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ARCTIC SEARCH AND RESCUE: A BILATERAL CONPLAN FOR THE HIGH ARCTIC

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JCSP 45

Exercise Solo Flight

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CANADIAN FORCES COLLEGE – COLLÈGE DES FORCES CANADIENNES

JCSP 45 – PCEMI 45
MAY 2019 – MAI 2019EXERCISE *SOLO FLIGHT* – EXERCICE *SOLO FLIGHT***ARCTIC SEARCH AND RESCUE: A BILATERAL CONPLAN FOR THE HIGH ARCTIC**

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Introduction

In 2011, Canada and the seven other Arctic states signed a landmark treaty entitled *The Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic* (Arctic SAR Agreement). The agreement bound the states together with the mutual objective to ensure the aid and assistance to persons in distress by dividing the world's Arctic into search and rescue regions (SRR) with a region assigned to each of the Arctic states.¹ The Canadian SRR encompasses a vast area including all Canadian territory from 60 degrees of northern latitude to the north pole, including the Canadian Arctic Archipelago and a vast maritime area of the Arctic Ocean.

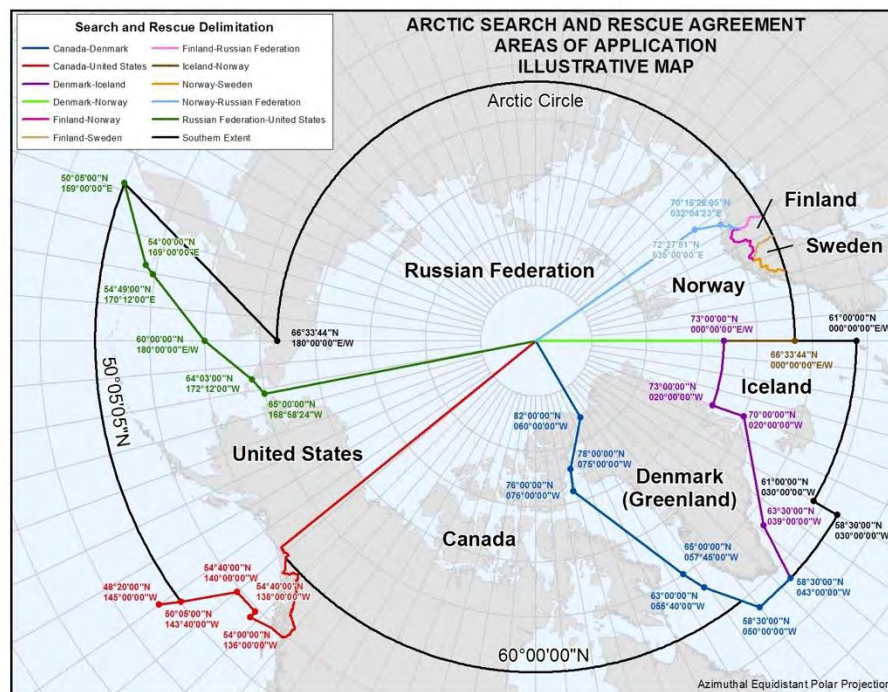


Figure 1 – Arctic Search and Rescue Regions.

Source: Arctic Portal, Arctic Search and Rescue Agreement

¹ Arctic Council. 2011. "Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic." Nuuk: Arctic Council, 05 12; Note: The Arctic States are Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the United States of America.

Search and rescue (SAR) in the Canadian Arctic is an ongoing challenge due to many unique characteristics of the region. Factors such as extreme environmental conditions, the lack of support infrastructure (maritime or aviation) and vast distances add to the complexity of operations in the region. These complexities are exacerbated in the Arctic Archipelago due to the imposing geography and increasingly harsh conditions. The result is a large region in the high Arctic, west (and north) of the Arctic Archipelago (HAWAA), in which a consistent and reliable SAR response is not possible within the capabilities of the current National Search and Rescue Program (NSP).² In this regard, Canada is not meeting the obligations of the Arctic SAR Agreement by failing to provide an “adequate and effective search and rescue capability” throughout the entire SRR.³

This paper will demonstrate that the most suitable option available to close the SAR capability gap in the HAWAA is with a bilateral CONPLAN with the US through the Alaskan SAR organizations. This argument will be presented in four sections. The first section will present a background on the unique Arctic operating environment and the identified SAR capability gap within the NSP. The next section will examine the international SAR policy framework and the established convention of international SAR cooperation. The following section will examine the US SAR organization, specifically the Alaskan SAR policies and capabilities, and the reasoning for a bilateral CONPLAN for the HAWAA. Finally, the last section will assess alternatives to address the capability gap including procurement options, a civil contract, Canadian Coast Guard (CCG) strategy and capability development.

² Mann, Dennis. 2019. "Canadian Search and Rescue in the Western High Arctic: A Capability Analysis ." *DS501 Modern Joint Air Campaigns*. 03 03; Note: This author wrote the referenced paper for a previous course at the Joint Command and Staff College;

³ Arctic Council. 2011. "Agreement on Cooperation...". *Article 3.3*.

The High Arctic and the SAR Capability Gap

The Canadian high Arctic is a harsh environment characterized by extreme weather and temperature, lack of daylight, vast distances and sparse infrastructure. Two features dominate the high Arctic portion of the Canadian SRR: The Arctic Archipelago and the Arctic Ocean. The geography of the Arctic Archipelago is characterized by 94 major islands and 36,469 minor islands with mountainous regions reaching over 8000 feet in elevation on northern Elsmere Island.⁴ This geography severely confines movement over any significant distance to aircraft or ships capable of operating in the Arctic environment. Within this region there are only a few locations with adequate infrastructure to support maritime or aviation operations, significantly limiting SAR operations in the high Arctic.

The HAWAA, shown below in Figure 2, is a predominantly sea-ice covered maritime region of the northern Arctic Ocean.⁵ It is essentially the entire western and northern portion of the Canadian Arctic SRR above 75 degrees of northern latitude.⁶ More specifically, it is the area bounded from (approximately) 75 degrees of northern latitude to the north pole, and between 140 degrees of western longitude eastward to a line approximately 150 nautical miles (NM) west of the Arctic Archipelago shoreline. As the only options for SAR in the HAWAA are maritime or aeronautical assets then the

⁴ Peter Adams, Maxwell J. Dunbar. 2015. *The Arctic Archipelago*. 10 26. Accessed 03 04, 2019. <https://www.thecanadianencyclopedia.ca/en/article/arctic-archipelago>.

⁵ National Snow and Ice Data Center. 2012. *Arctic sea ice extent settles at record seasonal minimum*. 09 19. Accessed 05 05, 2019. <http://nsidc.org/arcticseaicenews/2012/09/arctic-sea-ice-extent-settles-at-record-seasonal-minimum/>.

⁶ Mann, Dennis. 2019. "Canadian Search and Rescue in the Western High Arctic...".

federal agencies of the NSP, namely the Canadian Armed Forces (CAF) and the Canadian Coast Guard (CCG) are responsible for a SAR response in this region.⁷

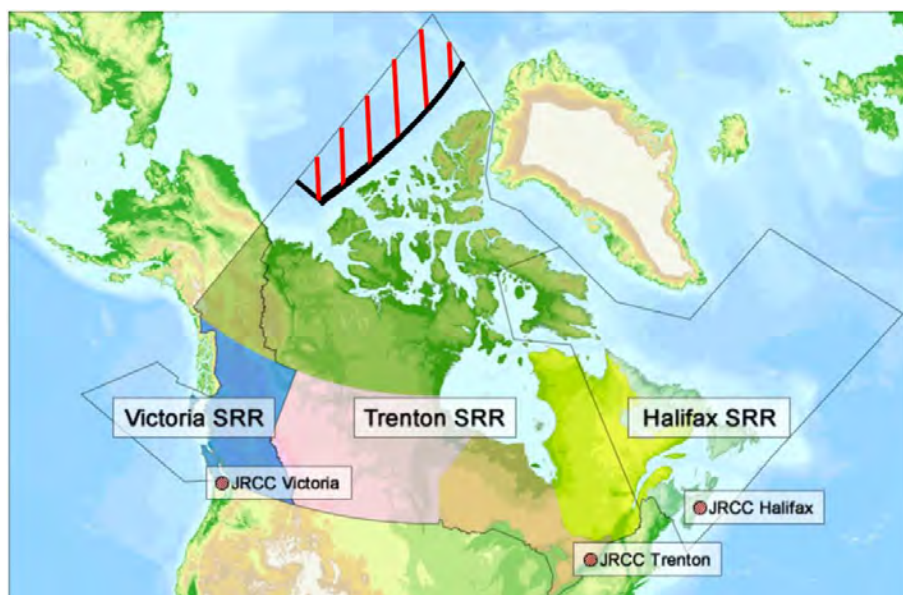


Figure 2 – Western High Arctic area of the Canadian SRR

Source: National Defence and the Canadian Armed Forces, *About Search and Rescue*

The key limiting factors for a reliable maritime SAR capability in the HAWAA are the CCG ice-breaker employment strategy, the persistence of year-round sea ice, and the vast distances and response times. The CCG generally operates their icebreakers in the Arctic only during the summer months (they are employed in the south on the Atlantic and Pacific coasts during the winter), so their ability to respond to a HAWAA SAR incident in the winter is not reliable. The vast distances to respond into the HAWAA from either coast, especially with sea ice limitations makes this option infeasible. Therefore, aside from an optimally placed CCG ice-breaker, a SAR capable aircraft would be the primary asset for an Arctic SAR incident for much of the year.

⁷ Public Safety Canada. 2017. *National Search and Rescue Program*. 09 27. Accessed 03 04, 2019. <https://www.publicsafety.gc.ca/cnt/mrgnc-mngmnt/rspndng-mrgnc-vnts/nss/prgrm-en.aspx>.

The critical limitation on the CAF's aeronautical SAR capability is the ability to conduct a rescue from the HAWAA. The fixed-wing SAR aircraft, the CC-130 Hercules aircraft, has sufficient range and austere landing capability to effectively operate and search across the entire SRR. The capability gap is within the ability to reach the entire HAWAA and land or hover in order to conduct a rescue. The limitation is that even operating out of Eureka, NV, an austere landing strip which is the closest to the majority of the HAWAA, it is still approximately 540NM to the western edge of the SRR, requiring a 1100NM minimum range.⁸ Unfortunately, there is no aircraft in the RCAF inventory capable of transiting that range which can conduct a landing on the ice pack or hover, possibly at night in Arctic conditions.⁹

There are several reasons that this capability gap should be addressed, first and foremost because incidents happen in the HAWAA. While the number of incidents is significantly lower than in other areas, there were fifteen incidents in the HAWAA from 2006 to 2011.¹⁰ This capability gap may be considered a failure in Canada's obligations under the Arctic SAR agreement to establish an "adequate and effective search and rescue capability."¹¹ Further to this, *Strong, Secure, Engaged: Canada's Defence Policy* (SSE) states that two of the core missions of the CAF is to "conduct search and rescue" and to "respon[d] to Intl and Domestic Disasters/Major Emergencies" with "...decisive military capability...".¹² This gap raises the concern that if a dedicated SAR function

⁸ Google Earth. 2019. *Google Earth*. 04 06. Accessed 04 06, 2019. <https://earth.google.com/web/@80.18576591,-112.19293361,-397.87963927a,3011076.87546283d,35y,351.99238041h,0t,0r>.

⁹ Mann, Dennis. 2019. "Canadian Search and Rescue in the Western High Arctic..."

¹⁰ Major Jay Nelles (on Behalf of Major K. Grieve). 2012. *CF Overview of SAR in Canada Airline Post Brief*. Canada Command, 01 31.

¹¹ Arctic Council. 2011. "Agreement on Cooperation...". Article 3.3

¹² Minister of National Defence. 2017. *Strong Secure Engaged: Canada's Defence Policy*. Defence Policy, National Defence, Government of Canada, Minister of National Defence. pg 81

cannot be reliably conducted how would Canada respond to other emergencies or disasters in the HAWAA like a major air disaster (MAJAJD). This is concerning as many international flights cross the Arctic SRR, some directly through the HAWAA. Other incidents in the region could include major maritime disasters, environmental disasters or international emergencies enter the Canadian SRR. For these reasons, Canada must pursue options to close the SAR capability gap in the HAWAA with the consideration that "...policy proposals must be weighed in consideration with other spending priorities and threats."¹³ With this in consideration, the next section will examine the existing SAR policy framework surrounding bilateral arrangement.

The Search and Rescue Policy Framework

The international policy framework for search and rescue includes several organizations and conventions dating back as far as 1914 to the International Convention for the Safety of Life at Sea.¹⁴ Since then, groups such as the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO), both of which Canada is a member, have furthered the goals of international search and rescue through conventions and international SAR agreements.¹⁵ In 1944, the *Convention on International Civil Aviation* (Chicago Convention) established, under Article 25, the obligation to "provide measures of assistance to aircraft in distress" within a member

¹³ Matthew Carnaghan, Allison Goody. 2006. *Canadian Arctic Sovereignty*. Political and Social Affairs, Ottawa: Library of Parliament.

¹⁴ IMO. 1914. "History of SOLAS (The International Convention for the Safety of Life at Sea)." *International Maritime Organization*. 01 20. Accessed 04 23, 2019. <http://www.archive.org/stream/textofconvention00inte#page/n5/mode/1up/search/1914>.

¹⁵ National Defence, Fisheries and Oceans Canada. 2014. "CAMSAR." *Canadian Aeronautical and Maritime Search and Rescue Manual*. Issued under the Authority of the Chief of Defence Staff and the Commissioner Canadian Coast Guard, 09 30.Ch 5.01

nations territory.¹⁶ Additionally, in the case of an aircraft in distress that was registered in another state, this article provided a basis for bilateral SAR cooperation by setting the conditions for cross border SAR activities.¹⁷

In 1979, the *International Convention on Maritime Search and Rescue* (SAR Convention) established the first international system specifically covering search and rescue operations. The landmark convention established the foundation for an international search and rescue plan, a requirement for an “adequate SAR services in [their] coastal waters” and the basis for international SAR cooperation.¹⁸ While the context of the convention was within a maritime environment, the intention was the improved collaboration with neighbouring states to aid those in distress.

The value of international SAR cooperation was reinforced in 1982 in the *United Nations Convention on the Law of the Sea* (UNCLOS). Specifically, *Article 98: Duty to Render Assistance* of the UNCLOS formalized the obligation to establish an “adequate and effective search and rescue service” and “where circumstances so require, by way of mutual regional arrangements cooperate with neighbouring States for this purpose.”¹⁹

In 2011, in recognition of the increased presence in the Arctic, the harsh environmental conditions and the importance of cooperation in SAR operations, the eight Arctic states entered into the *Agreement on Cooperation on Aeronautical and Maritime*

¹⁶ International Civil Aviation Organization. 1944. "International Civil Aviation Organization." *Convention on International Civil Aviation*. 12 07. Accessed 04 24, 2019. https://www.icao.int/publications/documents/7300_orig.pdf. Article 25

¹⁷ Ibid.

¹⁸ International Maritime Organization. 27 . "The SAR Convention." *International Maritime Organization*. 04 1979. Accessed 04 2019, 24. <http://www.imo.org/en/OurWork/Safety/RadioCommunicationsAndSearchAndRescue/SearchAndRescue/Pages/SARConvention.aspx>.

¹⁹ United Nations. 1982. "United Nations Convention on the Law of the Sea." *Oceans and the Law of the Sea*. 12 10. Accessed 04 24, 2019. https://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf. Article 98

Search and Rescue in the Arctic (Arctic SAR Agreement).²⁰ The Arctic states include Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the USA, and the agreement detailed the delimitation of the Arctic search and rescue regions (SRR) of each state. This agreement ensured total Arctic SAR coverage while reinforcing the importance of urgent response and cooperation.²¹

Between the Chicago and SAR conventions, the UNCLOS and the Arctic SAR Agreement, a robust international SAR framework had been developed based on the concepts of state responsibility and interstate cooperation. Building on this, the IMO and the ICAO developed and jointly released the *International Aeronautical and Maritime Search and Rescue* (IAMSAR) Manual, considered the capstone implementation guidance for SAR operations. The stated tenants of the IAMSAR Manual is “to foster cooperation between themselves, between neighbouring States, and between aeronautical and maritime authorities... and to ensure that persons in distress will be assisted without regard to their locations, nationality, or circumstances.”²² Additionally, international standardization of SAR procedures facilitates better national SAR programs through the implementation of industry best practices and improves bilateral and multilateral interoperability through standard operating procedures. From this common source, national and regional SAR manuals have been developed such as the Canadian Aeronautical and Maritime Search and Rescue (CAMSAR) Manual.

²⁰ Arctic Council. 2011. "Agreement on Cooperation..."

²¹ Ibid. Article 7,3(b), 7,3(d)

²² IMO/ICAO. 2003. "International Aeronautical and Maritime Search and Rescue Manual." London/Montreal: Jointly by the International Maritime Organization and the International Civil Aviation Organization. 1.1.3.

The CAMSAR Manual provides standardized guidance for the federal component of the Canadian National Search and Rescue Program (NSP), specifically the federal aeronautical and maritime SAR component. Of note, there is a section detailing “SAR agreements with neighbouring states” and lists a national level memorandum of understanding (MOU) between Canada, the USA and the UK for cooperation among SAR agencies.²³ Under this MOU, operational level MOUs and standard operating procedures exist among the participants detailing specific procedures and coordination instructions, which permit direct coordination between participant regional coordination centres (RCC).²⁴

The existing framework for SAR cooperation and a bilateral agreement with the USA is robust and well-established down to the operational level MOUs. With this framework established, an operational level bilateral CONPLAN for a SAR response within the HAWAA can be examined.

CONPLAN HAWAA

This section will focus on a CAN/US CONPLAN for the HAWAA region. This CONPLAN does not preclude consideration of a multilateral response, but as the HAWAA region is bounded within the Canadian SRR and bordered by the US SRR, a pre-planned bilateral response is the logical escalation within this region if Canadian assets are insufficient to respond. As previously stated in the section describing the capability gap, both Canada and the US can reach the entire CAN and US SRRs and

²³ National Defence, Fisheries and Oceans Canada. 2014. "CAMSAR." *Canadian Aeronautical and Maritime Search and Rescue Manual*. Issued under the Authority of the Chief of Defence Staff and the Commissioner Canadian Coast Guard, 09 30.Ch 5.01. Ch.5.01.4;

²⁴ US Department of Homeland Security, Public Safety Canada. 2012. "Compendium of U.S. - Canada Emergency Management Assistance Mechanisms." *Public Safety Canada*. 06. Accessed 04 24, 2019. <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/cmpndm-ntdstts-cnd-archvd/cmpndm-ntdstts-cnd-eng.pdf>. Pg 8-9;

conduct search activities. The capability necessary to identify is that required for rescue, that is, the vertical take-off and landing (VTOL) ability from the maritime or pack ice environment with a suitable passenger/casualty capacity and an adequate medical capability.

An examination of a bilateral CONPLAN in the HAWAA between CAN/US requires an understanding of the existing Arctic SAR organization within the greater US SAR system. The SAR coordination and assets used for US Arctic SAR based in Alaska. There are some capabilities at Thule Air Base (AB) in Greenland which could prove useful in a HAWAA SAR, specifically a 10,000 ft paved runway and the existing infrastructure for basing Arctic aviation operations. Additionally, Thule AB is closer to much of the HAWAA region than Alaska. However, Thule AB is primarily operated in a transient support role and does not have any permanently stationed US aircraft. The only permanently stationed aircraft is a Greenlandic helicopter operated by the Greenland Home Rule/Port Authority.²⁵ For this reason, a bilateral CONPLAN would best be established with the Alaskan SAR organizations.

The *National Search and Rescue Plan of the United States* (NSP-US) designates two federal SAR coordinators, the USCG and the United States Northern Command (USNOTRHCOCOM). In practice, the USAF is tasked with the coordination of all military and civil aeronautical SAR within the continental US and Alaska region, while the USCG coordinates the maritime and civil aeronautical SAR outside of the continental US and

²⁵ Thule Air Base. 2017. "WELCOME TO THULE "THE TOP OF THE WORLD." *Peterson Air Force Base*. 06 06. Accessed 05 04, 2019. <https://www.peterson.af.mil/Portals/15/documents/Units/THULE-Welcome%20Package%202017.pdf?ver=2017-06-06-095031-607>.

Alaskan region.²⁶ However, while this appears to be a clear delineation of responsibilities, the execution of SAR in the Arctic SRR requires a fluid and cooperative effort.

The Arctic SRR north of Alaska is a maritime environment, and consistent with the stated task of maritime and civil aeronautical SAR outside of the continental US and Alaskan region, the USCG is designated as the competent authority for the US in the Arctic SAR Agreement. It is worth noting that the agreement lists both the USCG and the US Department of Defence as SAR agencies, indicating an understanding that cooperation between these agencies is required to execute the SAR responsibilities in this region.²⁷ This distinction is a prudent consideration given the harsh Arctic environment, vast distances and limited SAR resources capable of operating across the region. Even with an ice breaker and organic helicopter capability, it is unlikely the USCG could execute this task in unilaterally. Only a medium or heavy icebreaker, such as the USCGC Healy, could manage limited year-round operations. Even if the USCGS Healy was positioned in the bearing sea, it could still take upward of two weeks to respond to the northern reaches of the US and Canadian SRRs given a 3-knot speed estimate through the pack ice.²⁸ Even with a ship-based MH-65 helicopter, with a response radius of 145NM, capable of shortening a response time by almost 48 hours, the trudging pace through the ice is still far from ideal.²⁹

²⁶ Deputy Commandant for Operations, United States Coast Guard. 2016. "National Search and Rescue Plan of the United States." *United States Coast Guard*. Accessed 05 01, 2019. https://www.dco.uscg.mil/Portals/9/CG-5R/manuals/National_SAR_Plan_2016.pdf. Para 15.a,b.

²⁷ Arctic Council. 2011. "Agreement on Cooperation...". Appendix II

²⁸ Smith, Timothy William James. 2017. "Search and Rescue in the Arctic ..." pg 57

²⁹ Smith, Timothy William James. 2017. "Search and Rescue in the Arctic ..." pg 52

The USCG operates several SAR capable aircraft; however, the primary limiting factor for a rescue capable aircraft is the range. Shown below in Table 1, the maximum range of a VTOL capable aircraft is the MH-60 Jay Hawk, limited to a 300NM response radius from Ship or shore (refuelling point). From this assessment, in the absence of an optimally located ice-capable maritime SAR asset, the USCG would be severely limited in their ability to respond to the northern reaches of the US Arctic SRR and the HAWAA. Therefore, it is necessary to consider longer range aviation assets capable of responding.

Table 1 – The United States Coast Guard Alaskan SAR assets
 Table 4.2: USCG Aviation SAR Assets

Location	Asset	Number	Capacity (litters/ppl)	Response Radius (nm)	Speed (knts)
Kotzebue FOL	MH-60	2	8/19	300	150
Air Station Kodiak	MH-60	2	4/8	200	130
Air Station Kodiak	HC-130	4	12/40	2500	290
Air Station Sitka	MH-60	2	4/12	300	130
USCGC Cutters	MH-65	10	2/4	145	148

Source: Interviews with USCG SMEs

Source: Smith, *Search and Rescue in the Arctic: Is the US Prepared?*

The USNORTHCOM is responsible for SAR coordination within the aeronautical SRR over continental U.S and Alaska.³⁰ The coordination of this task is delegated to the USAF and executed for the Alaskan region by the Air National Guard (AKANG) through the Alaskan Rescue Coordination Center (AKRCC) at Joint Base Elmendorf-Richardson (JBER).³¹ The mandate of the AKRCC is "... to provide 24-hour rescue coordination capability in support of US military and civil aviation search and rescue (SAR) needs in

³⁰ Deputy Commandant for Operations, United States Coast Guard. 2016. "National Search and Rescue Plan of the United States." Para 15.a

³¹ Smith, Timothy William James. 2017. "*Search and Rescue in the Arctic: Is the U.S Prepared?*" Dissertation, Santa Monica: Rand Corporation. Pg 3

the Alaska search and rescue region (SRR).”³² However, despite the USAF coordination of the AKRCC, the RCC does not own forces and must request available SAR assets.³³ There are many aeronautical SAR assets available in the Alaskan region including civil air patrol, the North Slope Borough SAR, Alaskan State Troopers, the National Park Service, the USCG and the AKANG; however, the availability of USAF/AKANG SAR assets come with caveats.³⁴

The primary SAR role of the United States Air Force is military SAR, generally aeronautical but including all military training and operational incidents. As such, the USAF does not have a primary mandate for executing civil aeronautical SAR, just coordinating the response.³⁵ Despite this, the NSP-US directs that “Cooperative arrangements involving DoD commands should provide for the fullest practicable use of their facilities for SAR on a non-interference basis with primary military duties.”³⁶ As such, despite the lack of primary mandate for the execution of civil aeronautical SAR, in practice, it is the AKANG’s 176th Wing’s 210th, 211th and 212th rescue squadrons (RQS) that hold alert status for military and civil aeronautical SAR response. These squadrons provide a critical combat SAR (CSAR) capability for the Alaskan 11th Air Force, and by convention for the civil aeronautical SAR tasking through the AKRCC.³⁷ Shown below in Table 2 are the SAR assets of the AKANG rescue squadrons.

³² Alaska Rescue Coordination Center. n.d. *Joint Base Elmendorf-Richardson*. Accessed 05 01, 2019. <https://www.jber.jb.mil/Units/11af/akrcc.aspx>.

³³ Smith, Timothy William James. 2017. “*Search and Rescue in the Arctic ...*”Pg 15

³⁴ Maj. Jay Randall. 2017. "AKRCC Overview." *National Ocean and Atmospheric Administration*. 02 28. Accessed 05 01, 2019. https://www.dco.uscg.mil/Portals/9/CG-5R/EmergencyBeacons/2013SarsatConf/Presentations/SAR2013_Mar21_AKRCC%20Overview_Carte.pdf

³⁵ Smith, Timothy William James. 2017. “*Search and Rescue in the Arctic ...*” pg 10

³⁶ Deputy Commandant for Operations, United States Coast Guard. 2016. "National Search and Rescue Plan of the United States." Para 75

³⁷ Smith, Timothy William James. 2017. “*Search and Rescue in the Arctic ...*” pg 21

Table 2: Alaskan Air National Guard SAR Assets

Organization	Asset	#	Capacity (litters/ppl)	Speed (knts)	Comment
210th RQS (Elmendorf)	HH-60	5	4/8	130	Unlimited range with aerial refueling
210th RQS (Eielson)	HH-60	1	4/8	130	Shorter alert status than Elmendorf crews
211th RQS	HC-130	4	10/20	290	Aerial refueling, land on gravel runways
212th RQS	Guardian Angel (GA)	36	--	--	Pararescuemen/combat rescue officers (PJs/CROs) and gear, air-droppable, can provide paramedic-level medical care
517/249 AS	C-17	8	36/54	450	Trained to drop GA

Source: Interviews with, and briefings provided by, AKANG SMEs

Source: Smith, *Search and Rescue in the Arctic: Is the US Prepared?*

This composition of SAR assets is a critical enabler as the AKANG brings a capability to the table that no other organization in Alaska (or Canada) possesses: the HH-60 Pave Hawk helicopter with an air to air refuelling capability. This capability is conducted with the HC-130 Hercules aerial refueler, effectively extending the range of the helicopter indefinitely allowing for a transit and extraction capability from anywhere within the US/CAN Arctic SRR. As the HC-130 can also land on gravel runways, it has the flexibility for operating out of Canadian high Arctic airfields such as Eureka, Sachs Harbour, Resolute Bay and CFS Alert. Additionally, the pararescuemen and combat rescue officers of the 212th RQS bring a specialized paramedical capability organic to the AKANG CSAR fleet.³⁸ Shown below in Figure 3, an HH-60 with an HC-130 aerial refueler could reach the most southern section of the HAWAA within 6 hours and the most northern section within 12 hours. As such, this is the only designated aeronautical SAR asset within the Canadian or Alaskan SAR system that can conduct a consistent and reliable Arctic rescue capability within the entire HAWAA region.

³⁸ Smith, Timothy William James. 2017. “*Search and Rescue in the Arctic ...*” pg 48

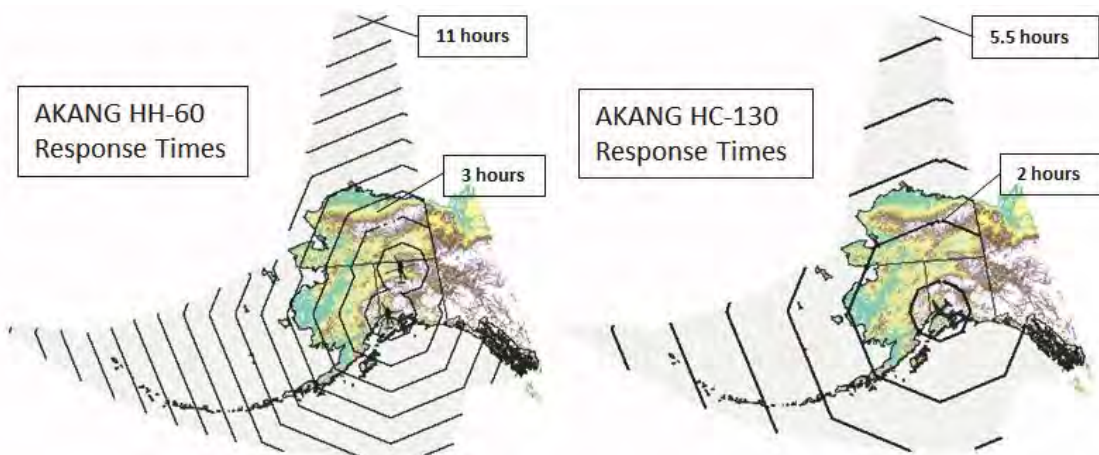


Figure 3 - AKANG HH-60 and C-130 Response Times in Arctic SAR Region

Source: Smith, *Search and Rescue in the Arctic: Is the US Prepared?*

The subtlety of the AKANG SAR assets existing within the established MOU is based on the AKANG executing a critical capability of the 11th Air Force of the USAF. In this capacity, their operational command is to the 11th Air Force of the USAF, while their administrative command remains with the AKANG.³⁹ This distinction is essential as the signatories to the CAN/US/UK MOU include (among others) the Department of National Defence Canada (CAF), the Department of Oceans and Fisheries Canada (CCG), the USCG and the USAF, but not the AKANG. The distinction of the AKANG executing a function of the USAF establishes AKANG SAR within the national level MOU both legally and by convention.

As for the AKANG conducting international civil SAR support, the *Department of Defence Instruction 3003.01 – DoD Support to Civil Search and Rescue (SAR)* states that the DoD shall “support foreign civil authorities performing civil SAR operations in territory and international waters beyond recognized U.S. aeronautical and maritime

³⁹ Maj. Jay Randall. 2017. "AKRCC Overview."

search and rescue regions (SRRs) consistent with U.S. obligations under international agreements." In this scenario precisely, this is the HAWAA under the Arctic SAR Agreement.⁴⁰ The conclusion is that an independent bilateral agreement or MOU is not required and that a bilateral CONPLAN is permissible and executable between JRCC Trenton and the AKRCC. The critical benefits to this plan are the immediate rectification of the capability gap in a non-cost prohibitive manner.

There may be concerns that an arrangement such as a bilateral CONPLAN to address a capability gap within the Canadian Arctic SRR could negatively impact the Canadian Arctic sovereignty claim. There are concerns about the "disagreements exist[ing] between the United States and Canada" regarding Arctic boundaries and the North West Passage.⁴¹ However, the entirety of the HAWAA lies outside of Canadian sovereign territory. Moreover, the Arctic SAR agreement explicitly states that "the delimitation of the search and rescue regions is not related to... sovereignty, sovereign rights or jurisdiction."⁴²

Alternatives to close the Capability Gap

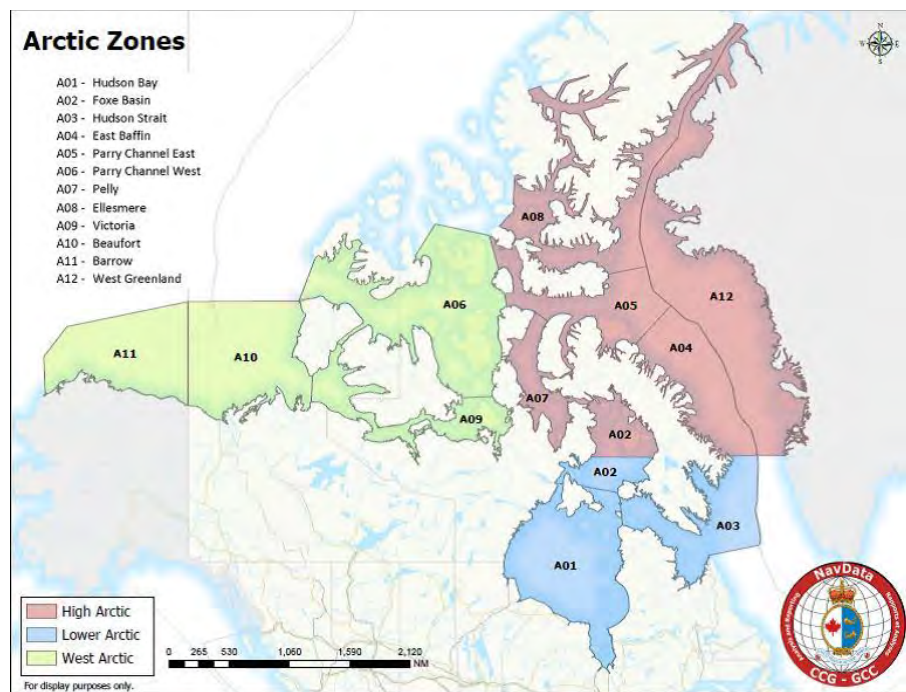
There are many alternative options available to the NSP to close the Arctic SAR capability gap. This section will examine several options including the presence of a year-round icebreaker in the HAWAA, the procurement of capable assets or enhanced capabilities for existing assets, and civil contracting. Lastly, the development of a capability to close the gap within the existing assets of the CAF will be considered.

⁴⁰ Department of Defense. 2011. "Department of Defense Instruction." 09 26. Accessed 05 04, 2019. <https://www.hsdl.org/?view&did=688304>. Para 4.d(1)

⁴¹ Government of Canada. 2017. "Canada's Arctic Foreign Policy." *Government of Canada*. 05 12. Accessed 05 06, 2019. https://international.gc.ca/world-monde/international_relations-relations_internationales/arctic-arctique/arctic_policy-canada-politique_arctique.aspx?lang=eng#a2.

⁴² Arctic Council. 2011. "Agreement on Cooperation...". Article 3.2

Given that the entirety of the HAWAA region is a maritime environment, albeit a sea-ice covered maritime environment, there is a consideration for a CCG heavy icebreaker permanent presence. While this may seem reasonable at first glance, many factors indicate that this is implausible and highly unlikely. Firstly, the Arctic sea ice coverage remains persistent year-round, significantly limiting the ability to conduct operations in the region. Even during the 2012 record low, the ice pack remained across the majority of the HAWAA.⁴³ The limitations of the Canadian Coast Guard to operate in the HAWAA appear to be reflected in the CCG operational plan, as it is not a dedicated Arctic operating zone.⁴⁴ Shown in Figure 4, the entire north-western section of the Arctic SRR is unlabeled.



⁴³ National Snow and Ice Data Center. 2012. *Arctic sea ice extent settles at record seasonal minimum*. 09 19. Accessed 05 05, 2019. <http://nsidc.org/arcticseaicenews/2012/09/arctic-sea-ice-extent-settles-at-record-seasonal-minimum/>.

⁴⁴ National Marine Advisory Board Icebreaking Sub-Committee Icebreaker Requirements 2017-2022. 2018. "Annex A - NMAB Requested Icebreaker Deployment / Coast Guard Planned Deployment 2017 - 2022." *Canadian Coast Guard*. 02 19. Accessed 05 05, 2019. <http://www.ccg-gcc.gc.ca/Icebreaking/Icebreaker-Requirements/Appendices#8.1.2>.

Figure 4 – Canadian Coast Guard Map of Arctic Zones

Source: Canadian Coast Guard, *National Marine Advisory Board Icebreaking Sub-Committee Icebreaker Requirements 2017-2022*

The CCG currently only has two heavy and four medium icebreakers, none of which are scheduled for a winter season high arctic mission in the foreseeable future.⁴⁵ In fact, according to the CCG planned icebreaker deployment report for 2017-2022, “the number of heavy and medium icebreakers will be reduced over the next several years, by one or two vessels per winter season, in order to schedule major refits in an attempt to keep these icebreakers operating as long as possible.”⁴⁶ This plan indicates that a permanent year-round deployment to the high Arctic is neither feasible nor desirable within the in the CCG operational strategy. As such, aeronautical SAR options must be considered.

As previously mentioned, no aircraft in the CAF can consistently and reliably reach the entire HAWAA and conduct a rescue due to the required combination of the VTOL capability and a 1100NM minimum range (not to mention Arctic suitability). There are only a few aircraft that can meet this statement of requirements, but one example is the V-22 Osprey.

The Canadian fixed-wing SAR replacement project considered the V-22 Osprey. It was presented at the *2010 Standing Committee on National Defence* in which claimed that it “...successfully blends, in one platform, the high-speed, long-range, long-endurance search and assist capability of fixed-wing transports with the manoeuvrability

⁴⁵ Ibid. Annex A

⁴⁶ Ibid. Ch. 6

and vertical flight rescue capabilities of SAR helicopters.”⁴⁷ Critics of the platform have questioned if it is suitable in maritime and [white]out conditions and its usefulness as a rescue platform due to its strong downwash negatively impacting survivors in the water.⁴⁸ However, for the CAF, the reason that the V-22 or similar aircraft is an unlikely option to address the Arctic SAR capability gap is, more simply, due to limited resources.

The Airbus C-295 has been announced as the fixed-wing SAR replacement and the CH-149 Cormorant is expected to remain in service as Canada’s rotary-wing SAR aircraft until 2040.⁴⁹ As a new SAR fleet is absent from consideration in SSE, it is unlikely that the CAF will pursue procurement of a new SAR aircraft.⁵⁰ Furthermore, the procurement of an additional fleet would add significantly more stress to the aircrew and technician cadre, worsening the manning shortages currently afflicting the Royal Canadian Air Force (RCAF).⁵¹ Therefore, it is not necessarily the (un)suitability of the V-22 to conduct the task that is the limiting factor, but the organizational strategic outlook and the human capacity to man the fleet.

In this context, there is a consideration to explore a civil contact option. A contracted service would reduce the added manning pressures caused by a CAF procurement of an additional fleet, but it is unlikely to be a viable option for a few reasons. First, there is a lack of available assets capable of executing the task. There are

⁴⁷ 2010. "Standing Committee on National Defence Number 035, 3rd Session, 40th Parliament." *NDDN Committee Meeting Minutes of Proceeding*. Ottawa: House of Commons Canada, 11 23.

⁴⁸ McCain, Jack. 2014. "Your Periodic Reminder That the V-22 Is a Piece of Junk." *War is Boring*. 07 15. Accessed 05 05, 2019. <https://warisboring.com/your-periodic-reminder-that-the-v-22-is-a-piece-of-junk/>.

⁴⁹ Team Cormorant. n.d. "Team Cormorant Situation." Accessed 05 05, 2019. <https://www.teamcormorant.com/situation.aspx>.

⁵⁰ Minister of National Defence. 2017. "Strong Secure Engaged..."

⁵¹ Bertrand, Grieve, Bews. 2018. "Annual Brief Career Managers - PLTs APS 2018." Ottawa: Director of Military Careers 4, 01.

not many all-weather SAR capable aircraft with a VTOL capability and a 1100NM minimum range. When considered in conjunction with the required northern support infrastructure, an endeavour of this size would likely be cost prohibitive when weighed against the other options presented, specifically the bilateral CONPLAN. While the Government of Canada has promised to spend \$700 million in the Arctic over the coming years, it is unlikely that there is the political will to develop a costly niche capability for such a low rate of incident occurrence.⁵² Even if a service contract of this type could be viable, the time required to conduct a capability analysis and implement the service would still leave an interim capability gap. Consideration of a more immediate solution and more cost permissive options are necessary, such as the procurement of additional capabilities to the existing fleets.

The CH-149 Cormorant is a dedicated, all-weather SAR helicopter capable of operating in the Arctic environment. Otherwise capable of executing its assigned task throughout the entire Canadian SRR, the limiting factor for a reliable SAR response in the HAWAA is the lack of effective range. As such, consideration should be given to acquiring an air to air refuelling (AAR) capability during the scheduled mid-life upgrades.⁵³ This modification would also decrease transit times to remote locations and benefit the SAR activities in other regions as well, specifically the east coast off-shore seasonal SAR activities. This option would ensure that the Cormorant could reach the entire Canadian SRR, as well those of neighbouring states, thereby better meeting the core missions of SSE and the obligations of the Arctic SAR Agreement.

⁵² Sevunts, Levon. 2019. *Federal budget hints at content of Canada's Arctic Policy Framework: expert*. 03 20. Accessed 05 06, 2019. <http://www.rcinet.ca/eye-on-the-arctic/2019/03/20/federal-budget-hints-at-content-of-canadas-arctic-policy-framework-expert/>.

⁵³ Team Cormorant. n.d. "*Team Cormorant Situation*." Situation page

The downside to this consideration is that the Cormorant is currently experiencing strain on the fleet due to obsolescence issues.⁵⁴ While an AAR capability on the Cormorant would ensure a domestic ability to conduct SAR across the entire Canadian SRR, secondary factors of developing this capability must be considered. For example, the acquisition of an additional capability generally includes additional training and currency requirement for the crews, and there will be an impact on the tasking of existing CC-130 aerial refuelers, a non-dedicated SAR fleet. Although a promising option, the time required to analyze and acquiring the capability would still result in an interim capability gap.

Lastly, the option of developing an air deliverable forward arming refuelling point (FARP), or similar capability, should be considered. This capability could effectively extend the range of the Cormorant by air deploying a usable fuel cash at key locations with the HAWAA. A FARP could also extend the range of other helicopters used for SAR across the SRR provided the capability set is incorporated into the standard operating procedures of the fleet. The downside of a capability like this is the increased risk associated with this type of activity. There are many variables involved in effectively air delivering a fuel cash to a remote and austere environment with little to no backup. As such, this option creates a domestic SAR competence to close the capability gap, but it does so at the cost of developing the capability and skill set, and at a higher risk than other options available.

The options presented are not an exhaustive list of all of the available possibilities to address SAR in the HAWAA. To this point, there is one last perspective that warrants

⁵⁴ Ibid.

consideration. Maybe a long-term SAR capability gap within the HAWAA is within an acceptable risk given the extremely low incident rate. The ability to attempt an ad hoc response domestically is always retained before requesting for international assistance. Moreover, if a major air or maritime disaster occurs within the Canadian SRR, the CONPLAN HAWAA would prove insufficient due to the potential magnitude of an incident.

However, a CONPLAN does facilitate a more rapid verification of available assets and response authorization in a region where delays can have a catastrophic impact. It serves to ensure that the key stakeholders are engaged and that the available options have been deliberately considered in a non-time critical method.

Conclusion

The Arctic SAR Agreement established the foundation for international SAR cooperation in the Arctic and the Arctic Search and Rescue Regions. A capability gap was identified in the Canadian National Search and Rescue Program which determined that Canada could not provide a consistent and reliable SAR response, specifically the rescue capability, in a region of the high Arctic west of the Arctic Archipelago. This paper examined the options available to rectify the capability gap, arguing that the most suitable option available is the establishment of an operational level, bilateral CONPLAN for the HAWAA between the Canadian and Alaskan SAR organization.

There are three factors critical to the argument. First, the AKANG is acting under the USAF in the Alaskan civil aeronautical SAR capacity and therefore falls under the CAN/US/UK SAR memorandum of understanding. As the CONPLAN falls within the international and domestic policy framework, an independent bilateral agreement is not

required. The second factor is that the Alaskan Air National Guard (AKANG) has SAR HH-60 Pave Hawk helicopters with air to air refuelling capability, enabling them to extend their range indefinitely and reach the entire HAWAA effectively. Finally, the CONPLAN can provide an immediate solution to the capability gap in a non-cost prohibitive manner.

The next section examined several alternative options to rectify the capability gap. It was determined that positioning a Canadian Coast Guard icebreaker in the HAWAA year-round was infeasible due to the persistence of permanent sea ice, evident as the Arctic operations are reserved for the summer season only and do not even consider the HAWAA to be a designated CCG operating area. Additionally, due to limited resources and forecast fleet sustainment, there is no indication of a strategy change for the high Arctic in the near future.

An examination of procuring a VTOL capable aircraft with a 1100NM minimum range, like the V22 Osprey, was determined to be unlikely because the C-295 fixed-wing SAR replacement has already been selected and the CH-149 Cormorant helicopter is forecast for service until 2040. Additionally, a new SAR fleet was not designated in *Strong, Secure, Engaged: Canada's Defence Policy* and there is a lack of available aircrew and technician to man an additional fleet.

A civilian contract option was considered but was determined to be cost prohibitive when weighed against the other options. This assessment was based primarily on the limited number of aircraft capable of rectifying the capability gap and the requirement for significant northern infrastructure development to support operations. In

consideration of the low incident rate, it seemed unlikely that there is the justification to prioritize the development of a costly niche capability in the high Arctic.

The examination of procuring additional capabilities for the existing fleet identified two options with potential. First, the development of an air to air refuelling capability on the CH-149 Cormorant helicopter during the mid-life upgrades would address the capability gap in the HAWAA, as well as support an improved SAR capability across the entire Canadian SRR. The main detractors for this option were the timeline to conduct a thorough analysis of the capability and the procurement process. While this is a viable option and should be further examined, it is a mid-term solution which leaves an interim capability gap.

Second, the development of range enhancing capabilities were considered such as an air deliverable FARP. While there is a benefit to obtaining these capabilities, there is also increased risk with these types of operations when compared with the alternative options. However, the development of a range extending capabilities for SAR aircraft could be a cost-effective force multiplier within the SAR organization and should be researched further.

In conclusion, it is recommended that a bilateral CONPLAN for the HAWAA be pursued between the Canadian and Alaskan RCC. This option immediately addresses the capability gap, is not cost prohibitive, and is in the spirit of international SAR cooperation. A bilateral CONPLAN does not compromise the Canadian sovereign claim to the Arctic (as reinforced in the Arctic SAR agreement) and will strengthen the SAR relationship with the US.

As for the future of Canadian SAR, the options for developing an air to air refuelling capability on the CH-149 Cormorant should be explored further, as well as the development of range enhancing capabilities like an air deliverable FARP. These options would increase the effectiveness of the Canadian SAR capability and therefore the Canadian contribution to international SAR cooperation.

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