

# Dsolve

SFI Biodegradable Plastics for Marine Applications

Research summary – 2024

Retrieval operations of derelict fishing gears  
give insight on the impact on marine life



Norwegian Centre  
for Research-based  
Innovation

## Highlights

- Abandoned, lost or discarded fishing gear (ALDFG) leads to ghost fishing
- Assessing the impacts of ghost fishing through ALDFG retrieval operations
- Ghost fishing catch was observed in retrieved gillnets and king crab pots
- Gillnets captured more marine life than king crab pots
- Gillnets had a greater impact on species richness and biodiversity

## Research summary

### *Retrieval operations of derelict fishing gears give insight on the impact on marine life*

Large quantities of abandoned, lost, or discarded fishing gear (ALDFG) enter the marine environment every year. This is due to wear and tear, gear failures, collisions, human error, severe weather, and intentional dumping. An estimated 380 tons of fishing gear are lost annually in Norway alone, and only a small percentage of this is recovered through registered ALDFG retrieval operations. The Norwegian Directorate of Fisheries' retrieval operations show that ALDFG continues to catch marine life for many years (called ghost fishing). Their research also shows that gillnets and pots pose the greatest risk to ecosystems and biodiversity.

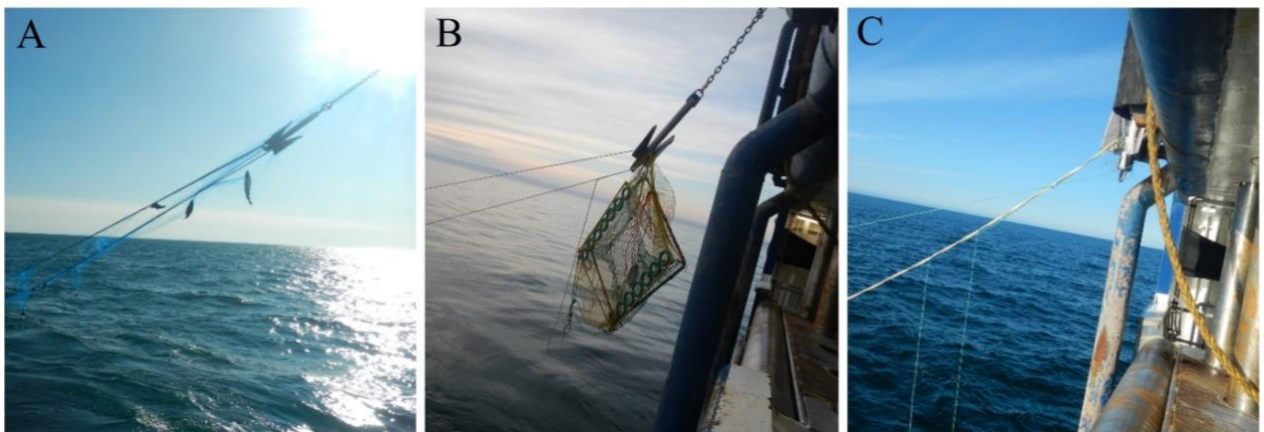


Figure 1. Retrieval of an ALD gillnet (A), king crab pot (B) and longline (C).

In September 2023, UiT joined the annual ALDFG retrieval operation conducted by the Norwegian Directorate of Fisheries. Our goal was to assess the impact of ghost fishing in Norwegian waters by recovering ALDFG and analyzing the marine life caught in it. During the operation, 307 marine organisms, weighing a total of 382 kilograms, were recovered from 60 gillnets and 49 king crab pots. No ghost fishing catch was found in retrieved longlines. Recovered gillnets' ghost fishing catch included four different species: red king crab (*Paralithodes camtschaticus*), saithe (*Pollachius virens*), cod (*Gadus morhua*), and redfish (*Sebastes* sp.). Red king crabs dominated the ghost

fishing catch in recovered gillnets because the nets had been in the marine environment for an average of 201 days. Over time, scavenging crustaceans such as red king crabs are attracted by decaying ghost fishing catch, which means that they gradually replace fish as the primary catch. The ghost fishing catch was limited to red king crabs in the retrieved king crab pots.

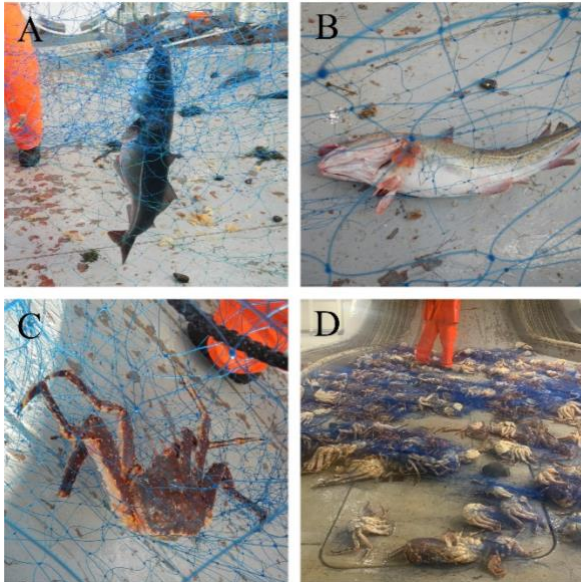


Figure 2. Species observed in retrieved gillnets:  
A – Saithe, B – Cod, C – Red king crab



Figure 3. Red king crabs in a retrieved king crab pot

Recovered gillnets were found to cause more harm to the marine environment than crab pots, capturing more marine life and affecting a higher species richness and biodiversity. This is partly due to the lower selectivity of gillnets and partly because newer Norwegian king crab pots are fitted with biodegradable cotton string (maximum 4 mm in diameter) as part of the netting to reduce ghost fishing. If a pot is lost, the string degrades, creating a permanent opening that allows captured red king crabs to escape. Both available literature and our study suggest that the amount of marine life caught by ALDFG decreases over time and then stabilizes, continuing to impact marine life. Fishing gear is designed to resist physical, chemical, and biological breakdown, which means that ALDFG can harm marine life for decades.

**“This study introduces an approach to assess the impact of ghost fishing on marine ecosystems. The data collected will help in developing future estimates of how much marine life is affected by ALDFG, also when the gear is not retrieved.”**

This study highlights the ongoing impact of ghost fishing on marine environments and the need for more data from retrieval operations to better understand the harmful effects of ALDFG on ecosystems and biodiversity. By better understanding these impacts, we can support more thoroughly analyse the environmental impacts and benefits of developing biodegradable fishing gear alternatives.

# Research team

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