



NOVA SCOTIA SPECIES SPOTLIGHT: ATLANTIC HALIBUT (*Hippoglossus hippoglossus*)

FISHERY

The Atlantic halibut fishery in Nova Scotia takes place in the Northwest Atlantic Fisheries Organization (NAFO) areas 4VWX, and is within the 3NOPs4VWX5Zc management unit.

Halibut is targeted primarily by long liners using bottom hook-and-line gear.

The total allowable catch (TAC) in 2022 for 3NOPs4VWX5Zc unit was 4807 t.

The total value of halibut landed in NS in 2021 was \$60.8M, and an export value of \$107M.

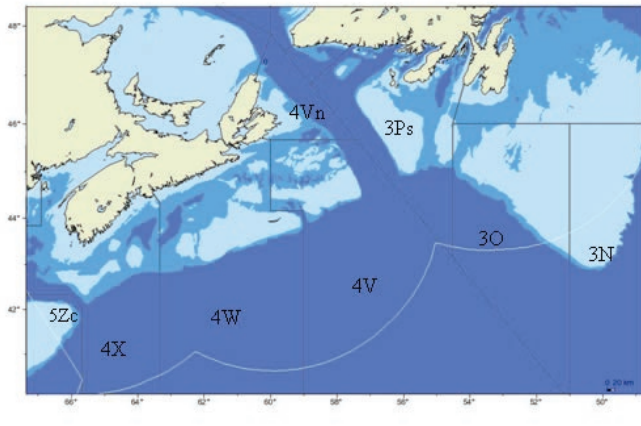


Figure. Halibut fishing areas in the Northwest Atlantic

BIOLOGY

Halibut is a demersal (bottom-dwelling) flatfish species that feed on invertebrates when small, and then on whole fish when they grow larger.

Halibut swim most often with their left side facing the bottom because both eyes are located on the right side of their body. The bottom-facing (blind side) has a white/pearl-like appearance, and the top-side is dark and spotted.

Halibut is found at depths of 200 to 500 m and prefer water temperatures between from 3 to 5 °C.

Halibut grow more than 2.5 m in length and exceed 300 kg in weight. Growth slows after 7 to 8 years, but they can live for at least 50 years.

LIFE CYCLE

Female halibut can produce from 500,000 to 7 million eggs in a single season. Spawning occurs in late winter/early spring. Once released, the incubation period can last from 2 to 3 weeks, but is dependent on water temperatures.

Once hatched, larva measure nearly 1 cm in diameter, and travel from the ocean bottom up through the pelagic zone to the ocean surface. Larvae rely on external food sources for approximately 50 days after hatching, and metamorphosis begins after 80 days with the migration of the eye to one side of the body. Halibut measure 2 cm in length at this stage.

After 1 year, metamorphosis is nearly completed and juvenile halibut measure approximately 10 cm in length. As they grow larger, halibut settle to deeper ocean depths.

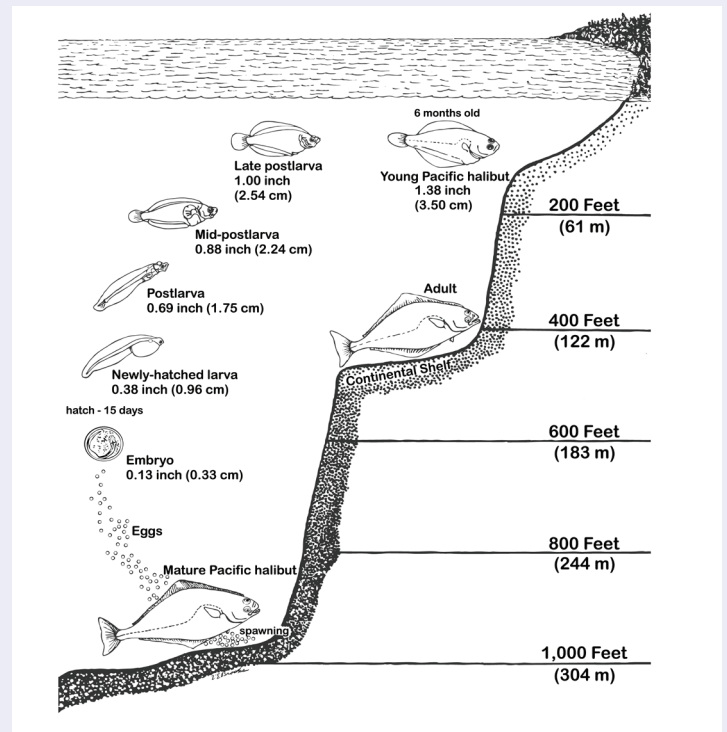


Figure. Halibut life cycle (IPHC, 2017)



NOVA SCOTIA SPECIES SPOTLIGHT: ATLANTIC HALIBUT (*Hippoglossus hippoglossus*)

MANAGEMENT AND CONSERVATION

The 3NOPs4VWX5Zc unit is managed by Fisheries and Oceans Canada. The TAC is set annually based on the outcomes of research surveys, and is evaluated against stock reference points established using the precautionary approach to fisheries management.

General management strategies focus on areas of fishery productivity, impact on biodiversity and habitat, access for traditional culture and sustenance, and overall prosperity.

Management tactics include setting an annual TAC, minimum fish size limit (>81 cm), seasonal closures, and fleet sector quota allocation. Compliance with management objectives include inspections by fishery officers, observer coverage on vessel, dockside monitoring programs, vessel monitoring systems, hail in/out requirements, and maintaining logbooks.

The fishery was first certified by the Marine Stewardship Council in 2013.

SEAFOOD LABELLING

	Terminology	Description
Common Name	English: Atlantic Halibut; Halibut French: Flétan	Accepted common name(s) for <i>Hippoglossus hippoglossus</i>
Production Method	Wild/Farmed	Harvested from the ocean or cultivated in marine net pen or land-based production systems
Certifications	Marine Stewardship Council (MSC)	Certifies that fish products come from wild fisheries that meet environmental standards for sustainable fishing
Product Forms	Round	Unprocessed
	Dressed	Eviscerated only
	Headed & Gutted (H&G)	De-headed and eviscerated
	Fillets	Strips of flesh cut parallel to the central bone of the fish
	Steaks	Strips of flesh cut perpendicular to the central bone of the fish
	Loin	Upper portion of the fillet
Process Description	Fresh	Not previously frozen
	Refreshed/Previously Frozen	Thawed and sold fresh

PROCESSING/HANDLING

Process Yields

Round to H&G = **70 - 83%**

Round to Skin-On fillet = **56%**

Round to Skin-Off fillet = **46%**

*Smaller halibut (10 – 50 lbs) have lower yields than larger halibut (50 lbs +)

Primary Products

Dressed, H&G

Secondary Products

Loins, Steaks

Post-Harvest Primary Processing

Harvest » Slaughter » De-heading and Evisceration » Stowage » Off Loading » Storage » Transport

By-Product

Offal, blood, heads (discarded at sea)

Post-Harvest Processes Impacting Quality

- Delay in slaughter
- Product exposure to elements and handling on deck of vessel
- Delay in icing, inadequate icing
- Gaff punctures and ragged cuts
- Cleanliness of gut



NOVA SCOTIA SPECIES SPOTLIGHT: ATLANTIC HALIBUT (*Hippoglossus hippoglossus*)

CHEMICAL COMPOSITION

	Proportion (g / 100 g)	
	Raw	Cooked
Moisture	80.30	76.10
Protein	18.60	22.50
Fat	1.33	1.61
Carbohydrate	0.00	0.00
Ash	1.29	1.57

*USDA Nutritional Database ID, 15036 (raw), 15037 (cooked)

Halibut is considered a lean fish.

STORAGE

Proper icing practices are essential to ensure halibut go to market of the highest quality. Halibut is susceptible to degradation by delays in chilling and stowage on the vessel, rough handling, and extended storage in ice.

Fresh H&G halibut should be stored in melting ice and belly cavities should be filled with ice and positioned downward to prevent the accumulation of melting ice inside.

Prior to deheading and evisceration, halibut should be stored with the white side facing up to calm the fish and prevent thrashing of the animal on deck. Once processed, storing halibut in this way ensures the proper drainage melting ice and any blood. Exposing the white side to air for extended periods will promote the growth of *Pseudomonas fluorescens* that secretes a yellow/green pigment and can discolour the white skin.

Fresh H&G halibut remains acceptable for up to 3 weeks

KEY FOOD SAFETY AND QUALITY CONCERNS

Fresh raw halibut does not pose an inherent food safety risk if products are cooked to an internal temperature of 70 °C / 158 °F.

As halibut grow, they can feed on larger and larger fish. Over a long-term period, halibut can be at risk for bioaccumulation of heavy metals.

Halibut can sometimes be described as chalky. Chalky halibut is characterized by opaque white flesh, and a soft watery texture. These characteristics result from the coagulation of muscle proteins driven by a lactic acid-induced drop in muscle pH triggered by thrashing (stress) of fish on the line during capture. There has been some success in attempts to identify chalky Halibut at the time of capture by measuring the pH of the muscle tissue; fish measuring a pH > 6.2 do not become chalky, fish measuring a pH < 6.0 is almost always chalky, and fish measuring a pH from 6.0 - 6.2 sometimes develop to be chalky. Chalky meat should not be confused with mushy or jellied meat which is caused by an enzyme-secreting parasite.

The following conditions can contribute to halibut with a higher than normal incidence of chalkiness:

- I. Harvesting actively feeding halibut with high muscle glycogen reserves.
- II. Excessive thrashing, or exhaustion causing death and high muscle lactic acid concentrations.
- III. Halibut which cannot naturally clear high muscle lactic acid accumulation.
- IV. High holding temperatures affecting more rapid development of chalkiness.

REFERENCES

Cargnelli, L.M., Griesbach, S.J. and Morse, W.W. 2004. Life History and Habitat Characteristics of Atlantic Halibut. <https://thefishsite.com/articles/atlantic-halibut-hippoglossus-hippoglossus-i>

DFO. 2018. 4VWX5 groundfish – Maritimes Region. Fisheries and Oceans Canada. <https://www.dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/groundfish-poisson-fond/groundfish-poisson-fond-4vwx5-eng.html>

DFO. 2018. Atlantic Halibut. Fisheries and Oceans Canada. <https://www.dfo-mpo.gc.ca/species-especes/profiles-profil/atl-halibut-fletan-atl-eng.html>

DFO. 2022. Seafisheries landed value by province, 2021. Fisheries and Oceans Canada. <https://www.dfo-mpo.gc.ca/stats/commercial/land-debarq/sea-maritimes/s2021pv-eng.htm>

Fish Fillet Butchering Yields - <https://www.chefs-resources.com/seafood/seafood-yields/>



NOVA SCOTIA SPECIES SPOTLIGHT: ATLANTIC HALIBUT (*Hippoglossus hippoglossus*)

Fisheries and Oceans Canada. Canadian Trade. Last updated December 8, 2022, <https://inter-j01.dfo-mpo.gc.ca/ctr/canadiantrade?rpt=true&rptYearFrom=2020&rptYearTo=2022&tradeTypeId=X> (accessed December 20, 2022).

International Pacific Halibut Commission. 2017. Pacific Halibut Stock Status and Biology. <https://iphc.int/management/science-and-research/pacific-halibut-stock-status-and-biology>

Kramer, D.E. and Paust, B.C. 1985. Care of Halibut aboard the fishing vessel – Marine Advisory Bulletin No. 18. <https://nsgl.gso.uri.edu/aku/akuh85002.pdf>

NOAA. 2023. Atlantic Halibut. National Oceanic and Atmospheric Administration. <https://www.fisheries.noaa.gov/species/atlantic-halibut>

U.S. Department of Agriculture. FoodDataCentral. <https://fdc.nal.usda.gov/fdc-app.html#/>

Wild Pacific Halibut. Biology & Life Cycle. <https://www.wildpacifichalibut.com/biology-life-cycle>