Received: 25 June 2022 | Accepted: 27 April 2023

DOI: 10.1002/2688-8319.12258

Ecological Solutions and Evidence | BRITISH ECOLOGICAL SOCIETY

PRACTICE INSIGHTS

Co-Designed Projects in Ecological Research and Practice

Collaboration between local Indigenous and visiting non-Indigenous researchers: Practical challenges and insights from a long-term environmental monitoring program in the Canadian Arctic

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Funding information
ArcticNet; Carleton University; Environment Canada-Canadian Wildlife Service Northern Region Division; Environment Canada-Wildlife Research Division; Nature Legacy Fund; Nunavut General Monitoring Plan; Nunavut Wildlife Research Trust; Weston Family Foundation; Baffinland Iron Mines

Handling Editor: Steve Hill

Abstract

1. There is a growing appreciation for the value of collaborative research projects involving local Indigenous and visiting non-Indigenous researchers. Examples of such partnerships are now numerous and diverse, and best practices and respectful approaches have been well presented, including the five priorities of the National Inuit Strategy on Research (NISR) defined by Inuit Tapiriit Kanatami in Canada. However, the application of best practices remains challenging, and examples of 'on-the-ground' implementation remain scarce in the literature.
2. We present a practical case study in which scientists from the Federal Department of Environment and Climate Change Canada and Inuit have co-delivered a multidecade-long monitoring program of nesting common eider ducks *Somateria mollissima* in the Arctic. We review our experience as southern-based government researchers in this collaboration. We reflect on successes and, more importantly, on the practical challenges that prevent the full implementation of best practices in our program.
3. First, we highlight challenges to co-designing a data collection protocol that combines both Indigenous and Western scientific methods. We show how combining the strengths of Inuit Knowledge and rigorous random sampling design has led to a more powerful approach to eider population monitoring.
4. Second, we review how the federal government's administrative approaches are poorly suited for employing seasonal Indigenous workers living in remote communities, particularly in Canada. We argue that to deliver respectful employment and payment practices, the financial and hiring administration of collaborative projects must be based at the community level.
5. Finally, we show how sociocultural factors have made it challenging to ensure the safety of all field workers consistently. To increase their perceived value and uptake, we suggest that safety guidelines must be co-designed by visiting

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researchers and local partners for each project to ensure that they are appropriate to the local culture, field conditions, and the nature of the fieldwork.
6. Based on our experience, we draw attention to gaps that still exist between the best practices of collaborative research and factors that hamper their practical implementation. We invite other research teams to do the same so that, collectively, we can improve collaborative approaches nationally and internationally.

KEYWORDS
Arctic, best practices, common eider duck, community-engaged research, environmental monitoring, Indigenous research collaboration, Inuit strategy on research, practical challenges, research co-design, research safety

1 | INTRODUCTION

There is a growing appreciation for the value of incorporating Indigenous perspectives and full participation in environmental monitoring (Buxton et al., 2021; Inuit Tapiriit Kanatami [ITK], 2018). However, in Canada, there is a dark history regarding the relationships between federal institutions and Indigenous Peoples that continues to hamper collaboration (Inuit Tapiriit Kanatami [ITK], 2018). The Federal Government increasingly recognizes the continued presence of systemic racism within its regulations and actions and has begun shifting policy and leadership in response (Trudeau, 2021). This effort is in concert with regional and national initiatives, including the legal obligation to consult Inuit in Nunavut under the Nunavut Land Claim Agreement (Inuit Tapiriit Kanatami [ITK] and Nunavut Research Institute [NRI], 2007), the National Inuit Strategy on Research (NISR) prepared by Inuit Tapiriit Kanatami [ITK] (2018), and the United Nations Declaration on the Right of Indigenous Peoples Act (2021).

Collaborative Indigenous and Western sciences projects are now numerous and diverse (e.g. reviews by Alexander et al., 2019; David-Chavez & Gavin, 2018; Thompson et al., 2020). Best practices and respectful approaches have also been clearly articulated (e.g. Canadian Institutes of Health Research et al., 2018; Inuit Circumpolar Council [ICC], 2021; Pedersen et al., 2020; Yua et al., 2022) including the five priorities of the NISR (Inuit Tapiriit Kanatami [ITK], 2018). Some of these best practices, however, remain challenging to implement and few published studies identify the constraints on further progress (Buxton et al., 2021; Drake et al., 2022).

In this article, we present a case study focusing on the ongoing collaboration between local Indigenous Peoples (Inuit) and visiting non-Indigenous researchers contributing to a multidecadal environmental monitoring program of coastal sea ducks in the eastern Canadian Arctic. We present successes and, importantly, highlight where administrative burdens, culturally inappropriate southern-centric hiring practices, and cross-cultural issues continue to challenge the full implementation of NISR priorities in the program. By identifying these challenges and considering ways to overcome them, we aim to offer insights about the implementation of best practices when delivering collaborative monitoring programs. In doing so, we join other researchers who are advocating for more studies to present and critically analyse failures and challenges within research projects to improve scientific outcomes and the well-being of the research community and partners (Cvitanovic et al., 2022). Although we present a case involving scientists from the Department of Environment and Climate Change Canada (ECCC) and Inuit partners in remote communities, we believe that the challenges and insights presented could apply to other research groups working within large and regulated organizations, including academia.

2 | THE FIELD RESEARCH PROGRAM

The objective of the research program is to monitor the population trends and nesting distribution of common eider ducks (*Somateria mollissima*) breeding in colonies in remote coastal archipelagos of the eastern Canadian Arctic. This is to inform wildlife co-management and associated sustainable harvesting practices. This monitoring is achieved by conducting eider breeding surveys of nesting colonies in summer. These surveys consist of field workers visiting colonies during the egg incubation period to walk transects to count nests. The survey data also help detect and study environmental factors that may affect population trends over time, including changing sea ice conditions (Chaulk et al., 2007), the emergence of avian diseases (Iverson et al., 2016) and increased nest predation by polar bears (Iverson et al., 2014). Monitoring waterfowl is a shared priority of both ECCC and Inuit. ECCC is the leading federal agency in Canada responsible for managing migratory bird populations (Migratory Birds Convention Act, 1994), while Inuit prioritize the maintenance of healthy eider populations due to their importance for community harvest (Ndeloh Etiendem et al., 2020).

Incorporating local knowledge and direct collaboration were key elements of the implementation of eider breeding surveys since the program's inception in 1956. From 1956 to 2022, 14 Inuit communities participated in eider breeding surveys. In the eastern Canadian Arctic, there are key concentrations of nesting eider ducks on islands found along the coasts of Labrador, Hudson Strait, Hudson Bay, Ungava Bay,

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and Frobisher Bay (Goudie et al., 2020). In each region, local Inuit Knowledge was key to identifying important breeding areas. Local expertise was also essential to ensure that field workers could safely access remote nesting islands using locally owned small boats (see, e.g. Cooch, 1965; Iverson et al., 2014; Nakashima & Murray, 1988).

Despite the best efforts of government and community research partners, several collaborative research priorities and approaches are still to be achieved within this program. Issues related to research co-design, program administration, and fieldwork safety (summarized in Tables 1–3, respectively) continue to pose significant challenges to program success as they impede respectful collaboration and the hiring of local field workers. In particular, we discuss challenges associated with co-designing survey methods, constraints to hiring and financial approaches, and maintaining continuous workers' safety.

3 | METHODS

The following reflections are based on the collective experiences of three of the co-authors (SR, GHG, HLH), who are non-Indigenous southern-based federal government and academic researchers conducting seabird research and monitoring in direct collaborative partnership with several Inuit communities in Inuit Nunangat (Inuit homeland in Canada). Consequently, hereafter, the pronouns 'we' and 'our' refer specifically to the co-authors of this manuscript. We individually reflected on the challenges we faced conducting collaborative research in the Arctic and then held three meetings to discuss these as a group. These meetings had three purposes: (1) to compile the main challenges faced and the associated lessons learned, (2) to select the three most important ones to present in a manuscript and (3) to list potential solutions associated with the challenges identified.

Our views are informed by numerous informal conversations with Inuit partners while conducting the fieldwork itself, as well as during community-based meetings with Hunters and Trappers Organizations (HTOs) before, during, and after the summer field studies. During these meetings, we developed the survey program, evaluated the resources necessary to implement it (e.g. equipment, boat rentals, hiring), and reviewed the outcomes following each field season. Note that HTOs are community-based associations responsible for regulating harvesting practices on behalf of their communities (The Nunavut Agreement—Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada as amended, 2018), and our primary local collaborators for conducting wildlife research in Nunavut. That said, we emphasize that the considerations and experiences presented here are those of the authors and that we do not speak for Inuit.

4 | RESEARCH CO-DESIGN

A crucial element of collaborative research is to align the priorities of the partners when co-designing projects (Pearce et al., 2009).

TABLE 1 Summary of the agreements and challenges when co-designing the common eider ducks monitoring program.

Research co-design	Alignment (shared priorities)	Divergence or challenge	Example	Proposed solutions
Research priority setting	Monitoring common eider duck populations to inform co-management and sustainable harvest	Differences in priority setting for the geographic scale of research	Regional versus national and international	Engage in frequent prior communication to approve concepts: • Primarily face-to-face meetings • Occasional follow-up by phone or videoconference • Project planning should occur in person
Project planning	Conducting a cost-effective, efficient, and safe survey		Timing of the survey to optimize the number of days when the ocean is ice-free and common eider ducks are still on nests	• Consult with local experts: Incorporate Indigenous Knowledge for project optimization at the regional scale (e.g. the timing of the survey, important regions to visit) • Following priority-setting meetings, hold meetings with breakout groups to plan logistical details
Co-designing eider breeding survey methods	Design surveys that leverage local logistical capacity and expert knowledge. Use boat-based surveys to visit nesting islands	Co-design a survey protocol that includes both Indigenous Knowledge and Western scientific methods	Random sampling design versus the selection of islands known by local Inuit to support important eider duck colonies	• Maintain rigorous scientific methods and fully incorporate community-identified priorities • E.g. A stratified sampling design that keeps a random sample to meet statistical assumptions and includes important colonies based on Inuit Knowledge

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TABLE 2 Summary of the administrative issues encountered when conducting collaborative common eider ducks monitoring fieldwork.

Administrative issues	Alignment (shared priorities)	Divergences or challenges	Examples	Potential solutions

Hiring approaches	Hiring field workers locally	• Culturally inappropriate hiring approaches; government hiring approaches developed with a southern-centric institutional bias
		• The official languages (i.e. English and French in Canada) used by institutions may be a barrier to Indigenous workers who speak neither official language.
		• Poor flexibility and responsiveness of large institutions hiring mechanisms to accommodate last-minute changes in staff as Indigenous Peoples in remote communities often have unforeseen competing priorities
			• Online work application and contracting process
			  • Limited computer and internet access in remote communities
			  • Individuals most skilled in wilderness fieldwork often have limited computer expertise
			• Some of our most experienced workers are often unilingual Inuktitut speakers
			• The hiring process requires completing many steps a long time in advance of employment (e.g. security clearance, submitting many online forms including electronic direct deposit and online contract)
				(Solution to both the hiring and financial issues)
				• Have the project administration delivered at the community level
				  • Set formal agreements with local organizations (e.g. Hunters and Trappers Organization [HTO])
				  • The local organizations administer the funds to hire and pay skilled field workers
				• This ensures culturally appropriate and respectful employment and payment practices (e.g. providing work opportunities to more people, accommodating last-minute staff changes, and appropriate and rapid payment upon completion of work (e.g. cheques))
				• This also provides authority to Indigenous organizations over how the project is conducted. This contributes to Indigenous self-determination in research

Financial administration	Deliver timely payments to staff according to local cultural standards	• Culturally inappropriate timing of payment; • Online payment methods are inappropriate for Indigenous workers in remote communities (e.g. electronic direct deposit)	• Local Inuit staff have expressed fair expectations to be paid the next day following the end of the fieldwork. However, the payment process with government administration necessarily involves delays. • Government payments require employees to have online banking while most Inuit communities have no banks and limited bandwidth. Some people also do not have a fixed address and/or a bank account	
Personnel selection	Hiring field workers locally to provide employment opportunities and enhance existing local capacity	• Institutional employment often requires certified formal training and prior work experience while community remoteness and institutional barriers can limit such opportunities for Indigenous Peoples	• In many remote communities, opportunities to complete certified training (e.g. firearm safety, wilderness first aid) are rare and/or expensive and there are few job opportunities through which gaining the formal work experience required by government hiring policies	• Develop exemption to recognize prior practical life experience in place of certified training (e.g. firearm use for subsistence hunting in lieu of the federal firearm safety course)

While government and Inuit researchers share similar priorities for eider duck monitoring and conservation, we faced challenges in co-developing the specifics of the eider breeding survey design itself. Here, we present how we accommodated divergent priorities for identifying which islands to sample during a recent survey conducted in the summers of 2021 and 2022.

We agreed with our Inuit partners that eider breeding surveys should leverage local logistical capacity and expert knowledge (which was achieved). This important approach is also highlighted in many other studies (e.g. Brunet et al., 2014; Gittelsohn et al., 2020). However, we sometimes disagreed on the selection and approach of which islands to survey.

The goal of ECCC scientists was to repeat established survey sampling methods of the original eider breeding surveys that were conducted in the region in the 1980s and 1997. This was to ensure statistical comparability of data collected during the three survey periods. In the original design, local Inuit knowledge informed the important nesting areas to visit, while government researchers randomly selected sample islands within those regions based on Western scientific methods with the help of topographic maps. We considered the random sample as essential to subsequently performing inferential statistics required to detect potential changes to population size and geographic nesting distribution over time (Whitlock & Schluter, 2009).

To be more efficient while conducting the surveys, our Inuit partners stated that it would be better to base our sampling strategy on Inuit Knowledge. Selecting islands to be surveyed based on Inuit Knowledge of nesting colonies would help reduce the chances of missing the largest colonies, which are known by local hunters (several of which were not included in the original sampling design). The approach of focussing efforts on the largest known colonies would also reduce the waste of time devoted to surveying islands known by local hunters to support very few or no nesting birds. They explained that, as eider breeding distribution is often clustered in a few large colonies, a random sample could potentially miss some of these most important

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TABLE 3 Summary of the worker's safety issues encountered when conducting collaborative common eider ducks monitoring fieldwork.

Safety issues	Alignment (shared priorities)	Divergence or challenges	Examples	Solutions

Workers' safety	Consistent commitment to safety that values the life and well-being of all field workers	• High standards of workers' safety are a legal requirement in all Canadian workplaces. Comprehensive risk mitigation protocols have been defined by government institutions with limited consultation with field experts from local communities.
		• Safety standards and risk tolerance vary between partners of diverse cultures, often based on previous experiences with the field environment. Compliance with safety measures can vary among members of the same field team resulting in Indigenous Peoples being poorly protected
			• Safety equipment: weak uptake by Inuit workers of some safety items
			  • Floater suits are considered too hot, restrictive, and too bright
			  • Survival packs are considered bulky to load and offload in and out of the boats
			• Accident and disability insurance: Southern-based government workers and students have insurance provided by their employers while local Inuit hired through other mechanisms are often not insured
				• The co-design of safe operating procedures in advance of the fieldwork. Both government and local partners should, as a team, critically evaluate what is needed and why
				• They should also agree on how to implement the safety measures and make sure they are followed by everyone. This may require:
				  • Finding equipment better adapted to the nature of fieldwork
				  • Emphasizing a consistent commitment to safety and having both Indigenous and government field leaders explain the values of safe operating procedures

breeding sites, which may constitute large proportions of the population. Including or excluding one or more of these largest colonies by chance alone could translate into important sampling errors.

To accommodate these different priorities in the survey approach, we (1) kept the random sample to meet statistical assumptions and long-term data comparability between surveys, and (2) added islands that had not been included in the original random sample by chance but were known by Inuit to recently support large nesting concentrations. In this way, we could still perform inferential statistics that could detect changes to regional movements of nesting eiders, while improving the precision of our population estimate by including more large colonies that previously had not fallen into the random survey design. This solution combined the strengths of both methods, resulting in a more robust data set. We acknowledge that there is room for further incorporation of Inuit methods into data collection and analysis protocols going forward, and this will require more reflection, creativity, and discussion between research partners in the months and years ahead.

5 | PROJECT ADMINISTRATION

Our experience has shown that many federal government administrative regulations related to staff hiring are poorly suited to employ seasonal Indigenous personnel living in remote communities, particularly in Arctic Canada. Gittelsohn et al. (2020) noted similar issues in academia and health research institutions in the United States. This has repeatedly hindered our collaborative research efforts, particularly given our shared priority of hiring field workers locally. Common eider duck breeding surveys require a field team of 8–12 people working together for 4 weeks. This has the potential to generate seasonal work opportunities (Garnett et al., 2009; Gearheard & Shirley, 2007). Since most of the funding is provided by the Federal Government (in this case, ECCC), all field workers must be hired through established institutional mechanisms. Government hiring approaches have been developed with a southern-centric institutional bias that generates administrative burdens for potential skilled workers while at the same time generating a lack of flexibility to replace field workers under short notice. We highlight that collaborative research with Indigenous communities requires flexible and responsive hiring approaches that are based in the communities themselves.

Government hiring practices assume that applicants have reliable access to the Internet; can interpret and complete online forms; and can financially maintain a personal phone, an Internet account (and associated email), and a fixed home address. Furthermore, security clearance now requires that potential workers have their fingerprints taken at a police station as a precondition of employment.

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Additionally, salary payments are no longer issued by mailed cheque and require that the employees have online banking in place before receiving electronic payments. Such requirements are challenging in remote locations that have poor Internet connectivity (Canadian Radio-Television and Telecommunications Commission, 2020), no community banks (Fong, 2022), and where police are understaffed and have more pressing priorities (George, 2019). Moreover, the most skilled workers suitable for extreme wilderness field research are often absent from town and have limited computer expertise for completing online applications, understandably so. They spend a lot of time 'on the land' (out of town) practicing traditional activities such as hunting and gathering or working on other field studies. This is specifically what makes them the most skilled candidates. It has been our experience that the most experienced field workers (many of whom are unilingual Inuktitut speakers) must often seek administrative support from the staff of local organizations such as the HTO, the Municipal Hamlet Office, or from family members simply to apply.

The federal hiring mechanisms in Canada also provide limited flexibility and weak responsiveness to accommodate last-minute changes in personnel because the online paperwork process must be submitted weeks and often months in advance. Potential workers from remote Indigenous communities often have immediate and unforeseen competing priorities, such as family or community responsibilities, land use activities, or new opportunities that arise for other higher-paid seasonal jobs (Wolfe et al., 2007). In practice, it is common for a member of the survey team to decline work under short notice only to have another person eagerly offering to replace them on the very same day. Our Inuit partners have expressed genuine and ongoing frustration in our inability to 'just change the name' on a federal contract the day before departure or mid-way through the season (during a break in field activities) to hire someone eager, skilled, and deserving.

Finally, the government pay system continues to be incompatible with the reasonable expectations of our Inuit partners of being paid immediately upon completion of the work. All partners on the eider survey agree that the timely payment of staff, following local expectations, is an important sign of respect and an essential element of harmonious collaboration; a lesson learned and previously reported by Carter et al. (2019). Some Inuit field workers have waited up to 4 months for their last pay periods to be processed. Understandably, this results in frustration and erodes good working relationships and future partnerships.

We have found that the only general solution to these issues is to have the financial and administrative elements of the project delivered at the community level, and not directly by government institutions. Other studies also highlighted the importance of partnering and establishing subcontracts with local organizations (e.g. Gittelsohn et al., 2020). Our program works proactively to establish formal agreements with recognized local organizations, such as HTOs, to which we transfer funds well in advance of the field project. The local organizations then disperse the funds as required to field workers once the surveys are completed. Importantly, we also pay a previously agreed-upon administration fee to the HTO recognizing that these efforts generate additional work for them. With this approach, salaries can be dispensed immediately after the work is completed and last-minute personnel changes can be accommodated more easily. Moreover, even though initial research funding is often awarded to government researchers, a local Inuit organization has authority over how the project is conducted and by whom. This increases Inuit governance over the design and implementation of the research project, which is in line with key NISR priorities (Inuit Tapiriit Kanatami [ITK], 2018). As a result, the common eider duck monitoring program has provided work opportunities to more people and delivered respectful employment and payment practices while still ensuring rigorous financial management and accountability.

We recognize that in certain circumstances and communities, this solution may not be possible. For example, such local organizations may or may not have the logistical and/or staff capacities to assume such responsibilities (Johnson et al., 2016). This solution also requires additional work for local organizations that often have many other concurrent priorities (Pedersen et al., 2020). These issues should be taken into consideration by all partners when co-developing the project administration and hiring strategies.

Another important administrative issue was encountered when selecting field workers or establishing selection criteria. For safety reasons, government institutions require staff to have formal certified training (e.g. wilderness first aid and firearms safety courses) and prior experience. These formal requirements can be hard to achieve for residents living in remote communities where work opportunities are scarce and formal training is often not available and/or expensive to receive (Skudra et al., 2020). Meanwhile, it is necessary to enhance the capacity among these communities to participate in current and future research projects (Inuit Tapiriit Kanatami [ITK], 2018; Johnson et al., 2016). For the eider survey, we resolved this issue by developing exemptions to recognize years of practical life experience as equivalent to formal training such as the use of firearms for subsistence hunting, in lieu of the federal firearm safety course.

6 | SAFETY ISSUES

Safety is a top priority for all those involved in conducting eider duck breeding surveys. Differences in risk perception and cultural safety standards have sometimes made it challenging to maintain a consistent level of safety for all field workers. We have found that some guidelines defined by government institutions are poorly adapted to the working situation in remote field situations and with Inuit workers. In other cases, reasonable safety requirements, such as wearing floatation devices while boating, have been weakly accepted by Inuit. These discrepancies have resulted in local Inuit field workers being less protected than their southern-based ECCC colleagues, despite our best efforts.

It is a legal requirement for all Canadian workplaces to ensure that high safety standards are consistently maintained (Canada

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Labor Code, 2022). Failure to do so can not only increase the risk to staff, it can generate legal liability for managers not enforcing best practices as they should. Consequently, government and academic institutions have developed comprehensive risk mitigation protocols and safety measures to reduce the inherent risks associated with conducting fieldwork in remote environments. We have found, however, that compliance with government safety measures during our boat-based surveys and associated remote camping was adopted unevenly or not at all; even by field workers on the same team. Here, we highlight disparities in the use of provided safety equipment and the unequal protection of staff provided by injury and accident insurance.

Some pieces of field safety equipment provided by our program were embraced by visiting southern-based workers, whereas local Inuit field workers perceived them as being cumbersome, non-essential, and/or ineffective. For example, full-body floater suits were rarely worn by Inuit workers on our field teams because they were found to be too hot and restrictive and their bright colours inappropriate for hunting while travelling between survey regions (see Figure 1). They usually preferred camouflage or darker colours to blend in during the summer months. The boats also carried an emergency survival pack in case a crew was stranded and left exposed on an offshore island (as has occurred); however, because these survival packs are cumbersome to load and offload from boats, they were soon left behind on the boats when the teams stepped onto islands.

A less visible inequity relates to the coverage of field workers by disability insurance in the event of an accident; an issue that was raised in other collaborative research contexts (e.g. Ramírez-Castañeda et al., 2022). Visiting students and/or field technicians employed by ECCC and universities, most of them non-Indigenous (a topic worthy of discussion but not within the scope of this paper), have insurance provided by their institution. However, local Inuit, who are hired through other mechanisms due to the administrative challenges presented above, are often not protected by insurance. This is noteworthy considering that all team members work alongside each other in the same boats and camping situations and face the same hazards.

Several factors can explain these disparities in the adoption of safety measures. One is that individual risk perception is influenced by many factors, including sociocultural elements and risk familiarity (Rohrmann & Renn, 2000). While local Inuit field workers commonly engage in subsistence hunting in remote areas year-round following safety measures reflecting their personal degree of risk tolerance, southern-based government staff often have lower risk tolerance and a professional commitment to adhering to formal government operating procedures (as defined by formal task hazard analyses). The federal and territorial governments require that all participants in fieldwork comply with safety protocols, although these were developed with limited or no consultation with local Inuit experts. Although we trust Inuit as field experts on the team, imposing government safety guidelines can send an incorrect message that we do not trust Inuit judgement regarding safety. This can also mean imposing measures that are not culturally adapted or suitable for local field conditions.

We suggest that field safety rules, like other elements of the program, should be co-designed by government researchers and each local community on a case-by-case basis to increase the perceived value and uptake of safety guidelines. Inuit should be engaged in every step of the research process, including its implementation (Inuit Tapiriit Kanatami [ITK], 2018). We argue that this should apply to the very practical aspects of the research process, including fieldwork safety and insurance practices. Similar to how early, open, and continuous communication is important to align research priorities (Carter et al., 2019; Cullen-Unsworth et al., 2012; Pearce

FIGURE 1 Bright orange full-body floater suits were rarely worn by Inuit field workers in the common eider duck monitoring program because they were found to be too hot and restrictive and of inappropriate colour for hunting while travelling between survey regions.

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et al., 2009), discussions for identifying safety best practices should be held in advance of the fieldwork.

As a team, both government and Inuit partners will need to critically evaluate and agree, prior to embarking, on what safety measures are needed and why, while recognizing that high standards must be met to protect workers. This would help ensure that safety approaches are well suited to local working conditions and all workers, including Inuit. For example, some of our Inuit collaborators suggested that we will need to find safety equipment that is more streamlined and better adapted to the mobile nature of our boat-based fieldwork. All partners will also need to determine how to ensure that all safe operating procedures are consistently implemented and followed by everyone. This could require that both Inuit and government field leaders explain in a united way the merits of safety guidelines before embarking on field trips and, hopefully, reduce the need to 'enforce' them.

7 | CONCLUSIONS

Despite our best efforts and intentions as federal scientists to implement the NISR priorities (Inuit Tapiriit Kanatami [ITK], 2018) in the delivery of ongoing common eider duck breeding surveys, there remain practical challenges to do so. Here, we have highlighted issues related to research co-design, institutional biases affecting program administration (particularly related to hiring and pay issues for Indigenous Peoples in remote communities), and maintaining the consistent safety of all field workers (including disability insurance). By identifying and sharing these challenges, we intended to draw attention to ongoing factors that continue to constrain our progress. We believe that these insights may help other teams working within large and regulated organizations, such as academic and health institutions, improve their collaborative approaches nationally and internationally. We invite other research teams to do the same, by sharing their practical experiences from a diversity of fields, while we all work to achieve shared principles of ethical collaboration.

AUTHOR CONTRIBUTIONS

Samuel Richard, H. Grant Gilchrist, and Vivian M. Nguyen conceived the ideas and designed the methodology; Samuel Richard, H. Grant Gilchrist, and Holly L. Hennin contributed to the development of the practical challenges and lessons learned presented in this document. Samuel Richard and H. Grant Gilchrist conducted eider surveys associated with this manuscript and led the writing of the manuscript together with Vivian M. Nguyen. All authors critically contributed to reviewing previous drafts and gave their final approval for publication.

ACKNOWLEDGEMENTS

We would like to thank Lucassie Arragutainaq, Joel Heath, Dominique Henri, and the many Board Members of the Aiviq HTO in Kinngait, Nunavut, for the valuable insights that they provided to us. Funding was provided by the Canadian Wildlife Service Northern Region, the Wildlife Research Division of Environment and Climate Change Canada, the Nunavut Wildlife Management Board Research Trust, the Nunavut General Monitoring Plan, the Nature Legacy Fund, ArcticNet, Carleton University, the Weston Family Foundation (Student Fellowship to S.R.) and Baffinland Iron Mines. We thank Allison Drake and Sarah Neima for providing helpful editorial comments on earlier drafts of this manuscript, as well as two anonymous Associate Editors and Natalie Carter for their very insightful comments that greatly improved the manuscript.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

PEER REVIEW

The peer review history for this article is available at https://www.webofscience.com/api/gateway/wos/peer-review/10.1002/2688-8319.12258.

DATA AVAILABILITY STATEMENT

There are no data associated with this paper.

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How to cite this article: Richard, S., Gilchrist, H. G., Hennin, H. L., & Nguyen, V. M. (2023). Collaboration between local Indigenous and visiting non-Indigenous researchers: Practical challenges and insights from a long-term environmental monitoring program in the Canadian Arctic. *Ecological Solutions and Evidence*, *4*, e12258. https://doi.org/10.1002/2688-8319.12258

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