

Pulsvisserij op Garnaal

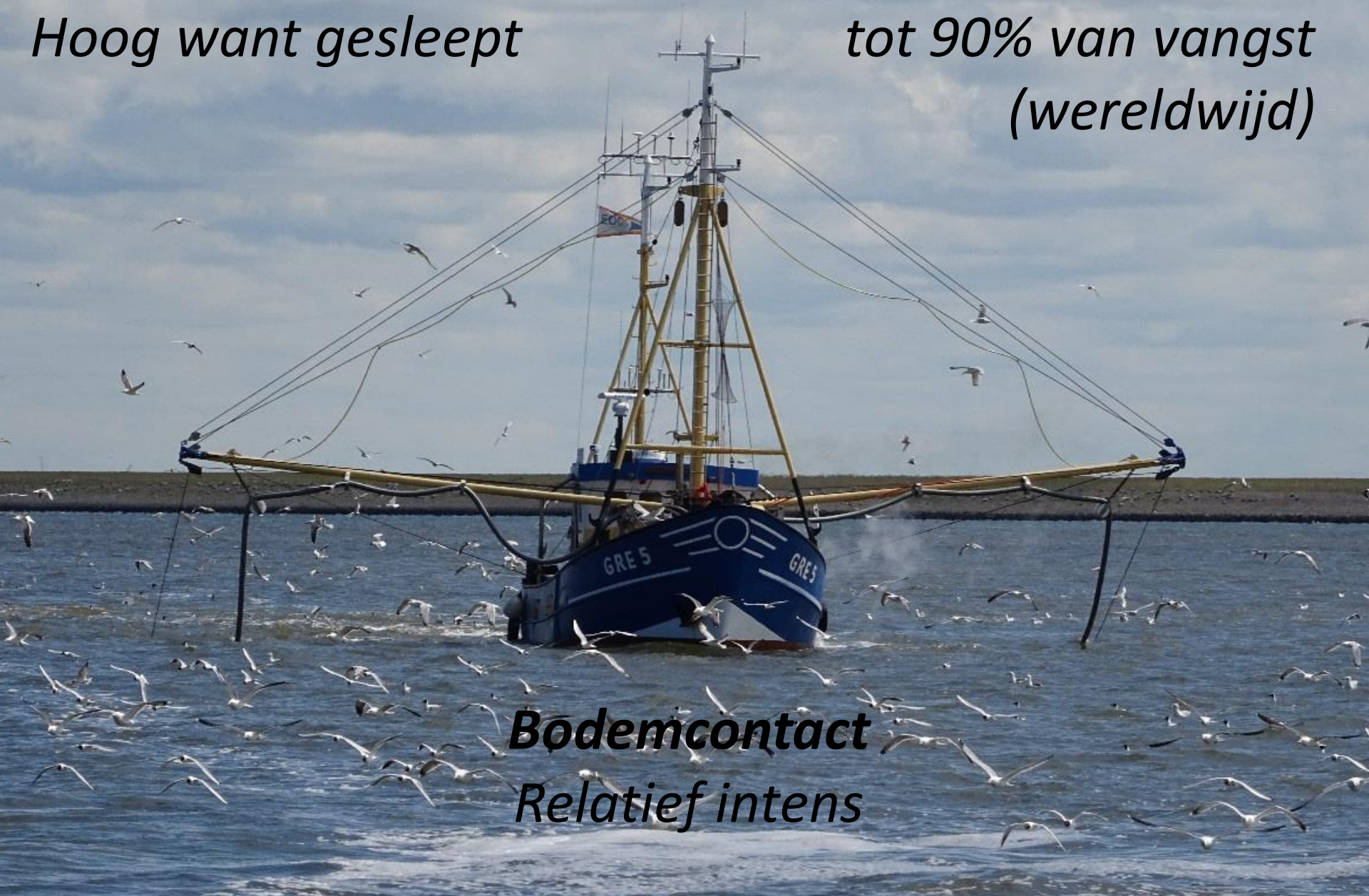


ILVO, 2019



Brandstofverbruik
Hoog want gesleept

Bijvangst
tot 90% van vangst
(wereldwijd)

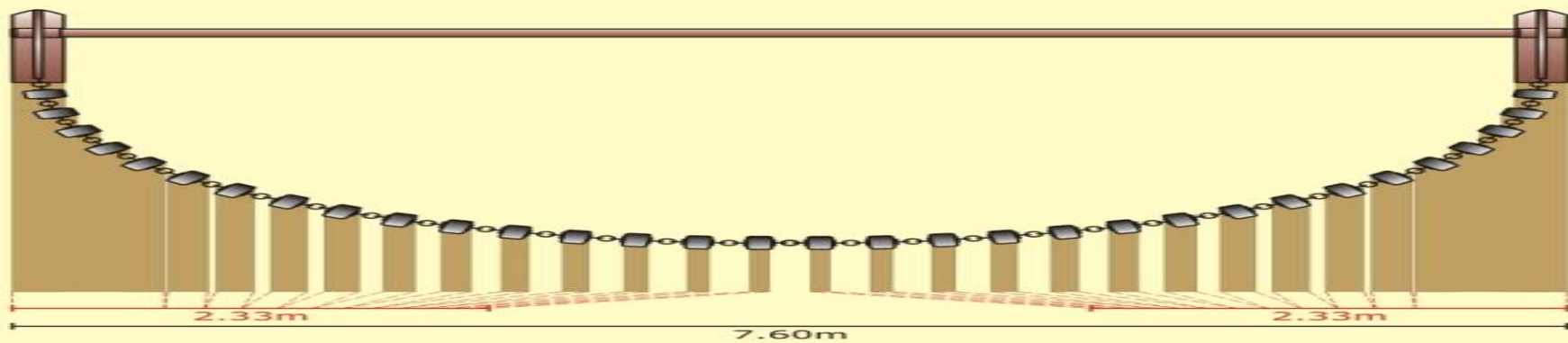


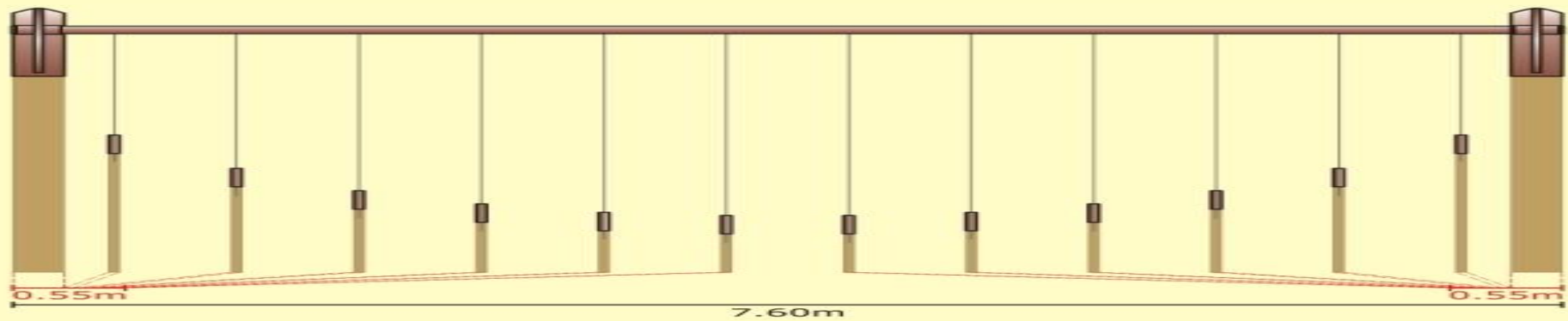
Bodemcontact
Relatief intens

Pulsvisserij op garnaal

... vervangt een zware ronde klossenpees met 32-38 klossen door een lichtere rechte pees met 12-20 klossen en elektrodes in lengterichting.





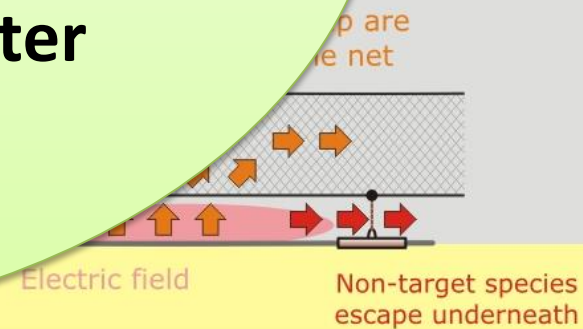
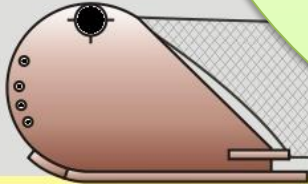




Bijvangst: 0-70% ↓

Bodemcontact: 0-75% ↓

Vangsten: ↑ in helder water



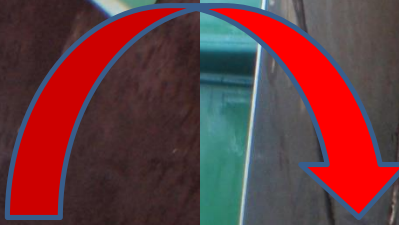
Traditioneel vistuig

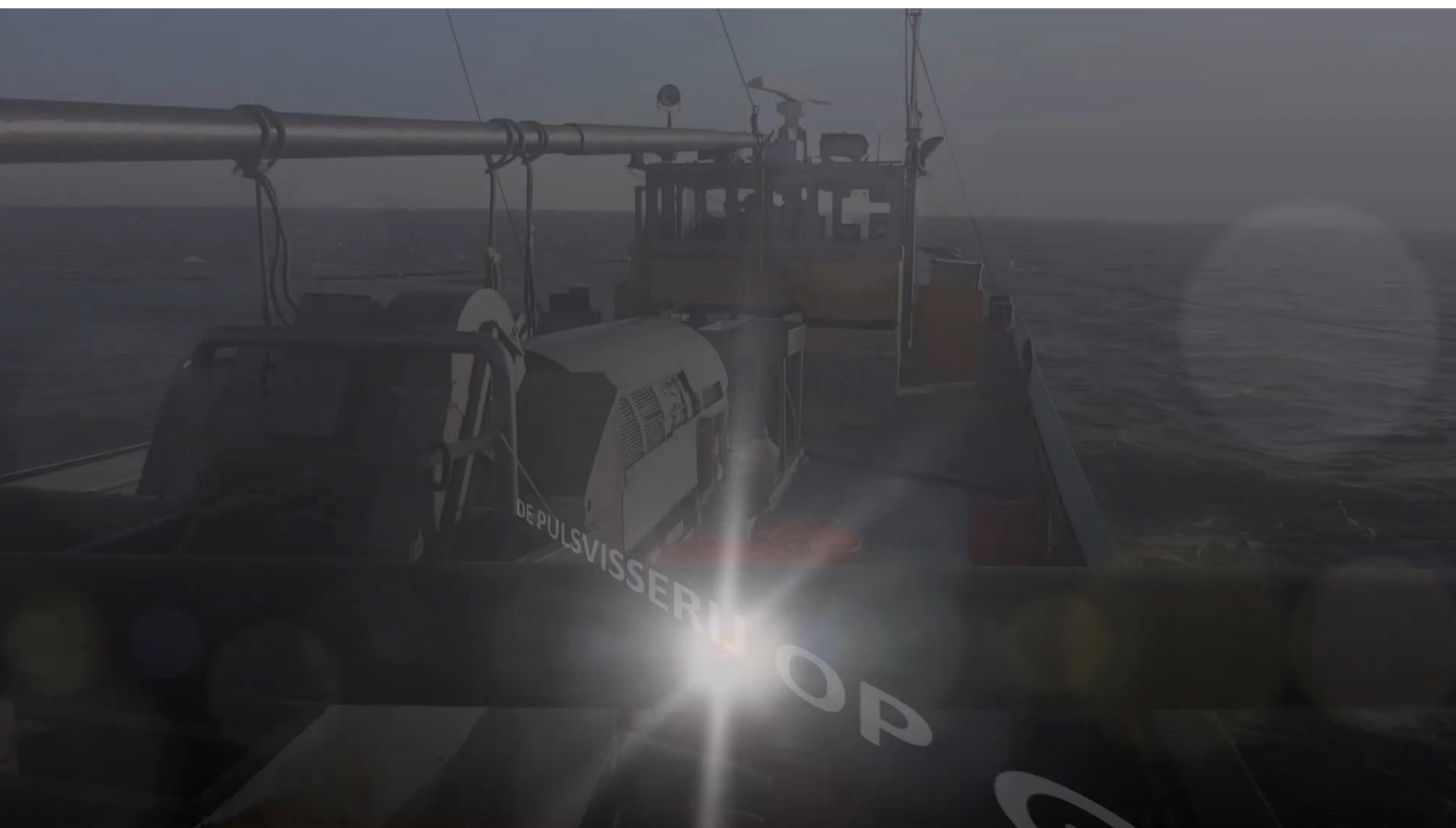
pulskor

Traditioneel vistuig



Pulskor





Neveneffecten op

Adulte dieren



Jonge
levensstadia



Experimentele set-up

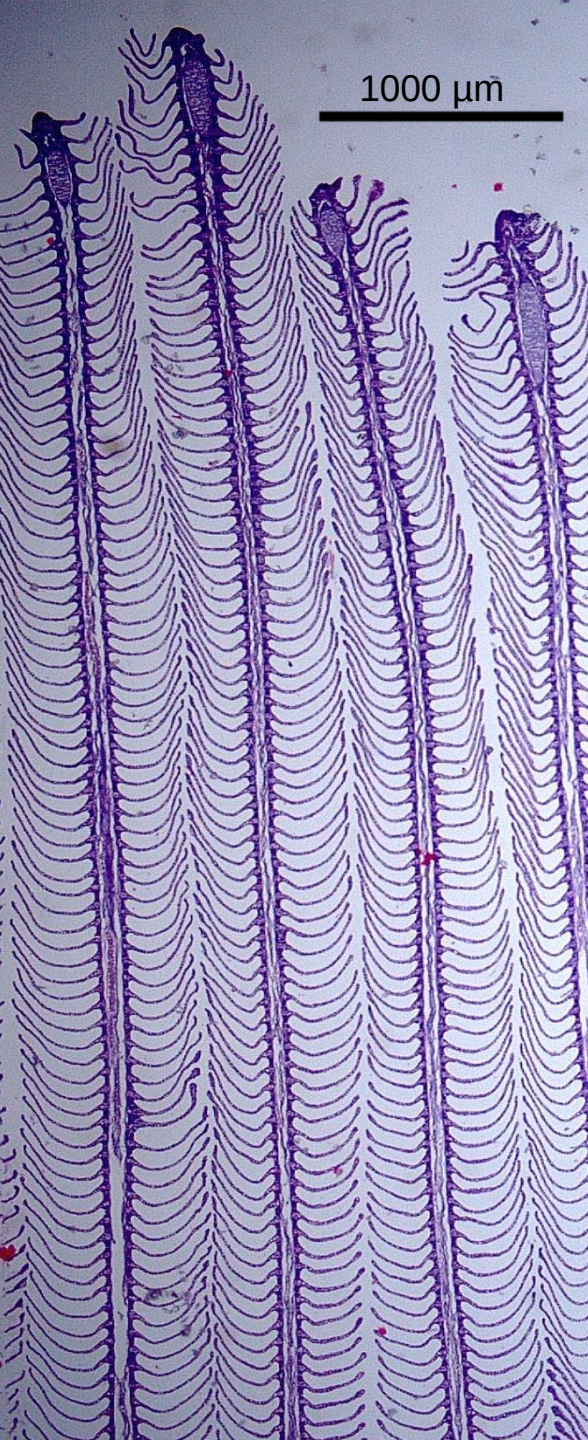
1. Blootstelling (2s)
2. Monitoring gedurende 1 – 14 dagen
3. Autopsie & verder onderzoek
 - Macroscopisch: bloedingen, zweren, ...
 - Histologie: kieuwen, hart, spier, lever, nier, milt, darm
 - X-ray opnames

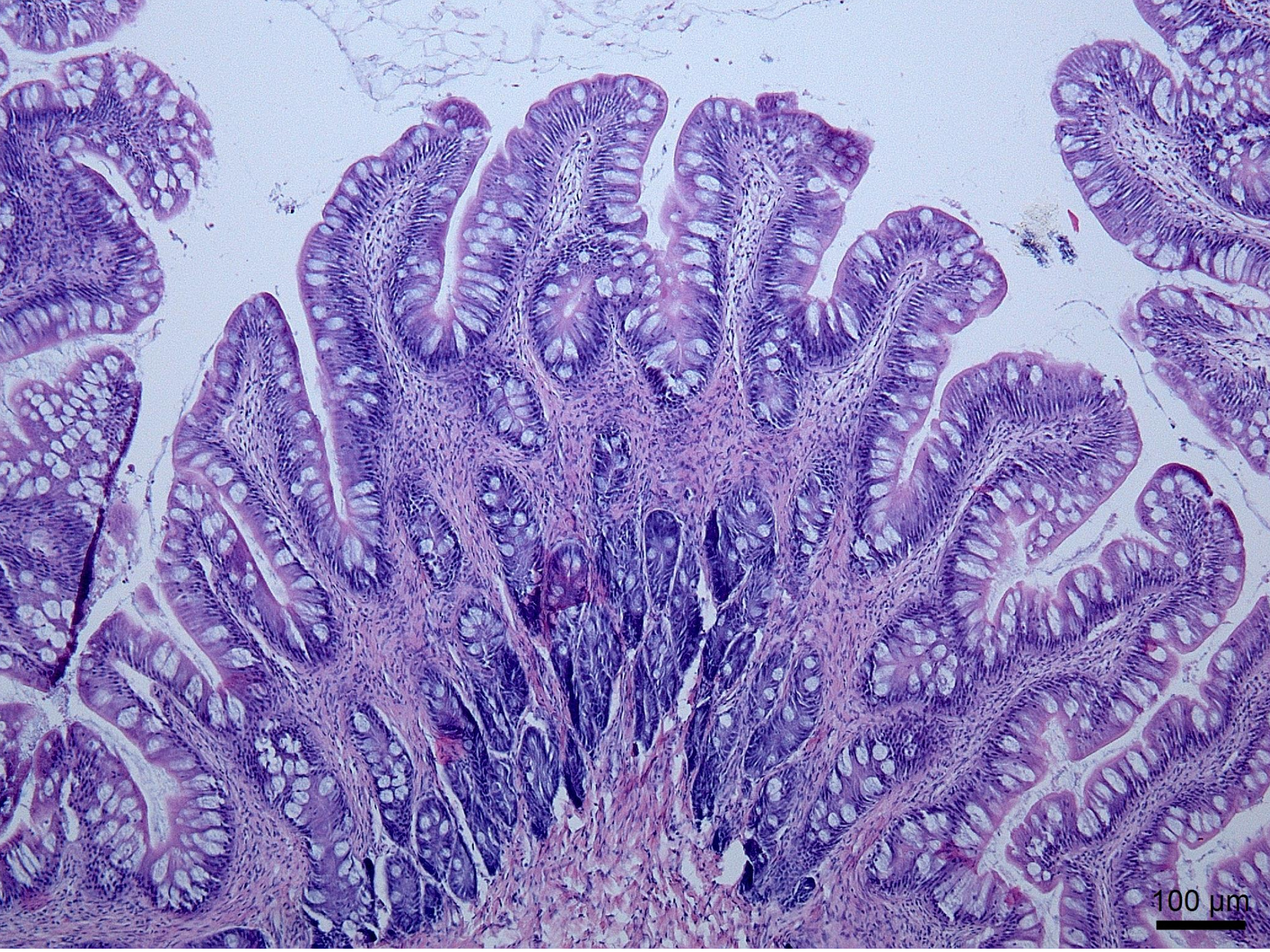




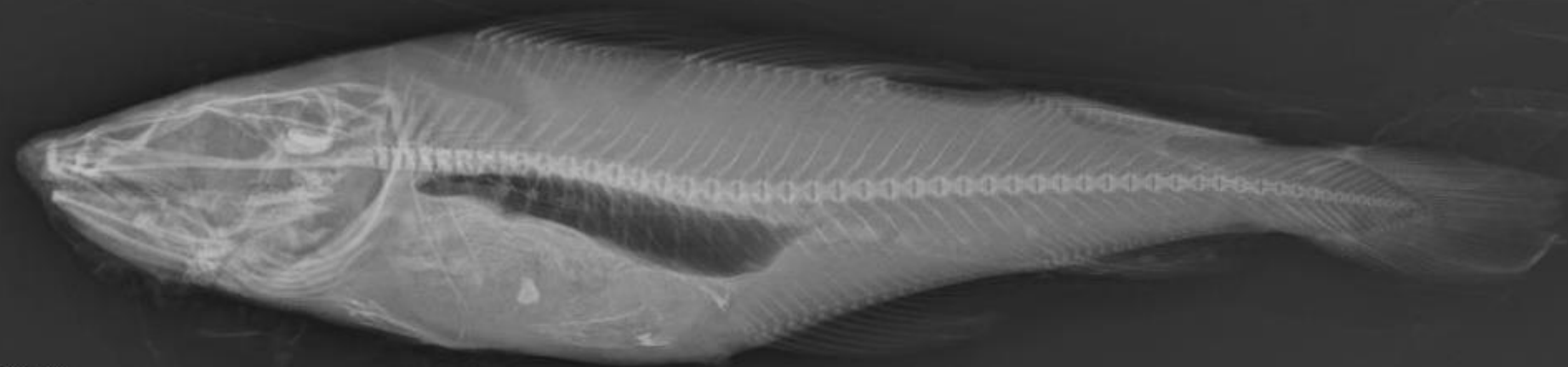
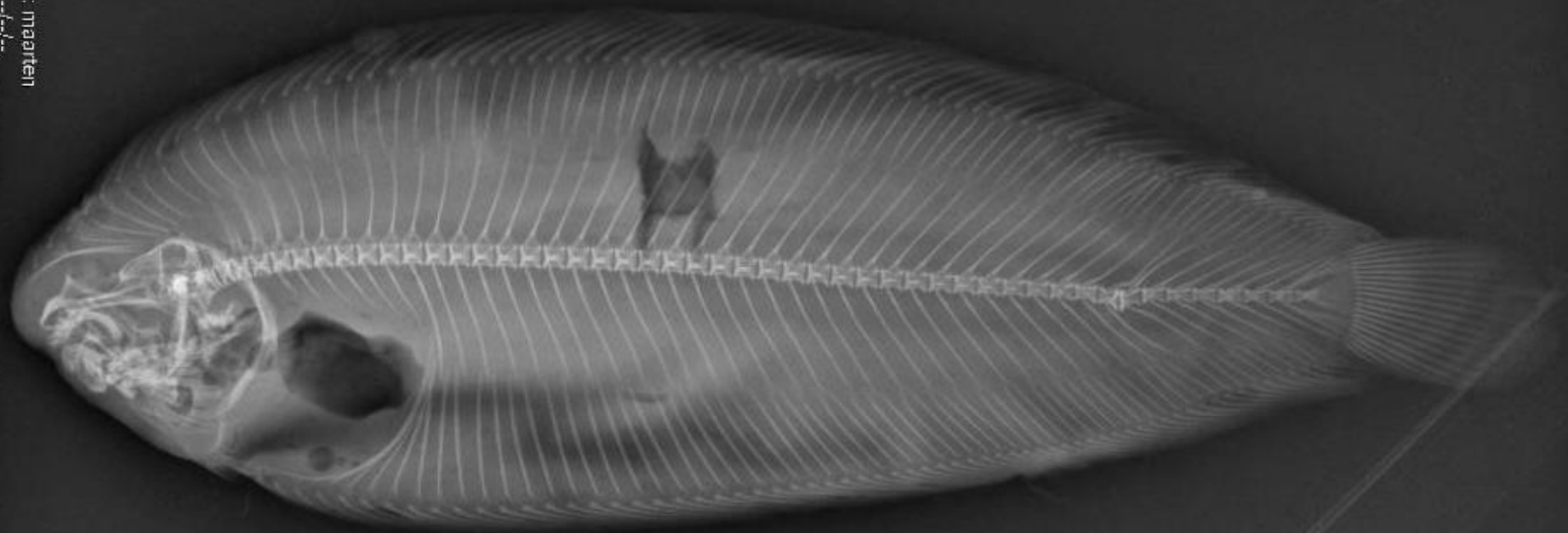








100 μ m



Besluit neveneffecten

Adulte vis:

tong & kabeljauw: geen neveneffecten (1 & 14d)

schol, harnasmannetje en zeedonerdpad: geen neveneffecten (1 d)

hondshaai: geen neveneffecten, geen effect op prooidetectie (3d)

Jonge levensstadia vis:

kabeljauw: potentieel effect op 2 van de 8 onderzochte jonge levensstadia

tong: geen neveneffecten

Adulte ongewervelden:

zager: geen neveneffecten (14d)

garnaal: geen neveneffecten (14d)

geen neveneffecten na 20x blootstelling in 1 week (14d)

Preliminair studies

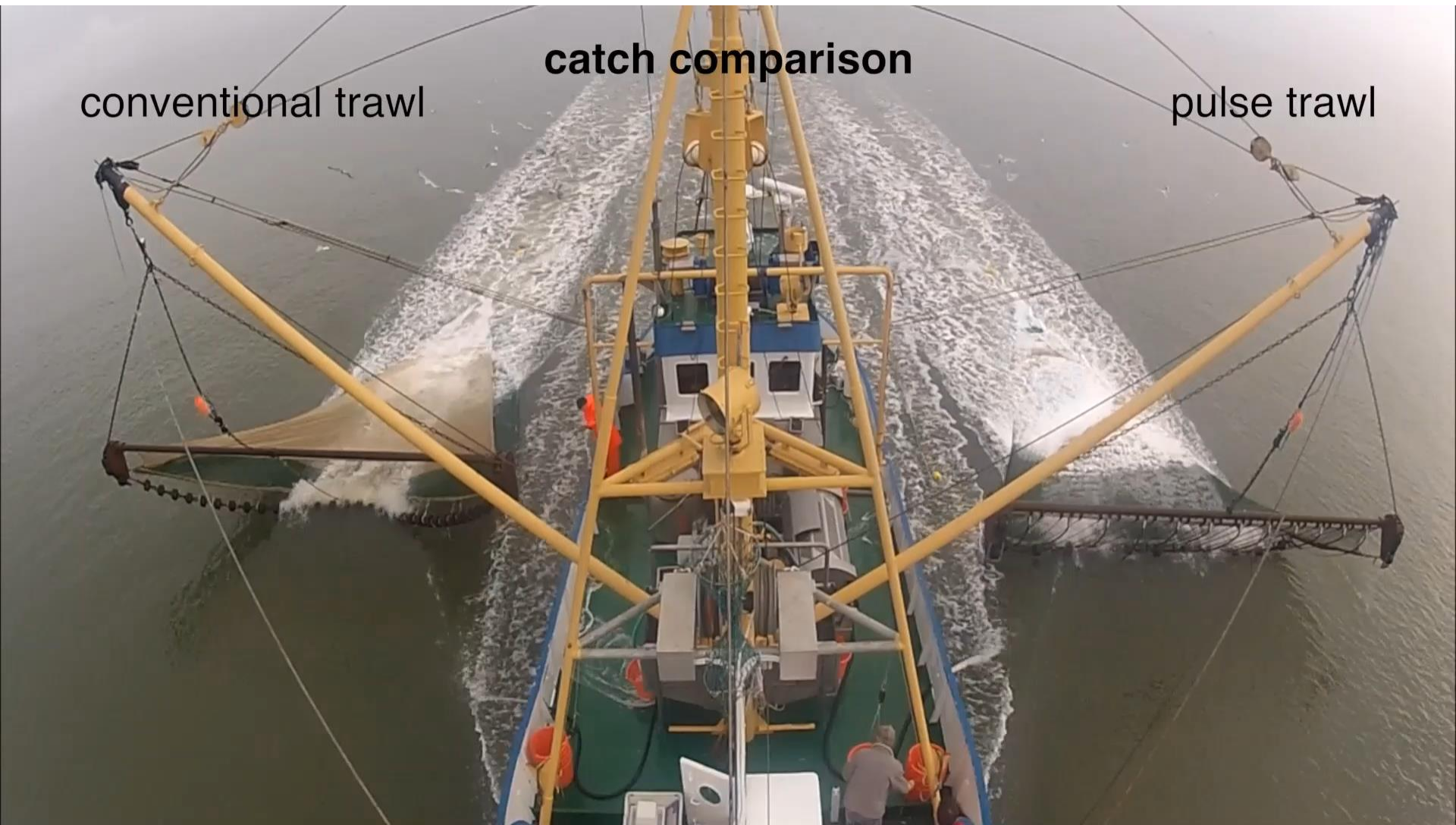
geen neveneffecten op schar, pitvis en meun

geen neveneffecten op zwem- en strandkrab, zeester, slangster, heremiet

conventional trawl

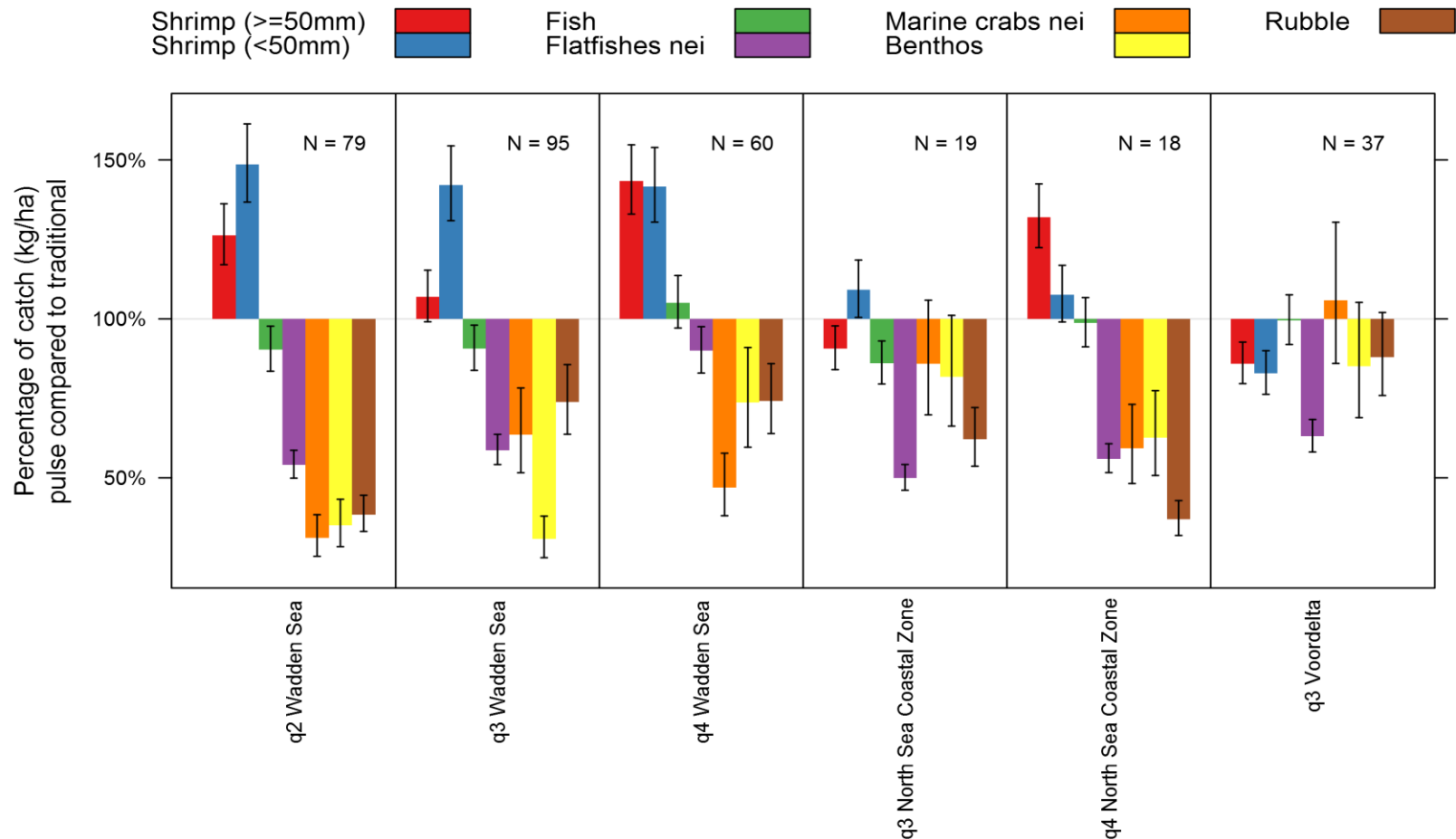
catch comparison

pulse trawl



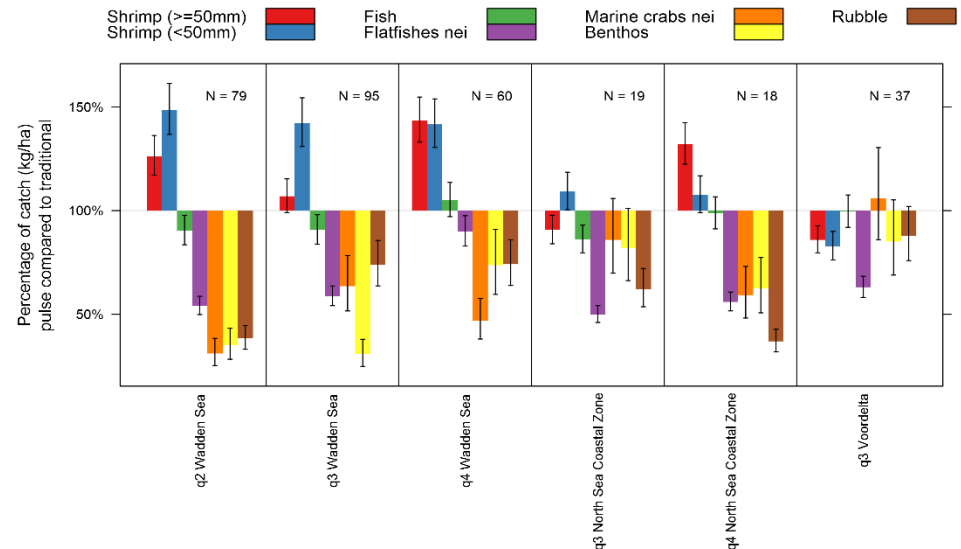
Prelim. resultaten Cranpuls

Jaarrond monitoring van 3 Nederlandse schepen



Prelim. resultaten Cranpuls

Jaarrond monitoring van 3 Nederlandse schepen



- ⇒ Hoe ondieper water = hoe effectiever (meer garnaal, minder bijvangst)
- ⇒ Grote variatie over seizoenen en visgronden
- ⇒ Groot verschil in effect naargelang de soort
- ⇒ Meer klossen/zwaarder vistuig = meer bijvangst

Conclusie – PRO's

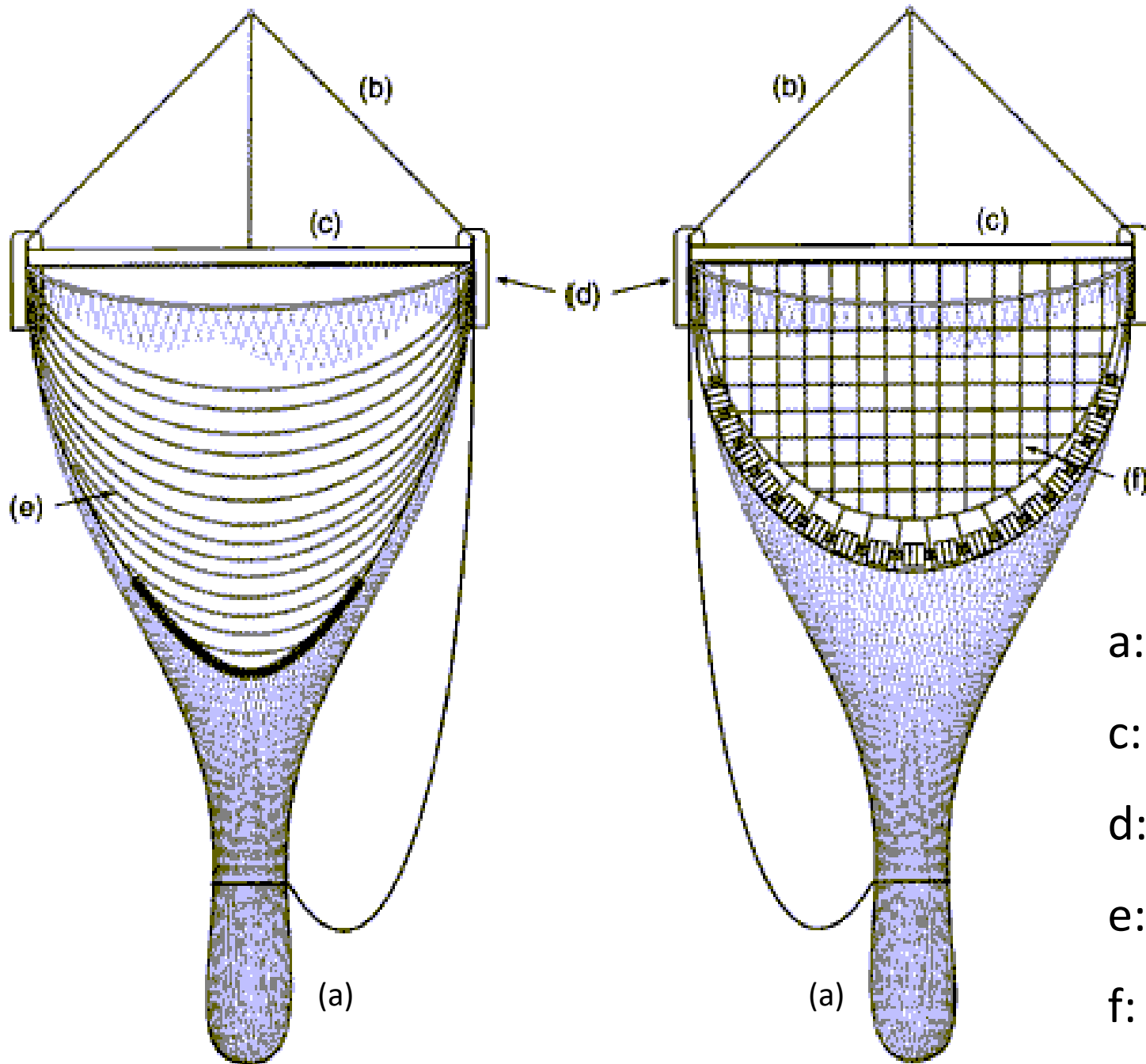
- Hogere garnaal/bijvangst ratio
- Slechts beperkte brandstofbesparing
- Makkelijkere vangstverwerking
- >50% minder bijvangs *mogelijk*
- Kleinere ecologische impact *mogelijk*

Conclusie – RISICO's

- De mens, en dus ook vissers, zoeken altijd meer:
 - extra mechanische stimuli
 - extra elektrische stimuli
- Strakke wetgeving & handhaving nodig!!!
- Vb China: totale instorting van garnaalbestand door ongebreidelde overbevissing.

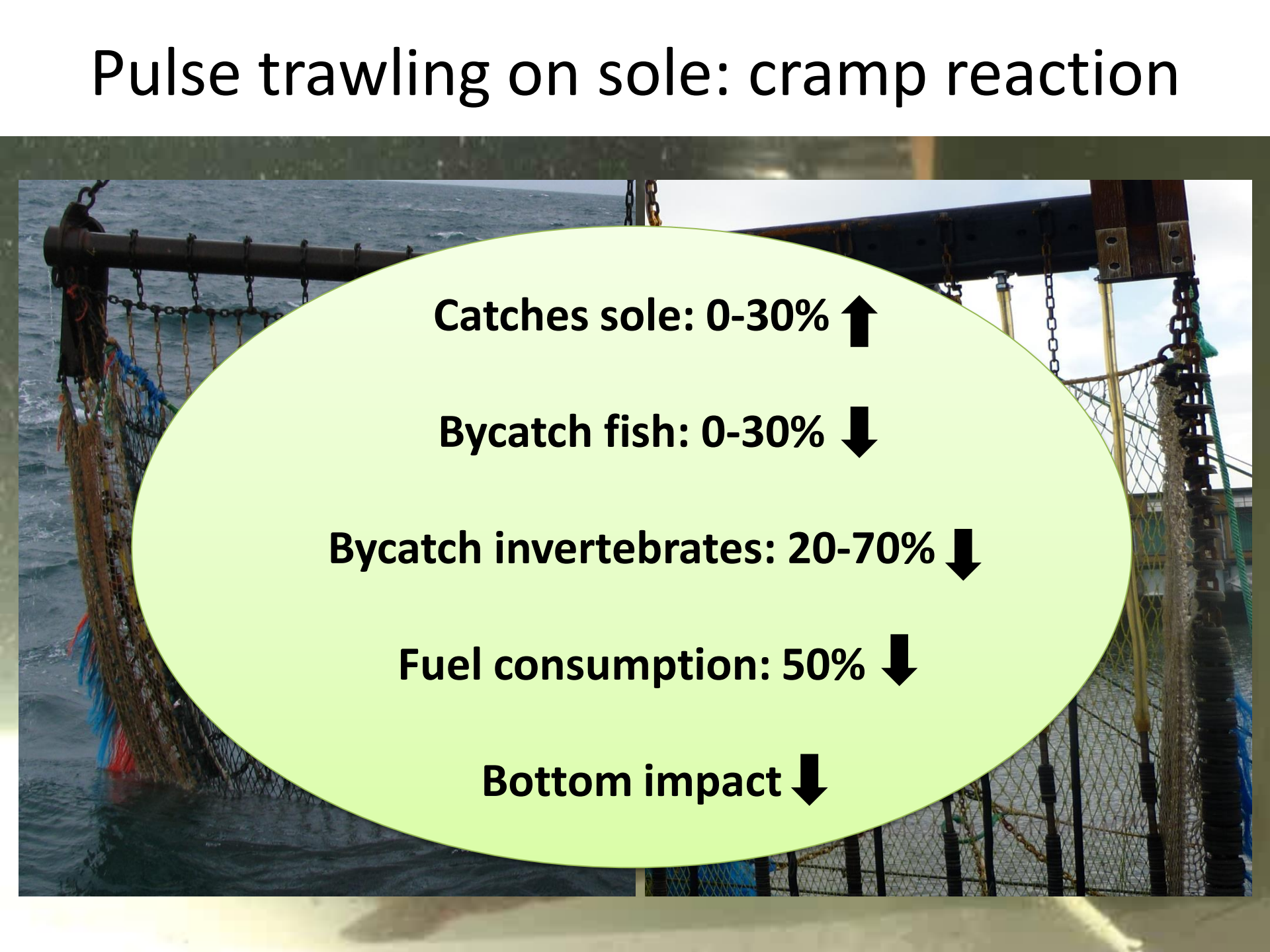
Pulse trawling for sole





a: cod end
c: beam
d: trawl shoe
e: tickler chains
f: chain mat

Pulse trawling on sole: cramp reaction



Catches sole: 0-30% ↑

Bycatch fish: 0-30% ↓

Bycatch invertebrates: 20-70% ↓

Fuel consumption: 50% ↓

Bottom impact ↓

Side-effects sole pulse : invertebrates

Brown shrimp: no or very limited effects (14d)

- 1 exposure: no effects on survival, effect on immune system?
- 4 exposures: no effect on survival, no effect on immune system
- 20 exposures: lower survival vs 1 of 2 control treatments,
but mechanical stimulation showed less moulting vs same control
No egg loss, no effect on moulting behaviour
No effect on immune system

Ragworm: no adverse effects (14d)

- 1 and 4 x exposed (to up to 4x stronger pulse)

Other species: no /small? Side-effects (14-21d)

- 19 species: no effect on 21d survival
- 6 species: variable and contradictory but limited effects

⇒ No evidence for alarming side-effects of electric stimulus

⇒ Mechanical impact and bycatch rates are much smaller

⇒ Total impact of pulse trawl most probably $\leq$ conventional beam trawl

Side-effects cramp pulse sole: fish

Sole: no adverse effects (14d)

1 x exposure to > 40 $\neq$ cramp pulses

Dab: no adverse effects (5d)

1 x exposure near field

Cod: 0-80% spinal injuries (1-14d)

No injuries above or >35 cm from electrodes

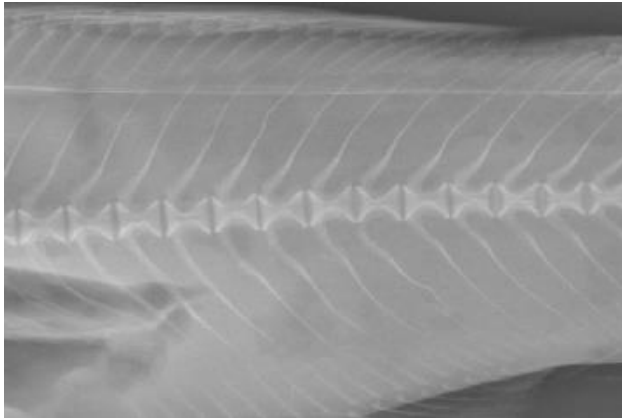
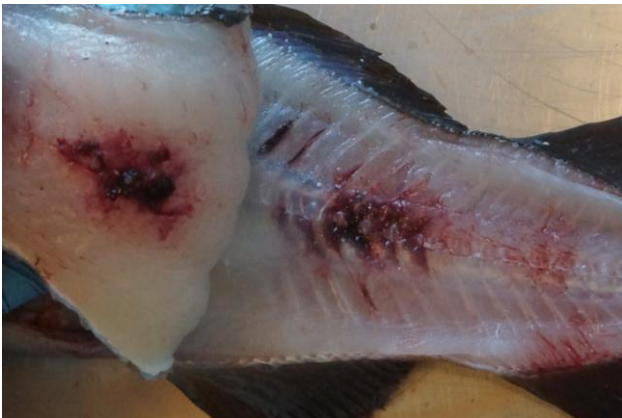
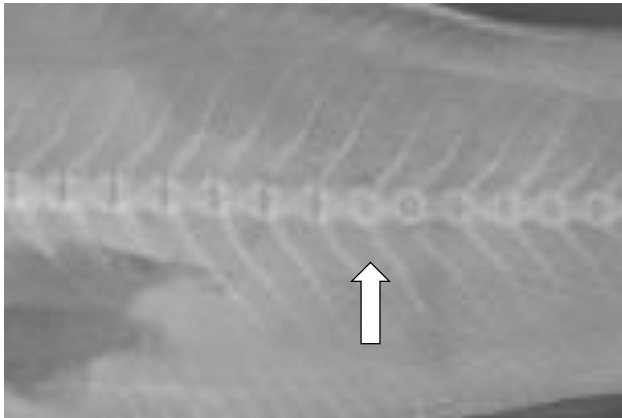
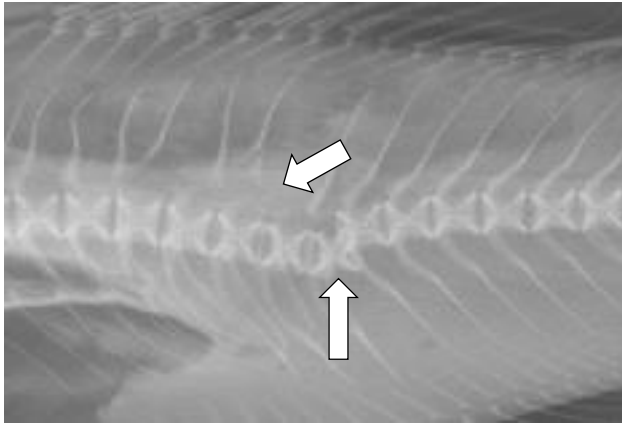
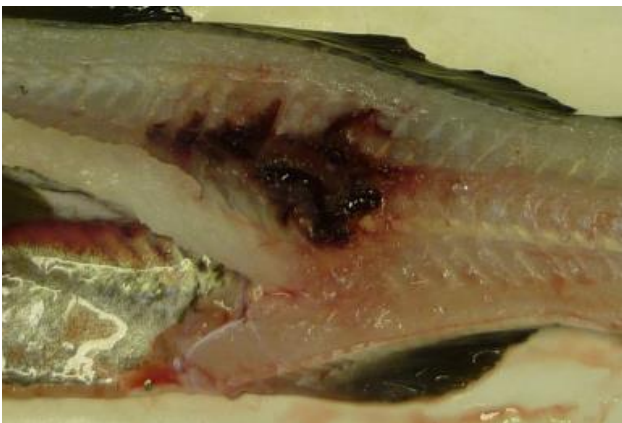
Very variable injury rate (0-80%) near electrodes

Seabass: no adverse effects (14d)

Dogfish: no adverse effects on survival (9 months)

no injuries

no effect on prey detection



Take Home Messages

- Replacing mechanical stimuli by electrical pulses can increase selectivity for sole and shrimp species
- Side-effects < advantages ecosystem & fisher
- Increased efficiency = risk for overfishing AND side-effects in (non-target) organisms possible

→ **!!! good management is crucial !!!** ←

A dramatic sunset scene over a dark, choppy ocean. The sky is filled with layers of clouds, some of which are illuminated from below by the setting sun, creating a warm orange and yellow glow. The sun itself is a bright, glowing orb partially obscured by clouds near the horizon. In the foreground, the dark blue water of the ocean is visible with small waves. On the left side, a large bird, possibly a frigatebird, is captured in mid-flight, its wings spread wide. A small, dark silhouette of a ship is visible on the horizon line to the left of the center.

Any Questions?