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Climate Change and the Canadian Armed Forces

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CLIMATE CHANGE AND THE CANADIAN ARMED FORCES

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ABSTRACT

The Canadian Armed Forces (CAF) are frequently requested to support missions in support of domestic Humanitarian Assistance and Disaster Relief (HADR) events. In Southern Canada, the rate with which the CAF is supporting HADR events is increasing, due to climate change making severe weather events more frequent. Though the Canadian Army has adapted its training cycle to be able to support HADR events, it is likely straining the resilience of its personnel. This paper argues that in Southern Canada, there should be an organization that is similar to the model from which the Canadian Rangers is built on. One that is low cost, supported by the CAF, and that can respond to local emergencies in an expeditious manner.

In Northern Canada, the problems associated with climate change are different. The Canadian Arctic is warming at an accelerated pace, where trade routes, natural resources are easily accessible. Vice a classic military threat, this paper argues that the main security challenge is for Canada to be able to respond to unauthorized commercial exploitation of its natural resources. The CAF can support this endeavor. However, there are also chronic problems associated with climate change in Northern Canada, such as food scarcity and the permafrost melting, destroying the foundations of community residences. This paper argues that these problems are systemic, and the CAF can not resolve these problems. To make any progress would require a Whole of Government approach, which is inclusive of local leaders, in order for these chronic issues to be properly addressed.

Introduction

When it comes to climate change, The Canadian Armed Forces (CAF) is at a precipice. Canada is experiencing global warming at an accelerated rate, which is changing Canada's climate drastically and increasing damaging environmental phenomena, directly impacting its population.¹ The issues and problems that require solutions to global warming generally are so complex and immense that at times it is difficult for the world, let alone Canada and the CAF, to reach consensus and pursue solutions. However, the prospect of admiring the problem indefinitely, is not something the CAF can afford to do. Nor is it in the make up of the CAF to not act on a problem, as seen recently in the CAF response to COVID-19. There the CAF paid attention to the indicators and warnings that were pointing to a pandemic. The CAF moved decisively to both preserve the force so that it can respond, and then react to the crisis in supporting both the federal and provincial authorities.² This sense of urgency, must be replicated in order for the CAF to be postured to respond to the effects of Global Warming. Therefore the intent of this paper is twofold. This paper will evaluate the effects that climate change is having on the CAF, and how the CAF is responding to the new challenges caused by climate change. The second aim of this paper is to offer suggestions as to how the CAF can better align its capabilities to maximize its ability to positively respond to climate change from a domestic perspective.

¹ Government of Canada. "Climate change, causes and effects." <https://www.canada.ca/en/environment-climate-change/services/climate-change/causes.html>. Last accessed: 26 April, 2021.

² Government of Canada. "Operation LASER" <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/laser.html>. Last accessed: 26 April, 2021.

Earth is warming at an unprecedented rate. The main cause of climate change relates to human activity.³ We are heating the Earth in multiple ways, however, the majority of the damage is due to burning immense amounts of fossil fuels. A by product of burning fossil fuels is Green House Gases (GHG), which do not dissipate or break up easily and remains in the atmosphere for hundreds of years.⁴ This creates a greenhouse effect that consequently raises the surface temperature of the Earth.⁵ The worst of the GHG is carbon dioxide (CO₂), which accounts for 76 % of all GHG emissions, and is primarily pumped into Earth's atmosphere through human activity, such as fossil fuel combustion and industrial processes.⁶ These GHGs, if left unchecked without massive global mitigation strategies, will heat the earth by approximately 3.7°C to 4.8°C by the year 2100.⁷ Humans will likely have to contend with warming of at least 1.5°C, having already warmed the Earth by approximately 1°C,⁸ regardless of the mitigation strategies that humans undertake.⁹ This global warming is driving climate change, affecting weather patterns and creating conditions that impact Canadians.

There climate change effects are impacting Canada as well, “ with our average temperature rising by more than twice the global average increase and, in the country's

³ Government of Canada. “Climate change, causes and effects.” <https://www.canada.ca/en/environment-climate-change/services/climate-change/causes.html>. Last accessed: 26 April, 2021.

⁴ *Ibid*

⁵ *Ibid*.

⁶ IPCC, 2014: *Summary for Policymakers. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*

⁷ *Ibid*. 7.

⁸ IPCC, 2018: *Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.*

⁹ IPCC, 2014: *Summary for Policymakers. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.*13.

Arctic region, by an even more dramatic amount.”¹⁰ Climate change is causing an increase in severe weather events, such as intense fires and floods, which will only be exacerbated as the Earth continues to warm.¹¹ As well, super storms are increasing, resulting in coastal areas being particularly vulnerable.¹² With the increased likelihood of both storm surges as well as general ocean levels increasing, there will likely be an increase of coastal erosion and the destruction of shores on the Atlantic and Pacific Ocean.¹³ In the Arctic, there exists multiple additional challenges, such as having to respond to melting permafrost, which was once the bedrock for the communities, to seasonal ice roads no longer a viable means of transportation.¹⁴

With an appreciation of the damaging aspects of climate change in Canada, there is a high probability that the CAF will be required to increasingly provide support to domestic Humanitarian Assistance Disaster Relief (HADR) events. Chapter 2 will review the effects of climate change on the CAF. Specifically this chapter will undertake an historical analysis of provincial Requests for Assistance (RFA) during the last twenty years, where the provinces have sought the CAF support in response to HADR events. This analysis will aid in determining if there is in fact an increase of the CAF providing support in response to RFAs. Determining if there is an increase in RFAs will be

¹⁰ Government of Canada. *Climate Change: Its impact and Policy Implications*. Publication no. 2019-46-E. Library of Parliament, Ottawa, Canada. 2020. P7.2.

¹¹ IPCC, 2018: *Summary for Policymakers*. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*.6.

¹² *Ibid.*

¹³ Government of Canada. *Climate Change: Its impact and Policy Implications*. Publication no. 2019-46-E. Library of Parliament, Ottawa, Canada. 2020. P7.2.

¹⁴ Government of Canada. *Emergency Management Strategy for Canada. Toward a Resilient 2030*. Her Majesty the Queen in Right of Canada. Ottawa, Ontario. 2019.1.

informative, and discussed later on with a view to determine how the CAF HADR support impacts its training obligations in order to maintain combat effectiveness.

Chapter 2 will also examine the implications of climate change in the Arctic and how these changes are impacting the CAF. Typically the CAF has been seized with supporting the lower half of Canada (Below the 70th parallel). However, the climate in the Canadian Arctic is heating at an accelerated pace.¹⁵ The Northwest Passage is becoming a viable trade route. As well tourism and destination shipping in the Arctic is on the rise. However, for indigenous populations their way of life is facing numerous challenges, causing disruptions to whole communities.¹⁶ These climate change challenges will also structurally change how the CAF operates in the Arctic, and is the foundational information required to enable further analysis with respect to how the CAF is responding to climate change in Northern Canada, which will be discussed in Chapter 3.

In chapter 3 there will be a review of the CAF organization to evaluate how it is responding to climate change. It will discuss how the CAF is building relationships with communities to ensure the CAF is aware when a RFA may be coming. This section will also highlight some of the difficulties the CAF is experiencing, when it comes to maintaining training to ensure a combat effective force while responding to HADR events.

¹⁵ AMAP, 2019. *AMAP Climate Change Update 2019: An Update to Key Findings of Snow, Water, Ice and Permafrost in the Arctic (SWIPA) 2017*. Arctic Monitoring and Assessment Programme (AMAP). Oslo, Norway. 2.

¹⁶ Nerberg, Susan. *Meltdown - The Permafrost that Holds the Arctic Together is Falling Apart*. The Arctic Institute. Published 2 March 2021. <https://www.thearcticinstitute.org/meltdown-permafrost-arctic-together-falling-apart/>. Last Accessed 26 April, 2021.

In discussing the CAF's support to HADR events, Northern Canada frequently gets forgotten. Therefore Chapter 3 will highlight how the CAF views the Arctic mission and how it is currently providing support in the Arctic. It will also discuss how the CAF is adapting to the Arctic environment. This section will discuss the particular utility of the Arctic Offshore Patrol Ship (AOPS), which the RCN is currently bringing online, and how the inherent capabilities that it possesses can provide short term support to remote Indigenous populations who are struggling with negative aspects of climate change. This section will also cover how unique and effective the Canadian Ranger program is and detail the support and leadership that they provide to their local communities. This chapter will also highlight the significant value the Canadian Rangers provide to the CAF organization in responding to the effects of climate change, as well as providing a CAF presence in the Arctic.

Chapter 4 will discuss the challenges that the CAF will continue to encounter in dealing with climate change, and will explore ideas that could enable a more effective approach for the CAF. There will be a consideration on whether the CAF is particularly suited for HADR events. As well, there consideration of three different courses of action that the CAF may take to improve its response for climate change. Firstly, changing the focus of the CAF towards responding to climate change will be considered. Secondly, this paper will consider whether augmenting the resourced to the CAF's Disaster Assistance Response Team would be beneficial. Finally this paper will consider whether creating a reserve HADR Defence Force has any merit.

In evaluating the CAF in Northern Canada, this chapter will evaluate whether the CAF is positioning itself correctly to address the key problems in the area. This chapter

will also look at whether the CAF can, or should, increase its support in the Canadian Arctic, through continued engagement with the Indigenous populations. In evaluating the Canadian Arctic, there will be closer look at what the local populations are looking for regarding support, and whether the CAF can contribute in this area.

Chapter five will conclude this research project by discussing the key deductions that were developed throughout the preceding chapters. This chapter will also reiterate that due to the sheer immensity of the climate change problem, the CAF is unable to address global warming. This is a global issue that will require global consensus, with particular emphasis on developed and developing nations weaning themselves of the burning of fossil fuels. The CAF cannot address that problem. However, the CAF can, and must, plan and prepare to support and protect Canadians as the impacts of climate change continue to be felt throughout Canada.

CHAPTER 2

CAF AND CLIMATE CHANGE CHALLENGES

The CAF is a federal agency that supports and protects Canadians. However, there are times when the CAF can be called in by provinces to provide assistance. These requests are usually in response to Humanitarian Assistance / Disaster relief (HADR) events. As climate change is increasing the frequency of HADR events globally, this chapter will conduct an analysis on whether this translates into increased Requests for Assistance (RFA) by provincial authorities. There will also be an evaluation of the effects of climate change in the Canadian Arctic, with a view in subsequent Chapters to evaluate how the CAF is responding to these changes. The analysis in this chapter of both Southern and Northern Canada will enable further deductions and analysis as it pertains to the CAF, and the effects that climate change is having on the CAF organization.

However, before conducting a historical analysis of recent CAF response to provincial for RFAs, it is beneficial to understand how and why provinces typically look for support from the CAF. Therefore, how do provinces submit RFAs? Do provinces send RFAs directly to the CAF? Does the province submitting the RFA pay for the CAF expenses when it provides support? Under what mission sets is there an expectation that the CAF will proactively respond to provincial requests? These questions will be considered, prior to moving on to an evaluation of the RFAs to the CAF.

As detailed in the Canadian Forces Joint Publication, *Domestic Operations*, the CAF is primarily mandated to protect Canada from threats emanating from other

countries.¹⁷ However, with the CAF having a force that is highly mobile and professionally trained for diverse scenarios, it is also well suited to respond to emergencies in a supporting role.¹⁸ A request for assistance from the province to the CAF is be the last resort. Typically, the HADR RFA process initially starts at the municipal level. When a municipality is unable to effectively respond, it will elevate its RFA to the provincial authorities. These RFAs are usually addressed to the provincial Minister of Public Safety (MPS) equivalent.¹⁹ When the province can not support a municipality, the RFA will be forwarded to the federal MPS's office. The federal MPS is mandated through the Emergency Management Act for "coordinating the Government of Canada's response to an emergency."²⁰ The federal MPS will request the Minister of National Defence (MND) to support the RFA as required. The MND, will then respond to the MPS, providing the type of support that the CAF is able to provide. Usually there is collaboration at all governmental levels throughout the RFA process, ensuring that the CAF is not caught off guard, and the right RFA is submitted to ensure that the CAF's capabilities are appropriately tasked to maximize support. Therefore typically provinces follow the above mentioned procedures, vice going directly to the CAF requesting support. See figure 2.1 for an example of Joint Task Force Central depiction of how the RFA process works for the CAF to respond during the pandemic. This is a helpful flowchart as the process is very similar to the standard RFA process and visually depicts the above description.

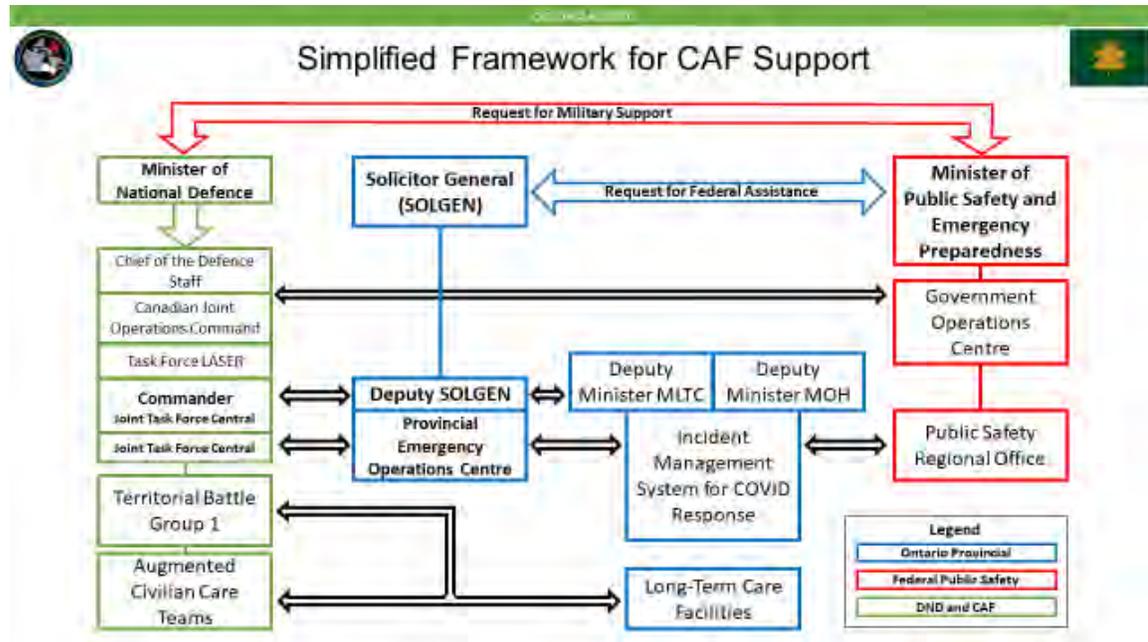
¹⁷ Government of Canada. Canadian Forces Joint Publication, Domestic Operations, Department of National Defence. 2011. 1-1

¹⁸ *Ibid.*

¹⁹ *Ibid.* 2-4

²⁰ Canada. Emergency Management ACT. S.C 2007, c. 15 assented to 2007-06-22. Para 4 (c).

Figure 2.1 JTFC's flowchart displaying RFA Pandemic process.²¹



The humanitarian assistance that the CAF can provide to a municipality is quite broad in scope. The National Defence Act (NDA) divides the support the CAF can provide into two categories. One, if the “assistance in the national interest.” And the other support is if “the matter cannot be effectively dealt with except with the assistance of the Canadian [Armed] Forces.”²² CJOC for its planning purposes classes the types of support that the CAF are capable of providing as the following:

- a. Rescue and evacuation of individuals in emergency situations, emergency life-saving treatment, the safeguarding of public health.
- b. Emergency restoration of essential services (including fire-fighting, water, power, communications, transportation, and fuel).
- c. Emergency clearance of debris, rubble, and dangerous items from public facilities and other areas to permit the rescue or evacuation of people and the restoration of essential services.

²¹ MGen Mialkowski. Presentation on the topic of Domestic Operations from the perspective of a RJTF Comd. 16 April 2021.

²² Canada. National Defence Act. 1985. 273.6 (1).

- d. Detection and monitoring of chemical, biological, and radiological contamination, the control of the spread of contamination and the timely reporting of such incidents.
- e. Provision of emergency transportation and movement control.
- f. The safeguarding, collection, and distribution of essential supplies and materiel.
- g. Preparation of emergency or preliminary damage assessments.
- h. Restoration of interim emergency communications.²³

After the emergency is over and the CAF discontinues its support, there is a process in place to charge the province for the support that the CAF provided.²⁴

As the approval process to support the RFA is working its way through the chain of command, the CAF will concurrently start preparing in anticipation that it will be directed to support the RFA, conducting reconnaissance type activities to understand the issue at hand and getting materials in place to support.²⁵ This paper will only cover the incidents of RFAs submitted to the CAF requesting support in relation to HADR events, highlighting the effects that climate change is having on the CAF.

Armed with a general understanding of the RFA process, now allows for a historical analysis of the level of support the CAF has provided in the last ten years. As well, there will be an evaluation to see if this CAF HADR support has increased. This will be determined by comparing the years 2000-2009 RFAs to the years 2010-2019. From this, and in extrapolating climate change data into the future, there will be a determination if the CAF is likely to be more frequently tasked to support domestic HADR events.

²³ Government of Canada. Canadian Forces Joint Publication, Domestic Operations, Department of National Defence. 2011. 5-4.

²⁴ *Ibid.* 5-1.

²⁵ *Ibid.* 5-3.

The CAF has established a plan of action to support domestic HADR events. The CAF has codified this plan into an order called Operation LENTUS (Op LENTUS).²⁶ This order streamlines resource allocation and can be updated quickly with a release of a fragmentary order (Frag O). The overarching objectives of this order is “to help provincial and territorial authorities, respond quickly and effectively to the crisis [and] to stabilize the natural disaster situation.”²⁷ Please figure 2.1, which depicts the incidences of domestic HADR events that the CAF has provided support from 2000-2019.

Figure 2.1 Depicting events that the CAF has provided domestic HADR support.²⁸

HADR EVENTS REQUIRING CAF SUPPORT					
Year	Floods	Winter Storm	Fires	Hurricane support	# Of Events
2010				Support to NL	1
2011	MB/QC		ON		3
2012					0
2013	AB				1
2014	MB, 3XON				4
2015	ON		SK		2
2016			AB Fort Mac		1
2017	NL/QC/ON/NB		BC/MB		6
2018	BC/NB/ON	QC	BC/MB		6
2019	ON/QC/NB		MB	NS	5

From 2000-2009, there were only two HADR events that employed the RFA process, and requested CAF support. Both were in 2003, one was support to Nova Scotia after a hurricane and the other was providing fire fighting support in BC.²⁹

²⁶ Government of Canada. “Operation LENTUS” <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-lentus.html>. Last accessed: 26 April, 2021.

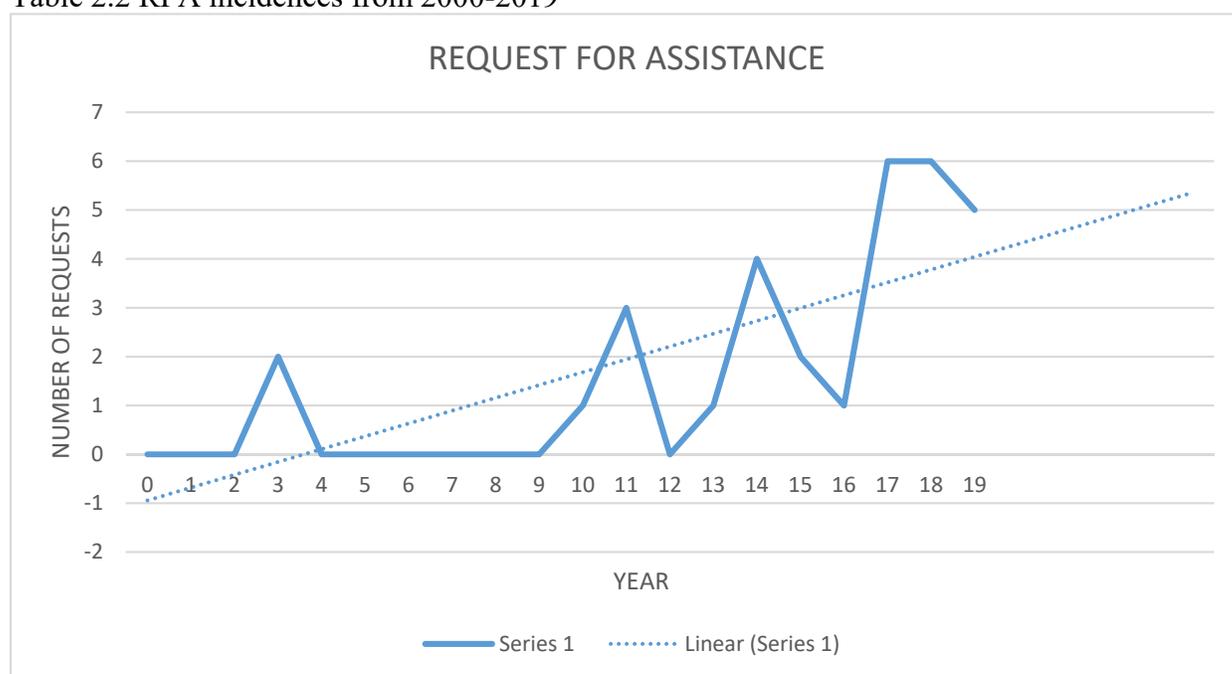
²⁷ *Ibid.*

²⁸ Compiled by author from information at: Government of Canada. “Operation LENTUS” <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-lentus.html>. Last accessed: 26 April, 2021.

²⁹ Claire Bamma. *Directing the DART Towards Climate Change*. Canadian Forces College. Toronto, Ontario. 2015. 45.

From the information above and placing it a graphical representation (see figure 2.2 below), the data appears to suggest that the CAF is receiving RFAs at an increasing rate. Especially in the last five years, there seems to be an increase. As well, there are certain trends that can be noted. One is that since 2014, in 5 of 7 years the community of Kashechewan (indigenous community in Northern Ontario) has required evacuation to deal with flooding in the area. As well, since 2015, flooding and fire RFAs have dominated the support that the CAF has provided.

Table 2.2 RFA incidences from 2000-2019³⁰



These results seem to point quite conclusively to the CAF being increasingly required to support provincial governments. Some of the data bears this out, as in the case with wild fires, where in the last 37 years (1980-2017), half of 448 000 Canadians that

³⁰ Compiled by author from information at: Government of Canada. "Operation LENTUS" <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-lentus.html>. Last accessed: 26 April, 2021.

were required to evacuate, occurred in the last decade.³¹ There is perhaps some ambiguity on whether the more frequent requests are partly due to provincial governments more at ease at requesting federal government support. As well, there can also be concern that the provinces are overly dependant on federal aid, especially in light of recurrent HADR events on an annual basis, such as the support to Kashechewan. However, in evaluating the Canadian Disaster Database, maintained by the ministry of Public Safety, it is clear that the severity of HADR events is increasing. From 2000 - 2009 the most costly storm took place on the 19th of August, 2005,³² where Southern Ontario experienced multiple thunderstorms and tornadoes in a dense urban environment. Though costly, with an estimate cost of \$500 million dollars, it pales in comparison to the HADR events that took place from 2010-2020. There were 7 events that surpassed the \$500 million tally, showcasing the increasing severity and damage that HADR events are causing (the Fort MacMurray wildfire in 2016 cost 4 Billion dollars, for example).³³ HADR events in Canada are increasing in severity, resulting in an increase in the RFAs submitted to the federal MPS requesting CAF support. With an increase of wild fires projected to increase by 30% by 2030, and 75% by 2100,³⁴ and a resulting burn area increase of up to 390% by mid century,³⁵ it is quite likely that the CAF will continue to have a role to play in HADR events (such as wild fires) in the future. Climate change is causing an increase in severe

³¹ Coutney Howard, Chris Buse et al. *Policy Brief for Canada*. The Lancet Countdown on Health and Climate Change. Ottawa Ontario. November 2019. P 1.

³² Public Safety Canada. "Access the Canadian Disaster Database." <https://cdd.publicsafety.gc.ca/srchpg-eng.aspx?dynamic=false>. Last Accessed 26 April, 2021.

³³ *Ibid.*

³⁴ B.M.Wotton, C.A Nock and M.D. Flannigan. *Forest fire occurrence and climate change in Canada*. International Journal of Wildland Fire. 19(3) 253-271. 2010.

³⁵ X.Yue, J.J Mikley et al. *Impact of 2050 climate change on North American wildfire: consequences for ozone air quality*. Copernicus publications on behalf of the European Geosciences Union. 2015.

weather events, consequently causing HADR related events, and will increase as global warming continues.³⁶

The increase of RFAs highlights the emergencies that provinces face related to climate change. However, the Canadian Arctic is also feeling the effects of climate change. This region, which includes Canada's territories, northern Quebec and Labrador,³⁷ should be incorporated into the discussion as it is adversely impacted by climate change, and one the CAF must monitor as it prepares to respond to the effects of climate change.

From the data compiled during the years 2000-2019, the vast majority of the HADR events were geographically located in the provinces. The CAF responds to emergency situations to provide a stop gap means, providing provinces time to coalesce their resources to provide support to their people. Once the flooding subsides, for example, it is usually the provincial authorities that lead the clean up. However, in the Arctic, there are long term challenges due to climate change. This longer time scale is greater than what the CAF is typically used to, however, will still require the CAF's support at some point.

For example, there is a humanitarian crisis on the horizon due to the relative food scarcity in northern communities, where traditional food sources are increasingly difficult

³⁶ IPCC, 2018: *Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.*6.

³⁷ The Arctic Institute. "Canada." <https://www.thearcticinstitute.org/countries/canada/?cn-reloaded=1>. Last accessed: 26 April 26, 2021.

to reach, partly due to melting sea ice,³⁸ partly due to traditional foods disappearing. From 1970-2004 there was a 26% decline in vertebrate species in the Arctic³⁹, and a 50-95% decrease in certain Caribou herds over the last three generations.⁴⁰ Also due to the cost of transportation, food typical of most grocery stores cost multiples of what is normal in the provinces and Southern Canada.⁴¹

There are also homes sinking into the ground from the melting of permafrost,⁴² destroying whole communities and accelerating global warming. Ice roads that were once used for transportation are no longer usable, and the very foundation of the Canadian Arctic is under threat.

Northern Canada is also going through a period of development that creates opportunities for its residents. From 1948-2016, Northern Canada has warmed 2.3 degrees Celsius (compared to 1.7 degrees Celsius in Southern Canada).⁴³ During the warmer summer months, which now last longer than before (a trend likely to continue),⁴⁴ there is now a viable trade route through the Canadian Archipelago in the form of the Northwest Passage (NWP), which was previously covered in ice year round. This new trade route decreases the transportation distances between continents, such as Asia and

³⁸ Government of Canada. *Aboriginal Food Security in Northern Canada: An Assessment of the State of Knowledge*. Council of Canadian Academies. Ottawa, Ontario. 2014.132.

³⁹ *Ibid.* 134.

⁴⁰ *Ibid.* 135

⁴¹ Leanna, Garfield. *Food prices in Arctic areas of northern Canada are insanely high*. Business Insider. Published 21 September 2017. <https://www.businessinsider.com/food-prices-high-northern-canada-2017-9>. Last Accessed 26 April, 2021.

⁴² Susan, Nerberg. *Meltdown - The Permafrost that Holds the Arctic Together is Falling Apart*. The Arctic Institute. Published 2 March 2021. <https://www.thearcticinstitute.org/meltdown-permafrost-arctic-together-falling-apart/>. Last Accessed 26 April, 2021.

⁴³ Bush, E. and Lemmen, D.S., editors (2019): *Canada's Changing Climate Report*; Government of Canada, Ottawa, ON. Chap 4.1.

⁴⁴ *Ibid.* Chap 4. 1.

Europe by upwards of thousands of kilometers, potentially saving billions of dollars each year.⁴⁵ With the Canadian Arctic becoming more accessible, there are also significant natural resources in the area,⁴⁶ increasing the likelihood of both destination shipping and development in the area. This could improve the lives of the local communities.

However, with international access to the Canadian Arctic, there is also a requirement for security in the area. With new potential fishing areas in the Canadian Arctic, there will also be competition for these resources. As well, with commercial shipping and destination shipping increasing there will be a requirement for a constabulary presence that the CAF can support. Therefore the CAF has to prepare to support local residents dealing with the climate change as well as providing security in the area.

Therefore the focus in the next chapter will be to determine how the CAF is currently structured to respond to climate change events in Canada. There will be an evaluation how the CAF is adapting to the ever increasing amount of HADR events in Southern Canada. As well, there will be a section that focuses on how Northern Canada and the Canadian Arctic, and how the CAF views both the emerging security challenges in the area due to the Canadian Arctic melting, as well as the challenges the CAF have in supporting the local population, who are adversely affected by climate change.

⁴⁵ P. Whitney Lackenbauer, Adam Lajeunesse, James Manicom et al, *China's Arctic ambitions and what they mean for Canada*. Canadian Defence and Strategic Studies Series, No. 8, University of Calgary Press, Calgary, 2018, 74.

⁴⁶ Franklyn Griffiths, Rob Huebert and P. Whitney Lackenbauer, *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press, 2011, 29.

CHAPTER 3

HOW THE CAF IS RESPONDING TO CLIMATE CHANGE

This Chapter will discuss how the CAF is responding and adapting to the effects of climate change. The climate change dynamics are broken up into two sections, Southern Canada and Northern Canada. In Southern Canada, the CAF is being challenged with the increasing rate of HADR support required to the provinces. Therefore this chapter will discuss how the CAF has adapted the organization to respond more effectively. This chapter will consider what impacts the increase HADR support is having on the organization. In Northern Canada, the climate change problem is different, requiring different solutions. As such this chapter will discuss how the CAF is adapting to the changes brought on by climate change in Northern Canada and the Canadian Arctic more specifically.

SOUTHERN CANADA

Climate change creates the conditions for an increase in extreme weather events. These events create emergency situations for provincial authorities in Canada, necessitating an increase in RFAs submitted to the MPS requesting the CAF's support for HADR events. As discussed in chapter 2, the RFAs for CAF to support HADR events have increased dramatically in the last decade. As such, the CAF has adapted and has become more efficient in providing CAF support to HADR events. This showcases one aspect on how the CAF has adapted to climate change.

In responding to a domestic HADR events, the CAF quickly deploys a reconnaissance team and liaison officers into the affected area. This will take place

usually 24-36 hours after the CAF has been approved to aid the province/territory in question, though can happen quicker if required.⁴⁷ The CAF support will always be in support to provincial authorities.⁴⁸ Once the crisis is mitigated, the CAF will look to extricate itself from the mission.

As well, though military troops are supporting the provincial authorities, they still operate under military authority, where specific tasks and spans of control are spelt out through orders. Usually the Commander of the Canadian Joint Operations Command (CJOC) is the designated lead at the operational level, to support the HADR event. At the tactical level, the designated authority is dependent on the region that is effected. The CAF divides Canada into 6 regions. Joint Task Force (JTF) North commands the domestic military support in the territories. JTF Pacific controls British Columbia. JTF West controls Alberta, Saskatchewan and Manitoba. JTF Central is Ontario. JTF East is Quebec and finally JTF Atlantic covers the Maritimes (including Newfoundland).⁴⁹

These regional commands provide key coordinating functions in the areas of their responsibility, and already have established points of contacts with the provincial authorities. This allows the CAF to maximize support, when requested to do so. The regional commands also provide key indicators and warning to CJOC and the Chief of the defence staff (CDS), when they think it is likely the provinces will submit an RFA. This potentially allows both CJOC and CDS's staff to start planning early and to start

⁴⁷ Government of Canada. *Humanitarian Operations and Disaster Relief Operations*. Department Of National Defence. Ottawa, Ontario. 2005. 3-5.

⁴⁸ *Ibid.*

⁴⁹ Government of Canada. "National security and defence/ CAF/Operations and exercises/Military operations/ How we conduct operations." <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/conduct/regional-task-force.html>. Last Accessed 27 April, 2021.

alerting high readiness troops that they could deploy to support a domestic HADR event. It also provides an opportunity to help shape the RFA, ensuring the provinces are requesting support that the CAF can provide.

The CAF is adapting to the reality that there will be an increase in RFA looking for HADR support. Domestic HADR events typically occurs in from May-October,⁵⁰ therefore forces are maintained at high readiness during these months in anticipation of likely being called in to support.⁵¹ As well, CJOC has extensive contingency plans (CONPLANS) in place that quickly provides guidance and direction on how best to use the CAF. For HADR type events this order is code named Operation LENTUS,⁵² which provides the governance to allow the CAF to react quickly to support the critical mission of supporting Canadians in times of crisis. Operation LENTUS was created in 2014 for ease of responding to HADR events and the standing orders provide a great framework for planners.⁵³ Previous to 2013, each domestic operation required a separate operation with specific authorities.⁵⁴ However, as HADR events become more common place, Operation LENTUS allows for the CAF to respond in an efficient manner and

⁵⁰ Public Safety Canada. "Access the Canadian Disaster Database." <https://cdd.publicsafety.gc.ca/srchpg-eng.aspx?dynamic=false>. Last Accessed 26 April, 2021.

⁵¹ Leuprecht, Christian and Peter Kasurak. *The Canadian Armed Forces and Humanitarian Assistance and Disaster Relief: Defining a Role*. Centre for International Governance Innovation. Published 24 August 2020. [Thttps://www.cigionline.org/articles/canadian-armed-forces-and-humanitarian-assistance-and-disaster-relief-defining-role](https://www.cigionline.org/articles/canadian-armed-forces-and-humanitarian-assistance-and-disaster-relief-defining-role). Last Accessed 26 April, 2021.

⁵² Government of Canada. "Operation LENTUS" <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-lentus.html>. Last accessed: 26 April, 2021.

⁵³ Department of National Defence. *Standing Operations Order for Domestic Operations (SOODO)*. Ottawa: Canadian Joint Operations Command, 2014.

⁵⁴ Government of Canada. "Operation LENTUS" <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-lentus.html>. Last accessed: 26 April, 2021

expeditiously provide disaster relief to the affected community. This is another one of the methods that the CAF has adapted to climate change.

Does the CAF supporting HADR events, with its limited resources and requirements for annual training, diminish the combat effectiveness of the CAF? This question has been previously considered by political scientist Christian Leuprecht and independent researcher Peter Kasurak. They posit that the current HADR support that the CAF provides is “well within the capabilities of the CAF.”⁵⁵ In the US, however, it is recognized that the armed forces are “being called on more frequently to battle wildfires, respond to flooding and major snow events, and move water to drought-stricken areas, at home and abroad”⁵⁶ and that this “will stress these organizations.”⁵⁷ However, it is difficult to quantify whether or not the CAF is being impacted, without first understanding how the CAF trains its forces. With understanding of the training requirements for the CAF elements supporting domestic HADR events, it will be easier to consider the impact of providing HADR support vice conducting the requisite training to maintain combat effectiveness.

Also, where in CAF policy is there direction on the CAF providing HADR support, vice solely training to respond to threats to Canada? Fortunately, there is clear policy guidance on the CAF being responsible to support domestic HADR response.

⁵⁵ Christian Leuprecht, and Peter Kasurak. *The Canadian Armed Forces and Humanitarian Assistance and Disaster Relief: Defining a Role*. Centre for International Governance Innovation. Published 24 August 2020. <https://www.cigionline.org/articles/canadian-armed-forces-and-humanitarian-assistance-and-disaster-relief-defining-role>. Last Accessed 26 April, 2021.

⁵⁶ Government of Canada. *Climate Change: Its impact and Policy Implications*. Publication no. 2019-46-E. Library of Parliament, Ottawa, Canada. 2020. 24.

⁵⁷ *Ibid.*

Canada's defence policy, *Strong Secure Engaged (SSE)*, provides a vision statement where the CAF will enable Canada, domestically, to be, "Strong at home, its sovereignty well-defended by a Canadian Armed Forces [which is] also ready to assist in times of natural disaster, other emergencies, and search and rescue."⁵⁸ As well as it relates to North America, SSE expects Canada to be an active participant in the North American Aerospace Defence (NORAD) partnership with the United States.⁵⁹ Finally, SSE envisions Canada and by proxy the CAF to be engaged in the world, contributing to a "more stable, peaceful world, including through peace support operations and peacekeeping."⁶⁰ Now armed with an understanding of Canada's defence policy and vision statement for the CAF, it is clear that there is a clear mandate to support HADR events domestically. Second only to providing security and maintaining Canada's sovereignty, the CAF has a clear mandate to support Canadians during HADR events. However, is it possible to maintain a high level of readiness to support Canada's sovereignty, while supporting an ever increasing amount of HADR events due to climate change?

In Southern Canada, sovereignty, such as border security is currently being maintained with constabulary law enforcement agencies providing a robust presence to ensure compliance. As well the CAF is both trained and ready to support threats in Southern Canada. The CAF has the Royal Canadian Navy (RCN) dispersed on both the Pacific and Atlantic coasts, and can react appropriately to any threats to Canada's sovereignty. The Royal Canadian Air Force (RCAF) has fighter bases dispersed near both

⁵⁸ Government of Canada. *Strong Secure Engaged: Canada's Defence Policy*. Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017.

⁵⁹ *Ibid.* 14.

⁶⁰ *Ibid.*

coasts (located in Cold lake Alberta, and Saguenay Quebec respectively) that can respond to threats as well. The Canadian Army (CA) has large force concentrations dispersed throughout Southern Canada, who are well trained to rapidly deploy to provide combat capable troops in diverse scenarios. However, with the CA especially, as they are usually the personnel that are tasked to provide extensive support to HADR events, and there is a danger that with ever increasing RFAs for HADR support, the CA's ability to maintain a high combat readiness may degrade in time, as they will not be able to conduct the required training to maintain their combat effectiveness

The RCN provides limited support for HADR events. Most of the flooding and fires are inland, where the Navy has a limited footprint. For the RCAF, providing support to HADR events, still allows the forces to maintain some proficiency, however it directly impacts the logistical support that the RCAF provides domestically and to overseas missions. If a transport aircraft like a C130J Hercules, or a C17, is tasked to support a HADR event, the pilots and operators are still conducting missions that are similar to other logistical missions. Moving supplies in support of a domestic event, or moving supplies supporting a mission in Latvia, still allows operators to practice their craft. For the CA, however, providing support to HADR events may degrade soldier's combat skill sets over time. This could impact the CAF's ability to support Canada's sovereignty in the future and for the CAF to be able to conduct combat mission abroad that are in the national interest. Before evaluating whether the combat effectiveness is degraded by supporting HADR, it is beneficial to have a periphery understanding on the combat capability of the CA.

The CA trains to a high level of proficiency to conduct brigade level operations. From Canada defence policy, “the brigade group consists of approximately 4, 800 soldiers, organized in eight major units generally including Artillery, Armour, Infantry, Engineer, and Combat Service Support organizations.”⁶¹ This is brigade level mandate is the “minimum level at which it is possible to execute joint campaigns while integrating various components, be they from another service, government department, non-governmental organization, or coalition partner.”⁶² Therefore if a brigade level capability of the CA is the minimum requirement, what does the training requirement to have this capability entail? Also how does supporting HADR events effect the training required to have a functional brigade? These questions will provide insight of whether the CA and the CAF are being impacted by the increasing rate of HADR events due to climate change.

To build a brigade capability is not as easy task, and requires extensive planning to be successful. Like an aircraft, there are numerous components that are required to work in harmony, in order for a brigade to function as properly. Once the aircraft is built, the flight crew require training in order to be able to properly use the aircraft to its full potential. In a similar sense, the brigade’s major units that build the machine are the back bone of the brigade.⁶³ However, in order to integrate successfully, the major units have to also conduct individual unit training throughout the year, to maintain proficiency. The major units then integrate during a capstone exercise where training is conducted to

⁶¹ Government of Canada. *Strong Secure Engaged: Canada’s Defence Policy*. Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017.36.

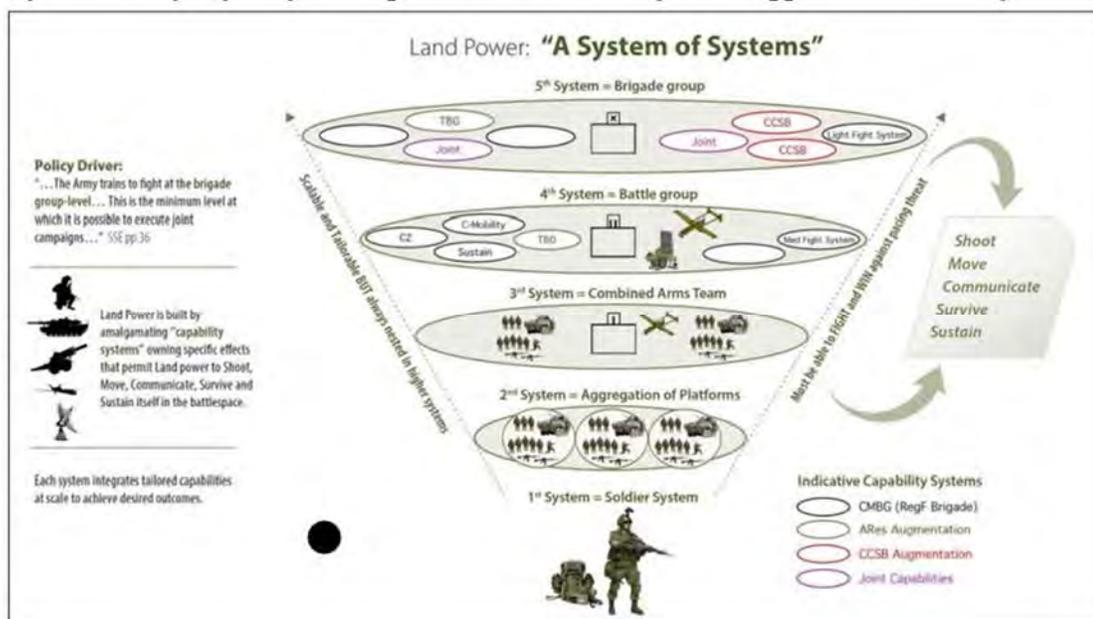
⁶² Government of Canada. *Strong Secure Engaged: Canada’s Defence Policy*. Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017.36.

⁶³ Assistant Deputy Minister (Review Services), *Evaluation of Land Readiness*. Department of National Defence. Canada. Nov 2016. Annex E.

ensure the brigade is functional and capable of working in harmony.⁶⁴ As depicted in figure 3.1 below, the ability to take a soldier and integrate them into a brigade requires multiple levels of training.

Understanding that creating a combat capable brigade is not simple, however, how long does this typically take to train a brigade? This analysis will be informative as it will allow an evaluation on how HADR events impact the combat readiness of the Brigade.

Figure 3.1, highlighting the importance of a building block approach to training.⁶⁵

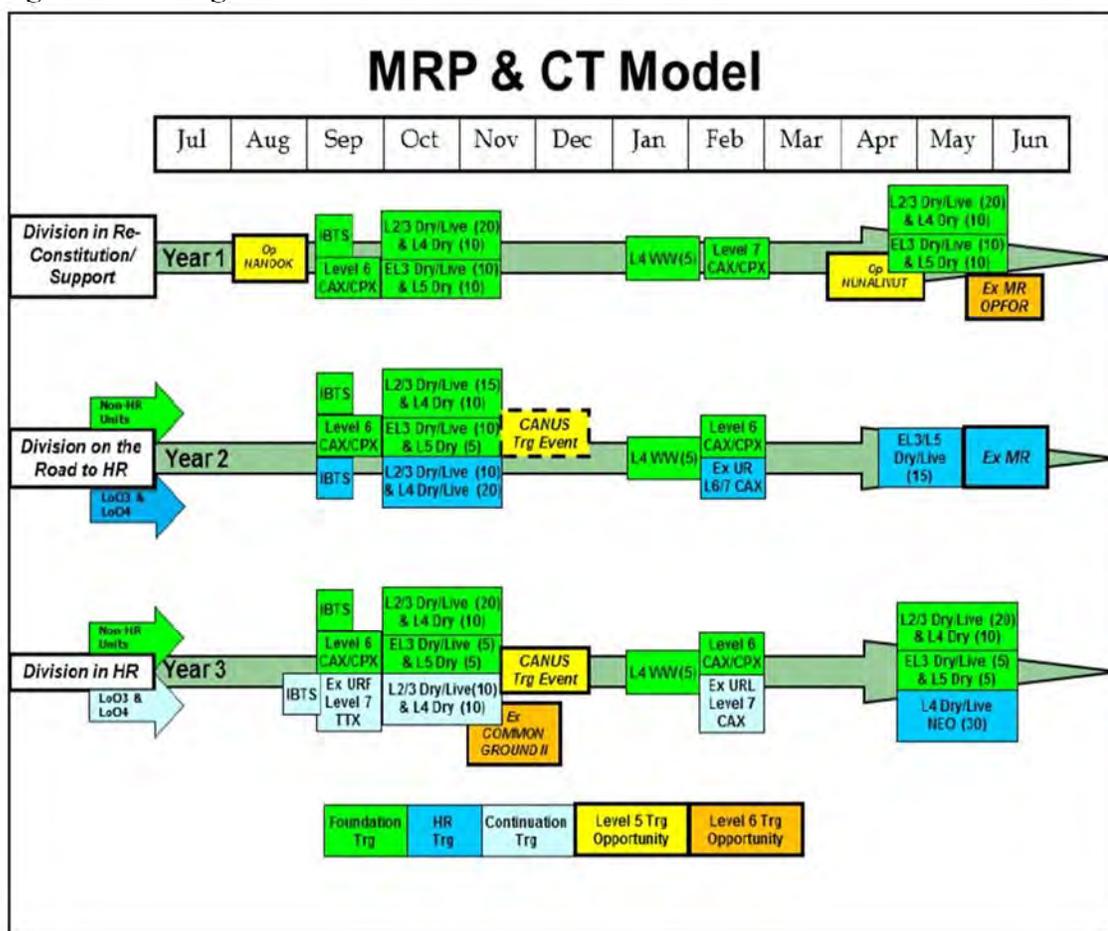


The CA, is divided up into 4 Canadian Divisions. However, of these four divisions, only three of them have regular force standing brigade capabilities. There is one in CFB Edmonton (3rd Canadian Division), CFB Petawawa (4th Canadian Division) and CFB Valcartier (2nd Canadian Division). The timeline for creating combat capable

⁶⁴ Assistant Deputy Minister (Review Services), *Evaluation of Land Readiness*. Department of National Defence. Canada. Nov 2016. Annex E.

⁶⁵ Canadian Army. *Advancing With Purpose: The Canadian Army Modernization Strategy*. Department of National Defence. Ottawa Ontario. 18.

brigades falls under a plan called the Managed Readiness Plan (MRP). Here (see figure 2.2) the training plan is a 3 year cycle, where one division is in re-constitution, another is building up its combat capability to be at high readiness (called the road to high readiness) and the other division is at high readiness. Therefore to get a brigade to high readiness typically takes one year and then it operates at a high readiness level for a year, before going into a reconstitution phase. Of note, even in the reconstitution phase there is still are still training requirements (OPFOR depicted in figure 3.2 implies that the brigade in reconstitution will act as the enemy during the capstone event for the brigade entering high readiness).

Figure 3.2 Managed Readiness Plan for the CAF.⁶⁶

The MRP ensures that Canada has a division that is poised to always be at high readiness with a regular force brigade at its disposal. Figure 3.2 also highlights that the brigade level exercise that certifies a brigade as combat mission ready, takes place between May and June (EX MR stands for Maple Resolve, and is the high readiness certification exercise of the CA)⁶⁷. Missing this exercise, severely degrades the ability of a brigade to function together. However, the months of May and June are also prime

⁶⁶ Assistant Deputy Minister (Review Services), *Evaluation of Land Readiness*. Department of National Defence. Canada. Nov 2016. Annex E.

⁶⁷ [National Defence News Release: Exercise MAPLE RESOLVE 19: Canadians and allies train for complexities of modern conflict - Canada.ca](https://www.crest.ca/2019/03/24/national-defence-news-release-exercise-maple-resolve-19-canadians-and-allies-train-for-complexities-of-modern-conflict-canada.ca). Posted 24 March 2019. Last Accessed 26 April, 2021.

flood risks, which can be a problem for the CA to maintain their combat effectiveness, if they are tasked to support flood mitigation. Therefore a central questions is, why can't Ex Maple Resolve occur during a different time of the year? Unfortunately, there are multiple reasons.

One reason is that July and August are the typical months that the CAF moves its personnel. Also new recruits will typically be conducting basic training during the summer as well. Therefore new personnel are coming into the brigade during the months of July and August and getting situated with their families. Many military families have school aged children, where classes run from September through the end of June. Therefore posting someone to a new unit, and then immediately sending them on a months long training exercise would be exceedingly difficult on the family. As well, for CAF members to be able to fully integrate into a brigade prior to an exercise like Maple Resolve, takes months of sub-unit collective training to be properly ready for the high readiness exercise.⁶⁸

Currently even in a peace time situation when a brigade is not deployed overseas, there are numerous tasks associated with being a qualified infantry soldier. By some estimates upwards of 160 of the 200 yearly training days allocated to train a soldier are already designated for training outside of collective training at the company level and below.⁶⁹ Therefore soldiers have to be in place starting in September, in order to be ready to be gainfully employed in Ex MR in May. Also, even if it were possible to move the

⁶⁸ Canadian Army. *Advancing With Purpose: The Canadian Army Modernization Strategy*. Department of National Defence. Ottawa Ontario. 18.

⁶⁹ Jesse van Eijk. *Doing Too Much With Too Little, All of the Time: The Effects of Tempo on Canadian Infantry Battalions*. Her Majesty the Queen in Right of Canada. Toronto, Ontario. 2018. 56.

training dates to earlier in the year, it is unlikely that the weather would cooperate. Wainwright Alberta is the main training establishment for Ex MR. Weather in Wainwright from November through April is not conducive to high level training, with temperatures frequently straying into sub zero weather.⁷⁰ Having to adapt to frigid weather, directly impacts desired learning objectives, thus changing the training exercise to one of winter survival for the soldiers.

Therefore if the training schedule for high level training is somewhat set, and also corresponds to the HADR timings, what is the impact to the CA MRP and the pursuit of a high readiness brigade in Canada?

Currently the CA is able to manage the HADR response because outside of the MRP, it maintains, in each division, units that are at high readiness called Incident Response Units (IRU).⁷¹ In these IRUs, there is a reconnaissance team that can quickly deploy in 8 hours,⁷² to figure out what the situation is, and how best the IRU can support. The IRU is divided into a reconnaissance team (8 hours to respond), a Vanguard team (12 hours to respond) and main body (24 hours to respond) of the IRU.⁷³ These units are capable of responding to HADR events and can coalesce to the areas of the greatest need

⁷⁰ World Weather Online. "Wainwright monthly climate averages." <https://www.worldweatheronline.com/wainwright-weather-averages/alberta/ca.aspx>. Last Accessed 27 April, 2021.

⁷¹ Department of National Defence. *Standing Operations Order for Domestic Operations (SOODO)*. Ottawa: Canadian Joint Operations Command, 2014.

⁷² Department of National Defence. *Standing Operations Order for Domestic Operations (SOODO)*. Ottawa: Canadian Joint Operations Command, 2014. Annex C.

⁷³ *Ibid.* Annex B.

and add on special requirements as the situation demands.⁷⁴ This is one of the methods the CA has adapted to climate change.

However, responding to an ever increasing amount of HADR events is taking a toll on the CA. The previous Chief of the Defence Staff (CDS), Gen (retired) Vance, thought that the CAF's "...force structure....is probably too small to be able to deal with all of the tasks."⁷⁵ As well, the strain of training to high readiness and then subsequent deployments, and then being called into to support HADR events during the reconstitution phase of the MRP is not ideal. As Gen (retired) Vance explains, “

if you think of the average year in the life of a soldier, they might be away six months doing an operation outside of Canada, come home, during that reconstitution period -the period of time that they're with their family, and sort of getting back into [the] swing of things back home- they could be called out again in their thousands to be dealing with the effects of climate change.⁷⁶

There is also growing concern that the impact of responding to HADR events at an ever increasing pace will also having an effect of the combat capability of the CA in the future. As the previous leader of the CA, LGen Eyre now acting CDS, when taking command of the CA, highlights that, “if this [CA HADR response] becomes of a larger scale, more frequent basis, it will start to affect our readiness.”⁷⁷ Further more he explains that, “It's like a hockey team that would never train, never play on the ice

⁷⁴ Claire Bramma. *Directing the DART Towards Climate Change*. Canadian Forces College. Toronto, Ontario. 2015. 33.

⁷⁵ Major, Darren and Salimah Shivji. *Canada's military feeling the strain responding to climate change*. CBC News. <https://www.cbc.ca/news/politics/canada-s-military-adopting-climate-change-1.5186337>. Published 24 January 2019. Last Accessed 26 April, 2021.

⁷⁶ Major, Darren and Salimah Shivji. *Canada's military feeling the strain responding to climate change*. CBC News. <https://www.cbc.ca/news/politics/canada-s-military-adopting-climate-change-1.5186337>. Published 24 January 2019. Last Accessed 26 April, 2021.

⁷⁷ Berthiaume, Lee *Disaster relief a threat to the Canadian army's fighting edge, commander says*. National Post. Published 20 January 2020. <https://nationalpost.com/news/canada/disaster-relief-threatens-to-hinder-canadian-armys-readiness-for-combat-commander> Defence Budget - Canada.ca. Last Accessed 26 April, 2021.

together, and then all of a sudden being thrown into an NHL game and be expected to win.”⁷⁸ Though in this case, where soldiers are not able to consistently train together, the result is more dire than a loss in a sporting event, and could potentially have real consequences. Currently LGen Eyre, is comfortable with the CA army readiness, and doesn’t mind if training is missed, “for a year or two.”⁷⁹ However, he is concerned that in the future, the increasing demands for large scale CA support to HADR, may have real consequences in the future combat capability of the CA.⁸⁰ To answer the question posed in the beginning of the chapter, it seems that the CA response to HADR events is currently manageable, however, with an ever increasing rate of RFAs, this may change in the near future.

As the CA is not in a war time scenario, it is difficult to measure quantitatively whether the increasing demands for a CA HADR response, is decreasing the combat capability. Additionally if the combat effectiveness was in fact degraded, it would be unlikely that this would be released to the public, due to concerns about National security. The CAF is unlikely to say no to provide support fellow citizens in extenuating circumstances, therefore the cost will be borne by the troops. The CA will likely always respond to the call for domestic support, and it is baked into Federal policy and army doctrine. However, there is a cost. Though beyond the scope of this research project, the impacts from an increased operational tempo can perhaps more qualitatively be evaluated, with an analysis of the increased stress placed on individual soldiers. Stress

⁷⁸ Berthiaume, Lee *Disaster relief a threat to the Canadian army’s fighting edge, commander says*. National Post. Published 20 January 2020. <https://nationalpost.com/news/canada/disaster-relief-threatens-to-hinder-canadian-armys-readiness-for-combat-commander> Defence Budget - Canada.ca. Last Accessed 26 April, 2021.

⁷⁹ *Ibid.*

⁸⁰ *Ibid.*

injuries, medical releases, or an increased rate of suicides could be symptoms of overtaxed soldiers. This would be difficult to prove a causal relationship with respect to HADR support, however, there is a relationship between increased operational tempo and mental health issues.⁸¹ As well, between 2002 and 2013 mental health problems have increased in the CAF, though this is likely due to the fact that upwards of 40 000 CAF personnel having deployed to the Afghanistan mission.⁸² With a constant battle rhythm of training, operations and HADR response, it may be difficult for soldiers to reconstitute and build back mental resiliency, as the former CDS alluded to. The next chapter will discuss possible avenues for mitigation of the CA being increasingly called in for HADR support.

However, the CAF HADR response is only one part of the issues that the CAF is facing with the onset of climate change. The other half is in the Canadian Arctic, and the issues and problems in the region due to climate change. The problems and issues in the Arctic are quite different, and require a separate section to discuss.

THE CANADIAN ARCTIC

In Southern Canada, the sovereignty of Canada is pretty well established. Few dispute that the CN tower is not part of Canada, or the Ottawa River is not Canadian internal waters. However, the same can not be said for Northern Canada.

⁸¹ British Medical Journal. *Overstretched Armed Forces Leading To Mental Health Problems*. Science Daily. Published 6 August 2007. www.sciencedaily.com/releases/2007/08/070802202112.htm Last accessed April 27, 2021.

⁸² MA Zamorski, Bennett RE, Rusu C, Weeks M, Boulos D, Garber BG. *Prevalence of Past-Year Mental Disorders in the Canadian Armed Forces, 2002-2013*. The Canadian Journal of Psychiatry. 2016.

Figure 3.3 Depiction of the Canadian Arctic⁸³

In Northern Canada (see figure 3.3 above) the coastline is immense, and accounts for 70% of Canada's coastline.⁸⁴ Previously the water ways between the Canadian archipelago islands have been frozen year round, with local indigenous communities living and hunting on the ice for thousands of years.⁸⁵ However, global warming has changed this dynamic. It has created a trade route that was until recently not viable, and didn't exist previously. This trade route (see figure 3.4 below), the Northwest Passage (NWP), which is now open for extended periods during the summer season, could

⁸³ Lemmen, D.S., Warren, F.J., James, T.S. and Mercer Clarke, C.S.L. editors (2016): *Canada's Marine Coasts in a Changing Climate*. Government of Canada, Ottawa, ON. 157.

⁸⁴ *Ibid.* 155.

⁸⁵ Michael Byers, *Who owns the Arctic? : understanding sovereignty disputes in the north* (Douglas & McIntyre An imprint of D&M Publishers Inc. 2009. 50.

potentially save billions in shipping costs as companies can take a more direct route to their destinations (see figure 3.5).

Figure 3.4 Map of the circumpolar region.⁸⁶



The Economist

⁸⁶ M.D. *Who owns the Northwest Passage? America tries to freeze Canada out of the route through the Arctic.* Published 22 May 2019. The Economist. London England. <https://www.economist.com/the-economist-explains/2019/05/22/who-owns-the-northwest-passage>. Last Accessed 26 April, 2021.

Figure 3.5 Differences in travel distances employing different trade routes.⁸⁷

Origin–Destination	Panama	Northwest Passage	Northeast Passage	Suez and Malacca
Rotterdam–Shanghai	25,588	16,100	15,793	19,550
Bordeaux–Shanghai	24,980	16,100	16,750	19,030
Marseilles–Shanghai	26,038	19,160	19,718	16,460
Gioia Tauro (Italy)–Hong Kong	25,934	20,230	20,950	14,093
Barcelona–Hong Kong	25,044	18,950	20,090	14,693
New York–Shanghai	20,880	17,030	19,893	22,930
New York–Hong Kong	21,260	18,140	20,985	21,570
Rotterdam–Los Angeles	14,490	15,120	15,552	29,750
Lisbon–Los Angeles	14,165	14,940	16,150	27,225

Canada views the NWP as internal waters and has argued its case via international forums for decades.⁸⁸ However, the NWP as Canadian internal waters is not a universally held view. In fact, Canada’s ally and main trading partner views the NWP differently.⁸⁹ To the US, the NWP is not Canadian internal waters but rather

...fulfills the legal criteria for an international strait by connecting two expanses of high seas (the Atlantic and Arctic oceans) and being used for international navigation. From this perspective, Canada owns the waterway, but foreign vessels have a right of “transit passage,” much like walkers on a footpath through British farmland.⁹⁰

Therefore with the NWP being contested waters, does this affect Canada’s sovereignty? What has Canada done to secure the NWP? If Canada’s sovereignty is at stake, then the CAF must adapt to this reality, and be prepared to respond to any

⁸⁷ P. Whitney Lackenbauer, Adam Lajeunesse, James Manicom et al, *China's Arctic ambitions and what they mean for Canada*. Beyond Boundaries: Canadian Defence and Strategic Studies Series, No. 8. University of Calgary Press. Calgary.2018. 74.

⁸⁸ Michael Byers, *Who owns the Arctic? : understanding sovereignty disputes in the north* (Douglas & McIntyre An imprint of D&M Publishers Inc. 2009. 43.

⁸⁹ US Government. *National Strategy for the Arctic Region*. Washington, USA. 2013.9.

⁹⁰ Michael Byers, *Who owns the Arctic? : understanding sovereignty disputes in the north* (Douglas & McIntyre An imprint of D&M Publishers Inc. 2009. 43.

sovereignty threats in the Canadian Arctic. A sovereignty threat demands an aggressive military approach. It requires a robust military presence defending against a nation state that is challenging Canada's sovereignty and therefore the country itself. However, if it is more a security challenge, then the CAF can provide a more supporting role in the Canadian Arctic, supporting a secure environment, that is amenable to development, and aiding other government departments in the development of the region.

Canadian politicians have legislated nationally, and its diplomats have engaged globally, to highlight Canada's case regarding the NWP. Canada was first challenged by the US in 1969, when the US aimed to navigate the NWP with an oil tanker, *the Manhattan*, with out permission to do so. This could have set a precedent, and built a case that the NWP was not internal waters, but rather an international strait.⁹¹ This is what happened when Albania lost its bid to classify the Corfu channel as an internal waters.⁹² The international court of justice ruled against Albania in 1949 due to the Corfu channel "connecting two parts of the high seas"⁹³ and because "the fact of its being used for international navigation."⁹⁴ It is reasonable to understand why Canada is sensitive to not meet the second part of the international court of justice's argument, as the NWP does connect the Atlantic and Pacific Oceans. Therefore in the 1969 incident Canada granted permission to the *Manhattan* (despite note requesting permission) and the Canadian

⁹¹ Michael Byers, *Who owns the Arctic? : understanding sovereignty disputes in the north* (Douglas & McIntyre An imprint of D&M Publishers Inc. 2009. 43.

⁹² Danita Catherine Burke. *The Northwest Passage Dispute*. Oxford Research Group, 26 February 2018.

⁹³ Adam Lajeunesse, *Brief to the Standing Committee on Foreign Affairs and International Development: Canada's Sovereignty in the Arctic*. St. Francis University Mulroney Institute of Government, Antigonish, Nova Scotia. 2018. 7.

⁹⁴ *Ibid.*

Coast Guard escorted the *Manhattan* through the NWP.⁹⁵ This Challenge from the US also prompted Canada to legislate the 1970 Arctic Waters Pollution Prevention Act (AWPPA).⁹⁶ The AWPPA enacted regulations for multiple safety and environmental standards for vessels navigating the NWP, and increased the national territorial oversight boundaries from 12 Nautical Miles (NM) to 100NM.⁹⁷

Canadian diplomats have also admirably leveraged the United Nations (UN) to get the AWPPA, a national act, accepted internationally. They were strong advocates of the 1982 Convention on the Law of the Sea (UNCLOS).⁹⁸ UNCLOS is important as it recognized right to establish an Economic Exclusion Zone (EEZ) extending national oversight to upwards of 200NM from a country's shore. This is important as it further highlights Canada's responsibilities in the NWP, where there are distances between the Canadian archipelago that are greater than 12NM, therefore the UNCLOS provides additional international jurisdiction for Canadian oversight.

Of particular interest to Canada was also article 234 of the UNCLOS, which Canadian diplomats sponsored.⁹⁹ This article formally recognized the rights of countries to regulate ice covered waterways in its EEZ.¹⁰⁰ Therefore the AWPPA which was once national legislation, thereby carrying limited weight in international law, was now

⁹⁵ Franklyn Griffiths, Rob Huebert and P. Whitney Lackenbauer, *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press. 2011. 35.

⁹⁶ Danita Catherine Burke. *The Northwest Passage Dispute*. Oxford Research Group, 26 February 2018.

⁹⁷ Michael Byers, *Who owns the Arctic? : understanding sovereignty disputes in the north* (Douglas & McIntyre An imprint of D&M Publishers Inc. 2009. 43.

⁹⁸ *Ibid.*

⁹⁹ Franklyn Griffiths, Rob Huebert and P. Whitney Lackenbauer, *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press. 2011. 77.

¹⁰⁰ *Ibid*

recognized and legally enforceable with international legislation.¹⁰¹ This legislation has improved Canada's sovereignty in the Canadian Arctic.

Canadian diplomats and politicians also were also essential champions of establishing an organisation to discuss Arctic challenges. This institution in the form of an Arctic Council, was created in 1996 with the Ottawa declaration.¹⁰² The push for the creation Arctic council started back in 1989, under the Mulroney Government.¹⁰³ The Arctic council allows for Arctic nations (Canada, The Kingdom of Denmark, Finland, Iceland, Norway, The Russian Federation, Sweden and the US)¹⁰⁴ “to provide means for promoting cooperation, coordination and interactions among the Arctic States – including the full consultation and full involvement of Arctic Indigenous communities and other Arctic inhabitants.”¹⁰⁵

One of the most interesting aspects of this forum is that creates an avenue for Indigenous participation, as permanent participants, to be part of the discussions on the future of the Circumpolar Region. This aspect of the Arctic Council includes Canadian Indigenous populations, such as the Athabaskan, Gwich'in and the Inuit peoples.¹⁰⁶ This is important, as to some Southern Canadians (including the author), the Canadian Arctic is a place of myth and legend, whereas for the Indigenous populations, who have lived

¹⁰¹ Franklyn Griffiths, Rob Huebert and P. Whitney Lackenbauer, *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press. 2011. 77.

¹⁰² Arctic Council, “History of the Arctic Council”, 28 March 2021. <https://arctic-council.org/en/about/timeline/>. Last accessed: 26 April 2021.

¹⁰³ Franklyn Griffiths, Rob Huebert and P. Whitney Lackenbauer, *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press. 2011. 137.

¹⁰⁴ Arctic Council, “Who We Are”, 28 March 2021. <https://arctic-council.org/en/explore/work/cooperation/>. Last Accessed: 26 April 2021.

¹⁰⁵ Arctic Council, “How We Work, Agreements and Cooperation”, 28 March 2021. <https://arctic-council.org/en/explore/work/cooperation/>. Last Accessed: 26 April 2021.

¹⁰⁶ Arctic Council, “Permanent Participants” 28 March 2021. <https://arctic-council.org/www/www/en/about/permanent-participants/>. Last Accessed: 26 April 2021.

there since time immemorial, it is their home. It therefore creates an opportunity for Canadian diplomats and politicians to learn from Indigenous communities and to have awareness of the actual tangible problems in the Canadian Arctic. As well, since the Indigenous populations are not bounded by national boundaries (The Athabaskan, The Gwich'in and The Inuit peoples are located in multiple countries)¹⁰⁷ there is an added ability to collaborate on particularly divisive problems.

However, despite the work that Canadian diplomats and politicians have conducted, the debate on whether Canada sovereignty is at risk, with respect to the Canadian Arctic and the NWP, is still on going.¹⁰⁸ There is one viewpoint, led by political scientist Rob Huebert and David Wright,¹⁰⁹ that presents a vision that if Canada does not provide decisive action, it will be impotent to react to a changing environment and will be dominated by tri-lateral completion (Russia, US and China).¹¹⁰ The contrasting viewpoint, which was initially led by historian Dr. Franklyn Griffiths, emphasizes that leveraging concerns about national sovereignty is misguided, and potentially causes more harm than good.¹¹¹ Claiming that the Russians, Chinese, and the even the Americans are at Canada's doorstep garners a lot of media attention, however after the news cycle moves on, there is limited improvements to the systemic problems in the area.¹¹² Instead, the focus should be on stewardship and supporting the local

¹⁰⁷ Arctic Council, "Permanent Participants" 28 March 2021. <https://arctic-council.org/www/www/en/about/permanent-participants/>. Last Accessed: 26 April 2021.

¹⁰⁸ P Whitney Lackenbauer, Adam Lajeunesse, James Manicom et al, *China's Arctic ambitions and what they mean for Canada*. Beyond Boundaries: Canadian Defence and Strategic Studies Series, No. 8. University of Calgary Press. Calgary.2018.9.

¹⁰⁹ *Ibid.*

¹¹⁰ Rob Huebert. Zoom interview: NAADSN Ideas: *Did the Cold War Ever End?: The New Arctic Security Triangle Environment*. Oct 29, 2020

¹¹¹ Franklyn Griffiths. *Canada's Arctic sovereignty not on thinning ice*. International Journal, 2003

¹¹² *Ibid.*

indigenous population who are being challenged by the changing environment of the region.¹¹³ As well, though the NWP is melting, the Arctic Monitoring and Assessment Programme (AMAP) is forecasting that by 2030¹¹⁴ the Arctic Ocean will be ice free, and have months where transpolar navigation is possible.¹¹⁵ Additionally, Russia has developed its Northern Sea Route (NSR) to a greater extent than Canada has developed the NWP, therefore if all things are equal, companies are more likely to use the NSR than the NWP for shipping.¹¹⁶ Therefore there is the potential that Canada would needlessly expend resources to militarily arm the NWP for challenges that may not arise (due to the potential to conduct transpolar navigation through the Arctic Ocean, or use the NSR, vice navigating the NWP), which may result in a waste of resources badly needed in other areas in the Canadian Arctic. Therefore with no clear cut consensus from policy experts on whether Canada sovereignty is at risk in the Arctic, it may be helpful to evaluate the likeliest threat to Canada's sovereignty by reviewing the countries in the circumpolar region that will likely threaten Canada and its interests in the Arctic.

Russia seems to be the obvious choice as a threat to Canada's sovereignty in the circumpolar region. Russia constantly tests the North American Aerospace Defense (NORAD) response procedures, and frequently enters Canada's Air Defence

¹¹³ Franklyn Griffiths, Rob Huebert and P. Whitney Lackenbauer, *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press. 2011. 2.

¹¹⁴ AMAP, 2017. *Snow, Water, Ice and Permafrost. Summary for Policy-makers*. Arctic Monitoring and Assessment Programme (AMAP), Oslo, Norway. 20 pp

¹¹⁵ Franklyn Griffiths. *Canada's Arctic sovereignty not on thinning ice*. International Journal, 2003

¹¹⁶ P Whitney Lackenbauer, Adam Lajeunesse, James Manicom et al, *China's Arctic ambitions and what they mean for Canada*. Beyond Boundaries: Canadian Defence and Strategic Studies Series, No. 8. University of Calgary Press. Calgary.2018.74

Identification Zone (CADIZ) with its bomber fleets,¹¹⁷ including in the Arctic.¹¹⁸ As well, in the maritime domain, Russia has a robust navy, with a robust arsenal of submarines and surface ships positioned in its Arctic,¹¹⁹ and are building upwards of 13 additional ice breakers, worrying high level officials in DND.¹²⁰ However, is Russia a threat to Canada sovereignty in the Arctic?

It is reasonable to be concerned about Russia in the circumpolar region. It is a country that doesn't hesitate to interfere with other countries elections¹²¹ and its annexation of Crimea is particularly worrisome. Russia is governed by its own interests and Canada should rightly be concerned about what those are. However, when it comes to the Canadian Arctic and the NWP, it is unlikely that Russia is a direct threat.

Russia and Canada have common interests in the Arctic. Both countries treat their trade routes (the NSR and NWP) as sovereign waters. The actions that Canada has taken to gain legitimacy for the NWP, is very similar to the approach that Russia has taken.¹²² Each country maximized the UNCLOS in a similar manner to gain recognition that their trade routes were part of their country, and not an international strait.¹²³ Any challenges

¹¹⁷ Global News. *Canadian jets intercept 2 Russian bombers near North American coastline: NORAD*. <https://globalnews.ca/news/4894339/norad-russian-bombers-canada/>. Published 26 January 2019 Last Accessed 27 April, 2021.

¹¹⁸ CBC News. <https://www.cbc.ca/news/canada/canadian-fighter-jets-intercept-russian-bombers-in-arctic-1.2772440>. Published 19 September 2014. Last Accessed 26 April, 2021.

¹¹⁹ Jørgen Staun. *A Two-Faced Russia? Civilian Interests and Great Power Politics in the High North*. Springer Nature. Switzerland. 2020. 23.

¹²⁰ Fife, Robert. *Top defence official says China is a threat to Canadian Arctic*. The Globe and Mail. <https://www.theglobeandmail.com/politics/article-top-defence-official-says-china-is-a-threat-to-canadian-arctic/>. Published 10 March 2021. Last Accessed 27 April, 2021.

¹²¹ CBC News. *Russia interfered in U.S. election, likely at Putin's behest, intelligence report says*. <https://www.cbc.ca/news/world/russia-biden-trump-election-interference-1.5952076>. Published 16 March 2021. Last Accessed 27 April, 2021.

¹²² Andrey A. Todorov. *The Russia-USA legal dispute over the straits of the Northern Sea Route and similar case of the Northwest Passage*. Northern Arctic Federal University. 2017.

¹²³ *Ibid.*

that Russia makes with respect to Canada's sovereignty in the NWP and the Canadian Arctic, has the potential of being counter productive to its own interests. Russian trespassing into the NWP without permission also delegitimizes its own claim regarding the NSR. Also Russia's military build up in its Arctic region is not overly surprising, as it is quite possible it wants to protect the NSR as sovereign territory, and deter any direct challenges from the US and NATO.¹²⁴ There are many similar interests that Canada shares with Russia in the Arctic, to such an extent that a former minister of Foreign Affairs and National Defence noted that with respect to Russia there, "is a long-standing tradition of discreet, non-politicized-"under the radar," cooperation..."¹²⁵ with respect to search and rescue in the Arctic. In search and rescue as well as other areas, such as viewing the NSR and NWP as national internal waters, these common interests makes Russia unlikely to be a sovereignty threat in the Canadian Arctic.

Canada's defence policy, *Strong Secure Engaged* (SSE), recognizes that Arctic council members benefit more from a collaborative relationship vice an overly antagonistic one, when it comes to the Arctic. SSE states that "Arctic states have long cooperated on economic, environmental, and safety issues, particularly through the Arctic Council, the premier body for cooperation in the region"¹²⁶ and that they "have an enduring interest in continuing this productive collaboration."¹²⁷ Therefore SSE recognizes that it is the interests of the members of the Arctic Council to work together

¹²⁴ P. Whitney Lackenbauer and Adam Lajeunesse. *The Canadian Armed Forces in the Arctic: Building Appropriate Capabilities*. Journal of Military and Strategic Studies, Vol 16, Is 4 (2016). 28.

¹²⁵ Franklyn Griffiths, Rob Huebert and P. Whitney Lackenbauer, *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press. 2011 forward.

¹²⁶ Government of Canada. *Strong Secure Engaged: Canada's Defence Policy*. Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017.36.

¹²⁷ *Ibid.*

with respect to the Arctic, and that there are opportunities (specifically in search and rescue) for collaboration.

If Russia and Canada have overlapping interests in the Arctic, consequently making Russia perhaps not a threat to Canada's sovereignty in the Arctic, then what is the threat? Perhaps China?

China does seem to be particularly antagonistic towards Canada, especially since Canada's arrest of Meng Wanzhou from Huawei at the behest of the US.¹²⁸ Rob Huebert has highlighted the potential for the rise in tensions in the Arctic, commenting that "They [China] will be there [Arctic]. They're spending the money. Their navy is being modernized as we speak at a time when the American navy is facing huge budget cuts."¹²⁹

However, China directly challenging Canada's sovereignty in the Canadian Arctic and the NWP, could have the potential of backfiring on China. It could bring pointed questions regarding China's claims on the Qiongzhou Strait and the South China Sea.¹³⁰ Similar to Canada, China views those waters as internal waters and as such are unlikely to transit the NWP¹³¹ without first seeking permission.¹³² Also if China is

¹²⁸ Jane Wolsak. *Huawei and Canada: The story so far of the Chinese company, Meng Wanzhou's case and a global political feud*. The Globe and Mail. Published 6 December 2018. [Huawei and Canada: The story so far of the Chinese company, Meng Wanzhou's case and a global political feud - The Globe and Mail](#). Last Accessed 26 April, 2021.

¹²⁹ P Whitney Lackenbauer, Adam Lajeunesse, James Manicom et al, *China's Arctic ambitions and what they mean for Canada*. Beyond Boundaries: Canadian Defence and Strategic Studies Series, No. 8. University of Calgary Press. Calgary.2018.10.

¹³⁰ *Ibid* .91.

¹³¹ P.Whitney Lackenbauer and Adam Lajeunesse. *The Canadian Armed Forces in the Arctic: Building Appropriate Capabilities*. Journal of Military and Strategic Studies, Vol 16, Is 4 (2016).15.

¹³² Though with the Royal Canadian Navy challenging China by transiting through the South China Sea in March of 2021, perhaps Chinese reticence in engaging the Canada's sovereignty claims in the NWP will change.

looking to secure additional trade routes for its business, confronting Canada on the NWP may not be the best method gaining access for its companies.¹³³ China's Arctic policy states that it respects the sovereignty of Arctic states,¹³⁴ and that it recognizes the "existing framework of international law including the UN Charter, UNCLOS, treaties on climate change and the environment..."¹³⁵ China does want to be involved in the Arctic, and considers itself to be a "near Arctic state".¹³⁶ It is logical that China views the Arctic as strategically important. With trade routes opening that can expedite shipping and resources becoming available and accessible, China will continue to be a player in the Arctic. However, through its actions and published policies, it does not appear that China will be a direct threat to Canada's sovereignty through military intervention in the Canadian Arctic.

Therefore if military confrontation in the Canadian Arctic being unlikely, even with climate change and a melting Arctic, then what is the threat to Canada that the CAF must be ready for? Likely without a clear military threat, the more likely mission of the CAF is in a supporting role in guarding against unauthorized commercial exploitation of the Canadian Arctic. As previously mentioned, the CAF must prepare for an ice free area that is rich in both mineral and fishing resources, which may be enticing for companies to exploit without clear oversight and regulation. China, though unlikely to confront Canada militarily, has been known to exploit the seams in international law (or even circumvent

¹³³ P Whitney Lackenbauer, Adam Lajeunesse, James Manicom et al, *China's Arctic ambitions and what they mean for Canada*. Beyond Boundaries: Canadian Defence and Strategic Studies Series, No. 8. University of Calgary Press. Calgary.2018. 91.

¹³⁴ China's Arctic foreign policy. State Council Information Office of the People's Republic of China. Published 26 January 2018, http://www.xinhuanet.com/english/2018-01/26/c_136926498.htm. Last accessed 28 September 2019. (I, para 2).

¹³⁵ *Ibid.* III

¹³⁶ *Ibid.* II

them) with their “armada”¹³⁷ of fishing vessels.¹³⁸ China fishing vessels take in “about 15 percent of total global fishing captures in 2018, more than the total captures of the second- and third-ranked countries combined.”¹³⁹ As well the “fishing stocks closest to China’s shores have collapsed from overfishing and industrialization, which is why the Chinese government heavily subsidizes its fishermen, who sail the world in search of new grounds.¹⁴⁰ China has been known to send their trawlers upwards of “15, 000 kilometres from the coast of China to the Galapagos Islands”¹⁴¹ in search of fertile fishing grounds.¹⁴² It is not hard to imagine countries who have depleted their local fishing grounds, to then look hungrily to the Arctic. Therefore the military mission that makes the most sense in the Arctic, is one of surveillance and support to other government departments, such as the Canadian Coast Guard (CCG), in protecting Canada’s resources from unauthorized exploitation.

With respect to how the federal government views the CAF’s role in the Arctic, it is clear in SSE that “the sheer expanse of Canada’s North, coupled with its ice-filled seas, harsh climate, and more than 36, 000 islands make for a challenging region to monitor.”¹⁴³ With the relatively small size of the CAF, SSE seems to understand that for the CAF to be able to provide surveillance of the Canadian Arctic, will require the CAF

¹³⁷ Urbina, Ian. *The deadly secret of China’s illegal fishing armada: Desperate North Korean fishermen are washing ashore as skeletons because of the world’s largest illegal fleet*. NBC NEWS. <https://www.nbcnews.com/specials/china-illegal-fishing-fleet/> Published 22 July 2020. Last Accessed 27 April, 2021.

¹³⁸ *Ibid.*

¹³⁹ *Ibid.*

¹⁴⁰ *Ibid.*

¹⁴¹ Ebbighausen, Rodion. *Chinese fishing near Galapagos Islands raises fears for wildlife*. DW Akademie. Published 6 August 2020. [Chinese fishing near Galapagos Islands raises fears for wildlife | Asia | An in-depth look at news from across the continent | DW | 06.08.2020](#). Last Accessed 26 April, 2021.

¹⁴² *Ibid.*

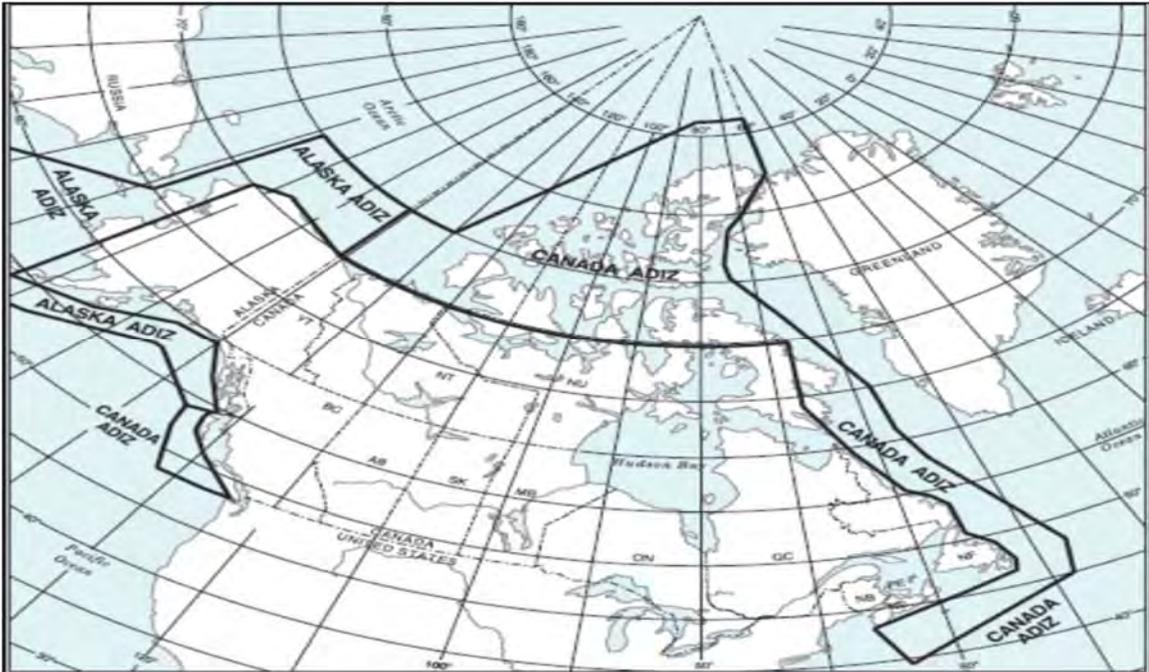
¹⁴³ Government of Canada. *Strong Secure Engaged: Canada’s Defence Policy*. Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017.79.

to leverage technology to its fullest extent. SSE also provides mandates for the Royal Canadian Air Force (RCAF), the Royal Canadian Navy (RCN), and the Canadian Army (CA) on how to accomplish this mission.

For the RCAF, SSE expands the Canadian Air Defence Identification Zone to align with Canada's airspace (see figure 3.6).¹⁴⁴ Through NORAD, the CAF is now responsible to identify all aircraft coming into the Canadian Arctic, vice only aircraft that are detectable by Canadian radar via the North Warning System (NWS) (see figure 3.7). Currently, this surveillance mandate is aspirational, as without an updated identification system to replace the NWS, the CAF is not able to identify aircraft outside of the NWS, (see figure 3.7). The NWS was initially designed to identify track the Russian bombers that were looking to attack Canada and the US with airborne launched cruise missiles. However, with the expanded surveillance ranges of the CADIZ, as well as new missile profiles with extended stand off capabilities, the NWS will need to be updated. This update will allow the CAF to fulfill its mandate, and to be able to respond to airborne sovereignty challenges over the newly defined CADIZ.

¹⁴⁴ Government of Canada. *Strong Secure Engaged: Canada's Defence Policy*. Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017.80.

Figure 3.6 Canada's CADIZ and area of responsibilities for detection.¹⁴⁵



¹⁴⁵ Kelsey Lindsey. *Canada expands its Air Defence Identification Zone to Cover Arctic Archipelago*. Arctic Today. <https://www.arctictoday.com/canada-expands-air-defense-identification-zone-cover-arctic-archipelago/> Published 29 May, 2018. Last Accessed 28 April, 2021.

Figure 3.7 Canadian Radar actual (unclassified) Coverage of the CADIZ¹⁴⁶



SSE also designates the RCAF as the CAFs lead for building the space based program.¹⁴⁷ SSE highlights the responsibility for the RCAF to create a surveillance picture of the Arctic employing space based assets to provide “earth observation and maritime domain awareness, and satellite communications that achieve global coverage, including in the Arctic.”¹⁴⁸ This includes the use of the Radarsat Constellation Mission (RCM). The RCM launched on 12 June 2019, is three satellites that work together employing synthetic aperture radars, which flies over the Arctic approximately every 6 hours.¹⁴⁹ From a maritime surveillance perspective, these satellites are capable of

¹⁴⁶ CBC News. *Nasittug to lay off 240 employees this summer*. Published 11 June 2014. Last Accessed 28 April, 2021.

¹⁴⁷ Government of Canada. *Strong Secure Engaged: Canada’s Defence Policy*. Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017.79.

¹⁴⁸ *Ibid.* 72.

¹⁴⁹ Government of Canada. “Canadian Space Agency/Satellites/RADARSAT/FAQs. <https://www.asc-csa.gc.ca/eng/satellites/radarsat/faq.asp>. Last Accessed 26 April, 2021.

detecting ships 25 metres in length, as far away as 2000Km from the coast of Canada.¹⁵⁰ These satellites provide a key capability in providing surveillance of the maritime domain, however they are also outfitted with an Automatic Identification System (AIS).¹⁵¹ AIS is required for all commercial vessels over 299 Gross Tonnage and all passenger vessels.¹⁵² Pairing the AIS data with the synthetic aperture radar allows for multiple deductions and tactical intercepts of any Vessels of Interest (VOI). First, it enables the CAF to determine if a VOI is where they are reporting to be. If the VOI is not reporting its correct location (as the radar data would show the correct location), this would warrant further investigation. The AIS/RCM data also verifies if VOIs are operating according to their sailing plan, which is mandatory to submit prior to entering the NWP.¹⁵³ As well, if there is no AIS data, however the RCM detects a VOI inside the Canadian Economic Exclusion Zone, this data could be used as a cueing system to maneuver the Canadian Coast Guard to investigate against a potential dark ship,¹⁵⁴ perhaps circumventing any vessels exploiting Canada's resources or a smuggling operation. As well with the RCM flying over the Canadian Arctic multiple times a day, it allows for the RCM to determine a pattern of life, which allows for machine learning to use predictive analysis to determine if a VOI is potentially conducting illegal activity.¹⁵⁵

¹⁵⁰ Government of Canada. "Canadian Space Agency/Satellites/RADARSAT/FAQs. <https://www.asc-csa.gc.ca/eng/satellites/radarsat/faq.asp>. Last Accessed 26 April, 2021.

¹⁵¹ *Ibid.*

¹⁵² Marine Traffic. "Marine Traffic Help/FAQs/About the AIS." [What is the Automatic Identification System \(AIS\)? – Marine Traffic Help](#). Last Accessed 27 April, 2021.

¹⁵³ Knight, Christopher. *NORDREG now Mandatory Within the Northwest Passage*. Mondaq. Published 8 November 2010. <https://www.mondaq.com/canada/marine-shipping/114788/nordreg-now-mandatory-within-the-northwest-passage>. Last Accessed 27 April, 2021

¹⁵⁴ Government of Canada. "Canadian Space Agency/Satellites/RADARSAT. <https://www.asc-csa.gc.ca/eng/satellites/radarsat/data-serve-canadians.asp> Last Accessed 27 April, 2021.

¹⁵⁵ Steven Horn. *Detection and Tracking of Ships in the Canadian Arctic*. Defence Research and Development Canada. Ottawa, Ontario. March 2018. 10.

The RCM is a key enabler for the CAF in preventing commercial exploitation of Canadian resources in the Canadian Arctic and provides a much needed data to support a maritime surveillance capability.

One problem with being overly dependant on the RCM, however, is that is a fragile space based system that has a short life span. Space-based assets are operating in austere environments where unforeseen circumstances, such as orbital debris colliding with the RCM. The RCM operates in Low Earth Orbit (LEO) which is increasingly congested and filled with space debris,¹⁵⁶ making this scenario quite possible. Also, since the technology doesn't exist to refuel constellations, the RCM only has a seven year expected lifespan.¹⁵⁷ Therefore, if Canada is to maintain its surveillance capabilities using space based assets, there is a requirement for a continual renewal process that is quicker than typical terrestrial equipment. However the replacement to the RCM, the Defence Enhanced Surveillance from Space Project (DESSP), is not projected to reach initial operational capability until 2033,¹⁵⁸ at the earliest. It is therefore quite likely that Canada will face a capability gap, as the end of life of the RCM is projected to be in 2026.

The RCAF through the use of the NWS and the RCM is able to provide a fairly significant surveillance picture. The NWS, though not covering all of the CADIZ, still covers a fair amount of the Canadian Arctic. Through the use of the RCM, the RCAF is able to support the maritime surveillance picture. The RCAF is also a lead agency in

¹⁵⁶ Rachel Joy. *NASA concerned about space's growing trash problem*. Florida Today. <https://www.floridatoday.com/story/tech/science/space/2020/12/23/nasa-concerned-spaces-growing-trash-problem/6544727002/> Published 23 December 2020. Last Accessed 27 April, 2021.

¹⁵⁷ Wei, Brandon. *Canadian Space Agency launches long-awaited satellite mission*. Canadian Geographic. Published 12 June 2019. [Canadian Space Agency launches long-awaited satellite mission | Canadian Geographic](#). Last Accessed 26 April, 2021.

¹⁵⁸ Public Works and Government Services Canada. "Buy and sell/Defence Enhanced Surveillance Amendment 05." [E_DESSP_RFI_Amd_005_Final\(buyandsell.gc.ca\)](#) Last Accessed 26 April, 2021.

supplying remote regions in the Canadian Arctic, including in Op BOXTOP where the RCAF resupplies Canadian Forces Base Alert located at the tip of the Canadian archipelago, 817Km from the North Pole.¹⁵⁹ The RCAF is also a lead agency providing Search and Rescue (SAR) in the Canadian Arctic. However, due to the high demand and low resource of the RCAF's assets, all the aircraft supporting SAR in Northern Canada are located throughout Southern Canada.¹⁶⁰ This limitation of not having air assets in Northern Canada, could cause serious delays in providing support, and may require consideration of strategically placing SAR assets further North during the increasingly busy summer months.¹⁶¹

However, the ability to act against Canadian resource exploitation is difficult through the sole use of RCAF assets. People in the Sea, and on the land, are required to provide a legitimate security presence, and to act in if required. Therefore the Royal Canadian Navy (RCN) and the Canadian Army (CA) are well suited to these roles, and have been preparing to do so, with the support of the federal government.

The RCN is well aware of the security challenge in the Canadian Arctic, and has been clear in defining how it sees its role. Its visionary document, *Leadmark 2050*, describes the future that the RCN is planning for, and also provides a clear picture for how it foresees operations in the Canadian Arctic. This document emphasizes that, “strategic cooperation is likely to remain in the interests of the members of the Arctic

¹⁵⁹ Government of Canada. “Operation BOXTOP”. <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-boxtop.html> Last Accessed 27 April, 2021.

¹⁶⁰ Shane Antoniuk, *RCAF Support For Arctic SAR: Are We There Yet?* Canadian Forces College. Toronto, Ontario. 2021. 3.

¹⁶¹ *Ibid.*4.

Council for some to come.”¹⁶² This is a similar statement to SSE, and highlights the realities of operating in the Arctic. *Leadmark 2050* also recognizes that the RCN’s “constabulary role will continue to increase in importance in the coming decades, as climate change gradually opens the Arctic to commercially viable transit and destination shipping.”¹⁶³ The RCN has ensured that the design of its Arctic Offshore Patrol Ship (AOPS) nests well with this strategic guidance. The RCN ensured that the AOPS could satisfy the most likely mission in the Canadian Arctic, by equipping it with a remotely controlled 25 mm gun.¹⁶⁴ Such a small caliber would be of limited use in a military on military engagement but is well suited to “support the domestic constabulary role.”¹⁶⁵ The RCN’s strategic guidance, is also clear that its mission is not just a maritime navy operation, but rather sees it as much broader than a typical defence mission in Canada.

Though the RCN is still preparing for a classic military role in the Arctic, where the RCN’s AOPS will “monitor and respond to events, with responsibilities ranging from assuring the safety of mariners and responding to environmental disasters to confronting incursions against Canada’s sovereignty.”¹⁶⁶ This is a similar mission statement that could perhaps be expected of RCN assets operating in the Pacific or Atlantic region. What is different, however, is the idea the RCN will play a role in developing the Canadian Arctic. The RCN recognizes that projects that the Canadian Arctic will be

¹⁶² Government of Canada. Department of National Defence. *Canada in a New Maritime World: Leadmark 2050*. Ottawa: Commander, Royal Canadian Navy, 2016.10.

¹⁶³ *Ibid.*

¹⁶⁴ Government of Canada. “The Royal Canadian Navy/Arctic Offshore Patrol Vessels/Fact Sheet.” https://navy-marine.forces.gc.ca/assets/NAVY_Internet/docs/en/rcn_aops_factsheet-8x11_web.pdf. Last Accessed 27 April, 2021.

¹⁶⁵ *Ibid.*

¹⁶⁶ Government of Canada. Department of National Defence. *Canada in a New Maritime World: Leadmark 2050*. Ottawa: Commander, Royal Canadian Navy, 2016.14.

developed differently than how Canada originally was originally formed and will be “connected by air and sea, not by wagon-trains, railways or 18-wheelers.”¹⁶⁷ In supporting the development of the Canadian Arctic, the RCN recognizes that:

Building our High North will call for a concerted whole-of-government effort, in which the RCN will play a part. Its effort will include supporting the charting of still largely unknown Arctic waters for the safety of ocean shipping; contributing to ocean science, to improve Canada’s understanding of fragile but changing Arctic ecosystems; supporting our federal partners to manage and protect Canada’s Arctic resources; and supporting the Canadian Coast Guard’s annual resupply of isolated coastal communities.¹⁶⁸

This scientific mission, and also recognition the requirement to support remote communities, is different than what the usual mission set for the employment of military assets. Vice a strictly military defence mission, the RCN has highlighted that it expects to be employed in a logistical and humanitarian one as well. It is also important to note that the RCN recognizes that these mission sets will be ones where the RCN operates in a support role, vice a lead role, providing support to other government departs and their respective federal mandates. In improving “Canada’s understanding of fragile but changing ecosystem”¹⁶⁹ there is also a role for conducting scientific research on the effects of climate change.

The RCN’s Arctic Offshore Patrol Ships (AOPS) will be the main vessels operating in the Arctic region and thus will be carrying out the vision statement that the RCN has laid out. As Arctic expert Adam Lajeunesse highlights, the AOPs will ensure that Canada’s sovereignty in the Arctic is “strengthened not by force per se, but by

¹⁶⁷ Government of Canada. Department of National Defence. *Canada in a New Maritime World: Leadmark 2050*. Ottawa: Commander, Royal Canadian Navy, 2016.14.

¹⁶⁸ *Ibid.*

¹⁶⁹ *Ibid.*

effective governance, control and the consistent application of Canadian law.”¹⁷⁰ He also points out that multiple other government departments (OGDs) have a specific mandate, but not the means.¹⁷¹ Whereas the RCN doesn’t necessarily have the mandate (as previously discussed there is limited military threat that the RCN will likely encounter) but with the AOPS will be able to support a whole of government response.¹⁷² Therefore the RCN can support OGD in areas of responsibility such as “pollution prevention and response, poaching, fisheries protection and law enforcement.”¹⁷³ Also the AOPS will be able to conduct research in charting the NWP,¹⁷⁴ determining “low impact shipping corridors,”¹⁷⁵ and thus supporting sustainable development in the Canadian Arctic.

The RCN expects to have 6 AOPS delivered to its inventory, where one is already delivered.¹⁷⁶ This ship, *Harry DeWolf*, is currently conducting sea trials, with an expectation to be fully operational by July of 2021 and deployed to the Arctic in support of Op NANOOK.¹⁷⁷ With its thicker hull, AOPS can withstand ice thickness of upwards of 120 cm,¹⁷⁸ and is the largest vessel in the RCN’s inventory.¹⁷⁹ Before the AOPS, the RCN was extremely limited it conducting operations in the Canadian Arctic, where since

¹⁷⁰ Adam Lajeunesse. *Canada’s Arctic Offshore and Patrol Ships (AOPS): Their history and purpose*. Marine Policy. Volume 124.2021.7.

¹⁷¹ *Ibid.*

¹⁷² *Ibid.*

¹⁷³ *Ibid.*

¹⁷⁴ *Ibid.* 8

¹⁷⁵ *Ibid.*

¹⁷⁶ Government of Canada. “Arctic and offshore patrol ships: Royal Canadian Navy”. <https://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/mer-sea/sncn-nss/npea-aops-eng.html>. Last Accessed: 26 April 2021.

¹⁷⁷ Naval News Staff. *Royal Canadian Navy Harry DeWolf OPV trials new capabilities at sea*. [Royal Canadian Navy Harry DeWolf OPV trials new capabilities at sea - Naval News](#). Published 07 December 2020. Last Accessed 27 April, 2021.

¹⁷⁸ Government of Canada. “First Arctic Offshore Ship” [Navy News | First Arctic and Offshore Patrol Ship delivered \(forces.gc.ca\)](#). Last Accessed 27 April, 2021.

¹⁷⁹ Adam Lajeunesse. *Canada’s Arctic Offshore and Patrol Ships (AOPS): Their history and purpose*. Marine Policy. Volume 124.2021.1.

1958, it never had Arctic class vessels in its inventory.¹⁸⁰ AOPs comes equipped with a 20 ton crane,¹⁸¹ and as “Read-Admiral David Gardam called “a big empty ship” that can “embark doctors, dentists, scientists, marine biologists, police and fisheries officers, environmentalists, and many other personnel with an interest in, or a mandate for, the development and sustainment of Canada’s north.””¹⁸² With such a versatile platform the AOPs can on load and offload multiple containers to support multiple mission sets and is capable of operating in Canada’s arctic. Therefore the scope of the mission sets the AOPs can support is fairly extensive.

However, there has been criticism related to the AOPs for what it can’t do. When Prime Minister Harper initially conceived of the RCN operations in Arctic, in 2006, his government projected that the CAF would require armed Icebreakers.¹⁸³ However, when viewing the initial concepts for the AOPS they were derisively referred to as “slush breakers.”¹⁸⁴ This does highlight a restriction of the AOPs, in that it can currently only operate independently from July through November, as outside of that the ice will potentially be too thick for it to transit.¹⁸⁵ As well, there is an argument that with the AOPs primary weapons system being a 25mm gun, it is limited in what kind of military or military engagement and deterrence mission it can enforce. The AOPS, like the car boat,

¹⁸⁰ Adam Lajeunesse. *Canada’s Arctic Offshore and Patrol Ships (AOPS): Their history and purpose*. Marine Policy. Volume 124.2021.1.

¹⁸¹ Government of Canada. “The Royal Canadian Navy/Arctic Offshore Patrol Vessels/Fact Sheet.” https://navy-marine.forces.gc.ca/assets/NAVY_Internet/docs/en/rcn_aops_factsheet-8x11_web.pdf. Last Accessed 27 April, 2021.

¹⁸² Adam Lajeunesse. *Canada’s Arctic Offshore and Patrol Ships (AOPS): Their history and purpose*. Marine Policy. Volume 124.2021.2.

¹⁸³ Franklyn Griffiths, Rob Huebert and P. Whitney Lackenbauer. *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press. 2011. 101.

¹⁸⁴ *Ibid.* 102.

¹⁸⁵ Adam Lajeunesse. *Canada’s Arctic Offshore and Patrol Ships (AOPS): Their history and purpose*. Marine Policy. Volume 124.2021.10.

will neither perform well in its military mission in Arctic, or as patrol boat off the coast.¹⁸⁶

The detractors of the AOPs bring up valid criticisms, but perhaps they are missing the point. Given the long life space of Canadian military procurements, in the years to come, there is a likelihood that the season that the AOPs can operate will be extended. If multi year ice, is becoming less and less frequent, then it is logical that the sea ice in the future will be thinner and at a depth that the AOPS can operate independently in. Additionally maritime traffic in the winter months “grinds to a halt,”¹⁸⁷ leaving little for the AOPS to do if in fact it was capable of operating year around.¹⁸⁸ Also, as discussed, there is unlikely to be a valid military threat in the Canadian Arctic for the time being, therefore to procure a fully armed warship, for exclusively Canadian Arctic operations, is potentially a waste of resources. That the AOPs is coming off the production line and nearing initial operating capability, stands in stark contrast to the delays and rising costs of producing the Canada next naval warship, the Canadian Surface Combatant.¹⁸⁹ As well the logic behind wanting to hold the government to account to continue to proceed in the acquisition strategy for armed ice breakers, may be overly limiting for the RCN. Ice breaking is best left to the Canadian Coast Guard, who are well versed in conducting these types of operations, in contrast to the RCN, who last had an ice breaking capability

¹⁸⁶ Adam Lajeunesse. *Canada's Arctic Offshore and Patrol Ships (AOPS): Their history and purpose*. Marine Policy. Volume 124.2021.10.

¹⁸⁷ *Ibid.*

¹⁸⁸ *Ibid.*

¹⁸⁹ Alan, Williams. *Under this plan, Canada's new warships will never be built*. Ottawa Citizen. <https://ottawacitizen.com/opinion/williams-under-this-plan-canadas-new-warships-will-never-be-built>. Published 29 March 2021. Last Accessed 27 April, 2021.

in 1957.¹⁹⁰ Making the RCN do this, is redundant and is analogous to “...trying to improve highway safety by having the police drive the snowploughs.”¹⁹¹ Though not perfect, the AOPs is well suited to the current problem sets facing the Canadian Arctic and is also potentially an extremely useful tool for future Canadian Arctic operations. These Canadian Arctic operations will likely become more prevalent as global warming and climate change continues, where the AOPs will be an important asset for the CAF to employ in supporting these operations.

The RCN and the RCAF have extensive assets, with personnel that have the requisite training to support operations in the Canadian Arctic. However, currently their presence is fleeting. The planes at some point go home and after the summer season ends the AOPS will go back to port (or another mission in warmer waters) in the south. However, the CA, in contrast, have a permanent presence that is embedded throughout the Canadian Arctic in the form of the Canadian Rangers. The Canadian Rangers are key reserve force personnel that fulfill a unique and special role, and are really a success story with mutual benefits for both the CAF, and the local indigenous populations. As well, as we will see in the preceding chapter, they also present a model, which could perhaps be applied elsewhere in Southern Canada.

Strong Secure Engaged (SSE), recognizes the strength of having Canadian Rangers in the north. The ability they provide in the region, such as surveillance and ground search and rescue, as well enabling the development of CAF relationships with

¹⁹⁰ Franklyn Griffiths, Rob Huebert and P. Whitney Lackenbauer. *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press. 2011. 102.

¹⁹¹ Adam Lajeunesse. *Canada's Arctic Offshore and Patrol Ships (AOPS): Their history and purpose*. Marine Policy. Volume 124.2021.4.

remote communities.¹⁹² Canada's defence policy also prioritizes increasing the training of the Canadian Rangers, thereby improving their functional capabilities.¹⁹³ The CA doctrine on Arctic operations, *Northern Approaches*, acknowledges that there "currently exists no conventional military threat in the North"¹⁹⁴ but rather "due to climate change and new economic opportunities raise prospects for the onset of other security challenges, such as organized crime, illegal immigration, environmental degradation and the possibility of a major disaster."¹⁹⁵ In responding to these security challenges, the Canadian Ranger will be relied upon. The Canadian Army's modernization strategy, *Advancing with Purpose*, highlights the importance of the Canadian Ranger as it sees the Rangers as the

eyes, ears, and guides of the Canadian army in the remote, coastal and northern areas in which they serve, and they allow the Canadian Army to maintain contact with those communities. A critical and enduring presence on the ground, they are vital too routine surveillance as guides, local cultural advisors and interpreters. They form the core of local liaison capacity in many locations while remaining immediately available to support local government or other agencies.¹⁹⁶

Both Canada's defence policy and the Canadian Army (CA) strategic guidance highlights the importance of the Rangers, and how they are vital to current and future operations in the Canadian Arctic. As they are dispersed throughout local Northern communities, they are well suited to respond and aid remote populations who require support. This will become even more important as the climate change is causing such drastic changes in the North. However, who are the Canadian Rangers? With their red

¹⁹² Government of Canada. *Strong Secure Engaged: Canada's Defence Policy*. Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017.80.

¹⁹³ *Ibid.*

¹⁹⁴ Canadian Army Land Warfare Centre. *Northern Approaches: Army Arctic Concept 2021*. Department of National Defence. Kingston, Ontario. 2013.10.

¹⁹⁵ *Ibid*

¹⁹⁶ Canadian Army. *Advancing With Purpose: The Canadian Army Modernization Strategy*. Department of National Defence. Ottawa Ontario. 15.

sweat shirts and rifles, they are synonymous with the Canadian Arctic, but how and why are they a part of the CAF? Typically when one thinks of the CAF it is soldiers with green uniforms, however, the Canadian Rangers are different, why? What is their role? Are they cost effective? Are they meaningfully contributing to the CAF's response actions with respect to climate change? This questions will be addressed in this chapter, and will be informative for the subsequent chapter on how the CAF can continue to adapt to climate change and HADR events.

The Canadian Ranger concept is derived from the Pacific Coast Militia Rangers (PCMR), which were formed in 1942, during World War Two (WW2), where the PCMRs provided a surveillance function and, if needed, would provide a counter insurgency, in the event the Japanese invaded British Columbia¹⁹⁷ However, after WW2 ended, the PCMRs were disbanded in 1945.¹⁹⁸ The PCMR's allowed people who were otherwise unable to serve over seas, to protect their local home that "freed other people for overseas service."¹⁹⁹ However soon there after with the nascent beginnings of the Cold War, it was recognized that have a reserve force PCMR type presence on the coasts of Canada could still be of use. Though met initially with resistance, it was determined by the regional CAF commanders that the creation of the Canadian Rangers was a low cost endeavour (negligible amount of training, providing obsolete firearms to the Rangers)

¹⁹⁷ P Whitney, Lackenbauer. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 35.

¹⁹⁸ *Ibid.* 54.

¹⁹⁹ *Ibid.* 55.

with minimal risk. Hence on 23 May 1947, the Canadian Rangers were created by Minister Claxton.²⁰⁰

In standing up the Canadian Rangers, there was a fear that they would impede on the recruitment of local reserve units. Therefore from the outset there was a determination that Canadian Rangers would recruit from a much deeper pool than what is usually suitable for military service, and the rangers would be different than the primary reserves in key aspects. Unlike the primary reserves, there was no age restriction, and no minimal physical limitations.²⁰¹

Today, the age requirement is that a recruit must be greater than eighteen years old, with no mandatory retirement age, and the physical fitness is determined by the commanding officer of the Canadian Rangers Patrol Group (CRPG).²⁰² A medical examination is not required.²⁰³ The requirements for joining the Canadian Rangers is that recruits must be:

1. Intimately familiar with the local population, terrain, weather and other conditions within the area.
2. Able to recognize, observe and report on any unusual ships, aircraft or incidents within their area,
3. In the opinion of the Commanding Officer of the CRPG, possess useful skills for Canadian Ranger duties in their area.²⁰⁴

This open concept of serviceability allows for a more varied system of recruitment and allows for a more diverse group of recruits. With no requirement to

²⁰⁰ P Whitney, Lackenbauer. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 74

²⁰¹ *Ibid.* 76.

²⁰² Government of Canada. "Canadian Rangers." <http://www.army-armee.forces.gc.ca/en/canadian-rangers/index.page?> Last Accessed 26 April, 2021.

²⁰³ *Ibid.*

²⁰⁴ *Ibid.*

deploy or face combat, it also allows for recruitment of personnel who are perhaps reticent of the combat aspects inherent in the CAF. The Canadian Rangers are not an indigenous program, but rather they are a CAF sub-component reserve unit that happens to have a large demographic of Indigenous participation.²⁰⁵

With the CAF struggling to meet its diversity recruiting goals,²⁰⁶ there are likely multiple lessons that the CAF can learn from the Canadian Rangers, where its personnel are very diverse and its personnel speak over 26 different languages.²⁰⁷ The Canadian Rangers personnel are also 21% female.²⁰⁸ This is upwards of almost 33% higher than the CAF.²⁰⁹ As historian P. Whitney Lackenbauer highlights, the Canadian Rangers “offers an alternative form of military service to those Canadians who live in remote areas, do not want to join the Regular Force, but still want to serve their country and their communities”²¹⁰ and where “unity in diversity may apply best”²¹¹ in describing the Canadian Rangers. This really seems to form the core of who the Canadian Rangers are, patriotic people living in remote regions, who have diverse backgrounds and upbringing,

²⁰⁵ P Whitney, Lackenbauer. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 76.

²⁰⁶ Akin, David. *Canada’s Armed Forces, struggling to hit diversity goals, turns to new digital recruiting tools*. <https://globalnews.ca/news/4450927/canada-armed-forces-diversity-goals-digital-recruiting/>. Global News. Published 14 September 2018. Last Accessed 26 April, 2021.

²⁰⁷ Government of Canada. “Canadian Rangers.” <http://www.army-armee.forces.gc.ca/en/canadian-rangers/index.page?> Last Accessed 26 April, 2021

²⁰⁸ Government of Canada. “DND/CAF Ombudsman/Educational Information CAF members/Career/Canadian Rangers.” <https://www.canada.ca/en/ombudsman-national-defence-forces/education-information/caf-members/career/canadian-rangers.html>. Last Accessed 26 April, 2021.

²⁰⁹ Government of Canada. “National Security and defence/ CAF/Women in the CAF”. <https://www.canada.ca/en/department-national-defence/services/women-in-the-forces/statistics.html>. Last Accessed 27 April, 2021.

²¹⁰ P Whitney, Lackenbauer. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 14.

²¹¹ *Ibid.* 22.

who come equipped with special skillsets that meaningfully contribute to the service and protection of Canada.

With an understanding of who the Canadian Rangers are, the next logical question is, what do they do? The answer is fluid as the rangers adapt to the local environment, providing aid to the local community as required. During the pandemic the Canadian Rangers have been active in multiple ways, from aiding in vaccination delivery to remote communities by acting as liaisons with medical personnel, who are coming in to deliver vaccines.²¹² This also have support vaccine distribution by creating receiving areas (such as schools, community halls, etc.) to have the vaccines administered.²¹³ As well they have been active in the last year of supporting at risk populations by checking in on vulnerable populations in their community and distributing supplies in their communities.²¹⁴ They have also been supporting the elder community by providing food and energy security (providing firewood, water, medications and groceries).²¹⁵ Canadian Rangers also extensively support ground search and rescue,²¹⁶ respond to forest fires²¹⁷ as well as flooding events in their region.²¹⁸ Therefore the Canadian Rangers, who typically

²¹² Moon, Peter. *Canadian Rangers Provide Significant Support for Vaccine Rollout*. Net News Ledger. Published 9 February 2021. <http://www.netnewsledger.com/2021/02/09/canadian-rangers-provide-significant-support-for-vaccine-rollout/>. Last Accessed 27 April, 2021.

²¹³ *Ibid*

²¹⁴ Canadian Military Family Magazine. *Canadian Rangers deployed to remote areas for Operation Laser*. [Canadian Rangers deployed to remote areas for Operation Laser - Canadian Military Family Magazine \(cmfmag.ca\)](https://www.cmfmag.ca). Last Accessed 26 April, 2021.

²¹⁵ *Ibid*

²¹⁶ P Whitney, Lackenbauer. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 422.

²¹⁷ Peter Moon. *Canadian Rangers assisting again in second Pikangikum fire evacuation*. The Maple Leaf. <https://www.canada.ca/en/department-national-defence/maple-leaf/defence/2019/09/rangers-pikangikum-evacuation.html>. Published 20 September 2019. Last Accessed 27 April, 2021.

²¹⁸ Tersigni, Natasha. *Canadian Rangers supported spring flood relief operations in northern Alberta*. Government of Canada. Published May 11 2020. <https://www.canada.ca/en/department-national-defence/corporate/news/regional-news/western-sentinel/2020/07/canadian-rangers-supported-spring-flood-relief-operations-in-northern-alberta.html>. Last Accessed 26 April, 2021.

are also leaders in their communities,²¹⁹ support the needs of the local community by helping out as they are able to, in addition to the mandated patrols in support of sovereignty operations.

Another key task that the Canadian Rangers perform, that directly benefits the CA, is the training they provide to the Regular Force. During the height of the Cold War, the CA had developed tactics, techniques and procedures that allowed it to operate in the Arctic at a level that was “second to no other first world nation.”²²⁰ However, after the end of the Cold War, there had been less of a focus on operating in the Arctic, and a greater focus of deploying and operating in the Middle East. This shift in focus led to a degradation of the operating capacity of the CA in the Arctic.²²¹ However, with the renewed focus on the Canadian Arctic, the CA has been active in improving its operating capabilities in the Arctic. In 2008, during Exercise Northern Bison, it was determined that the CA had minimal capabilities with limited winter warfare skills.²²² However, in subsequent years, the CA has greatly improved its Arctic capabilities, allowing the stand up of 4 Southern Canada based Arctic Response Company Groups (ARCG) that allow for the CA to force project into the Canadian Arctic. These ARCGs depend on the skills and knowledge that the Canadian Rangers provide, as evidenced by “after-action reports from Army exercises [that] repeatedly highlight the benefits of this partnership and the need to leverage the Rangers’ knowledge and capabilities to facilitate operations and further

²¹⁹ Whitney, Lackenbauer. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 424.

²²⁰ Franklyn Griffiths, Rob Huebert and P. Whitney Lackenbauer, *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press. 2011. 104.

²²¹ *Ibid.*

²²² P. Whitney Lackenbauer and Adam Lajeunesse. *The Canadian Armed Forces in the Arctic: Building Appropriate Capabilities*. Journal of Military and Strategic Studies, Vol 16, Is 4 (2016). 44.

develop the Army's northern skills."²²³ During the Cold War, during training events in the Arctic the CA greatly valued the Canadian Ranger skills set that they provided. As was noted by Brigadier General John Hater, "We [the CA] don't permit any army training north of 60 without Ranger involvement."²²⁴ Therefore another key task that the Canadian Rangers fulfill is to teach Southern Canadians survival skills and environmental knowledge of operating in the Northern Canada.

With a greater understanding of who the Canadian Rangers are and what they do in the Canadian Arctic, it is now beneficial to consider whether the Canadian Ranger program is cost effective. If it is a sustainable program, then it will likely continue to be leveraged into the future. However, if it is not, it could be a problem. This is an especially pertinent in consideration of the massive stimulus in support of the COVID-19 pandemic federal government response.

With the low cost to maintain a military presence in the Canadian Arctic, it is unlikely the Canadian Rangers budget will be cut. They are extremely cost effective with a small training bill, to have such a large impact in the Canadian Arctic. Even during the Force Reduction Program (FRP) the Canadian Rangers budget was not cut. This is significant as the FRP brought the strength of the CAF from 120,000 in 1991 to 81,600 in 2001, a significant 33% cut to the force strength.²²⁵ However, the Canadian Rangers who in January 1992 had a total strength of 2,367, were in 2001 gradually increased to

²²³ P. Whitney Lackenbauer and Adam Lajeunesse. *The Canadian Armed Forces in the Arctic: Building Appropriate Capabilities*. Journal of Military and Strategic Studies, Vol 16, Is 4 (2016). 51

²²⁴ P Whitney, Lackenbauer. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 292.

²²⁵ Jungwee Park. *A profile of the Canadian Forces*. Statistics Canada. Government of Canada. Ottawa, Ontario. July 2008.

approximately 4,000 personnel.²²⁶ Instead of the Canadian Rangers program receiving a cut in budget commensurate with the rest of the CAF during the FRP, the Ranger program actually grew.²²⁷ Since then the Canadian Ranger's numbers has continued to increase with a current standing force of 5,255 Rangers and an annual budget of \$44.6 million.²²⁸ The CAF's annual budget is \$21.9 billion,²²⁹ therefore, relatively speaking, the capabilities that the Canadian Rangers provide should continue to be sustainable for the CAF going forward.

The Canadian Rangers are a CAF reserve sub unit that has a mandate and the experience to directly respond to the challenges resulting from climate change. During HADR events in Northern Canada, the Rangers are present and support local populations. As well, with the Canadian Rangers being part of their local communities, they are able to support the local communities as they adapt to the effects of climate change, and highlight to Senior CAF leadership when further support may be required. They are a low cost high payoff organization that provide value to both the CAF and the remote communities that they are a part of.

Thus far in this chapter, there has been an evaluation on how the CAF has adapted to climate change, and how it employs its forces both in Southern Canada, and in the

²²⁶ P Whitney, Lackenbauer. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 439.

²²⁷ *Ibid.* 330.

²²⁸ Government of Canada. "National Defence/Proactive Disclosure" <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/proactive-disclosure/supplementary-budget-b-2019-2020/other-issues/activities-domestic.html>. Last Accessed 27 April, 2021.

²²⁹ Government of Canada. "National Defence/Reports and Publication/Defence Budget." <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/transition-materials/defence-101/2020/03/defence-101/defence-budget.html>. Last Accessed 27 April, 2021.

North. In the South, which is well developed, the climate change has increased the severity of disaster related events. With provinces still adapting to this increase has led to an increase of Requests for Assistance (RFA) from the CAF. Therefore in the last ten years, the CAF has had to adapt to this reality and has created plans to be able to respond HADR events in Southern Canada. This is having an impact on training, however, the tangible impacts are difficult to quantify, though it likely impacts both the mental resilience of the CAF members, and may also degrade the combat capability in the future. This is especially pertinent to the Canadian Army, as this element provides the “boots on the ground” support.

In Northern Canada, the situation is different with respect to climate change. The warming in the region is opening parts of Canada that previously were not passable, such as the Canadian Archipelago and the Northwest Passage. This area, however, is not currently facing a sovereignty threat, but it is rather confronting a security challenge. With increased access, there is now a possibility of unauthorized commercial exploitation. As such, the federal government has increased the support to the CAF to respond to this challenge. The RCAF, through the use of its airborne platforms and space assets has increased its surveillance mandate. The RCN is in the process of fielding a new fleet of Arctic Offshore Patrol Ships (AOPS) that can operate in the region during the summer season. However, it is the CA, through the use of the Canadian Rangers that have a permanent presence. The Rangers are the “eye’s and ears”²³⁰ of the Canadian Army, but perhaps more importantly they are also “voice.”²³¹ They alert the CAF on

²³⁰ Canadian Army. *Advancing With Purpose: The Canadian Army Modernization Strategy*. Department of National Defence. Ottawa Ontario. 15.

²³¹ P Whitney, Lackenbauer. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 439.

potential disasters and typically the first responders providing support in the Canadian Arctic. As one patrol commander noted, the rangers are “the eyeglasses, hearing aids and walking stick for the CF [CAF] in the North.”²³² The Canadian Rangers voice will hopefully continue to be heard, especially in light of climate change and the environmental concerns that will come from an Arctic, which is warming at an accelerated rate.

We are now armed with an understanding on what the CAF is currently doing, which is by no means all inclusive, to respond and adapt to climate change. The subsequent chapter will explore potential areas that could merit further consideration to improve the CAF’s response to climate change.

²³² P Whitney, Lackenbauer. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 477.

CHAPTER 4

HOW THE CAF COULD FURTHER ADAPT TO CLIMATE CHANGE

Like in previous chapters, this chapter will be broken down by geography, where initially climate change events and how the CAF can adapt to support these issues in Southern Canada will be discussed, before moving on to Northern Canada and more specifically the Canadian Arctic.

In Southern Canada, from the analysis conducted in Chapter 2 we have come to the conclusion, due to climate change,²³³ the severity of environmental events is increasing in Canada. These events (flooding, forest fires, tornadoes, etc.) are requiring the provinces to ask for federal support. This support frequently takes the form of the CAF coming in and responding to the crisis as best they can. However, with an increasing rate of Humanitarian Assistance, Disaster Relief (HADR) events requiring CAF support, there are signs of stressors on the Canadian Army's ability to manage operational deployments, training its personnel for high level combat, while being ready to respond to HADR events.²³⁴ We have already discussed how the CAF is responding. However, acknowledging that the rate of HADR events are likely to increase in frequency, this paper will evaluate three initiatives that may lessen the burden of RFAs requiring the CAF's support. Initially, we will look at whether a reorganization of the CAF focus towards responding exclusively to climate change, may be a better use of

²³³ Government of Canada. *Climate Change: Its impact and Policy Implications*. Publication no. 2019-46-E. Library of Parliament, Ottawa, Canada. 2020. P7.2.

²³⁴ Christian Leuprecht, and Peter Kasurak. *The Canadian Armed Forces and Humanitarian Assistance and Disaster Relief: Defining a Role*. Centre for International Governance Innovation. Published 24 August 2020. <https://www.cigionline.org/articles/canadian-armed-forces-and-humanitarian-assistance-and-disaster-relief-defining-role>. Last Accessed 26 April, 2021.

Canada's resources. Then, we will discuss whether increasing spending to the Disaster Assistance Response Team (DART) organization, would aid in the CAF's ability to respond to domestic HADR events. Finally, we will look at the Canadian Ranger model to see if there are attributes of it that can be expanded in Southern Canada, in support of HADR events.

In Northern Canada, the problems associated with climate change are fundamentally different, and thus require different approaches. There are practical military problems related to climate change, requiring military solutions. These will be touched on briefly. However, there are also climate change related problems that are not necessarily military problems requiring military solutions, however perhaps the CAF can support a solution. One is the food scarcity with traditional foods disappearing in the Canadian Arctic, as discussed previously. Another climate change problem is the devastating effects caused by the permafrost melting. These subjects will be discussed in this chapter to see if there is a CAF nexus that can provide support.

Southern Canada

Is the current CAF combat focus out of step with where it should be? Should the CAF itself be restructured to enable it to be more responsive to climate change? There is an argument to be had that with the CAF only experiencing major combat twice since WW2 (the Korean War, and the combat mission in Afghanistan) that the CAF would be better suited to prepare for HADR events and adjust when there is a major combat requirement.²³⁵ However, to reorient the CAF towards solely HADR response type

²³⁵ Christian Leuprecht, and Peter Kasurak. *The Canadian Armed Forces and Humanitarian Assistance and Disaster Relief: Defining a Role*. Centre for International Governance Innovation. Published 24 August

events, and then have the CAF pivot for combat, could leave Canada at a severe disadvantage for numerous reasons.

One issue is that fielding modern combat forces is hard. With professional forces being the norm for most developed nations, the idea a force can adjust from its primary HADR role to a combat one, harkens back to the days of the Canadian militia myth. This myth exemplifies Canadians, highlighting that they are well suited for combat and that “every red-blooded Canadian male is “half man, half grizzly bear, with just a touch of lightning bolt thrown in.””²³⁶ This myth has been widely discredited, and it is understood that to be successful in combat, requires professional well trained soldiers.²³⁷ To switch the CAF’s roles to be more climate change focused will severely impact the CA’s ability to be combat effective, potentially putting at it risk of its capacity to defend Canada and its interests. Therefore the CAF should be a professional force that is well trained and combat focused. Otherwise, when the CA is needed, it will be unable to perform its duties, if it doesn’t have the right training, as the previous commander of the CA alluded to.²³⁸

There is also an argument that it is easier for a combat capable force to respond to HADR events easier, than a HADR force responding to a combat requirement. A CAF that is well disciplined and trained to perform under stressful operational conditions can

2020. <https://www.cigionline.org/articles/canadian-armed-forces-and-humanitarian-assistance-and-disaster-relief-defining-role>. Last Accessed 26 April, 2021.

²³⁶ Donald E, Graves. *The Canadian Militia Myth of the War of 1812: Its Origin, Course and Dissolution*. The War of 1812 Magazine. Issue 25 May 2016. 1.

²³⁷ *Ibid.* 10.

²³⁸ Berthiaume, Lee *Disaster relief a threat to the Canadian army’s fighting edge, commander says*. National Post. Published 20 January 2020. <https://nationalpost.com/news/canada/disaster-relief-threatens-to-hinder-canadian-armys-readiness-for-combat-commander> Defence Budget - Canada.ca. Last Accessed 26 April, 2021.

also support HADR events, if required. In fact, the Stockholm International Peace Research Institute (SPRI) in measuring the usefulness for the deployment of military assets to foreign countries, also highlights a couple of benefits of having a well trained military such as timeliness and efficiency. SPRI recognizes the “timeliness” of a military force in responding to HADR events.²³⁹ With the CAF having high readiness forces available, capable of deploying in a moments notice, they can also respond quickly to HADR events. Efficiency is another attribute of a well trained military force.²⁴⁰ A combat capable force can “bring with them a high degree of self-sufficiency and do not strain local resources. Further they can operate under extreme conditions for protracted and intense periods, including day and night operations.”²⁴¹ Conversely, having a well trained HADR defence force, would intuitively suffer high casualties in conducting a combat mission, and is not well suited for the task.

If re-orienting the CAF to a HADR type organization might be dangerous to the national interests of Canada, then perhaps there are other avenues to prepare the CAF to respond to domestic HADR events. There is a sub unit of the CAF that seems to be a logical choice. This is the Disaster Assistance Response Team (DART). It is purpose built to deploy internationally to support local responders who are facing a crisis HADR event.²⁴²

²³⁹ Sharon, Wiharta Hassan Ahmad et al. *The Effectiveness of Foreign Military Assets in Natural Disaster Response*. Sweden: Stockholm International Peace Research Institute. 2008. 32.

²⁴⁰ *Ibid.* 38.

²⁴¹ *Ibid.*

²⁴² Government of Canada. “National Security and defence/CAF/Operations and exercises/Military operations/DART” <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/types/dart/deployments.html>. Last Accessed 27 April, 2021.

The DART can provide support for up to 60 days,²⁴³ enough time to hopefully stabilize the crisis. The DART is organizationally divided into 5 sections (platoons) making up a unit (company). It has an engineering platoon that can provide both field and construction engineering support and supply upwards of 50, 000L of safe drinking water daily.²⁴⁴ There is also a medical section that can support upwards of 300 patients daily (not to include trauma care or surgical services).²⁴⁵ There are also logistics and force protection platoons in the DART. Finally, there are civilian advisors that provide “counsel on political and humanitarian issues. They also are the link between the military and the civilian people in the area.”²⁴⁶ In total there are approximately 357 personnel in the DART organization.²⁴⁷ Since the DART has stood up it has deployed 7 times between the years 1998 - 2015.²⁴⁸ The results when the DART were called upon are impressive as evidenced by the figure 4.1 below.

²⁴³ Government of Canada. “National Security and defence/CAF/Operations and exercises/Military operations/DART” <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/types/dart/deployments.html>. Last Accessed 27 April, 2021.

²⁴⁴ Government of Canada. “National Security and defence/CAF/Operations and exercises/Military operations/DART” <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/types/dart/deployments.html>. Last Accessed 27 April, 2021.

²⁴⁵ *Ibid.*

²⁴⁶ *Ibid.*

²⁴⁷ Claire Bramma. *Directing the DART Towards Climate Change*. Canadian Forces College. Toronto, Ontario. 2015. 33.

²⁴⁸ Government of Canada. “National Security and defence/CAF/Operations and exercises/Military operations/DART” <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/types/dart/deployments.html>. Last Accessed 27 April, 2021

Figure 4.1 depicting DART deployments²⁴⁹

Year	Operation	Location	Medical (Patients)	Water Purified (Litres)	Engineering
1998	CENTRAL	HONDURAS	7,500	250 000	Unknown
1999	TORRENT	TURKEY	5,000	2.5 million	Unknown
2004	STRUCTURE	SRI LANKA	7,620	3.5 million	Transported 70k people across waterway
2005	PLATEAU	PAKISTAN	12, 000	3.8 million	500 tonnes of humanitarian aid supplies.
2010	HESTIA	HAITI	22, 000	2.9 million	Unknown
2013	RENAISSANCE 13-1	PHILIPPINES	6,325	500 000	Multiple projects
2015	RENAISSANCE 15-1	NEPAL	700		Multiple projects

²⁴⁹ Government of Canada. "National Security and defence/CAF/Operations and exercises/Military operations/DART" <https://www.canada.ca/en/department-national-defence/services/operations/military-operations/types/dart/deployments.html>. Last Accessed 27 April, 2021. Compiled by author.

Returning to the evaluation of whether the DART model would be worth replicating and expanding in support of domestic HADR events, it would be useful to evaluate the contributions that the DART provides. The capabilities of water purification, medical support and engineering capabilities are also resident in regional commands.²⁵⁰ The Canadian Joint Operations Command (CJOC) Standing Operations Orders for Domestic Operations (SOODO) recognizes that the “main strength of the DART is its high readiness, but in many cases the actual capabilities of the DART would be dwarfed by existing capabilities with the provinces and units.”²⁵¹ Therefore there is limited benefit to deploying the DART domestically, when the regional Incident Response Unit (IRU) can draw from local capabilities to respond. As well, though the DART has not been employed in Canada, and is most useful in international operations, there is nothing preventing the DART from being called upon for supporting a domestic HADR event. It is within the authority of the Chief of Defence Staff to authorize the Commander of CJOC to employ the DART domestically.²⁵²

Therefore given the relative limited times the DART has been employed internationally (7 times in 23 years) and never deployed domestically, it may be difficult to justify expanding the capability. This is not to say that Canada should not continue to retain this capability, it should, as it is an excellent high readiness unit that can deploy rapidly to support HADR events. When called upon, the DART performs admirably. Also the argument that provincial capabilities dwarf the provincial capabilities is valid,

²⁵⁰ Claire, Brama. *Directing the DART Towards Climate Change*. Canadian Forces College. Toronto, Ontario. 2015. 42.

²⁵¹ Department of National Defence. *Standing Operations Order for Domestic Operations (SOODO)*. Ottawa: Canadian Joint Operations Command, 2014.19.

²⁵² *Ibid.* 18.

however, this is not necessarily the case in the territories and the Canadian Arctic. Some of these remote communities do not have the extant capabilities that exists in Southern Canada, nor a military presence with the DART capabilities. Remote communities struggle to attract and retain trained medical professionals.²⁵³ Therefore when faced with a domestic HADR event, the Canadian Arctic would likely benefit from the DART capability. Therefore a recommendations is not to increase the capabilities of the DART for domestic HADR. However, the DART should be strongly considered in supporting future HADR missions in the Canadian Arctic.

The final consideration to alleviate some the requirements for the CAF to be called in to support HADR events in Southern Canada, is to create an organization that is task tailored to respond to HADR events. For ease of discussion this organization will be called the HADR Defence Force (HDF). This would allow the CAF, specifically the Canadian Army (CA), to continue to train and maintain the Brigade combat capability that was previously discussed in Chapter 3. The HDF could borrow some of the attributes that have made the Canadian Rangers successful.

What would this arrangement look like, and how would it work? Here the Canadian Ranger model could fit. Like the Canadian Rangers the HDF would fall under a sub-components of the reserve forces of the CAF.²⁵⁴ However their training would be purpose built to support HADR events. The training bill for rangers is minimal, it initially comprises 10 days of training that provides general information on working as a

²⁵³ Roy J Romanow. *Building on Values: The Future of Health Care in Canada – Final Report*. Governor in Council. Ottawa Canada. 2002. 159.

²⁵⁴ Government of Canada. “Canadian Armed Forces Reserves.” <https://www.canada.ca/en/ombudsman-national-defence-forces/education-information/caf-members/career/reserves/reservists.html>. Last Accessed 29 April 2021.

Canadian Ranger, as well as the benefits and administrative requirements when they are activated for duty.²⁵⁵ This training bill could be tailored for the expected HADR support that the local HDF would be expected to fulfill, based on location. For example, in Alberta, focus more on fire fighter duties, where as in Ontario focus more on flood prevention. Regardless of the location there would be general training, such as first aid and first responder duties. This training can be conducted on a week night and weekends such that the training wouldn't conflict with civilian employment. This training could be military led, such that it is well organized and ensures that momentum is maintained.

As well, the Canadian Rangers have an annual requirement of 12 days of sustainment training that can cover “advanced levels of first aid, flood and fire evacuation, search and rescue, disaster assistance, communications, marksmanship exercises, navigation, and setting up bivouac sites.”²⁵⁶ Most of this training, less marksmanship exercises, is directly applicable to what would be useful training for an organization supporting HADR events.

An additional benefit of an organization set up to support HADR events is that it can be constructed to appeal to a broader population base than just personnel that are attracted to the military. With the right recruiting program specifically targeting people to support their local community, who can join regardless of age and with minimal physical fitness requirements, it may have a greater appeal. As noted during WW2, when “half of our NHL hockey stars could not pass the Army medical. These potential recruits, deemed

²⁵⁵ Government of Canada. “Canadian Rangers/Training.” <http://www.army-armee.forces.gc.ca/en/canadian-rangers/training.page> Last Accessed 26 April, 2021.

²⁵⁶ Government of Canada. “Canadian Rangers/Training.” <http://www.army-armee.forces.gc.ca/en/canadian-rangers/training.page> Last Accessed 26 April, 2021

unfit for overseas service, could certainly perform useful functions on the home front.”²⁵⁷ Additionally, recruiting environmental activists who may be hesitant in joining the CAF, potentially joining of the HDF could appeal to them. Recruiting community leaders to participate in this organization, similar to how the Canadian Rangers operate, would add extra credibility to the organization and also help in recruiting. The Canadian Rangers are supported by “1.44% of northerners serving as Canadian Rangers against 0.27% of Canadians serving in the Regular Force and all other reserve components.”²⁵⁸ This showcases that an organization that is more attractive to local communities can potentially draw from a larger pool of personnel. This would have the added benefit of being more representative of the local population and thus benefit from greater diversity than the CAF currently has in its organization. This diversity would greatly support HADR events as it could provide ideas and considerations for solutions that the CAF would not necessarily have thought off. As well having a local HDF would facilitate solutions, as the HDF members would have enhanced knowledge of the local area. As well for the CAF, it would be beneficial engagement with local communities, where it could potentially dispel pre-conceptions of the CAF, and aid in the CAF systemic problem of recruiting diverse personnel to join.

This HDF should also be adaptable to the local population. Similar to how the Canadian Rangers has adapted to what works for them, then HADR response organization should do the same. Vice the leaders being appointed for command, like in the military, local jurisdictions could run their organization in a manner that worked for

²⁵⁷ Lackenbauer, P. Whitney. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 79.

²⁵⁸ *Ibid.*449

them, such as electing their leadership, as in the Canadian Ranger model.²⁵⁹ The size of the local units should be functionally designed to meet the likely tasks they will potentially have to respond to.

The HDF funding responsibilities should not only be a federal responsibility. A clear difference from the Canadian Rangers is that this organization would not have a surveillance mandate, like the Rangers do, but rather an exclusively HADR mandate. Therefore the funding should draw from provincial resources and augmented by the Federal government. How they would be called to action, therefore should fall under the provincial authorities and built into the RFA process when municipalities require support. This would alleviate the requirement for provincial governments to have to ask for support from the federal government for support, and may have the added benefit politically where the provinces are seen as being capable of handling the HADR event on its own. For extreme events, such as provincial emergencies, the CAF would still be called in to support as it would require an “all hands on deck”²⁶⁰ mentality requiring federal and the CAF support.

Therefore a recommendation for HADR events in Southern Canada, is to consider creating an organization, based on a similar model of how the Canadian Rangers operate, to respond to HADR events that is supported, tangentially, by the CAF.

²⁵⁹ Lackenbauer, P. Whitney. *The Canadian Rangers: A living History*. UBC Press. Vancouver. 2013. 79.324.

²⁶⁰ Christian Leuprecht, and Peter Kasurak. *The Canadian Armed Forces and Humanitarian Assistance and Disaster Relief: Defining a Role*. Centre for International Governance Innovation. Published 24 August 2020. [Thttps://www.cigionline.org/articles/canadian-armed-forces-and-humanitarian-assistance-and-disaster-relief-defining-role](https://www.cigionline.org/articles/canadian-armed-forces-and-humanitarian-assistance-and-disaster-relief-defining-role). Last Accessed 26 April, 2021.

Northern Canada

In Northern Canada there are practical military problems, requiring military solutions, such updating the North Warning System (NWS) to detect airborne platforms that are flying into the Canadian Air Defence Identification Zone (CADIZ). There is also a requirement for the CAF to be able to operate in all areas of Canada, including the Arctic. Solutions to these problems require training and the right equipment and it appears that the CAF is building capabilities in order to meet these challenge (discussed in Chapter 3). The CAF mission in the Canadian Arctic also revolves around a security challenge, requiring a whole of government approach. With the Northwest Passage opening, the potential for unauthorized commercial exploitation is increasing. The CAF will have to support Other Government Departments (OGDs) such as the RCMP and the Canadian Coast Guard in guarding against this security challenge.

The CAF is relatively well prepared to handle these problems, with Federal Government support. The update to the NWS to aid in aircraft identification, will likely cost billions, require multi-domain sensor integration,²⁶¹ and is outside the scope, or main focus, of this research project. However, without an update, the CAF will not be able to meet its NORAD mission in identifying Aircraft in the CADIZ. This is a problem for multiple reasons. One is the requirement to detect foreign aircraft flying into Canadian territory. Another problem is the fact the transpolar flights have been increasing dramatically, where from “Analysis of NAV CANADA data from 2007 to mid-2019 reveals that the number of overflights north of the 60th parallel in Canadian Domestic

²⁶¹ John, Verran. *All Domain Awareness: The Future of the NORAD Deter, Detect, Defeat Mission*. Canadian Forces College. Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence. Toronto, Ontario. 2021.

Airspace more than doubled from approximately 4,500 flights per month to a peak of 12,000 monthly”²⁶² Therefore as the CAF is responsible Search and Rescue (SAR) (with the air assets located in Southern Canada) situational awareness of where an aircraft crashes would be beneficial to provide SAR support, especially considering the dearth of satellite coverage in the Canadian Arctic (making it difficult for aircraft to broadcast their position via satellite communications). Therefore a recommendation is to continue to pursue a NWS update, with vigour.

The CA, as previously discussed, has measurably improved its ability to operate in the Canadian Arctic. By deploying to the North more often, while leveraging the training for survival that the Canadian Rangers provide, the CA is better prepared to operate in the Arctic than they were previously. As well, the Canadian Rangers are a permanent presence that can be called upon to support multiple different HADR events. They also can alert the CAF on impending problems.

With the security challenge of unauthorized commercial exploitation, the RCAF with the Radarsat Constellation Mission (space based satellite constellation, discussed in chapter 3) capable of detecting foreign vessels, and the Royal Canadian Navy fielding a new fleet of vessels, the Arctic Offshore Patrol Ships, the CAF is well on its way to being able to directly confront this security challenge.

However, how can the CAF respond to the impending crisis in the Canadian North with respect to communities struggling with what was once their bedrock of their communities, permafrost, melting and the fact that food scarcity is increasing? The

²⁶² Air Line Pilots Association International. *White Paper: Improving Commercial Aviation Safety in the Far North*. ALPA. McLean Virginia. 2019. 4.

answer, unfortunately, is that the CAF can not fix these problems. The CAF is constructed to be respond to emergency type scenarios. It will provide Search and Rescue with the RCAF, and Ground Search and rescue via the Canadian Rangers. It can respond to threats, such as unauthorized commercial exploitation, with the use the RCN. But to fix chronic and impending disasters, the CAF is not the organization to respond to these type of problems.

It can support a Whole of Government (WOG) response. The new Arctic Offshore Patrol Ships (AOPS) are purpose built to be versatile. The RCN is getting a capability that can provide large logistical and medical support to remote communities and can enable a WOG mission. Other than that, however, is there something more that the CAF can do?

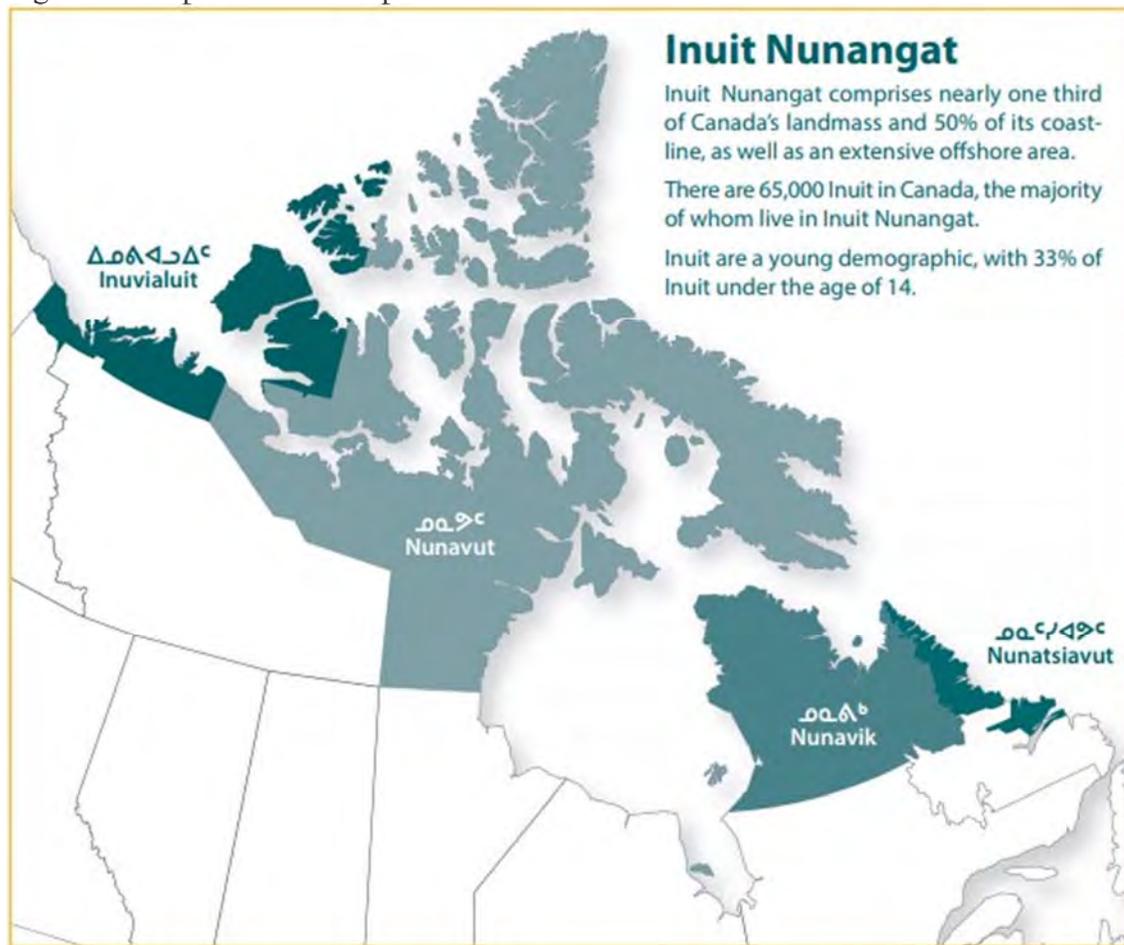
This is the wrong question to ask. The question to ask is therefore does the Northern communities, in concert with the federal government, want anything else from the CAF? It appears not much more than already provided. Any real solution space for systemic problems due to climate change will likely be locally driven, with Federal support. Development where “Northerners are seizing opportunities to become more fully involved in the North’s resource development activities and are seeking to ensure that that they derive primary benefits Arctic resources”²⁶³ will likely benefit systemic issues more than creating an additional military base in the North or further augmenting bases with additionally troops will ever do. Similarly, having local populations benefit from fisheries in what was ice covered regions, would also help the local populations.²⁶⁴ Here

²⁶³ Griffiths, Franklyn, Rob Huebert and P. Whitney Lackenbauer, *Canada and the changing Arctic: Sovereignty, Security, and Stewardship*. Wilfrid Laurier University Press, 2011.

²⁶⁴ *Ibid.*

the RCN with the AOPS can support this endeavour in guarding against unauthorized commercial exploitation, and it also speaks for the requirement for sustainable development that benefits local populations.

Figure 4.2 Depiction of Inuit presence in the Canadian Arctic.²⁶⁵



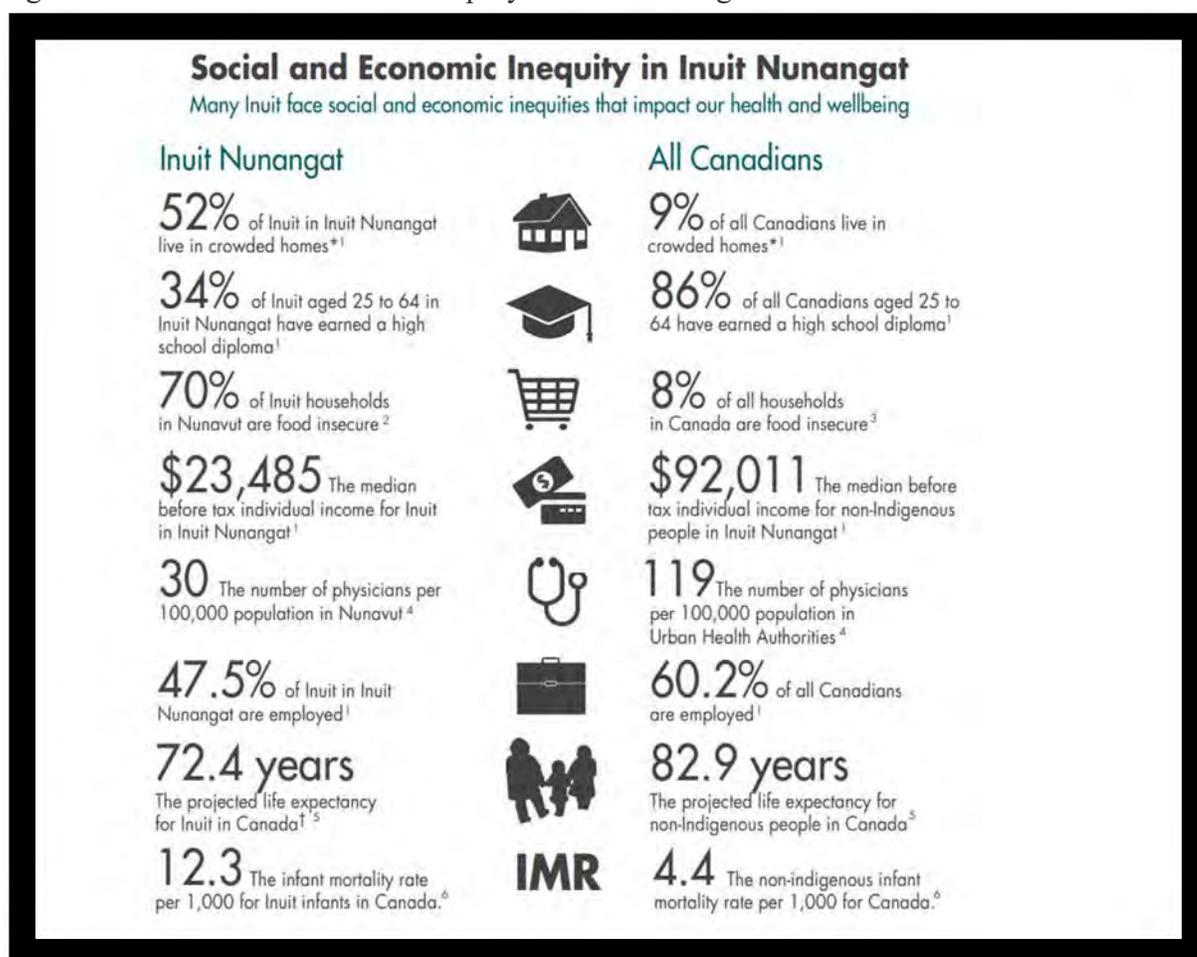
Canada has taken a more inclusive role with indigenous partner in updating its Arctic policy, including chapters from indigenous communities on how they view future in the Arctic. As such it is important to consider the Inuit Nunangat chapter, whose

²⁶⁵ Government of Canada. *Arctic and Northern Policy Framework: Inuit Nunangat*. Inuit Tapiriit Kanatami. 2019.1.

populations reside primarily in what is the Canadian Arctic (see figure 4.2). This chapter highlights that

Addressing social and economic inequity, both between Inuit Nunangat and within Inuit Nunangat itself, is a necessary pre-condition to the development of a healthy, resilient and secure Canadian Arctic. Economic prosperity, national security and public safety all depend on healthy communities and inclusive economies and systems of governance.²⁶⁶

Figure 4.3 Social and Economic Inequity in Inuit Nunangat²⁶⁷



²⁶⁶ Government of Canada. *Arctic and Northern Policy Framework: Inuit Nunangat*. Inuit Tapiriit Kanatami. 2019. 2.

²⁶⁷ *Ibid.* 3.

Figure 4.3 also highlights that some of the problems that are resident in the Canadian Arctic, and that these problems are not something that the CAF can solve. It is a community that is looking for development of a scale that is “comparable to the development of the trans-Canadian Highway for the trans-national railway connected Western and Eastern Canada.”²⁶⁸ These project can come in the form of readily accessible high speed internet, as well as Maritime and Air infrastructure (hardened runways).²⁶⁹ The Inuit people are looking for funding that supports the Inuit people’s specific requirements, not prescribed solutions from Ottawa.²⁷⁰ However, with consultation with the local populations (leveraging existing relationships with the Canadian Rangers), there are areas that the CAF can support. The AOPs and the RCM have research capabilities that can help build the science and knowledge in the area and thus support the Inuit in what they looking for, applying a WOG approach.

With respect to food security, the Inuit people are clear.

Federal policy should recognize the interconnected nature of harvesting activities, climate change and food security for Inuit households when developing policies and programs which address any of these three related issues, and should prioritize innovative approaches for supporting Inuit harvesting in such polices and programs.²⁷¹

Here the CAF, leveraging the Royal Canadian Navy (RCN) can employ the AOPS to guard against unauthorized commercial fishing exploitation. The RCN has done this before. Off the coast of Newfoundland, in 1995, the RCN supported the Department

²⁶⁸Canada. *Arctic and Northern Policy Framework: Inuit Nunangat*. Inuit Tapiriit Kanatami. 2019. 4.

²⁶⁹ *Ibid.* 9.

²⁷⁰ *Ibid.* 5.

²⁷¹ *Ibid.* 9.

of Fisheries and Oceans when they boarded a Spanish trawler that was seen as further exhausting Canada's fishing resources.²⁷²

However, it should be clear that nowhere in the Inuit Arctic policy is a request for an additional military presence.

Therefore in summary, the recommendations for the CAF to continue adapt to climate change are different in Southern Canada than they are in Northern Canada. In Southern Canada, it is recommended that the federal government expand the CAF reserves to include an additional sub-component organization that provides HADR support. This organization should be built around the model of the Canadian Rangers, as it is cost effective, engages local populations, and would allow the Canadian Army to maintain its focus on training to be combat capable and defending Canada's interests.

In Northern Canada, it is recommended that the DART be considered for future Northern deployments in support of HADR events. Their high readiness capability as well as the training and expertise that the DART has could be beneficial in Northern Canada. As well, it is recommended that the federal government continue the procurement process to replace the North Warning System (NWS) such that it can identify and track all aircraft in Canadian Airspace. However, with respect to the systemic problems in the Canadian Arctic, such as food scarcity and the permafrost melting, the CAF is limited in how it can support. The CAF seems to be planning to support the Canadian Arctic as best it can by employing equipment that can support scientific research (AOPS, RCM) that will hopefully aid in the development of the

²⁷² Government of Canada. Department of National Defence. *Canada in a New Maritime World: Leadmark 2050*. Ottawa: Commander, Royal Canadian Navy, 2016

region. As well, the AOPS can help prevent any unauthorized commercial exploitation, thereby protecting the resources in the area.

CONCLUSION

The aim of this paper was to evaluate the effects that climate change is having on the CAF, and how the CAF is responding to the new challenges caused by climate change. As well, the second focus of this paper was to offer suggestions as to how the CAF can better align its capabilities to maximize its ability to positively respond to climate change from a domestic perspective. In doing this research, as the problems were different in both the North and South of Canada, it became evident that the research had to be divided up as well to meet the aims of this paper.

In Southern Canada, the effects of climate change on the CAF have led it to adapt the organization to be able to respond to an increasing amount of requests for assistance with respect to HADR events. It now sets aside units to be able to heed the call for HADR support. However, the training cycle in the Canadian Army overlaps with the major season of natural disasters (fires, floods and extreme weather). Senior CAF leaders recognize that having to both train to maintain its combat capability, deploy on operations around the world, and set aside personnel to respond to HADR events, is likely placing high levels of stress the CA's troops. In responding to the first aim of the paper, the CAF has adapted to climate change, however, it is still impacting the organization and its people.

A suggestion on how to improve how the CAF is adapting to climate change in Southern Canada, and to mitigate some of the stress that soldiers are facing, is to create a HADR Defence Force which is modelled on the Canadian Rangers concept. They would be a low cost option, with minimal training exclusively focused on HADR support. This

sub component of the reserves could provide needed relief to the CAF, especially as HADR events will likely increase in the future.

In Northern Canada, there is much the CAF is doing to adapt to climate change. It has expanded and adapted the roles of the Canadian Rangers, who have provided excellent support to remote communities, as well as providing useful training to Southern Canadians on how to survive in Northern Canada. The CAF is also procuring and employing equipment that will significantly improve the surveillance in the maritime domain, such as the Arctic Offshore Patrol Ship as well as well as the RADARSAT Constellation Mission. These procurements are interesting as they can be employed militarily and also support other government department mandates, such as scientific research, employing a Whole of Government (WOG) approach to operating in Northern Canada and the Canadian Arctic. Additional suggestions for the CAF to adapt to the effects of climate change in the Canadian Arctic is to continue to pursue a replacement for the North Warning System radar system. This would provide situational awareness of the Canadian Arctic as well as aid in search and rescue. Additionally a suggestion is to consider employing the DART domestically in support of HADR events in Northern Canada, as these communities do not have the resources that are more typical in Southern Canada.

The findings and responses to the aim of this research paper do not find any solutions to climate change. This is a problem that the CAF cannot solve. As well, systemic issues in Northern Canada such as food scarcity, income inequality and the permafrost melting are not issues that the CAF can resolve. The CAF can support scientific research with the use of its space assets and the RCN AOPS. The AOPS can aid

in preventing unauthorized commercial exploitation. The Canadian Rangers can be the eyes, ears and voice of the region, letting the CAF know of any impending disaster that may require a more robust governmental response. However, the CAF contributions will not fix the systemic problems in the Canadian Arctic.

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