

# Biological and archeological assessment of Itinneq, July 2023



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Cover photo: Itinneq facing west, with head of Miligiaq fjord in the distance. H. Harmsen, 2023.

Special thanks to Frederik Fuuja Larsen for Danish and Greenlandic translations.

## Recommendations for Itinneq

Value	Recommendation
<b>Vegetation</b>	<ul style="list-style-type: none"> <li>• Further fieldwork and monitoring should be conducted on the flora of the area to gain insights to the frequency, distribution and occurrence of other plant species currently unidentified at Itinneq</li> <li>• Further fieldwork should be conducted on the flora of the area to gain insights on the occurrence of other red-listed species historically known in the area.</li> <li>• Clearly demarcating a path for the ACT would reduce future damage to the vegetation and weak spots in the landscape.</li> <li>• Discourage illegal ATV use in the open land.</li> </ul>
<b>Wildlife</b>	<ul style="list-style-type: none"> <li>• Wildlife is most active and often migrates in the hours around dusk and dawn, therefore minimal human presence in those periods may lower potential negative impacts to these resident species.</li> <li>• Efforts should be made to avoid disturbing White Fronted geese in the late spring at Itinneq.</li> <li>• Further research and monitoring should be performed on White Fronted geese and their use of and behavior in this area.</li> <li>• Humans should move through the area in predictable patterns within a designated space and on formally marked paths. This allows the wildlife to become accustomed to an increased human presence over time.</li> <li>• Visitors should exercise extreme caution at Itinneq in late July and August when male musk ox are observed to be more aggressive and territorial.</li> </ul>
<b>Cultural Heritage</b>	<ul style="list-style-type: none"> <li>• New signage and dissemination materials sharing the history of Itinneq and Itinnerup Tupersuai, as well as Site-specific guidelines for sustainable use of the area could help to add value to the visitor experience and decrease future damage.</li> <li>• Following the regulations outlined in Inatsisartutlov nr. 11 af 19. maj 2010 om fredning og anden kulturarvsbeskyttelse af kulturminde, all paths or marked trails should remain at a minimum distance of 2 meters from any ancient cultural feature observed in the landscape and in some cases completely avoid highly vulnerable area.</li> <li>• Encouraging better waste management and a 'carry-in, carry-out' policy for all visitors.</li> </ul>



## Anbefalinger for Itinneq

Værdi	Anbefaling
<b>Plantevækst</b>	<ul style="list-style-type: none"> <li>• Der bør udføres yderligere feltarbejde og overvågning af områdets flora for at få indsigt i hyppigheden, udbredelsen og forekomsten af andre plantearter, der i øjeblikket ikke er identificeret ved Itinneq</li> <li>• Der bør udføres yderligere feltarbejde på områdets flora for at få indsigt i forekomsten af andre rødlistede arter, der historisk er kendt i området.</li> <li>• En tydelig afgrænsning af en sti til ACT vil reducere fremtidige skader på vegetationen og svage steder i landskabet.</li> <li>• Fraråder ulovlig ATV-brug i det åbne land.</li> </ul>
<b>Dyreliv</b>	<ul style="list-style-type: none"> <li>• Dyrelivet er mest aktivt og migrerer ofte i timerne omkring skumring og daggry, derfor kan minimal menneskelig tilstedeværelse i disse perioder sænke potentielle negative påvirkninger af disse lokale arter.</li> <li>• Der bør tilstræbes at undgå at forstyrre Blisgæs i det sene forår ved Itinneq.</li> <li>• Yderligere forskning og overvågning bør udføres på Blisgæs og deres brug af og adfærd i dette område.</li> <li>• Mennesker bør bevæge sig gennem området i forudsigelige mønstre inden for et udpeget areal og på formelt afmærkede stier. Dette gør det muligt for dyrelivet at vænne sig til en øget menneskelig tilstedeværelse over tid.</li> <li>• Besøgende bør udvise ekstrem forsigtighed ved Itinneq i slutningen af juli og august, når han moskusokse observeres at være mere aggressiv og territoriale.</li> </ul>
<b>Kulturarv</b>	<ul style="list-style-type: none"> <li>• Ny skiltning og formidlingsmateriale, der deler historien om Itinneq og Itinnerup Tapersuai, samt stedspecifikke retningslinjer for bæredygtig udnyttelse af området kan være med til at tilføje værdi til besøgendes oplevelse og mindske fremtidige skader.</li> <li>• Følger de regler, der er beskrevet i Inatsisartutlov nr. 11 af 19. maj 2010 om fredning og anden kulturarvsbeskyttelse af kulturminde, bør alle stier eller afmærkede stier forblive i en afstand på mindst 2 meter fra ethvert fortidsminde i landskabet og i nogle tilfælde helt undgå meget sårbare områder.</li> <li>• Tilskyndelse til bedre affaldshåndtering og en 'carry-in, carry-out'-politik for alle besøgende.</li> </ul>



## Itinnerq innersuussutit

Naleqassusaa	Innersuussut
<b>Naasoqassusaa</b>	<ul style="list-style-type: none"> <li>• Itinnerani naasoqassusaa sumiiffimmilu naasunik suli nalunaarsorneqarsimanngitsunik misissueqqinnissaq alaatsinaannissarlu kissaatiginarpoq.</li> <li>• Sumiiffiup naasoqassusaa sukumiinersusumik misissuiffigineqarnissaanut ilaatigut pissuteqarpoq sumiiffimmi naasut qaqutigoortut qangarsuaaniilli ilisimaneqartut paasiniaaruarnissaat.</li> <li>• Pisuttut aqquataa ACT (Arctic Cirkel Trail)’ip erseqqarinnerusumik killilerlugu nalunaaqutserneratigut naasoqassuseq nunalu qaarsuunngitsoq taamaalillutik illersorneqassagaluarput.</li> </ul>
<b>Uumasut</b>	<ul style="list-style-type: none"> <li>• Sumiiffimmi uumasut ullaassakkut unnulerneranilu angallakkajunnerusarput, taamaattumik piffissani taakkunanani uumasunik akornusersuivallaannginnissaq eqqarsaatigalugu inunnik angallattoqarpallaannginnissaa kissaatiginarpoq.</li> <li>• Itinnerani upernaap naajartornerani nerlerit sumiiffimmiikkajuttartut akornusersornaveersaartariaqarput.</li> <li>• Nerlerit sumiiffimmi atuinerat annerusumik ilisimatusarfigineqarlutik malinnaavigineqartariaqarput.</li> <li>• Inuit sumiiffimmi aalajangersimakannersumik aammalu nalunaarsukkanik angallaffeqartariaqarput, taamaalilluni piffissap ingerlanerani uumasut inuit angallannerannut akornusersorneqarpallaaratik sungiussiniassammata.</li> <li>• Julip naalernerani aamma augustimi Itinnerani takornariat mianersorluartariaqarput piffissamimi tassani umimmaat angutiviarsuit qaninngoorsinnaammata ulorianarsinnaasarlutillu.</li> </ul>
<b>Kulturikkut eriagisassat</b>	<ul style="list-style-type: none"> <li>• Itinnerup aamma Itinnerup Tupersuai’sa oqaluttuassartaat pillugit allagartaliisoqarlunilu paasititsiniutinik pilersitsisoqarneratigut aammalu sumiiffimmik atajuartitsinissaaq pillugu malittarisassiortoqartariaqarpoq, taamaalilluni aamma atuisunut tikeraanullu tikikkuminarnerussammat sumiiffillu illersorneqarnerulluni.</li> <li>• Inatsimmik eqqissisimatitsineq kulturikkullu kingornussat pillugit Inatsisartut Inatsisaanni nr.11, 19.maj 2010-meersoq malikkaanni aqqusiat / aqqutit nalunaakkat kulturikkut eriagisassaniit minnerpaamik 2 meterinik ungasitsigisumiissapput, ilaatigut aamma nunaminertat innarliasut aqqutigineqartarnissaat innersuutigineqanngilaq.</li> <li>• Eqqakkanik qimatinngilluinnarnissaaq kajumissaarutigineqarpoq sumiiffimmilu atuisunut “Ilummut nassaruk silammullu nassaruk” politikki tamanut atuuttariaqarpoq.</li> </ul>

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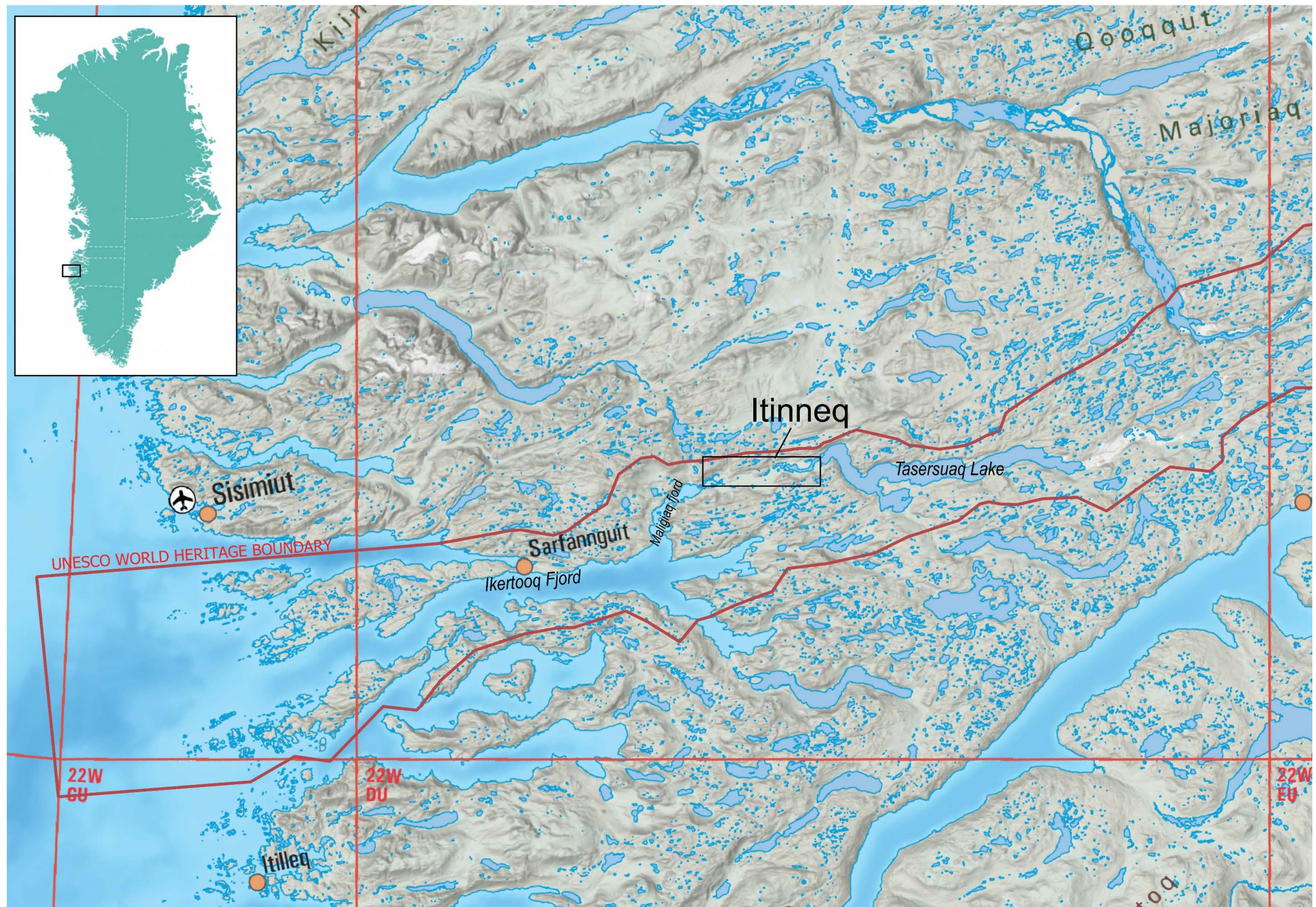


Figure 1. Map showing the location of the Itinneq inside the UNESCO World Heritage area of Aasivissuit – Nipisat.



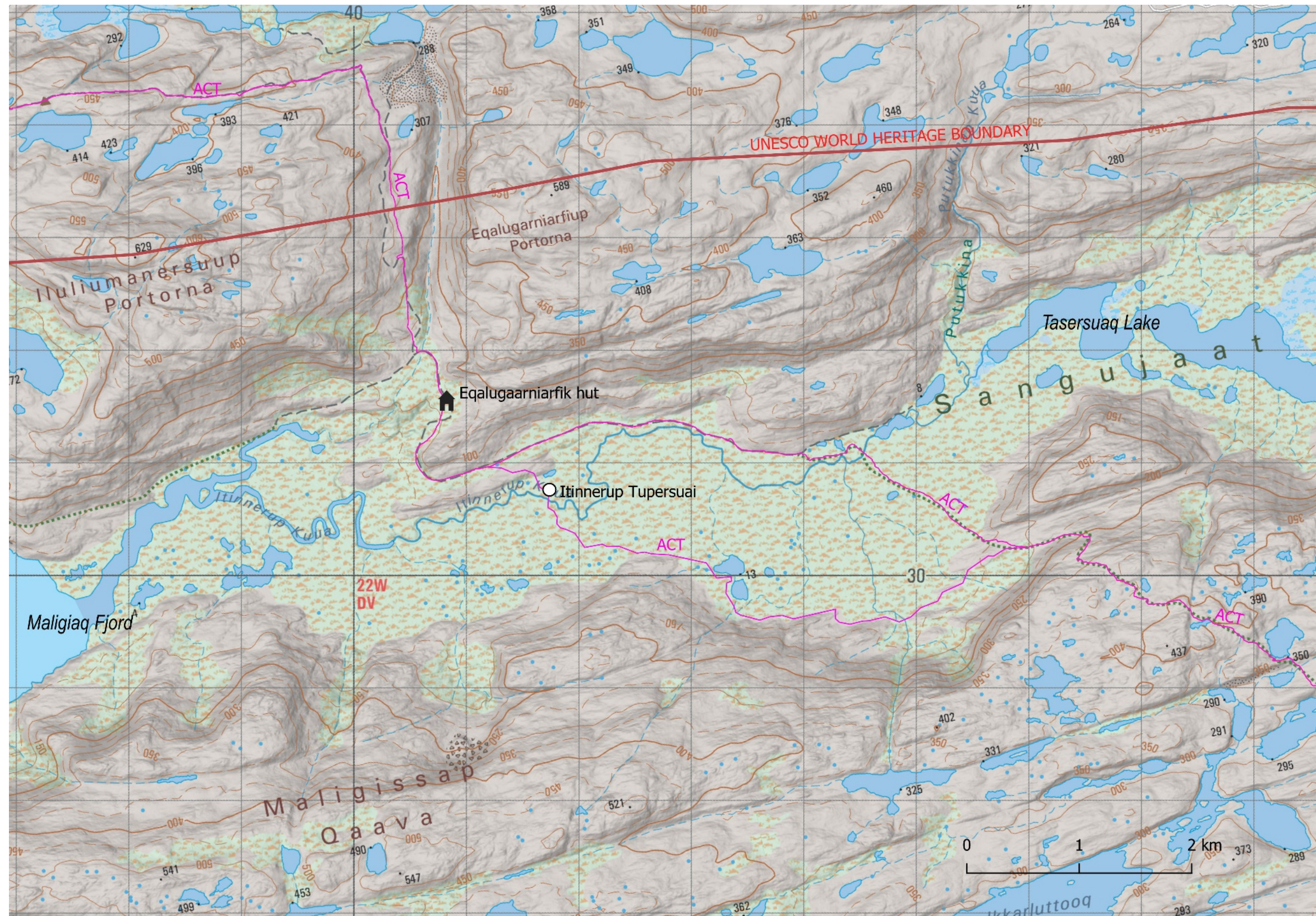


Figure 2. Map of Itineq with Arctic Circle Trail (ACT) shown in purple. Note: when entering into the valley the trail splits between a northern and southern route. In 2024, hikers took to the southern route due to the high level of the river that required using the foot bridge near Itinnerup Tupersuai.





Figure 3. Itinneq valley and the Itinnerup Kuua (Itinnerup River), facing east. Photo: Harmsen 2023.

## Introduction

Itinneq is a low-lying river valley between the head of Maligiaq fjord and the Tasersuaq lake just below the northern border of the UNESCO World Heritage area of Aasivissuit – Nipisat (Figure 1). Stretching approximately 13 kilometers from east to west, the Itinnerup Kuua (Itinnerup River) winds its way between the lake to the east emptying into the Maligiaq fjord (Figure 2). The valley measures just over 2 km at its widest point, with many small ponds and marshy areas that increase in size and frequency depending on the annual amount of precipitation. This valley has a long history as a transportation corridor that would provide easy access from the Ikertooq and Maligiaq fjords to the inland hunting areas. Once the river became too shallow, people would portage their kayaks and umiaqs overland to Tasersuaq. Using this route, a whole settlement could be moved in two or three days from the outer coast to the interior hunting grounds.

Today, many local people still use this route, travelling by boat upriver in the summer (Figure 3) and by snowmobile over the frozen land in the winter. The Arctic Circle Trail (ACT) also cuts across the valley with a northern and southern route. The southern route cuts through the ancient camp of Itinnerup Tupersuai and connects with the winter snowmobile trail roughly 100 meters to the north of the ancient campsite. When arriving from the east, the ACT crosses the river over a wooden bridge nearby the site. However, in July of 2023, due to the high-water level and strong current of the river, the bridge was moved a short distance upstream by local hunters.

The area is home to a diverse ecosystem supporting several different types of vegetation and animal species. The most striking attribute related to sensitivity for the terrain and vegetation in this area is the dry and fine-grained soil in the higher elevation areas contrasted by the wet and inundated areas in the lower terrain. This ecosystem is dynamic and was shaped by both humans and natural processes over the last several millennia. Strong wind and dry weather have resulted in sand-flow and natural erosion, and it is not always possible to differentiate between these natural processes and more recent human influences on this landscape. One of the main challenges for the local environment is that natural recovery for vegetation is incredibly slow, requiring long periods of time to re-establish itself after a disturbance.

Although many of the visible archaeological remains in the area are most likely from the 19<sup>th</sup> and 20<sup>th</sup> centuries, several ancient graves are also identified, providing evidence that the valley was a hunting ground and frequently traversed by Inuit travelling inland from the coast. If visitor levels continue to increase at Itinneq, it will be important to inform people to stay on the established paths and warn against venturing into the steep terrain or wet areas so as to avoid widening or creating non-sanctioned shortcuts through sensitive areas.

Itinneq has only been visited a few times by archaeologists and biologists in recent years. In 2016, during the early part of the UNESCO nomination process, Itinnerup Tupersuai was investigated a small team of archaeologists from the National Museum of Denmark and Greenland National Museum. In 2021, the site was revisited and a vulnerability assessment performed by Dagmar Hagen from the Norwegian Nature Institute, Victoria Qutuuq Buschman from the Greenland Nature Institute and Jens Fog Jensen from the National Museum of Denmark (see Harmsen, Hagen, and Buschman 2022) as part of a larger survey connected to the Activating Arctic Heritage project. During the site visit in 2021, the team surveyed the ancient camp area and the surrounding terrain with special attention given to the eastern section of the ACT, and west up to the public cabin (Eqalugaamiarfik) situated near to the northwest of the site.

Between 10-12 July 2023. A follow-up site visit was performed by National Heritage Resources Manager, Hans Harmsen from Greenland National Museum, biologists Ida B. Dyrholm Jacobsen, Mathilde Le Moullec from the Greenland Nature Institute and UNESCO Park Ranger Christian Pihlblad Jerimiassen. During this visit, further efforts were made to map the immediate area around Itinnerup Tupersuai, establish more baselines for presence/absence of different vegetation and animal species and examine what other human pressures were becoming visible on the landscape. This report summarizes the observations collected by the team as well as additional commentary on the future development of the area and ACT by Lisa Germany, Qeqqata Municipality's Content & Trail Manager for Arctic Circle Business.

## **Present and Future Use of Itinneq**

Entry to Itinneq is possible either by boat or by hiking overland. Most local hunters arrive by boat, and travel further inland by sailing smaller boats upriver to Tasersuaq. Larger boats are left in the fjord in favor of flat bottom skiffs that can traverse far up the river to Itinnerup Tupersuai. The principal season of use of Itinnerup Tupersuai is by local hunters in August and September. This general area is expected to become a prominent destination with more intensified camping activities due to both its proximity to the new Sisimiut-Kangerlussuaq Nature Road to the north and the steady annual increase of hikers on the ACT. Except for one sign (Figure 4) denoting the direction to the Itinneq river bridge found high on one of the ridges to the north of Itinnerup Tupersuai, the area currently





Figure 4. UNESCO Park Ranger Christian Pihlblad Jerimiassen standing by the one directional sign at Itinneq that points the way toward the river bridge. Photo: Harmsen, 2023.

possesses no informational or interpretive signage to inform visitors of the history of the area or guidelines for best practices while on the trail.

The overall impression of this site from a biological perspective is that it is very sensitive, the sandy soil being highly friable and unstable with thin vegetation cover. However, this is a natural consequence of the terrain and the traditional use of the area that has shaped the present-day ecosystem. The area is currently protected under several legislative acts and executive orders that are intended to protect the cultural heritage, wildlife, environment and unique values of the UNESCO World Heritage area. These legal protections are listed in Table 1 on the following page.

Table 1. Current legislation and executive orders defining the use and protection of the inscribed World Heritage property of Aasivissuit – Nipisat.

<b>Year</b>	<b>Designated legislation</b>
1937	Letter of 10 April 1937 to the Colony Manager at Angmagssalik regarding protected sites, j.nr. 556/36 (cf. Nipisat)
2010	<b>Inatsisartut Act no. 11, 19 May 2010</b> on Cultural Heritage Protection and Conservation.
2010	<b>Inatsisartut Act no. 17, 17 November 2010</b> on Planning and Land Use.
2011/2012	<b>Inatsisartut Act no. 9 of 22 November 2011</b> on Environmental Protection, revised in <b>Inatsisartut Act no. 1 of 29 May 2012</b> .
2015	<b>The Museum Act – Inatsisartut Act no. 8, 3 June 2015</b> on museum activities
2016	<b>Executive Order no. 12 of 21 June 2016</b> on protection of Greenland's internationally appointed wetlands and protection of some species of water birds ('The Ramsar Executive Order').
2018	<b>Executive Order no. 1 of 30 January 2018</b> on the second cultural heritage protection of a defined area in West Greenland around Aasivissuit-Nipisat.
2020	<b>Executive Order No. 38 of 1 October 2020</b> on the assessment of the impact on cultural heritage in cultural history areas.





Figure 5. Tall shrub (75 - 100 cm) of *Betula nana* and *Salix glauca* is one of the dominant vegetation types at Itinneq. Photo: Dyrholm Jacobsen, 2023.

## Vegetation in Itinneq

The dominant vegetation types at Itinneq are *Betula nana* and *Salix glauca* shrub (Figure 5). Vegetation communities can be grouped into three broad categories: (1) exposed abrasion ridges dominated by *Saxifraga triscuspidata*, *Calamagrostis purpuracense* and *Poa glauca*; (2) wetland areas dominated by *Eriophorum angustifolium* and other *Calamagrostis* species; and (3) sandy and silty areas almost completely devoid of vegetation but are in fact important habitats for the red listed species *Spergularia canadensis* (Figure 6).

A mosaic of taller *Betula* and *Salix* shrubs dominate the central flatter wetland plains of the central part of the valley along former riverbeds, with exposed ridges and sandy areas common in the surrounding hills of the valley. Additionally, several red listed vascular plant species (Figure 7) have historically been registered in the area (Boertmann and Bay 2018).



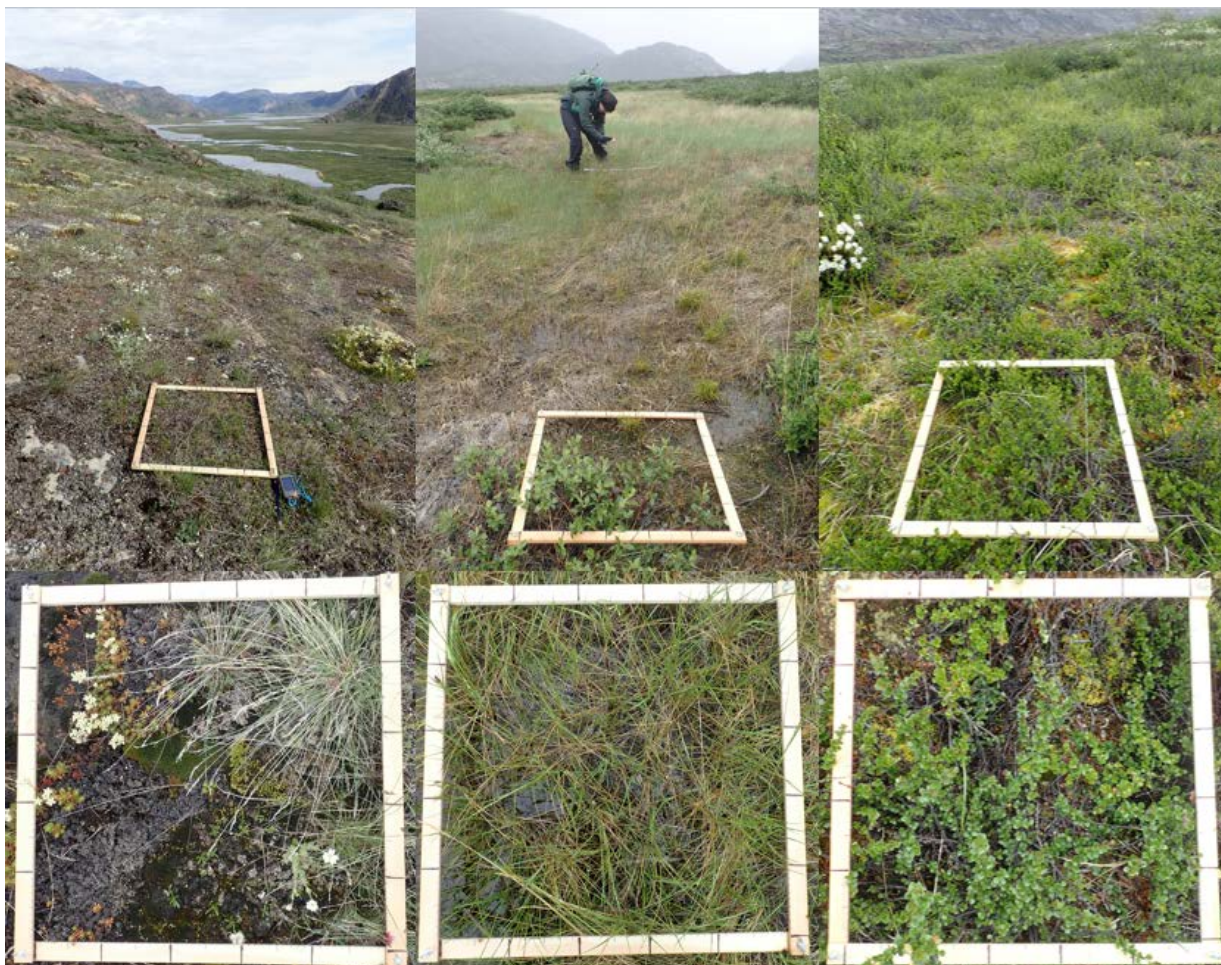


Figure 6. Illustration of the three main vegetation communities monitored, abrasion/steppe (left), wetland (middle) and shrubland (right). Red Listed Plants Species. Photos: Dyrholm Jacobsen, 2023.



Figure 7. *Spergularia canadensis*. One of the red listed plant species know from the area. Observed in 2023. Photo: Dyrholm Jacobsen, 2023.



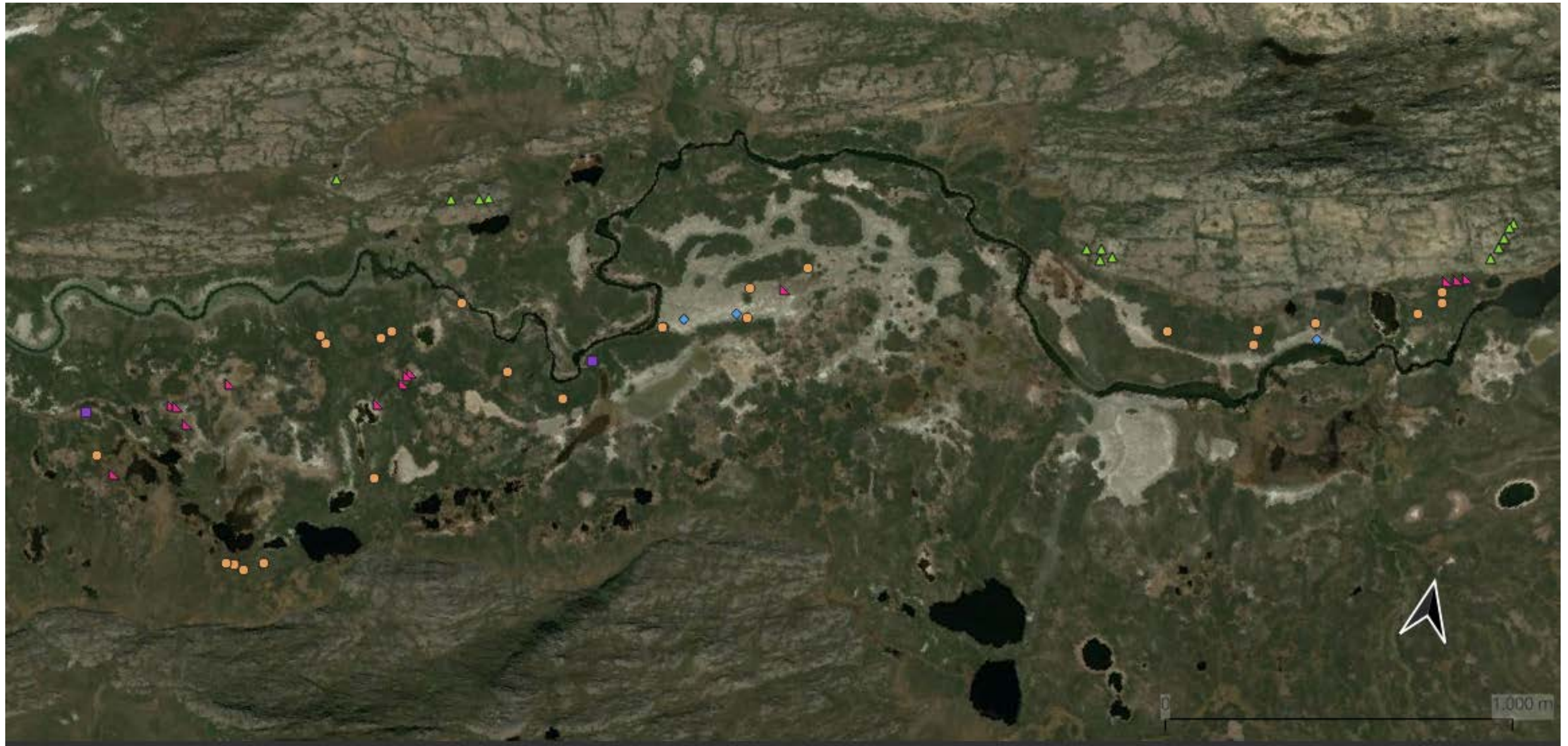


Figure 8. Map of the valley of Itinneq. Symbol indicators marks vegetation sampling. Green triangle = abrasion/steppe, purple square = grassland, orange circle = shrub, blue square = silt, red triangle = wetland.





Figure 9. Plant biologist Ida B. Dyrholm Jacobsen from the Greenland Nature Institute registering plant species at Ittineq, which are now publicly searchable on iNaturalist. Photo: Harmsen, 2023.

## Red Listed Plants

Red listed species observed at Ittineq include *Arctostaphylos uva-ursi* ssp. *coactilis*, *Juncus ranarius*, *Myriophyllum spicatum* ssp. *exalbescens*, *Primula egaliksensis*, *Ranunculus cymbalaria*, and *Spergularia canadensis*.

*Spergularia canadensis* (Figure 7) was specifically identified during the field work in 2023 (see [Appendix A](#)). Red listed plant taxa in Greenland are not subject to any specific protection. At present, no human activities at Ittineq are observed to have a negative impact specifically on red listed plant taxa.

## Plant species registered in the area

All plant taxa observed at Ittineq during the 2023 field work were registered online in [iNaturalist](#). The taxa registered including 53 plant taxa (previous page Figure 8). Both the website and app work well as both an outreach and dissemination platform for anyone interested in the biology of the area. The data from the 2023 fieldwork is publicly available and serves as a repository for accumulating observations from the area by researchers, professionals and citizen scientists (Figure 9).





Figure 10. Human made tracks and trails at Ittneq may potentially alter water flow which can influence species composition and vegetation structure. Photo: Harmsen, 2023.

### **Potential impacts on the vegetation**

The most prominent evidence of anthropogenic influences on the area is from paths carved into the terrain from pedestrian hikers and ATVs (Figure 10). Both types of tracks are clearly visible in several locations in the area. The tracks visually impact the area, but we would note that these types of tracks are common in all recreational areas visited by people all over Greenland. However, we would note that the formation of tracks does have the potential to change the flow of water in areas bigger than the track itself and over time influence species composition and vegetation structure. This is because water regimes (e.g., availability, flow, level) are a central determinant of the species composition of vascular plants, bryophytes and lichens.





Figure 11. Caribou in West Greenland. Photo: H. Thing from Jensen et al. (2017):34, Fig. 2.13.

## Wildlife in Itinneq

Itinneq holds a high diversity of resident and migratory animal species. Wildlife documented in this report by wildlife biologist Mathilde Le Moullec from the Greenland Nature Institute between 10-12 July 2023 provide only evidence of presence (Figure 12, Table 2). Other terrestrial species may have been unnoticed or use the area in different seasons or times of day. The site was and is still used as a key hunting location for caribou. Caribou hides and legs were left at the transition transport points, from the land to the river (connected to the sea) and from the land (on foot) to the ATV track access to the cabin. The remains of 26 caribou were identified from the last hunting season.

The Arctic Circle Trail cuts across Itinneq which may bring hikers into close contact with local wildlife residing in the area at various times of the year. During the visit in July 2023, one musk ox bull was observed in the area. A well-marked path would avoid the spreading of hikers across the southern part of the valley which would help minimize wildlife disturbance.

Itinneq is particularly important for the population of Greenland white-fronted geese (*Anser albifrons flavo-stris*). This subspecies of white goose winters in Ireland and Scotland migrating north via Iceland to Greenland to breed. It breeds only in West Greenland between Nuuk (64°N) and Upernavik (73°N). After arriving in Greenland at the beginning of May, the geese, especially the females, are completely dependent on being able to replenish their fat reserves before the breeding season. Geese stay an average of 11 days at resting places before moving on to their breeding grounds.



feeding on sedge and willow. Access to good resting places with suitable and nutritious herbs plays a decisive role in their breeding success. (Mæhl, Aamand Kristensen, and Larsen 2017:16)

Our visit in June 2023 was after the breeding season of most ground nesting birds so we did not observe any white-fronted goose (*albifrons flavirostris*) in the area. However, we did observe signs of grubbing on the vegetation (which could be attributed to either the White-fronted or Canadian geese.) We also observed one newly hatched Lapland longspur. This was likely the second clutch of the breeding pair as large chicks were already flying around. Some ptarmigan were also observed with newly hatched chicks.

On the upper mountain, above the cabin, two caribou were observed in the mid-afternoon. With the warm weather, absence of wind and mosquitoes, caribou are expected to use high elevation habitats during the day, seeking out breezes and/or snow patches to escape the heat. At dusk, caribou may come down to graze in the valley, however, this was not observed at the time of our visit. Only one caribou carcass was found, believed to be from a natural death during the previous winter.

Table 2. List of species observed at Itinneq between 10-12 July 2024.

Terrestrial mammals	Caribou ( <i>Rangifer tarandus groenlandicus</i> ) Muskox ( <i>Ovibos moschatus</i> ) Arctic hare ( <i>Lepus arcticus</i> ) Arctic fox ( <i>Vulpes lagopus</i> )
Birds	Common redpoll ( <i>Acanthis flammea</i> ) Northern wheatear ( <i>Oenanthe oenanthe</i> ) Lapland longspur ( <i>Calcarius lapponicus</i> ) Snow bunting ( <i>Plectrophenax nivalis</i> ) Rock ptarmigan ( <i>Lagotus muta</i> ) Red-necked phalarope ( <i>Phalaropus lobatus</i> ) Raven ( <i>Corvus corax</i> ) White-tailed eagle ( <i>Haliaeetus albicilla</i> ) Mallar ( <i>Anas platyrhynchos</i> ) Red-breasted merganser ( <i>Mergus serrator</i> ) Harlequin duck ( <i>Histrionicus histrionicus</i> )
Fresh water fish	Arctic char ( <i>Salvelinus alpinus</i> ) Spined stickleback ( <i>Gasterosteus aculeatus</i> )



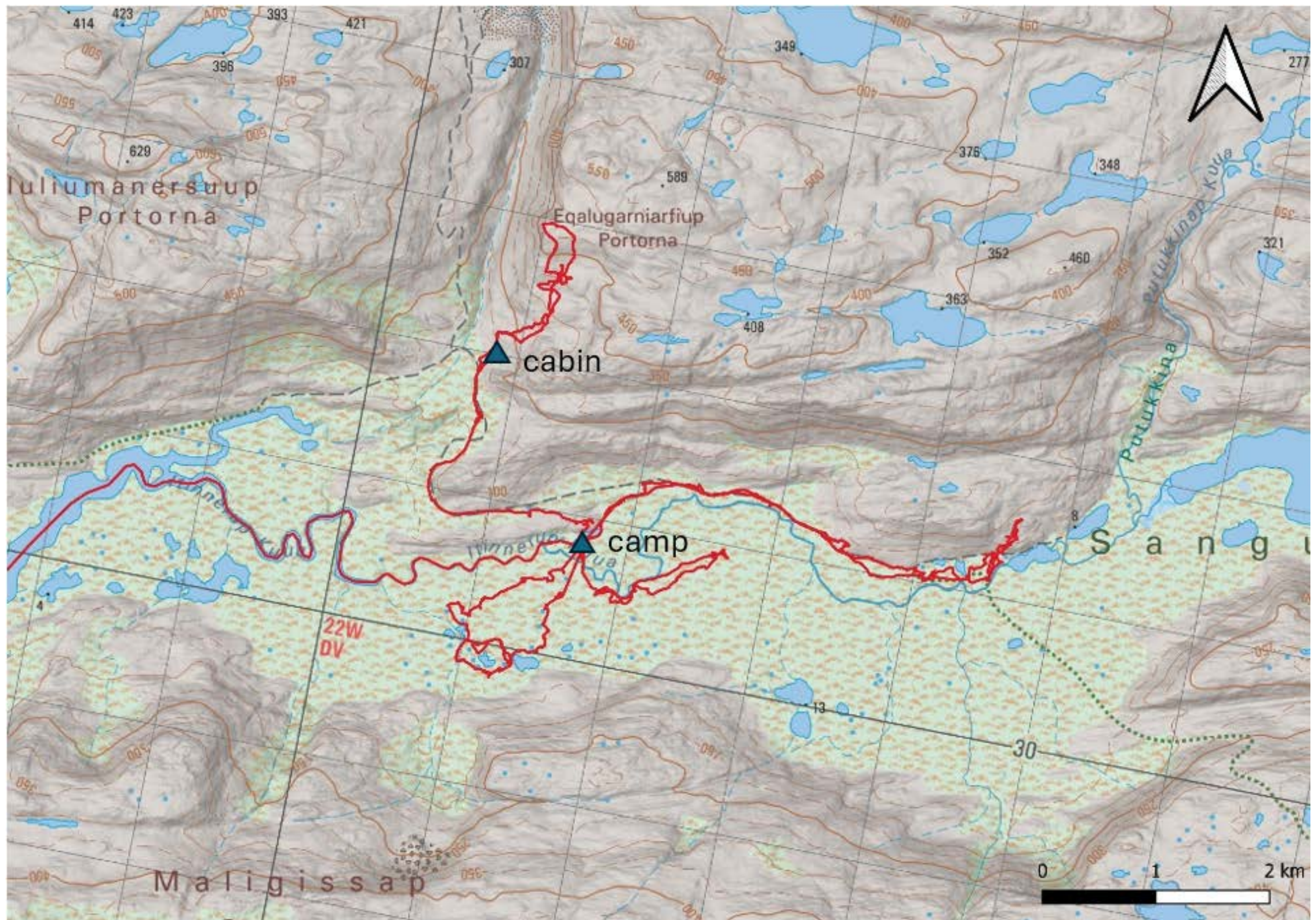


Figure 12. Red line shows routes walked for the wildlife/vegetation monitoring at Itinneq.



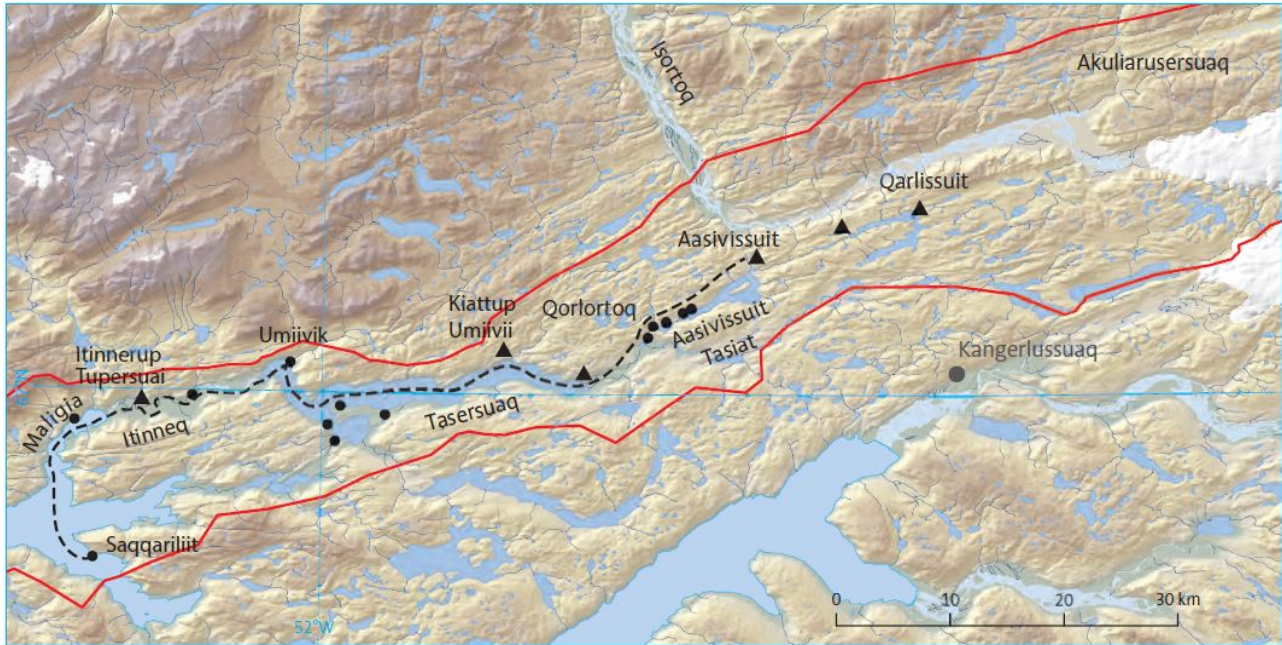


Figure 13. Map showing the route (broken line) from Saqqariliit to Aasivissuit and the archaeologically recorded camp sites along the route. Triangle: camp sites with many ruins (tent houses, tent rings); circle: small camp sites/shelters. From Jensen et al. (2017:55, Fig. 2.33)

## Cultural Heritage in Itinneq

The route from the Ikertooq Fjord through Maligiaq and Itinneq to the inland hunting areas was used by early Paleo-Inuit groups and later by Thule culture Inuit (Figure 13). This route was efficient and fast, allowing quick travel to the head of the fjord, upriver and across the inland lakes by umiaq and qajaq. In this manner a whole Inuit settlement could be moved with by within a few days, portaging the boats overland at certain points along the way. One notable stopover on this journey to the inland for many families was Itinnerup Tupersuai (Figure 14), a small summer camp area located at the of the bend of the river that becomes too shallow to traverse by boat. The early use of inland resources throughout this area is evidenced by the many Paleo-Inuit/Inuit stray finds, features and camp sites found along the route.

### Itinnerup Tupersuai (NKAH 2618)

Itinnerup Tupersuai can be accessed by hikers arriving from either the east or from the northwest along the ACT (Figure 15). The site is characterized by a large, grassy pear-shaped 70 x 60 m<sup>2</sup> flat area surrounded by willow scrub (Figure 16). The site is still used today for camping by local people and the only visible features are more recent tent rings comprised of head-sized cobbles. These stones have been re-used and arranged according to the needs of people during seasonal occupations spanning far into the past. There are no ruins of any other dwelling types (such as tent houses) or other domestic features (e.g. smoking ovens or caches) observed at Itinnerup Tupersuai. There are, however, a few pits and depressions which could be the remains of older tent house constructions—but none are preserved well enough to suggest their function or a discernable





Figure 14. The Key Site of Itinnerup Tapersuai facing the southeast. At the time of the visit, a tent had been pitched but was unoccupied and a large amount of garbage was found in the vicinity which was cleaned up by the Park Ranger. Photo: Harmsen 2023).

diagnostic type. In 2016 limited sub-surface testing was performed by Harmsen from the Greenland National Museum to see if midden deposits were present on site and only conducted on the south facing slope of the camp area. At that time no demonstrable evidence of any midden deposits were identified. Midden deposits could be present in other nearby locations that have not been thoroughly surveyed.

A small graveyard containing six Christian burials is found approximately 50 meters to the southeast of the camp area with several other traditional Inuit cairn graves found in the surrounding terrain and higher elevation areas to the north (Figure 15). These graves are described in further detail below.



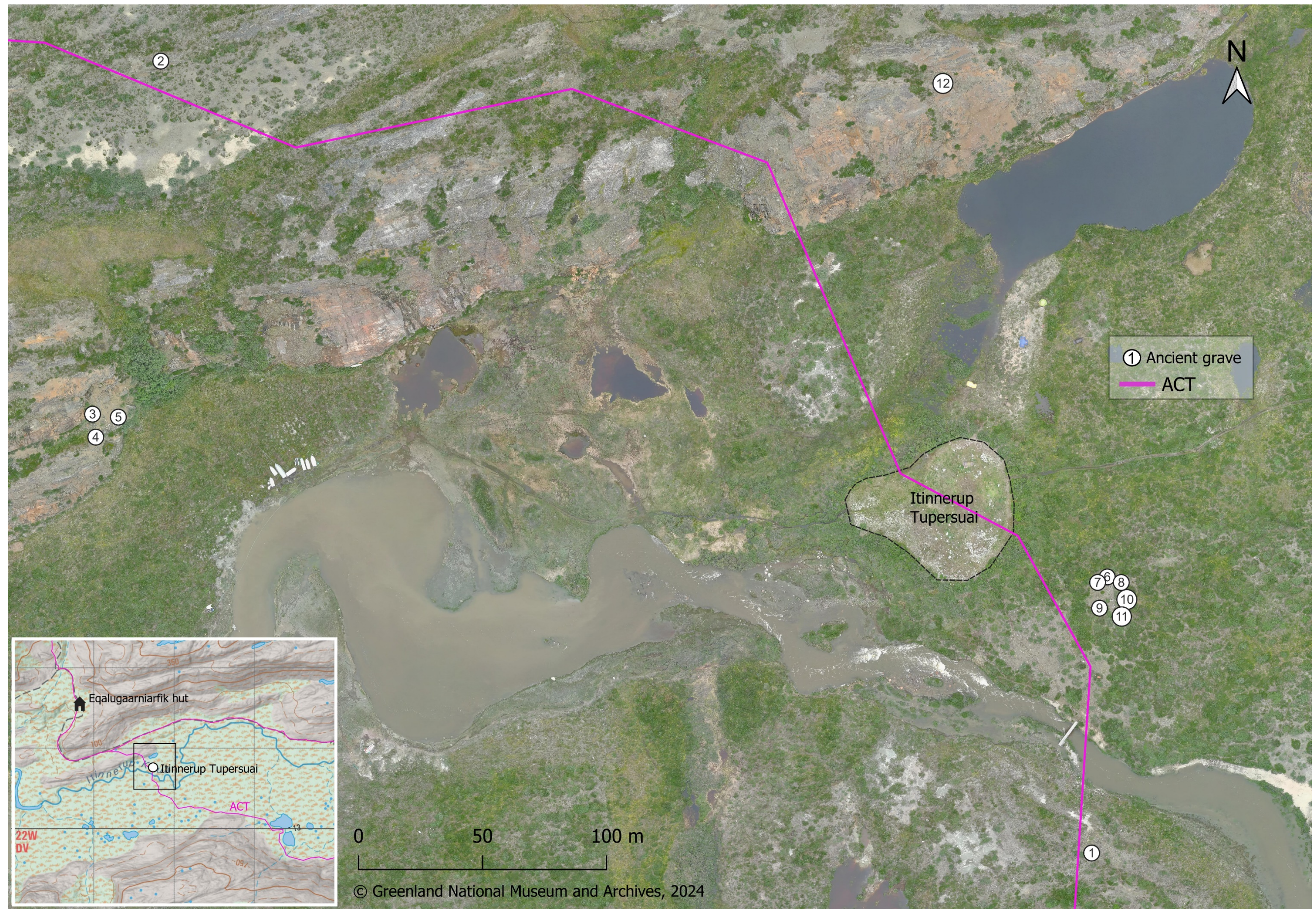


Figure 15. Location of documented graves at Itinneq with grave numbers corresponding to list provided in Table 3. The purple line denotes the general placement of the ACT trail in 2023.





Figure 16. Bird's eye view of the ancient camp of Itinnerup Tupersuai. The area is still used as a camp site by local people visiting the area. Photo: Harmsen 2023.



## Graves

Twelve ( $n=12$ ) graves are identified in the terrain surrounding Itinnerup Tupersuai. These graves include both traditional Inuit chamber graves and more recent Christian burials. Figure 16 shows the location of known graves found at Itinneq with corresponding descriptions provided in Table 3. Documentation photos of the graves taken by Jens Fog Jensen in 2021 are also provided in following pages (Figures 17-29). Due of their tendency to blend into the landscape, all graves at Itinneq are potentially vulnerable to disturbance. Dissemination strategies should be implemented that ensure that these graves and their components remain undisturbed by visitors.

Table 3. Coordinates and description of graves found at Itinneq. Grave nr. corresponds to the number provided in Figure 17. Notes provided by Jens Fog Jensen, 2021.

Grave nr.	Latitude	Longitude	Notes
1	66.9876°	-52.3358°	Situated on the south side of the river near the bridge, long bones can be seen in the partially collapsed chamber.
2	66.99039°	-52.3446°	Chamber grave on hill to the north of Itinnerup Tupersuai site. The chamber is built of flat stones against a natural ledge in the bedrock.
3	66.98911°	-52.345°	This chamber grave has not been disturbed, despite its situation in direct prolongation of burial 4 and 5. The three chamber graves are situated against a natural ledge and crack in the bedrock and right beside an inconspicuous foot path leading up to the cliffs bordering the flat valley. The three burials are built in extension of one and another and almost joined.
4	66.98909°	-52.3449°	Central burial out of three burials that are almost joined. Note the lack of lichen on many stones showing that the burial has been disturbed recently, and that the capstones have not been put in place. Seen from west.
5	66.9891°	-52.3449°	Easternmost one out of three burials that are almost joined. Like burial 4, the capstones have been removed from this grave and the chamber left open. The newly exposed surfaces have no lichen showing that the disturbance is recent. During a brief survey of the site in 2016 none of these graves had been opened. Seen from west.
6	66.9886°	-52.3356°	Adult burial with large flat stone in western end. Seen from north.
7	66.98858°	-52.3357°	Child burial approximately 1 m long with upright flat stone of white rock in western end. Seen from north.
8	66.98858°	-52.3356°	Adult burial partially covered by willow.
9	66.98855°	-52.3356°	Burial 9 is built as an east-west oriented, rectangular shaped stone with some turf between the stones.
10	66.98855°	-52.3356°	Minor ovate burial partially covered by lichen, seen from the west.
11	66.98852°	-52.3356°	Minor oval burial with characteristic trapezoid stone in western end. The position of the stone indicate that it might be a tilted tomb stone
12	66.99037°	-52.3374°	A large well preserved chamber grave on the hill to the north of Itinnerup Tupersuai, situated near the Arctic Circle Trails winding route from the hill and down to the plain. Note the burial is constructed against a natural ledge like the construction of burial 3 which is situated a few hundred meters further west.





Figure 17. Grave 1, facing south. Photo: Jens Fog Jensen 2021.



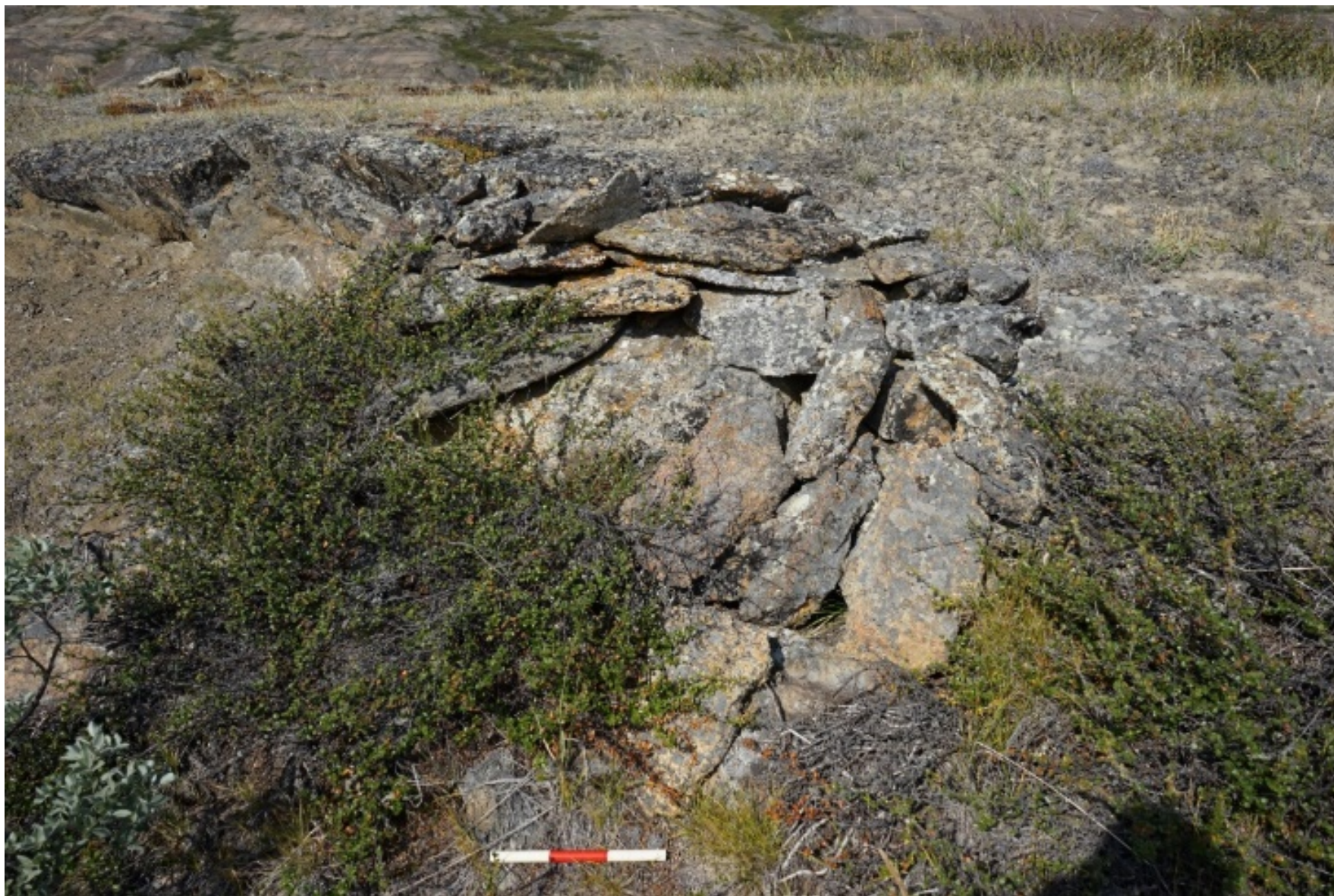


Figure 18. Grave 2, facing north. Photo: Jens Fog Jensen 2021



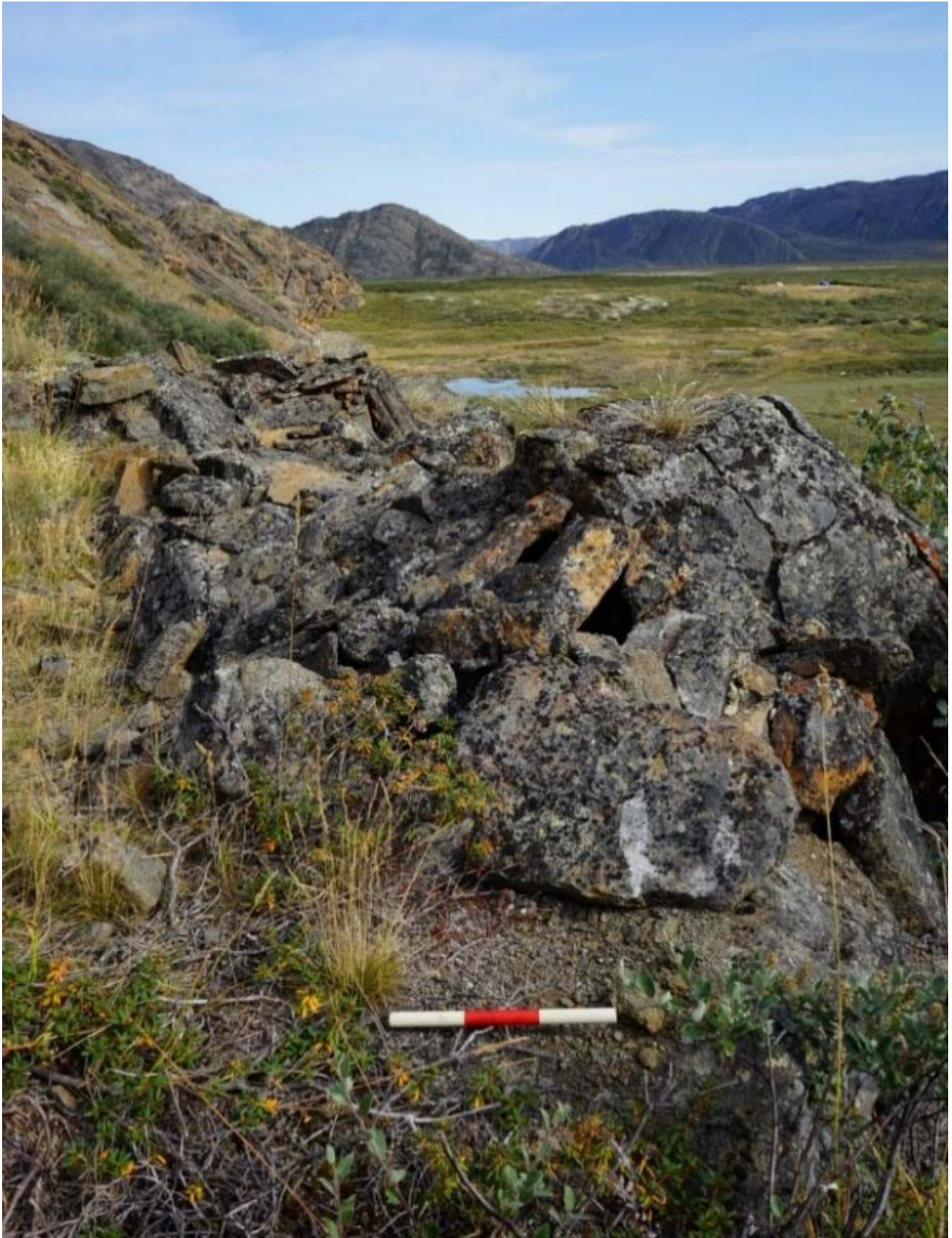


Figure 19. Grave 3, facing east. Photo: Jens Fog Jensen.





Figure 20. Grave 4, facing east. Photo: Jens Fog Jensen 2021.





Figure 21. Grave 5, facing east. Photo: Jens Fog Jensen 2021.



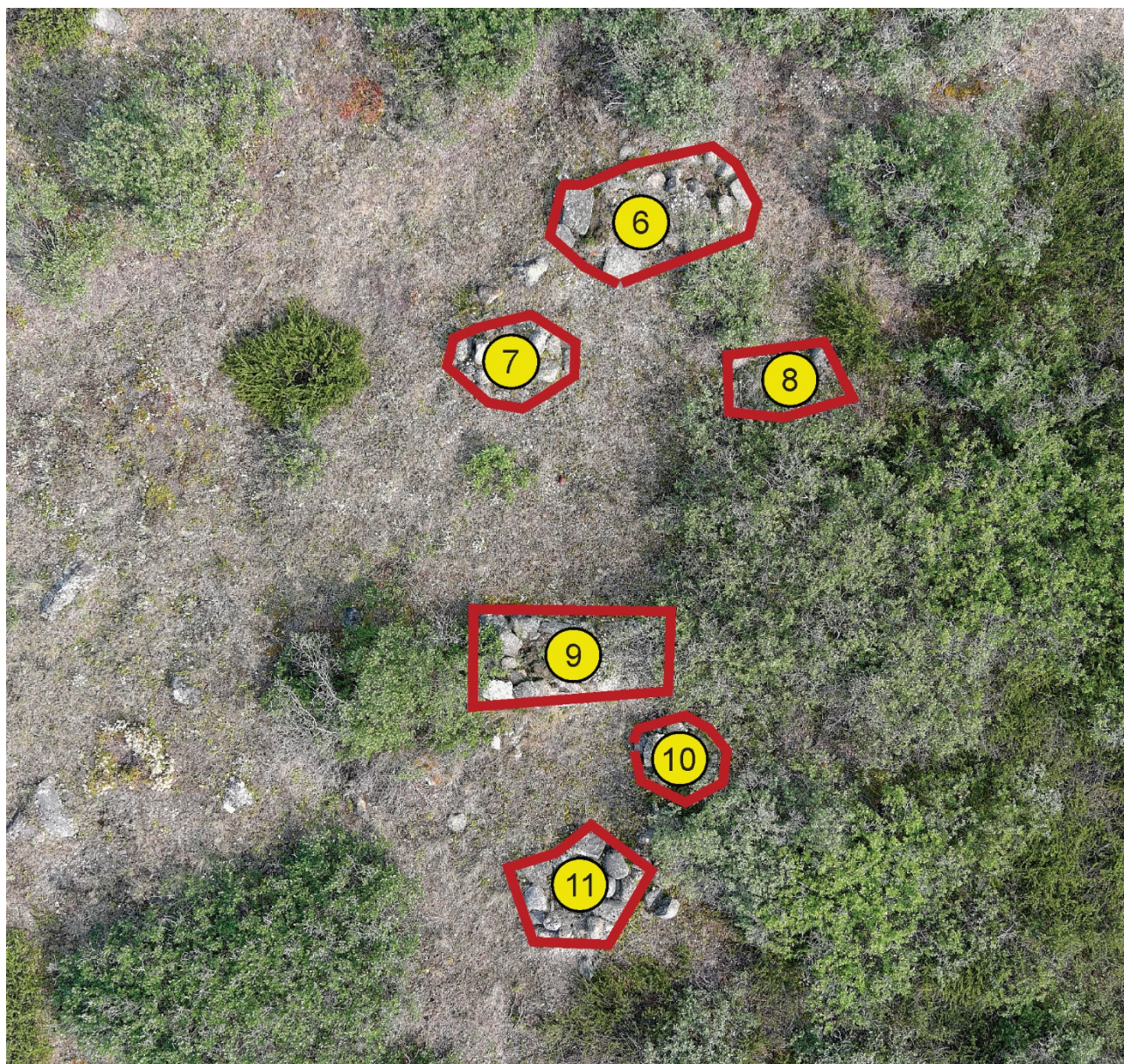


Figure 22. Orientation of the Christian graves (nr. 6-11) found to the southeast of Itinnerup Tupoersuai.





Figure 23. Grave 6, Christian burial, facing south. Photo: Jens Fog Jensen 2021.





Figure 24. Gravel 7, Christian burial, facing south. Photo: Jens Fog Jensen 2021.



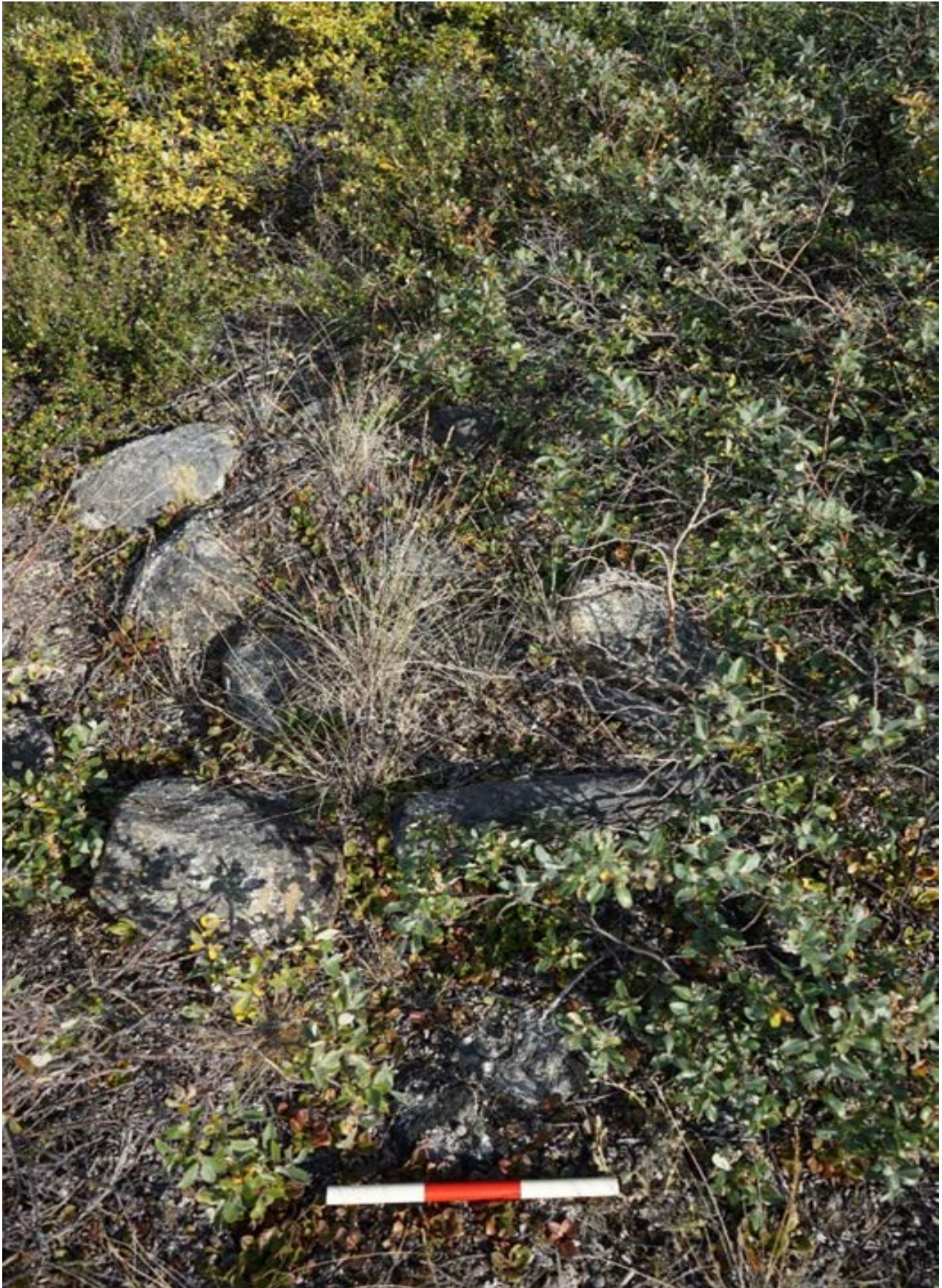


Figure 25. Gravel 8, Christian burial, facing south. Photo: Jens Fog Jensen 2021





Figure 26. Grave 9, Christian burial, facing south. Photo: Jens Fog Jensen 2021.





Figure 27. Grave 10, Christian burial, facing east.





Figure 28. Grave 11, Christiann burial, facing east. Photo: Jens Fog Jensen 2021.





Figure 29. Grave 12. Photo: Jens Fog Jensen 2021.





Figure 30. UNESCO Park Ranger, Christian Pihlblad Jeremiassen collecting trash at Itinnerup Tupoersuai.

## General Recommendations

As Itinneq's vegetation, wildlife and archaeological remains are extremely sensitive to human disturbance, and because the area possesses immense heritage value, we conclude this report by stating that serious consideration should be given to the formal creation of a path for controlled movement of visitors. Close communication between management authorities and tourist operators is strongly recommended for the future development of the site. Exchange of knowledge about new types of vulnerabilities, changing conditions, access ways, expectations, reporting, etc. will help to avoid conflict and the potential irreversible loss of both natural and cultural values. We also strongly recommend that regular monitoring and assessments be performed to track changes in the area as a result of increasing human activity.

Based on the data collected during the visit to Itinneq between 10-12 July 2023 and in combination with consultation with various stakeholders, we offer the following suggestions for **management initiatives** that could compliment and reduce the overall vulnerability of the area if they are prioritized within the next 5 years at Itinneq:

1. **Path markers.** Clearly demarcating a path for the ACT would reduce future damage to the vegetation and weak spots in the landscape. For example, it was observed several times



during the site visit that the lack of visual markers for the southern route of the ATC through Itinneq results in many hikers cutting through the bush and trampling vegetation. Demarcating a clear path will also help to avoid unnecessary wildlife disturbances by hikers spreading across the southern route in their attempt to ‘find the bridge’. Creating an established path would encourage hikers to move in a predictable and patterned way and allow wildlife to get accustomed to their presence. Additionally, the Qeqqata municipality could encourage the use of [OpenStreetMap](#). This is an opensource and free GIS tool that could help reduce pressures on the more vulnerable biological/ecological areas and direct traffic away or around sensitive archaeological remains and graves.

2. **New signage and site-specific guidelines.** New signage and dissemination materials sharing the history of Itinneq / Itinnerup Tupersuai, as well as Site-specific guidelines for sustainable use of the area could help to add value to the visitor experience and decrease future damage. This could also include **informing visitors about dangerous wildlife prior to their journey**. During our visit a solitary, young male musk ox was observed in the area, often obscured by high brush and vegetation. Musk Ox become more territorial and aggressive in late summer. Additionally, bear encounters on the ACT are also increasing. Hikers should always remain situationally aware of their surroundings and carry deterrents to scare away potentially aggressive bears.
3. **Encouraging better waste management and a ‘carry-in / carry-out’ policy for all visitors.** This includes not only small loose pieces of trash (Figure 30), but the eventual removal of abandoned snow mobiles and boats (Figure 31). Better communication about waste management at the Eqalugaarniarfik hut is recommended whether in the form of signage or as part of Site-specific guidelines. There is often detritus from hunting and garbage from hikers left around the hut. In 2023, a pile of caribou skins were left to decay nearby the Eqalugaarniarfik hut (Figure 32) which created a strong odor and attracted flies and insects. New signage at the hut could include ‘nudging’ tactics that are culturally resonant to different user groups (for example, local hunters, ACT hikers, etc.) Arctic Circle Business has plans to remove the blue bin this winter at Equalugaarniarfik. This will (hopefully) encourage all visitors to carry all their garbage out with them.
4. **White fronted geese visit Itinneq in the spring.** The public could be informed as to the sensitivity of this species and their protected status and that they are not to be disturbed during this very important resting period before their mating begins.
5. **Discourage ATV use in the open land.** On the northern ACT route in Itinneq we observed significant ATV damage to the terrain and vegetation (Figure 33) in several places. This unsanctioned ATV use has resulted in deep ruts, pooling water and muddy areas that counters the narrative of a “pristine wilderness” in the UNESCO WH area. This area is also used as a winter corridor for snowmobiles, and we would encourage the municipality to remind citizens that driving snowmobiles along this route is not permitted when there is minimal snow cover or the ground has thawed.





Figure 31. Garbage observed in Itinneq in July 2023. An abandoned snow mobile was found on the shore of the river. Photos: Harmsen 2023.





Figure 32. Documentation of the hunting remains from the previous hunting season. These images attest that the site is still used by local hunters, transiting their catch from the land to the river (boats) or to motorized-vehicle (ATV and snow-mobile). Photo: Le Moullec 2023.





Figure 33. On the northern ACT route deep rutted ATV tracks were observed in the terrain which has resulted in pooling of many areas during this particularly wet summer in 2023. Photo: Harmsen 2023.



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## Appendix A.

List of historically known occurring plant taxa (Fredskild, Bent, 1996). NT (Near Threatened, Næsten truet) and VU (Vulnerable, Sårbar) delineates red listed plant taxa (Boertmann & Bay, 2018).

Name	GRL RED
<i>Alopecurus aequalis</i>	LC
<i>Antennaria affinis</i>	LC
<i>Antennaria angustata</i>	LC
<i>Antennaria canescens</i>	LC
<i>Arabis holboellii</i>	LC
<i>Arctostaphylos uva-ursi</i> ssp. <i>coactilis</i>	NT
<i>Armeria scabra</i> ssp. <i>sibirica</i>	LC
<i>Arnica angustifolia</i>	LC
<i>Artemisia borealis</i>	LC
<i>Betula nana</i>	LC
<i>Calamagrostis langsdorffii</i>	LC
<i>Calamagrostis lapponica</i> var. <i>groenlandica</i>	-
<i>Calamagrostis purpurascens</i>	LC
<i>Campanula gieseckiana</i>	LC
<i>Campanula uniflora</i>	LC
<i>Cardamine pratensis</i>	LC
<i>Carex bicolor</i>	LC
<i>Carex bigelowii</i>	LC
<i>Carex canescens</i>	LC
<i>Carex capillaris</i>	LC
<i>Carex capillaris</i> ssp. <i>robustior</i>	-
<i>Carex capitata</i>	LC
<i>Carex capitata</i> ssp. <i>capitata</i>	-
<i>Carex glareosa</i>	LC
<i>Carex marina</i>	LC
<i>Carex maritima</i>	LC
<i>Carex misandra</i>	LC
<i>Carex nardina</i>	LC
<i>Carex norvegica</i>	LC
<i>Carex rariflora</i>	LC
<i>Carex rupestris</i>	LC
<i>Carex saxatilis</i>	LC
<i>Carex scirpoidea</i>	LC
<i>Carex subspathacea</i>	LC
<i>Carex supina</i> ssp. <i>spaniocarpa</i>	LC
<i>Carex ursina</i>	LC
<i>Cassiope tetragona</i>	LC
<i>Cerastium alpinum</i>	-



<i>Cerastium arcticum</i>	LC
<i>Chamaenerion angustifolium</i>	LC
<i>Chamaenerion latifolium</i>	LC
<i>Cochlearia groenlandica</i>	LC
<i>Cystopteris fragilis</i>	LC
<i>Diapensia lapponica</i> ssp. <i>lapponica</i>	LC
<i>Draba aurea</i>	LC
<i>Draba cana</i>	LC
<i>Draba cinerea</i>	NA
<i>Draba crassifolia</i>	LC
<i>Draba glabella</i>	LC
<i>Draba incana</i>	LC
<i>Draba lactea</i>	LC
<i>Draba nivalis</i>	LC
<i>Dryas integrifolia</i>	LC
<i>Dryopteris fragrans</i>	LC
<i>Eleocharis acicularis</i>	LC
<i>Elymus arenarius</i>	LC
<i>Elymus violaceus</i>	LC
<i>Empetrum nigrum</i> ssp. <i>hermaphroditum</i>	LC
<i>Epilobium palustre</i>	LC
<i>Equisetum arvense</i>	LC
<i>Equisetum scirpoides</i>	LC
<i>Erigeron compositus</i>	LC
<i>Erigeron uniflorus</i>	LC
<i>Eriophorum angustifolium</i> ssp. <i>subarcticum</i>	LC
<i>Eriophorum scheuchzeri</i>	LC
<i>Euphrasia frigida</i>	LC
<i>Festuca brachyphylla</i>	LC
<i>Festuca rubra</i>	LC
<i>Galium brandegeei</i>	LC
<i>Halimolobus mollis</i>	LC
<i>Harrimanella hypnoides</i>	LC
<i>Hierochloë alpina</i>	LC
<i>Hippuris vulgaris</i>	LC
<i>Juncus arcticus</i>	LC
<i>Juncus castaneus</i>	LC
<i>Juncus ranarius</i>	NT
<i>Juncus subtilis</i>	LC
<i>Juniperus communis</i> ssp. <i>alpina</i>	LC
<i>Kobresia myosuroides</i>	LC
<i>Kobresia simpliciuscula</i>	LC
<i>Ledum groenlandicum</i>	LC



Ledum palustre ssp. decumbens	LC
Lomatogonium rotatum	LC
Luzula arctica	LC
Luzula confusa	LC
Luzula groenlandica	LC
Luzula multiflora ssp. frigida	-
Luzula spicata	LC
Lycopodium annotinum ssp. alpestre	LC
Melandrium affine	LC
Melandrium triflorum	LC
Menyanthes trifoliata	LC
Minuartia biflora	LC
Minuartia rubella	LC
Montia fontana ssp. fontana	LC
Myriophyllum spicatum ssp. exalbescens	NT
Oxyria digyna	LC
Papaver radicum	-
Pedicularis flammea	LC
Pedicularis hirsuta	LC
Pedicularis labradorica	LC
Pedicularis lanata	LC
Pedicularis lapponica	LC
Plantago maritima ssp. borealis	LC
Poa alpina	LC
Poa arctica	LC
Poa glauca	LC
Poa pratensis	LC
Polygonum viviparum	LC
Potamogeton alpinus ssp. tenuifolius	LC
Potamogeton pusillus ssp. groenlandicus	LC
Potentilla crantzii	LC
Potentilla egedii	LC
Potentilla hookeriana	LC
Potentilla hyparctica	LC
Potentilla nivea	LC
Potentilla tridentata	LC
Primula egaliksensis	<b>NT</b>
Primula stricta	LC
Puccinellia coarctata	LC
Puccinellia deschampsoides	LC
Puccinellia groenlandica	LC
Puccinellia phryganodes	LC
Pyrola grandiflora	LC



Ranunculus confervoides	LC
Ranunculus cymbalaria	<b>VU</b>
Ranunculus hyperboreus	LC
Ranunculus lapponicus	LC
Rhodiola rosea	LC
Rhododendron lapponicum	LC
Rumex acetosella	LC
Salix arctophila	LC
Salix glauca	LC
Salix herbacea	LC
Saxifraga caespitosa	LC
Saxifraga cernua	LC
Saxifraga foliolosa	LC
Saxifraga tricuspidata	LC
Scirpus caespitosus	LC
Silene acaulis	LC
Sparganium hyperboreum	LC
Spergularia canadensis	<b>VU</b>
Stellaria edwardsii	NA
Stellaria humifusa	LC
Stellaria longipes	LC
Taraxacum lacerum	LC
Tofieldia pusilla	LC
Triglochin palustre	LC
Trisetum triflorum	LC
Vaccinium uliginosum	LC
Vaccinium vitis-idaea ssp. minus	LC
Viscaria alpina	LC
Woodsia glabella	LC
Woodsia ilvensis	LC