

Marine biodegradable demersal seine ropes



Plastic ropes with a steel core used by demersal seine vessels can be a source of marine plastic pollution. This is due to high abrasion and wear on the ropes during use. To address this, SEARCULAR is testing a novel seine rope made from biodegradable polymers with high abrasion resistance. This helps fishing gear last longer, while reducing the release of plastics from fisheries into the environment.

Background

Demersal seine ropes lose an estimated 20–30% of their plastic mass during each fishing season (approximately six months) due to abrasion, making demersal seining a significant source of microplastic pollution. In Norway alone, these losses contribute an estimated 77–97 tonnes of microplastics to the marine environment annually. Total microplastic release from demersal seining across Europe is estimated at around 311 tonnes per year.

To address microplastic release caused by rope wear, SEARCULAR has developed an innovative solution – a novel, biodegradable seine rope, made from biodegradable polymers. These ropes have high abrasion resistance and are designed as an alternative to conventional plastic ropes.



Left: testing full-scale biodegradable seine rope aboard our partner fishing vessel.

Right: A comparison of a new conventional seine rope (right) and a used rope (left) showing loss of plastic. Images courtesy of SINTEF Ocean.

Our Research

Our goal was to produce biodegradable polyester fibers with high abrasion resistance that can be used to replace conventional plastic fibers used in seine rope production.

Our work consisted of three main stages:

1. Laboratory and pilot-scale production of biodegradable monofilaments for abrasion and tensile strength testing.
2. Upscaling of fiber production and the development of smaller-diameter ropes
3. Industrial-scale extrusion of fibers for full-scale rope production and sea trials.

Our lab testing has shown that the biodegradable polymers have high abrasion resistance and tensile strength.

Next Steps

Following the production of full-scale rope, we are trialling the ropes aboard our partner commercial fishing vessel. The performance of the ropes is being monitored.

Initial results from sea-tests suggest the new ropes are performing well with comparable behaviour to conventional ropes.

SEARCULAR aims to reduce marine litter and microplastic pollution originating from European fisheries. This report presents the work and outcomes of Work Package 2 (Deliverable D2.1). More information about our work on biodegradable seine ropes can be found [on our website](#).