# A Pilot Project on Seabird Interactions with Paravane Gear on an Alaskan Groundfish Trawl Catcher Processor


**Shannon M. Fitzgerald** • Alaska Fisheries Science Center • NOAA Fisheries • 7600 Sand Point Way NE, Seattle WA 98115 USA • *shannon.fitzgerald@noaa.gov*
**Todd Loomis** • Cascade Fishing, Inc. • 3600 15th Ave W, Seattle WA 98119 USA
**Jeff A. Pesta** • Alaska Fisheries Science Center • NOAA Fisheries • 411 Riley Drive, Northfield, MN 55057 USA

## BACKGROUND

Because seabirds attend vessels to take advantage of fish discharge, they could possibly come into contact with various cables such as the trawl warps, third wires (a net-monitoring device hard-wired to the headrope), and paravanes (net-monitoring device that receives an acoustic signal). North Pacific Groundfish Observers have noted mortalities associated with trawl warps and third wires but we have little information on paravanes, which are deployed alongside a vessel at the end of a boom. This study is the first work in the North Pacific on seabird interactions with paravane gear.

## PARAVANE GEAR

A paravane is a component of a subsea acoustic ("wireless") communication system that provides a range of possible sensing attributes such as underwater target detection, trawl door alignment, trawl speed sensors, catch and codend filling rates, bottom contact, codend sounders, depth and temperature, and even trawlnet rip sensors. Acoustic signals from equipment mounted on the net are sent to the vessel, where it is received either by a hull-mounted sensor or by using a paravane sensor boomed out alongside the ship. The paravane receives the acoustic signal and transmits it to the bridge via a cable.

photo by Jeff Pesta, NOAA

**Figure 1.** *The Acoustic receiver that obtains a signal from the transducer mounted on the trawl headrope. This "fish" is deployed alongside the vessel off of a boom, and set about 10-15 fa deep.*

photo by Todd Loomis, Cascade Fishing Inc.

**Figure 2.** *View of the paravane deployed along the starboard side of the ship, off the end of a ca. 10 m boom.*

photo by Todd Loomis, Cascade Fishing Inc.

**Figure 3.** *One of several types of readouts that are available in the bridge, this one showing trawl door alignment.*

## PROJECT GOALS

1. Learn about the basic usage of paravane gear in the commercial trawl fishery
2. Obtain baseline information on seabird interactions with paravane gear
3. Develop and deploy at least 3 different types of mitigation measures and monitor seabird responses

A collaborative project was developed by the Alaska Fisheries Science Center, NOAA, and the North Pacific Fisheries Foundation. The vessel *Seafisher* from Cascade Fishing Inc. hosted a field biologist during a trip fishing north of the Aleutian Islands on August 8 through 16, 2009. Funding support was provided by NOAA's Bycatch Reduction Engineering Program and National Cooperative Research Program with in-kind support from Cascade Fishing Inc.

## METHODS

Counts of seabirds were made astern of the ship several times each day. Birds in the immediate area of the paravane were also counted prior to and after a series of observation sessions.

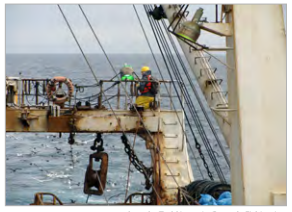

photo by Todd Loomis, Cascade Fishing Inc.

**Figure 4.** *Observer making a seabird count from stern helo deck.*

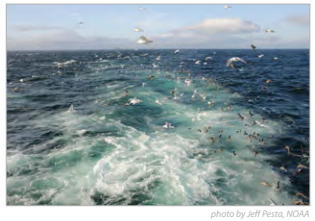

photo by Jeff Pesta, NOAA

**Figure 5.** *Typical seabird abundance astern of the ship.*

Baseline information of seabird interactions with paravane gear were made. Proximity to the paravane cable was counted as an interaction. Recording actual cable contacts and any related injuries or mortalities were part of the methods.

photo by Jeff Pesta, NOAA

**Figure 6.** *View looking outboard from the base of the boom. Observations were made from here.*

photo by Jeff Pesta, NOAA

**Figure 7.** *Seabird interaction with the paravane cable. Fulmar is moving away from the cable.*

Several monitoring sessions were completed for the trawl warps as well, but no birds approached the warps, which dove steeply behind the vessel due to the deep fishing depth. After several sessions we discontinued these observations in order to focus on the paravane.

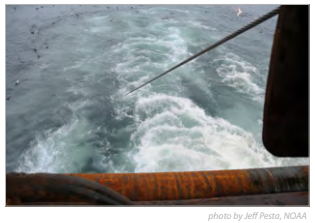

photo by Jeff Pesta, NOAA

**Figure 8.** *Trawl cables with steep descent directly behind vessel. Warps were in prop wash, which kept the birds away from the warp cables.*

## COLLABORATION

Collaboration with the crew is an important feature when testing mitigation gear for bycatch reduction.

photo by Jeff Pesta, NOAA

**Figure 9.** *Crew members working on their idea for a seabird mitigation device.*


photo by Todd Loomis, Cascade Fishing Inc.

**Figure 10.** *The mate getting into the act – with the observer handling safety duties.*

## MITIGATION MEASURES

"First generation" mitigation measures were developed and we were able to gather information on seabird responses to these mitigation measures and on how to work with the paravane system to design better experiments in the future. The goal of mitigation is to clear birds away from the potential entanglement, which could happen either on the water or in the air.

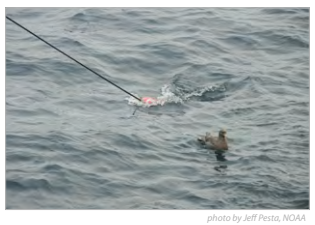

photo by Jeff Pesta, NOAA

**Figure 11.** *Float mounted around the paravane cable, able to move freely along the cable itself.*

photo by Jeff Pesta, NOAA

**Figure 12.** *Streamer lines strung along the paravane cable boom.*

**Figure 13.** *A boom line hanging near the discharge area.*

photo by Todd Loomis, Cascade Fishing Inc.

## PRELIMINARY RESULTS

The field biologist was able to complete 20 15-minute observation sessions to obtain baseline information on interaction rates

Collaboration between the crew and scientific staff produced three types of mitigation measures that were deployed and monitored. Several variations were attempted within these types. The field biologist completed a total of 20 15-minute observation sessions of these measures.

Interaction rates varied from 0 to 138 per session, all sessions combined (control and experimental).

No mortalities or injuries were observed. Nearly all interactions were by Northern Fulmars (*Fulmaris glacialis*) and were of the paravane cable itself rather than the various lines supporting or controlling the paravane boom. Black-footed Albatross (*Phoebastria nigripes*) were in attendance around the ship but did not approach the vessel closely and were not seen to interact with the paravane gear.

A great deal was learned about basic paravane deployment features that will facilitate additional testing in future field projects.