



OCEANS OF OPPORTUNITY



THE ECONOMIC CASE FOR
REBUILDING NORTHERN COD

A rebuilt northern cod fishery could provide 16 times more jobs and five times more economic value in today's dollars.

THE ECONOMIC CASE FOR REBUILDING NORTHERN COD	3
REVITALIZING CANADA'S FISHING SECTOR	4
A HISTORY OF OVERFISHING	6
OPPORTUNITY FOR REBUILDING	7
REAPING THE BENEFITS	9

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THE ECONOMIC CASE FOR REBUILDING NORTHERN COD

Northern cod is an iconic species, deeply connected to the communities that have long lived along the shores of northeast Newfoundland and Labrador.

It stands as a symbol of the bounty and prosperity that supported massive fisheries, drove economies and fed millions. It is also a symbol of loss and the devastating consequences of overfishing. The cod collapse in the early 1990s—the largest fisheries collapse the world has ever seen—is a legacy of fisheries mismanagement, but it doesn't have to be our future. Signs of a fragile recovery of northern cod bring hope, and with it, opportunities to rewrite the wrongs of the past.

To grasp Canada's full potential for abundant, healthy oceans, Oceana Canada commissioned a study by leading fisheries economists analyzing the socio-economic costs and benefits of rebuilding fisheries. *Economic and Social Benefits of Fisheries Rebuilding* found that a rebuilt northern cod fishery could have a net value in today's dollars worth up to five times its current value and provide 16 times more fishing jobs. With low fishing pressure and under favourable environmental conditions, we could see the fishery support 26,000 jobs, 16 times more than today, and economic activities worth \$233 million in as little as 11 years (Table 1).

THE BENEFITS OF A REBUILT NORTHERN COD FISHERY



SIXTEEN TIMES MORE EMPLOYMENT—

boosting the number of jobs from approximately 1,600 to 26,000.¹



INCREASED ECONOMIC ACTIVITIES,

from \$36 million to \$233 million (in today's dollars).



THOUSANDS MORE PEOPLE BENEFITTING

from indirect socio-economic impacts of the commercial and recreational fisheries.

¹ Based on average historical catches from 1983-1989, assuming a rebuilt fishery of more than 209,000 tonnes.

REVITALIZING CANADA'S FISHING SECTOR

The loss of fish abundance jeopardizes our social and economic well-being and the health of our oceans. In Canada, only 34 per cent of fish populations are healthy and more than 13 per cent are critically depleted, including northern cod.² Of 26 critically depleted stocks, only five have rebuilding plans in place, and of these plans, the majority do not follow global best practices, such as setting targets and timelines for recovery. There is an urgent need for the government to intensify its efforts to rebuild Canada's fisheries. The future health of our oceans, economies and coastal communities depends on it.

Rebuilding scenarios outlined in *Economic and Social Benefits of Fisheries Rebuilding* make a strong socio-economic case for rebuilding northern cod. By keeping fishing pressure low and delaying a limited payoff today, there is potential to rebuild the population to healthy levels and support a lucrative, sustainable fishery for the future.

From 1950 to 1992, industrial fleets "fished to near annihilation" many of the commercial stocks in Newfoundland and Labrador.³ Northern cod plunged into a critical state and has stayed there ever since. For decades, the federal government has not followed its own policies and scientific advice to keep northern cod fishing mortality as low as possible and it has also failed to deliver a rebuilding plan.

The current approach to managing the fishery is a dangerous one. It cheats future generations of the benefits of a rebuilt fishery and goes against government policy. Continuing to fish populations that are deep in the critical zone, like northern cod, prevents them from rebuilding and risks driving them further downwards. Studies show that the deeper populations descend into the critical zone and the longer they are allowed to remain there, the longer they take to recover.⁴

Today, northern cod is showing small, incremental increases in biomass, but it is still less than half of the amount that would see it move it out of the critical zone and into the cautious zone, let alone move it into the healthy zone. These small increases have yielded calls from some stakeholders for substantial increases in fishing quotas. However, history has shown that increasing fishing before stocks are sufficiently large and resilient can thwart the recovery and economic potential of fisheries.

² Archibald D & Rangeley R (2018). Fishery Audit 2018. Oceana Canada. Available at <http://dx.doi.org/10.31230/osf.io/sn78t>

³ Rose, GA (2007). *Cod: The Ecological History of the North Atlantic Fisheries*. St John's: Breakwater Books Ltd.

⁴ Neubauer P, Jensen OP, Hutchings JA, Baum JK (2013). Resilience and recovery of overexploited marine populations. *Science* 340: 347-349



Credit: Oceana, Carlos Minguell

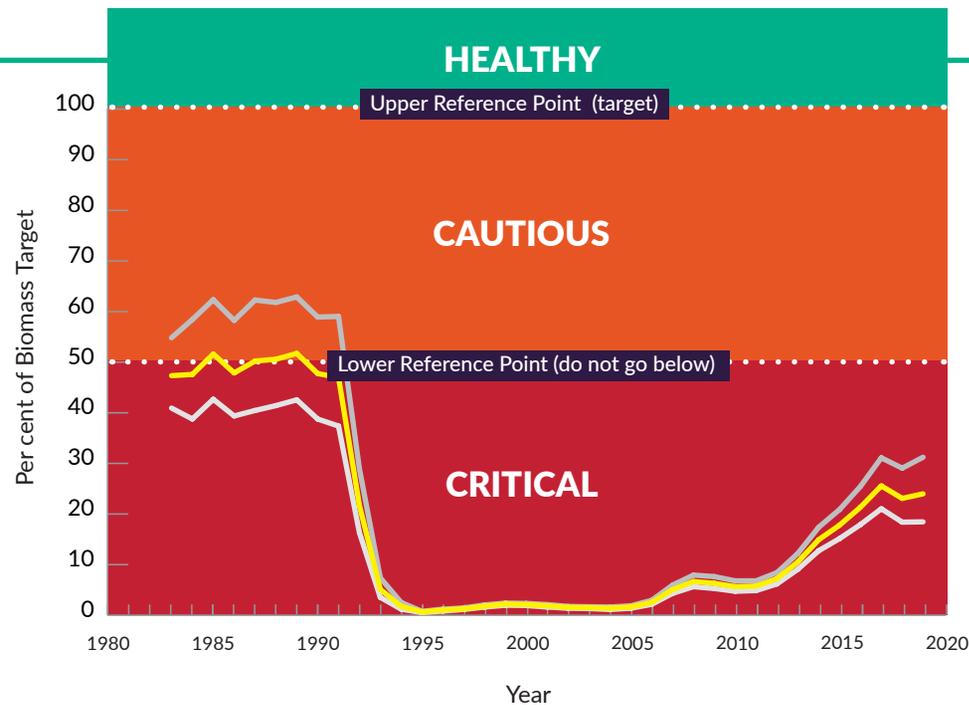
“IF WE KEEP TAKING MORE AND MORE FISH OUT OF THE WATER FROM A COLLAPSED POPULATION, WE WILL NEVER REALIZE THE LONG-TERM ECONOMIC AND SOCIAL BENEFITS OF A HEALTHY, ABUNDANT FISHERY.”

Josh Laughren, Executive Director, Oceana Canada

Credit: iStock/AzmanL

SPAWNING STOCK BIOMASS AS A PERCENTAGE OF THE BIOLOGICAL UPPER REFERENCE POINT⁷

NORTHERN COD WAS ONCE ABUNDANT, WITH A POPULATION THAT SUPPORTED SUSTAINABLE FISHING. FROM 1800-1950, ITS BIOMASS WAS IN THE FOUR-TO-SIX MILLION TONNE RANGE,⁵ COMPARED TO 398,000 TONNES IN 2019.⁶



FAST RECOVERY AND LOW FISHING PRESSURE COULD RESULT IN A HEALTHY NORTHERN COD POPULATION IN AS LITTLE AS 11 YEARS.

⁵ Rose, GA (2007). *Cod: The Ecological History of the North Atlantic Fisheries*. St John's: Breakwater Books Ltd.

⁶ Dwyer KS (2019). DFO technical briefing on northern cod, April 2, 2019

⁷ Adapted from the DFO technical briefing on northern cod April 2, 2019. This graph presents the spawning stock biomass of cod as a percentage of the upper reference point (URP), where the URP is the level where a stock is considered healthy. DFO has not defined a target reference point for rebuilding. In the absence of an estimate of the maximum sustainable yield, a target healthy zone reference line (known as the upper stock reference point or URP) can be approximated as double the lower reference point (LRP), the boundary line between the critical and cautious zones. The solid dark line shows that the cod stock is at 48 per cent of the LRP in 2019, well within the critical zone, but showing an increasing trend. The light lines are the 95 per cent confidence intervals.

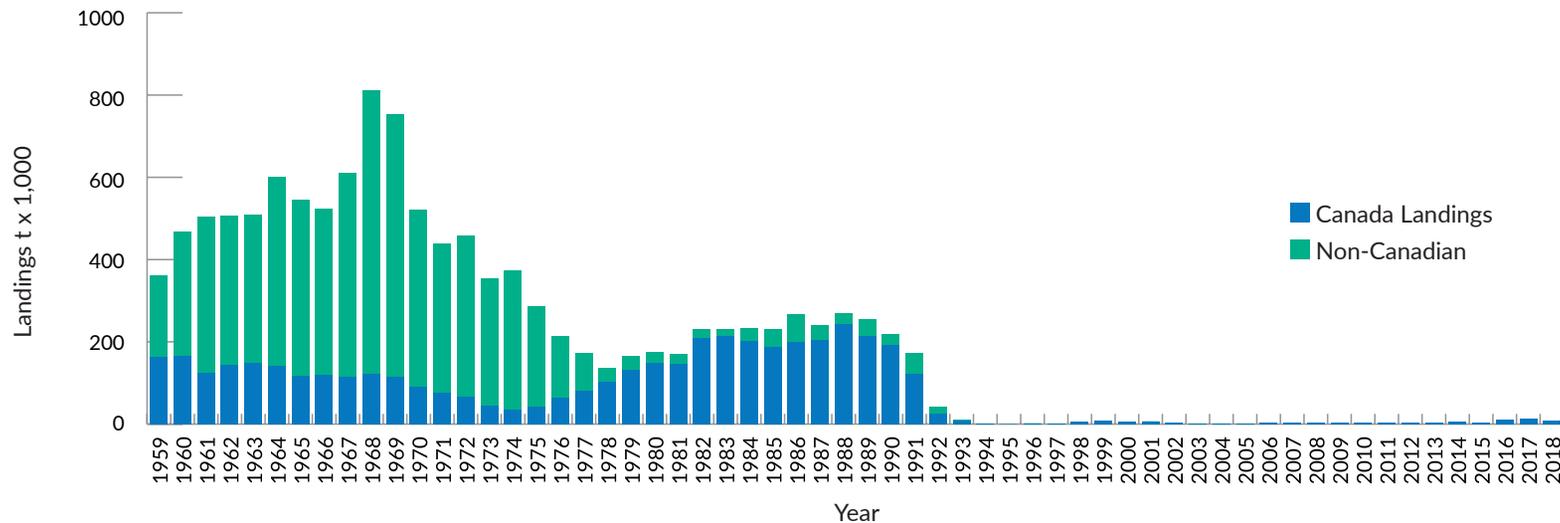
A HISTORY OF OVERFISHING

Historically, much of the overfishing that led to the collapse of northern cod was the result of foreign fishers. This mostly ended in 1977, when a 200-nautical-mile Exclusive Economic Zone (EEZ) around the coastline was claimed and Canada became responsible for most of the range of northern cod, except for a small area on the nose of the Grand Banks outside of this Zone. After the EEZ came into effect, fishing again increased as the Canadian industry overbuilt its capacity, leading to a total collapse of northern cod in the early 1990s. In 1992, the fishery was put under a moratorium. Despite this, fishing never completely stopped. Limited quotas, recreational fishing and bycatch continue, putting constant pressure on the population's fragile recovery.



IT'S TIME TO LET THE NORTHERN COD FISHERY LIVE UP TO ITS FULL POTENTIAL. THIS MEANS KEEPING FISHING PRESSURE AS LOW AS POSSIBLE AND IMPLEMENTING A PLAN TO REBUILD THE POPULATION TO THE HEALTHY ZONE.

HISTORICAL LANDINGS⁸



⁸ Redrawn from Dwyer KS (2019). DFO technical briefing on northern cod, April 2, 2019 and Bratney J, Cadigan N, Dwyer KS, Healey BP, Ings DW, Lee EM, Maddock Parsons D, Morgan MJ, Regular P, Rideout RM (2018). Assessment of the northern Cod (*Gadus morhua*) stock in NAFO Divisions 2J3KL in 2016. DFO Can. Sci. Advis. Sec. Res. Doc. 2018/018. v + 107p.

OPPORTUNITY FOR REBUILDING

Economic and Social Benefits of Fisheries Rebuilding focuses on the economic outcomes of fisheries recovery based on different environmental conditions and levels of fishing pressure. Three scenarios were analyzed based on slow, expected and fast recovery (i.e., how favourable the environmental conditions are), paired with either low fishing pressure or a fishery closure. The study shows that the management strategy of fishery closures always produced higher economic gains compared to low fishing, regardless of the rate of fish stock recovery among the case studies analyzed.

With low fishing pressure and favourable environmental conditions, Canada could see a healthy northern cod population supporting economic activities worth \$233 million in as little as 11 years (Table 1).

“BY REBUILDING OUR WILD OCEAN FISH STOCKS, WE CAN FEED PEOPLE AND FUEL THE ECONOMY, ALL WITHOUT USING SCARCE LAND AND FRESHWATER RESOURCES”

Dr. Rashid Sumaila, Professor, Institute for the Oceans and Fisheries and the School of Public Policy and Global Affairs, University of British Columbia

⁹ The best economic scenario is to close all fishing. The “low fishing” scenario was based on the 2018 stewardship fishery recommended catch levels to not exceed 9,500 tonnes.

¹⁰ The report used the 2017 stewardship fishery reported landings of 13,000 tonnes for status quo.

CHOICES FOR NORTHERN COD

The one thing we can control is how we manage fish populations. Here are the choices for northern cod:



REBUILDING

Rebuild the fishery to health by keeping fishing pressure low⁹ and adapting as environmental conditions change.



STAGNATION

Keep the status quo by fishing at current levels¹⁰ and risk poor performance for both the cod population and economic activity. This leaves the stock vulnerable to further collapse if conditions deteriorate.



COLLAPSE

Ramp up the fishery prematurely by increasing the quota, delaying the population’s recovery and potentially pushing it deeper into the critical zone.

Credit: iStock/Rixipix



The benefits of rebuilding fisheries will extend well beyond the fishing sector. This includes increased biodiversity and restored ecosystems and social-cultural values. More abundant fish populations also contribute to healthy ecosystems and food webs far beyond those considered within *Economic and Social Benefits of Fisheries Rebuilding*.

MORE BENEFITS TO REBUILDING

INCREASED BIODIVERSITY

RESTORED ECOSYSTEMS

**CONTRIBUTES TO
SOCIAL-CULTURAL VALUES**



Credit: iStock/witoldkr1

REAPING THE BENEFITS

A healthy northern cod fishery could support sustained annual commercial and recreational catches of more than 209,000 tonnes, generating greater wealth and employment. The case for rebuilding is clear: there are significant economic, social-cultural and ecological benefits. To reap them, Fisheries and Oceans Canada must keep fishing pressure low and implement a strong rebuilding plan.

The lessons from the story of northern cod are relevant for many other populations. Rebuilding a long-collapsed stock is challenging, so we must act before it declines toward the critical zone. Fish populations have a much better chance of rebounding to healthy levels, and do so much faster, when rebuilding efforts begin before they dip too low.

The long-term potential of northern cod vastly outweighs the limited short-term returns we might get from it now. Let's not repeat the past. By focusing on the long-term health of northern cod, rather than short-term gains, we can create a profitable, sustainable fishery that will support ecosystems and communities for generations to come.



Credit: iStock/Rixipix



Credit: iStock/Drimafilm

STUDY DETAILS

Two rebuilding strategies were identified in *Economic and Social Benefits of Fisheries Rebuilding*:

- 1) Fishery closure, which represents a higher weighting to long-term conservation objectives; and
- 2) Low fishing levels, which represents a higher weighting to short-term socio-economic objectives.

Both scenarios are compared to the status quo, which reflects the prevailing management and biological regimes in place. The biological response of each stock

represents the speed at which it rebuilds. Three rates of biological recovery response were considered: fast, expected and slow. Biological response is expressed in terms of northern cod generation time.¹¹ The scenarios are thus defined by a matrix of two rebuilding strategies and three biological responses, plus status quo, which assumes that both management and biological realities stay unchanged from recent years.

TABLE 1. Length of rebuilding period (in years) under each of the six scenarios and the present value of the fishery’s economic impact in the year of recovery. Value is shown in millions of dollars and includes the economic multipliers for both commercial and recreational fisheries.

SCENARIO	NORTHERN COD REBUILDING PERIOD (IN YEARS)	PRESENT VALUE (IN \$MILLIONS)
Status quo	Present	36.58
Fast recovery + closure	8.25	272.60
Fast recovery + low fishing	11	233.71
Expected recovery + closure	16.5	147.28
Expected recovery + low fishing	22	100.23
Slow recovery + closure	24.75	79.57
Slow recovery + low fishing	33	42.99

¹¹ Generation times were defined as the average age of spawning individuals, adjusted for growth and mortality rates. For northern cod, generation time of 11 years was taken from: COSEWIC (2010) COSEWIC assessment and status report on the Atlantic Cod *Gadus morhua* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Xiii + 105 pp.



**THE LONG-TERM POTENTIAL OF A HEALTHY
NORTHERN COD FISHERY VASTLY OUTWEIGHS
THE LIMITED SHORT-TERM RETURNS FROM
THE CURRENT DEPLETED STATE.**



WE CAN SAVE THE OCEANS AND FEED THE WORLD.

Oceana Canada was established as an independent charity in 2015 and is part of the largest international advocacy group dedicated solely to ocean conservation. Canada has the longest coastline in the world, with an ocean surface area of 7.1 million square kilometres, or 70 per cent of its landmass. Oceana Canada believes that Canada has a national and global obligation to manage our natural resources responsibly and help ensure a sustainable source of protein for the world's growing population.

Oceana Canada works with civil society, academics, fishers, Indigenous Peoples and the federal government to return Canada's formerly vibrant oceans to health and abundance. By restoring Canada's oceans, we can strengthen our communities, reap greater economic and nutritional benefits, and protect our future.



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