

RESPONSIBLE
FISHING
SINCE 1976

CAPTAIN KEVIN SWIMM

Harbour Grace,
Newfoundland & Labrador



SUSTAINABILITY PROFILE



ARCTIC SURF CLAM

(HOKKIGAI OR BEI GEI BEI)

Mactromeris polynyma



NORTHERN PROPELLER CLAM

(KURO MIRUGAI OR BING SHAN BANG)

Cyrtodaria siliqua



GREENLAND COCKLE CLAM

(SHIRO TORIGAI OR BEI GEI BAI YU BEI)

Serripes groenlandicus

Sustainability is a core business value embedded in Clearwater's culture and expressed throughout our mission, strategies and values. Stewardship of our resources is not only good for business, we see it as our personal and corporate responsibility.

Learn more about the Canadian offshore clam fishery and our commitment to the long-term sustainability of the resource.



WHO CAN FISH

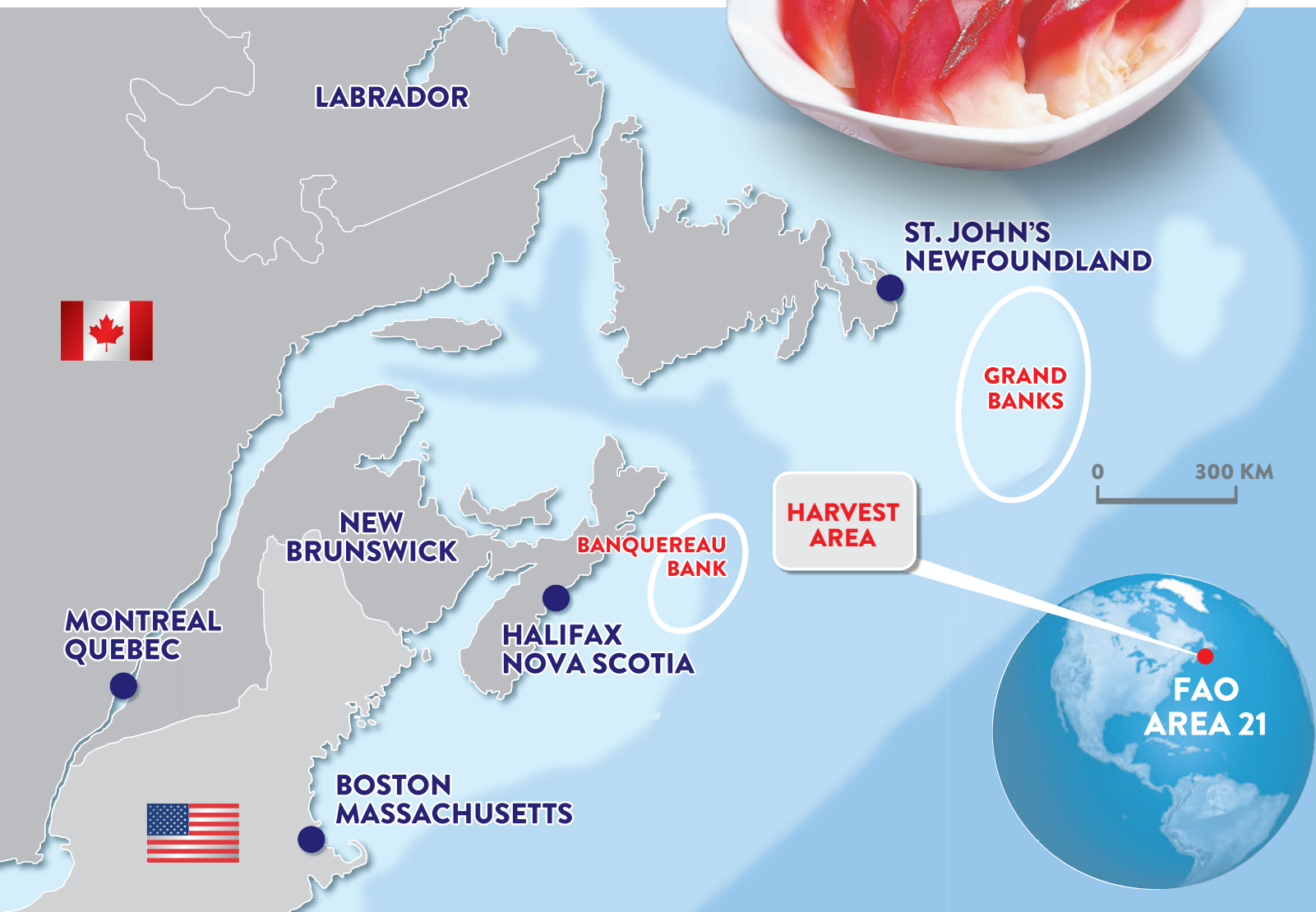
Fishing access is permitted by Fisheries and Oceans Canada (DFO) which authorizes harvest based on a total allowable catch (TAC). Clearwater has participated in the offshore clam fishery since its inception in 1986. Clearwater harvests 75% of the clam quota held on its own licences as well as the remaining 25% of the clam quota through a Landmark Agreement with E'sukutimkewey, a business partnership of 14 Mi'kmaq first nations, 13 in Nova Scotia and one in Newfoundland and Labrador.

HARVEST AREAS & SEASONS

Fishing for Arctic surf, northern propeller, and Greenland cockle clams takes place on Banquereau Bank off the southeast coast of Nova Scotia and the Grand Banks off the southeast coast of the island of Newfoundland in eastern Canada. Fishing takes place year-round. DFO sets a TAC for the Arctic surf clam fishery and monitors landings of all species.

PARTICIPATING IN RESEARCH

Scientific research is the foundation of the offshore fishery. Multi-year joint project agreements signed between DFO and Clearwater significantly contribute to our understanding of life history, biomass, and environment of the offshore clam species. Scientific surveys were conducted on Banquereau Bank in 2004 and 2010, and Grand Banks throughout 2006-2009. Since then, new assessment models based on fisheries data, sampling, and sea-floor mapping underpin the scientific understanding of the resource and inform TAC-setting decisions. Clearwater crew members, guided by DFO protocols continue to collect data and samples on regular fishing trips to monitor the size composition of the catch, the fishing footprint, and the fishing effort.



RESPONSIBLE HARVESTING

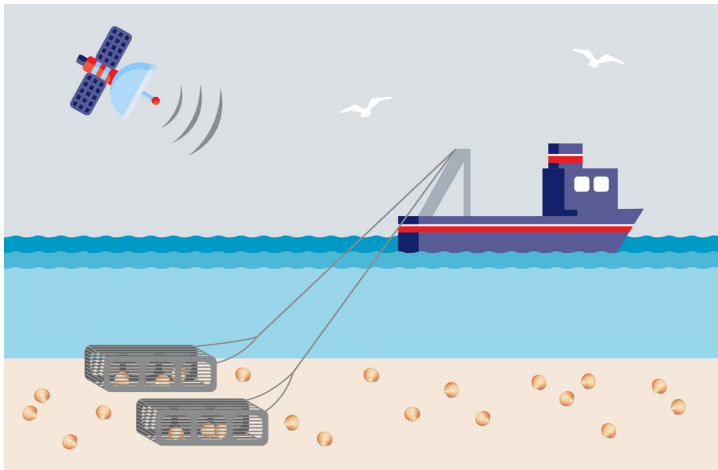
BYCATCH

Bycatch in the offshore clam fishery is low. The most recent stock assessment of both fishing banks indicated that over **95% of the catch was Arctic surf, northern propeller and Greenland cockle clams**. All finfish species combined make up less than 1% of any recorded catch and because the gear is towed at slow speeds there has never been any known interaction with a marine mammal, turtle, or bird.



HARVESTING METHOD

The fishery is carried out with hydraulic clam dredges which encounter the sandy bottom where the clams live. The offshore sand bank habitats have a high level of natural disturbance and are highly resilient to the disturbance caused by the fishing gear.

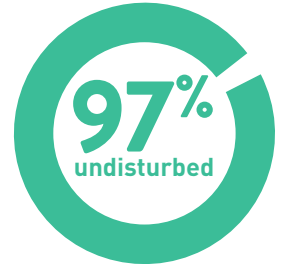


GEAR LOSS AND WASTE

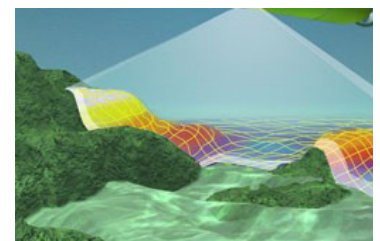
Gear loss is extremely rare in the offshore clam fishery and the size and value of the dredges make them highly likely to be recovered if they are separated from the vessel. No waste generated on board the vessel is released overboard and any debris encountered while fishing is secured on board. Clearwater has standard procedures for onshore disposal for any waste generated or encountered, which includes a recycling partnership with a local animal shelter for fundraising purposes.

IMPACT STUDIES

Clearwater financially supported a **10-year habitat impact study** undertaken by DFO to fully understand the impact of offshore clam fishing gear on the benthic ecosystem. This study is one of the most rigorous gear impact studies available in Canada and internationally, and resulted in three scientific peer-reviewed papers¹²³. During this study, fished and unfished sites were compared using sophisticated sampling techniques such as sidescan sonar, benthic grab samples, and underwater photography and video. It was found that the bottom habitat is resilient, and that non-target species recover within two years. The fishery is rotational in nature, meaning that after harvesting the target species, fishing activity does not resume in that area for a period of approximately 10 years. With a very low exploitation rate on the target species, a long time in between fishing events, and the sandy habitat resiliency, DFO has calculated that only 3% of the available clam grounds are in a recovery process at any given time, meaning **97% of the grounds are undisturbed or in a fully recovered state**.



Clearwater has also undertaken **multi-year, multi-million dollar research projects** in partnerships with DFO and academic institutions such as Nova Scotia



Community College and Dalhousie University. Research has combined detailed harvest data and multibeam sonar technology to produce habitat suitability maps of the clam grounds. Research continues to explore new methods for biomass assessments. This research increases our understanding of the clam habitats, helps us manage our fishing footprint, and drives further understanding of the overall health of the stocks.

¹ Gilkinson, Kent & Fader, G.B.J. & Gordon, D.C. & Charron, R. & McKeown, D. & Roddick, Dale & Kenchington, Ellen & Macisaac, Kevin & Bourbonnais, Claude & Vass, P. & Liu, Q. (2003). Immediate and longer-term impacts of hydraulic clam dredging on an offshore sandy seabed: Effects on physical habitat and processes of recovery. Continental Shelf Research, 23, 1315-1336. 10.1016/S0278-4343(03)00123-7.

² Gilkinson, Kent & Jr, Donald & Macisaac, Kevin & McKeown, David & Kenchington, Ellen & Bourbonnais, Claude & Vass, W. (2005). Immediate impacts and recovery trajectories of macrofaunal communities following hydraulic clam dredging on Banquereau, eastern Canada. ICES Journal of Marine Science, 925-947. 10.1016/j.icesjms.2005.03.009.

³ Gilkinson, K., King, E., Li, M.Z., Roddick, D., Kenchington, E., & Han, G. (2015). Processes of physical change to the seabed and bivalve recruitment over a 10-year period following experimental hydraulic clam dredging on Banquereau, Scotian Shelf. Continental Shelf Research, 92, 72-86.



TRACEABILITY

Internal monitoring systems on our state-of-the-art vessels, at our land-based facilities, and with our dedicated inventory and logistics teams allow Clearwater to trace the product to the production day and fishing area where it was caught. The catch is entered into our traceability system and can be tracked throughout the entire Clearwater supply chain.

CERTIFICATIONS

The Arctic surf clams from the offshore fishery have been MSC certified since 2012. The amounts of northern propeller clams and Greenland cockle clams retained in the Arctic surf clam fishery have been assessed by the MSC audit team and determined to be at responsible levels, but these species have not been evaluated in as much detail as Arctic surf clams and therefore do not carry the MSC logo or claim. Once sufficient data on these co-occurring species is collected, northern propeller clam and Greenland cockle clam could be included in the MSC certification.



SCIENCE-BASED MANAGEMENT

Arctic surf clams are long-lived species and take many years to grow, so the fishery is managed conservatively and the TAC set as a small fraction of total biomass. The size at which surf clams become sexually mature is far below that at which they are commercially harvestable, with the result that individual surf clams will likely spawn 10 times before they are recruited into the fishery, ensuring that future brood stock is well protected.

Clearwater can also retain Greenland cockle clams and northern propeller clams in the offshore fishery. Like Arctic surf clams, these two species are also long-lived and reach sexual maturity long before they are harvested by the fishery. The conservative harvest rate applied to determine the Arctic surf clam TAC offers some additional protection against over-exploitation of these co-occurring species. While there is no TAC set for northern propeller and Greenland cockle clam, the level of removals of these two species are monitored and are **not posing a conservation risk** and there are efforts underway to establish indicators for these species that would further inform the stock status.

The fishing fleet is subject to 100% vessel satellite monitoring, 100% dockside monitoring and an independent at-sea observer program. Daily logbook recording is mandatory and requires that target catch and interactions with non-target species are reported. Crew members regularly collect data on the retained catch as well as preserve samples which are returned to DFO scientist for analysis. These efforts contribute to our understanding of the life history and size distribution of all three species.

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REMARKABLE SEAFOOD,
RESPONSIBLE CHOICE