

# Efficiency of "seal-safe" pingers in deterring and reducing bycatch of harbour porpoises (*Phocoena phocoena*) in commercial fisheries

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## Introduction

Incidental bycatch in gillnets is a substantial threat to harbour porpoises and other small whale species globally. Acoustic Deterrent Devices, "pingers", have been successful in reducing bycatch of harbour porpoises in gillnets. However, past conflicts where seals have used pingers as "Dinner-bells" to raid and destroy gillnets have made fishermen reluctant towards pingers.

## Aim

Testing the efficiency of two alleged "seal safe" pingers, an experimental Banana pinger, "SSB", and the Future Oceans F70 pinger, "FO", in deterring and reducing the bycatch of harbour porpoises in commercial cod and lumpfish gillnet fisheries. The frequency of the SSB pinger sounds was changed to make it less audible to seals compared to the standard SSB pinger.

## Methods

### Study area

Data were collected from September 2018 to January 2020. Four fishermen in four areas on the Swedish west coast participated in this project.

### Experimental set-up

#### Pinger efficiency

Harbour porpoise presence was estimated using data extracted from C-PODs, which are porpoise click train monitoring devices. C-PODs were positioned at each end of the experimental gillnets. Gillnets were provided with either experimental SSB pingers, FO pingers or no pingers and spaced along the float line of the gillnets in accordance to the specifications of the pinger manufacturer.



SSB pinger



FO pinger



C-POD porpoise click logging device

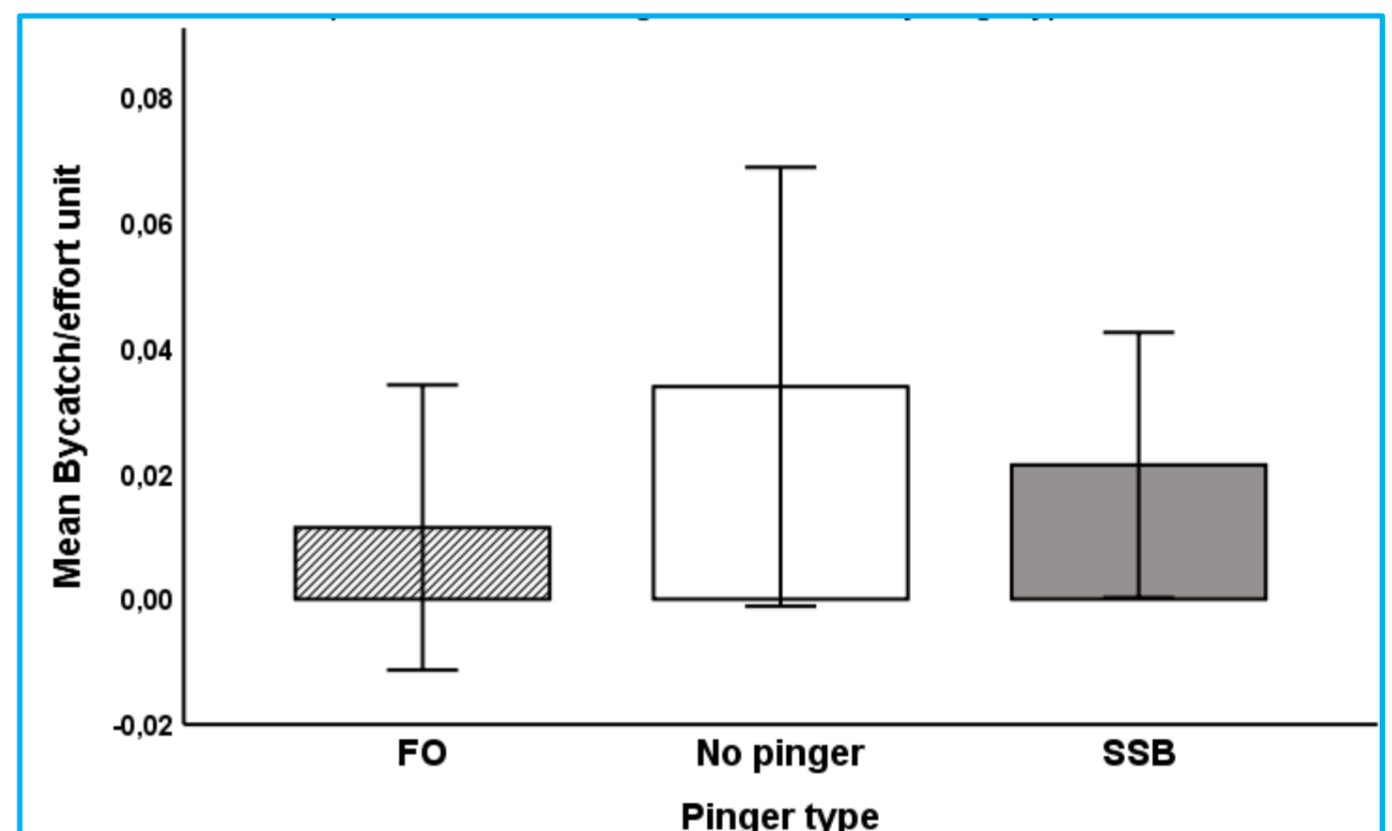
## Results

### Pinger efficiency

Gillnets with FO pingers significantly lowered porpoise presence in all areas compared to gillnets without pingers. Gillnets with SSB pingers significantly lowered porpoise presence in three of the four areas compared to gillnets without pingers.

### Bycatch efficiency

Porpoise bycatch was reported in all experimental areas. Pingers did not significantly lower bycatch.



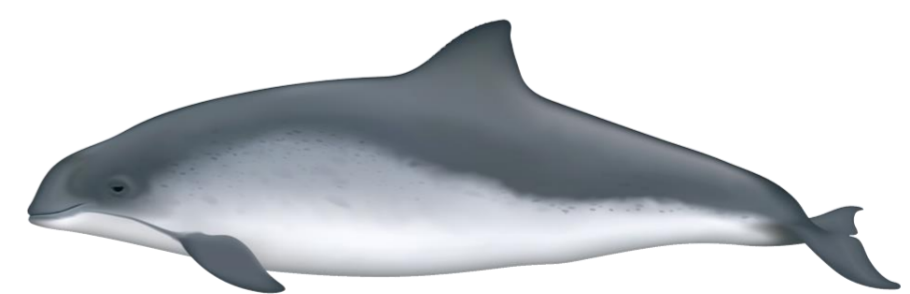
Average bycatch frequency in lumpfish fisheries

### Bycatch efficiency

Any harbour porpoise bycatch was recorded by the fishermen in catch logbooks provided by us. These were later verified using videos from onboard video recording systems.

### Analysis

Pinger efficiency was measured by comparing porpoise presence in the vicinity of gillnets between SSB pingers, FO pingers and gillnets without pingers. Bycatch differences between the three gillnet configurations were calculated using a bycatch per effort unit.



## Conclusion

Both pinger types consistently reduced harbour porpoise presence more than gillnets without pingers, but neither pinger significantly lowered bycatch. However, this is likely a result of the low overall number of bycatches and not pinger inefficiency. Although not significant, gillnets with pingers had lower bycatch frequencies than gillnets without pingers, in lumpfish fisheries.