applied to wildlife management in Nunavut?

Elijah Panipakoocho: "All this information is very great information and should be distributed to the younger generations and I hope that there is a chance that the information will be shared not just to NWMB and some of this information include medication from Inuit knowledge."

7. Is there any information not included in the Final Project Report that you think is important to the outcomes of the project?

Elijah Panipakoocho: “Maybe by going through the report, it would be great if the survival techniques are added, on how to survive on the land if you do not have equipment with you, using what is on the land. Maybe perhaps include an education program including as part of exploration, for people who are new to the Arctic. This is a really great information to use, especially if there was an incident, these methods could be used if something happens on the land. The vegetation that is on the pictures could be used for medical purposes even if people are on the land without food; the method could be used to save lives if something happens on the land. If we have any chance to add information about survival skills to younger generations, I would like to educate younger people about this very useful information. I would really appreciate if these documents could be used for educational purposes and as an elder person I have only so much time and not enough time to educate younger generations, and in the long run I hope this information will be used in the future, or even perhaps the school can adapt this and use it for education programs in the long run, not just being kept with Parks Canada Agency or NWMB, but used for education purposes. I do hope that Sirmilik National Park can share this information in the future, that it is a very useful document, and to keep it alive for the long run. Maybe perhaps have colour documents available and distributed.”

Reporting to communities/resource users

Community / HTO	Before research	During research	Completion of research
Mittimatalik HTO	Dates: 17 January and 23 May 2017 Type: In-person consultation at HTO meeting.	None	Date: Fall 2018 Type: In-person sharing of results at HTO meeting.
Sirmilik National Park JPMC	Dates: 12 January and 30 March 2017 (in-person) 29 May 2017 (conference call)	One JPMC member participated in BioBlitz	Date: 18 December 2017 Type: Conference call presentation of field report Date: Fall 2018 or Winter 2019 Type: Conference call presentation of final report
Pond Inlet Sirmilik National Park Inuit Knowledge Working Group	Dates: 23 February 2017 (in-person) 17 May and 21 June 2017 (conference call)	Three members, including youth member, participated in BioBlitz	Date: February 2-3, 2018 Type: In-person workshop to share results and review Inuit Qaujimaqatuqangit recorded during BioBlitz Date: Fall 2018 or Winter 2019

			Type: Conference call or in-person meeting presentation of final report
Inuit Qaujijimajatuqangit Leaders	Inuit Qaujijimajatuqangit leaders were identified from members of the Pond Inlet Sirmilik National Park Inuit Knowledge Working Group and Joint Park Management Committee, and both these groups were consulted as described above.		
Youth participants	None	4 July 2017 (Orientation before BioBlitz event) Participation in main event not possible due to helicopter issues	Date: February 10, 2018 Type: Workshop for elders to share knowledge with youth, and present on BioBlitz event and results
Community of Pond Inlet	Date: 29 May 2017 Type: In-person presentation at Hamlet meeting	Date: 8 July 2017 Type: Community celebration	Date: Fall 2018 / Winter 2019 Type: Radio call in show and/or in person sharing of results,

Conclusion

During the BioBlitz event, the schedule was changed dramatically due to helicopter issues preventing youth participants from traveling into the park. This also meant that participants camping inside the park were unable to visit sites other than those within walking distance of the Base Camp. Although disappointed that they could not visit other locations or share knowledge with local youth, everyone able to attend was incredibly understanding of these challenges and very flexible and happy to work with organizers to conduct surveys and share knowledge around the Base Camp location.

The Sirmilik National Park BioBlitz was successful in its goals of contributing to the park’s terrestrial inventory and by gathering Inuit Qaujijimajatuqangit (knowledge) in an area of the park that has been largely unstudied. Both western scientific and Inuit knowledge were effectively captured, as seen above, and this information will be used to update park species lists and in the Sirmilik National Park Ecological Integrity monitoring program.

In addition to the scientific and knowledge-based goals, the BioBlitz aimed to connect researchers and local Inuit community members. The opening evening of the BioBlitz event was a session with Inuit elders and researchers to build relationships and facilitate an exchange of knowledge. These discussions and



Figure 20: Inuk elder Elijah Panipakoocho and researcher Dominique Berteaux (Université de Québec à Rimouski) examine the remains of a sodhouse. Photo: M. Mahy, Parks Canada

connections continued throughout the remainder of the event and were a highlight for all participants. As one researcher, Gilles Gauthier (Université Laval), stated:

“... I totally enjoyed the time I spent here the past couple of days... I’ve been coming here for a long time, and my studies aim at learning more about how the ecosystem works and the species interact... I use the scientific method; it’s a different perspective than the Inuit knowledge. Every year I learn new things, but I must say in the last two or three days, it’s been a long time since I’ve learned so many new things in such a short period of time through the interaction that we had, learning more from the local perspective.”

During the follow-up meetings in February 2018, the Inuit Knowledge Working Group expressed their wish that the knowledge and stories recorded during these sessions be shared, particularly with the younger generations. Parks Canada aims to do this in part by the sharing of the 2017 BioBlitz results, as well as continuing to build connections through future workshops and experiential learning on the land with youth and elders whenever possible.

