Are we ready for Ecosystem Based Fisheries Management (EBFM) implementation - now that stocks are being rebuild

Esben Sverdrup-Jensen
Danish Pelagic Producers Organisation

Seminar on Optimizing sustainable fishing on rebuilt fish stocks - A scientific mini-symposium organized by the MSE-project group
23 November 2022, Axelborg, Axeltorv 3, Copenhagen V, Denmark

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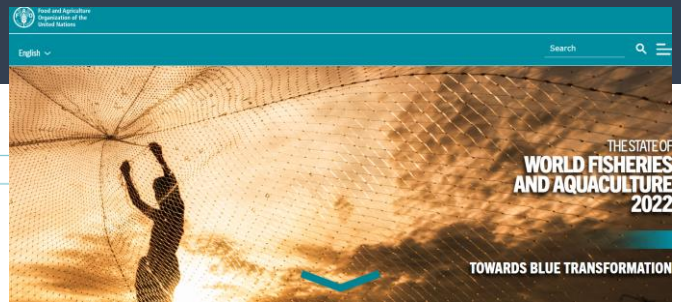
FAO: BLUE TRANSFORMATION?

How do we feed a growing world population and deal with the hidden hunger?

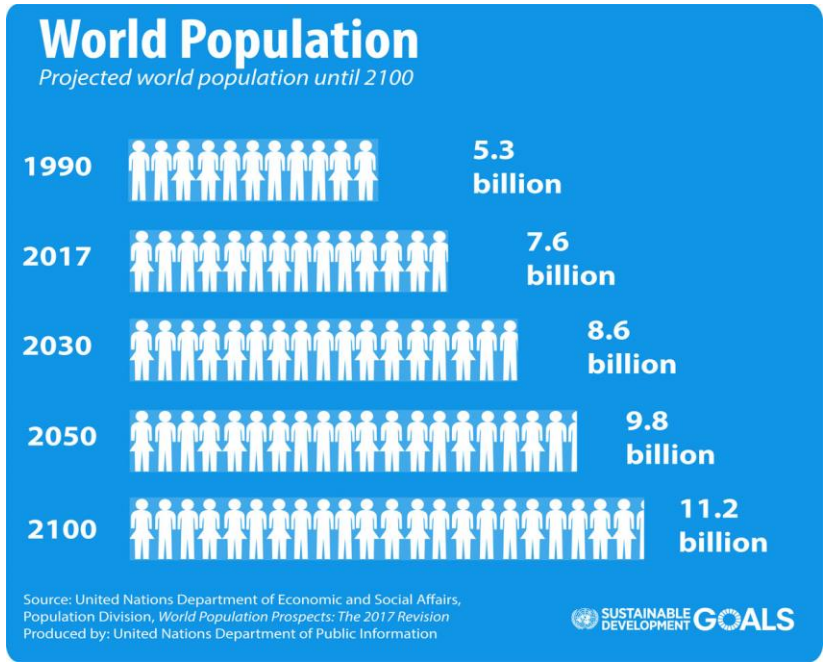


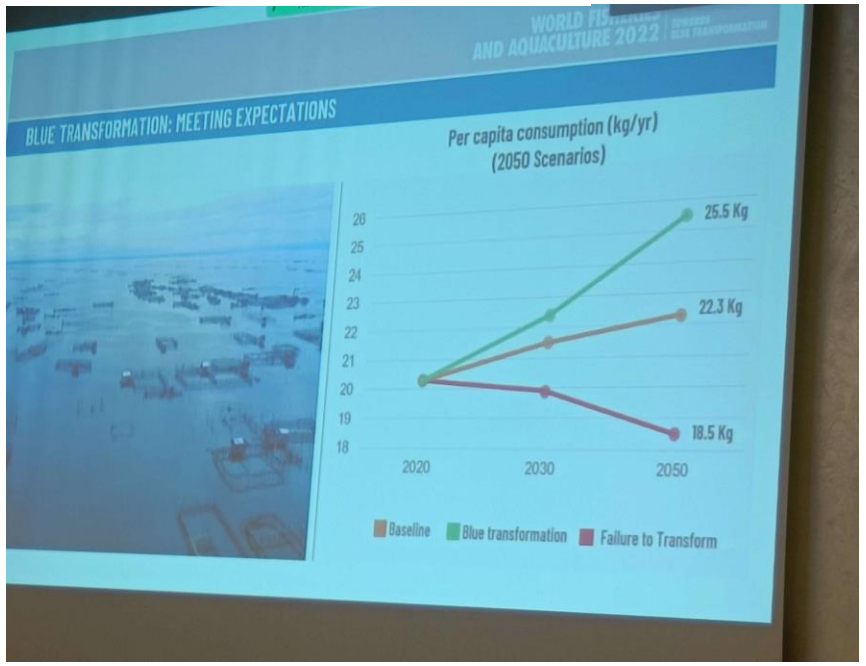
THE STATE OF **WORLD FISHERIES AND AQUACULTURE 2022**

KEY MESSAGES

3. The world's consumption of aquatic foods has increased significantly in recent years and will continue to rise.

Global consumption of aquatic foods (excluding algae) has increased at an average annual rate of 3.0 percent since 1961, compared with a population growth rate of 1.6 percent. On a per capita basis, consumption of aquatic food grew from an average of 9.9 kg in the 1960s to a record high of 20.5 kg in 2019, while it slightly declined to 20.2 kg in 2020. Rising incomes and urbanization, improvements in post-harvest practices and changes in dietary trends are projected to drive a 15 percent increase in aquatic food consumption, to supply on average 21.4 kg per capita in 2030.





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More food from aquaculture and more food from the oceans

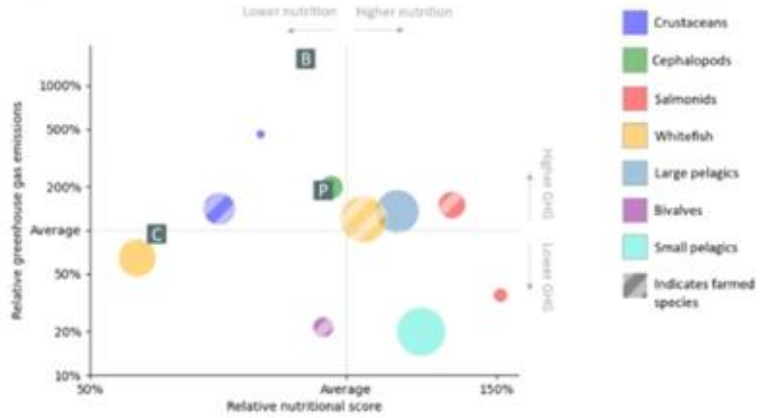
SOLUTIONS

- Low trophic fisheries
- Ocean, freshwater and land based aquaculture
- Seaweed
- Mesopelagics?
- Algea?

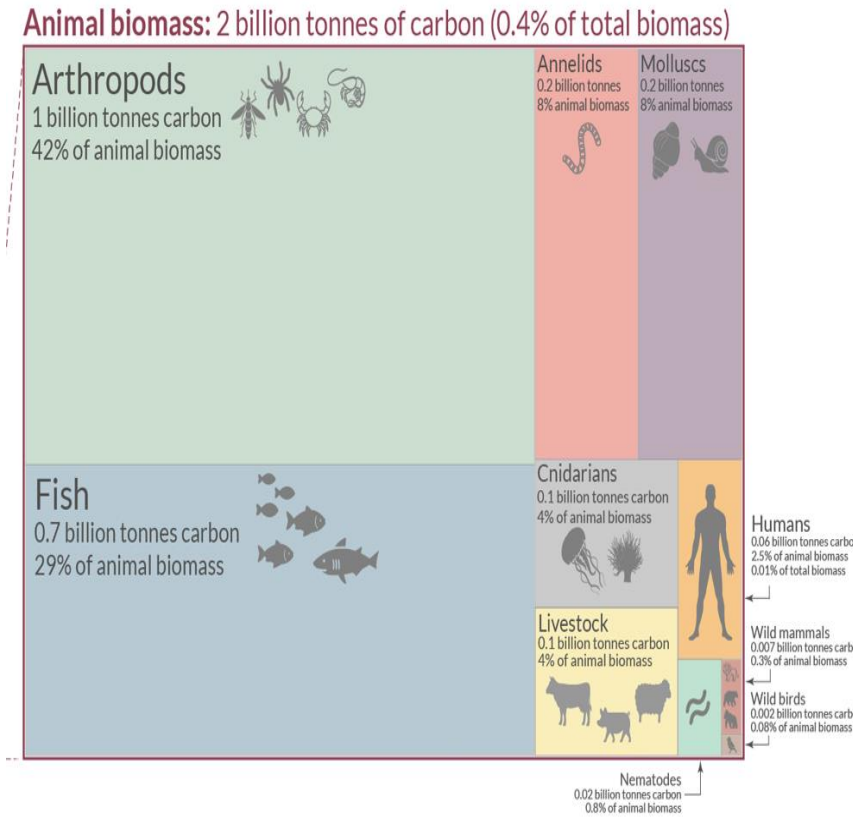
Assessing seafood nutritional diversity together with climate impacts informs more comprehensive dietary advice

Marta Bianchi, Elinor Hallström, Robert W. R. Parker, Kathleen Mifflin, Peter Tyedmers & Friederike Ziegler

Fig. 1: Nutrient density and greenhouse gas emissions of globally important seafood groups.



Relative nutrient density and production-related GHG emissions (i.e. post-harvest emissions are excluded) per edible weight of globally important seafood groups from fisheries (solid colours) and aquaculture (striped) at the point of landing or harvest, along with beef (B), chicken (C) and pork (P). Relative size of seafood group bubbles is proportionate to 2015 global edible weight production volumes, and GHG and nutrient density values are weighted by species. Both GHG values and nutrition scores are log-weighted and positioned relative to the weighted average of all included seafood species (3.7 kg CO_2e per kg edible weight and NDS 4.0). For graphs showing species in each species group individually, see Supplementary Figs. 1–8.



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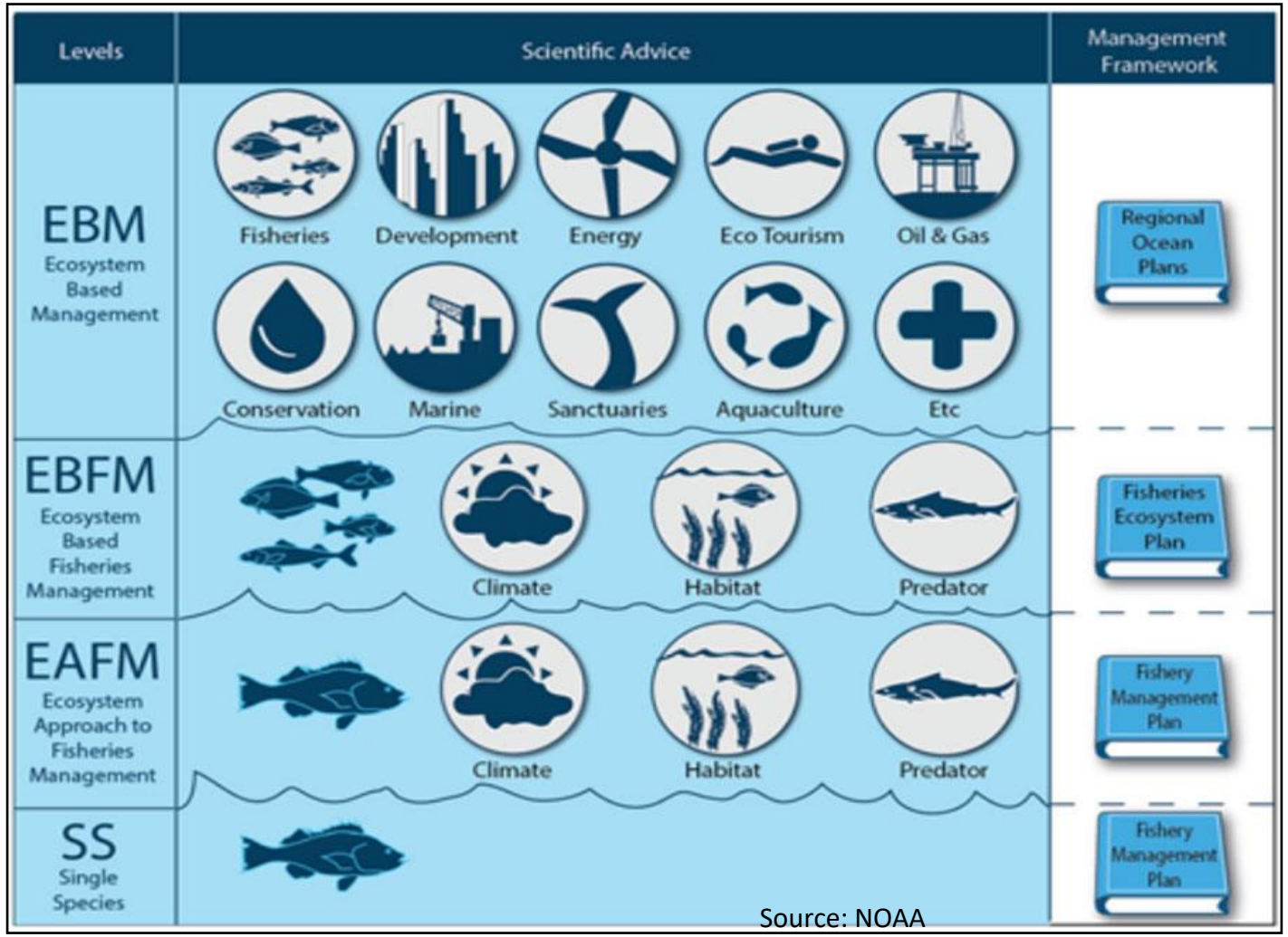
Is the EBFM the solution to optimized exploitation

Agenda

- What is the aim?
- Are we capable?
- What are the Challenges?
- Tough choices



Source: NOAA

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Where are we now? Is industry ready? Is science capable?

Regime shift in quality of fisheries dependent data, control and compliance over the last 20 years

Industry taking lead in scientific programs and introducing fully documented fisheries

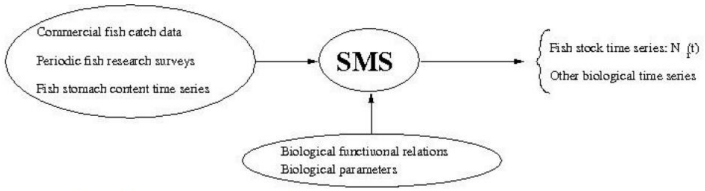
Science is already using ecosystem models like SMS

– the Stochastic Multi-Species model

DTU

What is the SMS model ?

- Natively HTL analysis model – not a simulation model …
- Application proven data-oriented model for assessing multiple fish stock time series

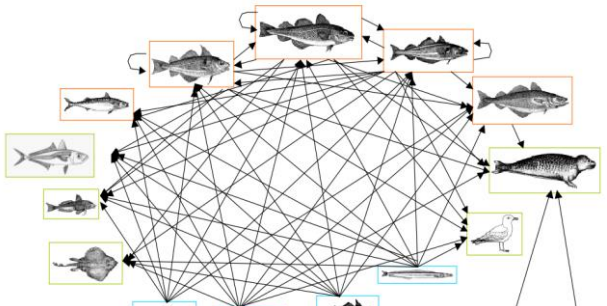


Strengths of the SMS model:

- Advanced trophic interactions
- Management strategy evaluation setup available

Upper trophic interactions in the North Sea

DTU



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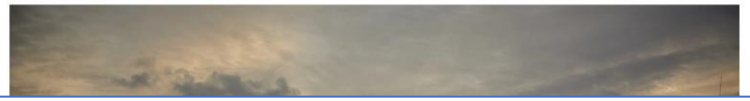
Menu

The danish pelagic fishing fleet in DPPO's membership introduces 100% documented fisheries

mar 11, 2022

As the first in Europe, the Danish pelagic fleet is now introducing fully documented fishing on all vessels. By the end of 2022, CCTV and associated sensors will be installed on all Danish pelagic vessels organised in the Danish Pelagic Producer Organisation (DPPO).



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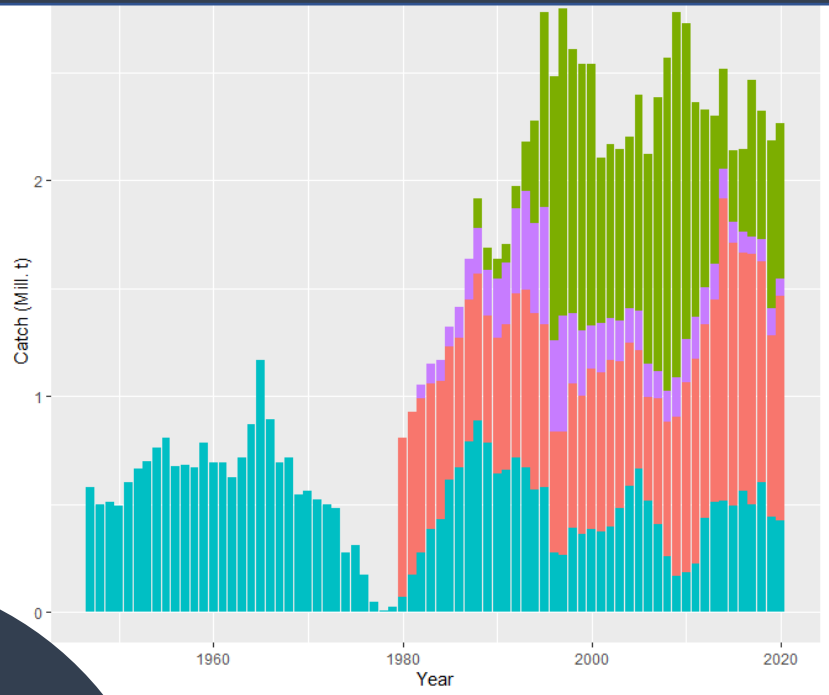
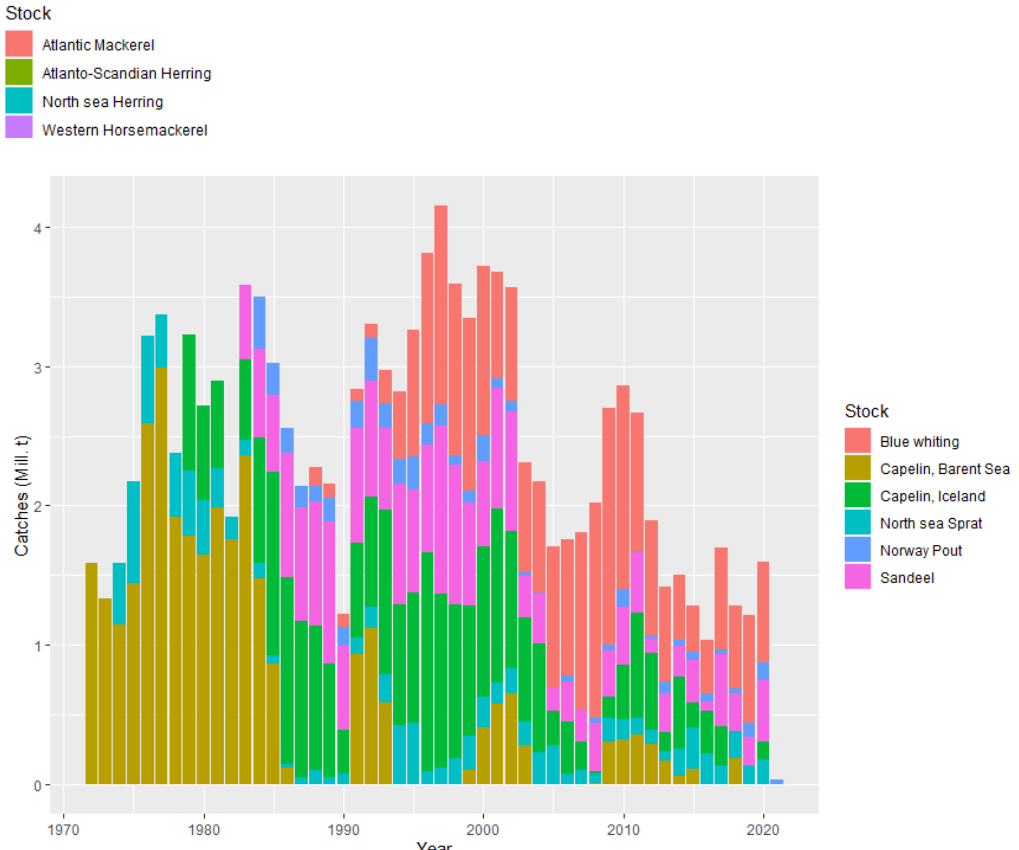
How good are we at understanding what is going on in the North East Atlantic?

Pelagic consumption species:

Stable catches - but overfished





Pelagic industrial species:

Decreased stocks – but scientific advice followed

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Is science capable?

Challenges for science:

- “MSY: We took the pain – where is the gain?”
- Wide and deep knowledge gaps for physical-biological interactions for many species and life stages
- MSY project identifies flaws in relation to density dependence?
- How rapidly is climate change affecting the dynamics?
- “Shifting baselines” for science

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Can EBFM balance harvest and conservation? Are managers ready?

Challenges for managers:

- How do we define the goal?
- How does “relative stability” and zonal access limitations fit with EBFM?
- “Shifting baselines” for socio economics
- What is the “hirachy” of the ecosystems we are aiming for?
- Do we want to rewild or to feed the world?

- ***EBFM comes with tough choices!***

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Shifting baselines

Are we able to define a target status of the ecossytem:

What is the natural state of the Eastern Baltic Cod?

Source: Oceana

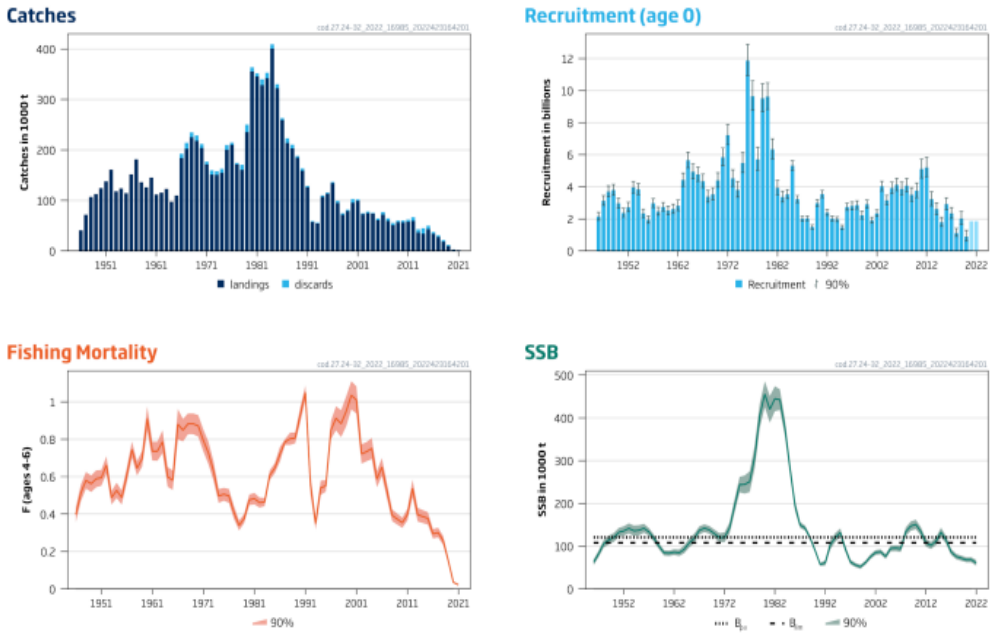
Cod (*Gadus morhua*) in subdivisions 24–32, eastern Baltic stock (eastern Baltic Sea)

ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, there should be zero catch in 2023. This advice applies to all catches from the stock in subdivisions 24–32.

Stock development over time

Spawning-stock size is below B_{lim} and B_{pa}. No reference points for fishing pressure have been defined for this stock.



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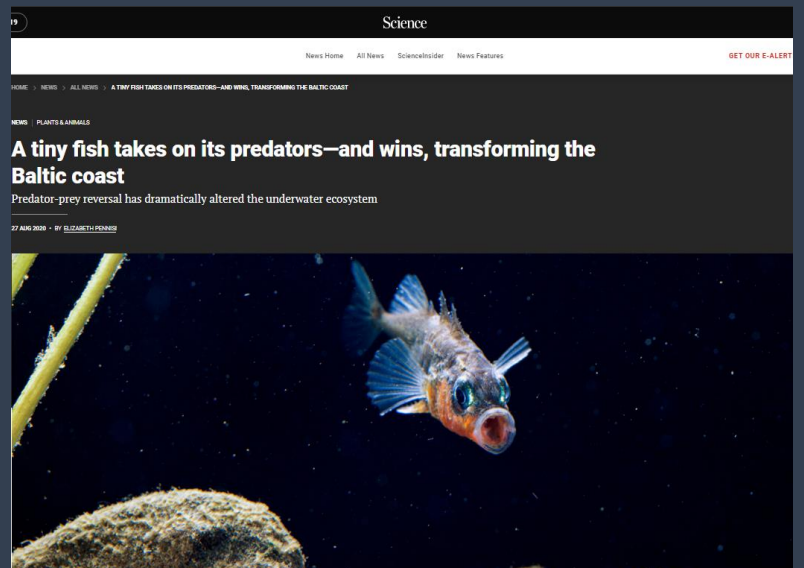
Shifting baseline

Are we able to define a target status of the ecossytem:

- *Is the ecosystem most "natural" when we have predators or prey?*



nature > communications biology > articles > article

Article | Open Access | Published: 27 August 2020

A spatial regime shift from predator to prey dominance in a large coastal ecosystem

Johan S. Eklöf, Göran Sundblad, Mårten Erlandsson, Serena Donadi, Joakim P. Hansen, Britas Klemens Eriksson & Ulf Bergström

Communications Biology 3, Article number: 459 (2020) | Cite this article

6214 Accesses | 29 Citations | 139 Altmetric | Metrics

Abstract

Regime shifts in ecosystem structure and processes are typically studied from a temporal
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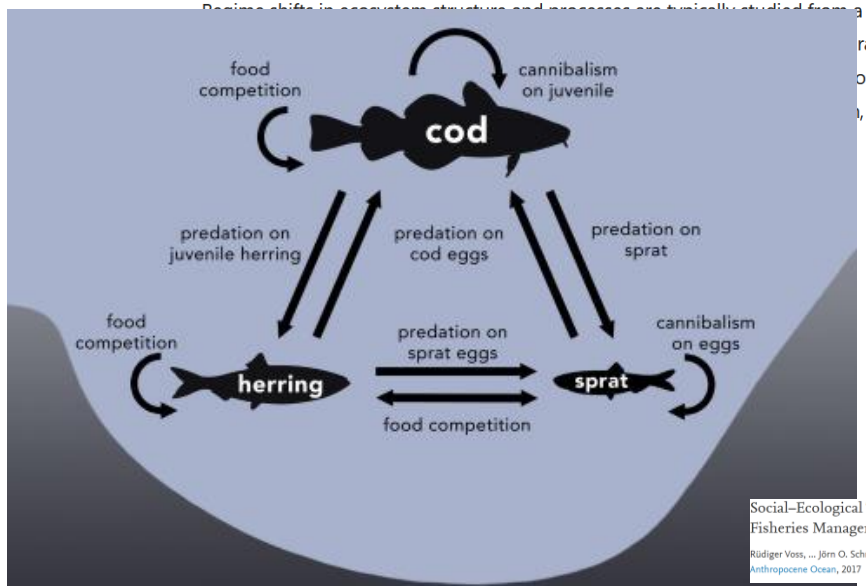

Social–Ecological Trade-Offs in Baltic Sea Fisheries Management

Rüdiger Voss, ... Jörn O. Schmidt, in Conservation for the Anthropocene Ocean, 2017

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Goal:
Blue transformation or rewilding the oceans?
Something in between?

What is most important to you?
What is most important for us?

THANK YOU!

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