

In Cod we Trust: Cod in Atlantic Canada

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Introduction

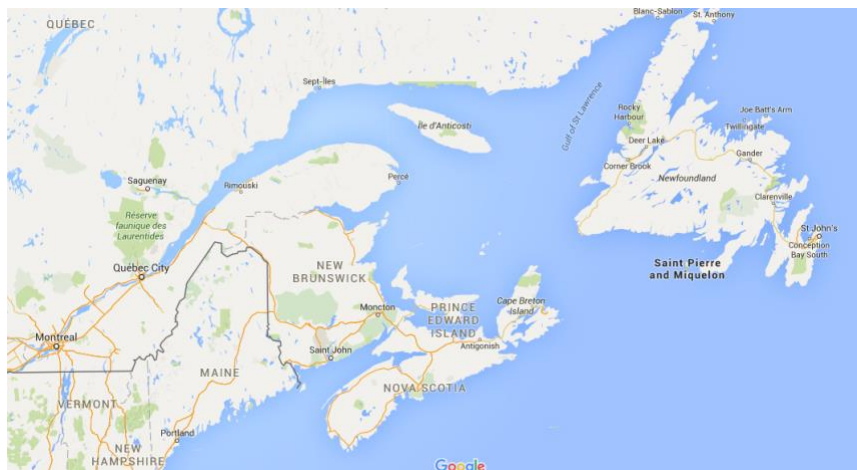


Figure 1. Atlantic Canada, location of cod collapse (<https://www.google.co.uk/maps/>)

When examining the issues of cod in the Atlantic we are instantly reminded of the Tragedy of The Commons. The first accounts of cod off the Atlantic Coast of Canada is one of complete abundance, however the reality today is very different. As often happens with an overly abundant resource it quickly became overharvested. The cod population in the Atlantic is a fraction of what it once was and because of this the once abundant population has become a wicked problem.

Framing the Problem

The term wicked problem was coined by Rittel and Webber (1973) and was used to describe difficult planning in social policy and later related to the environment and resource management. Roberts (2000) stated that defining the problem in the beginning is a problem within itself, with disagreement from stakeholders the main reason with solutions creating further complications. Within the fields of resource management and environmental issues, wicked problems are highlighted by their scientific uncertainty and lack of technological solutions (Gunderson, 1999).

The wicked problem under analysis here is the collapse of the cod stock in Atlantic Canada. Since 1550 there has been large scale cod fishing off the Canadian Atlantic coast, up until 1993 (Government of Canada, 2015). Atlantic cod could be found from western Greenland

down to Maine and was the main economic driver for The Maritimes (New Brunswick, Nova Scotia, Prince Edward Island) and Newfoundland and Labrador where they account for 75% of all fish catches in Canada (Mackenzie, 2015). Since the moratorium on fishing in the region, stocks have yet to show a recovery to pre-collapse levels Myers et al (1997). The result of the collapse has not been confined to the aquatic world or the environment. The World Wildlife Fund (WWF) (2015) have noted that 30,000 jobs were lost and the social and cultural stability of the region has been shaken. Figure 2 reveals the issues surrounding this wicked problem.

Developing Rittel and Webber's (1973) description of a wicked problem, some characteristics could be added, like that of uniqueness, complexity and persistence. Canada's Atlantic Provinces are socially unique, with its residents being fiercely loyal to their province and the country as Kenny (1999) states. No other region of Canada has such reliance on the ocean and its resources making it susceptible to change. The Atlantic cod collapse is only one of a few fishery collapses around the world, making it scientifically unique (WWF, 2015). The other factor making it scientifically different is the added complexity of a warming ocean and its effect on this ecosystem. Scientific uncertainty on the recovery is hampering the issue, with different sources stating different statistics. The background problem to the methods of calculating fish populations is that there is no certainty behind it. The multiple views on the collapse also makes this topic a wicked problem with the many stakeholders involved, including environmentalists, locals, fisherman and the government. Adding to the complexity is the multiple options for solutions with Jentoft and Chuenpagdee (2009) and Khan and Neis (2010) noting only some of the possible solutions. The persistence of the problem is contributing to the instability of the social, economic, and environmental aspects.

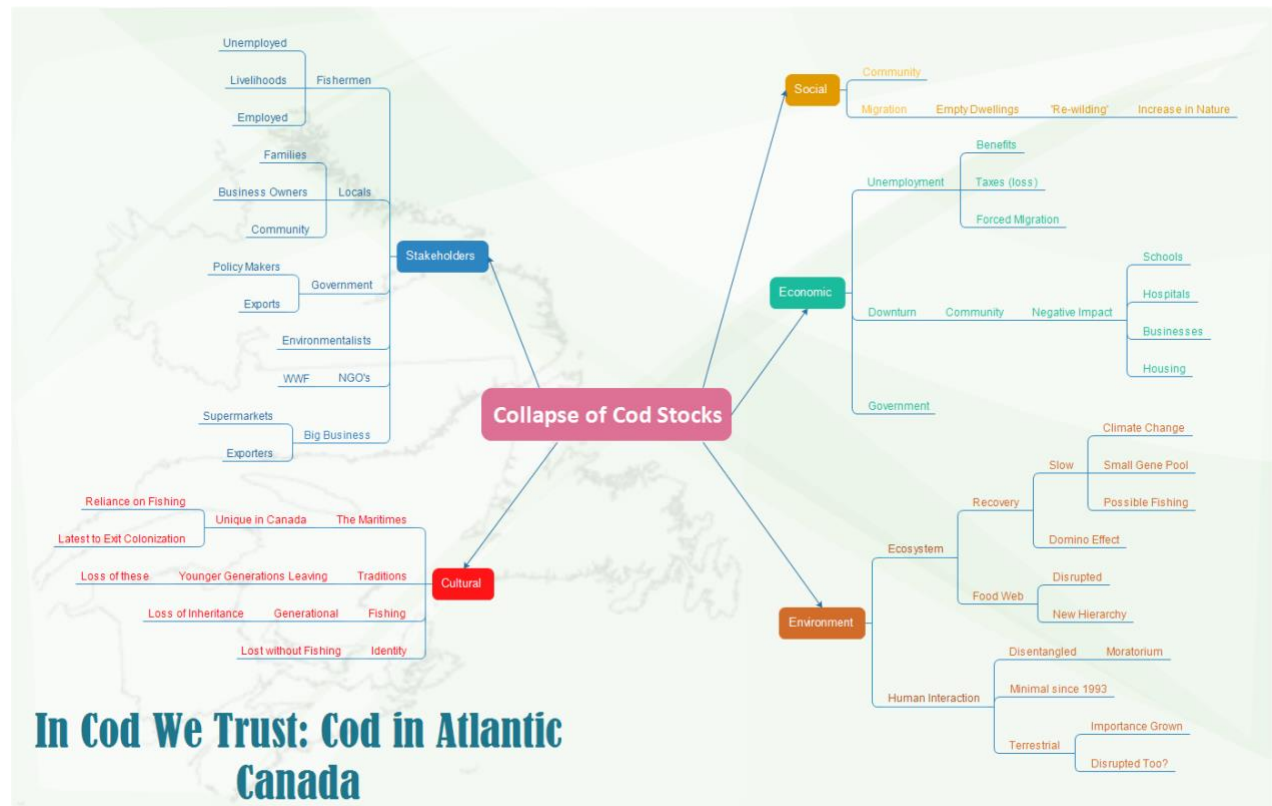


Figure 2 Mind map of the wicked problem (Authors own).

Wicked problems cause numerous issues when developing solutions; prioritising aspects cannot happen as all issues are intertwined. For example, many would see tackling the unemployment issue first, however this then ignores the cultural identity of the area as you move away from fishing or remove the moratorium, which only makes the situation worse.

Governance Framework

In Canada, the federal government has worked to protect the population of cod and introduced policies with the goal of undoing damage incurred by a lack of policy enforcement that led to the destruction of this population. In 1992, the Federal Government was forced to close the Newfoundland fishery, demonstrating the dire position of cod in the Atlantic as a total ban on fishing affected every possible stakeholder, including the Federal Government themselves. To avoid having to take any further extreme measures both Canada and the United States have put more effort and resources into its protection. In Canada there is work done by both the federal and provincial government. In 2003, three federal-provincial Cod Action Teams were created, with Quebec, Newfoundland and Labrador and the Maritimes (New Brunswick, Nova Scotia and PEI). The creation of these teams is strategic, allowing for each province or group of provinces to have their own team, but the overarching involvement of the federal government allows for a greater number of resources available to the provinces and allows for a cohesion among each province's action plans to protect this population.

The regulating body in the U.S. is the National Oceanic and Atmospheric Administration (NOAA), all of the members of this organization are sworn in by the United States Senate. It is important to note that there is also often mention of the National Marine Fish Services (NMFS): this is a department of NOAA. The United States has divided up the responsibilities of this resource management, but in a different way than their neighbours to the North. States have their own regulation, but as is mentioned in the regulation book, "In accordance with the New England Fisheries Management Council and for consistency with the National Marine Fisheries Service (NMFS) federal regulations" (2014). Although individual work is being done by the state, in this case Maine, there is cooperation found between the different levels of government to achieve a common goal.

Although the U.S. has done so on a less official level, these two neighbours have both found effective ways for the federal and state governments to work together to help save this species. Having a multi-leveled approach allows for more comprehensive regulations and enforcement of these regulations. A more local source of government allows for the many who rely on this industry feel as if they have voice that is being heard, which is something that the federal government is often lacking. Provincial and state governments have an added aspect of transparency, especially when in both Canada and the United States the smaller branches involved include contact information for the staff members involved in this project for anyone to call.

With the international aspect associated with the ocean and its inhabitants there is also the requirement for an overarching international body. Therefore, United Nations (U.N.) also has a presence in this issue, through the Food and Agricultural Organization of the United Nations (FAO). The U.N. examines where the main producers of cod are located along with the processes currently used in the collection of these locations. Although there is much monitoring, the U.N. does not have any specific involvement in the regulation of Atlantic Cod or the application of these regulations. The North Atlantic Fisheries Organization (NAFO)

Convention is an international/global agreement on protecting the waters of the North Atlantic and everything within it, including the Atlantic cod species. The convention under Article I states that the coastal states of the North Atlantic (Canada and United States) have jurisdiction on the living resources that are in the 200 nautical mile boundary from where the territorial sea is measured. (NAFO, 2004) The jurisdiction includes rights for exploiting, exploring, managing, and conserving resources that lie within the area. Article II of the convention states that only contracting parties of NAFO can have their vessels in these waters. The importance of this convention allows protection on Atlantic cod stocks because it creates a border preventing people from countries not on the contracting parties to come into these waters and fishing in it. This inhibits illegal fishing which will further deplete the stock and allows legal legislation to be put into place because now the law has a concrete area to control.

It is impossible to have the population size that cod once did in the Atlantic and then experience such a dramatic drop without gaining the attention of non-governmental associations. Cod currently remains on the priority species list for the WWF; they argue strongly that the cod population is struggling to grow and that this is an indicator and a warning as to what can happen with overfishing and lack of regulations. As a non-governmental organization, they are unable to impose new policy, however this does not prevent the lobbying of government as well as the WWF taking on their own initiatives. One of the most known and memorable is the Certified Sustainable Seafood, indicating that the seafood being sold or served has been fished in a sustainable method (WWF, 2015). They also currently have effective programs are used to implement more sustainable fishery practices; along with the promotion of smart fishing gear, the goal is to have these safer tools be a compulsory aspect of fishing. The government plans to support the initiatives of any other agencies or organizations that have visions to plan for Atlantic cod sustainability.

Moving Forward

With the many stakeholders and potential economic benefits/losses, the next steps taken are very important ones. There are strategies that have been implemented previously, both for cod and other fish species that have experienced over exploitation. Popular methods include, Marine Protected Areas (MPA), seasonal regulations and quotas.

Currently, the approach of MPAs are underutilized with a very small percentage of the ocean falling under protection. This approach would allow for certain areas to be completely restricted from fishing with the aim of protecting the remaining population of cod and will be implemented over the long-term. This is an effective method of fishing control, and with strategic placement, such as spawning areas, this method could help the cod population return (Gubbay, 1995). The reason this is an important step forward is due to the lack of implementation of this strategy, as can be seen in Figure 3, the Canadian government has implemented some areas of protection, but there are still many areas that would be ideal candidates for protected areas. However, fish are not stationary and will move along the coastline in order to find optimal feeding grounds, therefore protecting other areas along with spawning grounds will be needed. Environmentally this works well, but consideration of the social and economic aspects will be needed. As MPAs are extended, the area of available fishing grounds will shrink, putting the fishing industry under further stress (Sanchirico et al, 2002). On the other hand, the MPA may well cover territories of other species, for example lobster (which is now a key player in the industry). It may also give protection to species which

are not in immediate need of protection or it may increase competition for the cod by helping other populations.

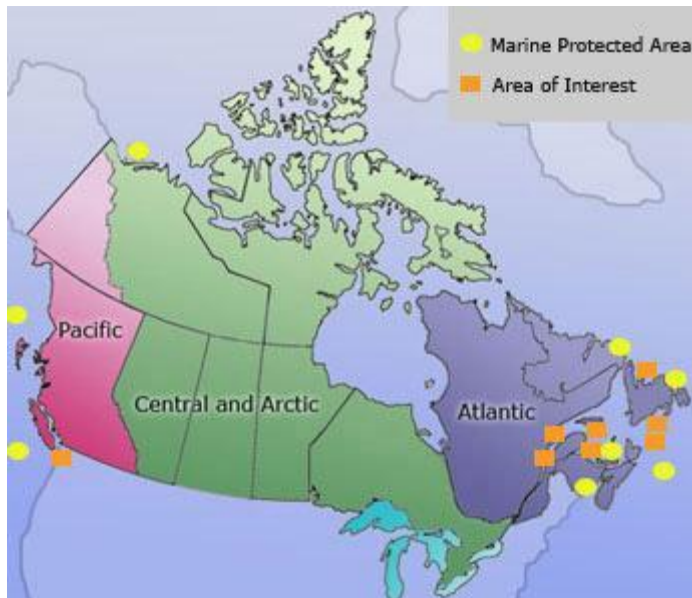


Figure 3 <http://www.dfo-mpo.gc.ca/oceans/marineareas-zonesmarines/mpa-zpm/index-eng.htm>

Imposing a moratorium on all species or reducing quotas may also be a solution to this wicked problem. Since the depletion of cod, the food web has been altered dramatically allowing its prey to thrive, including lobster. (Waddell, 2015). This has now moved the focus of fishing too, where most vessels now harvest lobster. This will continue until their fate is sealed like that of the cod, which will cause fishermen to catch smaller species yet again creating unsustainable consumption of aquatic species. This decrease in lobster would definitely end the possible recovery of the cod stock. Therefore imposing stricter quotas would increase prey for the remaining cod, leading in the long term to an increased and stabilised cod population. The aim is to indirectly increase the stock of cod whilst also improving the ecosystem which creates a more resilient environment and one less sensitive to change. Similar to the previous solution, the consequences would be felt largely on the economic and social aspects of the issue.

Similar to quotas, seasonal regulations also help the aspect of depopulation of cod. Only during the open season, is fishing allowed which grants these fish the time to reproduce during the closed season. By preserving the source, it is beneficial towards cod, allowing the young fish a time for survival to continue the cycle of reproduction. However, with seasonal regulations, this also helps fishermen by letting them catch larger cod, which yields greater returns. It is mutually beneficial to create a sustainable cycle for the future.

Moving away from the environmental solutions, solving the immediate problem of unemployment and depopulation should be a priority. More provincial and federal funding for education and businesses will stop the migration of younger generations and give alternative employment opportunities to fishing (Gibson and McKenzie, 2011). Important for the small communities relying on the cod industry to understand that these changes are not taking their jobs away from them, but ensuring that the jobs are there and will stay there for years to come. With improvement in technology over a long period, jobs in the fishing industry would have slowly decreased. However the collapse of the cod stock has forced mass

unemployment and this solution may not be accepted due to the lack of adjustment time for the community. Yet realistically this is all dependent on the financial situation.

Conclusion

Through our research, we found the once abundant source of cod, was heavily overfished leading to major depopulation causing enormous economic struggles and vast unemployment. Over the last two decades, through government issued protected areas, quotas and other regulations, the stock of Atlantic cod has slowly been able to reproduce. Of course, further funding towards the protection of the cod industry still needs to be in place for years to come to allow not only allow an economic sustainable cycle for the workers but to make sure the overfishing of cod will never happen again.

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