

Science Advisory Report 2020/007

SUMMARY: Review of Arctic Cod (*Boreogadus saida*) Bycatch in Canadian Arctic Shrimp Fisheries

- The shrimp fishery in the Canadian Arctic is an important resource for Inuit of Nunavut and Nunavik and the commercial shrimp industry in Shrimp Fishing Area 1 (SFA 1) and the Eastern and Western Assessment Zones (EAZ/WAZ). In general, a positive correlation between the total shrimp catch and Arctic Cod (*Boreogadus saida*) bycatch has been observed.
- Due to insufficient data, Science Advice could not be provided in regards to a “cap” for Arctic Cod removal and specifications of the “move away” provision.
- Due to the scarcity of data and the patchy spatial and temporal distribution of Arctic Cod, there is high uncertainty in the biomass index estimates obtained from the surveys that are not designed to target Arctic Cod. This uncertainty leads to low confidence in determining the impacts of Arctic Cod removal by the shrimp fishery. If the biomass index estimates are considered accurate, then the percentage of Arctic Cod removed from the total biomass is likely very low but given the high uncertainty, precaution is advised.
- The absence of a dedicated survey and the limited data on life history of Arctic Cod preclude the use of the Guidance Related to Bycatch and Discards in Canadian Commercial Fisheries (DFO 2012) to determine a sustainable catch limit.
- Canada is committed domestically and internationally to implementing conservation and management measures to address incidental bycatch, including Arctic Cod in the Northern and Striped Shrimp fisheries in the Eastern Canadian Arctic.
- Arctic Cod is a small bodied, short-lived forage fish with an atypical life history for gadoids as it occupies the pelagic zone for a portion of its life beyond the larval and juvenile stages. Despite these characteristics, Arctic Cod is specified as groundfish in the Atlantic Fishery Regulations and therefore “move away” provisions in the offshore Northern shrimp Conditions of Licence apply.
- Arctic Cod transfers energy from lower to higher trophic levels and thus is considered a pivotal species in the Arctic marine ecosystem, providing food for numerous species of seabirds, marine mammals, and fishes. A substantial total biomass of Arctic Cod is required for ecosystem maintenance.
- Arctic Cod have a circumpolar distribution and are considered seasonal migrants that use different habitats throughout the year (e.g., summer aggregations, under-ice habitat use).
- Continued reporting of both target and bycatch species from the At-Sea Observer program and vessel logbooks will be necessary to provide future Science Advice regarding any species caught in this fishery.
- Dedicated research is needed on Arctic Cod biology, ecology, population dynamics, and ecosystem modelling to better understand their pivotal role in the food web. This would also allow for greater certainty in biomass index estimates to improve Science Advice on sustainable bycatch removals by the shrimp fishery.