

The Legacy of Overfishing

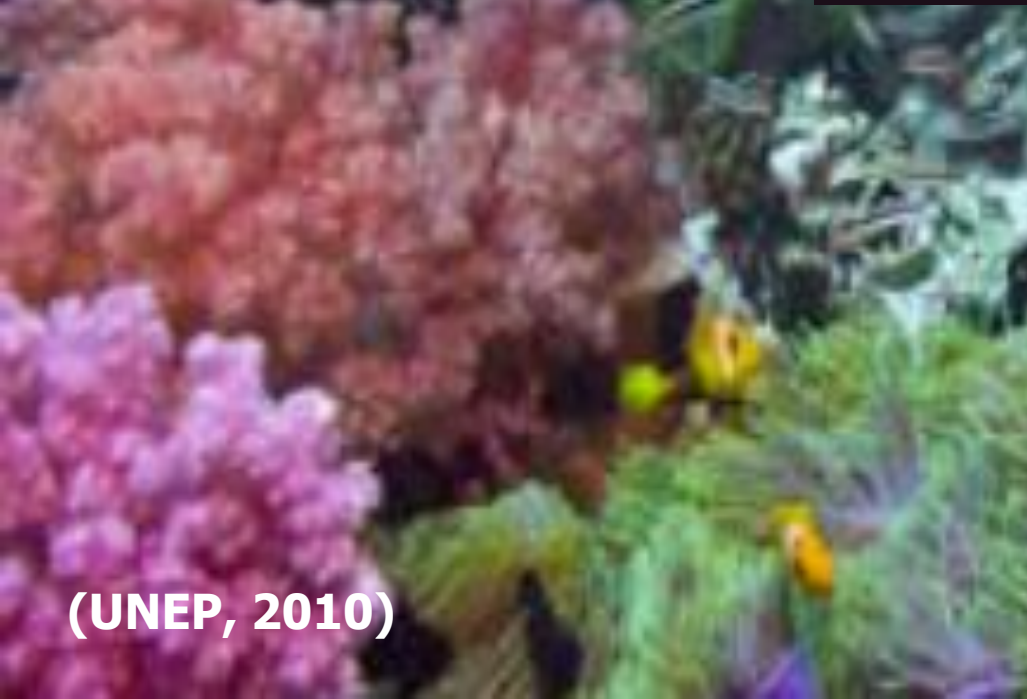


“When is an endangered species not endangered? When it’s in the sea apparently!” (Pope, 2010:1)





With climate change,
more than 80% of the
world's coral reefs may
die within decades



**Ocean acidification will
damage cold water
corals & negatively
affect shell-forming
organisms**

(UNEP, 2010)

A photograph of a rocky coastline. In the foreground, a metal structure, possibly a ladder or part of a pier, is visible. The water is dark, but there is a prominent, bright green algal bloom or sea urchin aggregation in the middle ground. The sky is overcast.

91% of inhabited coastlines will be impacted by marine pollution through increasing coastal development by 2050

A photograph of a cloudy sky, showing a mix of white and grey clouds against a pale background.

Consequential marine dead zones – many will be in primary fishing grounds

(UNEP, 2010)

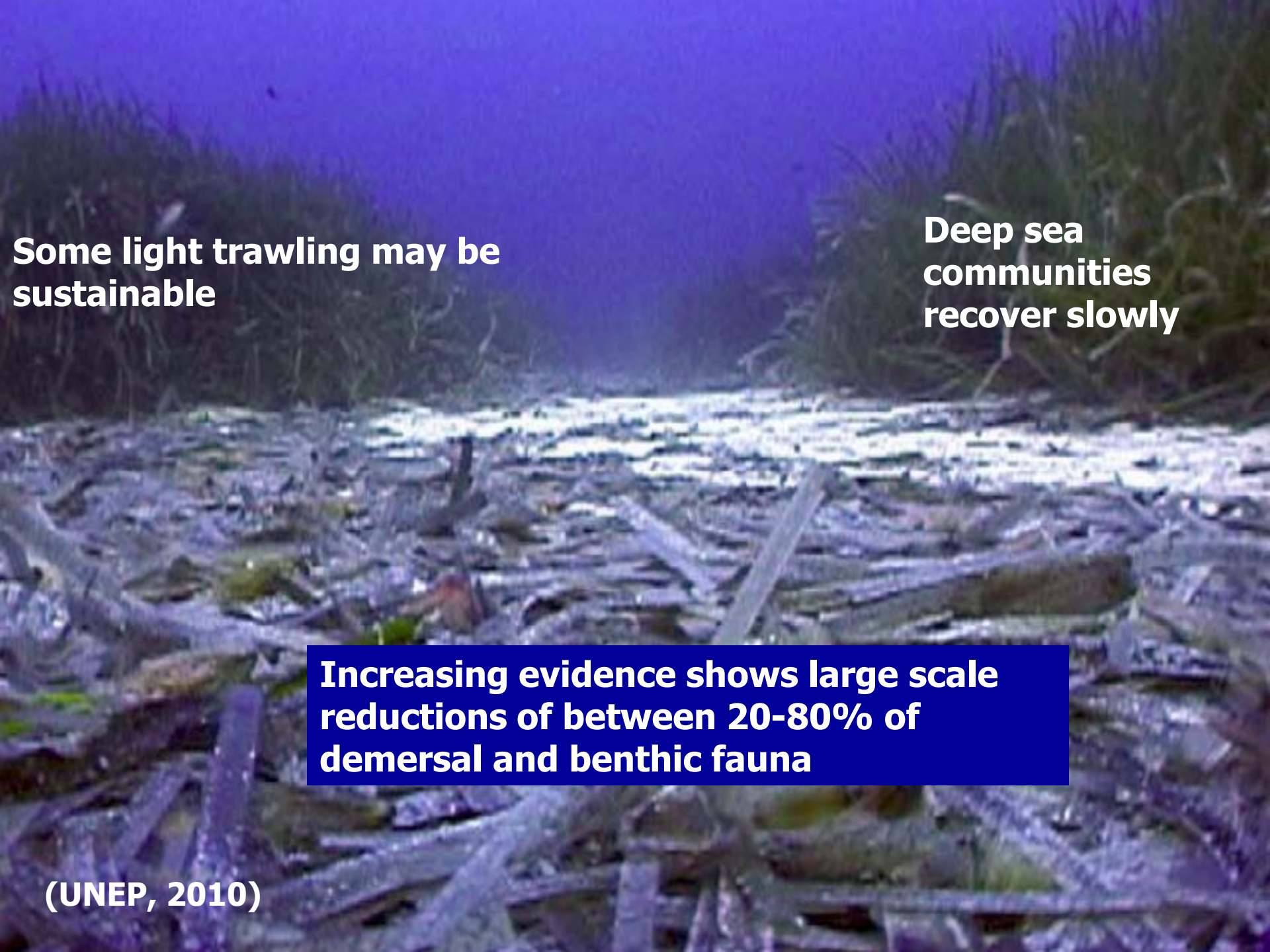


**Reduced thermohaline circulation and
natural flushing of coastal areas –
climate change & pollution**

**Ocean biodiversity hotspots degraded
through bottom trawling and
overharvesting**



(UNEP, 2010)

An underwater photograph showing a severely degraded seabed. The seafloor is covered in a thick layer of debris, including wood, plastic, and other unidentifiable waste. Sparse, dark, leafy vegetation is visible in the background, but the foreground is dominated by the wreckage. The water is a murky, brownish-grey color.

Some light trawling may be sustainable

Deep sea communities recover slowly

Increasing evidence shows large scale reductions of between 20-80% of demersal and benthic fauna

(UNEP, 2010)



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- A sunset over the ocean with a bird in flight and a ship on the horizon.
- Assess state of global fish stocks
 - Appreciate limitations of and mismanagement involved in regulating industry
 - Provide credible evidence and statistics on
 - Habitat degradation
 - Biomass removal
 - Bycatch
 - Aquaculture

Overview: Over-harvesting

- Biggest human impact – global catch 100 million tonnes
- Overfishing – caught faster than they can reproduce
- Bycatch – 40 million tonnes
- One in every four fish is wasted
- Overcapacity:
 - Subsidies
 - Price controls
 - Low interest loans and grants



(CNN, 2010)

95% of global annual commercial ocean catch comes from coastal waters – within 200nm of coast (UNEP, 2010)



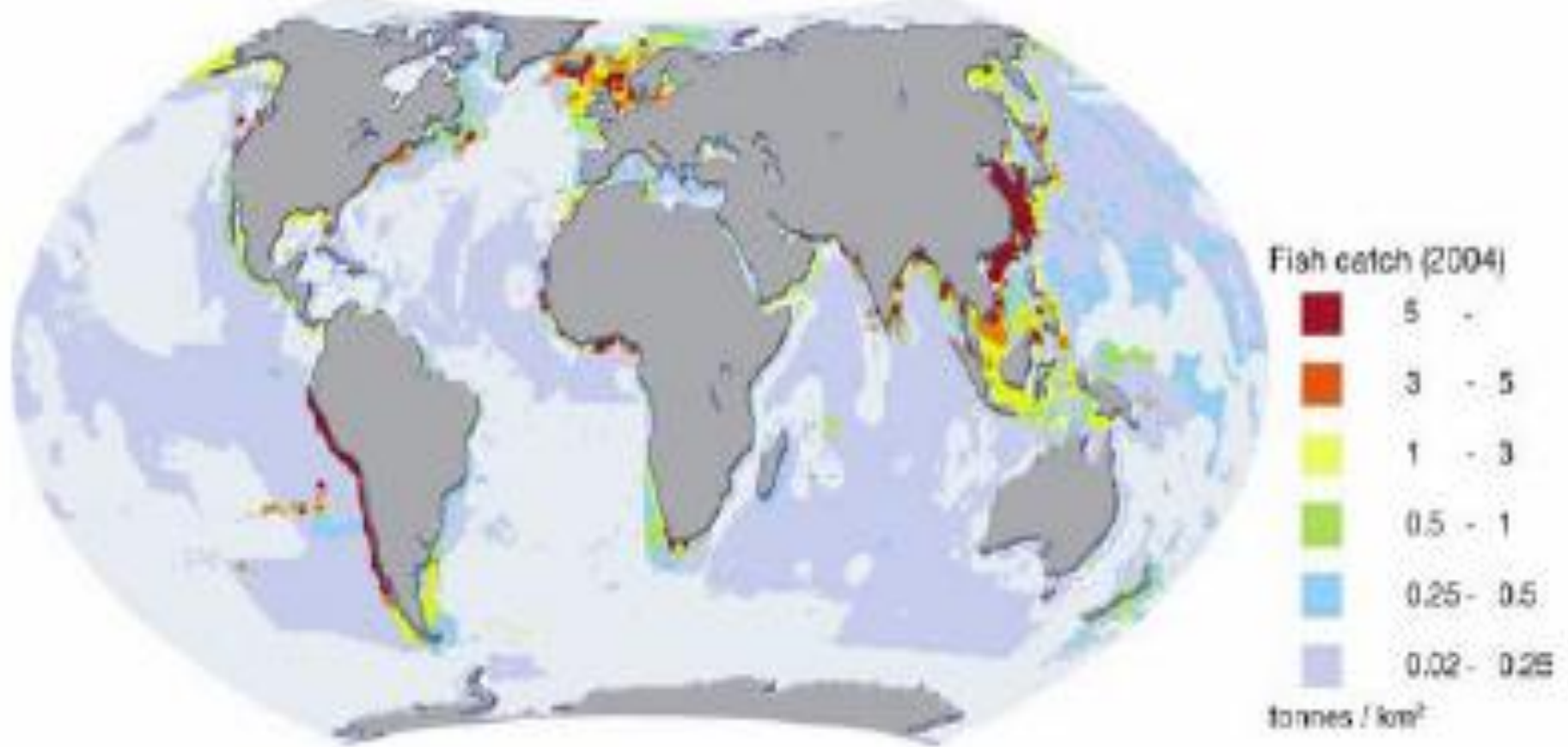
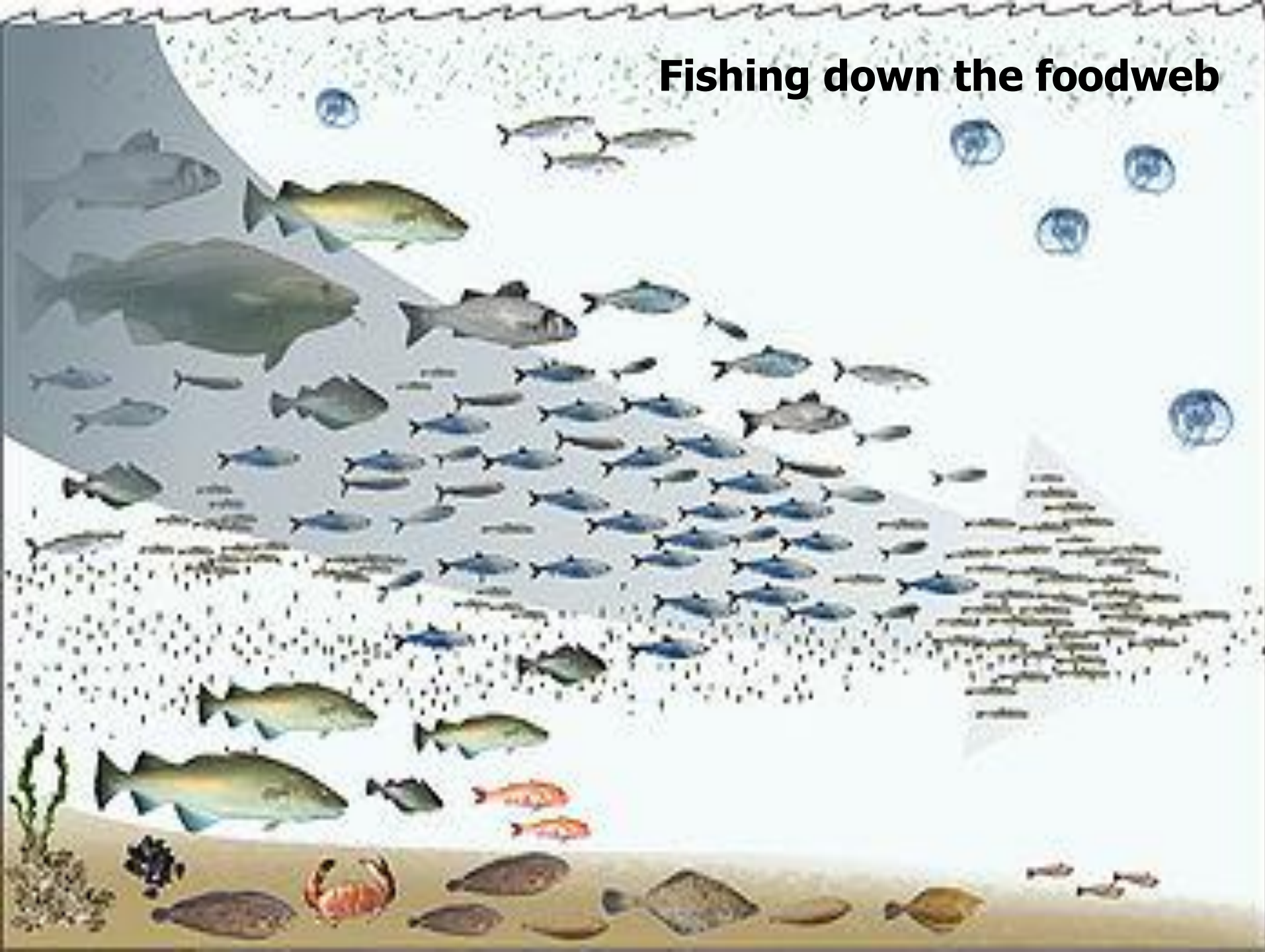


Figure 6. The World's most productive fishing grounds are confined to major hotspots, less than 10% of the World oceans.

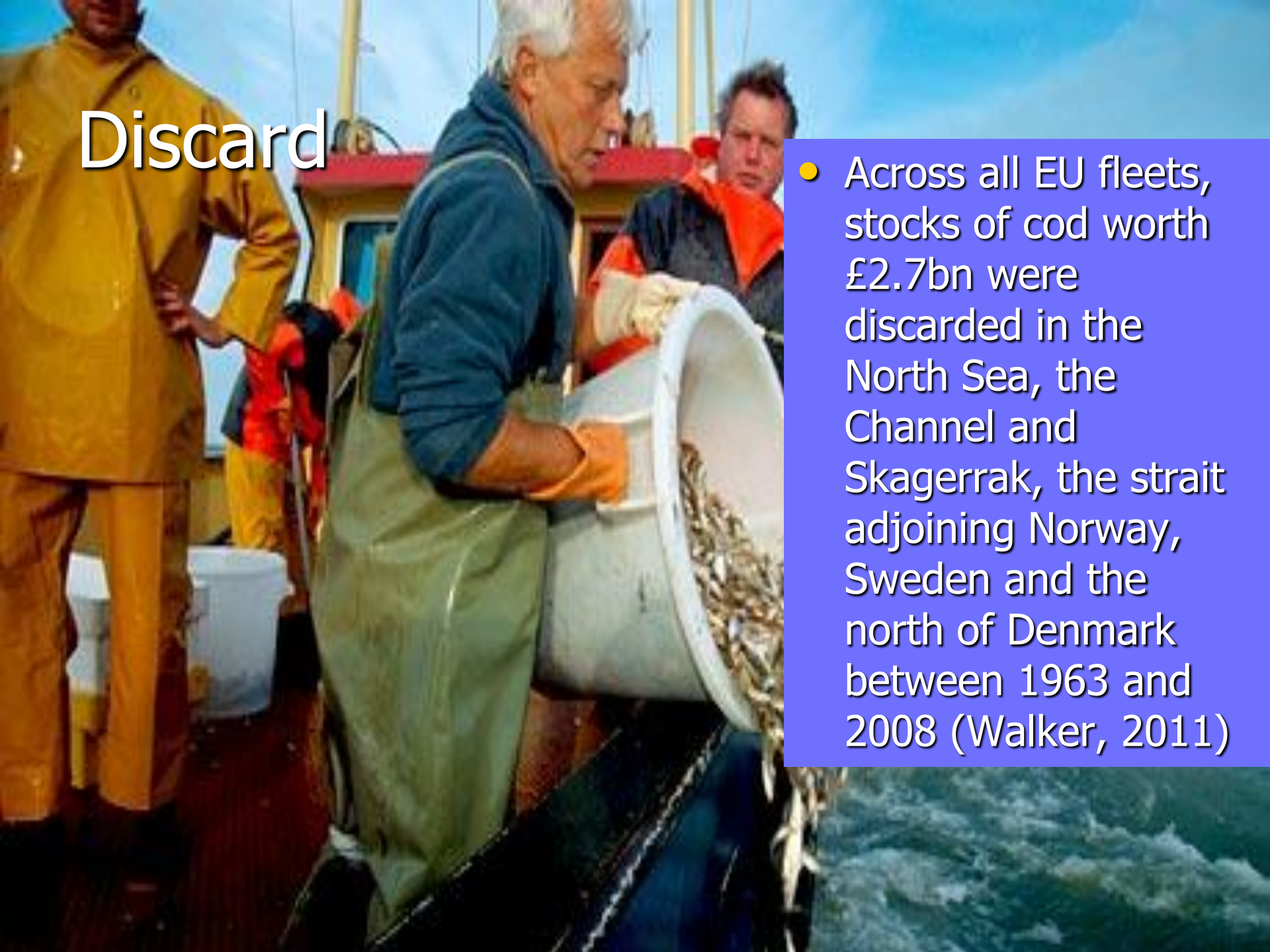
Annual catch (tonnes per km²) : a strong geographical concurrence with continental shelves, upwelling and primary productivity

Fishing down the foodweb



Discard

- Across all EU fleets, stocks of cod worth £2.7bn were discarded in the North Sea, the Channel and Skagerrak, the strait adjoining Norway, Sweden and the north of Denmark between 1963 and 2008 (Walker, 2011)



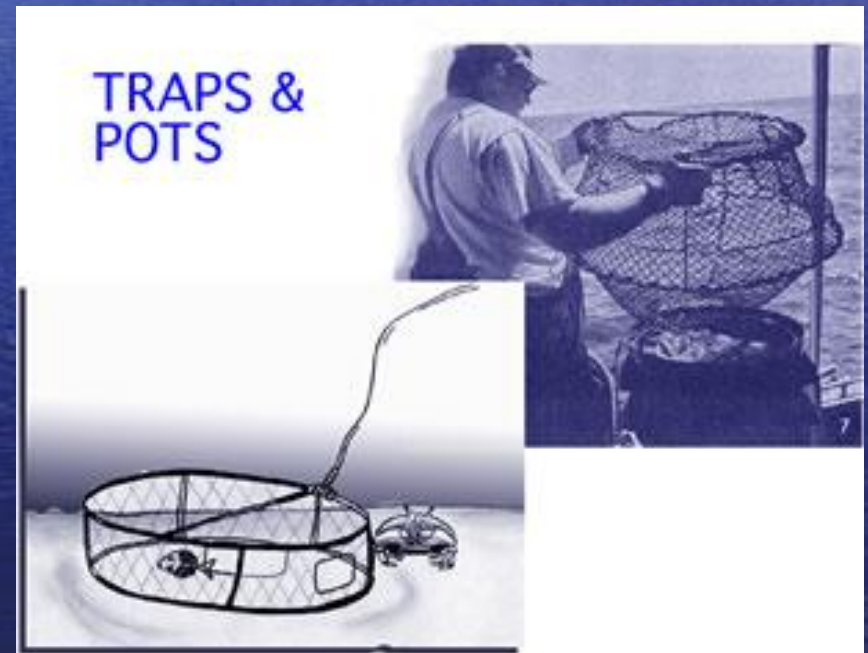
Why Discard?

- Regulations of CFP are to blame:
 - Non-quota species
 - Quotas exceeded
 - Immature stock – under legal minimum landing size
 - Low commercial value
 - Unwanted benthos or capture protected species
- Unselective gear



Fishing Techniques: Traps & Pots

- Baited cages
- Bottom-dwelling species like crab and shrimp
- Selective fishing
- Degradable line



Fishing Techniques: Trolling

- Trolling poles upright when not fishing
- 45° when fishing
- Hooks and lines attached
- Lines pulled behind boat
- Faster species which will chase a lure
- Salmon, albacore and tuna



Fishing Techniques: Fishwheel

- Used in rivers mainly
- Spawning fish
- Similar to water wheels
- Fish can be sorted and non-target species released



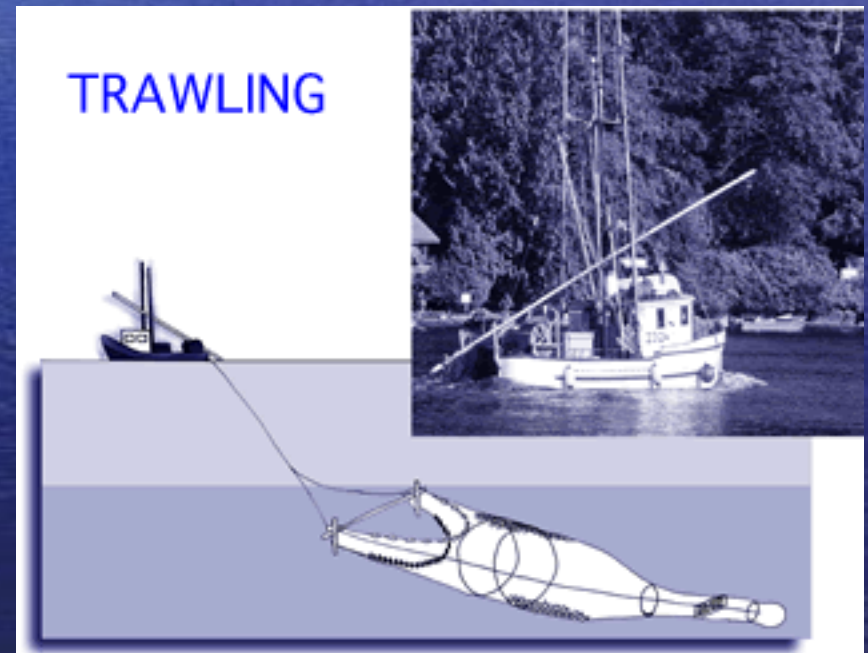
Fishing Techniques: Longlining

- In BC – used for halibut, rockfish, dogfish
- Swordfish and tuna
- Sunken long line is anchored, buoyed at surface
- Hundreds of small baited lines (100km long)
- Bycatch



Fishing Techniques: Trawling

- Cone-shaped net dragged behind the vessel
- Cod-end
- Differ according to depth fished
- Electronics and depth sounders
- Floats on one line; weights on bottom line
- Efficient – bycatch & habitat degradation



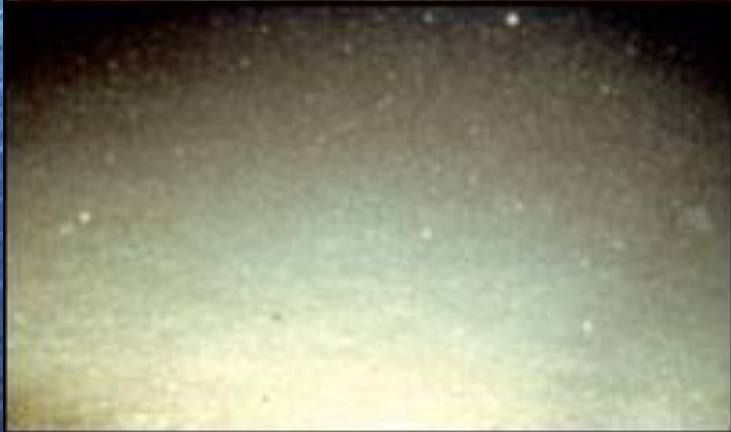
For every kilogram of sole caught in North Sea by trawlers, up to 14kg of other seabed animals are killed



Habitat Degradation: Trawling

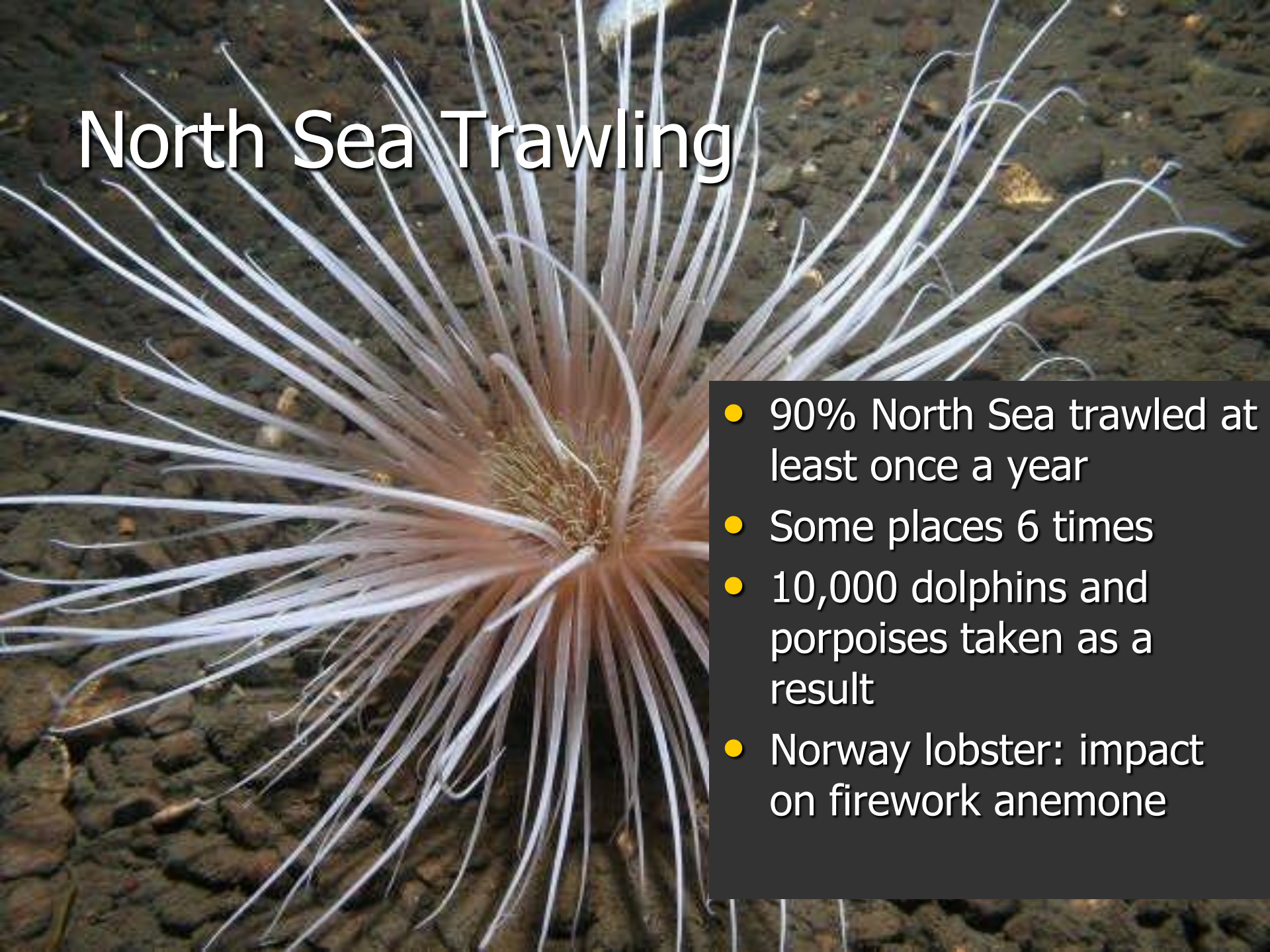


Before



After

North Sea Trawling

A close-up photograph of a firework anemone, a deep-sea creature with a central, fleshy, pinkish-brown body and numerous long, thin, white tentacles that radiate outwards. It is resting on a dark, rocky seabed.

- 90% North Sea trawled at least once a year
- Some places 6 times
- 10,000 dolphins and porpoises taken as a result
- Norway lobster: impact on firework anemone

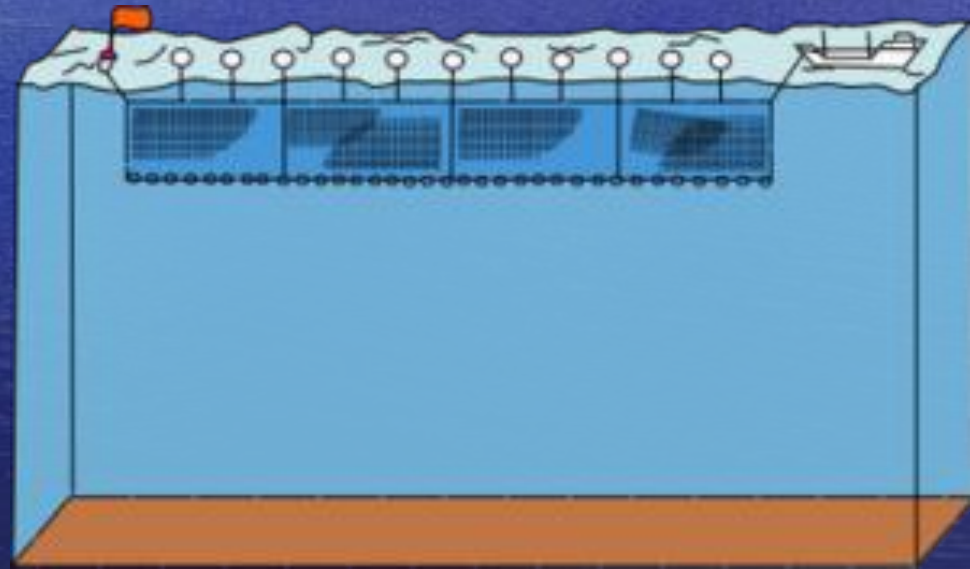
Fishing Techniques: Gillnetting

- Long, flat nets
- 'Curtains'
- Virtually invisible from underwater
- Spaces just big enough to fit fish heads
- Selective – depth & size
- Bycatch – revival tanks



Fishing Techniques - Driftnets

- Tangle nets – pelagic fish
- Free floating
- Set by boats and collected later
- Ghost fishing
- Swordfish and bluefin tuna (illegally)
- Effective, easy to use and passive – no specialisation required





- 1993 a UN moratorium on driftnets
- EU ban - >2.5km in Med
- 2003 global ban on driftnets for swordfish, marlin, sharks & cephalopods

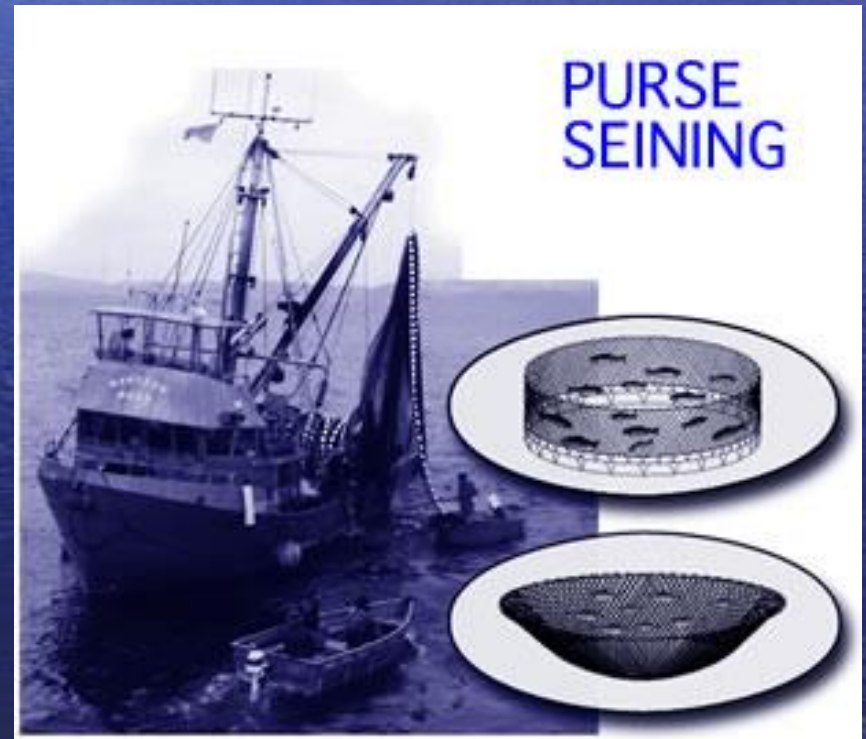
Driftnets

A close-up photograph of a tangled orange driftnet with several brown floats attached. The net is made of a fine, orange mesh and is heavily entangled. The floats are brown, oval-shaped, and attached to the net with black lines. The background is a blurred continuation of the net and floats.

- Banned by UN & EU but many infringements (Italy, Morocco & Turkey)
- 20% swordfish catch in Med using driftnets
- Many longliners use driftnets as well
- Loopholes – conversion plan in Italy following Regulation 1239/98 = compensation
- Poor records – no idea how many driftnets
- Co-operatives beyond EU so driftnetting could continue
- New licences for ‘anchored gillnets’ <5km

Fishing Techniques: Purse Seining

- School fish encircled with a net – tightened like a drawstring
- Two boats needed
- Efficient
- Bycatch
- Ramping



Fishing Techniques: Recreational Fishing

- Big business – charter boats
- Released
- 'Sport'? – high powered electronics and fish finders







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**Spear fishing may
be more
sustainable but it
still has its dangers**

Marine Fisheries

- 1% global economy - livelihood of 200 million people
- Poor management and regulation
- 30-50% overcapacity
- Biological stock estimates – quotas set
- $\frac{2}{3}$ fish stocks around UK over-exploited
- Size of catch altered
- 60% probability spawning Southern bluefin tuna reduced to zero by 2020

