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Biological and Archaeological Assessment of Aasivissuit, August 2022

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Recommendations for Aasivissuit

Value	Recommendation
Vegetation	▪ Any organized tourist activities should only be done with the full recognition that this will come with the risk to the vegetation of the area. These risks include initiating erosion zones in the exposed areas of the GVC's suggested hiking path. ▪ Further fieldwork be conducted on the flora of the area to gain insights to the frequency, distribution and occurrence of other plant species currently unidentified at Aasivissuit. ▪ Further fieldwork be conducted on the flora of the area to gain insights on the occurrence of specific red listed species historically known in the area.
Wildlife	▪ 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. ▪ Efforts should be made to avoiding disturbing the lake (Issat) where White Fronted geese molt and nest in June and July. ▪ Further research and monitoring should be performed on White Fronted geese and their use of and behavior in this area, as well as Ittineq (also with in the Aasivissuit-Nipisat UNESCO site). ▪ Humans should move through the area in predictable and patterns within a designated space. This allows the wildlife to become accustomed to an increased human presence over time. ▪ Visitors should exercise extreme caution at Aasivissuit in late July and August when male musk ox are observed to be more aggressive and territorial.
Cultural heritage	▪ The creation of a public access route to Aasivissuit should not proceed before interventions and protections to the areas are set in place. Uncontrolled access to Aasivissuit places the entire site at risk. These risks include (but are not limited to): increased erosion through foot traffic, damage and manipulation to archaeological features and their components, illegal ATV and snowmobile use, illegal camping and other problems resulting from lack of sanitation and waste removal on site. ▪ The ancient summer camp settlement and the *naanngisat* possess fragile in situ archaeological remains and lie on terrain that can be damaged through human activity. Visitors should not enter or access these areas. ▪ Following the regulations outlined in Inatsisartutlov nr. 11 af 19. maj 2010 om fredning og anden kulturarvsbeskyttels af kulturminder, 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. Additionally, future planning must also take into consideration the already existing caribou path identified as an 'emergency stop' in this report and make adequate recommendations for avoiding the area. ▪ Regarding Aasivissuit's OUV, consideration must be given to the potential displacement of resident caribou populations due to an increased human presence in the future. **What does it say about our stewardship of Greenland's largest caribou hunting drive if the caribou disappear because tourism was prioritized above conservation of the area?**

Anbefalinger til Aasivissuit

Værdi	Anbefaling
Plantevækst	▪ Eventuelle organiserede turistaktiviteter bør kun ske med fuld anerkendelse af, at dette vil medføre risiko for vegetationen i området. Disse risici omfatter igangsættelse af erosionszoner i de udsatte områder af GVC's foreslåede vandresti. ▪ Yderligere feltarbejde udføres af plantevæksten i området for at få indsigt i hyppigheden, fordelingen og forekomsten af andre plantearter, der i øjeblikket ikke er identificeret ved Aasivissuit. ▪ Yderligere feltarbejde udføres af plantevæksten i området for at få indsigt i forekomsten af specifikke rødlistede arter, der historisk er kendt i området.
Dyreliv	▪ Dyrelivet er mest aktivt- og migrerer ofte i timerne omkring skumring og daggry. Derfor kan minimal menneskelig tilstedeværelse i disse perioder mindske potentielle negative virkninger for disse hjemmehørende arter. ▪ Der bør gøres en indsats for at undgå at forstyrre søen (Issat), hvor hvidnæbbede gæs skifter fjer og yngler i juni og juli. ▪ Yderligere forskning og overvågning bør udføres på White Fronted gæs og deres brug af og adfærd i dette område, samt Ittineq (også med i Aasivissuit-Nipisat UNESCO site). ▪ Mennesker skal bevæge sig gennem området i forudsigelige mønstre inden for et bestemt område. Dette gør det muligt for dyrelivet at vænne sig til en øget menneskelig tilstedeværelse over tid. ▪ Besøgende bør udvise ekstrem forsigtighed ved Aasivissuit i slutningen af juli og august, når moskustyre observeres at være mere aggressive og territoriale.
Kulturarv	▪ Oprettelsen af en offentlig adgangsvej til Aasivissuit bør ikke fortsætte før forbedringer og beskyttelse af områderne er på plads. Ukontrolleret adgang til Aasivissuit bringer hele området i fare. Disse risici omfatter (men er ikke begrænset til): øget erosion på baggrund af trafik fra gående, skader og ændringer af arkæologiske levn og deres komponenter, ulovlig brug af ATV og snescootere, ulovlig camping og andre problemer som følge af manglende sanitet og fjernelse af affald på stedet. ▪ Den gamle sommerlejrbosættelse og naanngisat besidder skrøbelige in situ arkæologiske levn og ligger på et terræn, der kan blive beskadiget gennem menneskelig aktivitet. Besøgende bør ikke komme ind- eller få adgang til disse områder. ▪ Efter reglerne i Inatsisartutlov nr. 11 af 19. Maj 2010 Om Fredning og anden kulturarvsbeskyttelse af kulturminder, alle stier eller afmærkede stier skal forblive i en afstand af minimum 2 meter fra ethvert gammelt kulturtræk observeret i landskabet og i nogle tilfælde helt undgå et meget sårbart område. Derudover skal den fremtidige planlægning også tage hensyn til den allerede eksisterende rensdyrsti, der er identificeret som et "nødstop" i denne rapport, og fremsætte passende anbefalinger til at undgå området. ▪ Med hensyn til Aasivissuits OUV skal der tages hensyn til den potentielle fordrivelse af hjemmehørende rensdyrpopulationer på grund af en øget menneskelig tilstedeværelse i fremtiden. **Hvad siger det om vores forvaltning af Grønlands største rensdyrjagtssystem, hvis rensdyrene forsvinder, fordi turismen blev prioriteret over fredningen af området?**

Aasivissuarnut innersuussutit

Naleqassusaa	Innersuussut
Naasoqassusaa	▪ Aaqqissuussamik takornariartitsisoqassatillugu akisussaassuseqartumik eqqumaffigeqqissaarneqartariaqarpoq sumiiffimmi naasoqassusermik innarliisoqarsinnaanera. Innarliisinnaanerit tassaasinnaapput GVC'ip pisuffissiatut / takornarianut aqqutissatut toqqaagaani nunap nakkaakkiartulernissaa. ▪ Aasivissuarni naasoqassuseq allanillu naasunik suli misissorneqarsimanngitsunik nalunaarsuisoqassaaq ▪ Sumiiffimmi eqqaanilu naasut aalajangersimaqqissaartut qangarsuarli ilisimaneqareersut misissoqqinneqassapput.
Uumasut	▪ Uumasut qaammalaalernerani taarsilerneraniluunniit annerusumik angallattarmata inuit sumiiffimmiinnerat uumasunut sunniuteqarsinnaanera minnerpaaffissaminiitinneqarsinnaavoq. ▪ Tatsimi sapinngisamik akornusersuinaveersaarnissaq pisariaqarpoq, tamaanimi nerlerit aalajangersimasut juni aamma julimi piaqqiornerisa (isanerisa) naligisarmassuk ▪ Nerlerit tatsimi taamatuttaarlu Itinnerani misissugarinerat / malinnaavigineqarnerat ingerlateqqinneqassaaq. ▪ Sumiiffimmi inuit aalajangersimasumik aqqummik ingerlaveqartarnissaat pisariaqarpoq. Taamaalilluni aamma uumasut sumiiffimmiittut avatangiisiminnut allanngorsinnaasumut naleqqussarnissaat anguneqarsinnaammat ▪ Takornariat inuillu allat Aasivissuarniittartussat julimi augustimilu mianersorluarnissaat kissaatigineqarpoq, taamaalineranimi umimmaat – ingammik angutiviarsuit – najugartik illersorusullugu inunnut qanillattorsinnaasarmata.
Kulturikkut eriagisassat	▪ Aasivissuarnut aqqusiortoqalertinnagu sumiiffimmik pinaveersaarutissatut / illersuutissat assigiinngitsut naammasseqqartariaqarput. Aqutaanngitsumik Aasivissuit tikinneqartalissappata sumiiffik tamarmi iluarseqqissinnaanngitsumik innarlerneqarsinnaavoq. Innarliutit ukkuusinnaapput: Pisuffiusuni nunap uukkaakkiartornera, itsarnitsat innarlerneri isikkuianiillu allanngortinneqarneri, ATV-nik snescooterinillu akuerisaanngitsumik ingerlaarnerit, akuerisaanngitsumik tupertorneq taassumalu nassatarisaanik mingutsitsineq eqqakkanillu qimatsineq. ▪ Aasivissuarni tupersuaqarfiit taamatuttaarlu naanngisat eriagilluinnagassat nunap qaani ersiinnartut inunnit uteqattaarfigineqarlutik innarlinnginnissaat pinaveersaartinneqartariaqarpoq. ▪ Eqqissisimatitsisarneq aamma allatigut kulturikkut erigisassanik kulturikkut kingornussatut illersuineq pillugu Inatsisartut Inatsisaat nr. 11 af 19.maj 2010-meersoq malillugu, aqqusineeqqat imalt. aqqusiat nalunaarsuutillit sumiiffimmi kulturikkut eriagisassaniit minnerpaamik 2 meterinik ungasisuseqassapput, illaatigullu pisariaqartassaaq mianernarluinnartunut qanilleqqusaannginneq.Taamatuttaaq siunissami pilersaarutini tuttut aqqutitoqarsui puigorneqassanngillat, uani nalunaarusiami "uniffittut" (Nødstop) taaneqarsimasut. Pilersaarummi mianernarluinnartunut periusissiamik napertuuttumik innersuussisoqassaaq. ▪ Aasivissuit nunarsuarmioqatigiinni immikkorluinnaq naleqartitaasumi (Outstanding Universal Value) mianerilluinnartariaqarpoq sumiiffimmi inunnit angalavallaartoqarnera pissutaalluni isunissami tuttunit sumiiffik qimanneqarnissaa. **Qanoq oqartoqassava / qisuariartoqassava nunatsinni qanga aaqqissuussamik tuttunniartarfissuusimasut annersaani takornariat eriaginninnermiit salliutinnerisigut tuttuerutissappat?**

Contents

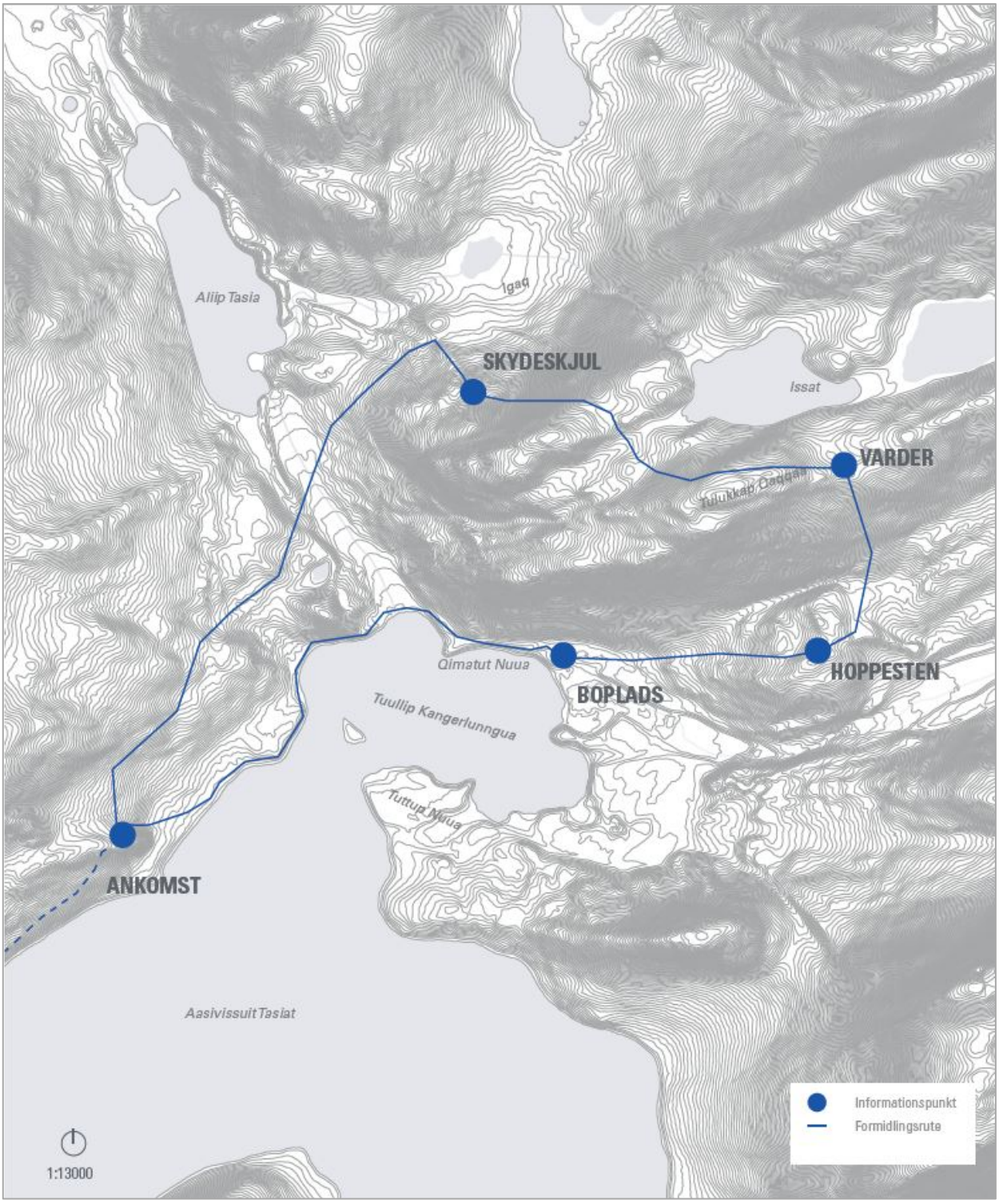

Figure 1. Map of the Key site of Aasivissuit with proposed path and locations of arrival and interpretation points suggested by the Greenland Visitor Center in the document, *Qeqqata Kommunia, turistanlaeg ved nationale sevaerdigheder* (2021:11).

1. Introduction

The UNESCO Key Site of Aasivissuit, "the Great Summer Camp" is one of Greenland's largest and most archaeologically well-preserved Inuit caribou hunting drive systems. Covering an area over 15 km^2, Aasivissuit is a complex and diffuse cultural landscape comprised of several different types of ancient hunting features (e.g., inussuit, stone walls, lookouts, meat caches, graves and shooting blinds) and an summer settlement camp replete with exceptionally well-preserved tent house remains. The area is home to several species of migratory wildlife and a variety of different plant species unique to this part of West Greenland. The site's Outstanding Universal Value (OUV) is a combination of its physical attributes and lived history as a traditional hunting ground that extends back in time over two millennia. The deep history of Aasivissuit was revealed by excavations undertaken by Grønnow, Meldgaard and Nielsen in the late 1970s (Grønnow, Meldgaard, and Nielsen 1983). Radiocarbon dates, lithic debitage and a microblade from the earliest cultural layers excavated in the midden of the Aasivissuit lower camp area suggest that Paleo Inuit peoples had utilized the site possibly as far back as 200 B.C. (Grønnow, Meldgaard, and Nielsen 1983: 63). Upper layers of the midden suggest that Thule culture Inuit were hunting at Aasivissuit as early as the 13th century AD, a short time after their initial arrival in West Greenland. From the 13^{th}-16^{th} centuries, archaeological remains suggest these visits by Inuit were both frequent and intensive and connected to a traditional migration of small communities and family groups from the coast to inland hunting grounds during the late summer months. Because of this history, Aasivissuit played an instrumental role in the property's inscription on the UNESCO World Heritage list in 2018 (Jensen et al. 2017).

Qeeqata Kommunia and the Greenland Visitor's Center's (GVC) proposal for a public access road to Aasivissuit will inevitably bring new types of pressures to the areas vegetation, wildlife and ancient remains that could risk diminishing the Key site's Outstanding Universal Value (OUV) if certain precautions are not made at the outset. These new types of human pressures can be amplified when combined with other types of climate-driven environmental changes, as seen elsewhere in West Greenland and across the Arctic (Hollesen et al. 2017; Fenger-Nielsen et al. 2019; Harmsen et al. 2018). Indicators for these new types of pressures include increased erosion along trails and foot paths, damage to fragile vegetation, disruption to migratory animal species, loss of biodiversity, non-biodegradable litter/waste and the loss of integrity of in situ archaeological remains.

The inscribed World Heritage area of Aasivissuit – Nipisat is regulated by extensive legal restrictions that include national legislation and local municipal management of the property. Parliamentary Acts and Executive Orders defining the use and protective status of the inscribed World Heritage property of Aasivissuit – Nipisat and its values are outlined in Table 1. below. A management plan for the property (see *Aasivissuit – Nipisat. Inuit Hunting Ground between Ice and Sea [1557], Annex 2*) was formulated by a dedicated working group, with participants from the Greenland National Museum and Archives, Qeqqata Kommunia, and other agencies from the Government of Greenland.

1.1. Identifying vulnerabilities at Aasivissuit

In this report, we define *vulnerability* as the relative degree to which the terrain, vegetation, wildlife or ancient ruins are susceptible to or could be adversely affected by increased human activity in the area (Harmsen, Hagen, and Buschman 2022). Indicators for vulnerability include the degree of exposure and potential risk that combine observed visible signs of damage or deterioration, as well as prior knowledge of site and current types of land use (e.g. hunting, camping, hiking, etc.)

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

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

Determining the degree of vulnerability for Aasivissuit is important, as several locations within the area have been proposed as future interpretive dissemination points for tourists that would be connected by a hiking path. These locations are identified on the map in Figure 1 and include: (1) the ancient summer camp (*boplads*); (2) northern hunting drive (*skydeskjul*); (3) the naanngisat or 'hopping-stones' playground (*hoppesten*); (4) the viewpoint found along the upper hunting drive (*varder*); and (5) the visitor arrival point (*ankomst*). This report provides an assessment of the relative vulnerability of these locations and some portions of the proposed path. The methodology for identifying and assessing the vulnerability of the area is modeled after the protocol developed by the Norsk institutt for naturforskning and Norsk institutt for kulturminneforskning and currently employed in Norway and Svalbard for use in national parks and cultural heritage areas (Hagen et al. 2019; Hagen et al. 2014). As our methodology is still being refined for application in Greenland, here we decided to take a slightly more qualitative and descriptive approach by summarizing the overall vulnerable character of the vegetation, wildlife and ancient remains at Aasivissuit observed during three visits to the site in 2020, 2021 and 2022. The first assessment and mapping of the vulnerability of the ancient remains at Aasivissuit was performed by three archaeologists from the NKA between 29-31 August 2020 at the request of the UNESCO Site Manager, Qeqqata Municipality and the Greenland Visitor Center. The NKA performed an inventory and assessment of cultural heritage remains of the north shore of Aasivissuit Tasiat and three key locations identified by the GVC as potential interpretation points along a proposed visitor path. The results of these findings were reported in Harmsen, Larsen, and Myrup (2021).

The second visit to the site was conducted in September 2021 as part of a larger investigation by the Activating Arctic Heritage (AAH) project[1]. During this visit, the site and surrounding area was

[1] Activating Arctic Heritage project 2019-2023, https://arcg.is/1rCme4.

Figure 2. Location of the proposed viewpoint (*varder*) along the upper hunting drive at Aasivissuit. UNESCO Park Ranger, Christian Pihlblad Jeremiassen, Biologist Ida B. Dyrholm Jacobsen and Landscape Architect, Johan Carlsson, discuss the orientation of the proposed GVC path. Photo: Harmsen 2022.

further documented by archaeologists from the Greenland and Danish national museums that included installing environmental monitoring equipment at the ancient camp settlement. During this visit, the AAH team also hosted a group of Arctic Adventure Guide students from Campus Kujalleq Adventure Guide school program. The students were introduced to the site and as part of their training and after their visit drafted a list of recommendations for sustainable management of the area in the future (see Appendix A).

The final visit to Aasivissuit and motivation for this current report was conducted in early August 2022. The evaluation was primarily descriptive and focused on observing sensitivities and potential risk factors to opening the site to tourists based on the GVC's proposal, *Qeqqata Kommunia, turistanlaeg ved nationale sevaerdigheder* (2021). Surveys were performed by researchers from the Greenland National Museum and Greenland Institute of Natural Resources and supported by the newly hired UNESCO Park Ranger and a landscape architect working on behalf of the GVC. While this current report summarizes the work performed in August 2022, the conclusions are informed heavily by the previous visits to the site (2020 and 2021) allowing us to provide a general commentary on the most important and critical vulnerabilities observed at Aasivissuit to date. This document is intended to be a tool for helping the Site Manager to open the site to the public and initiate sustainable interventions for minimizing potential damage to the site's values and the UNESCO area's OUV.

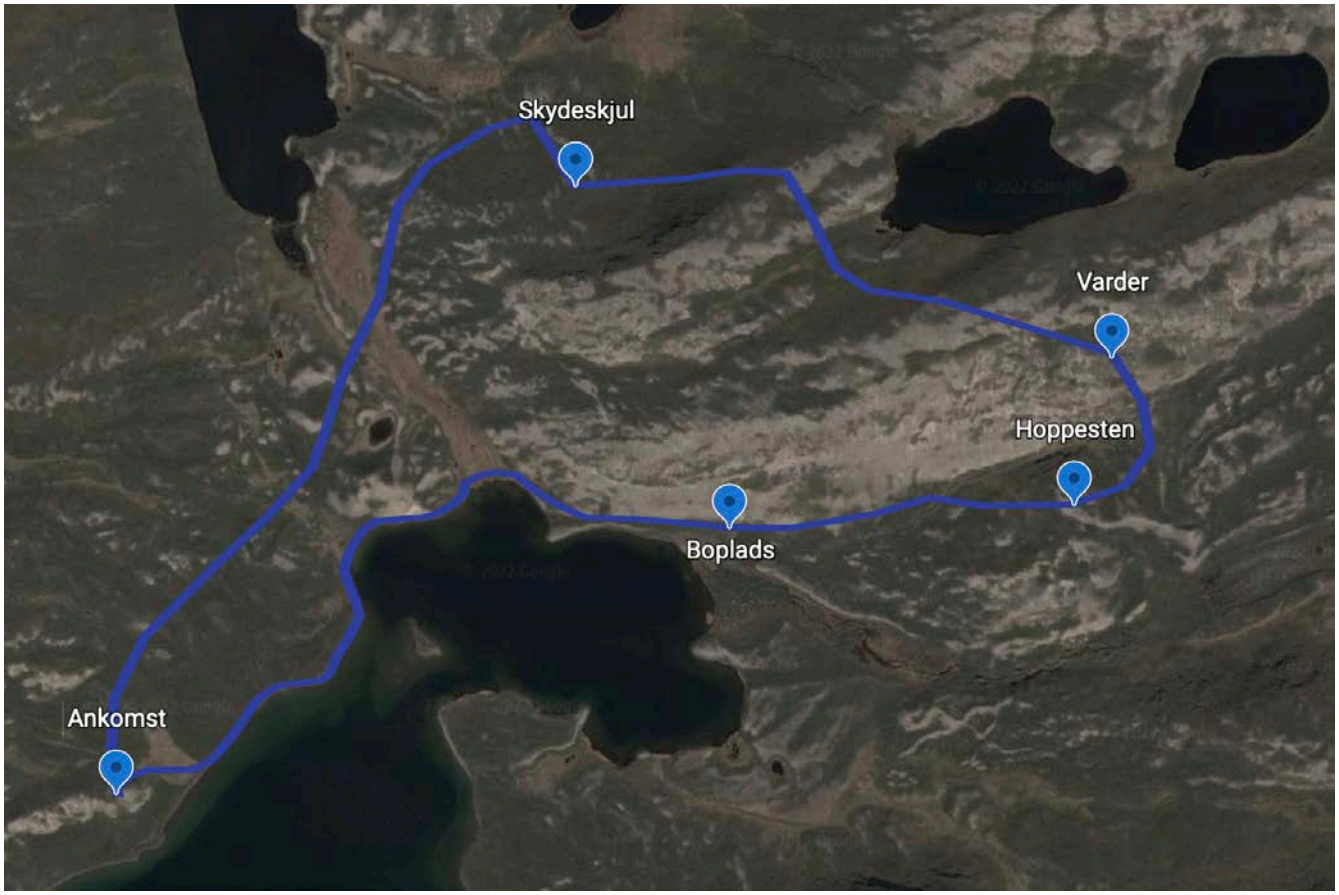

Figure 3. Satellite photo of the Aasivissuit area. Abrasion surfaces distinguishable as light brown patches. Other vegetation i variations are seen as green and dark brown. Source: Google Earth

2. Vegetation at Aasivissuit

Characterization of the vegetation at Aasivissuit was performed by Ida B. Dyrholm Jacobsen from the Greenland Institute of Natural Resources, Department of Environment and Minerals between 1-5 August 2022. The sensitivity of vegetation to disturbance is defined here as the tolerance and resilience of individual species in relation to different types of terrain. A limited number of ecological gradients determines the sensitivity, such as soil conditions (grain size, nutrient level, etc.), moisture, geology, species composition (functional plant groups), and any pre-existing states of disturbance.

- **Tolerance/resistance**. How much exposure can the vegetation tolerate before it tears, and the soil below is exposed?
- **Recovery/resilience**. To what degree can vegetation recover after a disturbance if the exposure is mitigated?

Some areas or vegetation types have poor tolerance but good recovery capacity (such as flat, wet areas). Other areas have high tolerance and poor recovery capacity (such as medium elevation, dry

Figure 4. View of the variable terrain at Aasivissuit. Several common vegetation types observed along abrasion surfaces such as *Carex supina* (also visible on the exposed ridges), shrub of *Salix glauca*, and fen vegetation in the hollows with white inflorences of *Eriophorum*. Photo: Jacobsen 2022.

abrasion surfaces). However, some areas have combination of poor tolerance and poor recovery capacity, making them particularly sensitive to human impacts, both in the short- and long-term (Harmsen, Hagen, and Buschman 2022).

2.1. Observations

Aasivissuit's landscape is comprised of a hilled terrain that provides a variety of habitats that range from exposed fell field and abrasion surfaces to more protected and sheltered areas with tall shrub and grass land (Figure 4). The dominant vegetation types observed are:

- Tall shrubs (abundant species such as *Salix glauca*)
- Dwarf shrub heath (abundant species such as *Betula nana* and *Vaccinium uliginosum*)
- Abrasion (abundant species such as *Carex supina*)
- Grass land and herb dominated (abundant species *Calamagrostis spp.* and *Equisetum arvense*)
- Fen and lake vegetation (abundant species *Eriophorum angustifolium* and *Carex saxatilis*)

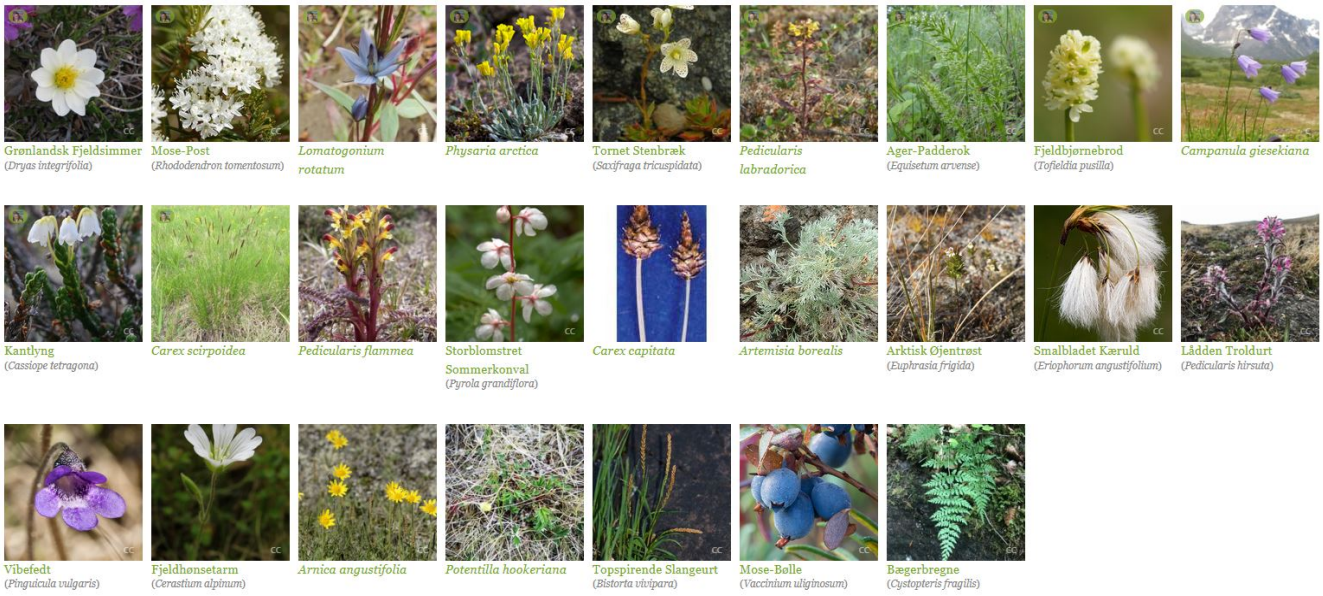

Figure 5. The documentation of species identified at Aasivissuit in August 2022 and publicly available through iNaturalist (https://www.inaturalist.org/). iNaturalist is an open and free platform that could be a citizen science tool for anyone interested in the biology of the area (all living organisms can be registered in iNaturalist).

The transition between these vegetation types and habitats in some areas are continuous gradients and in others\ areas very abrupt and distinct where the abrasion vegetation is conspicuous (seen as light sand-colored patches in Figure 3).

Taxa (species, subspecies etc.) of vascular plants identified at Aasivissuit (including the fieldwork of 2022) are now publicly available at https://www.inaturalist.org/places/aasivissuit (Figure 5.) Historic data on vegetation in the Aasivissuit area is also available in Fredskild (1996). No recent investigations of the flora in the area have been performed, making any future botanical fieldwork at Aasivissuit of great value and a contribution to better understanding variation in the regional ecology of West Greenland (for e.g., distribution patterns) and the public. The fieldwork in 2022 has already provided data on species not previously registered in the area.

2.2. Recommendations

The areas of particular interest in terms of disturbance and increased anthropogenic activities are the abrasion surfaces, dominated by *Carex supina*. At first glance and from a distance, these areas seem to be bare and un-vegetated, but are continuously vegetated (however sparsely) by species such as *Carex supina*—a species with subsurface stolons that contribute to stability of the soil. Disturbance of these species due to human foot traffic could pose a high risk for erosion. Incidents of erosion are already seen in the area in the northern side of the lake between the arrival point (ankomst) and the ancient summer camp settlement *(boplads)* (see Figure 3). Active erosion zones found across Aasivissuit could ultimately threaten the archaeological remains, for example the hopping stones (*hoppesten*), located on a wind exposed and sparsely vegetated ridge.

To protect and minimize the potential damage to the vegetation at Aasivissuit in the future due to an increased human presence in the area, we recommend that:

- Any organized tourist activities should only be done with the full recognition that this will come with the risk of impacts to the area. These risks include initiating erosion zones in the exposed areas of the GVC's suggested hiking path.
- Further fieldwork be conducted on the flora of the area to gain insights to the frequency, distribution and occurrence of other plant species currently unidentified at Aasivissuit.
- Further fieldwork be conducted on the flora of the area to gain insights on the occurrence of specific red listed species historically known in the area, such as *Arctostaphylos uvaursi ssp coactilis*, *Ledodendron vanhoeffeni* and *Myriophyllum spicatum ssp exalbesch* (see Boertmann and Bay 2018).

Figure 6. Example of a new species identified at Aasivissuit, *Lesquerella* or *Physaria arctica* (Arctic Bladderpod), previously not known to occur in the area prior to the fieldwork of 2022. Photo: Jacobsen 2022.

Figure 7. A path commonly used by visitors to Aasivissuit found along the north shore of Aasivissuit, just west of the ancient camp. Inset shows the location of the path on the map. The path is frequently used by caribou and musk ox and an increasing recent human use of the path has contributed to the erosion of the soil and edge of the south facing slope of the terrace. Photo: Harmsen 2022.

EMERGENCY STOP!

Following the edge of north shore of Aasivissuit Tasiat (Qimatut Nuaa), west of the ancient summer camp settlement area (*boplads*), a path winds its way along the edge of the lower terrace, approximately 3-4 meters above the current water line (Figure 7). At first glance the path appears to be intentional, the result of human foot traffic—however it is the combined result of both human and animal movements and a frequently corridor used by musk ox and caribou passing between valleys. The soil on the path is characterized as a friable, powdery silt which is easily carried away by the wind. Recent human use of this trail (observed between 2020 and 2022) has resulted in a constant and steady widening of the path and retreat of the vegetation. The path presents two problems: (1) disruption to natural animal movements in the area, and (2) cascading erosion of the soil. Use of this path should be minimized by persons visiting the Aasivissuit, perhaps opting for passage along the cobble shore of the lake.

Figure 8. Two male caribous (identified by the arrows) in the valley north of Aasivissuit. The lower caribou is estimated to be 4 years old while the upper is estimated to be 2 years old. Photo: M. Broberg 2022.

3. Wildlife

Characterization of the wildlife at Aasivissuit was performed by Mala Broberg from the Greenland Institute of Natural Resources, Department of Birds and Mammals, between 1-5 August 2022. The UNESCO area in general possesses a high degree of biodiversity and is home to several resident and migratory animal species. Comprehensive assessments of species presence, population estimates, and fine-grained identification of habitat preferences for critical life-cycle stages/seasons are not currently available for the area. Some general information on the wildlife and living resources is available in the original Aasivissuit - Nipisat nomination document (Jensen et al. 2017:30-37).

At Aasivissuit, several species have wide ranges of seasonal habitat use that fall within and outside the site area. As wildlife observations during single field surveys provide only limited information on

wildlife population dynamics, this section only offers a broad generalization of wildlife vulnerability that relies on the following information:

- In-person identification of species presence and potential preferred habitat (limited due to single field survey).
- The 2018 Greenland Red List for vulnerable and endangered species (Boertmann and Bay 2018)
- Previous mapping of species' habitats within the area.
- Previous local knowledge of the area by local hunters and citizens.

3.1. Observations

The Aasivissuit area had an abundant wildlife population both on land and in the lakes. The wildlife observed in August 2022 that included living land mammals, birds and fish, summarized in Table 2 below.

Table 2. Wildlife species observed at Aasivissuit in August 2022.

Land mammals	Reindeer (*Rangifer tarandus groenlandica*), Muskox (*Ovibos moschatus*) Arctic hare (*Lepus arcticus*) Arctic fox (*Vulpes lagopus*)
Birds	Rock ptarmigan (*Lagopus muta*) Great northern diver (*Gavia immer*) Red-necked phalarope (*Phalaropus lobatus*) Mallard (*Anas platyrhynchos*) White fronted goose (*Anser albifrons flavirostris*) Wheatear (*Oenanthe oenanthe*) Common redpoll (*Acanthis flammea*) Raven (*Corvus corax*) Peregrine falcon (*Falco peregrinus*)
Fish	Spined stickleback (Gasterosteus aculeatus) Arctic char (*Salvelinus alpinus*)

Initial impressions are that Aasivissuit possesses a healthy and abundant wildlife habitat compared to other inland areas found in west Greenland. Following the valley north of Aasivissuit towards the Isortoq River, we observed signs of hunting and other human activities (Figure 9). Several land mammal species were identified with young—a sign of good food availability and low levels of disturbance. Overall, the area is remote and difficult to access and showed very little signs of hunting and human presence. Several animal tracks showing signs of frequent use were observed passing near the ruins of the ancient summer camp settlement and other archaeological remains in the area. There is a narrow valley east of ancient camp below Tulukkap Qaqqa that creates a natural bottleneck for wildlife passing through the area along the lake and near the ruins.

A lake is found on Tulukkap Qaqqa, commonly known as Issat. This name is a variation of the word *isasoq* which literally translates to 'bird molting'. The name of the lake together with findings of goose feathers and droppings suggests that the white fronted goose molts and nests in the lake. The white

Figure 9. End of the valley north of Aasivissuit where the Isortoq river runs. Hunting camps were spotted along the riverbanks Photo: M. Broberg 2022.

fronted goose (*Anser albifrons*) has a Greenlandic subspecies (*Anser albifrons flavirostris*) endemic to Greenland (Figure 10) and assessed as endangered on the Greenland red list on the IUCN red list (Boertmann and Bay 2018). This goose is identified in the area during the summer months and was spotted flying in formation on two occasions during the visit in August 2022.

With the potential of increased human activity, it is reasonable to assume that the wildlife will probably be negatively affected—from both the setting up of trails and infrastructure and subsequently from more consistent ‘everyday use’ of the area. Most of the wildlife are used to avoiding humans due to hunting and will generally shy away and avoid the areas where they are repeatedly disturbed. However, it is also likely that if the wildlife is not hunted and visitors are channeled in predictable pattern through the area that some the wildlife would become accustomed over time and begin using the area once again. Predators and scavengers, like raven or foxes, will probably benefit from human activity, foraging on leftovers and garbage.

Figure 10. White Fronted Goose. 2. Efforts should be made to avoiding disturbing the lake (Issat) where White Fronted geese molt and nest in June and July. Photo: © Ryan Schain, eBird (https://ebird.org/species/gwfgoo1).

3.2. Recommendations

The area just above the ruins of the ancient summer camp settlement is an area of high concern and the most suitable place for wildlife to transverse when crossing between the valleys. Increased human activity may disrupt the natural movements of caribou and musk ox. It is possible that the wildlife will adopt other routes over time. The opening of a direct access road to Aasivissuit will increase the accessibility of the site and to adjacent areas to hunters and provide more possibilities to haul in equipment. Aasivissuit Tasiat could also be potentially used as a transport route for hauling out catches by small boat.

Regarding the vulnerability of wildlife at Aasivissuit, we recommend:

- 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.
- Efforts should be made to avoiding disturbing the lake, Issat (Figure 1) where White Fronted geese molt and nest in June and July.
- Further research and monitoring is done on White Fronted geese and their use of and behavior in this area, as well as Ittineq (also with in the Aasivissuit-Nipisat UNESCO site).
- Humans should move through the area in predictable and patterns within a designated space. This allows the wildlife to become accustomed to an increased human presence over time.
- Visitors should exercise extreme caution at Aasivissuit in late July and August when male musk ox are observed to be more aggressive and territorial.

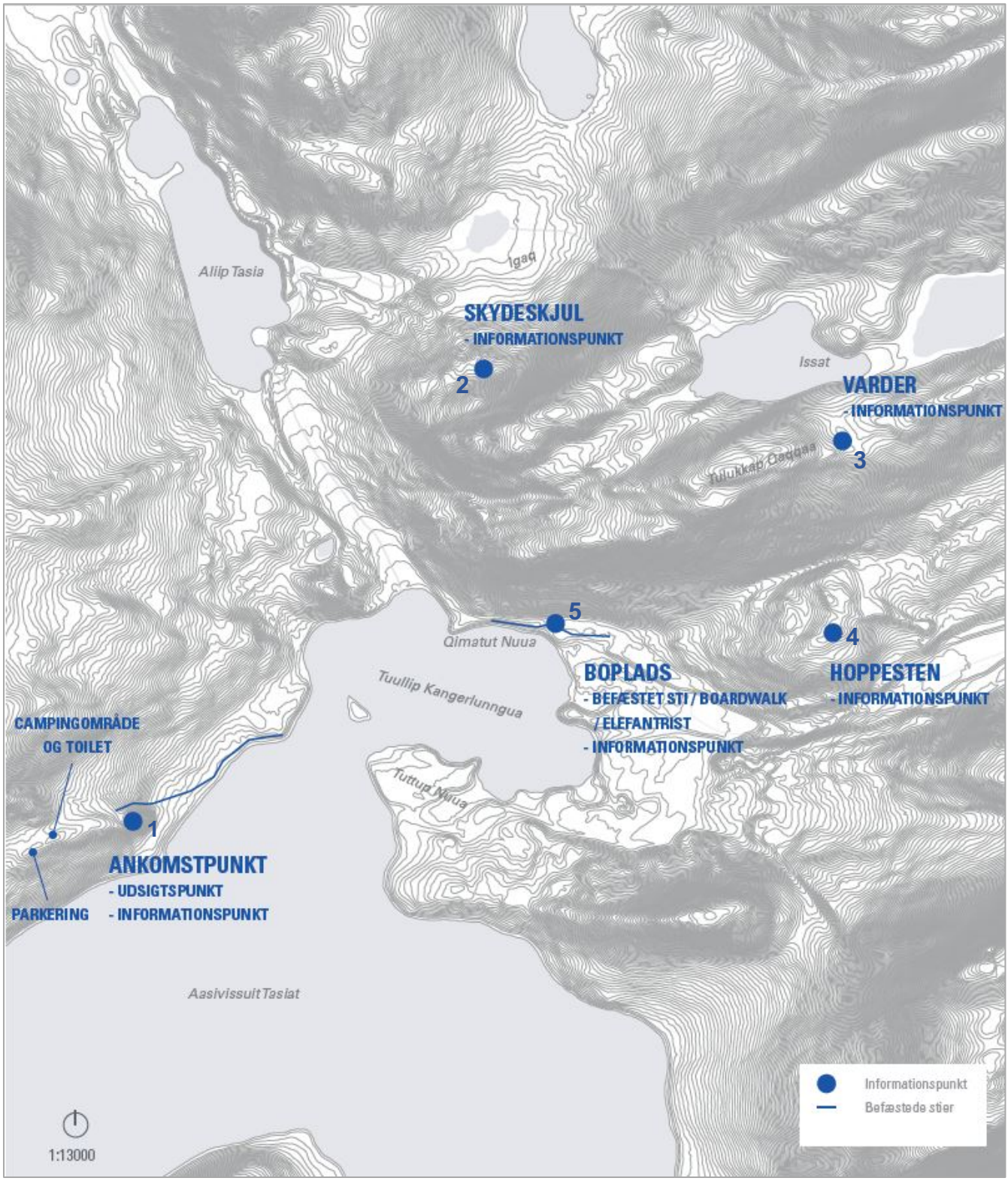

Figure 11. Map of Aasivissuit with locations of arrival and interpretation points proposed by the Greenland Visitor Center in their document, Qeqqata Kommunia, turistanlaeg ved nationale sevaerdigheder (2021:25). Numbers have been added for references to the locations found within the report.

4. Cultural Heritage at Aasivissuit

Documentation of the vulnerability of the cultural heritage at Aasivissuit was performed by Hans Harmsen from the Greenland National Museum and Archives in 2020, 2021 and 2022. Identification and registration of ancient remains was derived from this earlier documentation (Grønnow, Meldgaard, and Nielsen 1983) along with new features and high precision dGPS mapping. Archaeological features were segregated into individual 'units' based on their diagnostic type (e.g., winter house ruin, tent ring, shooting blind, grave, etc.) and presumed age. These 'units' include all associated components found adjacent to or near the feature (for example surface artifacts or displaced architectural components not found in situ). Evaluation and scoring of the vulnerability of the three main interpretation points in the GVC plan (2021) is reported in detail in Harmsen, Larsen, and Myrup (2021).

4.1. Observations

Regarding the vulnerability of the archaeological remains at Aasivissuit, the following observations are provided below with reference to the proposed GVC plan (see Figure 11).

1. **Arrival point (ankomspunkt).** The location chosen for the arrival point provides an outstanding view of Aasivissuit's ancient summer camp settlement and the surrounding landscape (Figure 12). Based on the GVC proposal, the arrival point would be located at the terminus of the nature road extension along the north shore of Aasivissuit Tasiat. Functional infrastructure would include a parking and camp area, public toilets and an interpretation materials. A few archaeological remains are identified in the vicinity making its vulnerability very low. More significant would be the potential impact to the site's OUV with the building and installation of modern infrastructure. Modern constructions could result in detracting from the area's authenticity and creating an 'eyesore' on the landscape.

2. **Hunting Drive (skydeskjul).** Approximately 750 m to the northwest of the ancient summer camp settlement is a diffuse cluster of archaeological features that include six shooting blinds, one ancient grave and a possible meat cache. Dimensions of the blinds can range between 1.5 to 2 m in length and .25 to .5 m in height. Shapes comprise both straight lines or slight arcs and usually oriented to camouflage a hunter to a nearby caribou trail where chances of successfully shooting a prey were greatest. Due to the high degree of integrity of the shooting blinds in this area, this location has been suggested by the GVC as a potential interpretation point for visitors. Collectively, these features were scored as possessing a very high vulnerability score in (Harmsen, Hagen, and Buschman 2022) due to their loose construction and natural tendency to blend into in the landscape. Consequently, suggested mitigations to reduce vulnerability by constructing visible trails, boundary markers and interpretive signage may have the unintended consequence of detracting from the site's natural OUV.

3. **Viewpoint (varder).** The viewpoint is found at approximately 300 meters elevation, in the saddle between the two ridges of Tulukkap Qaqqa and Inussuup Qaqqa. The nearby east-facing slope is dotted with the remnants of several innusuit demarcating the drive line used for ancient caribou hunting. The inussuit comprise several solitary head stones balanced on

Figure 12. The arrival point (ankomst) with a view toward the south and the shore of Aasivissuit Tasiat to the east. The arrow denotes where the visitor viewpoint would be located providing a large and impressive viewshed of the entire area.

boulders and a few well-placed rock cairns comprised of sometimes 3-6 cobbles. The overall vulnerability of this area is extremely low and displacement of inussuit is most likely attributed to musk ox traversing across the area.

4. **The Naanngisat (hoppesten).** This archaeological feature lies about 650 m east of the ancient camp area on a sandy, weather worn hill, parallel to the south face of Tulukkap Qaqqa. The naangissat extends approximately 24 meters, sloping down the ridge in an ESE orientation and is comprised of about 40 stones. Two shooting blinds are also found near the naanngisat, with the northern feature displaying some elements of at one time possibly possessing a more cohesive square form that could be interpreted as a remnant of a miniature square ‘tent house’ like the ones observed at the children’s playground on Nipisat. Due to the extremely vulnerable nature and rareness of this type of ancient feature and the unvegetated terrain, this areas was scored as extremely vulnerable to irreversible change in and should remain off-limits to visitors. Consequently, even controlled access may have the unintended consequence of ultimately doing more harm than good if unsupervised visitors are tempted to jump on the hopping stones.

5. **Ancient summer camp settlement (boplads).** The ancient summer camp covers an area located below the southwest slope of Tulukkap Qaqqaa, overlooking the small cove of Tuullip Kangerlunngua (Figure 13). The camp is split into two areas; the ‘upper’ camp situated in on

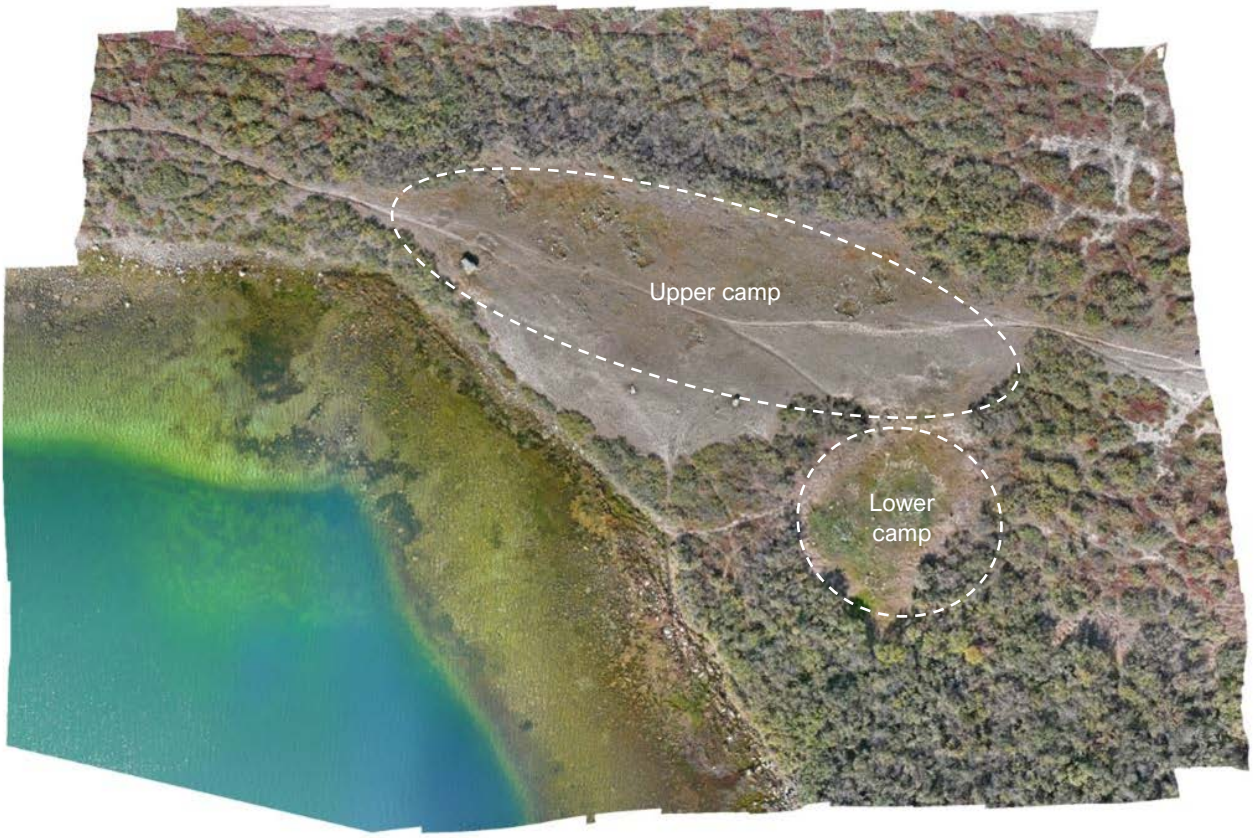

Figure 13. Upper and lower camps of the ancient summer camp settlement (*boplads*). The area is extremely vulnerable to human disturbance and visitors should not enter the area due to the high risk of erosion.

a flat area of loose gravel and silt with thin grass cover, approximately 6-8 m above the level of the lake. This terrace resides above a lower sloped oval shaped clearing (the 'lower camp') to the southwest and closer to the lake shore. This lower camp rests on a bed of turf and silt with dense vegetation surrounding archaeological features (Grønnow, Meldgaard, and Nielsen 1983: 54). Several well-worn and deep caribou trails cross the upper and lower camp areas. On the upper camp terrace, twelve tent-house ruins and 4 tent rings are identified. On the lower terrace 10 tent houses and 2 tent rings are still visible on the surface. Detailed descriptions of the features and excavations at the core camp can be found in Grønnow, Meldgaard, and Nielsen (1983:54-80). Due to the thin layer of protective vegetation and loose silty soil found on the upper terrace of the camp area, we here recommend that no entry should be permitted by visitors to the ancient camp. Consequently, suggested mitigations to provide looping trails, raised boardwalks and signage will negatively impact both local wildlife and detract from the site's natural authenticity.

4.2. Recommendations

The major vulnerabilities to the cultural heritage at Aasivissuit include the potential for manipulation and disturbance to in situ archaeological features and an irreversible loss of authenticity of the entire area as a direct result of an increased human presence. This includes sacrificing the intangible qualities of Aasivissuit that could result from constructing artificial pathways, boundary markers and

interpretive signage that would contrast against the natural landscape. Of particular concern are the following points as they relate to future risks due to an increased number of visitors to Aasivissuit:

- The creation of a public access route to Aasivissuit should not proceed before interventions and protections to the areas are set in place. Uncontrolled access to Aasivissuit places the entire site at risk. These risks include (but are not limited to): increased erosion through foot traffic, damage and manipulation to archaeological features and their components, illegal ATV and snowmobile use, illegal camping and other problems resulting from lack of sanitation and waste removal on site.

- The ancient summer camp settlement and the naanngisat possess fragile in situ archaeological remains and lie on terrain that can be damaged through human activity. Visitors should not enter or access these areas.

- Following the regulations outlined in Inatsisartutlov nr. 11 af 19. maj 2010 om fredning og anden kulturarvsbeskyttels af kulturminder, 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. Additionally, future planning must also take into consideration the already existing caribou path identified as an 'emergency stop' in this report and make adequate recommendations for avoiding the area.

- Regarding Aasivissuit's OUV, consideration must be given to the potential displacement of resident caribou populations due to an increased human presence in the future. **What does it say about our stewardship of Greenland's largest caribou hunting drive if the caribou disappear because tourism was prioritized above conservation of the area?**

5. Final Thoughts

As Aasivissuit's archaeological remains, vegetation and wildlife 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 opening up the area in various stages and with pre-determined timelines to coincide with the creation of low-impact corridors for controlled movement of visitors. For example, in the early stages of opening up Aasivissuit to the public, conditions could be made to only allow visitors to enter the site under the supervision of an certified or pre-approved interpretive guide (similar to requirements made by the Greenland National Museum for cruise ship guides operating in the Northeast National Park).This could also include setting quotas on the frequency and number of visitors permitted to enter Aasivissuit at certain times of the year with access restricted to certain times of the day and even competitive concessions for operators that can demonstrate a high standard of best-practices and knowledge of the site and its sensitivities. 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.

Works Cited

Boertmann, D., and C. Bay. 2018. "Grønlands rødliste 2018. Fortegnelse over grønlandske dyr og planters trusselstatus." Nationalt Center for Energi og Miljø (DCE) og Grønlands Naturinstitut. https://natur.gl/raadgivning/roedliste.

Fenger-Nielsen, Rasmus, Jørgen Hollesen, Henning Matthiesen, Emil Alexander Sherman Andersen, Andreas Westergaard-Nielsen, Hans Harmsen, Anders Michelsen, and Bo Elberling. 2019. "Footprints from the past: The influence of past human activities on vegetation and soil across five archaeological sites in Greenland." *Science of The Total Environment* 654:895-905.

Fredskild, Bent. 1996. *A phytogeographical study of the vascular plants of West Greenland*. Vol. 45, *Meddelelser om Grønland*.

Greenland Visitor Center. 2021. Qeqqata Kommunia, turistanlaeg ved nationale sevaerdigheder (2021). Naalakkersuisut.

Grønnow, Bjarne, Morten Meldgaard, and Jørn Berglund Nielsen. 1983. *Aasivissuit, the Great Summer Camp: Archaeological, Ethnographical and Zoo-archaeological Studies of a Caribou-hunting Site in West Greenland*, *Meddeleslser om Grønland, Man & Society*. Denmark: Commission for Scientific Research in Greenland.

Hagen, D. , N. E. Eide, A.-C. Flyen, K. Fangel, and O. I. Vistad. 2014. Håndbok for sårbarhetsvurdering av ilandstigningslokaliteter på Svalbard. edited by Norsk institutt for naturforskning and Norsk institutt for kulturminneforskning. Trondheim.

Hagen, D. , N.E. Eide, M. Evju, V. Gundersen, B. Stokke, O.I. Vistad, Rød-Eriksen L., S.L. Olsen, and K. Fangel. 2019. Håndbok. Sårbarhetsvurdering av ferdselslokaliteter i verneområder, for vegetasjon og dyreliv. edited by Norsk institutt for naturforskning: NINA.

Harmsen, H., D. Hagen, and V.Q. Buschman. 2022. Vulnerability assessment of selected key sites in Aasivissuit – Nipisat UNESCO World Heritage Area, West Greenland. Nipisat, Arajutsisut, Innap nuua & Itinnerup Tupersuai. In *NINA Report*. Trondheim: Norwegian Institute for Nature Research.

Harmsen, H., F. F. Larsen, and M. Myrup. 2021. Survey of the North Shore of Aasivissuit Tasiat and Vulnerability of the UNESCO World Heritage Key Site of Aasivissuit, 28-30 August 2020. Nuuk: Nunatta Katersugaasivia Allagaateqarfialu.

Harmsen, Hans, Christian Madsen, Henning Matthiesen, Bo Elberling, and Jørgen Hollesen. 2018. "A ticking clock? Considerations for preservation, valuation and site management of Greenland's coastal archaeology in the 21st century." *Conservation and Management of Archaeological Sites* (in-press). doi: 10.1080/13505033.2018.1513303.

Hollesen, Jørgen, Henning Matthiesen, Christian K. Madsen, Bo Albrectsen, Aart Kroon, and Bo Elberling. 2017. "Climate change and the preservation of archaeological sites in Greenland." In *Public archaeology and climate change*, edited by Tom Dawson, Courtney Nuimura, Elías López-Romero and Marie-Yvane Daire, 90-99. Oxford: Oxbow.

Jensen, Jens Fog, Claus Andreasen, Paninnguaq Fleischer-Lyberth, Laust Løgstrup, Hans Holt Poulsen, Ólafur Rafnar Ólafsson, Anne-Christine Løventoft-Jessen, Susan Barr, and Morten Meldgaard. 2017. *Aasivissuit-Nipisat: inuit hunting ground between ice and sea*: Qeqqata Municipality.

Poulsen, Hans Holt, Claus Andreasen, Paninnguaq Fleischer-Lyberth, Laust Løgstrup, Jens Fog Jensen, Ólafur Rafnar Ólafsson, Anne-Christine Løventoft-Jessen, Morten; Meldgaard, Susan Barr, and Kristina Wûrtz Poulsen. 2017. Annex 2: management plan: nomination of Aasivissuit-Nipisat - inuit hunting ground between ice and sea - for inclusion on the World Heritage List. Qeqqata Municipality.

Appendix A: Future guideline ideas for tourism in Aasivissuit-Nipisat

The following recommendations were provided by the Campus Kujalleq Adventure Guide students after their visit to Aasivissuit in September 2021.

Suggestions for heritage and nature protection:

1. Manmade path up the hill (elevated), where you can look down at the site. This will minimize harm in the area.
2. Maximum 15 tourist at the time, led by a guide. Two or more groups can rotate between the different sites – EXCLUSIVE
3. Camping site, where tourists can experience sleeping in tents etc. Copy of hopping stones for kids/adults to experience.
4. Guides will have iPads/tablets with illustrations of the hunting system, meat cache, hopping stones, tent houses etc.
5. All new buildings should not be visible from the site, this could ruin the vision of the Aasivissuit purpose/history.
6. Arriving “house”/museum, where the guests get the important messages and get to see history products, before entering the site.
7. Park rangers by the road to Aasivissuit, to keep people from driving ATV’s etc. outside the road.
8. No tourist will be allowed in the (ancient camp) site! Cultural heritage will be a restricted area!

Suggestions for visitors to minimize their environmental ‘footprint’:

- Take care of nature and leave it as you found it or better! (Trash/garbage and trails)
- Toilet 200 meters from camp, streams and cultural heritage sites and bring back used paper etc.
- Camp on a safe distance from cultural heritage sites and keep all of our stuff and hiking poles there.
- Keep a distance of 2 meters from all cultural heritage sites/attractions.
- Have respect and follow guidelines and rules.