EURO-BASIN
BASIN SCALE ANALYSIS, SYNTHESIS AND INTEGRATION

DiscardLess

EUROPEAN PARLIAMENT *Committee on Fisheries*
HOW TO IMPROVE SELECTIVITY IN THE CONTEXT OF THE DISCARD BAN, 13 April 2015

Ecological approach to implementing the discard ban

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Panel II : Selectivity through target-based management and regulatory measures

Scope of this presentation

- The case for improvements in selectivity – example: North Sea whitefish fisheries
- What are the potential ecosystem benefits of improved selectivity?
- What sort of targets could be set for improvements in selectivity?

Quotation from a Sea Fisheries Bill debate in the UK Parliament, on the implementation of minimum landing sizes for flatfish in the North Sea.

Mr Edward Marjoribanks MP (aka Lord Tweedmouth):

"All this Bill proposes to do is to prohibit the sale of small flat fish, but what we w… fish, grow…

"This Bill… fishe… catch… retur… they…

"I do not… cave… inde… which…

"It may d… there… the r… fish. With these few words, I desire to support the Bill so far as it goes."

In summary, he says…

"The proposed imposition of a minimum landing size only prevents the sale of small fish."

"It will not prevent their capture and subsequent discarding at sea in pursuit of large, marketable fish."

"The proposed legislation will have no conservation benefit."

20 June 1898

… anybody willing to guess what year this debate was held ?

PLOS ONE

RESEARCH ARTICLE

Hind-Casting the Quantity and Composition of Discards by Mixed Demersal Fisheries in the North Sea

Michael R. Heath*, Robin M. Cook

A century on, 'undersize' fish make >66% of discards in the North Sea whitefish fisheries

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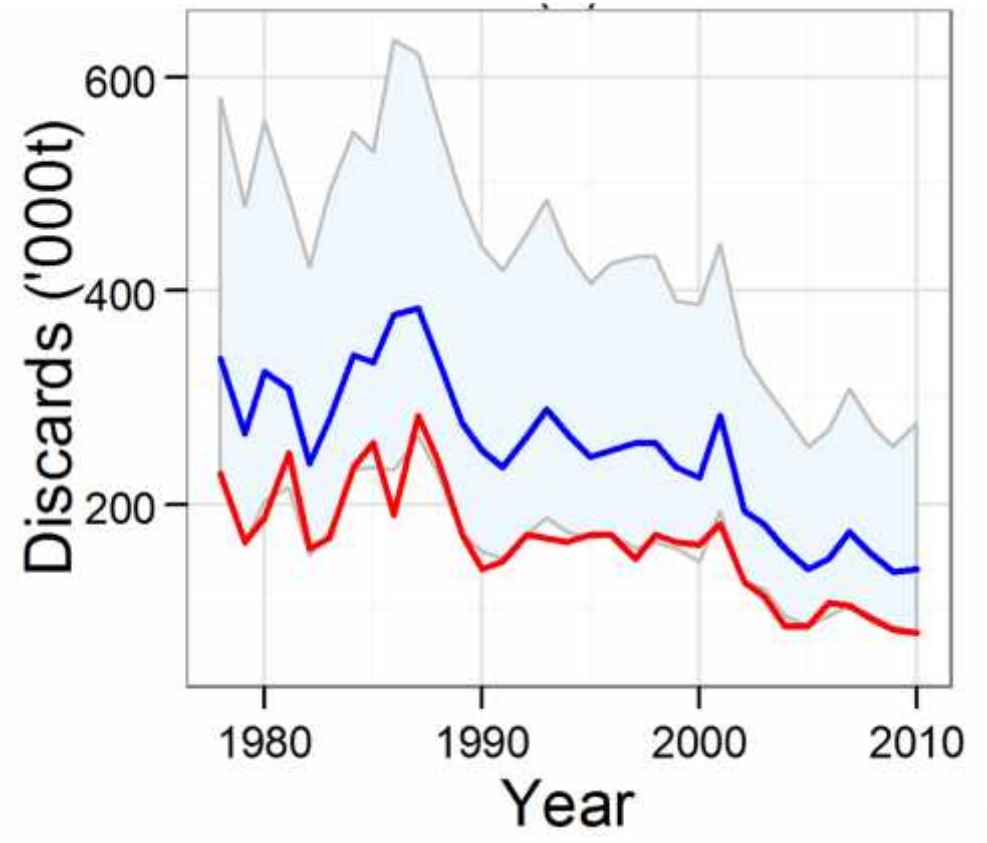


Species	Legal MLS (cm)
Cod	35
Haddock	30
Whiting	27
Plaice	27
Saithe	35
Common sole	24
Hake	27
Megrim	20
Ling	63
Blue ling	70
Pollack	30
Bass	36
Anglerfish	500 g ≈ 32cm

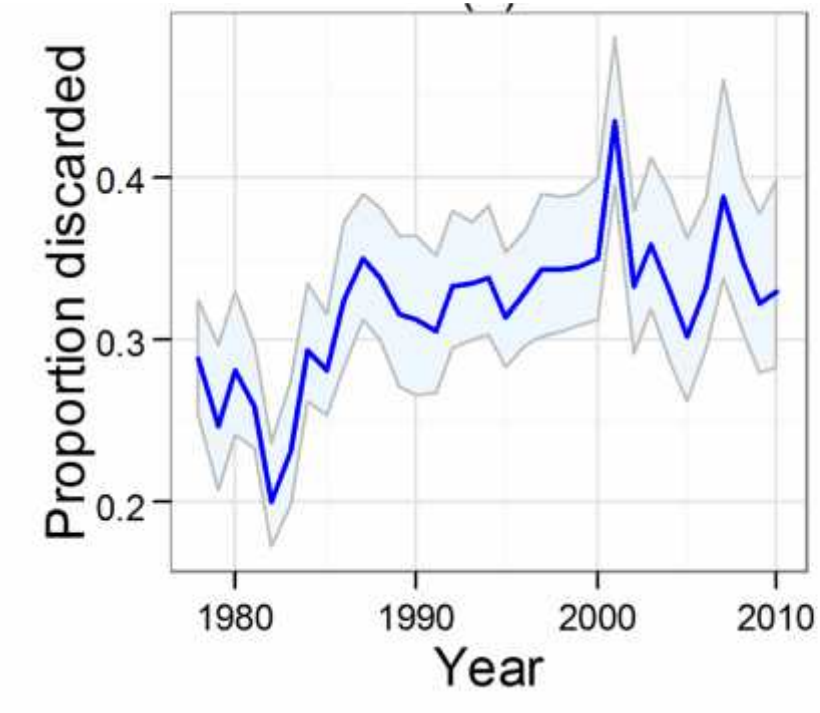
Species	De-facto MLS (cm)
Common dab	25
Lemon sole	25
Witch	28
Brill	30
Flounder	27
Gurnard	30
Mullets	16
Turbot	30
Halibut	45
Dogfishes and sharks	50
Spurdog	50
Rays and skates	40
Wolffish	30
Tusk	40

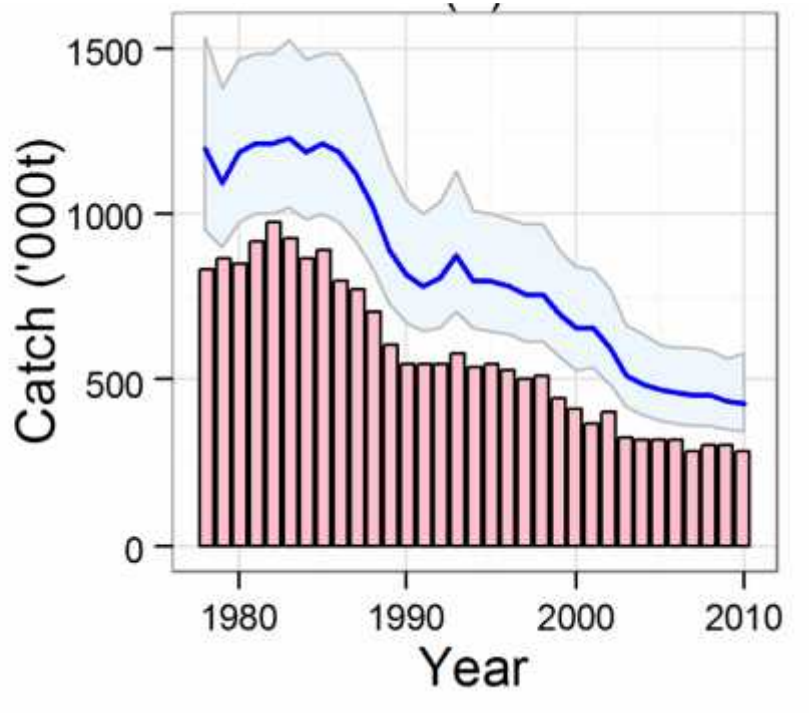
Blue – total discards (with 95% confidence intervals)

Red - 'Undersize' discards

Legal MLS to be replaced with Minimum Conservation Reference Sizes under discard ban

Whitefish discard quantity in the North Sea has declined, but the proportion of total catch discarded has increased

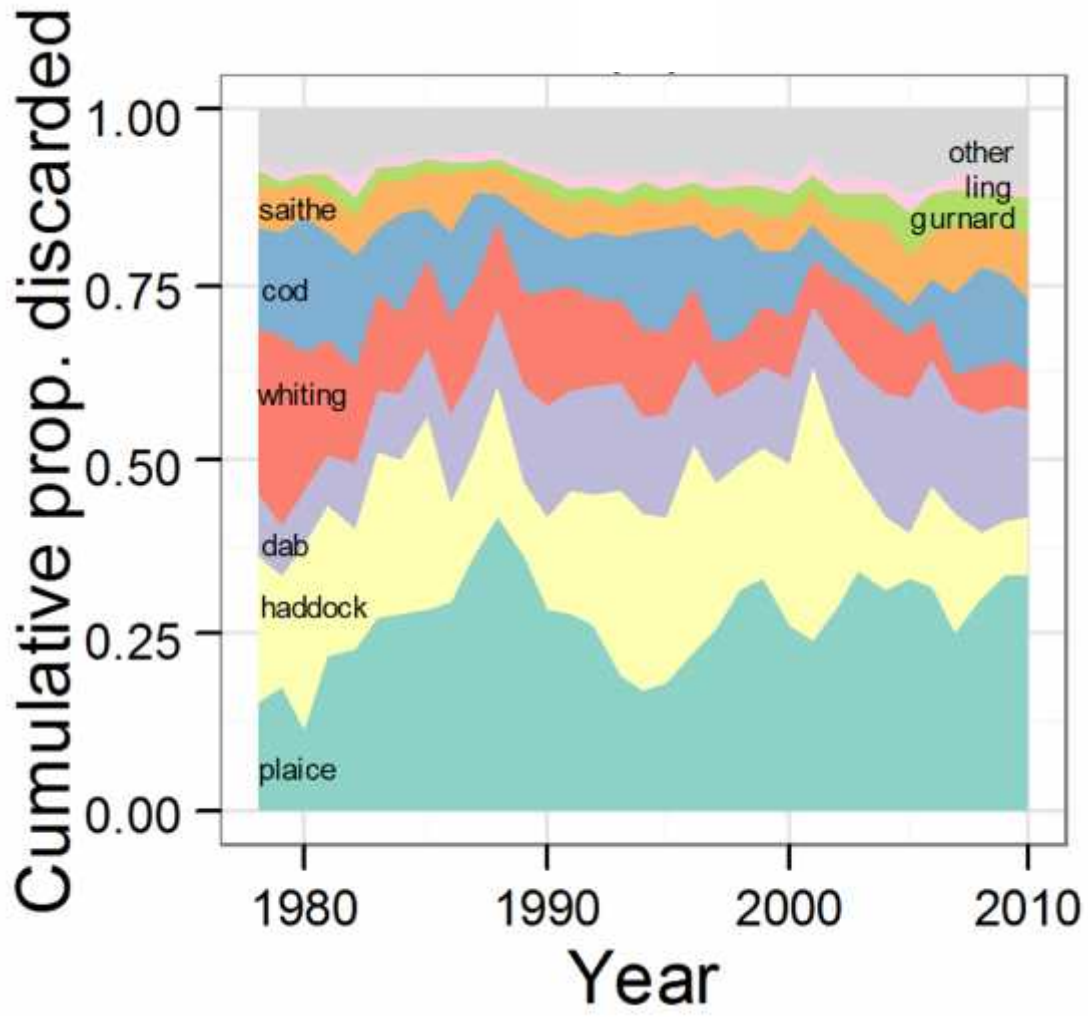




Discard rate (proportion of catch discarded)

Total catch (blue line with 95% interval) and landings (red vertical bars)

“Over-quota is not the issue” : by-catch species make up an increasing proportion of the discards



Since 1980:

more small flat-fish and non-target species;

fewer of the major targeted round-fish.

Key questions about discards from an ecosystem perspective

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- What is the fate of discarded fish in the ecosystem?

- What would be the effects on the ecosystem if we could catch only marketable fish?

Predictable food subsidies to wildlife by human activity are commonplace …

Effects on the ecosystem of nutritious waste, bait or intentional feeding

- Direct effect - provides a food source for scavenging species
  - adaptations in behaviour
  - advantage to opportunistic species able to capitalise
- Indirect effects – cascade through the food web to alter the balance of species elsewhere in the ecosystem
  - Predation
  - Competition
  - Nutrient transfer

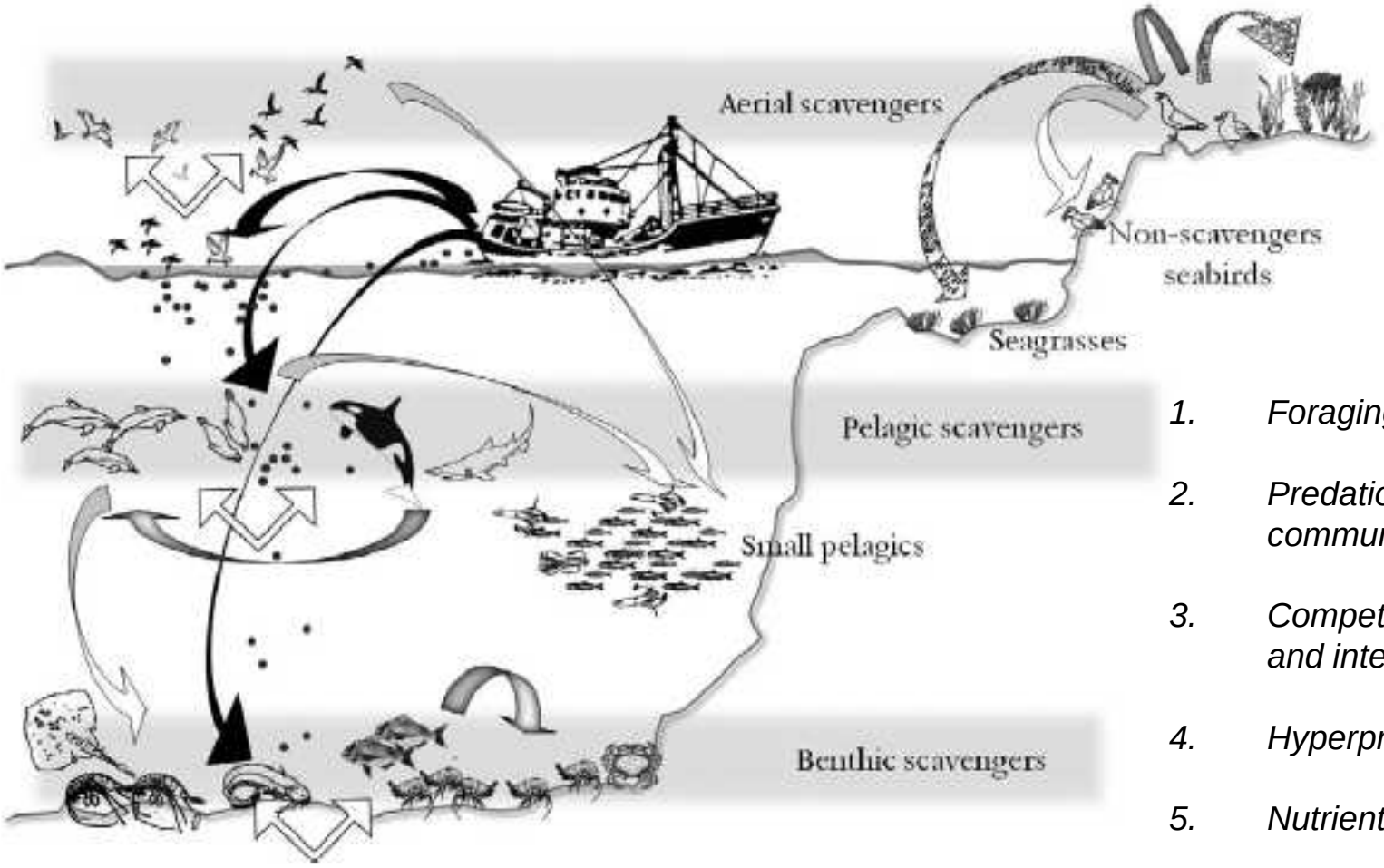
ECOLOGY LETTERS
Ecology Letters, (2013) 16: 1501–1514 doi: 10.1111/ele.12187

REVIEW AND SYNTHESIS

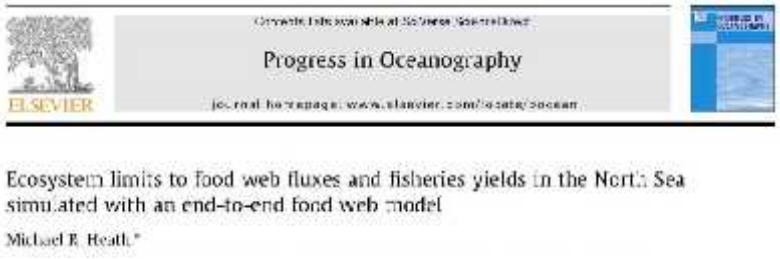
Ecological and evolutionary implications of food subsidies from humans

Daniel Oro,[1]* Meritxell Genovart,[1] Giacomo Tavecchia,[1] Mike S. Fowler[2] and Alejandro Martínez-Abraín[1,3]

University of Strathclyde Science



1. *Foraging exploitation*
2. *Predation within communities*
3. *Competition (resource and interference)*
4. *Hyperpredation*
5. *Nutrient release*



Computer simulation model of the North Sea food web

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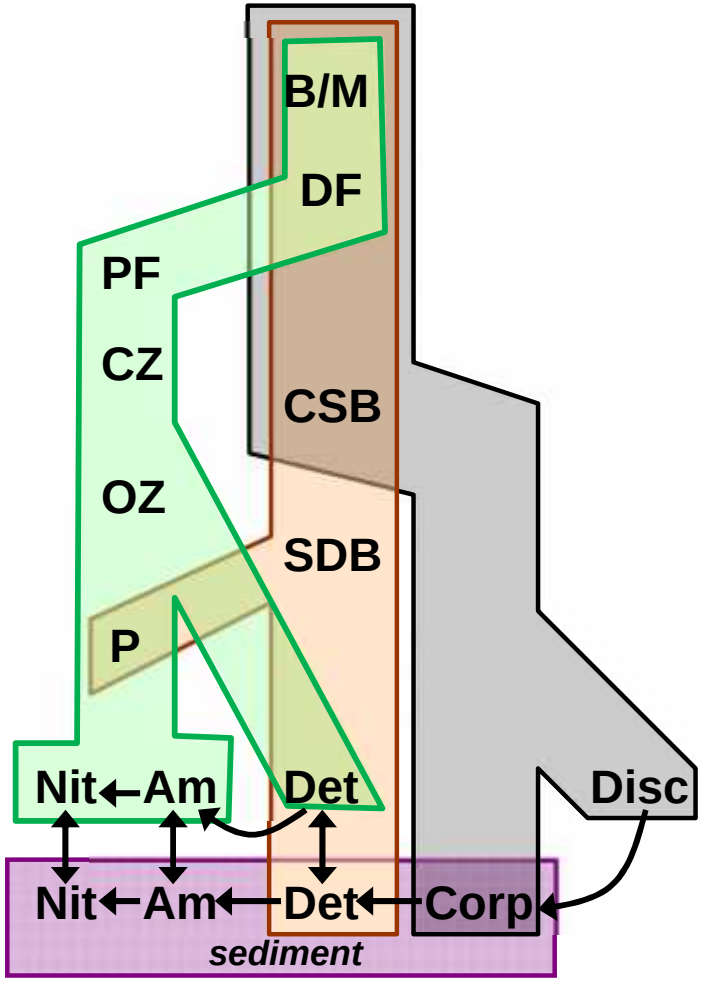
Four interconnected compartments: Pelagic, Benthic, Scavenging, and Sediment

Birds & mammals (B/M)
Demersal fish (DF)
Pelagic fish (PF)
Carnivorous zooplankton (CZ)
Carnivorous/scavenging benthos (CSB)
Omnivorous zooplankton (OZ)
Susp/deposit feeding benthos (SDB)
Phytoplankton (P)
Nitrate (Nit)
Ammonia (Am)
Detritus (Det)
Corpses (Corp)
Discards (Disc)



Model the effect of different selectivity scenarios

- Baseline model run – simulates the state of the ecosystem with current discarding practices in the pelagic and demersal (whitefish) fisheries

- Run the model with a landing obligation and two contrasting selectivity scenarios ("*Discards-landed*" & "*Improved selectivity*").

- Compare each of the scenario runs with the baseline.

Contrasting selectivity scenarios under landing obligation conditions

1. *"Discards landed"*

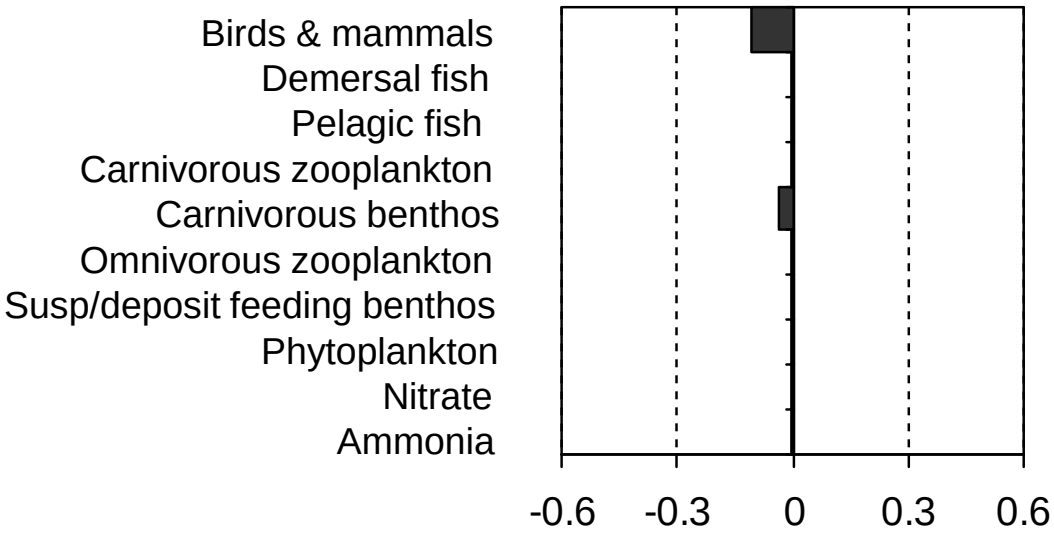
- Landing quotas inflated to match baseline total catch (quota uplift – no change in selectivity).

2. *"Improved selectivity"*

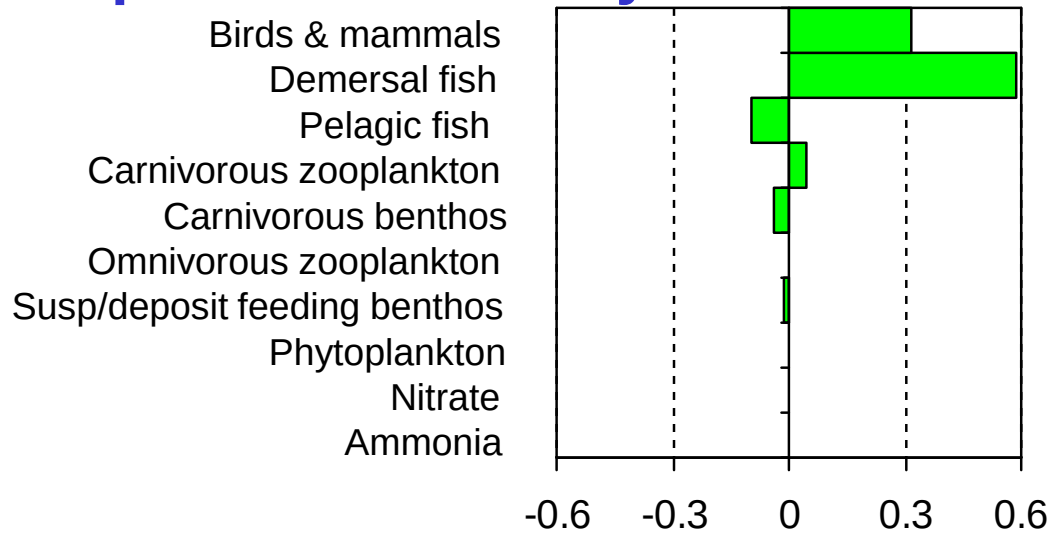
- No change from baseline landing quotas
- Unwanted by-catch eliminated by improving capture selectivity
- Industry solve the problem by choosing where, when & how to fish so as to catch only marketable fish.

"Results-based management"

“Discards-landed”



“Improved selectivity”



RESULTS - effects of alternative selectivity scenarios with a landing obligation

“Tornado diagram” shows change in abundance of food web components relative to the baseline

“Discards-landed” has only negative effect on scavenging groups

“Improved selectivity” creates a trophic cascade and positive effects on top-predators

Key conclusions

The majority of current discards (in the North Sea) are undersize and unwanted by-catch species, not over-quota catch

Aspirational target – "catch is composed solely of marketable sizes and species of fish"

Any progress towards this target represents a reduction in overall fishing mortality –

- ***Stock conservation benefits***
- ***Contributes to the goal of attaining MSY harvest rates***
- ***Maximises the economic return on the effort put into catching***
- ***Helps to achieve MSFD targets on biodiversity and food webs.***