

“A Great Investment in Our Communities”: Strengthening Nunavut’s Whole-of-Society Search and Rescue Capabilities

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ABSTRACT. Community-based organizations along with territorial, provincial, and federal agencies are responsible for search and rescue (SAR) in the Canadian Arctic. In delivering response capabilities at all hours of the day and for 365 days a year, the community-based organizations face a wide array of challenges. Using the data collected through the Kitikmeot Search and Rescue Project and the Kitikmeot Roundtable on SAR, coupled with academic and non-government organization literature, this article explores the major challenges facing community SAR organizations in Nunavut and builds a case for how targeted investment can best bolster community-based capabilities. We suggest novel, practical, and holistic solutions that have been proposed by or co-devised with community partners, are rooted in the unique context of Nunavut’s communities, and are reflective of a community resilience-building approach. One set of recommendations involves strengthening current programming, including the expansion of Nunavut Emergency Management’s inReach program, continued support for the enlargement of the CCGA, streamlining the process to activate Canadian Ranger patrols, and encouraging greater cooperation in the provision of training by federal and territorial agencies. We also propose new approaches, including a whole-of-society preventative SAR program centred on educational and youth programming, the adoption of a SAR equipment usage rate model, and the launch of a Community Public Safety Officer program in Nunavut. Finally, to justify greater investment at the community level, we argue that policymakers must change how they conceptualize community-based SAR capabilities in Nunavut. An effective SAR system is about more than the ability to respond to emergency events. It is a critical enabler to broader objectives and goals prioritized in the Arctic and Northern Policy Framework and other federal, territorial, and Inuit strategies.

Key words: search and rescue; community-based organizations; community resilience; emergency management; capacity-building; Arctic; Nunavut; Inuit; community-based research

RÉSUMÉ. Dans l’Arctique canadien, les activités de recherche et sauvetage (SAR) relèvent des organisations communautaires ainsi que des organismes territoriaux, provinciaux et fédéraux. Les organisations communautaires doivent fournir ces services 24 heures sur 24, 365 jours par année et ce faisant, elles éprouvent toutes sortes de difficultés. S’appuyant sur les données du projet de recherche et sauvetage de Kitikmeot et de la table ronde de Kitikmeot sur les activités de SAR, ainsi que sur la documentation des organisations non gouvernementales et universitaires, cet article explore les principales difficultés auxquelles les organisations de SAR font face au Nunavut et démontre comment un investissement ciblé peut rehausser les capacités communautaires. Nous suggérons des solutions pratiques, nouvelles et holistiques proposées ou conçues en collaboration avec des partenaires communautaires, enracinées dans le contexte unique des collectivités du Nunavut et axées sur une approche communautaire visant le renforcement de la résilience. Un ensemble de recommandations consiste à consolider les programmes actuels, dont l’expansion du programme inReach de gestion des urgences du Nunavut et de la Garde côtière auxiliaire canadienne, à rationaliser le processus d’activation des patrouilles des Rangers canadiens, et à favoriser une plus grande collaboration en ce qui a trait à la formation dispensée par les organismes fédéraux et territoriaux. Nous proposons aussi de nouvelles approches, dont un programme de SAR préventif pour l’ensemble de la société axé sur la programmation destinée aux jeunes et sur la sensibilisation, l’adoption d’un modèle du taux d’utilisation de l’équipement de SAR, et le lancement d’un programme d’agents de la sécurité publique communautaire au Nunavut. Pour conclure, afin de justifier un plus grand investissement au niveau communautaire, nous soutenons que les décideurs politiques doivent modifier leur façon de conceptualiser les capacités communautaires de SAR au Nunavut. L’efficacité d’un système de SAR ne réside pas seulement dans la capacité à intervenir en cas d’urgence. Il s’agit aussi d’un instrument critique permettant d’élargir les buts et les objectifs priorités dans le cadre de référence des politiques de l’Arctique et du Nord et d’autres stratégies fédérales, territoriales et inuites.

Mots clés : recherche et sauvetage; organisations communautaires; résilience communautaire; gestion des urgences; renforcement des capacités; Arctique; Nunavut; Inuit; recherche communautaire

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INTRODUCTION

In the Canadian Arctic, community-based Ground Search and Rescue (GSAR) teams, Canadian Coast Guard Auxiliary (CCGA) units, Marine SAR Societies, Civil Air Search and Rescue Association (CASARA) members, and the Canadian Rangers play essential roles in search and rescue (SAR). These community-based groups constitute the regional foundation of Canada's Arctic SAR system, given the distances involved, the paucity of federal and territorial resources in the region, and their intimate knowledge of local geography, sea and ice conditions, potential challenges and risks, and their fellow community members. They face the daunting task of providing response capabilities at all hours of the day and 365 days a year in an austere and changing environment.

Government reports and academic studies over the last decade have documented challenges facing Nunavut's community-based SAR groups, including an increasing case load, training gaps, equipment shortages, volunteer burnout, difficulty coordinating, cooperating, and communicating across the community, territorial, federal levels, and the slow response times from southern-based SAR assets (Benoit, 2014a; French, 2014; Funston, 2014; Munk-Gordon Arctic Security Program, 2014; Clark and Ford, 2017; Østhagen, 2017; Clark et al., 2018; Standing Committee on Fisheries and Oceans, 2018; Standing Committee on Foreign Affairs and International Development, 2019). Although federal and territorial agencies have taken significant steps to address challenges in recent years, such as the new "Nunavutized" GSAR training program and the expansion of the CCGA, and the Arctic and Northern Policy Framework has prioritized bolstering "whole-of-society emergency management capabilities in Arctic and Northern communities" (CIRNAC, 2019b: Objective 5), critical gaps remain.

The Kitikmeot SAR Project

Since 2019, the community collaborative Kitikmeot Search and Rescue Project (KSAR) has explored three overarching questions: What are the strengths of Nunavut's community-based SAR system? What challenges continue to impede the operational effectiveness of Nunavut's community-based SAR groups? What new approaches might be developed to mitigate these challenges? Launched in early 2019, the project focuses on the Kitikmeot communities of Kugluktuk, Cambridge Bay, Gjoa Haven, Taloyoak, and Kugaaruk (Fig. 1). The researchers chose to examine the Kitikmeot SAR system because of its relatively high number of ground and marine SAR cases over the last decade, the recent expansion of the CCGA in the region, and the pre-existing relationships they had with first responders in the communities.

The project's approach is rooted in a community disaster resilience framework, which refers to a community's ability to anticipate, prevent, prepare for, manage, and

recover from emergencies and major incidents (Cox and Hamlen, 2015; Justice Institute of British Columbia, 2021). Cox (2015:5–6) emphasizes that community resilience "is generated from the ground up, and resilience enhancement plans, activities and policies, if they are to be successful, must be participatory and respond to the specific cultural and social context. At its heart, CDR [community disaster resilience] is driven by community-defined priorities and practices." It requires that citizens be acknowledged as "full equity partners and codesigners of solutions" (Cox, 2015:5–6; see also Bhatt and Reynolds, 2012; Fournier, 2012; Conference Board of Canada, 2014; Murphy et al., 2014; Public Safety Canada, 2019:5–6). A resilience-building approach that emphasizes "capacities and assets and how these can be mobilized and/or enhanced in order to reduce vulnerability and risk" (Cox, 2015:6) fits well with recent calls from northern Indigenous leaders for policy development to focus on the knowledge and skills possessed by communities "and how the federal government can assist in building upon and supporting these strengths. This means focusing on what we have versus focusing on what we lack, and valuing our existing capacity over voices that tell us we are not capable" (Dene Nahjo et al., 2018:12).

Using data collected through the Kitikmeot Search and Rescue Project and a literature review on search and rescue operations in Canada's North, we suggest how federal, territorial, and municipal partners, Inuit associations, and private industry might strengthen whole-of-society SAR capabilities in Nunavut. We explore the major challenges facing community SAR organizations and highlight novel practical and holistic solutions proposed by or co-devised with community partners.

The Kitikmeot SAR System

In the Kitikmeot, several volunteer organizations with distinct mandates and responsibilities conduct SAR operations. Each community has an all-volunteer GSAR team, often supported by a formal SAR Committee. While team members volunteer their time and typically use their personal equipment, Nunavut Emergency Management (NEM) provides funding to cover expenses such as training, fuel, lubricants, emergency supplies, food, and equipment repair (Department of Community and Government Services, 2017). Marine SAR is carried out by CCGA units in Cambridge Bay, Kugluktuk, and Gjoa Haven, and facilitated by the SAR Committees in Taloyoak and Kugaaruk. Coast Guard Auxiliary units are made up of trained local volunteers who use their own vessels or a community vessel to respond to emergencies. CCGA members receive specialized training, insurance coverage, and reimbursement for certain operational costs, but they also fundraise to purchase additional equipment. Cambridge Bay and Kugluktuk have long-established Auxiliary units, while Gjoa Haven's became operational in 2017 as part of the federal government's Oceans Protection Plan (OPP), which seeks to expand the CCGA throughout the Arctic



FIG. 1. Inuit Nunangat is the Inuit homeland in Canada, encompassing the land claims regions of Nunavut, Nunavik, Nunatsiavut, and Inuvialuit Nunangat. The Kitikmeot SAR Project focuses on Nunavut’s Kitikmeot region, which includes the communities of Kugluktuk, Cambridge Bay/Iqaluktuuttiaq, Gjoa Haven/Uqsuqtuuq, Taloyoak, and Kugaaruk. Credit: Inuit Tapiriit Kanatami.

(Kikkert and Lackenbauer, 2019). Currently, the Coast Guard is laying the groundwork for a unit in Taloyoak. Furthermore, Civilian Air Search and Rescue Association (CASARA) volunteers have received training as aerial spotters in Gjoa Haven and Cambridge Bay pursuant to their mandate to provide air support services to searches and to promote SAR awareness (CASARA, 2021).

The Kitikmeot SAR system also includes Canadian Ranger patrols in each community, Inuit Guardians in Gjoa Haven, and other governmental and non-governmental partners. Each Kitikmeot community has an active Ranger patrol composed of part-time, non-commissioned Canadian Armed Forces (CAF) Reservists. These individuals can be called up to assist with SAR as volunteers who know how to work effectively as a group or, when formally activated, as a formal team on an official military tasking for which they are paid. The CAF provides Canadian Rangers with flexible training that is tailored to local terrain and environmental conditions but generally involves several elements directly related to SAR capabilities: first aid, wilderness first aid, GSAR, constructing emergency airstrips on land and ice, and communications. When

searches go on for extended periods, the search area is too vast to be covered by GSAR teams, or there are insufficient community volunteers, Ranger patrols offer an accessible community-based solution (Lackenbauer, 2013, 2015, 2020; DND/CAF Ombudsman, 2017). Since 2016, Gjoa Haven has also had a team of Inuit Guardians who protect and monitor the Wrecks of HMS *Erebus* and HMS *Terror* National Historic Site and offer an emergency response capability to any accidents or SAR activities that occur in the surrounding area (Nunavut Field Unit, 2018). During searches, community-based organizations in the Kitikmeot often work closely with NEM, the Royal Canadian Mounted Police (RCMP), the Coast Guard, Joint Rescue Coordination Centre Trenton, the Royal Canadian Air Force, and with aircraft servicing private industry and the North Warning System (Kikkert et al., 2020a, b, c).

METHODOLOGY

The empirical evidence gathering for the Kitikmeot Search and Rescue Project began with a comprehensive

review, synthesis, and analysis of academic, media, and government sources discussing search and rescue in Canada's North. This review focused on literature dealing with the operational challenges facing the execution of SAR missions at the community-level.

Next, the project employed a qualitative approach to explore the SAR experiences of community responders. The existing relationship that the researchers enjoyed with members of the Canadian Rangers Patrols in each community facilitated the development of the project. The researchers formed these relationships through their involvement in Ranger leadership and training activities and their participation in on-the-land patrols with Rangers from Gjoa Haven, Kugluktuk, and Cambridge Bay. The central questions that motivated the research team—identifying the strengths and challenges in Nunavut's SAR system and designing new approaches to community-based SAR—emanated from preliminary conversations between the researchers and Rangers, many of whom also serve on GSAR teams and Coast Guard Auxiliary units in their communities. Using referrals from members of the Ranger Patrols, the researchers used snowball sampling to recruit additional project participants. In April 2019, the researchers met with potential project participants in Taloyoak, Gjoa Haven, Kugluktuk, and Cambridge Bay to describe the project and disperse project information letters, seek the input of community responders on key questions, themes, and project design, and schedule subsequent meetings. Because of scheduling conflicts, the researchers conducted preliminary meetings with community responders from Kugaaruk over the phone before meeting face-to-face in Cambridge Bay prior to the Kitikmeot Roundtable on Search and Rescue in January 2020.

With the Kitikmeot SAR groups' support, the Nunavut Research Institute and the St. Francis Xavier University Research Ethics Board approved the Kitikmeot Search and Rescue Project. The research project followed the principles of ownership, control, access, and possession and was carried out in accordance with Chapter 9 of the TCPS2 Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans on research involving First Nations, Inuit, and Métis peoples of Canada (Government of Canada, 2018).

In October 2019 and January 2020, the researchers conducted semi-structured interviews with community SAR coordinators, Coast Guard Auxiliary unit leaders, and Ranger patrol commanders in each community. Several key themes guided these discussions: strengths and challenges, leadership, coordination, and organizational issues, future requirements, and suggestions for improvement. The interviews took place in locations convenient for participants, including community restaurants, homes, and while participants were engaging in on-the-land activities.

Following these discussions with leadership, the researchers conducted informal capacity-mapping workshops with community SAR groups to determine local

assets and resources, identify untapped or unrecognized resources, and register collective and individual capacities. Capacity mapping recognizes that communities have a wealth of assets and resources upon which to build with supplemental efforts and initiatives then based on the strengths of community members (McKnight and Kretzman, 1997; Ampomah and Devisscher, 2013:15–16; WHO, 2018). Participants in these workshops mapped out community assets ranging from who is involved in SAR (including the different “hats” that community members wear, e.g., Rangers serving in the Coast Guard Auxiliary and on GSAR teams), to the existence of defined response procedures, first-aid skills, equipment, infrastructure, completed training, geographic knowledge, the ability to communicate and coordinate during emergencies, and skills around effective planning. These data were then used to facilitate capability-based planning exercises, which determined whether a community has the right mix of assets it requires to respond to the wide array of SAR missions it might face (Caudle, 2005). Both capacity-mapping and capability-based planning aim to be inclusive, participatory, cooperative, egalitarian and solution-oriented to better facilitate consensus building among those involved (Keim, 2013:56).

During these interviews and workshops, the researchers met with 22 members of the Gjoa Haven Canadian Ranger patrol, eight members of the Cambridge Bay Canadian Ranger patrol, 18 members of the Kugluktuk Ranger patrol, and 25 members of the Taloyoak Canadian Ranger patrol. The 1st Canadian Ranger Patrol Group (ICRPG) facilitated Ranger involvement in the project and provided in-kind support by paying Rangers for their participation in meetings and interviews. In total, researchers met with five members of the GSAR Team/SAR Committee in Taloyoak, five members in Gjoa Haven, five in Kugluktuk, 10 in Cambridge Bay, and six members from Kugaaruk. They engaged with four members of the Coast Guard Auxiliary in Kugluktuk, seven in Gjoa Haven, and four in Cambridge Bay. The researchers also interviewed two members of CASARA in Gjoa Haven and one in Cambridge Bay. The provision of an honorarium encouraged participation in interviews and meetings. Where required, Canadian Rangers provided translation services. Meetings were not recorded (audio or video), but verbatim quotes were approved by community participants.

During community interviews and workshops, members of the research team conducted participant observation during trips on the land with community responders, participated in Canadian Ranger patrols in Gjoa Haven and Kugluktuk, toured community SAR facilities (e.g., SAR buildings, offices), and reviewed SAR equipment. These experiential learning opportunities fostered a deeper understanding of community SAR operations, the equipment used, and the difficulties encountered by community responders.

During the capacity-mapping and capability-based planning workshops in October, community participants

highlighted the need to elevate discussions to the regional level, where participants could share their knowledge with and learn from practitioners in other communities and discuss capacity issues with federal and territorial partners. They pointed out that a roundtable would serve as both a research opportunity and a resilience-building measure. The Kitikmeot Roundtable on SAR, co-organized by the researchers and Angulalik Pedersen, the second-in-command of the Cambridge Bay Coast Guard Auxiliary, was held at the Canadian High Arctic Research Station in Cambridge Bay from 31 January to 1 February 2020. It brought together 55 community responders from the five Kitikmeot communities, academics, and representatives of federal and territorial departments and agencies to discuss best practices, lessons learned, and future requirements for search and rescue in the Kitikmeot region. To encourage free-flowing and open discussion, most of the proceedings (with the exception of several formal presentations) were governed by the Chatham House Rule under which participants may use information from the proceedings, but the identity of the speakers is not revealed. As a result, no personal attribution was made to individual speakers. While most of the roundtable focused on community-level searches, the culminating Mass Rescue Operation Tabletop Exercise involved a scenario with an adventure cruise ship running aground. Although the Kitikmeot SAR Project framed discussions with the resources and capabilities of the Kitikmeot communities in mind, allowing participants to discuss region- and community-specific issues, government officials confirmed that many of the challenges identified and improvements suggested have broad applicability to other Nunavut communities. Roundtable presentations and discussions were recorded and published in a summary report, a general report with key findings, and a tabletop exercise report (Kikkert et al., 2020a, b, c).

The roundtable also facilitated the sharing of data collected during the interviews and workshops and discussions of preliminary research results. Project participants concluded that a Kitikmeot SAR website should be developed to share the collected data, research findings, SAR stories, and roundtable reports (building upon the website created specifically for the roundtable). Roundtable co-organizer Angulalik Pedersen agreed to work with the researchers to produce the website and its content.

RESULTS

Cumulatively, the interviews with SAR coordinators, unit leaders, and patrol commanders, the capacity-mapping workshops, and the Kitikmeot Roundtable on SAR 2020 identified several core strengths supporting effective community-based SAR operations and highlighted myriad challenges facing community responders, many of which reinforce the findings of previous studies on northern SAR.

Strength: Dedicated and Skilled Volunteers

On a volunteer-basis, the community-based organizations responsible for conducting SAR operations are generally able to recruit enough skilled and dedicated people. The Cambridge Bay GSAR team, for example, has 10–12 members who are ready and willing to go out on searches, with access to another pool of searchers whom they can draw upon for extended operations (information gathered during the 2019 Cambridge Bay Capacity Mapping Workshop). Community practitioners match their dedication with intimate knowledge of the land and local environmental conditions. As one roundtable participant pointed out:

We know the local weather. We know the conditions. We know the water and ice, the rocks. We know how the ice works. We know the best routes to take, the fastest, the safest routes to take. We know things that you can't get from a GPS or a weather report. We know how the tides work.

(Kikkert et al., 2020c:4)

When community participants are asked to reflect on the strengths of their organizations, they typically offer an illustrative story that showcases skillsets that make them effective. For example, Ranger Sgt. Roger Hitkolok and Jack Himiak, the founders of Kugluktuk GSAR, shared the story of how a lone hunter went missing one November when it was dark and the ice was still thin. He had no GPS or SPOT device with him, and he had told no one where he planned to go. Kugluktuk's GSAR team was notified and together they drew upon their knowledge of the land, ice, and hunting grounds to determine where to look. They speculated that the man had gone seal hunting along the coast towards High Lake and Bathurst Inlet. Hitkolok and Himiak led a small team of GSAR volunteers down the coast. After 130 miles of travel in terrible weather and treacherous ice conditions, they spotted the hunter's snow machine. The man had shot a seal and went to retrieve it on his snow machine, only to hit some rough ice, fall off, and hit his head. This left him disoriented and confused. The GSAR team provided first aid to the injured and near-hypothermic man. Hitkolok reported his position using his Ranger-issued satellite phone and requested a Twin Otter from 440 squadron in Yellowknife to evacuate the hunter. Next, he used his Ranger training to instruct his GSAR team on how to prepare an austere ice strip for the airplane. The team filled pots, pans, and plates with whatever they could light on fire to illuminate the improvised airstrip. The Twin Otter landed and successfully evacuated the hunter. As Hitkolok concluded (in typically understated fashion), "It was a hard one" (Hitkolok and Himiak, pers. comm. 2019; Kikkert et al., 2020b:58–59). This story highlights the level of skill and knowledge required to safely execute SAR operations in Nunavut. The individuals that make up community-based SAR organizations are comfortable

reading the snowbanks and technology like inReach Explorer+ devices, constructing airstrips and snow houses (iglus), and communicating with community members and the Canadian Armed Forces.

Strength: Preventative SAR

Project participants emphasized the important role that community responders play in teaching their fellow community members how to operate safely on the land, the dangers of going out unprepared, and how to respond appropriately when in trouble. In particular, participants highlighted the benefits of providing youth and young adults with survival training and involving young people more directly in SAR operations. In Kugluktuk, members of the GSAR team and CCGA visit the elementary school to explain to students what they need and what they should look for when they head out on the land. They also teach students to make a mental note of who is leaving the community, track the direction they are going, and note the equipment that they are taking with them. In one SAR case, two children had watched their uncles go out on the land, so they reported to the GSAR team what their relatives were wearing, what they were driving, and where they were going. This information led to a more efficient (and successful) search.

Strength: Effective Community-Based Leadership

If community-based SAR groups are the foundation of Canada's regional Arctic search and rescue system, SAR coordinators and unit leaders are its cornerstone. Prior to searches, group leaders must facilitate training for their teams; build and sustain relationships with the Hunters and Trappers Organization, the RCMP, and other local groups; and ensure that SAR volunteers are on standby at all times. During a search, they contact all the individuals who might be involved; secure a tasking number and liaise with NEM in Iqaluit, the Coast Guard, or the Joint Rescue Coordination Centre (JRCC) in Trenton, Ontario; organize the SAR teams and get them ready to deploy; purchase fuel and other supplies for the teams; and help direct search operations. In the aftermath of a search, SAR coordinators must complete expense forms, damage reports, and other required paperwork (information gathered during the 2019 capacity mapping workshops in Cambridge Bay, Gjoa Haven, and Kugluktuk).

Challenge: Increasing Case Load

The impacts of climate change and the loss of traditional skills (particularly amongst younger community members), coupled with the failure of some travelers to take requisite fuel and equipment when on the land, has led to an increase in SAR cases in the Kitikmeot over the last two decades—similar to trends reported in other parts of Nunavut (Laidler et al., 2009; Pearce et al., 2010, 2011; Clark et al., 2016; Clark and Ford, 2017; Gearhead et al., 2011; Huntington et

al., 2017; Ford and Clark, 2019; Kikkert et al., 2020b). As one Kitikmeot Roundtable participant emphasized:

With climate change and bad ice, machines are getting damaged and more people are getting hurt and getting lost. Even with the most experienced people things happen.

(Kikkert et al., 2020:43–44)

Community responders at the Kitikmeot Roundtable also highlighted the overreliance some travelers have on technology, which can fail (such as GPS, snow machines, and boats), echoing academic research on how this can lead to risky behavior by people who lack traditional skills to problem solve effectively when things go wrong (Aporta and Higgs, 2005). Project participants also confirmed how the pressures of food insecurity often force hunters to travel farther afield and in poor conditions (Ford et al., 2006a, b, 2008a, b).

Given these issues, the number of public SAR cases in the region (as opposed to private ones that are not elevated beyond the community-level) has remained consistently high over the last five years, particularly in Gjoa Haven and Taloyoak (Table 1). Project participants point out that these numbers do not accurately capture the SAR situation and only include public searches that involve NEM or the federal JRCC. The numbers do not account for community SAR members responding to private searches, breakdowns, and when people run out of fuel, which would make the numbers far higher.

The Kitikmeot SAR system also faces increasing demand as more people visit the region. Marine traffic has grown significantly as climate change increases summer accessibility into Arctic waters (Kikkert et al., 2020b:15), with Cambridge Bay seeing the third highest increase in vessel traffic in Nunavut (Dawson et al., 2018). Resource development in the Slave Geological Province around Bathurst Inlet, cruise tourism, localized maritime activity, and the anticipated creation of a low-impact shipping corridor are expected to bring more vessels to the waters of Dolphin and Union Strait, Coronation Gulf, Dease Strait, Bathurst Inlet, Victoria Strait, Queen Maud Gulf, Simpson Strait, Rae Strait, Bellot Strait, and the Gulf of Boothia (Carter et al., 2017, 2018). The increasing number of private pleasure craft that transit Kitikmeot waters also concerns community SAR organizations that anticipate future rescues involving these vessels. Referencing these vessels, Ranger Sgt. Roger Hitkolok (pers. comm. 2019) noted:

We need to find out what we can do. We need to talk about it. We need to plan this out and train. Something will happen. There are more boats every summer. Something will happen. We need to be ready; we need to talk about it.

The last decade has also provided three examples of large vessels running aground in the Kitikmeot that could have

TABLE 1. Public SAR cases in the Kitikmeot by community. Nunavut Emergency Management, Annual Reports 2015–19.

	2015	2016	2017	2018	2019
Cambridge Bay	4	1	2	2	7
Kugluktuk	2	0	0	1	6
Kugaaruk	4	6	11	5	7
Taloyoak	17	11	14	11	27
Gjoa Haven	22	33	22	20	24
Nunavut	251	282	233	216	245

spiraled into maritime disasters: *MV Clipper Adventurer* (2010), *MV Nanny* (2010), and *Akademik Ioffe* (2018) (CBC News, 2010; Stewart and Dawson, 2011; Struzik, 2018). In each incident, good conditions prevailed. Had the weather or sea conditions been worse, each could have demanded a complicated mass rescue operation. Project participants also identified adventure tourism as a year-round challenge for SAR organizations. In winter 2019, for example, the GSAR team from Cambridge Bay had to respond when tourists on a 400 km trek over the sea ice between the community and Gjoa Haven required evacuation because of exhaustion and other minor injuries.

Challenge: Equipment Shortages

Equipment shortages represent a longstanding source of concern in communities across the North (e.g., Legislative Assembly of Nunavut, 5 March 2012; Benoit, 2014a:8–13; Standing Committee on Fisheries and Oceans, 2018). During local GSAR operations, responders have to use their own snow machines, all-terrain vehicles (ATVs), and other personal equipment. NEM can provide reimbursement if a searcher can prove that their machine was damaged during a search, but there is no compensation for regular wear and tear on equipment (despite the rough terrain and seascapes in which SAR personnel operate). While each community has different equipment requirements, community practitioners point to the common need for snow machines, ATVs, boats, survival gear, and camp supplies. In spring 2019, one Kitikmeot community SAR Committee had only two members capable of responding because of equipment issues. On rare occasions in the past, territorial and federal agencies have donated surplus equipment to select community SAR organizations or created memorandums of understanding allowing for equipment to be shared during emergencies. These measures are insufficient. Given that they are providing an essential public safety service on a volunteer-basis, community volunteers argue that they should be given greater access to the equipment they require. One roundtable participant concluded:

You would never send a firefighter out to fight a fire with bad equipment or without any protective gear, yet we are asked to do this when doing searches on the land. Is this not also dangerous work?

(Kikkert et al., 2020b:20)

Challenge: Access to Training

Community participants emphasized similar ideas about the need for greater access to training, particularly courses in basic and wilderness first aid and cardiopulmonary resuscitation, radio operation, navigation, technical rescue skills, and use of the Incident Command System. These ideas echo the results of previous studies (Munk-Gordon Arctic Security Program, 2014:18–21; Benoit, 2014b; French, 2014:34–35; Ford and Clark, 2019). The participants also noted that NEM's previous GSAR training course had been far too "southern focused" and involved too many components geared towards SAR practices below the treeline with little Nunavut-specific content. Even when training is available at the community level, other occupational demands limit involvement. Municipal, territorial, and federal government employees who also serve in community SAR organizations argue that they should be given time off with pay to participate in training (see also Munk-Gordon Arctic Security Program, 2014:18).

Challenge: Horizontal and Vertical Communication, Coordination, and Cooperation

Difficulties surrounding communication, coordination, and cooperation also impede the successful execution of SAR operations (e.g., Benoit, 2014b; Munk-Gordon Arctic Security Program, 2014:21–31; Clark et al., 2018:13; Standing Committee on Foreign Affairs and International Development, 2019:82–83). SAR depends upon a "network approach" (Seymour, 2018), requiring that different components work together with minimal friction. Challenges start within individual community organizations that often lack clear plans and procedures to provide contact information, lay out the competencies and responsibilities of group members, and identify steps to be taken before, during, and after a search. Coordination and cooperation between groups remains informal and often limited at the community-level (information gathered during the 2019 capacity mapping workshops in Gjoa Haven and Taloyoak). In scenarios such as a prolonged shoreline search, CCGA, GSAR teams, Rangers, and CASARA volunteers may need to work together. Without opportunities for joint training and exercises beforehand, trying to coordinate the various elements of the local SAR system in a high-pressure, time-sensitive situation can be stressful and inefficient. As one Kitikmeot Roundtable participant explained:

Because people in these groups often know one another and there is usually a lot of crossover between them with all the hats people wear, there might be an idea that they can work together no problem. But in an emergency, when groups have different ways of communicating, different ways of doing things, different mandates from the South, we can quickly run into trouble. We need to practice cooperating. We need to practice working

together. And it's not just SAR—think about how helpful this would be during other emergencies that we might face in the community.

(Kikkert et al., 2020b:35)

Challenges also arise when the entire network—community groups, NEM, JRCC, and private industry—needs to coordinate its efforts (Benoit, 2014a, b). Federal and territorial officials often have inadequate knowledge of the capabilities or limitations of community-based SAR organizations, and project participants explained that some community responders find it challenging to communicate effectively with southern SAR partners, given specialized jargon (particularly in interactions with the military and JRCC). Furthermore, community responders often refer to geographical features in Inuinnaqtun and Inuktitut, thus providing information unintelligible to JRCC personnel relying upon English-language maps. The language issue indicates a need to better integrate Indigenous languages in the SAR framework. Furthermore, community groups, JRCC, and NEM all noted difficulties in engaging private industry, particularly when tracking down private aircraft to participate in a search, identifying assets in an area, and determining who to contact to access them. To improve coordination, communication, and cooperation at all levels, community participants emphasized the importance of sustained relationship building to foster trust and collaboration.

Roundtable participants also raised concerns about the negative impact of uncoordinated social media activity by community members and searchers who do not work with community SAR organizations. When SAR teams conduct their searches, they also have to worry about untrained people helping with the search who might themselves end up requiring assistance. One Kitikmeot Roundtable participant noted:

We need to educate community members on the dangers of this and how they can help from inside the community. We don't want to have to rescue the rescuers.

(Kikkert et al., 2020b:35–36)

If community SAR organizations call for additional volunteers, all responders must be prepared to work as a group and follow direction. While social media can provide useful information on where people might be located, it can also exacerbate coordination problems by providing false information, encouraging community members to search in an uncoordinated manner, and serving as an outlet for community members to vent frustration at the SAR teams (which detrimentally affects morale).

Challenge: Canadian Ranger Activation

A specific cooperation and coordination challenge emerges when a community wishes to officially activate its

Canadian Ranger Patrol to participate in a SAR operation. A Ranger participant at the Kitikmeot Roundtable observed:

The Taloyoak Ranger Patrol has taken part in many SAR operations around the community, with Kugaaruk, and Gjoa Haven. Rangers called up when there are not enough volunteers or the search goes long. They should be involved in SAR discussions. Sometimes it takes too long for the Rangers to be activated in SAR situations. It is a very confusing process and sometimes people don't seem to know how it works. This slows everything down and when someone's life is in danger, it doesn't make sense.

(Kikkert et al., 2020b:32)

Ranger support to GSAR operations in Canada's northern territories has been plagued for decades by an overly convoluted and complicated process through which a Territorial Emergency Measures Organization (EMO) or the RCMP request the assistance of ICRPG to support a local GSAR. As the Ranger participant in the roundtable concluded, the “Rangers can make a big difference in search and rescue... [and] it should be made easier to use us” (Kikkert et al., 2020b:32).

Challenge: Inadequate Number of Volunteers and Volunteer Burnout

Community responders frequently cited the problems posed by inadequate numbers of volunteers willing to serve in community organizations and the concomitant issues of volunteer burnout (e.g., Munk-Gordon Arctic Security Program, 2014:15; Standing Committee on Fisheries and Oceans, 2018:38; Standing Committee on Foreign Affairs and International Development, 2019:85). Many community participants are involved in multiple groups responsible for SAR; for example, some individuals are GSAR members, CCGA, Rangers, and CASARA volunteers. The simple fact that many of these volunteers wear “multiple hats” can lead decision makers outside of the community to overestimate the amount of local capacity upon which they can draw. Even in communities with a substantial volunteer pool, team leaders emphasized difficulties in attracting people to attend meetings or participate in training, practice, and fundraising efforts. Some participants also suggested that a lack of perceived enticements or incentives make it difficult to recruit new members. While SAR volunteers across Canada who serve more than 200 eligible hours in a calendar year are able to claim a \$3000 non-refundable tax credit on their personal tax return (resulting in an average of \$450 in tax savings), many volunteers in the Kitikmeot are unfamiliar with this benefit or are not sure how to access it.

The heavy workload, combined with the lack of volunteers and the fact that missing persons are often friends and family, can lead to emotional, mental, and physical exhaustion. One community participant explained:

All of it is very stressful, very tiring. When you have two-dozen searches a year, it takes so much out of you. It's easy to get exhausted. Sometimes you want to quit. Sometimes you are searching for people you love. Sometimes you don't find them or find them too late. It's all hard.

(Kikkert et al., 2020b:34–35)

Various individuals stressed how inadequate or non-existent access to mental health services is to deal with the trauma of SAR operations, which contributes to “burnout.”

Administrative Burden

Coordinators and unit leaders also noted that the accounting and administration burden on SAR organizations is a major contributor to leadership burnout. Facilitating training opportunities, organizing fundraising events (usually bingos), preparing after-action reports, and completing all of the legal paperwork required for non-profit society status (a requirement to receive annual funding from NEM) are onerous and time consuming. Administrative demands are intense during and particularly after a search: summarizing expenditures with supporting receipts, reporting on the status of equipment provided by NEM and damages to any personal equipment, and completing all of the actual search paperwork. The involvement of the hamlet office in community SAR organizations can alleviate some of this administrative burden, but this support is not readily available in several Kitikmeot communities.

Challenge: Slow Response Times by Federal Assets

Finally, Northerners and researchers frequently underscore slow response times from southern-based SAR air assets as a source of major concern (e.g., Byers and Covey, 2018; Leblanc, 2018; Ford and Clark, 2019; Standing Committee on Foreign Affairs and International Development, 2019:85). Several community responders at the Kitikmeot Roundtable on SAR echoed this critique, noting that a CC-130 Hercules flying out of Trenton, Ontario, generally takes five hours to reach the Kitikmeot region.

DISCUSSION

The long-standing challenges identified by community responders highlight the need for greater investment and fresh approaches to SAR operations in Nunavut that are tailored to the territory's unique context.

Basing Federal Air Assets in the Canadian Arctic

The solution to many of the challenges facing Nunavut's community-based SAR organizations is not as straightforward as simply basing or pre-positioning more air assets in the Canadian Arctic. Major-General William

Seymour, Chief of Staff, Operations for Canadian Joint Operations Command, explained in 2018 how the tyranny of distance means that stationing a capability in the central Arctic ultimately leaves SAR responders “no better off” than the current setup, with aircraft based in Winnipeg or Trenton that deploy north depending on the location of the incident. “Statistics bear out that the optimal way to deal with search and rescue in the Arctic is to continue what we are doing,” he noted, given the inability to know in advance when and where a SAR incident will occur (Seymour, 2018). The CAF and the Canadian Coast Guard already pre-position assets in the Arctic during their annual summer deployments, and searches in the Arctic represent a small overall percentage of Canada's SAR requirements (e.g., in 2017, the 46 CAF search and rescue missions in the region represented less than 1% of the total number of CAF SAR operations). Accordingly, the federal government insists that Canada's limited aerial SAR assets remain optimally stationed at southern bases (Mathisen, 2017; Standing Committee on Foreign Affairs and International Development, 2019:82). Further, basing aircraft in the Arctic on a permanent or seasonal basis would be extremely costly, entailing new infrastructure as well as accommodations for crews, maintenance personnel, and their families (Mathisen, 2017). While community responders note that they deal with many SAR cases never reported through the federal SAR system, thus indicating a data gap that may skew overall analysis, project findings suggest that further investment in community-based SAR organizations can leverage current whole-of-society initiatives to improve community resilience in Nunavut, embrace holistic approaches that focus on community strengths, and have broader societal impacts than more resource-intensive options involving pre-positioning federal aerial SAR assets in the region.

Expanding the Garmin inReach Program

In early 2020, NEM launched a new SAR program that addresses some of the training and equipment issues identified by community responders. Integrating feedback from Nunavummiut, NEM worked with Arctic Response Canada to “Nunavutize” the territory's basic and coordinator GSAR courses, focusing on the specific environmental and geographical characteristics of each community and incorporating community-specific Inuit Qaujimajatuqangit. NEM is also working with Nunavummiut to produce a set of “Go Bags” containing necessities that GSAR teams can access during SAR operations to supplement their personal equipment and resources (Kikkert et al., 2020b:25–26).

The new SAR courses include training on how to use Garmin inReach devices, which one community participant extolled as “a SAR game changer.” These devices act as GPS, emergency beacon, and as a two-way communicator, allowing the user to send and receive text messages and emails—a pivotal function during a search. Every message

includes location data, which allows a command post (or friends and family) to monitor a searcher's progress. During searches, GSAR teams are generally separated into pairs, with one responsible for keeping track of the time, regularly checking in with the SAR command post via the text function on the inReach, and using the device to monitor weather reports, while the other focuses on looking for tracks or other signs of the missing person. At the command post, SAR coordinators can use laptops to keep track of where all the teams are operating and where they have searched. If a team wishes, its members can share their link and allow community members to track their search online or via Facebook. Project participants emphasized that the devices improve the safety, coordination, and effectiveness of search and rescue operations.

At the end of basic GSAR training, NEM provides each community team with one inReach device. While the number of GSAR members deployed on searches depends on the community and situation, generally between six and eight searchers are sent out in pairs. Accordingly, a GSAR team would operate most effectively if provided a minimum of four inReach devices (to maximize their impact, units could be provided to community responders who serve in GSAR and the Coast Guard Auxiliary). The purchase of three new units (to combine with the one issued by NEM) for each of Nunavut's 25 communities would cost approximately \$44,500, with the monthly subscription for all devices coming in at \$7995. While this represents a significant cost, such an investment would fit well with the Arctic and Northern Policy Framework promise to improve whole-of-society emergency management and SAR (given the utility of the device in marine disasters, mass rescue operations, and other community emergencies).

Continued Expansion of the CCGA

The recent expansion of the CCGA has also brought a welcome boost to SAR capabilities in the Kitikmeot, providing community responders with a framework to inject their expert local knowledge of the marine environment into the broader national SAR system. The Coast Guard holds annual training meetings in Yellowknife and provides community-based summer training to teach auxiliary members how to coordinate with the JRCC, aircraft, and other ships, as well as safe boat handling, marine first aid, radio communications, search patterns, and CCG operations (Kikkert and Lackenbauer, 2019). In turn, Auxiliary members play an important role as "SAR detectives," gathering information otherwise unavailable to the JRCC, such as the condition of a missing vessel, the skill of its crew, or its potential location, based on Auxiliary members' familiarity with local conditions, marine spaces, and the marine activities of their fellow community members.

Given the difficulties of communities to identify and equip vessels suitable for SAR missions, the Oceans Protection Plan has funded a four-year Indigenous

Community Boat Volunteer Pilot Program to provide either vessels or equipment or both to Auxiliary units. Thus far in the Kitikmeot, Gjoa Haven, Cambridge Bay, and Kugluktuk have received new community SAR vessels, at costs of \$222,187, \$270,311, and \$246,417, respectively. The CCG Arctic Region also has announced plans to hire community engagement coordinators and establish a pool of full-time SAR response officers. Auxiliary unit leaders highlighted how, after years of feeling neglected, the new boats, equipment, and training have made their crews feel empowered to execute marine searches more safely and effectively (information gathered during the 2019 capacity mapping workshops in Cambridge Bay and Kugluktuk).

Conversations with Kitikmeot stakeholders confirm that the Coast Guard should proceed with its plans to expand the Auxiliary, even if funding pressures related to COVID-19 reduce the budget envelope. The plan to outfit and train Nunavut's auxiliary units, while prioritizing the employment of Nunavummiut as full-time SAR response officers and trainers, dovetails with the Oceans Protection Plan and broader Arctic and Northern Policy Framework priorities related to emergency response capabilities and increased employment opportunities.

Streamlining Canadian Ranger Activation

Recent efforts to clarify and streamline the Ranger activation process for short-term searches also should help address community concerns. A Ranger Patrol can contact the commanding officer of ICRPG who can activate up to eight patrol members for 24 hours and cover their pay, fuel, and food. Activating a Ranger Patrol for longer (or for larger SAR operations) still requires a formal request from the local RCMP and NEM, through Joint Task Force (North) in Yellowknife or the JRCC, which formally requests ICRPG assistance. Continued efforts to clarify when and how the Rangers are activated, how their training as Rangers fits with that provided by other SAR organizations, and under what conditions Rangers and their equipment are protected while on searches are important to sustaining trust and building capacity.

Horizontal and Vertical Coordination of Training Efforts

The main responsibility for preparing community-based SAR organizations falls to Nunavut Emergency Management (GSAR), the Canadian Coast Guard (Auxiliary), and the Canadian Armed Forces (Rangers and CASARA). Currently, community stakeholders explained that there is no formal coordination among these groups and that these agencies should seek to synchronize training schedules and share information on local capabilities. For example, if the Rangers bring in an instructor to teach wilderness first aid, an invitation to participate should be extended to the GSAR team and CCGA. If Coast Guard trainers are running an exercise with a community's auxiliary unit, they could invite the Ranger Patrol and

GSAR team to participate in a joint exercise (Kikkert et al., 2020b:47). Sharing training schedules between territorial and federal agencies is a straightforward solution to leverage existing community-based capabilities, realize cost savings, and improve efficiencies.

Whole-of-Society Preventative SAR

To reduce the strain on community-based SAR organizations, greater investment in preventative measures should focus on whole-of-society SAR education and technological solutions. To promote a whole-of-society approach to prevention, SAR organizations should continue to provide consistent messaging about preparedness to the rest of their communities. One Kitikmeot roundtable participant noted:

It's all about persistence. We have to keep on telling people every chance we get, on Facebook [and] on the community radio.

(Kikkert et al., 2020b:45)

George Angohiatok, a long-serving member of Cambridge Bay GSAR, noted:

Everyone needs to know how to read a trail, how to identify what type of machine is used. This will let them know who has been lost. Everyone needs to pay attention, needs to learn how friends act on the land... We need to educate the community, this will deal with the problem before it becomes a problem.

(Kikkert et al., 2020b:46)

Kugluktuk's Roger Hitkolok emphasized the importance of teaching people what to take with them in their emergency kits, how to remain calm on the land, and what to do if they run into trouble. Community-based SAR organizations should deliver these messages using social media, at community events, at fundraising bingos, and during community training days. If these activities become too onerous for volunteers to lead, an alternative delivery model could have Ranger patrols engage in preventative activities as part of their official paid duties.

While Kitikmeot SAR Project participants suggested that community responders could increase their outreach efforts at community events, they also recommended that on-the-land survival skills should be part of the secondary school curriculum. One participant noted that he had completed a survival skills course in high school during the 1980s, but that this was no longer an option in the curriculum. Community members with land skills represent a core community strength, and participants suggested that a land-based course should be developed specifically to impart traditional knowledge and survival skills, teach navigation, and develop SAR capabilities. These suggestions resonate with recent calls by Inuit leaders for a decolonized educational system emphasizing

Inuit Qaujijamajatuqangit and land-based education (Obed, 2017; Kaluraq, 2019). The focus on traditional skill and knowledge development also fits with recent research highlighting the adaptive capacity of traditional ecological knowledge, which can foster adaptation to changing conditions, hazard avoidance, and emergency preparedness (e.g., Ford and Pearce, 2012; Pearce et al., 2015).

Participants also recommended that the territorial and federal governments should invest in innovative technological solutions to reduce travel risks. For example, SmartICE (2020) provides community members with the situational awareness required to plan for safe on-ice travel and boating routes. One participant highlighted how "everyone has a cell phone in the communities," and erecting repeater towers to expand cell service to cover "the most common routes or hunting areas" would bolster community safety (Kikkert et al., 2020b:49–50). Although these preventative technologies may require significant short-term investment, participants emphasized that they should reduce the burden on the SAR system and build individual and collective confidence when heading out on the land (e.g., Clark et al., 2016).

A SAR Equipment Usage Rate (EUR)

Community responders rank concerns about equipment usage and lack of volunteers as amongst the highest challenges that they face. Some roundtable participants proposed that the territorial or federal government should provide essential equipment and financial incentives to entice more recruits. While significant Coast Guard investment in new boats for Auxiliary units bolsters local capacity, GSAR teams have received no comparable investments in equipment (Kikkert et al., 2020a:6). Some participants suggested that two snowmobiles and two ATVs should be issued to each GSAR team for searches, while other participants insisted that they would never trust an untested, random snow machine or ATV selected and maintained by government to mount a search. They trust their own personally maintained equipment. Furthermore, participants worried that using financial incentives to recruit more volunteers could undermine the basis of the entire SAR system and other volunteer-based organizations in the North (including firefighters).

The Canadian Rangers model might be used to address equipment challenges and to incentivize volunteers. During training and official taskings, the military compensates Rangers according to a fixed EUR when they use their own small-engine equipment (such as ice augers, chain saws, generators, and welding machines) and vehicles (including snow machines, ATVs, dog teams, and boats). This arrangement encourages Rangers to invest in their own equipment and tools appropriate to their local environment, which they can then use in their everyday lives without having to ask the government for permission. In so doing, the EUR model represents a fair way of reimbursing Rangers for using their tools in military activities and

makes a material contribution to local capacity building. Furthermore, it means that the military does not have to assume an unnecessarily high sustainment burden when it comes to maintaining equipment dispersed across 64 communities in the Territorial North (Lackenbauer and Kikkert, 2020:48–50, 118–122).

Funded by the federal government through Public Safety Canada, people using their personal equipment during authorized SAR training, exercises, and operations could receive compensation according to a SAR EUR. Such a program would recognize the wear and tear on personal equipment used by SAR volunteers to serve the public good, and community responders could use these funds to ensure that their equipment is ready to use at a moment's notice—a better solution than having NEM-owned machinery sitting in a sea container waiting for the next search.

Although a SAR EUR for volunteers represents a significant departure from how SAR operations are conducted in southern Canada, it represents a distinct solution suited to the unique context of Nunavut communities. Individuals involved in SAR rely on their equipment for their occupations, food security, and culture. Consequently, the strain that repeated SAR operations has on their gear and machines directly affects their broader lives. Nunavummiut involved in SAR are the experts on their environment and the equipment that they need to operate in it safely. They are well situated to decide how they should invest EUR reimbursements to heighten their effectiveness. Accordingly, a SAR EUR model represents an equitable and innovative approach to supporting and bolstering community resilience.

A Community Public Safety Officer Program

While a SAR EUR model may bring dependable equipment and more volunteers, it will not address coordination and cooperation issues, administrative burdens, and leadership burnout facing community SAR groups. Reflecting on how to improve capabilities during the Kitikmeot Roundtable, one community participant explained:

SAR cases are increasing. SAR is an essential service at the community-level; we need it for health and community safety. There are multiple community groups involved in SAR; it is tough to coordinate between all of them. We should have a paid coordinator in each community who is the full-time point of contact for all things SAR. This person could organize the searchers, train community members, ensure there is cooperation and coordination between the different groups, check equipment, and ensure that a community is always ready for SAR. This person could keep track of who has what training in the community. They could arrange the fundraising. This could be a full- or part-time job, but it should be paid work. I think it would be a great investment in our communities.

(Kikkert et al., 2020b:49)

Having a full-time SAR coordinator position in each community might be a difficult sell to government agencies, particularly when some communities conduct only a few searches each year. Through the development of a Community Public Safety Officer (CPSO) program in Nunavut, communities could be provided with personnel to act as SAR coordinators while carrying out other public safety and emergency management duties as well. A CPSO program would provide a platform through which to mobilize the existing strengths in a community, while providing the space for the development of new capabilities.

The Alaska Village Public Safety Officer (VPSO) program offers a possible model. In 1979, the state public safety department developed the program “to provide for development of a locally responsive public safety program reflecting traditional and emerging strategies” while increasing “local control and self-determination” (Hippler, 1982:2). Almost immediately, it yielded positive outcomes in advancing marine safety, effective SAR operations, and fire prevention and emergency medical assistance (Hippler, 1982:4-6). While the program has faced criticism related to its policing mandate, inadequate funding, and limited support (Joint House and Senate VPSO Working Group, 2020), VPSOs work with SAR coordinators and team leaders to organize community efforts, including training opportunities and prevention activities, and coordinate with outside agencies during searches. They also serve as a point of contact for community members who wish to share their travel itineraries and schedules (Alaska State Senators, pers. comm. 2019). The VPSO program has attracted the attention of Canadian First Nations, and the Kwanlin Dün First Nation and Selkirk First Nation recently launched a similar program in Yukon. Unarmed Community Safety Officers patrol their communities, mediate disputes between citizens, and act as intermediaries between the RCMP and citizens (Kwanlin Dün First Nation, 2020).

Kitikmeot SAR Project participants (pers. comm. 15 February 2021) suggest that the duties of Community Public Safety Officers in Nunavut, which must be determined in consultation with Nunavummiut, could focus exclusively on SAR (prevention, preparedness, response, and after-action activities), marine safety, emergency preparedness, and fire prevention. The officers also could lead a community's whole-of-society preventative SAR program, organize and lead community education and training events, support the schools in their efforts to offer land-based programming to foster survival skills, and work directly with people going out on the land to ensure their preparedness. The CPSO could ensure that each community organization has clear plans and protocols for what to do before, during, and after a search, and identify clearly defined roles for each member (e.g., buying food, checking the weather, preparing a komatik, getting information from the missing person's family). The CPSO could also create and update SAR resource sheets that contain the contact information of SAR committees, GSAR teams, Auxiliary members, and all relevant territorial and federal organizations, along with

information on available SAR resources in a community and private industry assets. Resource sheets would list all of the skills, training, equipment, and competencies possessed by community responders and be distributed to territorial and federal agencies. With support from NEM and interested federal agencies, the CPSO could organize regular training, meetings, and exercises between community groups and other governmental agencies to facilitate cooperation and coordination. Through all SAR activities, the CPSO would be a central point of contact between the community and outside agencies, facilitating essential relationship building. To ensure continuous readiness to conduct a search, the CPSO should also manage a sea container stocked with essential supplies and fuel. Finally, CPSOs could work with community-based SAR organizations to ensure they maintain their good standing with the Territory's Registrar of Societies, organize fundraising activities, and assist with paperwork.

During SAR operations, the CPSO would work to secure tasking numbers, ensure distribution of fuel and essential supplies, and act as a liaison between the community, NEM, and the Joint Rescue Coordination Centre. With advanced training, a CPSO would be able to organize and coordinate the search and manage the community command post. Working with the hamlet office, the CPSO could keep track of responder reimbursements, compensation for damaged vehicles, and, if implemented, gather the required information for the distribution of the SAR EUR.

The CPSO should also be responsible for the collection of best practices and lessons learned related to SAR both in the community and in collaboration with regional colleagues across Nunavut. During the Kitikmeot Roundtable on SAR, one participant explained that, "When we have taken the time to talk [collectively] about searches, and how they have gone, we've learned a lot" (Kikkert et al., 2020b:43). Discussing challenges and solutions after a search can identify lessons to improve better practices. Accordingly, the CPSO should be trained to effectively analyze searches: Where did it occur? What challenges were encountered? Solutions? How can the system operate better? They should be provided with a small budget for after action activities, including sharing circles led by elders to allow for debriefing, sharing of observations by team members, and critical incident stress management. Modest funding should also be provided to convene community meetings after each search to explain what happened, disseminate lessons learned, and undertake preventative SAR measures. These sharing circles and community meetings would improve practice within communities and would represent a form of relevant Inuit Nunangat research and analysis that is conducted by and for Inuit (ITK, 2018).

Reconceptualizing Community-Based SAR Capabilities

New programs in preventative SAR, a SAR EUR, and the establishment of a Community Public Safety Officer program will require sustained funding and government

support. Kitikmeot SAR Project participants noted that this kind of systemic reform requires southern Canadian policymakers to reconceptualize northern SAR, understand unique regional challenges, and fund community-based capabilities accordingly.

At the conclusion of the Kitikmeot Roundtable, a trio of community practitioners with decades of experience reflected on why SAR was so important to their communities. Effective capabilities allowed Nunavummiut to respond to life and death situations on the land—to save their neighbours, friends, and family members. Furthermore, it remained essential for Nunavummiut to go out on the land to be "healthy and whole," hunting and fishing to feed their families and travelling safely between communities over the ice, land, and water. They must be able to engage in economic activities that require extensive time on the land, such as commercial fisheries and professional guiding. As one community responder explained:

For all of this to be possible, you need SAR. You need people who know how to go out on searches. You need people who are willing to go out on searches. Because with all the changes going on, even the best-prepared people could have an accident and could need help.

(Kikkert et al., 2020b:58–59)

The health of Nunavummiut is tied to the land, and community SAR responders provide essential support to maintain this connection. In short, participants described SAR as an essential building block of the physical and cultural health and well-being of Nunavummiut, of the territory's economy, and of the overall resilience of their communities.

An effective SAR system supports territorial, federal, and Inuit priorities for Nunavut. Canada's Arctic and Northern Policy Framework (ANPF), which was created through a whole-of-government, co-development process involving Ottawa, the three territorial governments, over 25 Indigenous organizations, as well as three provincial governments, explicitly connects SAR to the rapid environmental change in the North. It prioritizes "Search and Rescue reaction and responsiveness to emergencies for Arctic residents and visitors" (CIRNAC, 2019a) and the strengthening of the region's whole-of-society emergency management capabilities. SAR requirements also should be considered in any policies involving people moving and working on the land. For example, the ANPF identifies harvester-support grants and community-led food production projects, tourism, commercial fisheries, conservation, and land-based cultural industries as areas for economic growth and diversification that also "reinforce Indigenous connections with wildlife and the land" (CIRNAC, 2019a). These activities require a strong community-based SAR safety net. As one roundtable participant observed, programs designed to get people on the land and to support hunters are essential, but they all

depend on SAR. “We need programs to ... build our SAR teams” to implement other land-based social and economic programs safely, he emphasized (Kikkert et al., 2020b:59).

Nunavummiut also highlighted the value of community SAR organizations in the transfer of Inuit Qaujimagatuqangit and in skill development more generally. Participation in GSAR teams, Auxiliary units, and Ranger Patrols facilitates intergenerational knowledge exchange through training and collective responses on the land. Kitikmeot’s SAR organizations regularly pair a new member with an elder or an experienced searcher so that the latter can teach the former. As new members gain experience, they can pass along their acquired knowledge to other recruits. Participation in these groups also provides opportunities for training and skill development that can be used to build resumes for potential wage employment—first aid and wilderness first aid, for example, are valuable transferable skills.

Community SAR organizations also exercise Canada’s Arctic sovereignty. When academics and government officials discuss the link between SAR and sovereignty, they typically focus on Canada’s responsibilities pursuant to the 2011 Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic (Arctic Council, 2011) or the Arctic Coast Guard Forum. Inuit leaders, however, emphasize that “sovereignty begins at home,” with communities empowered to protect their people, lands, and rights in the spirit of self-determination (Simon, 2009:250). SAR capabilities are central to this empowerment. “I strongly believe that the federal government’s goal of asserting arctic sovereignty needs to be backed up with enhanced support to organizations in the north that are active in the area of search and rescue,” Baker Lake MLA Simeon Mikkungwak asserted in 2014. He argued that Ottawa must provide more “support for search and rescue activities, equipment, and infrastructure” (Legislative Assembly of Nunavut, 12 March 2014:230). The ANPF has embraced similar ideas by situating northern communities at the heart of safety and security in the region and linking sovereignty to “strong, self-reliant people and communities working together” (CIRNAC, 2019b).

CONCLUSION

The ANPF describes the Canadian North as “an important crossroad where issues of climate change, international trade and global security meet.” Changing environmental conditions generating heightened outside interest and activity in the region in terms of shipping routes, natural resources, and increased commercial activity and tourism also give rise to concomitant safety and security challenges that place additional stress on search and rescue and disaster response capacities. “To ensure that the Canadian Arctic and North and its people are safe, secure and well defended,” the policy framework emphasizes Canada’s commitment to strengthening search

and rescue capabilities in the Arctic (CIRNAC, 2019b). The Kitikmeot SAR Project reinforces the importance of a holistic community-centred approach to enhance capabilities, coordinate efforts, and bolster capacity, and the importance of working with community expert stakeholders to identify and propose practical solutions. Although academic and think-tank literature on Arctic SAR has identified myriad challenges facing community-based SAR organizations, proposed solutions—which often take the form of general calls for more training, equipment, and coordination, or for large-scale, material items rather than a comprehensive suite of specific proposals—have not translated into policy action.

To address the longstanding challenges facing Nunavut’s community-based SAR organizations, the findings from this project encourage initiatives that recognize and enhance existing strengths in communities. One set of recommendations involves strengthening current programming, including the expansion of NEM’s inReach program, continued support for the enlargement of the CCGA and clarification of its mission and mandate, streamlining and improving awareness of the process to activate Canadian Ranger Patrols, and encouraging greater cooperation in the provision of training by federal and territorial agencies. The other set of recommendations propose new approaches, including a whole-of-society preventative SAR program centred on educational and youth programming, the adoption of a SAR EUR model, and the launch of a Community Public Safety Officer program in Nunavut.

While these policy and programming ideas are proposed with Nunavut in mind, we anticipate that they will also apply to other regions in Inuit Nunangat. Inuit have been consistent and clear in their desire for capacity building in the areas of SAR and emergency management. The Inuit Circumpolar Council, in its 2019 written submission to the Special Senate Committee on the Arctic, asserted that “Inuit are always the first to respond to an emergency, and in doing so with limited training and resources they risk their own safety and security” (ICC, 2019:5). Accordingly, it urged the federal government “to enhance search and rescue and emergency protection infrastructure and training in Inuit communities” (ICC, 2019:11). The Inuit Tapiriit Kanatami partner chapter to the ANPF insists that “Inuit are the stewards of the land, and given appropriate infrastructure, will continue as the principal players and first responders in Canada’s Arctic sovereignty and security” (ITK, 2019). These priorities match the ANPF’s promise to improve whole-of-society emergency management and SAR capabilities throughout the North.

The Kitikmeot SAR Project has provided a potential roadmap for progress on these objectives. Framed in partnership with SAR experts in the Kitikmeot and guided by suggestions made by Nunavummiut during community-based consultations and a regional roundtable, our findings reflect a “by Northerners, for Northerners” approach in which we, as academics, have played supporting roles.

In highlighting Kitikmeot voices, this article reinforces the importance of engaging local people and resources in building capacity to address public safety needs, improving organizational linkages, and embracing a strengths-based approach to Arctic resilience. For example, rather than focusing on the costly basing of military aircraft in a central Canadian Arctic location (which military analysts suggest will not inherently improve response times across this vast area and will bring limited economic benefits to Nunavummiut), we propose cost-effective, community-based SAR options that directly contribute to community health and well-being, promote “safety on the land and sea” (Simon, 2017), and build resilience. Although the implementation of some proposed initiatives (such as a SAR EUR model and a CPSO program in Nunavut) require additional funding and governance models, they fit with federal, territorial, and Indigenous government priorities that encompass not only public safety but economic development, community well-being, and local capacity building more broadly.

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