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Scaling Up Canadian Seapower

The Multi-Mission Corvette Project

Visions & Options Series

December 2025

The Naval Association of Canada | Corvette Series

Scaling Up Canadian Sea Power

Rebalancing the Navy's Surface Fleet

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This Naval Association of Canada series is devoted to examining options for Canada's Continental Defence Corvette Project. Support for this work is provided by the Canadian Maritime Security Network.

Executive Summary

Canadian sea power is at a critical juncture as aging ships retire and the River-class destroyers dominate future planning. While these advanced vessels provide formidable capabilities, there remains glaring naval disparities with the Royal Canadian Navy's (RCN) surface fleet composition. Despite the focus on the River-class, Canada must also develop appropriate responses to counter and deter low-intensity and unconventional threats. This paper argues for incorporating a straightforward but well armed corvette design, as well as fast attack crafts (FACs) to create a more balanced, adaptable, and combat-ready force. By doing so, the RCN will posses the speed, flexibility, and mass lethality required for modern sea warfare demands with equal credibility for responding to low-intensity and grey-zone challenges.

Canada's surface fleet, an indispensable pillar of the Royal Canadian Navy (RCN), is navigating a pivotal moment amid heightened geopolitical tensions close to home and internationally as aging platforms near the end of their operational lives and modernization timelines stretch into the future. From the Arctic and Atlantic to the Indo-Pacific, Canada must confront whether its future surface fleet can meet the demands of modern sea warfare and long-term defence commitments.

Should Ottawa want to assure Canadians that its surface fleet can address and respond to the ever-changing spectrum of sea warfare and is capable of advancing its maritime geopolitical interests, Canada must move forward in procuring a larger fleet of more affordable and versatile corvettes and Fast Attack Crafts (FACs) to grant the RCN greater operational range, lethality and mobility for sea warfare.

Canada's Future Surface Fleet: A Destroyer-Driven Vision

As it stands, Ottawa has acquired one of two Protecteur-class Joint Supply Ships (JSS), six Harry DeWolf-class Arctic and Offshore Patrol Ships (AOPVs) and is in the process of building 15 advanced River-class destroyers. Supporting this surface fleet are 12 outdated Halifax-class frigates and 12 waning Kingston-class Maritime Coastal Defence Vessels – eight of which are in the process of being decommissioned by the end of 2025.[1]

In the future, Canada's fleet composition will be driven by the River-class destroyer as the bulwark force. With impressive firepower, combat systems, and surveillance and digital platforms that will seamlessly pair with allied forces, the vessels will provide advanced capabilities for antisubmarine-warfare (ASW) and anti-air warfare (AAW) simultaneously with auxiliary roles in escorting and patrolling. With comprehensive attributes, it is hard-pressed not to see the River-class as the 'be-all, end-all' asset of the Canadian Armed Forces (CAF) sea domain and the navy's preferred platform of choice to project and utilize Canadian sea power.[2]

Challenges in the RCN Future Fleet Composition

Despite the capabilities that the River-class destroyer will provide the RCN, there will remain glaring naval disparities should Canada not expand its surface fleet size and composition, especially given the geographical environments and conflict scenarios the RCN will need to operate against.

In *Leadmark 2050*, it is emphasized that Canadian sea power should possess a sufficient fleet size to operate in Canada's Arctic, Atlantic and Pacific coastal waters to sustain domestic defence and security commitments, as well as being capable of sustaining an ongoing forward-deployable force for continental and international operations.[3] The document further attests the need to retain the capacity to have a high-readiness fleet, in the form of a naval task group, against major international contingencies. To successfully fulfill these objectives, and navigate the complexities and ambiguities of future naval operations, Canada's blue-water navy shall be balanced, combat-effective, multi-purpose, globally deployable, and forward-postured.[4]

However, Canada's future surface fleet – not counting the Halifax and Kingston-classes which will be decommissioned in the relative future – will total twenty-three vessels. The naivety to assume that this fleet size can sustain a credible naval force capable of defending Canada's 243,042 km coastline with the long-distances the RCN must cover to contribute to collective security operations with allies – stretching across the North Atlantic to the Mediterranean, Black and Baltic Seas to the Taiwan Strait and South China Sea – is deeply flawed.

The composition of the RCN, having a destroyer-driven fleet, will also plague Canada's agility to replenish its sea power. Given that Canada lacks the industrial and fiscal capacity to accelerate the assembly of new destroyers due to long delivery times and high associated cost of $7.4 billion per ship, the loss of a few of these vessels can result in a rapidly depleted naval force structure – eroding Canadian sea power at-an-instance.[5] This possibility could, in future, see Ottawa push for more risk-averse behaviour for when the RCN deploys its destroyers in forward operating position or as a primary strike force.[6]

Lastly, there are applicability issues between Canada's future surface fleet and the conflict continuum.[7] War operates along a spectrum that can range from conventional and unconventional conflicts of high or low-intensity. As it stands, Canada's projected surface fleet, with the River-class serving as its bulwark force, will face major operational and combat hurdles when either forms of conflict occur – whether it be simultaneously or isolated.

If Canada were to take part in a modern conventional and high-intensity naval conflict, the battlespace will see layered approaches to large-scale missile warfare through anti-access and anti-denial tactics, and more distributed maritime operations due to the advancements of drones, hypersonic missiles, land-based air defence weapons, electronic and space-based interference capabilities.[8]

In this scenario, the RCN will lack meaningful mass-firing schemes to contribute to a modern naval battle, as only the River-class destroyers are capable of dispatching that kind of firing volume to confront or deter an opposing peer-adversary, illustrating a lackluster ability of Canadian sea power to sustain a formidable tempo of large salvos in an operational environment demanding combat endurance and resilience.

The RCN will also need to plan an appropriate response capacity to counter and deter low-intensity and unconventional threats. Often assigned as constabulary or crisis response operations, low-intensity and unconventional threats blur the lines between regular and irregular warfare. Observed through grey-zone tactics, asymmetric sea operations can significantly undermine traditional narratives of maritime defence while offering cost-effective and innovative means to test and exploit defence capabilities and advance sovereignty claims without an outright conflict.

In Europe, Russia uses its shadow fleets to damage undersea infrastructure or to conduct intelligence, surveillance and reconnaissance (ISR) operations in NATO controlled waters to cause widespread disruption and deception tactics that tests the Alliance's defensive capabilities and commitments to collective security notions.[9] Turning to the Indo-Pacific, China is using similar grey-zone tactics, specifically instructing its fishing fleets and maritime militias to conduct illegal, unreported and unregulated fishing or harassing and intimidating its neighbours to advance its sovereignty claims in the South China Sea.[10]

More complicated and innovative grey-zone scenarios at sea will undoubtedly emerge and some may materialize by an adversary using a proxy, civilian, or commercial ship to lay sea mines, conduct ISR and sabotage operations, or launch a swarm of unmanned aerial or maritime drones close to Canadian coastal shores or further inside its inlets. The action objectives of these missions could aim to reduce or deplete the CAF's response capacity, cripple key industrial and technological manufacturing capabilities, devastate Canadian energy infrastructure, and destroy critical military platforms and assets, as well as causing havoc on non-military sectors by hampering Canadian trade and disrupting civilian aerospace and maritime transportation.

While more destroyers or Canada's future submarine fleet could be positioned to deter and respond to these threats from transpiring near or inside Canadian waters, it is important to observe that these platforms will most likely be in forward deployable operations to counter more conventional

maritime threats. It would also not make tactical sense to deploy a multi-billion-dollar platform, armed with millions of dollars of weaponry, to destroy, monitor, or respond to less-sophisticated and cheaper platforms threatening Canadian maritime security. Doing so would only serve the adversary's objective to remove Canadian sea power from forward operating areas or entrapping them in strategically planned operations to more readily dismantle Canada's combat capacity at sea.

Rather than observing more destroyers and submarines as the logical answer for resolving the RCN shortcomings, Canada must instead prioritize the incorporation of corvettes and FACs into the RCN's fleet composition.

Design Priorities for a Canadian Ccorvette

While the RCN does have a coastal defence vessel, the Kingston-class patrol ships were procured during the late 1990s. Styled as a general-purpose vessel, the RCN used these smaller platforms to expand its capacity for sovereignty operations, constabulary missions like search-and-rescue, fisheries and resource protection patrols, and ISR missions. Additionally, the ships also emphasized a niche role for minesweeping capabilities. The relatively simple, low-cost, and crew-limited design also permitted more critical training opportunities for junior officers, sailors, and reservists.

Despite the successes of the Kingston-class, the ships had major drawbacks for Canadian sea power. First, the combined role of minesweeping and patrol capabilities made the vessels remarkably slow, maxing out at 15 knots – modern corvettes are designed to attain higher speeds of 30 to 60 knots to maintain effective maneuverability for offensive and defensive naval warfare.[11] Second, the hull size and its materials – low-carbon and inexpensive steel – hindered its seakeeping ability in Canadian and international waters.[12] More problematic was the decision not to extensively arm the vessels with capabilities for anti-surface warfare (ASUW) and AAW needed to support larger vessels in conventional naval conflicts and for carrying out successful sea-denial and control operations.

Recently, the RCN announced that it is seeking to replace the Kingston-class through the Canadian Multi-mission Corvette project. According to Vice-Admiral Angus Topshee, the RCN is looking to acquire a dozen corvettes "with a long range that pack a punch in combat and can also deal with Arctic ice."[13]

For Canada, corvettes offer the RCN an opportunity to affordably expand its surface fleet composition by filling in the operational gap existing between the AOPVs and the River-class destroyers. For instance, corvettes can offer the River-class genuine escort support by providing close-range air defence and rapid-response actions against surface threats from fast-moving drones and ships.[14] Second, corvettes can assist the destroyers in performing mass-firing schemes to overwhelm the defence systems of an adversary's fleet or by targeting land-based forces and platforms ashore. Lastly, the emphasis on mobility, speed, and lethality means that corvettes can respond more expeditiously than an AOPV to low-intensity and irregular warfare threats, thereby offering more capable and credible combat responses and reactions.[15]

In designing a Canadian corvette, attention should be on application over sophistication. Whereas stealth technologies, electronic warfare instruments, radar, and sensors have a role on naval ships, they require extensive space demands early in the ship design that can take up valuable room needed for weaponry, logistical support, and other crew considerations. These factors can result in a vessel becoming more technologically complex, and larger and slower, requiring task-tailored critical supply chains, shipyards and skilled workforces to build and maintain. These features also erode the delicate balance for mobility, survivability, and lethality that a Canadian corvette must attain.

As such, the RCN should focus on a corvette design range from 80-130 meters in length, displacing 1,900–2,500 tons and crewed by 60-70 sailors.[16] While Admiral Topshee has expressed interest for an Arctic-capable corvette, the structural design requirements needed would topple on more material and maintenance costs and construction timelines. Instead, a Canadian corvette should be used to operate in Arctic waters during the navigable season.[17]

A Canadian corvette will also need to balance its combat management system – radars, sonars, and communication equipment – with the priority for mobility and lethality for ASUW and AAW. One avenue the RCN could undertake to leverage cost-effectiveness, operational fluidity, and installation flexibility with Canada's existing shipbuilding and software landscapes is to integrate CMS 330 into the RCN's new corvettes. This decision could provide space for more expansive conventional and precision-guided munitions.

For a Canadian corvette to possess compelling firepower, it should have a 76 mm-caliber naval gun at its bow and two Close-In Weapon Systems (CIWS) or two 30mm automated rapid-fire cannons above deck, as well as several vertical launch cells (VLCs) and deck mounted launchers capable of firing short-range surface-to-air and surface-strike missiles.

While a crewed helicopter capability provides some versatility for ASW and ISR missions by boosting targeting and firing support, a Canadian corvette needs to exclude a flight deck.[18] Avoiding the redundancy to make a ship larger, more heavily crewed, and generally more expensive to operate, a corvette design that omits a flight deck can considerably lower the design and operational costs of the vessel without risking its mobility and lethality.

To capitalize on the advancement and innovation of unmanned platforms, the corvettes should instead have storage and launch capacities for Unmanned Aerial Vehicles (UAVs) – specifically Vertical Take-off and Landing (VTOL) vehicles – and Unmanned Underwater Vehicles (UUVs) that can extend the range of detection and attack capabilities while also fulfilling niche roles like mine countermeasures or massed drone attacks. Additionally, the corvettes will need to have a replenishment-at-sea capability to be eligible for forward-deployable operations.[19]

Why Canada Needs Fast Attack Craft

Although corvettes will play a critical role to enhance Canada's surface fleet composition, the RCN must endeavour to think bolder to expand Canadian sea power. If Canada looks towards what its allies and potential adversaries are doing to expand their sea power, it will observe the incorporation of FACs or guided-missile patrol boats as genuine force multipliers.

With many navies now considering the threat posed by asymmetric capabilities, FACs are positioned as formidable and cost-effective platforms to deter, defend, and respond to the varying unconventional and low-intensity threats posed by irregular warfare. FACs are also beginning to be seen as valuable assets for conventional and high-intensity conflicts, given that their small size, low signature, and high speeds are being prompted up with powerful weaponry to bolster rapid firing actions to penetrate the engagement and operating zones of larger ships.[20]

For Canada, having FACs in its fleet composition can offer complementary roles that can widen the scope and scale of the RCN. Within the Navy's increasing need for ISR capabilities, FACs can offer more line-of-sight communications and data transfers by scouting and relaying targeting information in a battlespace should software-defined capabilities – like over-the-horizon means of communication – be disrupted in a high-intensity conflict.[21]

Second, with their smaller length and beam resulting in a lower profile and limited radar signature, FACs can contribute a more layered approach to sea warfare by offering wide-ranging offensive capabilities to high and low-intensity forms of regular and irregular warfare that a corvette and destroyer cannot do. Their smaller size also offers considerable capabilities to rapidly monitor, interrogate, and board vessels deemed to be operating in the grey-zone of unconventional activities while possessing the proportional lethality to destroy irregular threats posed by cheap drones.

In moving forward with FAC, the RCN should acquire 12-16 of these vessels. The ships design should range from 60-65 meters in length, displace 500-600 tons and be crewed by 30-40 sailors. If the RCN requires assistance to design their FACs, it should take inspiration from South Korea's Yoon Youngha-class patrol vessel and Israel's Sa'ar 4.5-class missile boats as both countries have balanced mobility, lethality, and survivability with cost, construction, and crewed considerations.[22]

For weaponry, a Canadian FAC should possess a 57-mm gun at the bow and a 40 mm gun at the stern, two manually operated or gas-powered 12.7-mm machine guns, and a plug-and-play layout to support short-range surface-to-air missiles or short-range surface-strike missiles. In having these armaments, the RCN will have a suitable platform for carrying out disruption tactics like hit-and-run operations, raiding missions on vulnerable land-based platforms, or deception-based tactics that can overwhelm an adversary's countermeasures by depleting their payloads. To negate any structural limits on the FACs speed and maneuverability, the RCN should consider above-deck Mini Vertical Launch System cells or angled tube-launched canisters.

Additionally, the RCN could also explore ways to equip FACs with more inexpensive missiles to increase the vessel's payload versatility. For instance, by integrating the Javelin Close Combat Missile System – the total system costing less than $250,000 and each missile costing $78,000 – FACs could attain a higher form of offensive capabilities across the conflict continuum for a better cost-effective rate that is considerably cheaper than the $3 million Block II Harpoon missile or the $2.1 million Naval Strike Missile.

Although FACs can be criticized for being too small, incapable of operating with high seakeeping standards or lagging advanced defensive weapon systems, there are ways to improve these shortcomings. Like many NATO allies, Canada should invest in developing a reinforced hull for

FACs, increasing their seakeeping standards to operate in the Canadian Arctic Archipelago, the North Atlantic and Pacific, and in the neighbouring seas of Europe and the Indo-Pacific.[23]

Despite the risk of equipping FACs with a simpler combat management system and CIWS – either the Phalanx-styled Gatling gun or SeaRam missile-based system – for defensive measures, FACs will be deployed with Canadian or allied destroyers, corvettes, submarines, long-range patrol aircraft, and land-based systems. Having better defensive support through integration and coordination, FACs can better fulfill its offensive role as part of a layered defence network.

Why Not Drones in the Fleet mix?

In a time of growing demand for fiscal responsibility, some may argue that human-operated and autonomous drones offer a clearer and more affordable path in expanding the RCN's combat footprint for continental and expeditionary operations.[24] Whereas drones can offer more cost-effective and innovative means to conduct naval warfare, the accelerating demand for better electronic warfare and jamming capabilities will increasingly see sea drones becoming more susceptible to these types of attacks.[25]

With no crews to repair or protect the drone after it is damaged or jammed, these platforms could be retrieved by an adversarial force and reverse engineered.[26] Instead, sea drones should be observed as auxiliary units, capable of expanding the RCN's ISR missions, mine laying and countermining operations, or amplifying a fleet's lethality through loitering swarming tactics

Conclusion

Scaling up Canadian sea power has never been more important for the country and its navy. By incorporating corvettes and FACs into its fleet composition, the RCN can have a more balanced, adaptable, and combat-ready force. These smaller and simpler vessels will provide the speed, flexibility, and mass lethality that modern sea warfare demands – enabling the RCN to respond to both high-intensity peer conflict and low-intensity grey-zone challenges with equal credibility.

Crucially, investing in corvettes and FACs will also strengthen Canada's National Shipbuilding Strategy by offering smaller Canadian shipyards an opportunity to participate in naval shipbuilding. Having this added benefit can reduce construction times and costs while also growing the country's industrial and labour-skill force capacity for building naval ships – a key component should Canada find itself in a conflict where the RCN requires more repairing operations to damaged vessels or replenishment efforts to keep Canada in the fight.

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Notes

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