How to capture the role of nature to design effective instruments that ensure sustainability?

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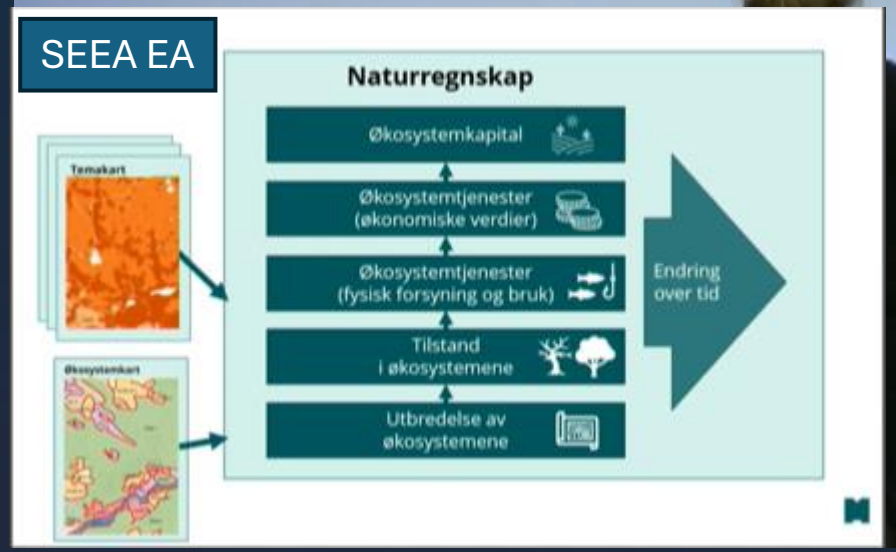

- Monitoring progress SDGs
- Reporting and monitoring progress of CBD comittments
  - Protect nature
  - Sustainable use
  - Benefit sharing
- Specifically, targets GBF

Press conference launching Norway's new BSAP 27/09/2024

Outline

- Case aquaculture – farmed salmon
- Biology of Atlantic salmon (*Salmo salar*)
- Pressures on Atlantic salmon
- Condition of Atlantic salmon (data)
- Suggestion for accounts of ES supporting the aquaculture industry (?)
- Questions

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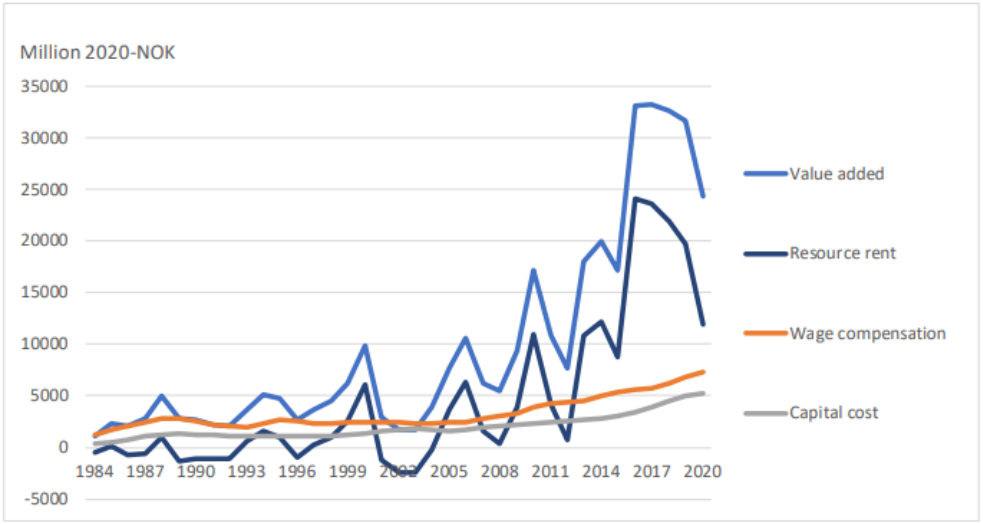
Figure 2. Resource rent in aquaculture 1984-2020.



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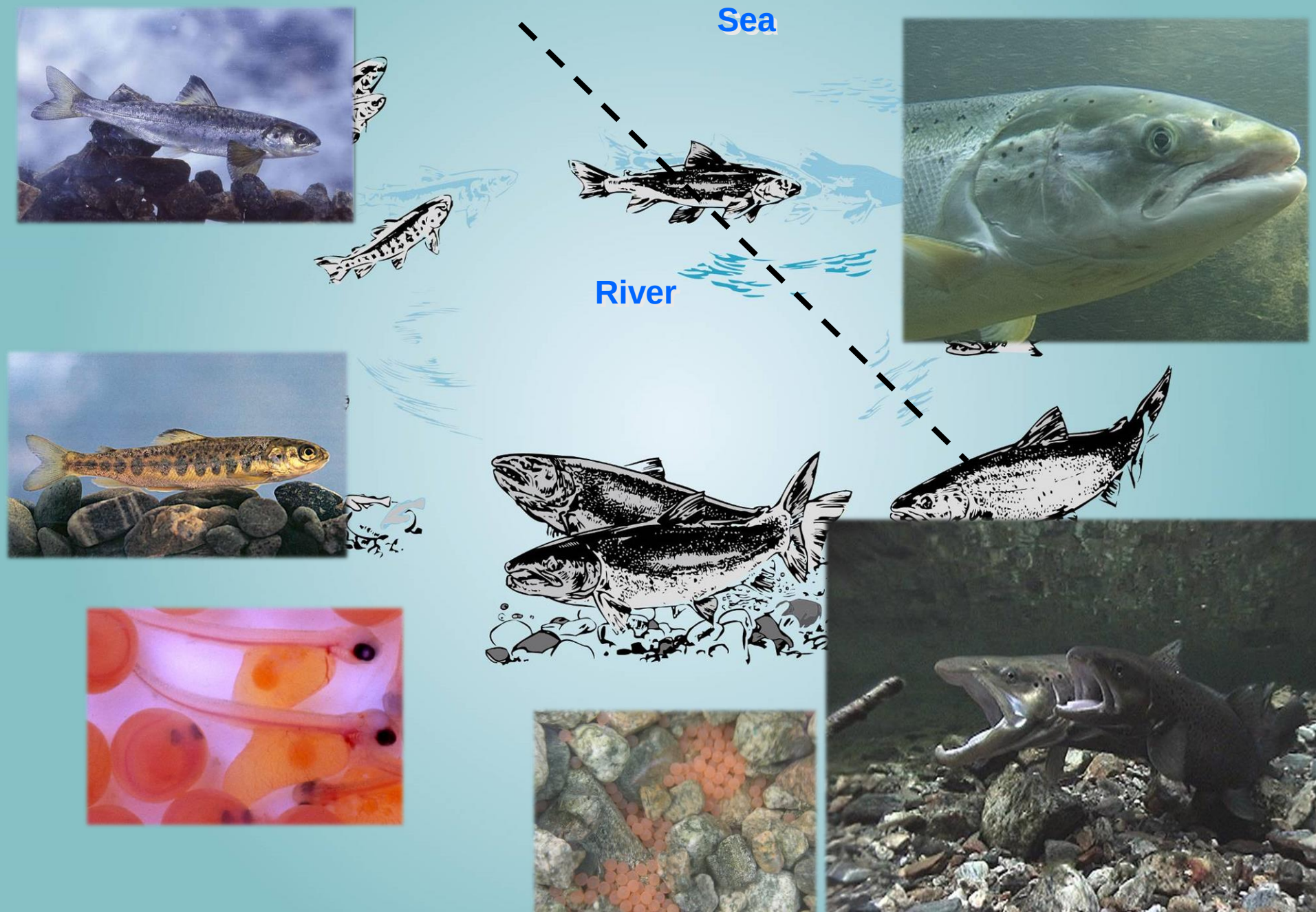
Innovating a new industry - Aquaculture

The Norwegian aquaculture industry thrives thanks to Norway's spectacular natural landscape. The cold, clear waters of the Norwegian fjords provide the perfect conditions for farming fish.

RR from ca 1 to ca 2.3 billion € in the period 2013 to 2017 (Greaker & Lindholt 2021)


Sea
River

Escaped farmed salmon and salmon lice are the most important on salmon populations

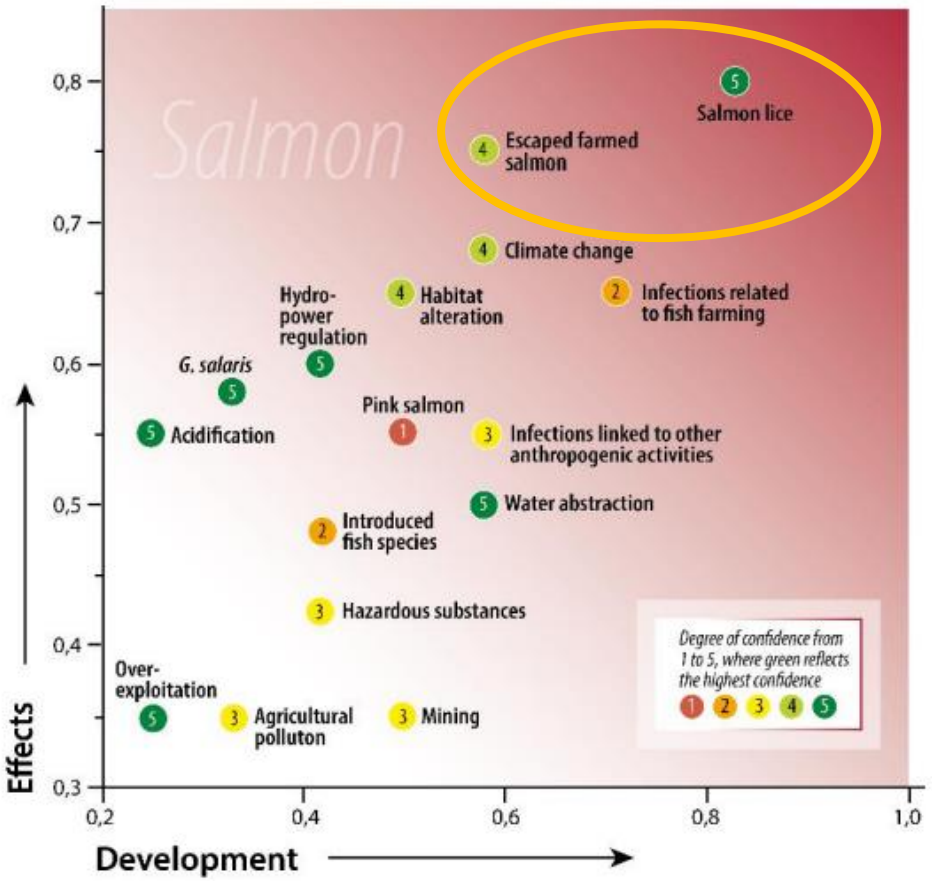
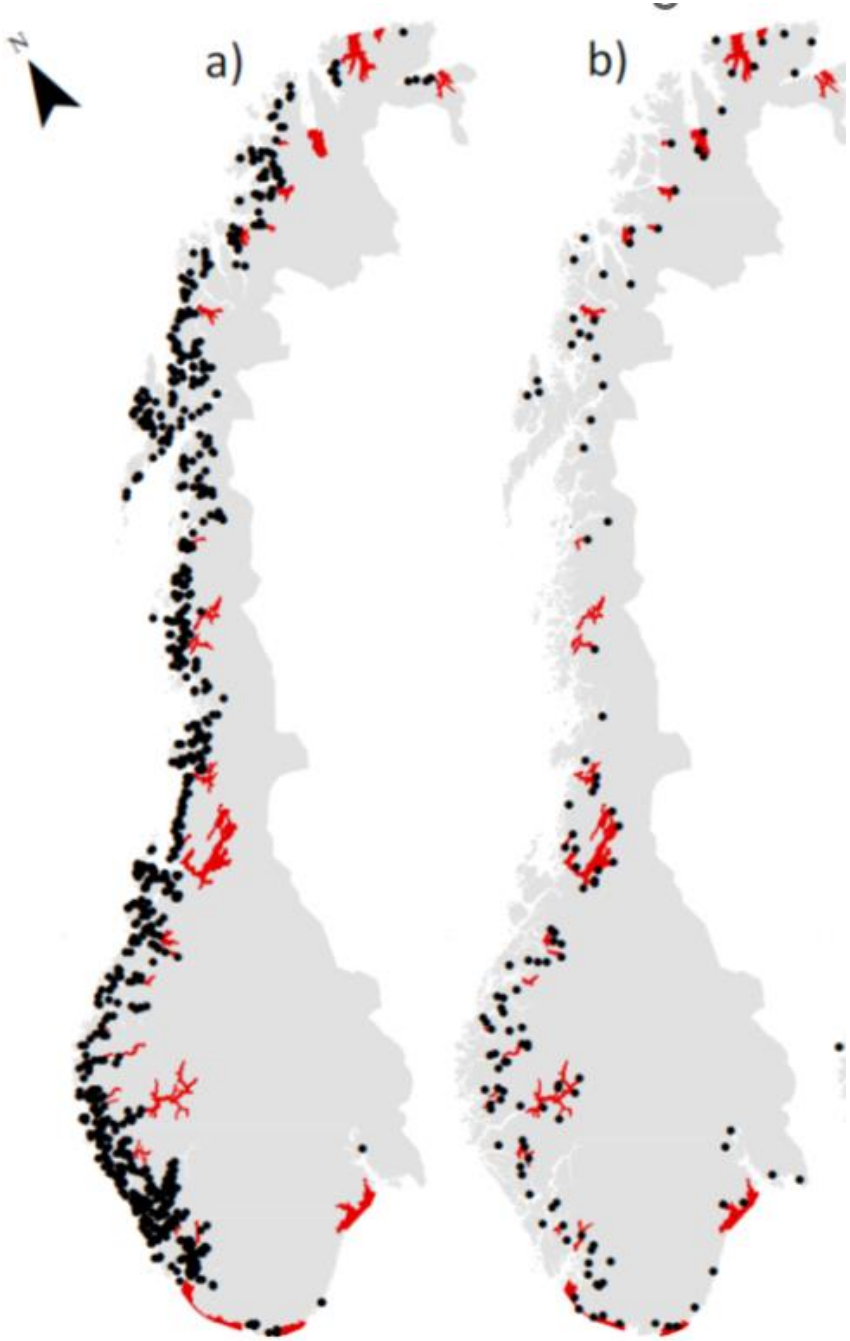


Figure 4. *Ranking of 16 impact factors considered in 2023, according to their effects on wild Atlantic salmon stocks, and the likelihood of a further negative development. Confidence for the assessment of effect by each threat is indicated by the color of the markers, where green indicates the highest confidence level and red the lowest.*

Crossings:

- Life history & survival
- Growth rates
- Reproduction rates
- Eroding genetic integrity

Source:Vitenskapelig råd for laksforvaltning 2024



Genetic diversity of the Atlantic salmon underpinns the species' and the aquaculture industry's capacity to e.g.:

- adapt to climate change
- resistance to diseases and parasites

National Salmon Fjords

a) Aquaculture net pens

b) 139 Atlantic salmon rivers where proportion of escaped farmed salmon is monitored

449 'Salmon rivers'

250 rivers where genetic introgression is estimated (95% of the total wild population)

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Importance of Atlantic salmon in Norway

Economic importance for millennia

Sea fishing

Recreational fishing & tourism

Cultural significance

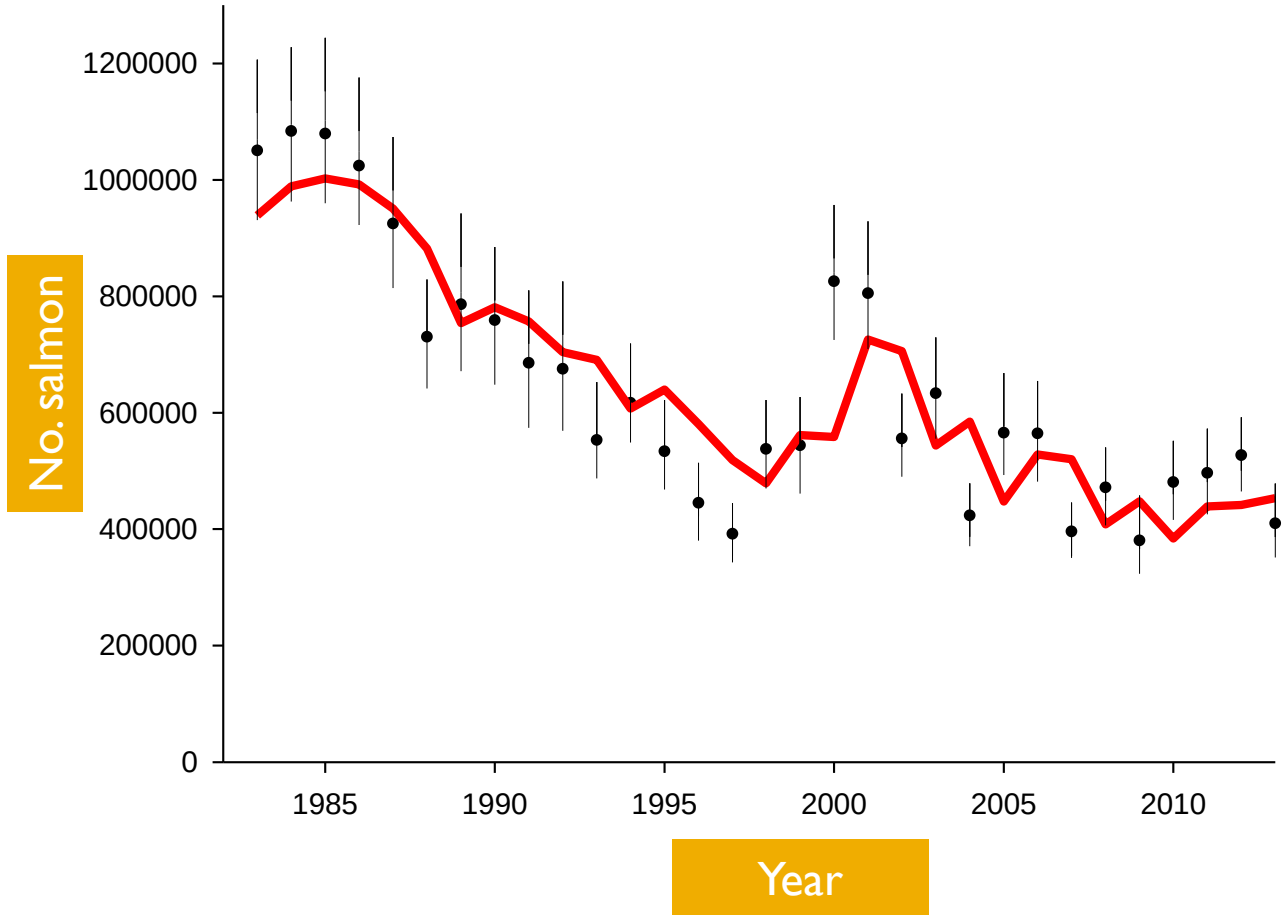
Knowledge aquisition

Marketing & Labelling acquaculture

30% of the global Atlantic salmon population

Photo: Jan Magne Gjerde (Source Research Gate)

Total migration low in past years and in 2023, less than 50% of values in 1983



- 80 000 – 100 000 recreational fishers/yr
- 350 rivers
- 10 000 agricultural properties
- 1 000 tourism companies
- ca 300 – 500 mill €

2024 a majority of main salmon rivers in Southern Norway were closed for recreation and nature-based tourism

IUCN – Red List Threatened (2023)

SEEA EA Accounts supporting aquaculture

	Extent accounts	Condition accounts	Biophysical ES supply accounts	Monetary value
River	Maps of 449 Atlantic salmon rivers (area)	• Quality norm for Atlantic salmon (FOR-2013-12-19-1757) - Population viability - Harvest potential - Genetic integrity	**P** Genetic resources (gene bank)	**P** Cost of gene bank maintenance (kr)
			P Genetic resources (wild, level of genetic diversity maintained)	**P** Option value. Risk of genetic degradation
Marine & coastal	Norwegian fisheries juridiction zones (?)	Sustainable catches (feed)	**P** Feed from fish (kg)	**P** Cost of fish feed (kr)
		Population viability wrasse	**P** Wrasse (No., ca 40 million fish per year).	**P** Cost of wrasse (kr)
		Condition indicators of fjord (e.g. seawater t°, O_2, carrying capacity of the seabed/ seawater).	**R ?**	**R** RR aquaculture (?)

Questions

- RR was used as the basis to estimate a tax to the aquaculture industry => for using a 'common resource'
- The purpose was distribution of wealth => comparable to oil & gas (extractive) industry (Government Pension Fund Global). Triggered debate and conflict. No reference to conservation purposes.
- Would explicit accounts of ES from Atlantic salmon:
  - enhance awareness about the need to sustainably manage the industry?
  - help design economic instruments that enable sustainable use salmon and other species (feed/wrasse) that support the industry?
  - enhance acceptance and uptake of conservation measures?

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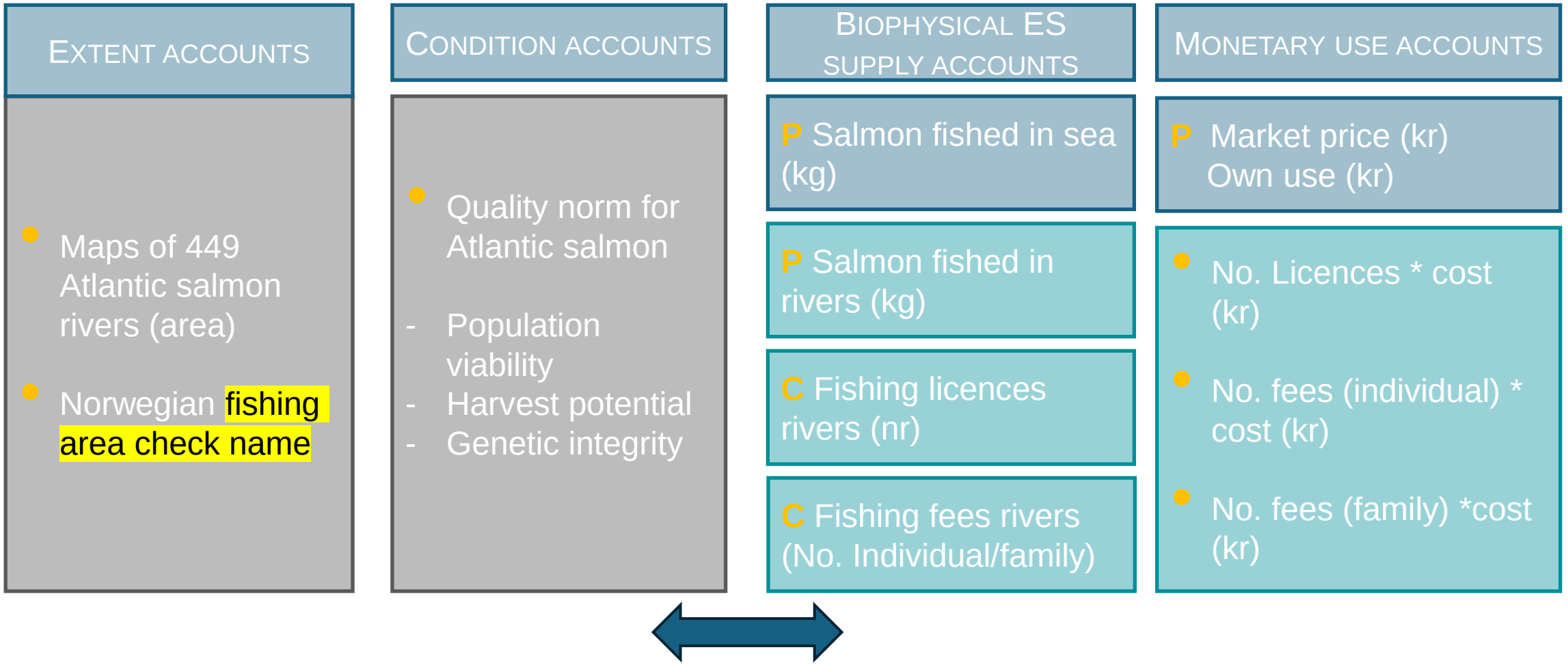
Leppefisk Photo: Terje Aamodt



ES model based on monitoring data (migration/ spawning) to establish fishing quotas