

Sea Change Canada

ABANDONED AND DERELICT VESSELS [ADV's] IN CANADA



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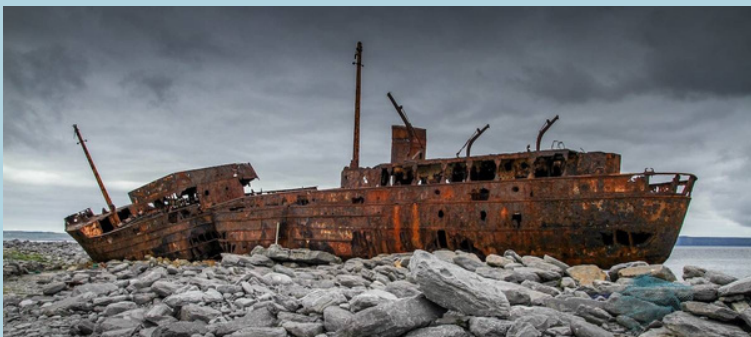
INTRODUCTION

Roughly 35% of Canadians (9.4 million people) actively participate in boating, where 4.3 million boats are owned throughout the country (National Marine Manufacturers Association Canada, 2012). The recreational boating industry alone brings in \$4.4 billion yearly in revenue, contributing \$5 billion a year to the Canada's GDP (NMMA 2012). As more vessels and leisure-crafts are being registered, it is essential for boaters to monitor their vessel for maintenance needs. On average, a vessel's lifespan lasts between five and fifty years with the correct upkeep (Harvey, 2022). Larger industrial scale vessels are typically built to last one hundred years (Harvey, 2022). When boats are neglected and mandatory maintenance is avoided, vessels become both derelict and abandoned. Abandoned and derelict vessels pose numerous environmental as well as socio-economical risks.

Vessels of significant disrepair that pose threats to the public and surrounding environments are deemed ADV's (National Oceanic and Atmospheric Association, 2022). Abbreviated for Abandoned and Derelict Vessels, ADV's are vessels where owners have intentionally given up ownership without intention of returning, surrendering or transferring ownership of the vessel, or vessels that are left without pertinent maintenance, falling into disrepair (Engh, 2017). ADV's also frequently refer to vessels that are dilapidated and in unseaworthy condition, with an identified owner (NOAA, 2022).

Vessels become ADV's in many instances. Owners may neglect or possibly abandon their boats when they can no longer afford to maintain them. Boats break loose from anchors or mooring, are stolen, or are involved in a catastrophic weather event (NOAA, 2022). As coastal storms hit, vessels detach from moorings and collide with surrounding objects, harbours, coasts and bays while materials break apart and are sent into the ocean along with the vessel itself (Gcaptain, 2022).

ADV's have the capability of significantly damaging ecosystems, harming ocean wildlife and surrounding coastal environments (NOAA, 2022). Moreover, ADV's impact industry, tourism and often obstruct navigational channels (NOAA, 2022). This report will outline the occurrence of ADV's within Canada, in addition to their environmental and socio-economical impacts. Moreover, governmental regulation and policy solutions will be explored.



BACKGROUND

Abandoned and derelict vessels have been noticeably growing in size surrounding Canada’s coastlines. In June of 2021, Canadian coastguards director of Vessels of Concerns *Robert Brooks* stated that there are 1,800 current recorded wrecked, abandoned or hazardous vessels across Canada (Burman, 2022). As of March 2022, the known number of ADV's grew to 2,000, with this amount expected to grow exponentially as coastal areas are further searched using funding from the Federal Governments Ocean Protection Plan (Burman, 2022). ADV’s come in a variety of different types of crafts, and not all vessels carry the same level of hazard. Risk factors relate to each vessels size, its structural makeup, and the materials carried within (Howes, 2021).

Smaller crafts are more frequently abandoned in comparison to larger vessels, often by people who are avoiding to pay disposal costs (WorkBoat, 2019). Often, the avoidance of correct disposal of ADV’s relates the vessels material makeup. Vessel’s built after the 1960s, with a majority being small private vessels, are commonly made with synthetic and composite materials that are not designed for recycling (Smedley, 2021). Therefore, disposal costs for newer ships are both much higher and unsustainable (Smedley, 2021).

The Ship-Source Oil Pollution Fund [SOPF] is an independent fund under the marine liability act which holds the responsibility for investigating claims related to oil spills from all ships across Canada (Engh, 2017). A statistical analysis was compiled over a ten year period (January 2006 - December 2015) of SOPF claims related to various vessels. Over the course of the decade, 58% of all claims were incidentally related to ADV’s (Engh, 2017). For the vessels recorded with the SOPF, wooden fishing vessels and ex-fishing vessels contributed to the majority of all claims, compiling 45% (Figure 1).

Wooden ships are highly problematic due to their rapid deterioration rate if not correctly maintained. Reasoning behind ex-fishing vessels taking up a large part of ADV’s found throughout Canada is because of the lack of regulation for these vessels. Ex-fishing vessels are not subjected to strict standards under pleasure craft titles, allowing for their lack of upkeep to ensue (Engh, 2017). Moreover, the most frequent location for ADV’s over the ten year period were within the province of British Columbia (Figure 2).

Location of incidents involving derelict and abandoned vessels and wrecks resulting in claims with the SOPF over the 10-year period

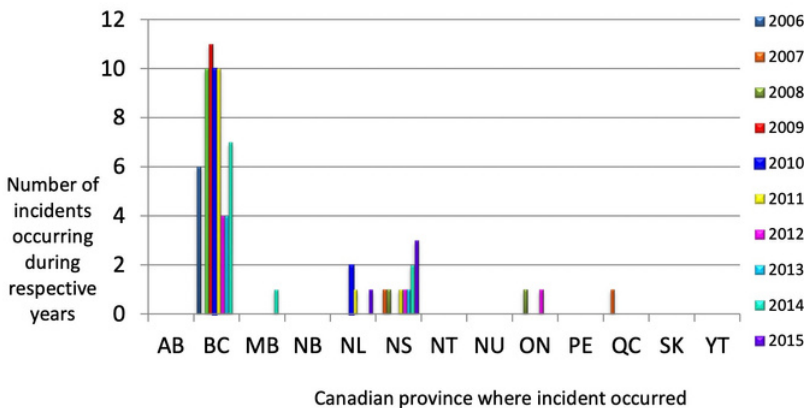


Figure 2: Locations of all SOPF claim vessels over a 10 year period by Province.

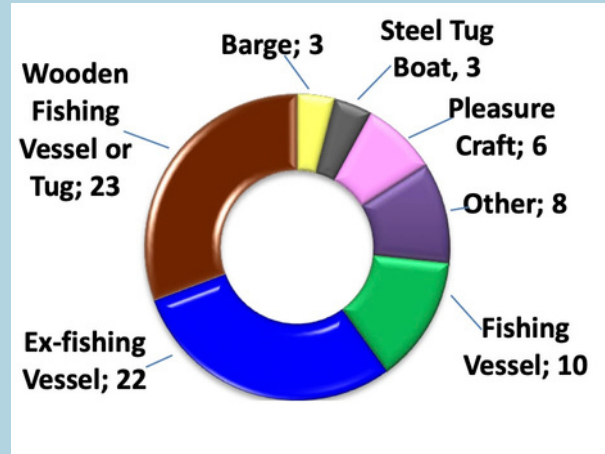


Figure 1: Types of vessels under SOPF claims over a 10 year period.

ECOLOGICAL IMPACTS

ADV's are a large concern for ocean species, as they surround aquatic and coastal environments. As boats deteriorate, hazardous substances leak from internal holds, accumulating in ocean ecosystems (Smedley, 2021). Hazardous substances also sink and integrate into the oceanic benthic sediment layer (Smedley, 2021). Toxic substances such as oil, polycyclic aromatic hydrocarbons (PAH's) and other heavy chemicals are taken in by microorganisms and consequently transferred up the food chain to fish, crustaceans and other sea life (Lindgren, 2022).

One of the most environmentally dangerous ADV leaks is in the form of an oil spill. Any type of boat left discarded both on land or water has a high chance of containing leftover oil (Howes, 2021). Canadian coastguard *Robert Brooks* states; while you may not see large amounts of oil and gas leaking from a vessel, it is very possible that harmful substances are present that are not visible or otherwise detectable (Burman, 2022). Oil leaks as a vessel decays, and an oil leak from an ADV can take decades to first occur (**Figure 3**) (Howes, 2021).



During the aftermath of an oil spill, fish, sea birds and all other marine mammals impacted are coated in oil, suffocated or poisoned (Edmond, 2021). Those either living close to the water's surface or those that come to the surface to breathe and feed are most affected (Edmond, 2021). Oil affects the ability for marine mammals to regulate body temperatures, also impacting a mammal's natural buoyancy, forcing them to drown (Edmond, 2021). The ingestion of oil damages the gastrointestinal tract, causes organ damage and also suffocation, while fumes impact the lungs if inhaled and overall vision quality (Edmond, 2021).

Oil spills affect phytoplankton and algae which are at the base of aquatic food webs and are essential nutrients for zooplankton, the larvae of fish and crustaceans (NOAA, 2019). Studies have found an important influence oil spills have in relation to marine phytoplankton. Large oil spills in closed and semi-closed ocean environments have led to serious algal blooms (Tang, 2015). Algal blooms deplete oxygen in water, produce toxins that kill fish, mammals and coastal birds, clog fish gills, smother corals and submerged aquatic vegetation (NOAA, 2016).

Phytoplankton requires sunlight in order to live, and spills block the ability of photosynthesis to occur. As oil droplets sink to the seabed, it collides with sedimentation rates, which is a critical source of food as well as habitat for many benthic ocean organisms (Edmond, 2021). Ocean life suffers following a spill from weeks to months afterwards (Edmond, 2021).



Figure 3: The Vessel titled MV Schiedyk was a 483 ft. cargo ship which sank off Blight Island, Nootka Sound in 1968. In 2020, fifty two years later, the sunken vessel started leaking oil from its corroded fuel tank (Chek News, 2021). Over Sixty tonnes of heavy fuel was removed from ocean areas of concern, along with 48,500 KG of oily waste (Chek News, 2021).

As ADV's age, the vessels wooden, fibreglass and metal structures deteriorate, thus discharging contents into the ocean (WorkBoat, 2019). While still in motion, ADV's scrape and smash into fragile reef habitats and disperse hull paint, typically containing copper and other toxic compounds (Smedley, 2021). Submerged aquatic vegetation, oyster reefs, marshes and mangrove habitats are the most sensitive areas to these situations (WorkBoat, 2019). Stationary ADV's also block the regrowth of future benthic life such as kelp, seagrass and benthic algal due to shading (WorkBoat, 2019).

Fishing vessels that become abandoned or derelict can contain fishing and trapping gear onboard, risking the release of ghost gear into the ocean (Government of Canada, 2021). Ghost gear refers to any fishing gear that has become abandoned, lost or discarded. (Goodman, 2021). Ghost gear is known to cause significant negative environmental, economic and social impacts (Goodman, 2021). Such examples include habitat degradation, indiscriminate fishing, mammal entanglements, decreased fishing yield, sea-safety hazards and vessels damage (Goodman, 2021).



Studies have shown that some types of plastic ghost gear can persist in marine environments for up to 600 years, continuing to impact marine life while in circulation (Goodman, 2021). Preventing the build up of Canada's ADV's may in turn stop ghost gear, boat parts, oil spills and toxic substances from entering the ocean environment.



SOCIAL IMPACTS

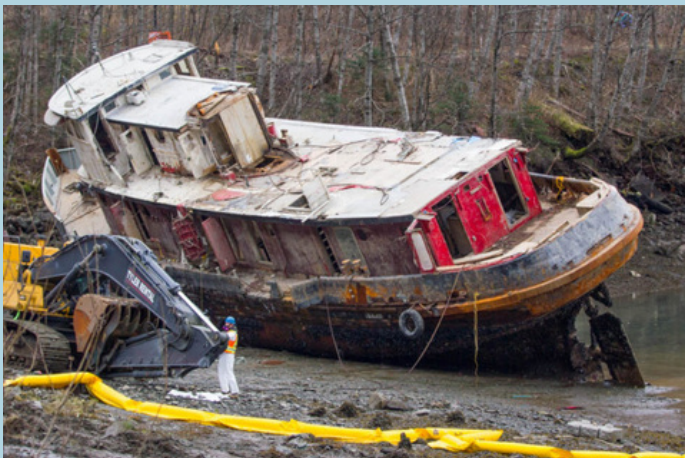
Many social impacts are seen to be created due to the impacts of ADV's. In many instances, Abandoned vessels endanger busy waterways, posing obstacles that threaten the safety of other surrounding boaters (Gcaptain, 2022). Boaters need to navigate around ADV's that have either been left in busy ports and waterways or have drifted to the area, establishing a difficult obstacle to avoid (Gcaptain, 2022). Fishers, trappers and other maritime workers constantly need to avoid and maneuver these vessels as well.

ADV's present a high safety risk due to their unpredictable movements and locations of rest. These vessels are typically unstable and dangerous, where those who board or attempt to move an ADV can become seriously injured depending on the vessels condition and location.

Abandoned vessels that are Submerged underwater can make them difficult to detect, thus providing another instance of endangering boaters who either do not have the correct detection equipment or are generally unaware of the problem vessels location (Gcaptain, 2022). Derelict vessels are a significant eyesore, establishing ramifications to the tourism industry or areas of commercial interest. ADV's disrupt tourist beaches, busy coasts and harbour areas (**Figure 4**). In conclusion, ADV's have the capability of endangering leisure-boaters and fishers, marinas and busy waterways and provide complications towards the coastal tourism industry.



Figure 4: An example of an ADV resting in a busy marina



SOLUTIONS

In recent years, significant steps have been taken towards establishing the correct policies, regulations and vessel standards to improve the current impacts that both abandoned and derelict vessels have on ecological and social fronts across Canada. These steps hope to be a notable improvement when compared to past vessel standards which have proven to be problematic.

In 2016, 'The National Strategy to Address Canada's Wrecked and Abandoned Vessels' was launched in part with Canada's Ocean Protection Plan (Government of Canada, 2022). Five key measures have been created which focus on preventing and addressing problem vessels. These measures collectively foster the idea of reducing the risk created by ADV's in Canadian waters while supporting the restoration of marine ecosystems and environments (Government of Canada, 2022).



Measure One: New legislation has been established in regards to increased ownership responsibility and liability once vessels reach their end-of-life, while prohibiting vessel abandonment and any other acts of irresponsible Vessel management (Government of Canada, 2022). Labelled the 'wrecked, abandoned or hazardous vessels act' (bill C-64), the bill prohibits owners from abandoning boats, additionally making owners liable for costs to remove vessels and wrecks (Government of Canada, 2018).

Measure Two: The creation of short-term funding programs supporting local coastal communities, organizations, harbours and marinas in the cleanup of high priority ADV's and supporting the research of vessel recycling and environmentally sustainable designs (Government of Canada, 2022). A five year \$6.58 Million abandoned boats program was launched in 2017, where 112 boats were removed before 2020 (Government of Canada, 2022). Likewise, a 5 year 'small craft harbours abandoned and wrecked vessels program' was launched by DFO in 2017, where 89 abandoned boats were removed from Canadian harbours (Government of Canada, 2022).

Measure Three: Establishing enhanced vessel ownership identification protocols by improving the capacity to identify vessels and owners by engaging with various provincial and territorial governments, indigenous groups, marine industry stakeholders and law enforcement (Government of Canada, 2022).

Measure Four: Formulating national risk assessment methodology by maintaining the national inventory of wrecked, abandoned and hazard vessels throughout Canada (Government of Canada, 2022). Using risk assessment methods to rank and prioritize vessels within the inventory for needed action (Government of Canada, 2022).

Measure Five: The development of a vessel remediation fund for the purpose of creating a long term fund to address cases of problem vessels moving forward (Government of Canada, 2022).

CONCLUSION

ADV's are a topic of concern surrounding the condition of Canada's pristine ocean and coastal environments by polluting and destroying ocean life and ecosystems. Furthermore, ADV's pose a hazard for leisure boaters, busy waterways and impact certain coastal tourism locations.

Many strategies and government funding streams have started to address ADV's within Canada's waters, holding owners accountable for their vessels with hopes to preserve and restore surrounding marine ecosystems (NOAA, 2022). Addressing the upkeep of vessels registrations, the purchasing of boaters insurance, advocating for regular maintenance for vessels and educating boaters on establishing an end-of-life vessel plan is crucial (Government of Canada, 2022). These motions hope to have a positive outcome, improving the current state of ADVs across the country.

Significant assistance has been seen from various non-profits and charities across Canada towards conducting problem vessel removal initiatives as well. Sea Change Coastal Champions such as Rugged Coast Research Society and Coastal Restoration Society (**Figure 5**) are amongst countless successful initiatives working to rid the Canadian coasts of ADV's (Coastal Restoration Society, 2022).

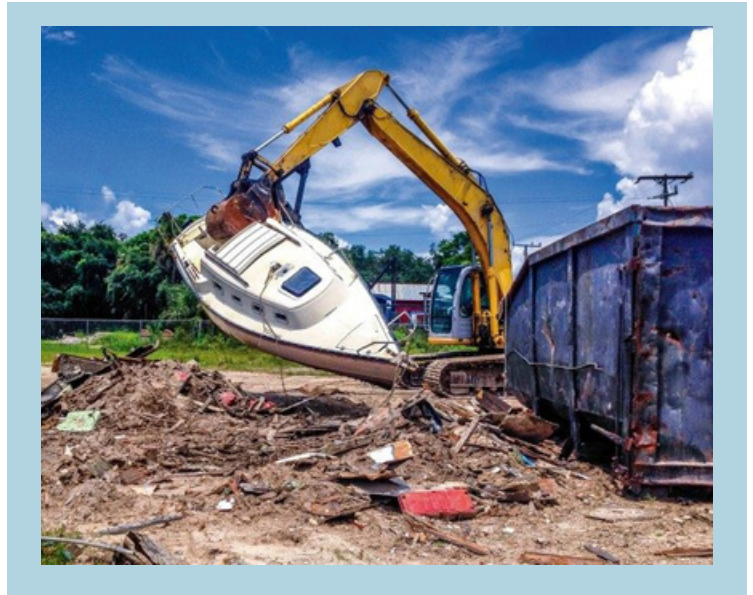


Figure 5: Coastal Restoration Society's (CRS) vessel removal initiative.

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