



Inuit Protected and Conserved Areas

Social Return on Investment Impact Analysis



Prepared by the Arctic Eider Society, Commissioned by Inuit Tapiriit Kanatami

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INUIT TAPIIRIT KANATAMI

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Introduction

Investing in Inuit communities will significantly benefit Canada. Investing in Inuit has several benefits, including achieving self-determination and reconciliation through Inuit led-research and environmental stewardship, supporting economic diversification through job creation, and benefits for health and wellness. In 2020, The Government of Canada made an international commitment at the UN General Assembly's first-ever Summit on Biodiversity to protect 25% of land and ocean by 2025, 30% by 2030 and implement more partnerships with Indigenous peoples (CPAWS, 2020). Achieving Canada's international commitments to conserve 30% of land and water by 2030 is only possible through Indigenous-led stewardship of marine and terrestrial regions. Many agree that Indigenous communities are our best chance for protecting the planet and it is therefore an ideal time for Indigenous communities in Canada, including Inuit, to negotiate self-determination in stewardship of their regions. In some cases this includes leveraging Impact Benefit Agreements to help address long-outstanding capacity gaps and provide sustainable means to protect, study and steward marine and terrestrial regions by investing in the development of Indigenous-led conservation economies to support Canada's international conservation targets and goals for UNDRIP at the same time.

Reaching Canada's targets requires nearly doubling Canada's current protected areas (Mitchell, 2021). Approaching this target will require diversifying Canada's approach to ecosystem services to protect lands and water while also diversifying the economy. By empowering Inuit to determine their conservation objectives on their territory and supporting their constitutionally protected rights to wildlife management and harvest, economic development in the north can be furthered through Inuit-led development of conservation economies. Conservation economies represent the opportunity to create long-term sustainable employment and generate professional and full-time opportunities to manage and enforce the protected area (Tran and al., 2019; Durand, 2020, 62). They also provide many benefits, simultaneously political, social, and ecological benefits, for communities living on the land and water, as it allows for sustained and sustainable use of its resources and sustains the connection of Inuit with their territory (Gardner and al., 2018; Durand, 2020, 62).

A conservation economy for Inuit means economic wealth derived from stewardship of local natural resources that respect and preserve Inuit Qaujimajatuqangit and meets local needs to restore rather than depletes natural resources and social capital. Supporting development of conservation economies means supporting conservation areas and sustainable industries such as harvesting. An investment in the conservation economy would provide the infrastructure needed for food sovereignty in Nunavut by giving harvesters the tools necessary to feed Inuit communities, reinvigorating cultural practices, and stimulating local economies. Harvesters' catch will fill the community freezer and feed Nunavut (QIA, 2019,10).

Investing in Inuit: Using land-based activities to build a conservation economy

Investing in Inuit Nunangat to reach Canada's commitment to protecting 30% of lands and water by 2030 can start with the Federal government building meaningful partnerships with Inuit communities. Investing in Inuit communities' conservation priorities will increase land and water protection in Canada and empower Inuit self-determination through grassroots economic growth.

Inuit have been reorienting management and stewardship of their lands away from what have primarily been colonial approaches toward local priorities (ITK, 2018, 5). For many years, non-Inuit have

conducted research in Inuit Nunangat and reaped the benefits, often without meaningful involvement of Inuit (ITK, 2018, 3). Although this dynamic has been changing in recent years, reaching Canada's commitment to protecting 30% of the lands and water by 2030, community-level research, monitoring, and harvesting must be prioritized in Inuit Nunangat.

Conservation-sector initiatives start with local Inuit communities (Fiser, Stonefish and Etitiq, 2022). Even though many Inuit have joined the wage economy, land-based activities continue to be popular (Fiser, Stonefish and Etitiq, 2022). Land-based activities are integral to Inuit culture, maintaining well-being, and supporting environmental monitoring; according to Statistics Canada, 84 percent of Inuit in Nunangat participate in harvesting and handicraft activities (Aboriginal Peoples Survey, 2017; Fiser, Stonefish and Etitiq, 2022). An emerging Inuit-led conservation sector is related to land-based activities and skills (Fiser, Stonefish and Etitiq, 2022). For Inuit, a conservation sector means economic wealth is derived from natural resources respectfully, using Inuit knowledge (QIA, 2018).

Growing the conservation sector in Inuit Nunangat through environmental stewardship support climate adaptation and job creation that fosters Inuit culture and supports food sovereignty through locally harvested country food while empowering and preserving Inuit Qaujimajatuqangit. Inuit Protected and Conserved Areas (IPCAs) present an opportunity to propel Canada's commitment to 30% forward. IPCAs provide significant opportunities for tangible and intangible benefits for Inuit communities respecting the holistic inter-connected approach to subsistence economies and stewardship. Enabling Inuit to safeguard the natural and cultural resources on their land, IPCAs can promote the maintenance of healthy Inuit communities and build sustainable economies for generations to come.

Protected and Conserved Areas for Inuit, by Inuit

Achieving Canada's international commitments to conserve 30% of land and water by 2030 requires supporting IPCAs. Inuit are uniquely positioned to benefit significantly by investing in land-based activities to support economic development through a conservation sector. Inuit Nunangat desires a new direction for PCAs, a path that Inuit forge. Inuit want more than federally designed PCAs; they want Inuit involvement in all decisions relating to their homeland and a whole-of-government approach that allows for long-term strategic investments in the environment, the local economy, and the community (QIA 2018). Thus, IPCAs will enable Canada to champion its international commitment to conserve 30% of land and water by 2030 and implement more meaningful action to reconciliation and self-determination for Inuit by investing in Indigenous led protected areas and development of conservation economies.

Achieving the increased conservation of land and water in Canada requires addressing long-outstanding capacity gaps for Indigenous communities. Funding and infrastructure that supports Inuit Nunangat's capacity to manage IPCAs will build a sustainable economic structure based on the principles of IQ and conservation. IPCAs are a tool to build conservation economies. In turn, conservation economies contribute to addressing the inequities between Inuit Nunangat and the rest of Canada by increasing food sovereignty by giving harvesters the tools necessary to feed Inuit communities, reinvigorating cultural practices and stimulating local economies (QIA, 2018).

IPCAs are inherently different from PCAs. The structuring of PCAs has more often than been built through the paradigm of the Western scientific model in Canada. Federally enforced agreements for PCAs are exclusionary conservation models reflecting a nature/culture dichotomy (Shultis and Heffner,

2016; Zurba and al., 2019; Durand, 2020, 58). Ill-adapted conservation measures, such as seasonal restrictions or restrictions related to species conservation status, restricted Inuit subsistence hunting and fishing diminish the ability of community members to harvest seasonally; this has lasting detrimental effects on Inuit food security (Hurtubise, 2016; Theriault, 2011; Durand 2020, 42). The imposition of quotas, which is still enacted in conservation frameworks, has further socio-cultural implications, as they violate Inuit practices and rights to subsistence harvesting and prevent Inuit from passing Indigenous Knowledge to younger generations through the practice of traditions and customs (Hurtubise, 2016; Theriault, 2011; Durand 2020, 42).

Not only does supporting Inuit-specific policy recommendations for IPCAs help Canada meet its international commitment to conservation, it directly responds to the calls for action in the National Inuit Strategy on Research. It builds on Canada's implementation of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), the Report of the Royal Commission on Aboriginal Peoples (RCAP) and the Truth and Reconciliation Commission (TRC) 's Calls to Action. Furthermore, it fundamentally emboldens the Federal government's Arctic and Northern Policy Framework (ANPF). Goal 3 of the ANPF is to "build strong, sustainable, diversified and inclusive local and regional economies" (CIRNAC, 2019). The objectives of the ANPF include increasing Indigenous participation in the economy, growing the Arctic economy, increasing retention of wealth in the Arctic and implementing Inuit-specific policy recommendations related to federal conserved and protected areas. Additionally, IPCAs make research more accessible for Inuit to inform local policy better, forecast, and evaluate the impacts of current policies (ITK, 2018, 11).

Why IPCAs?

IPCAs consist of protected areas and other effective area-based conservation measures (OECMs). OECMs are geographically defined areas (other than Protected Areas), which are governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity with associated ecosystem functions and services and, where applicable, cultural, spiritual, socio-economic, and other locally relevant value (Ramos Castillo and Tugendhat, 2022, 5). OECMs are areas that deliver the long-term conservation of biodiversity without being designated or otherwise recognized as protected areas. In addition, for OECMs, conservation does not need to be a primary objective of the governance or management of the area; it simply needs to be an outcome of it (Ramos Castillo and Tugendhat, 2022, 5).

IPCAs are lands, waters, and ice, where Indigenous leadership is a defining attribute in the decisions and actions that protect and conserve an area (ECCC, 2021). IPCAs have significant tangible and intangible benefits for the environment, economy, and society in Northern communities. Tangible benefits can be measured in financial terms. In contrast, intangible benefits cannot be quantified directly in economic terms but still significantly impact, especially in remote northern communities (TWProject, 2021). Importantly, in Inuit Nunangat, the goal of conservation is, for Inuit, sustainable and continued use of natural resources. This is distinct from a western and southern understanding of conservation, which focuses on limiting the use of depleted resources. Understanding the northern context of conservation is particularly important, where remote locations mean that visitor numbers to conservation areas are typically low (Gibson, Gould, & the Firelight Group, 2020, 32).

Intangible social returns on investment (SROI) (or those non-market values) are typically viewed as secondary to tangible (or those easier-to-measure) returns on investment (ROI) (Trousdale & Andrews, 2016, p.8). However, in subsistence economies, like many in Inuit Nunangat, project evaluations that

focus heavily on tangible measures can be misleading and fail to capture the complete picture. Tangible outcomes only account for monetary value derived from market prices – and it has limitations in accounting for social externalities (Hamelmann, Turatto, Then, Dyakova, 2017, p. 2). In the remote context especially, it is vital to consider the more difficult to measure (intangible) outcomes such as social equity, cultural vitality, traditional economic prosperity, environmental sustainability, health, and governance authority (Trousdale & Andrews, 2016, p.8). Measuring these intangible outcomes is key to redefining what is possible for Inuit-led approaches to stewardship and protected areas management, helping better negotiate impact benefit agreements, and redefining stewardship mechanisms.

Social Returns on Investment and Impact Measurement

Social returns on investment (SROI) uses financial proxies (estimates of financial value) for outcomes (those incremental changes that lead toward a goal: in this case, IPCAs) or impacts that are difficult to measure and monetize (Kalagnanam et al., 2019, 9). SROI focuses on the triple bottom line of environmental, social, and economic value (Kalagnanam et al., 2019, 9). While SROI's have in the past provided a simple ratio for reviewing impacts, it is now generally understood that this approach is overly simplistic and that impacts cannot be reduced to a simple number. As such, we take a more holistic approach to impact measurement for IPCAs that works to identify the various tangible and intangible outcomes of investments in Indigenous-led conservation and conservation economies.

With an increasing demand for accountability to stakeholders and better investment tracking, the focus has shifted from how resources are used to the outputs and impacts of those investments to improve social outcomes (Kalagnanam et al., 2019; Canadian Institute of Diversity and Inclusion, 2013). The principles-based SROI or impact measurement framework gives communities a tool to assess the outcomes of their efforts, to communicate their successes and impacts, manage their risks, and support evidence-based decision-making and optimal use of resources (Kalagnanam et al., 2019, iv). This approach enables better investment impact tracking and creates more opportunities to demonstrate the tangible benefits of conservation measures and investments in communities. In addition, Impact Measurement shows that there is a space for innovative projects, and there are benefits to evaluating the social impact of investment (Harji, 2008).

Tangible Benefits

IPCA initiatives in Inuit Nunangat must support participation in subsistence activities and, at the same time, generate tangible economic benefits. As such, it is important that the benefits and impacts of a IPCA can be calibrated and measured (Makeway 2021, 44). In addition, indicators are needed to evaluate if a program achieves its intended activities and outcomes (SRDC, 2021, 44). Moreover, tangible benefits are measurable, observable outcomes are important for Inuit communities to inform local policy (SRDC, 2021).

Similar Indigenous-led enforcement can (and does) exist in several communities without officially designated programs or IPCAs program (Artelle et al., 2019, 4; Sheil et al., 2015). Guardian programs in Canada are a good example of how formalizing the role of monitoring and enforcement of stewardship and IPCAs can result in tangible benefits for communities where patrolling and monitoring of their territories is something many members do already throughout most, if not all, year (Artelle et al., 2019, 4; Sheil et al., 2015; Social Ventures Australia, 2016; Trousdale and Andrews, 2016). For instance, Guardian work in Łutsël K'e and the Dehcho region has concluded that for every \$1 invested in the Guardian

program, approximately \$2.5 of social, economic, cultural, and environmental value has been created for stakeholders. (Social Ventures Australia, 2016). Similarly, Guardian programs on the coasts of British Columbia reached 10:1, all the way to 20:1 SROI (Artelle et al., 2019, 4; Trousdale and Andrews, 2016).

Communities increasingly recognize the power of monitoring research and stewardship activities as a vessel for community development (Gibson et al., 2020, 28). This includes tangible benefits such as job opportunities, increased capacity development for training opportunities for the community, and collecting and sharing technical findings, leading to more funding for research (Trousdale & Andrews, 2016, 30).

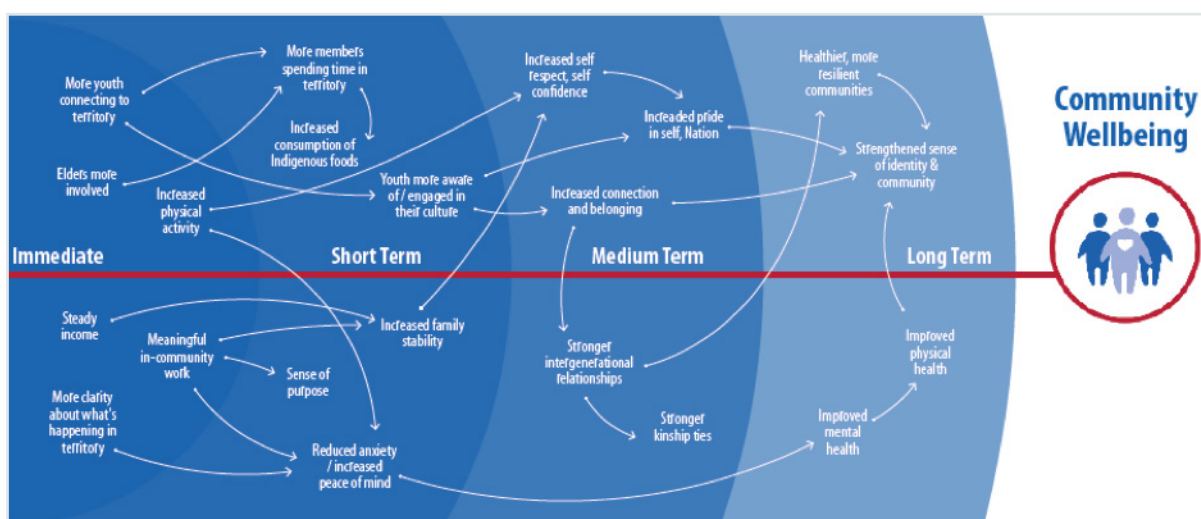
IPCAAs can provide tangible benefits for governance in Inuit communities in the form of data for informed decision making and stewardship. Formalizing the role of monitoring and enforcement of stewardship and conservation can break down the silos of measuring socio-economic success that the federal process often requires in governance. Contemporary examples of Indigenous stewardship approaches provide tangible and intangible examples of how the shift towards a conservation economy supports resurgent Indigenous governance and Inuit self-determination of research, monitoring, and policy (Artelle et al., 2019, 5; Artelle et al., 2018; Bhattacharyya and Slocombe, 2017; Kimmerer, 2013).

While there is still work to do to implement impact measurement frameworks more generally in the context of Inuit Protected and Conserved Areas, we focus here on a key case study of Sanikiluaq's programs for Qikiqtait assessing a resource inventory and base-line data for implementing community-driven protected and conserved areas, and piloting Guardians Programs, which have involved implementation of Impact Measurement models and forecasting in advance of efforts (see Appendix) and comprehensive measurement of Key Performance Indicators through the process that makes for an ideal case study demonstrating the impacts of investing in IPCAs.

Intangible benefits

By measuring intangible benefits for IPCAs, positive social impacts can ripple outward into the broader community. IPCAs safeguard cultural resources such as culturally significant sites, traditional food sources, medicinal plants, and traditional use areas (Trousdale & Andrews, 2016, p. 34). If community members have increased access to these resources, it can promote a renewed engagement in cultural practices. Moreover, Inuit-led and managed IPCAs promote a wealth of social benefits for the whole community, which increase community wellbeing (see Figure 1).

Figure 1- Potential SROIs from PCAs for Indigenous Communities

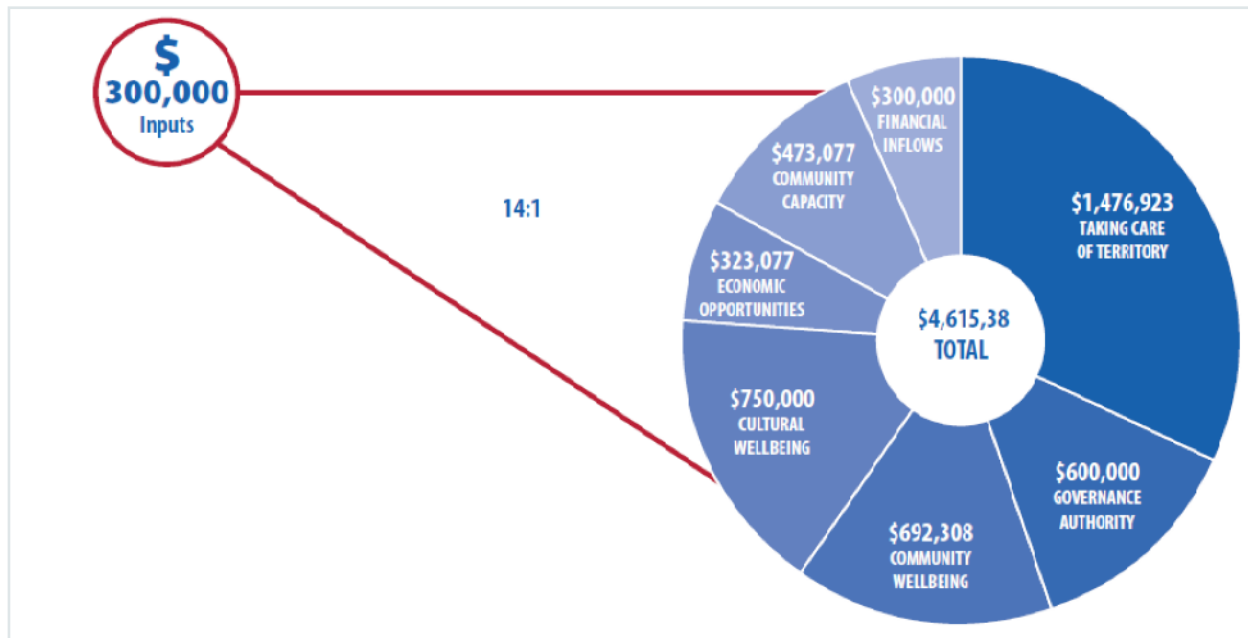


Source: Valuing Coastal Guardian Programs, 2016, p.32

Lending itself to better opportunities for food sovereignty, the intangible benefits from IPCAs can mean communities have more options and autonomy over the food they access, especially country food. If done right, IPCA agreements can create opportunities to bring more people back to the land by establishing harvesting provisions for community members. Therefore, an intangible benefit is that country food becomes more available.

Moreover, protected areas can contribute to less outward diversion of resources and more local economic and social return on investment (SRDC, 2021, p.7). A good example of this is the analysis of Guardian Watchmen programs, which the Coastal First Nations along British Columbia's North Coast, Central Coast, and Haida Gwaii have been working to establish and grow. Their evaluation of the program's impacts involved establishing and quantifying monetary equivalents for the relative importance of the magnitude of the change experienced by the Nation from the community's perspective. The weighting exercise clarified the importance of the program to the Nation's core values and wellbeing indicators. For example, based on an analysis of a one-year, \$300,000 investment into Coastal Nation's Guardian Watchmen program, there was a 10 to 1 return on investment at the low end from the Nation's perspective (Trousdale & Andrews, 2016, p. 52). In other words, for each dollar invested on an annual basis, a Nation was benefiting at least ten times that amount. On the high end, some Nation's are experiencing a 20 to 1 return on investment each year (Trousdale & Andrews, 2016, p. 52). The \$300K investment translated to a 14:1 return on investment, much of the returns being social (See Figure 2) (Trousdale & Andrews, 2016, p. 52).

Figure 2: Monetary Returns (Tangible & Intangible) from Guardian Watchman Program



Source: Valuing Coastal Guardian Programs, 2016, p.52

To determine the return on investment, Guardian Watchmen Programs in British Columbia created monetary equivalents that reinforce their business case (Trousdale & Andrews, 2019, 46). This is an important step to communicate the overall return on investment and the relative impact of the significance of the changes to each Nations values (Trousdale & Andrews, 2019, 46). These changes' relative importance was done using a three-stage value-weighting process employing a multiple method approach (Trousdale & Andrews, 2019, 46; Hobbs & Horn, 1997). The multiple methods approach uses swing weighting and points allocation (Trousdale & Andrews, 2019, 46; Van Grundy, 1988; McDaniels, 1992; Keeney, von Winterfeldt & Eppe, 1990).

The weighting exercise was done at a community gathering and involved community members filling out worksheets (Trousdale & Andrews, 2019, 46). Then the point allocation and reconciliation methods were employed in remote follow-up workshop sessions (Trousdale & Andrews, 2019, 46). The purpose was to determine a shared set of value weights that were indicative of the relative significance members place on the changes that occurred in their communities, respectively (Trousdale & Andrews, 2019, 46). Next, the contributions of each program were discussed, debated, and clarified by the whole community until they agreed with the final weighting. Determining the relative importance of the magnitude and extent of the changes to the community involves a whole of community approach and provides everyone with the opportunity to contribute (Trousdale & Andrews, 2019). Finally, the average and range of responses from community members were calculated to determine the final distribution of weight.

Redefining what was previously possible, investing in IPCAs for economic and social outcomes effectively reframes the narrative of Indigenous knowledge and data collection and how they can be used to inform conservation. What has largely been considered anecdotal evidence of environmental change can now be supported by community-driven data collection. For example, the Arctic Eider Society has developed a whole-of-community approach to stewardship and monitoring which has been highly successful,

involving over 100 community members, including women, elders, men, and youth, through the process. In addition to more typical community-driven research programs, they have created a compelling new approach to comprehensive data collection and stewardship through SIKU: The Indigenous Knowledge Social Network. In Sanikiluaq (between September 2020 – August 2021), almost 10,000 posts were made on the SIKU app, totalling 350,000 km travelled with over 184 contributors. Recently, SIKU data was also used to inform real-time wildlife management decisions by the Sanikiluaq Hunters and Trappers Organization (Enuaraq-Strauss et al. 2021). Data on harvesting activities collected by community members using SIKU for the Qikiqtaik program provided real-time data to the HTO on the reindeer population (which elders have been expressing concern over as they were declining). For the first time, this provided real harvest data that could play a key role in the decision making by the HTA to temporarily limit harvesting activities to allow the population to recover (Enuaraq-Strauss et al. 2021). As local community members were engaged in every stage of contributing the harvesting data, the approach provided increased community buy-in and respect for the HTO's decision. These examples illustrate that Indigenous environmental monitoring and tracking help communities, but it helps inform local organizations such as HTOs with up-to-date information and community engagement in the process.

With an increase in community knowledge of the land, ice conditions, and other factors, research roles that may have previously been given to academics from outside the community may instead be given to Indigenous community members, providing salaries and increased decision-making power and skills development within the community. An Indigenous-driven conservation economy can ensure that environmental and resource management respect Inuit Qaujimajatuqangit, Indigenous knowledge, and other traditional knowledge and respond to local needs and increase economic equality. This can also improve environmental and health outcomes (SRDC, 2021, p. 93). Moreover, Inuit-led environmental monitoring and stewardship over IPCAs are vital to supporting a conservation economy. At the heart of an economy driven by conservation is consciously investing in conservation for regional income rather than in activities that promote capitalizing on environmental degradation (i.e. mineral extraction). Decision-making around future land use, such as mining, ship traffic and harvest management, and other research initiatives, often discount anecdotal observation. While ongoing observations from daily land-use activities shape indigenous knowledge and perspectives, these were traditionally in the realm of oral history, and while well understood, data points representing daily observations were not always written down. With tools that allow systematically documenting these observations, communities are empowered to have data backing their observations providing equality in decision making when sitting across the table from consulting companies, industry, government, and academics and fully demonstrating the robustness of Indigenous knowledge and observations during land-use activities. The same approach also allows detailed impact tracking of tangible and intangible benefits. The development of an Indigenous-driven conservation economy supported by quantitative tools can provide communities with leverage to respond to local needs through locally produced data collection. IPCAs provide own-sourced Indigenous knowledge, which can help in the IBA or IPCA negotiation process (Gibson, Gould, & The Firelight Group, 2020 18).

Conclusively, Impact Measurement from Inuit-led PCAs are inherently valuable to remote communities and provide a suite of social, economic, and environmental benefits (SRDC, 2021, p.2). Community members get increased access to the land and an avenue to build on their land-based skills, including environmental monitoring skills and experience with conservation activities. This can provide communities with greater access to the conservation economy, such as developing a more sustainable

fishing industry, identifying safe travel routes, and monitoring the impact of marine shipping on the environment. It can also help contribute to greater environmental health and safety by providing up-to-date information on hazardous ice conditions (SRDC, 2021, p.92).

Although many challenges remain for the creation of IPCAs (such as more formal legislative measures and the negotiation process with federal and territorial jurisdictions), it is important to provide clear provisions for the continued practice of Indigenous rights and traditional use within those areas (Gibson, Gould, & The Firelight Group, 2020, 18). Financial security through IPCAs is possible and provides a way for Indigenous peoples to control their destinies while maintaining and protecting an important area. Prioritizing a conservation economy provides opportunities for economic development that focus on maintaining environmental values in these areas, such as supporting intact ecosystems, the continuation of Indigenous rights and interest through sustainable wildlife populations, and other values important to Indigenous governments and organizations (Gibson, Gould, & The Firelight Group, 2020, 24). Communities are increasingly recognizing the power of locally produced research to act as an instrument for community development; whether this is economic development, capacity development, or social development, the opportunities for increasing intangible and tangible community outcomes through IPCAs are significant (Gibson, Gould, & The Firelight Group, 2020, 28).

Sanikiluaq: A Case Study of the Pilot Nauttitsuqtiit Guardians Programs for the Qikiqtait Protected Area Program

Sanikiluaq is located in the Qikiqtani Region of Nunavut and is uniquely positioned to illustrate the return on investments for Inuit-led PCAs for their work on the development of the Qikiqtait Protected Area program. The community of Sanikiluaq is a coastal community that has been working towards the establishment of baseline data, a resource inventory and pilot Nauttitsuqtiit Guardians Programs (NGP) for the Qikiqtait Protected Area program since 2018 (hereinafter referred to as Qikiqtait). Qikiqtait is a community-driven stewardship program and IPCA of potentially 33,000km² for the Belcher Islands archipelago in the heart of Hudson Bay to protect the diverse unique habitats and wildlife such as the endemic Hudson Bay eider duck sub-population, and other culturally important species habitats (Durand, 2020, 60; Arctic Elder Society, 2019; ECCC, 2020). Qikiqtait represents a unique opportunity to build Sanikiluaq's capacity by providing stable and committed funding, employment opportunities, training, planning, and community engagement to the neighbouring Inuit and Cree communities (Durand, 2020, 60; Arctic Elder Society, 2019). As a part of the planning process for Qikiqtait, an impact measurement framework was developed to project social return on investments and to implement key performance indicators (KPIs) for tracking outcomes (see Appendix). This provides ideal groundwork for evaluating the impacts of investments in Qikiqtait as a unique case study that can be applied to understand more generally the benefits of investing in IPCAs in Canada. The following begins with a brief demographic overview of Sanikiluaq, then discusses the background of community-led Qikiqtait Protected Area program. Finally, the case study will exemplify a preliminary impact assessment for Qikiqtait.

Demographic Overview

Population

In 2016 census reported the total population of Sanikiluaq to be 885, of which approximately 50% were female and 50% male. The community's population grew 8.4% between 1996 and 2001, 8.8% between 2001 and 2006, 9.1% between 2006 and 2011, and 5.3% between 2011 and 2016. This trend demonstrates a consistent but moderately high growth rate but slowing down in the later years. This growth rate was also lower than the territorial rate of 12.6% between 2011 and 2016.

In 2016, the average age of residents was 26 years, slightly younger than the average age of all Nunavut residents at 27 years, and significantly lower than the general Canadian population, which averages 41 years of age. Sanikiluaq's population is relatively young, with nearly 36% of people under 15. In Nunavut, 32.5% of the population is under the age of 15 years compared with almost 17% of the Canadian

Economy

The government remains the largest employer in Sanikiluaq, with residents employed by the Hamlet of Sanikiluaq and the Government of Nunavut; this includes various fields such as health, social services, and education. In addition, other employment is provided in the services sector, goods-producing industries, retail and wholesale trade. However, residents participate in a variety of occupations. Still, the predominant occupations include sales and services, trades, transport and equipment operations, and

government services (including education). Overall, Sanikiluaq experiences lower labour participation rates (53.6%) and higher unemployment rates (28.3%) compared to the rest of the territory (68.3% and 21.5%, respectively).

Moreover, Sanikiluaq is a mixed economy, meaning it comprises market goods and the sustainable harvesting of resources (Haycock-Chavez, 2021; Fast & Berkes, 1994; McDonald et al., 1995; Quigley & McBride, 1987). A mixed economy allows for the continuation of subsistence living and traditional practices (Haycock-Chavez, 2021). The traditional economy is an important component of life, wellbeing, and sustainability in Sanikiluaq, supporting many households by contributing in-kind income and providing families with country foods that have nutritional and cultural value (Fast & Berkes, 1994; Imrie, 2009; Wein et al., 1996). Residents hunt, fish trap, and gather traditional foods and medicines (Sly, 1994a; Quigley & McBride, 1987). For example, in 2006, 80% of the population over 15yo reported participating in hunting activities in the previous 12 months (Statistics Canada, 2016).

As such, subsistence societies rely on community participation and respect for the ecosystems they depend on (Haycock-Chavez, 2021; NTK, 2006). Similarly, mixed economies such as Sanikiluaq emphasize the importance of maintaining healthy and reliable ecosystems (Quigley & McBride, 1987; Haycock-Chavez, 2021). Local food security relies heavily on fish, marine mammals, and wildlife hunting (Quigley and McBride 1987; Haycock-Chavez, 2021; Sly, 1994a). Additionally, income is produced by selling soapstone carvings, basket-making, and tourism (Quigley and McBride, 1987; Imrie, 2009; QIA, 2014; Haycock-Chavez, 2021).

Additionally in recent years, Sanikiluaq has been working to develop local conservation economy activities including an eider down economy, community-driven research programs that support local outstanding priorities while providing jobs to local experts (see below) as well as through development of local natural history filmmaking programs that were catalyzed with the creation of People of a Feather (2011) and have included BBC's Planet Earth, Frozen Planet, PBS, Nature of Things (Wild Canada) and other programming. These efforts all represent key ways that conservation economies have been being developed on an ongoing basis in the community.

Education

Concerning educational achievement, the 2016 census reported that among the population age 15 and over, 67% had no certificate, diploma, or degree (including high school), while 15% said the highest level of educational achievement was high school certificate or equivalent. In addition, the population reported a trades or apprenticeship-related certification or diploma as their highest level of educational attainment at 7%. Regarding other post-secondary education outcomes, 6% of residents reported a non-university diploma or certificate, and 4.5% reported a university certificate, diploma, or degree (Statistics Canada, 2016).

Background on the Qikiqtait Protected Area Program

The community of Sanikiluaq has shared a vision for many years of protecting the entire marine and terrestrial region of the Belcher Islands Archipelago (Appaqaq et al. 2020). This vision is reflected in their contributions to the Nunavut Land Use Plan (NLUP) and was emphasized in community planning meetings in 2018 and 2019 that leading up to the current Qikiqtait programs. The project aims to build long-term sustainability while aligning with the Qikiqtani Inuit Association's (QIA) regional vision, contributing to Inuit Impact Benefit Agreement negotiations and maintaining the community-driven

whole-of-community approach established to date. Finally, a crucial goal is to maximize community benefits and contributions to local conservation economies and stewardship for the Qikiqtait Protected Area in step-wise approach that is considerate of building local capacity and addressing key gaps (Sanikiluaq Qikiqtait Steering Committee (SQSC), 2021, 2).

In 2018 Sanikiluaq began planning and consultation meetings for Qikiqtait, and in winter 2019, through a collaborative meeting and written letter of support from QIA, they successfully applied for funding for creating Qikiqtait through the Nature Challenge Fund from Environment and Climate Change Canada (ECCC). A key component of this program included developing and implementing community wide approaches to assessing a resource inventory and baseline data that would form the basis of a Nautsiuqtiit/Guardians Pilot Program (SQSC, 2021, 2 - Note that this is referred to as Nautsiuqtiit in QIA terminology based on the Baffin dialect; however, Nautsiuqtiit is the Sanikiluaq dialect and used here in reference to Qikiqtait programs). In Fall/Winter 2020, the early stages of developing this program were initiated with an approach that built on and provided a substantial increase in capacity for the long-term work of the community to date, addressing the community's outstanding priorities for environmental research and monitoring (SQSC, 2021, 3).

The goal is to develop a whole-of-community approach to monitoring and stewardship that increases community engagement and provides comprehensive inclusion of Inuit knowledge from land use activities and observations in an unprecedented manner that, in the short term, uniquely contributes to resource inventory pre-implementation activities and longer-term provides proof-of-concept for a Guardians program and management approach for Qikiqtait that engages the community as a whole (SQSC, 2021, 3). The Nature Challenge Funding supported the planning, program development and piloting activities, with the intention that funding from the Inuit Impact and Benefit Agreement (IIBA) negotiations by QIA would provide continuity and sustainability for the ongoing activities beyond the Nature Fund timeline and help further scale up the capacity and scope of the program (SQSC, 2021, 3).

The local Sanikiluaq Qikiqtait Steering Committee presented the results of this program to QIA and federal agencies on several occasions over the last several years, with an enthusiastic response for accomplishments to date. There is a mutual desire for increased collaborative efforts to expand this program and ensure its sustainability as a part of the Qikiqtait IIBA.

Sanikiluaq's local Qikiqtait Steering Committee has been instrumental in pushing the Qikiqtait programs forward in the community. In 2019, to facilitate efficiencies related to an increase in activities associated with new levels of interest and engagement with QIA, government and other partners, the Sanikiluaq local Qikiqtait Steering Committee was formed. It is made up of delegates from the Hamlet Council, Arctic Eider Society and the Hunters and Trappers Association Board and local QIA representative, with a role to report back to, and bring priorities from, each respective group towards ongoing guidance on program development (SQSC, 2021). Ongoing consultation on community programs over the last decade have taken a whole-of-community bottom-up approach, engaging hunters and ongoing consultation through joint meetings with the Hunters and Trappers Association board, Hamlet Council and Arctic Eider Society (which has a Sanikiluaq Inuit majority board with Hamlet and HTA representation) (SQSC, 2021).

Approach to the Qikiqtaik Protected Area Program

Core Hunters Nautsitsuqtiit Pilot Program Approach

The core of the Hunters Nautsitsuqtiit Pilot Program program for Qikiqtaik is based on the ongoing work and support of 12 to 20 key hunters from Sanikiluaq that have been engaged in community-driven programs over the last two decades, including water, ice, climate and wildlife monitoring programs to address community priorities (SQSC, 2021, 6). These priorities and approaches were developed in the 1990s and early 2000s but largely remained outstanding until community-driven research programs began being implemented following the release of *People of a Feather*, with early funding from the Nunavut General Monitoring Program, ArcticNet, the University of Manitoba and the Northern Contaminants Program and creation of a collaborative Community-Driven Research Network with Inukjuak, Umiujaq, Kuujuaaraapik and Chisasibi reflecting the local ecosystem connectivity and inter-jurisdictional considerations for implementing programs in the region (SQSC, 2021, 6).

Funding from the Nature Fund pilot programs and matching funds to that proposal from project partners allowed building on this approach to hire a community supervisor and coordinator to help scale up capacity and provide additional jobs and more regular monitoring work for local hunters (SQSC, 2021, 6). Ongoing activities have included:

- Monitoring and research for the unique sub-species of common eider populations, distribution/abundance and winter ecology at key polynya and floe edge habitats (long-term ongoing)
- Monitoring for rapid freeze-up and wildlife sea ice entrapment events, including eiders and beluga (Nunavut General Monitoring Program 2014-19 and ongoing)
- Contaminants Sampling in the Marine Food Web (mussels, urchins, plankton, fish, seals, eiders, gull eggs) Northern Contaminants Program 2015-18
- Monitoring of oceanographic conditions, including water sampling for Oxygen18 isotope analysis, ice core sampling, deployment of CTDs and oceanographic moorings to assess large scale cumulative impacts of environmental change in the region (NGMP, UofM, ArcticNet, ongoing)



- Sea Ice monitoring of dangerous and changing conditions using the SIKU app, mapping of polynyas and floe edge habitats (SIKU)
- SmartICE monitoring of ice thickness along key travel routes (SmartICE)
- Monitoring of ecosystem trends associated with seals and polar bear harvesting (e.g. seal diets, habitats, body condition, ice conditions) using SIKU to support a greater role for Inuit Knowledge in Contaminants Research and to address the vision of late elder Peter Kattuk regarding Inuit Knowledge of changing trophic structure in the marine food web (Northern Contaminants

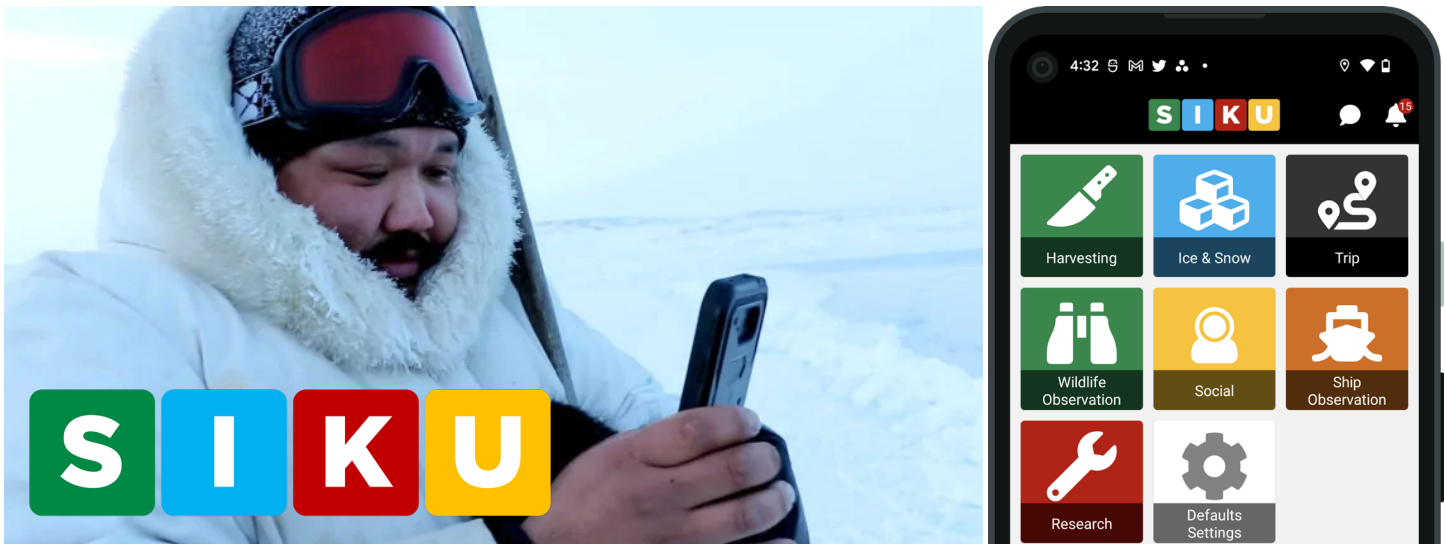
Program 2018-22) Presentation by Lucassie Arragutainaq (<https://vimeo.com/488757595>)

- Support for the development of natural history film making as a part of conservation-economic development for the region, including Planet Earth, Frozen Planet II and others.
- Deployment of remote weather stations, moorings, monitoring sea ice break-up (Univ. of Manitoba)
- Common Eider Nesting Survey + Walrus Surveys Summer 2021 (ECCC + Nature Fund) (SQSC, 2021, 6-7)

This program reflects the core of coordinated community-driven monitoring, research, stewardship and Nautsitsuqtiit approaches to addressing community priorities and developing conservation economies that directly support hunters and subsistence related activities and stewardship of Qikiqtait (SQSC, 2021, 7). These key individuals are the heart of related and connected activities, including youth programs, knowledge transfer, a leading role for Inuit knowledge and SIKU Qikiqtait programs. The Nature Fund allowed hiring the community supervisor and coordinator full time, training them in various skills administrative and field skills, providing experience and networking with other programs at conferences and meetings, and providing more casual and seasonal program-related work to the pool of hunters involved.

A key priority in the next phase of this program is hiring two new Nautsitsuqtiit Community Monitors (and additional individuals in future years) that can continue these activities on a more regular basis as well as support for increased work and stewardship activities by the larger casual pool of key hunters (some of these individuals would prefer to still work on a more casual basis related to their interests, skills, and other seasonal activities). The program has matured in recent years with this increased capacity and has provided key hunters with important work, investing in their knowledge and expertise while supporting training and skills development of younger hunters in relation to the different activities above.





Whole-of-Community Nautsituqtiit Approach to Monitoring, Management and Stewardship With "Siku For Qikiqait"

Based on tools developed to support the Community-Driven Research Network in 2014-17, Sanikiluaq entered a new phase of long-term efforts mobilizing Inuit knowledge to facilitate self-determination and a leading role for Inuit in research, monitoring, stewardship and governance with SIKU: The Indigenous Knowledge Social Network (SIKU). SIKU was created in Sanikiluaq in consultation with Inuit across Inuit Nunangat as an online project management platform and mobile app that ensures full ownership, access and control to Indigenous users, respects regional governance and empowers community members with tools and capacity to systematically document their knowledge and observations for environmental stewardship to manage local programs and projects for their own benefit.

SIKU is now being used by over 10,000 users across northern Inuit and Cree communities for large-scale regional efforts and is helping direct investments away from exclusively ivory tower academics and directly to Indigenous community led programs. While SIKU was developed with communities and rights holders across the north, it came from Sanikiluaq originally, inspired by elders like Piita Kattuk and developed by local hunters and elders over many years.

It is no surprise then that Sanikiluaq provides a compelling use-case study for impact tracking, and the use of SIKU for the Qikiqait resource inventory activities and pilot Nautsituqtiit programs have been hugely successful, demonstrating a compelling and comprehensive whole-of-community approach to monitoring, stewardship, food security and future management approach for the Qikiqait region. It gained substantial traction across the community since the pilot Nautsituqtiit began in the winter of 2020, despite the challenges of the pandemic, demonstrating the resilience of community-led efforts that are not reliant on visiting researchers from the south. It has developed into an integral part of community engagement, communications and meaningful involvement in the process of creating stewardship for Qikiqait while helping ensure equitable economic benefits for all community members.

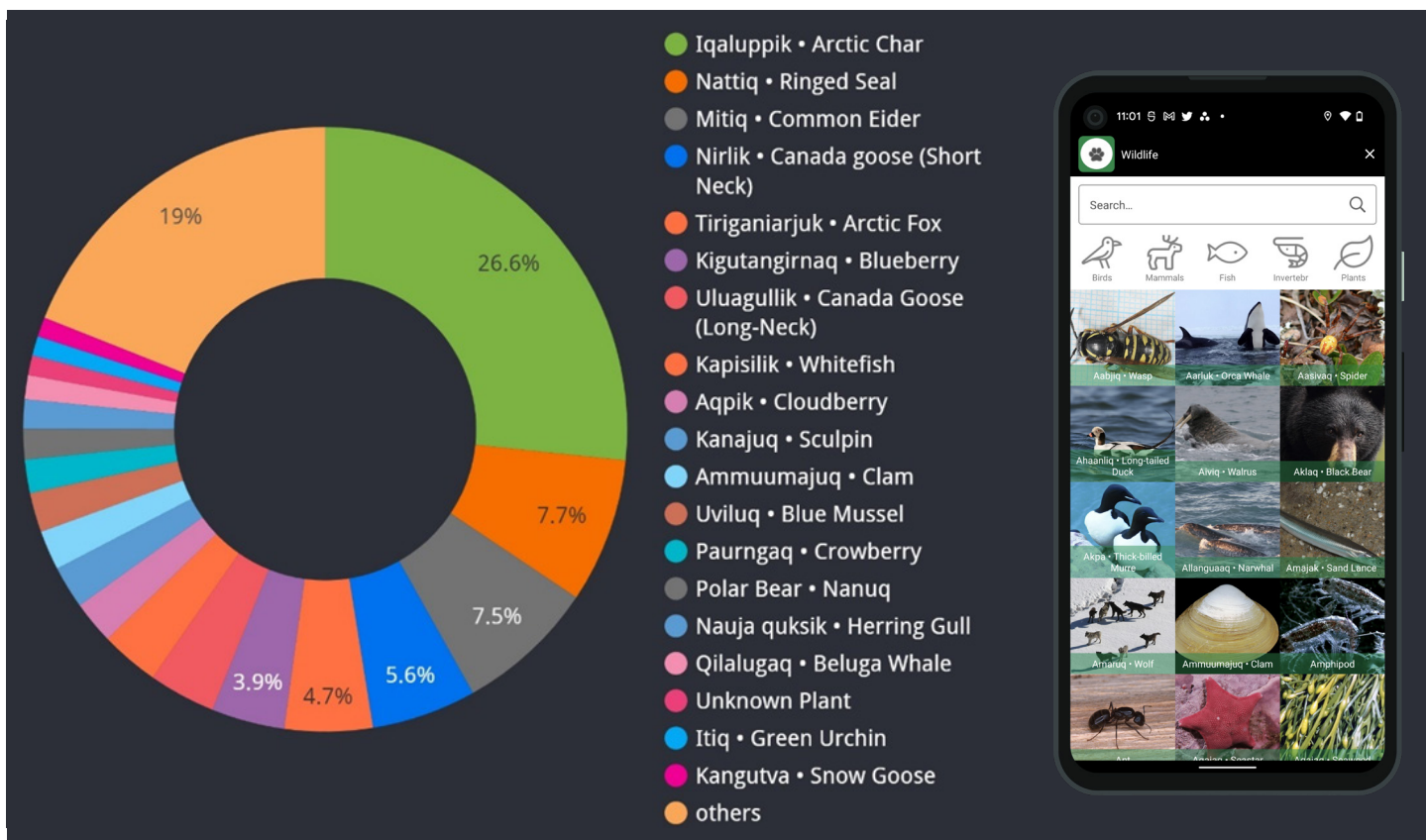
This approach has allowed Inuit to track their impact and has created a resource inventory and baseline data that provide a framework for ongoing stewardship and real-time management and stewardship of Protected and Conserved Areas by and for Inuit in a manner that implements recommendations of the National Inuit Strategy on Research and National Inuit Climate Change Strategy.



Elder Jimmy Iqaluq plays a leading role in developing SIKU and ice monitoring tools, pictured here with community supervisor Johnny Kudluarok



Late elder Piita Kattuk was a driving force for creating SIKU and a protected area for Qikiqtait

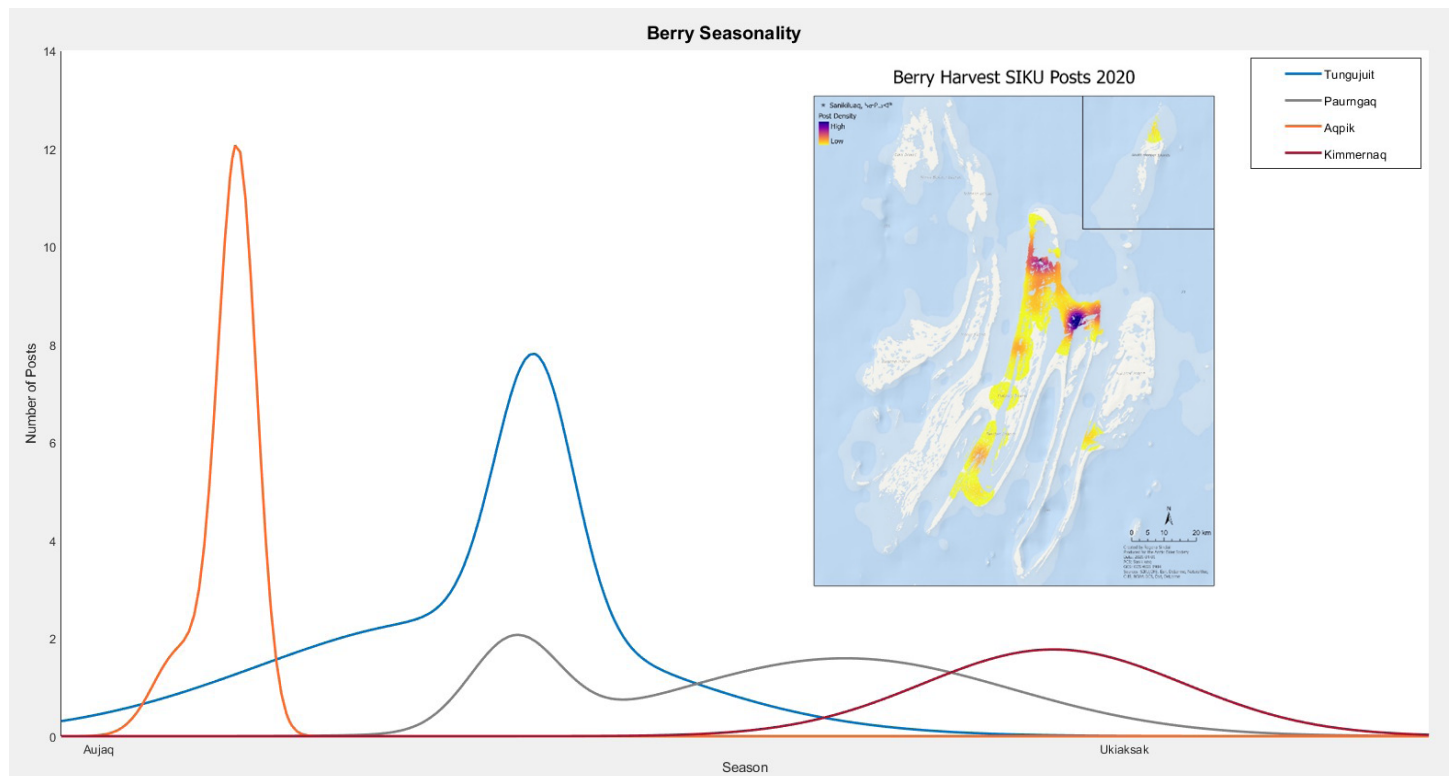
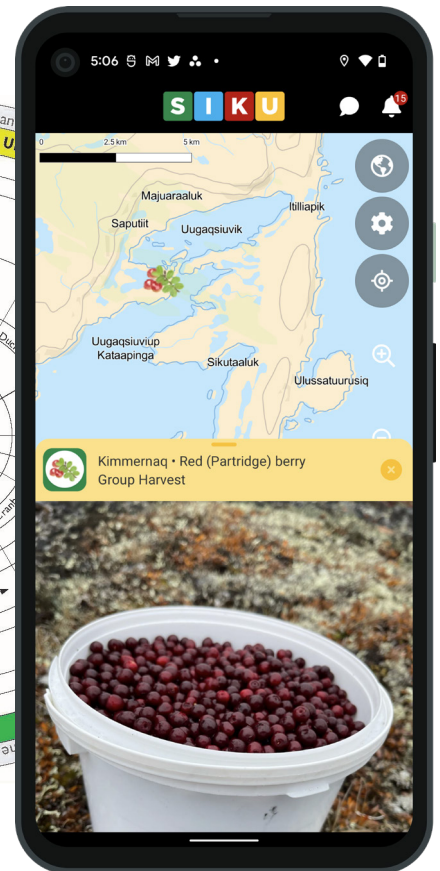
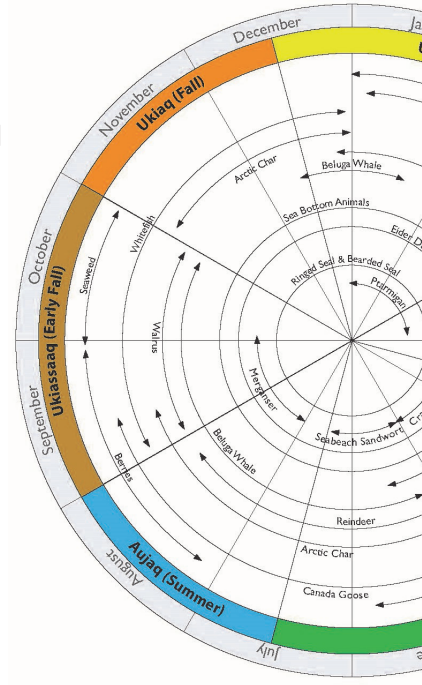


Amazingly over 200 participants (>20% of the community) are using SIKU in Sanikiluaq for the Qikiqtait project and have made >15,000 Posts as a part of their land use activities covering over 500,000 km of trips documented with SIKU and contributing to the Qikiqtait resource inventory and Nautsituqtiit program!

The approach to implementing this vision builds on the knowledge that collectively, Inuit observe and experience the environment and changing conditions on a daily basis through landuse activities that provide a compelling basis for stewardship. The program is voluntary and provides a small honorarium to help cover hunting expenses (\$40 to \$50/day depending on the mode of transportation) where harvesters document their trip including tracks, harvesting activities and observations of wildlife, sea ice or unusual conditions. Importantly, this honoraria does not affect the income support programs of community members involved in the program, and rather provides additional income to help cover fuel and equipment costs for harvesting, meaning those on income support are better able to afford to engage in land use activities, and be engaged in environmental stewardship while contributing to their food security and healthy living. It has been key to success during the pandemic, contributing to food security and community engagement, with many other benefits and outcomes as outlined below.

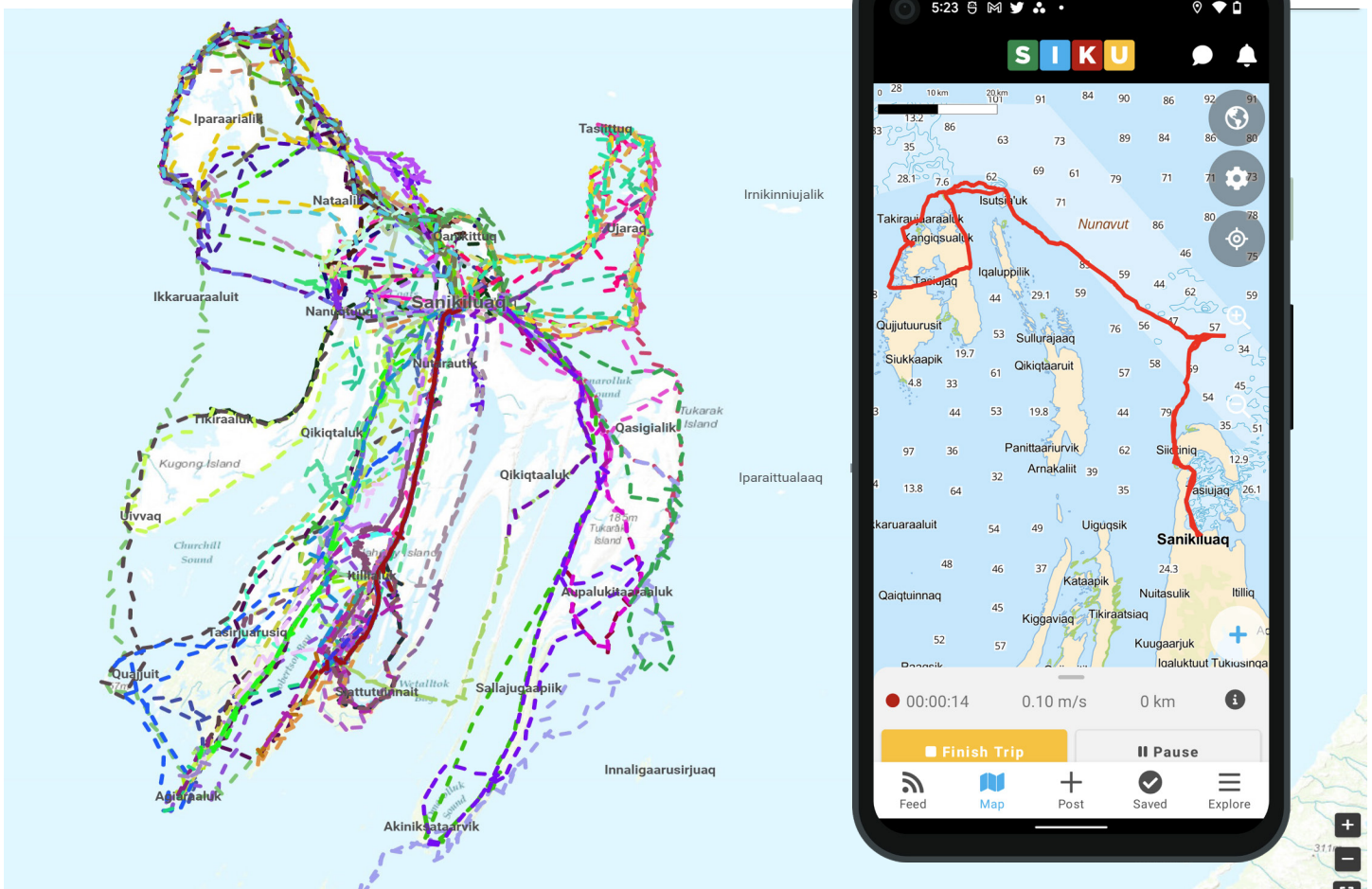
Benefits of SIKU Approach for Resource Inventory, Nautsituqtiit and Future Management

- Comprehensive information on all species of wildlife that are actively harvested year round and across the archipelago contributing to an in-depth resource inventory at a scale that is unprecedented and provides a compelling case at a national level for a leading role for Inuit knowledge in research, management and stewardship of protected areas.
- Crowd-sourcing of an Inuit calendar of seasonal resources for all wildlife species as a baseline for time series analysis for wildlife management and climate change monitoring on an ongoing basis for Qikiqtait in future years
- Real time land use and occupancy data that has played a key role in decision making, including recent reindeer management decisions by the Hunters and Trappers Association

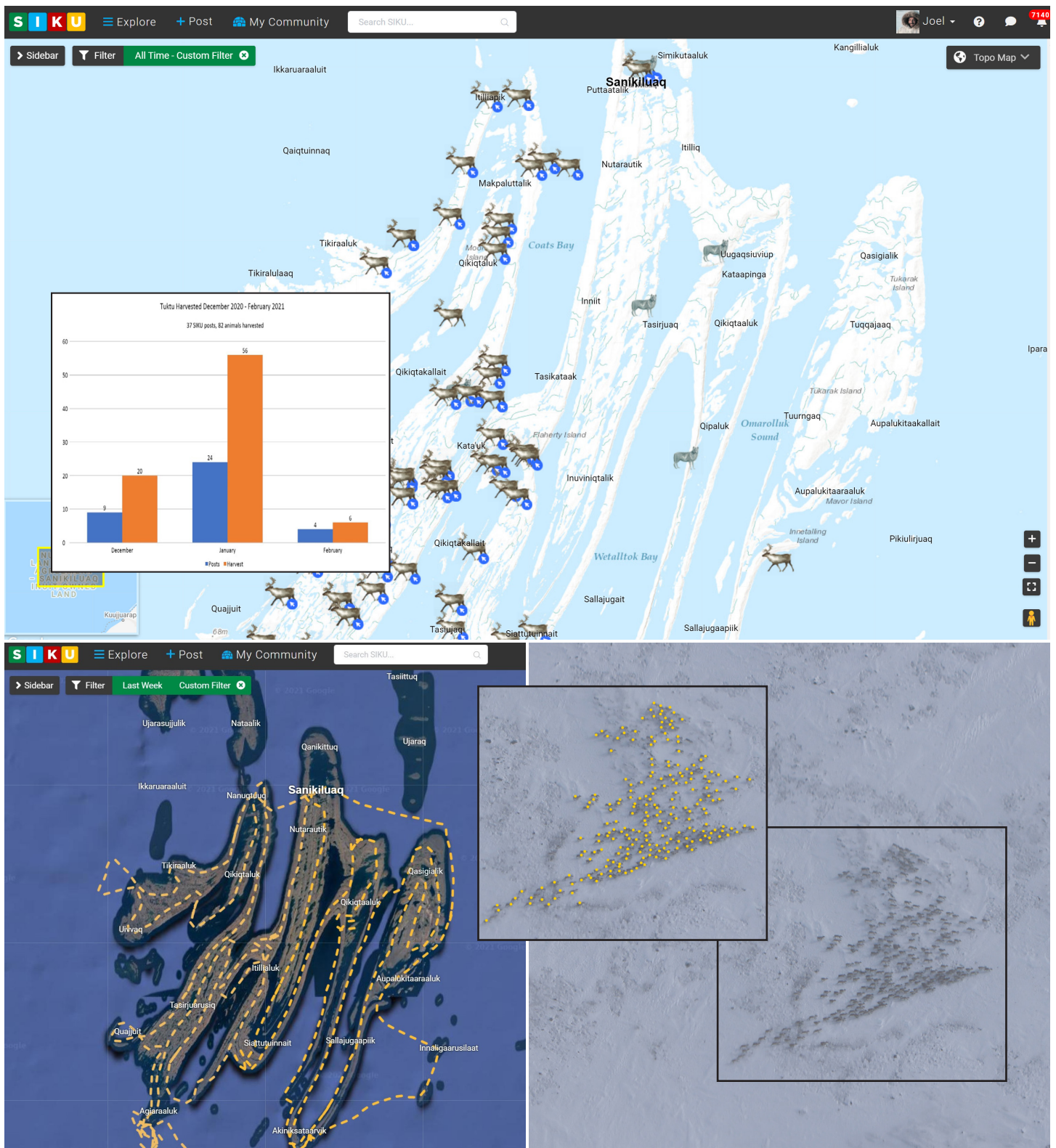


Fall 2020 Seasonal peaks of berry production crowd-sourced through Sanikiluaq harvesters using the SIKU app for the Qikiqtait Nautsituqtiit program, providing a baseline for evaluating future changes in timing and productivity

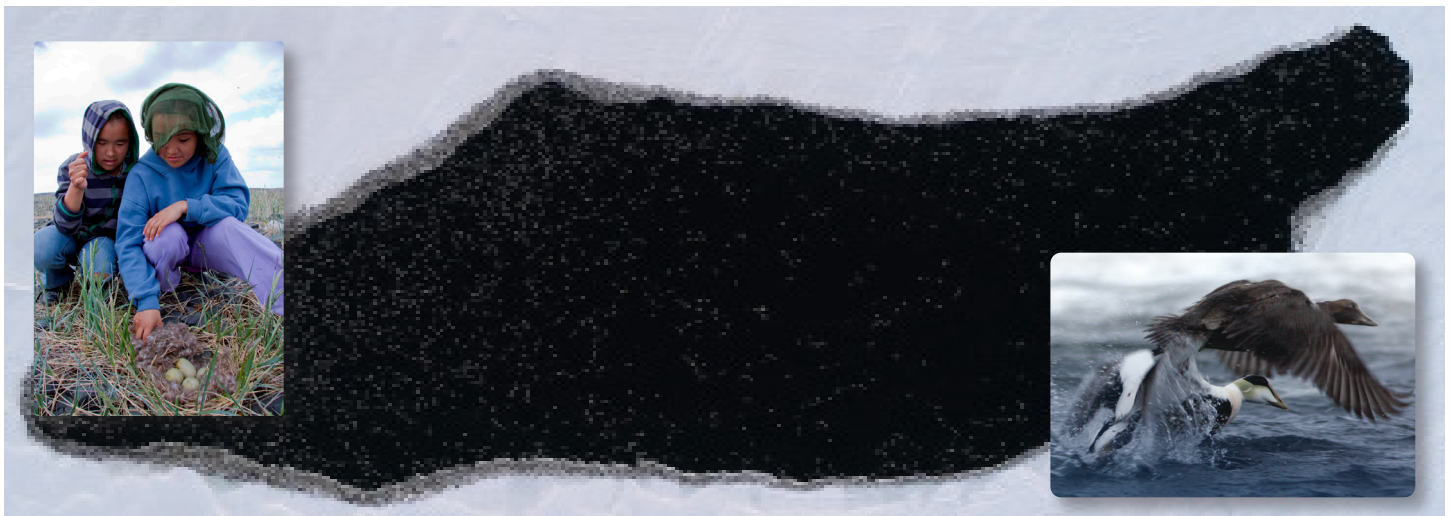
- A compelling basis for long-term management of the Qikiqtait Protected area that engages the whole community in all stages of the process, ensuring more comprehensive knowledge based for decision making.
- Engagement through a whole-of-community approach involving over 100 individuals supported and participating, equitably including women, men, elders and youth
- Support for harvesters contributing to food-security during the pandemic in a trackable quantitative way that contributes to both resource inventory and measuring impacts for conservation economies.
- Knowledge transfer among hunters in the community, including experienced hunters and youth about wildlife observations and safety that facilitate engagement in land use activities.
- Language preservation through the use of Inuktitut terminologies for local species, traditional place names and ice conditions as a key framework for monitoring based in Inuit Knowledge approaches
- An active role for community members to engage in the creation and process of the Qikiqtait protected area that is often only left to a few key community members
- The whole-of-community engagement ensures a more sustainable and robust approach to conservation and management as individuals are engaged in, informed, supported and benefit from the process on an ongoing basis.



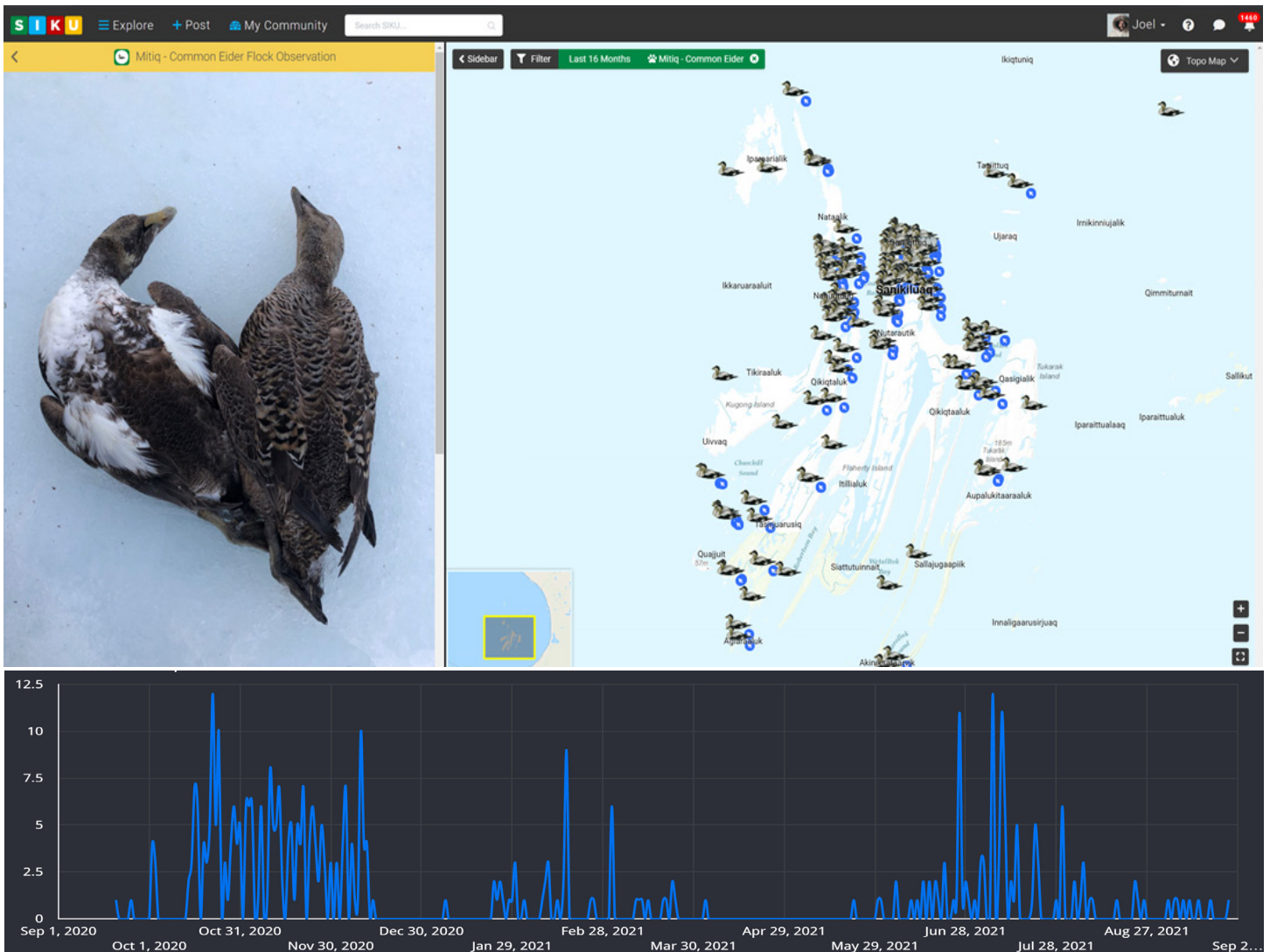
Winter hunting routes crowd-sourced with the SIKU app made over two months in winter 2020 as a part of the pilot Nauyasuqtiit Guardians program and resource inventory for Qikiqtait. Tracks are key for knowledge transfer on safe routes and documenting observation/survey coverage and effort such as catch per unit effort.



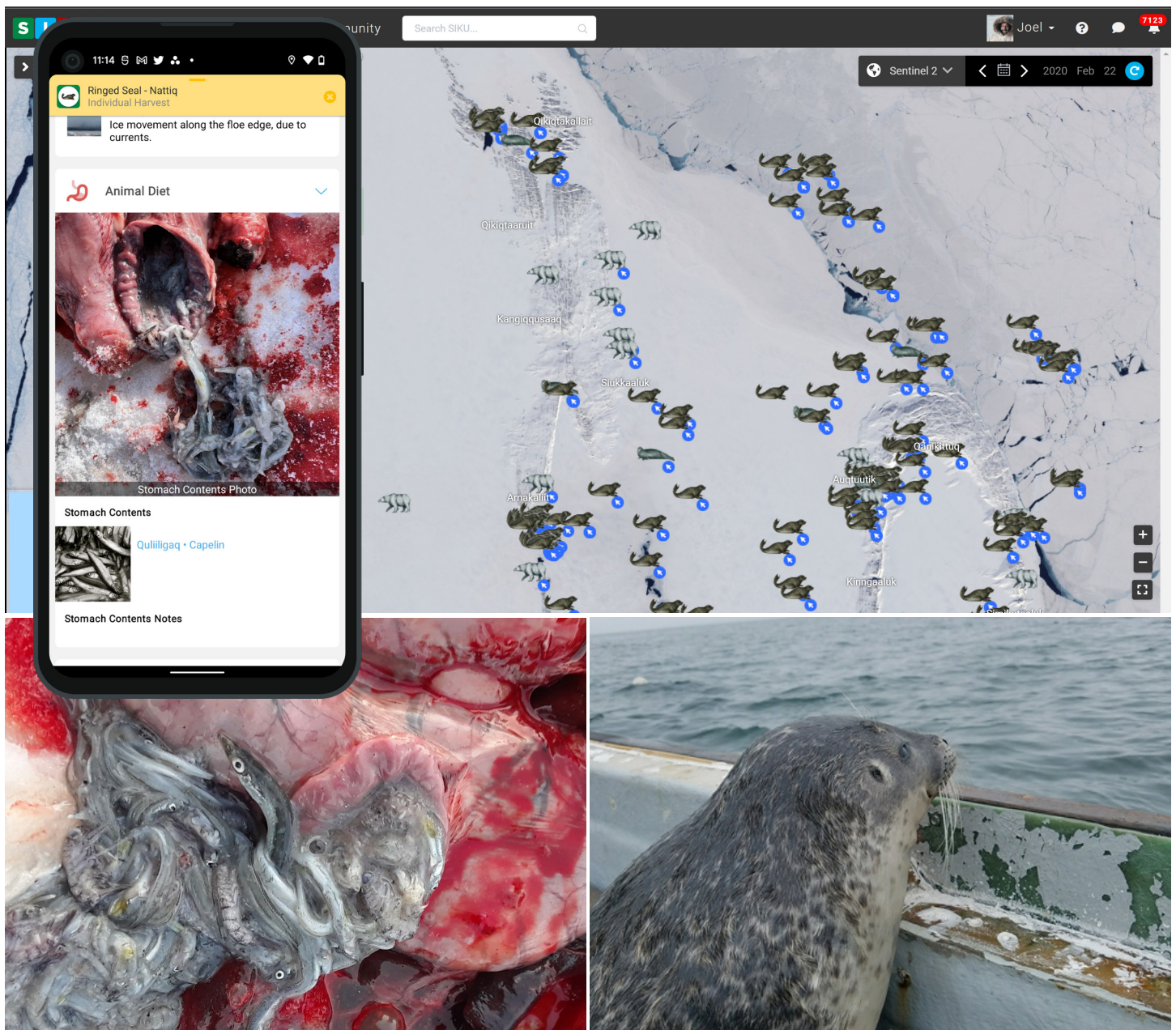
A combined approach with surveys by key hunters and harvesting posts on SIKU have been critical to real-time Tuktuk management by the Hunters and Trappers Association. The information on harvest levels, wolf observations and survey data allowed the HTA to make an informed decision that in 2021 led to a voluntary seasonal restriction on harvest. This demonstrates a key role for the SIKU Nautsiquitiit approach in unprecedented decision making using real-time data collected by hunters and analyzed by the HTA for management and stewardship.



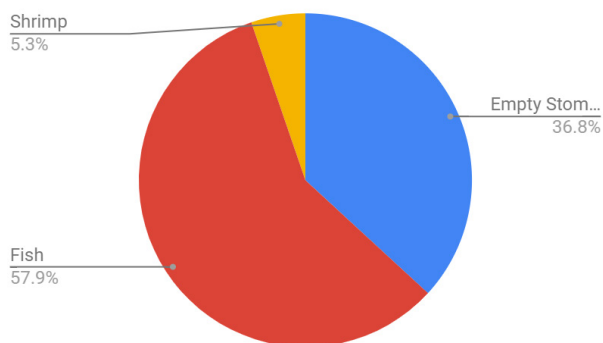
The eider sub-species unique to Qikiqtait is a core part of marine and terrestrial Nautsitsuqtiit programs. Polynya and floe edge populations are tracked with more intensive winter surveys. Nesting surveys using the SIKU survey tool and egg and down harvesting posts help track productivity, while juvenile to adult ratios from fall hunting posts on SIKU together allow monitoring year-round demographics. This holistic stewardship approach is key to food security, cultural identity and development of the eider down conservation economy.



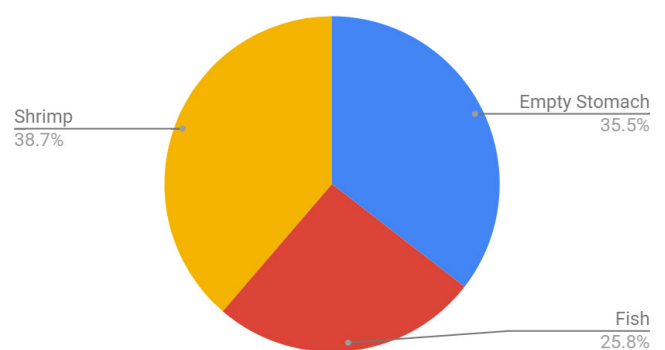
SIKU posts per day (fall hunt, winter polynya hunt, spring egg and summer down harvest)



Seal Stomach Contents - Summer



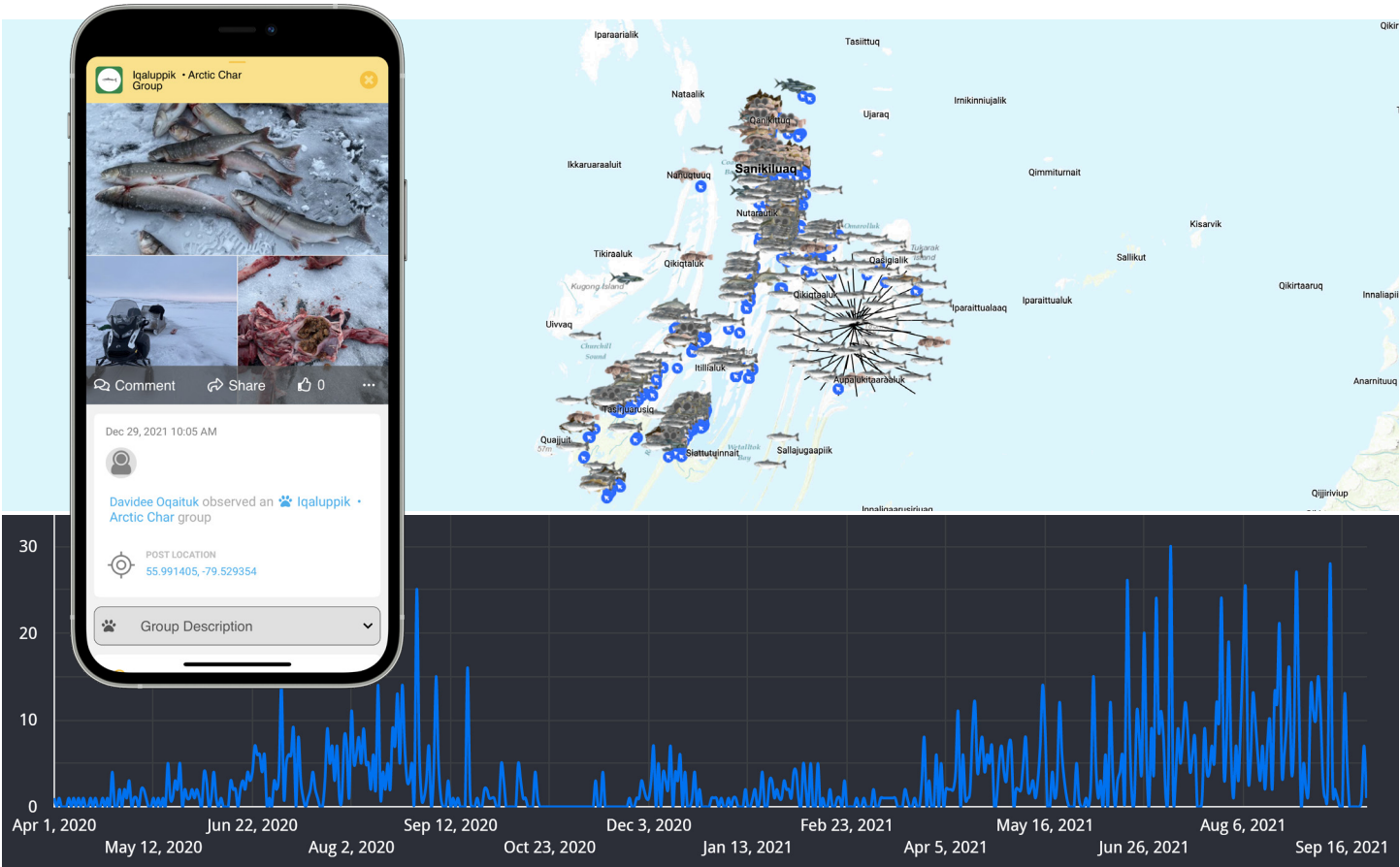
Seal Stomach Contents - Winter



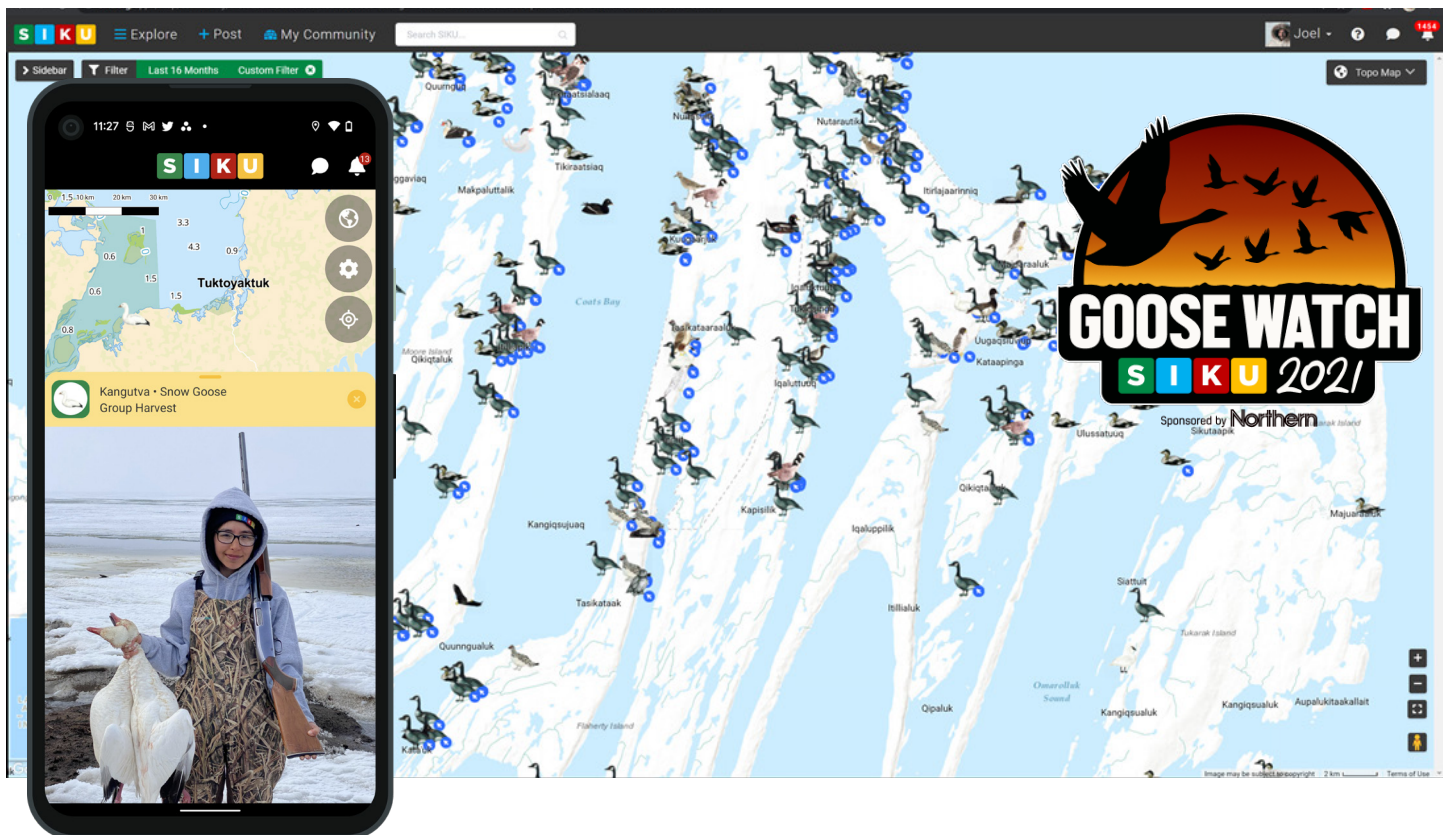
SIKU Posts for seals made by Sanikiluaq hunters over 16 months documenting a seasonal shift in seal diets, quantitatively showing the data behind Inuit knowledge of trophic shifts in the region identified by late elder Piita Kattuk, who's guidance inspired this as a pilot project for SIKU development, engaging Inuit to lead every aspect of the project including design, data collection and dissemination. See Arragutainaq et al. 2020 for details.



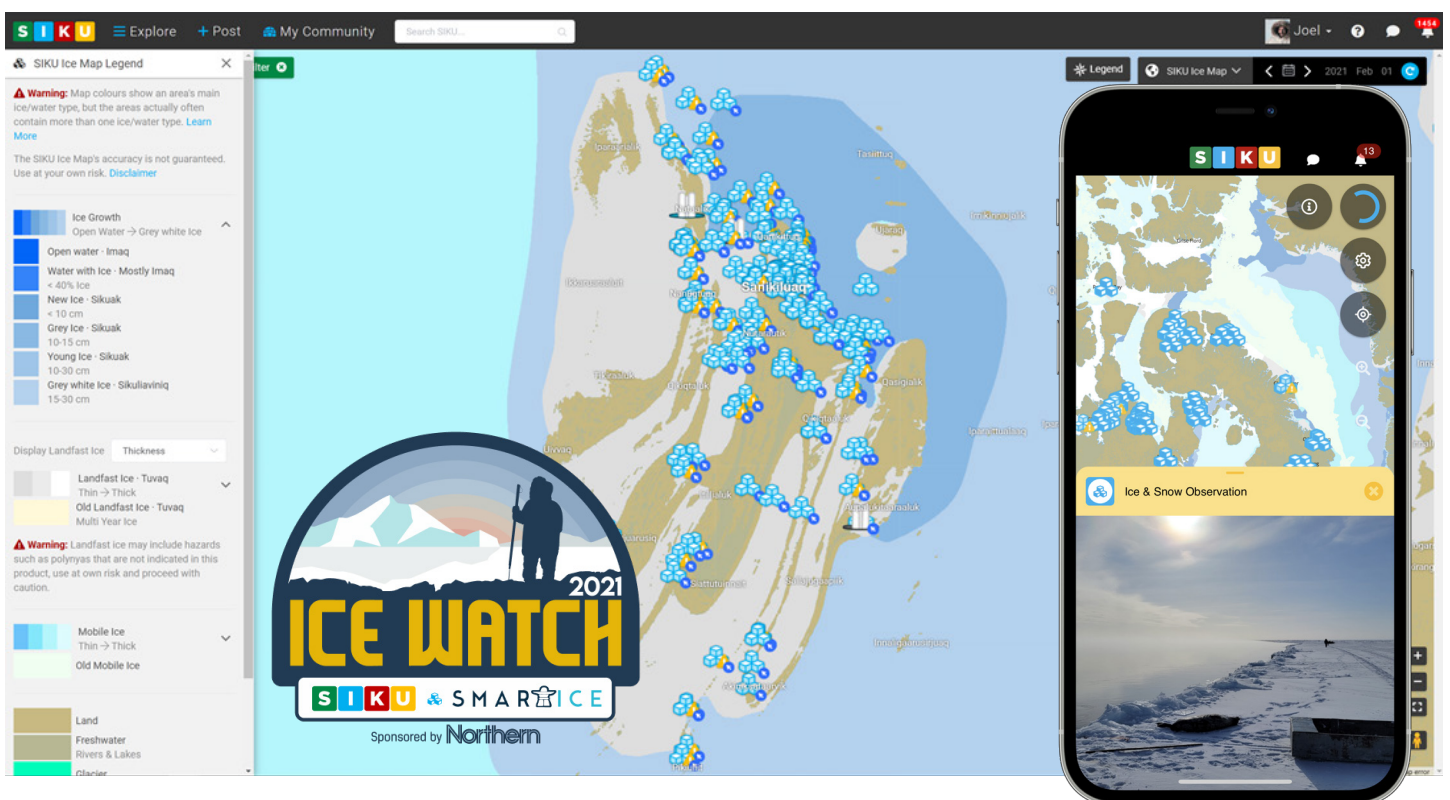
Harvesters in Sanikiluaq have made over 3000 fish posts on SIKU since 2020 documenting over 10,000 char harvested by jigging, nets and rod throughout the year, including prey species like stickleback and capelin, as well as timing of migration between lakes and the ocean. Photo tags are initiating new machine learning algorithms to identify sea run vs landlocked char. This work is making a substantial contribution to the resource inventory and a framework for future management. It has supported numerous families in Sanikiluaq during the pandemic by contributing to food security while providing measurable impact for local subsistence economies.

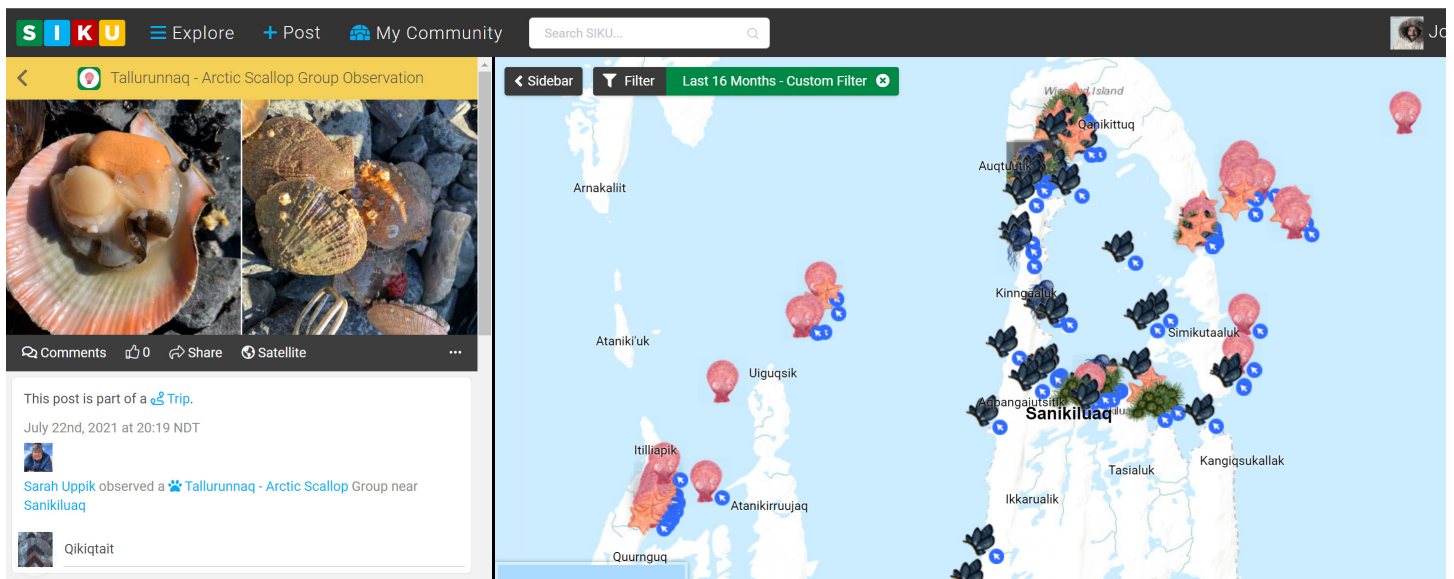


Arctic char posts per day (spring jigging, summer rod fishing & ocean nets, freeze-up jigging, winter lake nets)

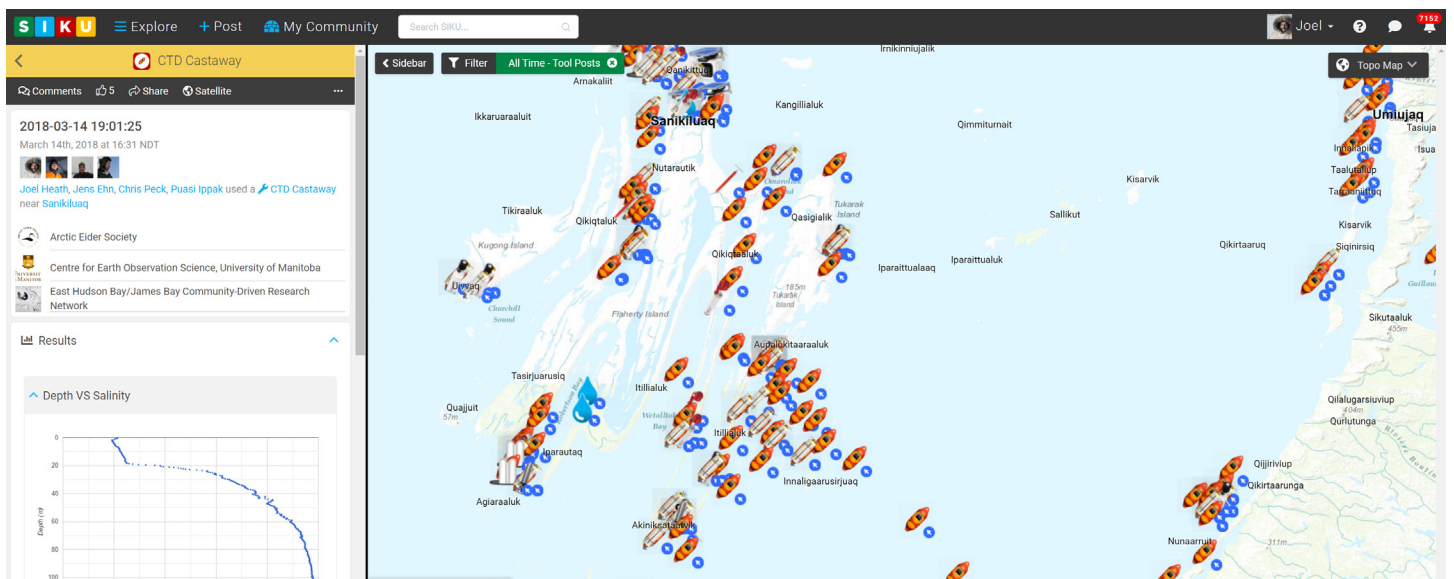


The SIKU Goose Watch started in Sanikiluaq for Qikiqtaaluk and is now pan-Arctic and is comprehensively documenting the timing of migration, nesting and hatching. The SIKU Ice Watch uses Inuktitut sea ice terminology across dialects to share dangerous conditions and document climate change, contributing to safety, situational awareness, knowledge transfer and language preservation. The Nautsitiit program in Sanikiluaq is also contributing to ground-truthing satellite imagery to deliver new sea ice products and services to Inuit communities across the north.





The SIKU Nautsitsuqtiit approach has also been instrumental in contributing to shellfish fisheries development



SIKU is also provides key tools for community-driven research jobs with academics and non-harvested species

Stewardship Outcomes of the SIKU for Qikiqtaaluk Nautsitsuqtiit Approach

The program has been highly successful in terms of community participation, knowledge outcomes, food security, and it is changing dialogues at the national level on how governments can invest in Indigenous communities to lead research, monitoring and guardians programs in an unprecedented manner. It has further demonstrated the robustness of community-led approaches to thrive even in difficult times such as the pandemic. It has been key to community engagement in the Qikiqtaaluk Nautsitsuqtiit pilot program and there is broad community consensus that it should be a key part of ongoing Nautsitsuqtiit programs and management for the Qikiqtaaluk protected area. In addition to contributing to Qikiqtaaluk goals, the approach allows ongoing tracking of impact, including quantitative measures of many parameters that have often been considered intangibles such as contributions to food security as developed below.

Preliminary Impact Assessment for Qikiqtait Protected and Conserved Areas

In 2017 through a new partnership with the LEAP:Pecaut Centre for Social Impact as a select portfolio organization, the Arctic Eider Society began to increase capacity for impact measurement and scaling impact for community investments. In 2019, in support of the newly awarded Nature Fund, LEAP through pro bono support from the Boston Consulting Group worked with AES to develop an Impact Measurement framework to forecast impacts of Qikiqtait programs and guide tracking of Key Performance Indicators for impact measurement (see Appendix). Now, with significant progress made on Qikiqtait programs, the approach can be revisited to parameterize impact measurement models with real data (vs forecasted projections) and can be expanded to include additional components and quantification of intangible benefits. The Qikiqtait program provides an unprecedented framework for a return on investment analysis in both social, economic, and stewardship outcomes. These outcomes are key to redefining what is possible for Inuit-led approaches to stewardship and protected areas management, helping better negotiate impact benefit agreements, and redefining stewardship mechanisms.

This section summarizes the economic benefits generated by the Sanikiluaq's Qikiqtait Nautsitsuqtiit Program for the 2020-2021 fiscal year. These economic benefits include wages earned by community members and country foods that were acquired during the monitoring stages of the program. We also discuss intangible social, cultural, and environmental benefits that have been realized in similar Indigenous land management and stewardship programs, and the potential value these benefits could have if achieved in Sanikiluaq.

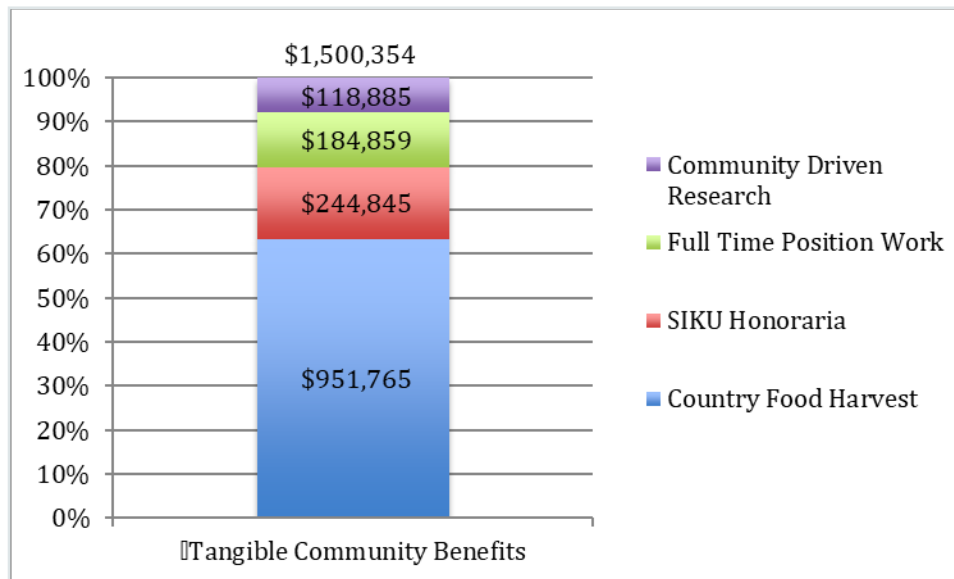
Tangible Community Benefits

The economic benefits are calculated as the sum of the employment benefits generated through the program and the food value of wildlife harvested with program support. Employment benefits are calculated as the wage payments made to employees and participating community members in the program. To calculate the total community benefits from employment, a 10% community dollar circulation multiplier was added to the total payment amounts to capture wages that were spent within the community and benefited other community members and local businesses. This multiplier is based on a recent economic leakage studies that calculate the amount of income earned in Canadian Indigenous communities that remained in the community. The 10% multiplier represents a conservative estimate found among several related studies (see Mirzaei et al. 2021). This multiplier can therefore be viewed as a conservative method for estimating the multiplier of effects of local revenues.

To calculate the economic value of country foods acquired from subsistence wildlife harvesting through the program, harvested animals were converted to edible food weights. Hunters reported their successful harvests through the SIKU app, which allowed us to quantify the amount of wildlife harvested through the program. We then calculated the sum weight of wildlife harvested by comparable store-bought equivalents to estimate the economic or replacement value of the country foods harvest.

The total tangible community benefits through employment opportunities and wildlife harvesting were estimated to be \$1,500,354 (Figure 1). The following sections discuss the employment and food security benefits in greater detail.

Figure 1: Total tangible community benefits from employment and food harvest.



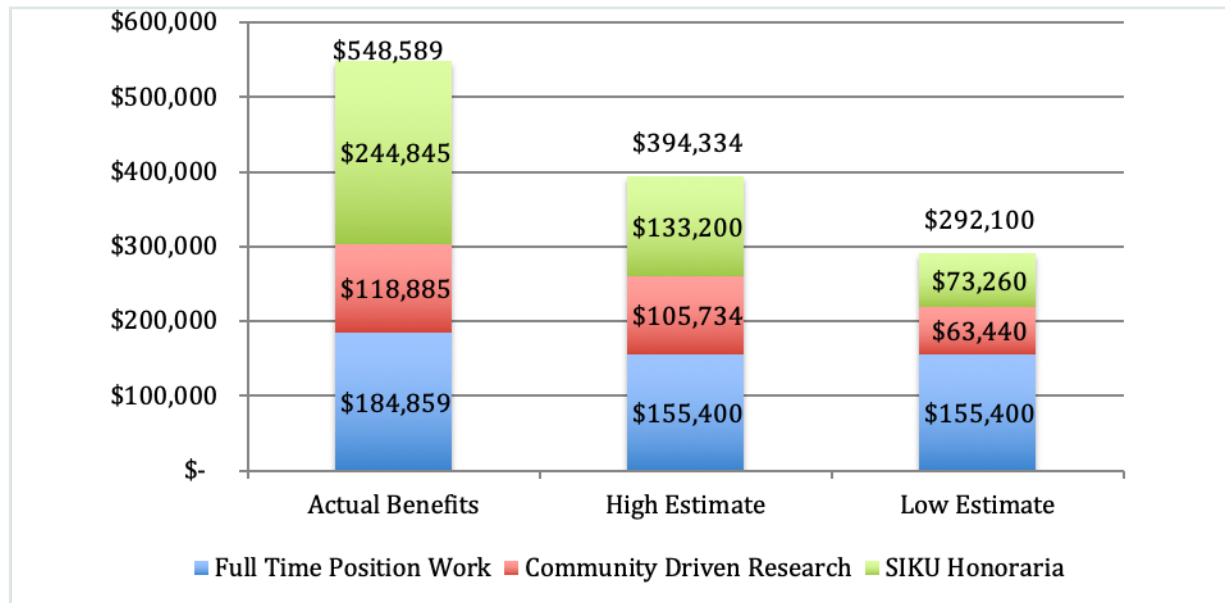
Employment Benefits

Sanikiluaq's Qikiqtait Nautsitsuqtiit Program created wage earning opportunities through three employment streams: 1) full-time position work, 2) community-driven research and monitoring, and 3) SIKU honoraria. Between these three employment groups, a total of \$498,717 was provided to Sanikiluaq residents in the 2020-2021 fiscal year in support of Qikiqtait programs. After applying the 10% community dollar circulation multiplier, the community benefits totaled \$548,589 (Table 1). Previous projections of the community benefits from employment generated through the program ranged from \$292,100 to \$394,334 (Figure 2). This indicates that the community benefits from employment exceeded the low-end projection by \$256,489, approximately 88%, and the high-end projection by \$154,255, roughly 39%.

Table 1: Economic benefits from employment.

Employment Type	Amount Paid	Total Community Benefits (Amount Paid Plus 10% Community Dollar Circulation Multiplier)
Full Time Position Work	\$168,054	\$184,859
Community Driven Research	\$108,077	\$118,885
SIKU Honoraria	\$222,586	\$244,845
Total	\$498,717	\$548,589

Figure 2: Actual employment benefits compared to projected benefits.



Full-Time Position Work

Two full-time positions, a community coordinator and a technician were created for Inuit residents through Sanikiluaq's Qikiqtaik Program. These two positions were paid a total of \$168,054 in salary, northern allowance, and benefits. After applying the 10% multiplier rate, the full economic benefit to the community was \$184,859. Full-time position work, therefore, accounted for 33% of the total employment benefits generated through the program. These positions were projected to create \$155,400 in net benefits to the community, indicating that the realized benefits exceeded the projected benefits by \$29,459 (19%).

Community Driven Research

The community driven research program paid key hunters as independent contractors in Sanikiluaq for every day they engaged in environmental or wildlife monitoring activities. Community driven research activities include but are not limited to: monitoring wildlife populations and distributions; deploying and using environmental testing equipment; monitoring sea ice thickness for dangerous and changing conditions; water and ice sampling; and applying Inuit knowledge and western science to monitor ecosystem trends associated with wildlife harvesting and climate change impacts. These activities reflect core principles of the program to promote community-driven monitoring, research, and stewardship to address community priorities and develop conservation economies that directly support hunters, subsistence related livelihoods, Inuit knowledge, self-governance, and stewardship of the land and water.

A total of \$108,077 was paid to 25 Sanikiluaq hunters who participated in the program over the fiscal year, indicating that, on average, each participating hunter received \$4,323. Applying the 10% community dollar circulation multiplier results in a total economic benefit to the community of \$118,885, or 22% of the total employment benefits. Community driven research was projected to have community benefits ranging from \$63,440 to \$105,734. This indicates that the realized benefits exceeded the low-end projection by \$55,455 (87%) and the high-end projection by \$13,151 (12%).

SIKU is a mobile app and online platform that provides a tool that allows harvesters to document their hunting trips, including their routes, harvesting and foraging activities, fish and wildlife sightings, and observations of unusual or unsafe sea ice conditions. The app allows harvesters to systematically document their knowledge and observations while maintaining full ownership, access and control over their data including privacy settings (e.g. hiding location, post details, etc.). It has developed into an integral part of community engagement, communication, and involvement in promoting local environmental stewardship and food security. SIKU users are paid an honorarium for each hunting trip they make to help cover hunting expenses and ensure they receive equitable economic benefits for their contributions.

SIKU honorarium payments totaled \$222,586 over the 2020-2021 fiscal year, which amounts to \$244,845 in total community benefits (after applying the 10% multiplier). SIKU honoraria therefore accounted for 45% of the total community benefits derived from increased employment. The projected community benefits from SIKU honoraria were between \$73,260 and 133,200, indicating that the SIKU portion of the program exceeded its low-end projection by \$171,585 (234%) and its high-end projection by \$111,645 (84%).

The SIKU program exceeded its projections by having a larger user base than expected. SIKU honoraria were projected to provide 20 to 30 hunters stipend payments to support 66 to 80 hunting days each, which would total between 1,320 and 2,400 hunting trips. However, 160 people used the SIKU app and 5,293 hunting trips were supported through the honorarium (Table 2). Over the course of these hunting trips, 4,948 posts were made to the SIKU app, including 4,674 wildlife observations and harvesting posts, 216 ice observations, and 58 deployments of research tools and equipment. Altogether, 379,281 km were travelled during hunting trips that were shared through the SIKU app. Based on the \$222,586 paid through the SIKU honoraria, the cost per hunting trip was \$42.05, the cost per post was \$44.99, and the cost per kilometer travelled and tracked in the app was \$0.59.

These costs are considerably less than other cost estimates of collecting wildlife monitoring observations and data. For example, the average cost of having a human observer monitor fish populations has been estimated to be \$677.32 per day (Sylvia et al. 2016). Given Sanikiluaq's remote location, this is likely a conservative estimate for the costs of having an academic, government, or non-government organization collect wildlife-monitoring data in the region. Assuming the costs of monitoring different wildlife species are relatively equal, and treating each wildlife or harvesting post recorded in the SIKU app as a day of monitoring, the costs to achieve an equivalent amount of wildlife monitoring would be \$3,165,794. Altogether, the large user base and usage of the SIKU app shows strong community interest in and support for the SIKU program, which supports its viability as a locally driven, relatively low cost environmental and wildlife monitoring program that can provide consistent data and compliment or substitute for existing environmental monitoring activities in the region.

Table 2: SIKU app statistics.

Description	Quantity
SIKU app users	160
Hunting trips made with SIKU app	5,293
Total posts	4,948
Wildlife and harvesting observations	4,674 (94%)
Ice observations	216 (4%)
Research tool deployments (use of CTD, water sampling, ice core, Eider survey tools on SIKU)	58 (1%)
Km travelled in SIKU hunting trips	379,281

Subsistence Harvesting Benefits

SIKU app users tracked their successful wildlife harvesting activities through the app, allowing for a transparent, accurate, and readily quantifiable harvest count of species and food weight. An estimated total of 66,666 kg of country food was harvested and documented through the SIKU app over one year (Table 3). Given Sanikiluaq has an estimated 220 households and population of 882 individuals, subsistence harvesting supported by the SIKU honorarium resulted in 303 kg of country food available per household and 76 kg per person. This harvest has an estimated market value of \$951,765 in substitute store bought foods. However, store bought products do not hold the same cultural value as traditionally harvested wildlife species, and often do not provide equivalent nutritional benefits.

Table 3: Wild food harvest tracked in SIKU app and estimated equivalent food value.

Species	Edible Harvest Weight (kg)	Food Value (\$)
Beluga whale	21,948	\$267,107
Arctic char	17,282	\$333,370
Ringed seal	7,788	\$94,780
Polar bear	6,837	\$83,206
Reindeer	4,848	\$59,000
Canada (short and long neck) and cackling goose	2,918	\$44,039
Common and king eider	2,352	\$35,492
Bearded seal	1,862	\$22,661
Walrus	480	\$5,842
Whitefish	232	\$4,483
Snow goose	118	\$1,787
Total	66,666	\$951,765

Table 4 compares the wildlife harvest data collected via the SIKU app to past subsistence harvest data collected in Sanikiluaq (see Wenzel et al. 2016). Subsistence harvesting levels reported through the SIKU app were greater than any of the past years from 1996-2001. The total edible food weight harvested and reported through the SIKU app was 81% greater than the five-year average of 36,770 kg in the past harvesting data, while the edible food weight per person was 46% greater than the five-year averages of

52 kg/person/year and 141 g/person/day. This suggests that an increase in subsistence harvesting could be, at least partially, attributable to the program, as it allows for increased access to and support for subsistence activities.

Table 4: Comparing past subsistence harvest statistics in Sanikiluaq to SIKU harvest. Past data from Wenzel et al. (2016).

	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2020-2021
Population	650	649	673	681	707	882
Edible Food Weight (EFW) (kg)	25,540	51,099	45,239	32,776	29,194	66,666
EFW/Person/year (kg)	39	63	67	48	41	76
EFW/person/day (g)	107	173	183	131	113	207

There were 291 posts made on the SIKU app regarding harvesting of berries that are not included in the food value calculation, as the quantity of berries harvested was not always specified. Furthermore, the food value does not account for the market value of non-edible wildlife products. For example, 123 Arctic Fox and 10 Red Fox were harvested for their furs and documented in the SIKU app. Eider down is also used in clothing that is key for local harvesters and is occasionally also sold to people within and outside the community. Although the values of nonedible animal products are not calculated here, they are important benefits to wildlife harvesters. It should also be noted that while SIKU has broad usership in Sanikiluaq, including many Elders, not all community members are using SIKU to document harvesting activities. As such, these estimates should be treated as an accurate yet conservative measure.

Intangible Benefits

Indigenous led environmental monitoring and stewardship programs generate a wide range of social, cultural, and environmental benefits for their communities and other stakeholders. Although many of these benefits do not have clear monetary values, they are often greatly valued by the participating Indigenous communities, governments, and other stakeholders. Intangible benefits that were identified in similar Indigenous stewardship programs include: Taking better care of land and water

1. Spending more time on the land
2. Strengthening relationships and connections with the land and water
3. Greater awareness of activity on the land
4. Peace of mind knowing the land is being looked after
5. Habitat and environmental protection
6. Promoting both Indigenous traditional knowledge and scientific data monitoring
7. Better scientific and Indigenous knowledge data collection
8. Strengthening cultural and community identity and wellbeing
9. Increasing pride in oneself and community
10. Increasing skills, confidence, and knowledge
11. Improved mental and physical health
12. Preservation of cultural values and natural assets
13. Increasing capacity for self-governance and self-determination
14. Builds relationships and collaboration with government
15. Greater opportunity for youth to engage in traditional activities and culture
16. Creates additional research and funding opportunities

Indigenous communities in Canada with similar programs have valued the combined intangible social, cultural, and environmental benefits such as these anywhere from five to 14 times greater than the employment benefits of their programs (EPI 2016; SVA Consulting 2016). If similar value was achieved in Sanikiluaq relative to the employment benefits, the intangible benefits to the community could range between roughly \$2.5 million and \$7 million annually. However, the estimated value of these intangible benefits was derived from other programs, and should therefore be viewed cautiously. Further research would be needed to identify, confirm, and estimate the value of the intangible benefits within this program.

IMPACT MEASUREMENT CONCLUSIONS

The Qikiqtait Case Study elucidates the many benefits of investing in Inuit-led conservation. While we avoid presenting a simplistic single SROI metric, the food security benefits alone were more than double the amount invested with intangible benefits likely in the range of 5 to 14x above and beyond that. The comprehensiveness of the data spatially, temporally (year-round) across key wildlife species groups for real time Inuit-led decision making and stewardship is a particularly important benefit that directly achieves conservation goals while also demonstrating the substantial data-per-dollar return on investment as likely being many times higher than that for more traditional academic-led approaches. Importantly, the Qikiqtait case study emphasizes a novel whole-of-community approach. In addition to the hiring of key individuals for stewardship programs, all community members engaged in landuse activities could participate. This not only provided an extremely comprehensive perspective of wildlife distribution and abundance as a basis for ongoing wildlife management and decision making, but further engaged community members directly in the process of creating Qikiqtait, which will be key to its long-term success. The approach also provided a reliable way to quantify impact of the programs on an ongoing basis to better evaluate the tangible and intangible benefits. Similar approaches could be implemented in other guardians programs, conservation programs and more generally for programs for harvester support across Inuit Nunangat that would build the case for increasing investments in community-driven programs. Time was limited to develop this report; however, some effort was made to acquire additional information on impact tracking for stewardship efforts in other regions of Inuit Nunangat. Within the limited timelines for this study, additional data was not available. While there are clear benefits of a variety of programs that are active across the regions, additional capacity is needed to better mobilize impact tracking and conduct impact measurement that could help demonstrate how important these investments are to communities, and lead to additional investments in northern community-led research and stewardship programs. The approach used for Qikiqtait can easily be applied to other guardians and protected areas programs for Indigenous communities in Canada, which no doubt have their own unique benefits specific to each community and region.

Sanikiluaq has a clear vision for continuing this approach and the Sanikiluaq Qikiqtait Steering Committee has requested that the whole-of-community approach with SIKU be included in IIBA negotiations as a means for ongoing stewardship and development of conservation economies. It should further be noted that the current case study did not consider other areas of investments such as infrastructure investments that are key to addressing broad outstanding community capacity gaps in the north. Additionally, it is worth noting that this study focused on an early stage of program development in Sanikiluaq for Qikiqtait, and a new phase of Nautsitsuqtiit programs is now starting in Sanikiluaq that further includes interconnected cultural programs for elder down economies with Atigii parka and qamotik making, for example, that not only provide knowledge transfer to youth as the next generation of stewards, but address gaps such as a lack of suitable clothing and equipment for youth to engage in training for environmental monitoring and harvesting activities that many community

members face. These circular economic development plans feed into and support each other and provide a holistic vision of Indigenous subsistence and conservation economies that will further elucidate inter-connected benefits in future impact measurement studies for Qikiqtait. The creation of a multi-purpose community research centre is already attracting new jobs for community-driven research, natural history filmmaking, and community fisheries development programs. As such, this analysis, while compelling, reflects just a preliminary assessment of the board impacts of investing in Qikiqtait and in Inuit-led conservation more generally that will be further developed as programs develop and mature when impact benefit agreements are implemented in support of the formal creation of Qikiqtait.

Examples of other Inuit PCAs and Programs with Combined Tangible and Intangible Social, Cultural, and Environmental Benefits for Inuit

NUNAVUT

Tallurutiup Imanga National Marine Conservation Area Inuit Impact and Benefit Agreement

Located in the Qikiqtani Region of Nunavut, Tallurutiup Imanga National Marine Conservation Area was formally established in August 2019 by signing an Inuit Impact and Benefit Agreement (IIBA) between QIA and the Government of Canada (QIA, 2022). At 108,000 km², it is Canada's largest body of protected waters. Through the establishment of the IIBA, QIA carried out the vision of Inuit leaders who have been seeking protection for these waters with growing outside interest in oil and gas development. The success of this IIBA should serve as a blueprint for what can be achieved for Inuit; this IIBA ensures Inuit governance of the protected areas, jobs for Inuit as environmental stewards and funding to address the infrastructure deficit in the High Arctic (QIA, 2022).

Tuvaijuittuq Marine Protected Area

In 2019 the Government of Canada and QIA announced an IIBA to establish Tallurutiup Imanga National Marine Conservation Area, which included provisions for the interim protection of Tuvaijuittuq Marine Protected Area. Combined, Tallurutiup Imanga and Tuvaijuittuq cover more than 427,000 square kilometres. QIA is collaborating with the Government of Nunavut and the Government of Canada to conduct a feasibility study to assess options to pursue permanent protection for Tuvaijuittuq (QIA, 2022).

Aviqtuuq Inuit Protected and Conserved Area

Located in the Kitikmeot regions of Nunavut, Aviqtuuq Inuit Protected and Conserved Area is an initiative being led by the Spence Bay Hunters and Trappers Association in Taloyoak (Oleekatalik, 2021). The Aviqtuuq IPCA would cover roughly 90,000 square kilometres of ocean, rivers, lakes and land. The IPCA puts Indigenous people in charge, ensuring food security with a sustainable harvest and economic development like small-scale fisheries, outfitting camps, and tourism. Nunavut hamlet of Taloyoak is home to 1,100 residents and won \$451,000 Arctic Inspiration Prize for their food sovereignty project (Oleekatalik, 2021). The Aviqtuuq area is coveted by the mining industry. With the opening of the Northwest Passage due to sea ice melt, international shipping routes threaten marine wildlife. This area is home to crucial caribou habitat during calving and post-calving (Oleekatalik, 2021). A mine might create jobs for 20 years. But a new food economy and the first-ever Inuit Protected and Conserved Area in Canada would generate jobs forever, from generation to generation, and still protect the land (Oleekatalik, 2021).

NUNATSIAVUT

Imappivut Marine Protected Area

Imappivut is a plan to manage and protect Labrador Inuit interests in the coastal and marine areas of Labrador (Nunatsiavut Government, 2020). In September 2017, the Nunatsiavut Government and the Government of Canada signed a Statement of Intent to begin an ocean management initiative in the Labrador Sea (Nunatsiavut Government, 2020). The intention is to create an integrated and adaptive marine plan for the full scope of the waters covered by the Labrador Inuit Land Claims Agreement that represents the diversity of the marine environment and the interests of Nunatsiavut communities (Nunatsiavut Government, 2020).

INUVIALUIT SETTLEMENT REGION

Anguniaqvia Niqiqyuam Marine Protected Area

In 2016, the Anguniaqvia Niqiqyuam Marine Protected Area was officially announced (Beaufort Sea Partnership, 2022a). It is located in Darnley Bay, Northwest Territories, covering an area of 2,361 km², and borders the east coast of the Parry Peninsula, near the community of Paulatuk, in the Inuvialuit Settlement Region (Beaufort Sea Partnership, 2022a). The Anguniaqvia Niqiqyuam Area of Interest Steering Committee is comprised of the Inuvialuit Regional Corporation, Fisheries Joint Management Committee, the Inuvialuit Game Council, the Paulatuk Hunters and Trappers Committee and the Department of Fisheries and Oceans (Beaufort Sea Partnership, 2022a). Together, the committee worked towards the designation of the Anguniaqvia Niqiqyuam MPA and currently collaborate on co-management of the MPA (Beaufort Sea Partnership, 2022a).

Tarium Niryutait Marine Protected Area

Established in 2010 in the Inuvialuit Settlement Region, Tarium Niryutait Marine Protected Area covered 1,750 km² (Beaufort Sea Partnership, 2022b). It was Canada's first arctic MPA and consists of three individual areas: Niaqunnaq, Okeevik, and Kittigaryuit in the Mackenzie River Delta and estuary in the Beaufort Sea (Beaufort Sea Partnership, 2022b). The goal of the Tarium Niryutait MPA is to conserve and protect the biological resources within the MPA and to support the viability of a healthy population of beluga whales (Beaufort Sea Partnership, 2022b).

NUNAVIK

Arqviiliit Indigenous Protected and Conserved Area

The Arqviiliit Indigenous Protected and Conserved Area is a Nunavik Inuit-led conservation project (Arqviiliit, 2022). Arqviiliit is the Nunavik Inuit name for colonially named Ottawa Islands, a chain of 24 islands in northeastern Hudson Bay, Nunavik. This conservation project will ensure ecosystem and biodiversity protection in this region of Nunavik and is important polar and other wildlife habitats. Within the IPCA, Nunavik Inuit will be monitors and guardians of the islands, increasing local capacity and adding jobs to the local economy (Knoppe, 2020). Once protected, the islands will act as a sentinel of the polar bear and common eider habitat in Nunavik and Hudson Bay and benefit generations to come (Knoppe, 2020).

TERRITORIAL INITIATIVES

North West Territories – Thaidene Nënë Indigenous Protected Area

The Thaidene Nënë Indigenous Protected and Conserved Area spans 6.5 million acres of land and water (Buono, 2021). In August 2019, an agreement was reached to protect Thaidene Nënë as part national park reserve, part territorial protected area and part wildlife conservation area (Buono, 2021). An establishment agreement was negotiated for funding designed around a trust and territorial and federal funding model. Honouring the vision of Łutsël K'é Elders and leaders, Nature United helped establish a trust that will steward Thaidene Nënë Indigenous Protected Area into the future. Thaidene Nënë is helping the Łutsël K'é Dene diversify their economy while preserving their ancestral lands for future generations (Buono, 2021). The designation of Thaidene Nënë also allowed the community to expand their environmental stewardship program called Ni Hat'ni Dene, or "Watchers of the Land," which transfers important cultural and ecological knowledge about the landscape from experienced knowledge-holders to younger generations (Buono, 2021). A crew of guardians tracks environmental changes on land and water throughout the protected area, interacts with visitors and maintains cultural sites (Buono, 2021).

INTERNATIONAL INUIT INITIATIVES

The Pikialasorsuaq Commission

The North Water Polynya, called Sarvarjuaq in Inuktitut and Pikialasorsuaq in Greenlandic, supports an abundance of marine mammals, including narwhal, walrus, seals and polar bears, as well as seabirds and a variety of fish (Oceans North, 2022). Covering about 85,000 square kilometres, the Arctic's largest polynya provides crucial habitat during annual migrations (Oceans North, 2022). In 2013, the Inuit Circumpolar Council Greenland met in Nuuk, Greenland, with community members from around Pikialasorsuaq to share their concerns about the future of this region. As a result, the Pikialasorsuaq Commission was created in 2016 (Oceans North, 2022). Its mandate was to facilitate community and regional input, incorporate Indigenous knowledge and recommend strategies for safeguarding and monitoring the health of the Pikialasorsuaq for future generations (Oceans North, 2022).

Sustainable Management Mechanisms for Inuit Nunangat

In addition to understanding the impacts of investments in Inuit-led conservation, preliminary consultations have identified key gaps and next steps for Inuit-led protected and conserved areas. For example, in some regions, sustainable impact benefit agreements are therefore investments are completely lacking, which preclude impact assessment. In essence these are lost opportunities for sustainable Indigenous-led conservation. While time was limited for this study, and further exploration of gaps in legislative measures was generally out of scope for this project, a meeting was held with the National Inuit Marine Committee facilitated by ITK to discuss both availability of data on impact tracking, and gaps in current legislative measures for Inuit-led conservations measures across the different regions. These are both topics that will require substantial additional work, however this preliminary conversation did help identify some key gaps and recommendations and next steps for a comprehensive study.

Improved capacity building for impact tracking would generally benefit northern programs. There are a variety of harvester support programs active across the regions that may be better linked to stewardship activities and benefit from more detailed impact measurement similar to what was possible for Qikiqtaaluk. There are some existing data of course, for example, measurements of harvester participation in harvesting support programs; however, these tend to be quite a high level and additional support and capacity building would be needed to develop more comprehensive impact tracking for harvester support programs across Inuit Nunangat. Additionally, harvester support programs could be more closely linked to environmental monitoring and stewardship efforts with the right tools and support. More generally, some regions had higher-level data collection and analysis of impacts of northern programs in partnership with Stats Can, though these have tended to focused on areas of health, education, and less on land-based subsistence and conservation programs. Support for capacity building that could include tracking of key performance indicators and provide for more detailed impact studies would contribute to addressing this gap for a variety of programs across Inuit Nunangat, with community-driven research and harvester support program impact measurement being able to support IPCA creation and IIBA negotiations. Capacity building for impact tracking would likely provide opportunities to leverage additional support for expanding or developing new Inuit-led programs across regions by better illustrating the social and economic benefits of ongoing programs to communities.

There is a substantial range of experiences among the Inuit regions regarding the establishment of marine and terrestrial protected areas. A variety of legislative mechanisms have been used to help create protected areas, particularly Marine Protected Areas (MPAs) and National Marine Conservation Areas (NMCA) while other regions like Nunatsiavut have been working to explore ways to use their land-claim agreements to implement conservation measures as a potential alternative to federal legislation. IPCAs have no formal legislative mechanism unless combined with existing federal legislation through Fisheries and Oceans, Environment and Climate Change Canada or Parks Canada, and there is a desire to explore options for a more comprehensive whole-of-government approach to legislated measures for IPCAs that do not require a mixed bag of existing departmental legislative measures. There have been ongoing questions about whether IPCAs will count toward Canada's international targets, as well as if they will trigger IIBAs in Inuit regions where those exist, or other funding mechanisms.

A shared concern is that, while there is a strong political appetite currently for protected areas to meet international targets, there is little evidence yet of long-term federal investment in stewardship

strategies. The need for sustainable (permanent) funding for Inuit led conservation and protection is critical to achieving conservation targets and developing long-term sustainable conservation economies associated with protected areas. It is important that Inuit-led protected and conserved areas serve long-term stewardship goals through sustained investments and not be abandoned with shifting political interests after short-term goals such as international targets are achieved.

Several regions reported that a major challenge in establishing protected areas involved the complexities of federal legislative measures. While communities are keen to ensure the sustainability of wildlife resources for future generations, it is difficult to disentangle the subtle differences among legislative measures and make sure these are clearly understood by community members and organizations and respect community visions for conservation. For example, small scale community-driven fisheries development including bottom-contact fisheries for shellfish are important to developing sustainable conservation economies, and it is not clear how these can be included in various legislative measures or what steps are required to develop exclusion zones or otherwise that would allow these activities to continue in a sustainable manner in parallel with conservation efforts. Often there is also a desire to protect both marine and terrestrial regions for multiple species, or for species such as walrus, polar bears and nesting water birds that use both marine and terrestrial habitats over the annual cycle. Many of the legislative measures do not holistically support both marine and terrestrial protection in the same legislation which increases the complexity of implementing protected areas when a mosaic or combined approach needs to be taken to address community priorities. More comprehensive legislation that respects Inuit and Indigenous frameworks would help address these issues.

Jurisdictional issues are also a key consideration for implementing protected areas, for example it is not fully clear how overlap agreements among Nunavut, Nuavik and Eeyou Marine regions impact the ability to secure various legislative measures for the overlap areas. For Sarvarjuaq / Pikialasorsuaq these complexities extend internationally. Key habitats for protection must be able to more easily transcend anthropocentric lines on maps which water and wildlife are not aware of, and reflect a more holistic vision of Indigenous stewardship. Connectivity is a key concept in conservation and support for connectivity among programs and a coordinated approach among protected areas initiatives being developed across different regions and jurisdictions would provide substantial benefits. The Hudson Bay Consortium is an example of such an approach that bridges jurisdictional boundaries for stewardship; however, federal support is needed to sustain and further develop efforts like this across Inuit Nunangat, as well as nationally and internationally.

Overall, there is a desire to explore more Indigenous and Inuit-specific legislative measures for protected and conserved areas that address these issues and reflect Inuit priorities in a more holistic approach, as well as long-term funding commitments and mechanisms to support stewardship and conservation economies well beyond the initial negotiation and implementation processes.

Recommendations:

- Further research and consultation are required to determine if there is support for the development of a pan-Inuit management strategy for protected areas, new legislative measures that would be more holistic to marine/terrestrial, community fisheries, jurisdictions, etc. Tools that facilitate community data collection, baseline data, ongoing stewardship, and tie into impact assessment (i.e. support for follow-up assessment and ongoing stewardship).
- A review and analysis of current international and federal legislation involved in the establishment and operations of protected areas. A key element of the study would be reviewing the challenges the regions encountered in needing to negotiate multiple legislative measures to achieve goals and/or have identified gaps in existing legislative measures when being considered across Inuit Nunangat. The analysis must include consideration of how Inuit-specific legislation could be developed and what would be included.

Existing background literature is available, and there are key ideas provided by the group, but the tight timelines of this study did not allow for a full review and analysis. This would be highly beneficial in future work on this topic.

- Development of case studies from each region that reflect the experiences and perspectives regarding protected areas across Inuit Nunangat. The study would provide an analysis of best practices, common challenges, funding strategies and otherwise.
- The current study should be continued on an appropriate timeframe that would allow more in-depth consultation with Inuit regions and sub-regions (e.g. QIA), as well as support to work with other organizations working on similar topics such as firelight group, indigenous mapping workshops, Makeway foundation and others doing similar work, as well as case studies from other non-Inuit regions that could help inform approaches for Inuit Nunangat.

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Impact assessment development recommendations and a preliminary future looking impact assessment of the stewardship program

A



Pros

- ### Cons

- ## Longitudinal study

Pros

- ### Cons

- ## Proxy based study

Pros

- ### Cons

- ## FUTURE

Pros

- ### Cons

- Methodology used in following pages*

This document contains 2 key sections



Defining a 'best-in-class' Impact Assessment & how AES can drive towards this



Projected forward looking impact based on available data

Slides to follow

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Note: pages represent a projected future impact built with limited available data

B

A brief note on the scope of this impact lever articulation and non-comprehensive impact assessment

The goal of the following slides is to both

- 1) Articulate the key impact levers that AES should both focus on and measure the performance of
- 2) Attempt to project the potential future impact of some of these key levers

However, it is important to note that many of the aspects of the value AES will create through the Nature Fund for Sanikiluaq are intangible or difficult to quantify & have been excluded from this analysis...

...For this reason this impact assessment is attempting to project only the direct impacts to the community (and therefore grossly underestimates the full impact inclusive of all impacts)...

...with a particular focus on the benefits associated with enabling community driven publically funded research (*as these are the most tangible, attributable, and predictable benefits*)...

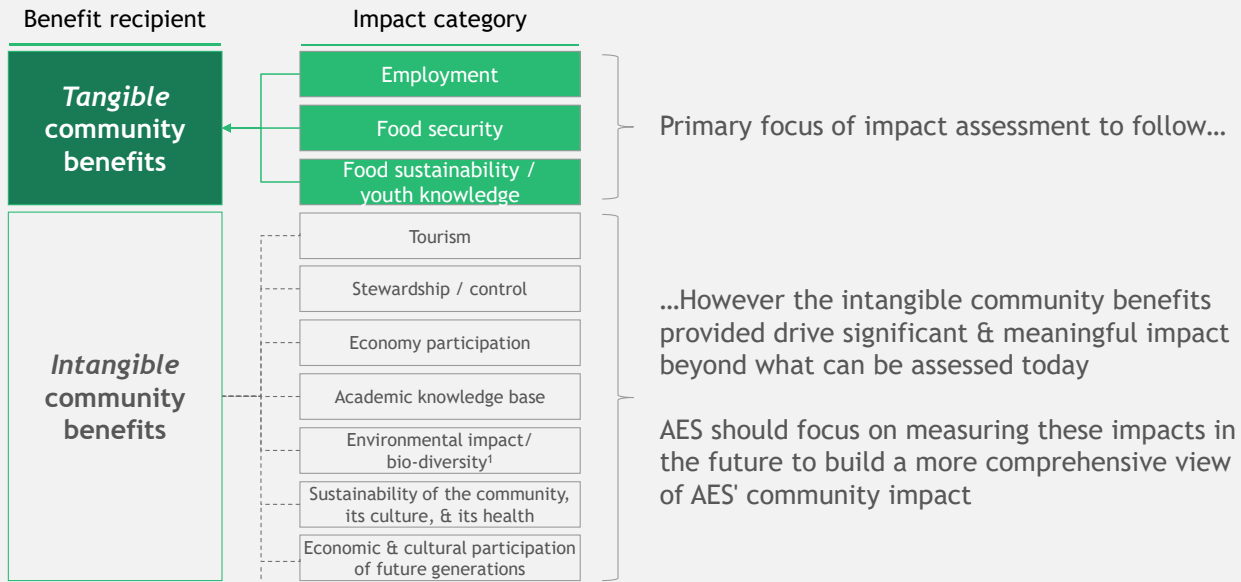
...given an understanding that the key impact metrics and levers will require refinement once the Nature Fund has been in place for a sufficient amount of time in Sanikiluaq...

...Along with the many additional benefits (*both simple and challenging to quantify*) that AES beyond the Nature Fund including the SIKU, research, education, & stewardship

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Key impact drivers and beneficiary recipients considered in the scope of this impact assessment

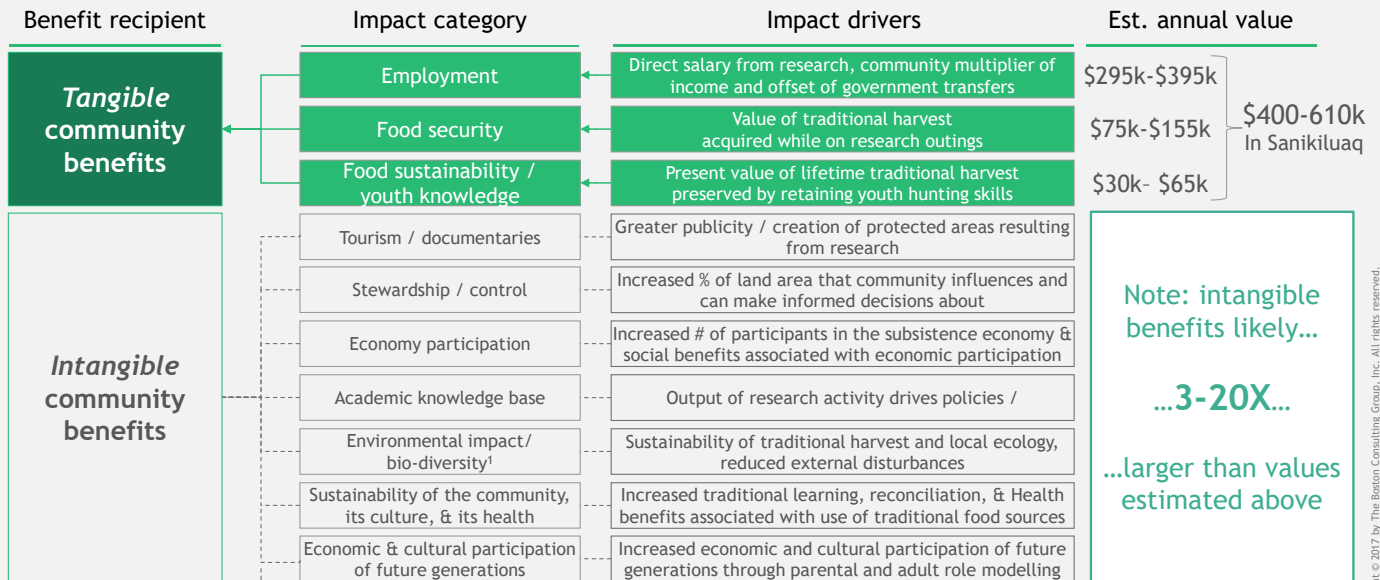


1. Bio diversity will require careful management by AES to ensure that all hunting efforts supported by SIKU are sustainable in nature;
Note: Assumes total economic benefit (e.g: does not net out research funding required)

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Nature fund has potential to drive significant tangible & intangible impact helping drive towards sustainability in Sanikiluaq



1. Bio diversity will require careful management by AES to ensure that all hunting efforts supported by SIKU are sustainable in nature;
Note: Assumes total economic benefit (e.g: does not net out research funding required); Analysis done with best available data in consultation with AES

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Appendix - Backup on assumptions and calculations

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Note: pages represent a projected future impact built with limited available data

Deep Dive: Impact assessment key assumptions & figures

Primary impacts	Driving assumptions & figures
All impacts	11% community dollar circulation multiplier (<i>The Structure of an Arctic Microeconomy</i> by N.C. Quigley & N.J. McBride - 1987) 2% historical per year Canadian inflation (<i>Bank of Canada</i>) 15 people employed for full days of hunting / research in Sanikiluaq (<i>estimate from the AES team's strategic plan</i>) 20-30 people provided a \$50 stipend to use the SIKU platform (<i>estimate from the AES team's strategic plan</i>) 2 people hired full time in Sanikiluaq (<i>estimate from the AES team's strategic plan</i>)
Improved employment participation	20 annual paid full research days per person (<i>estimate from the AES team's strategic plan</i>) 66-80 days of SIKU stipends provided per person (<i>estimate from the AES team's strategic plan</i>) \$300-500 average net salary per day of employment (<i>estimate from the AES team's strategic plan</i>) \$5.0k median per person social assistance & 13.7k median employment income (<i>Canadian Census data</i>)
Increased traditional food source utilization	~\$3.0M of food harvested by Sanikiluaq residents in 1984 (<i>The Structure of an Arctic Microeconomy</i> - 1987) 220 Sanikiluaq households (<i>Canadian Census data</i>) - Per person base of 100 hunting days per year (<i>assumption built with the support of the AES team</i>) 10-15% of stipend funded hunting days are incremental (<i>assumption built with the support of the AES team</i>) 50-70% of full day funded hunting days are incremental (<i>assumption built with the support of the AES team</i>)
Future hunting sustainability and knowledge base	~\$3.0M of food harvested by Sanikiluaq residents in 1984 (<i>source: The Structure of an Arctic Microeconomy</i> - 1987) 882 Sanikiluaq population (<i>Canadian Census data</i>) 1-2% annual attributable preservation of future traditional harvest (<i>assumption built with the support of the AES team</i>)

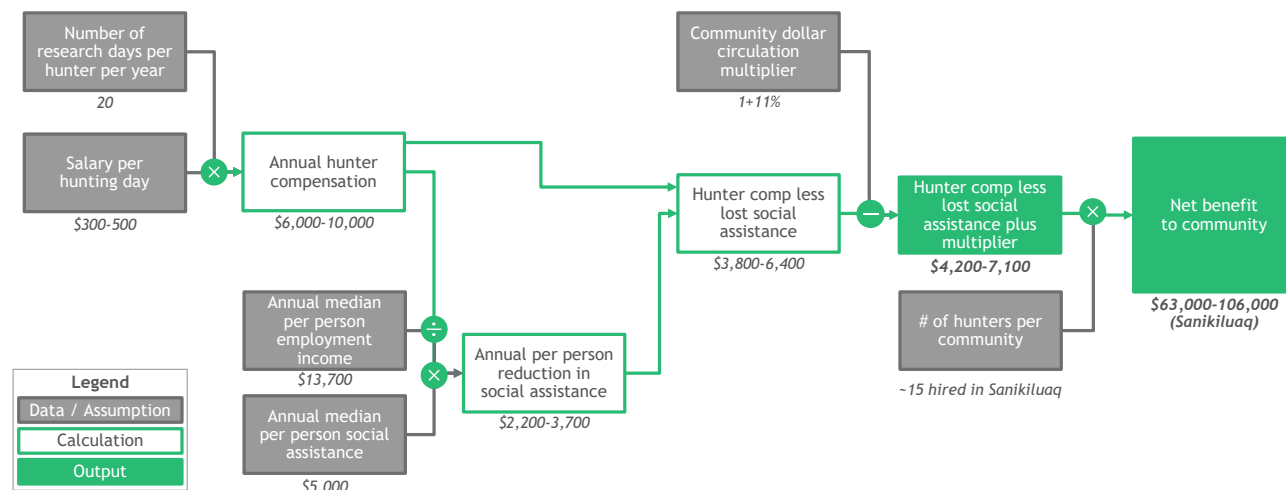
Note: Assumes total economic benefit (e.g. does not net out research funding required); Analysis done with best available data in consultation with AES

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Deep dive: Improved employment participation (1/3) - full day employment



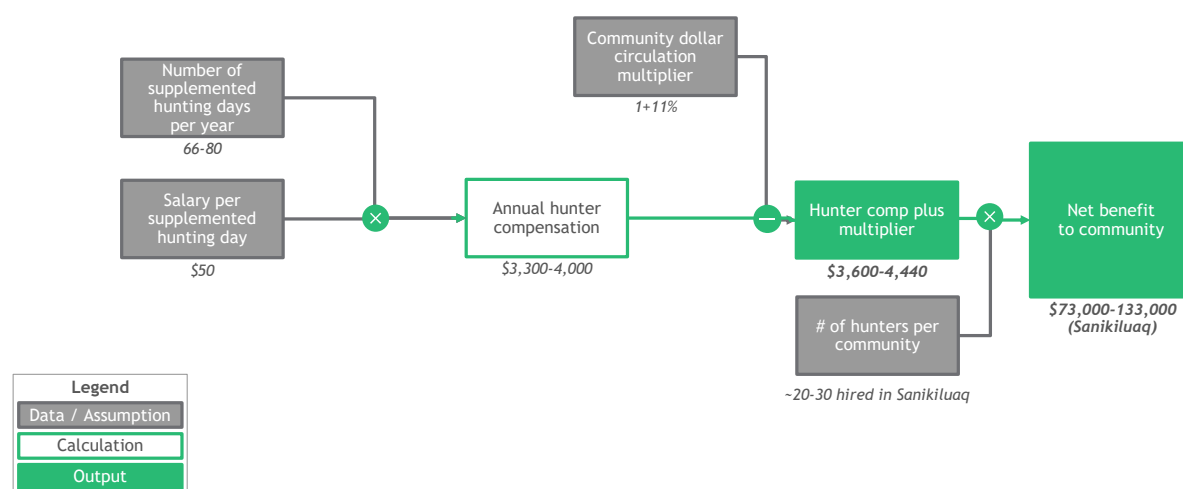
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Deep dive: Improved employment participation (2/3) - SIKU post employment



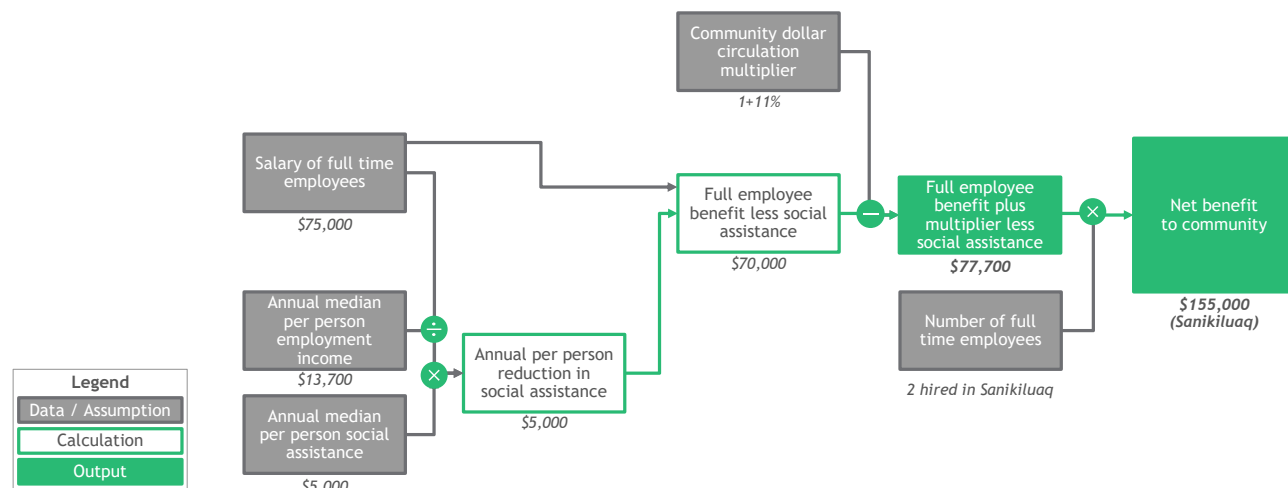
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Deep dive: Improved employment participation (3/3) - full time position work



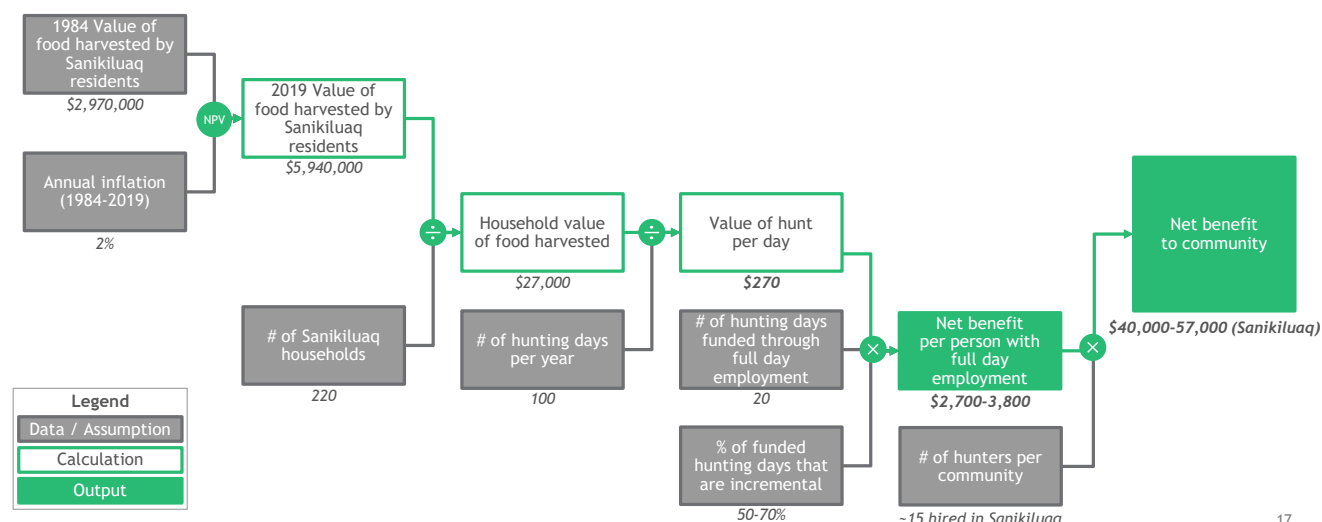
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Deep dive: Increased traditional food source utilization (1/2) - full day employment



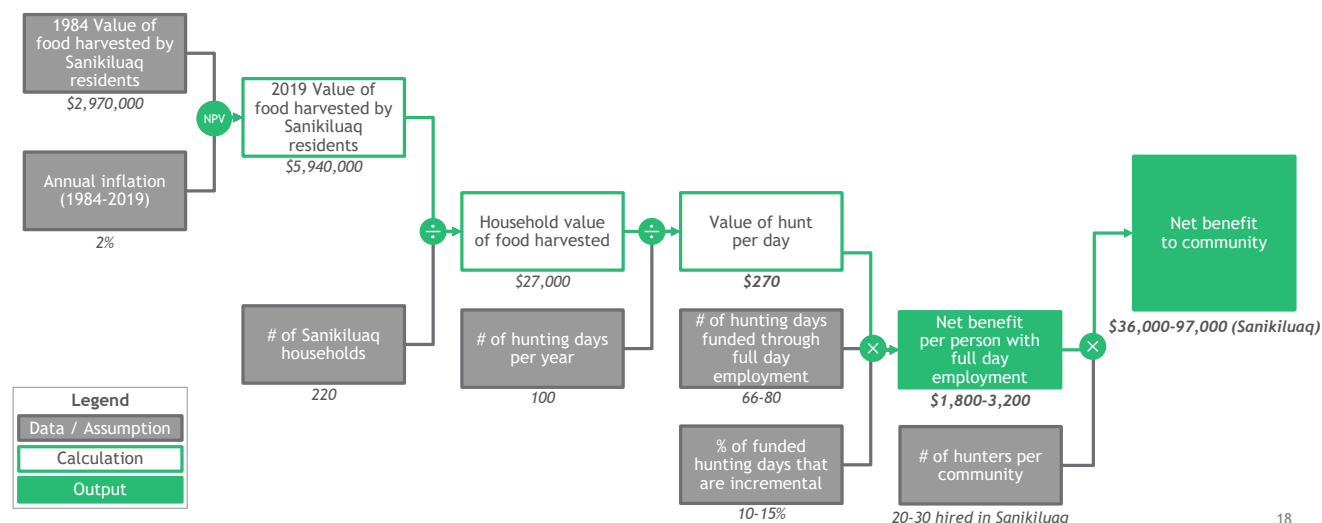
Note: Assumes total economic benefit (e.g. does not net out research funding required); Analysis done with best available data in consultation with AES

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Deep dive: Increased traditional food source utilization (2/2) - SIKU post employment



Note: Assumes total economic benefit (e.g. does not net out research funding required); Analysis done with best available data in consultation with AES

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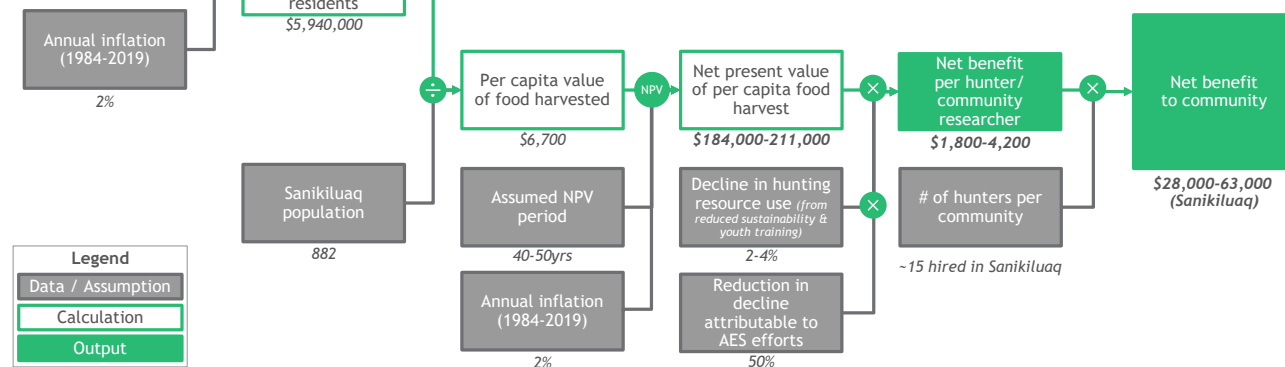
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Deep dive: Future hunting sustainability and knowledge base (1/1)

Note: the following logic is assuming that the utilization of the food source will decline over time related to both environmental sustainability and limited opportunities for cultural education

The fundamental calculation assumes that the decline in food source usage can be prevented



Note: Assumes total economic benefit (e.g. does not net out research funding required); Analysis done with best available data in consultation with AES

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