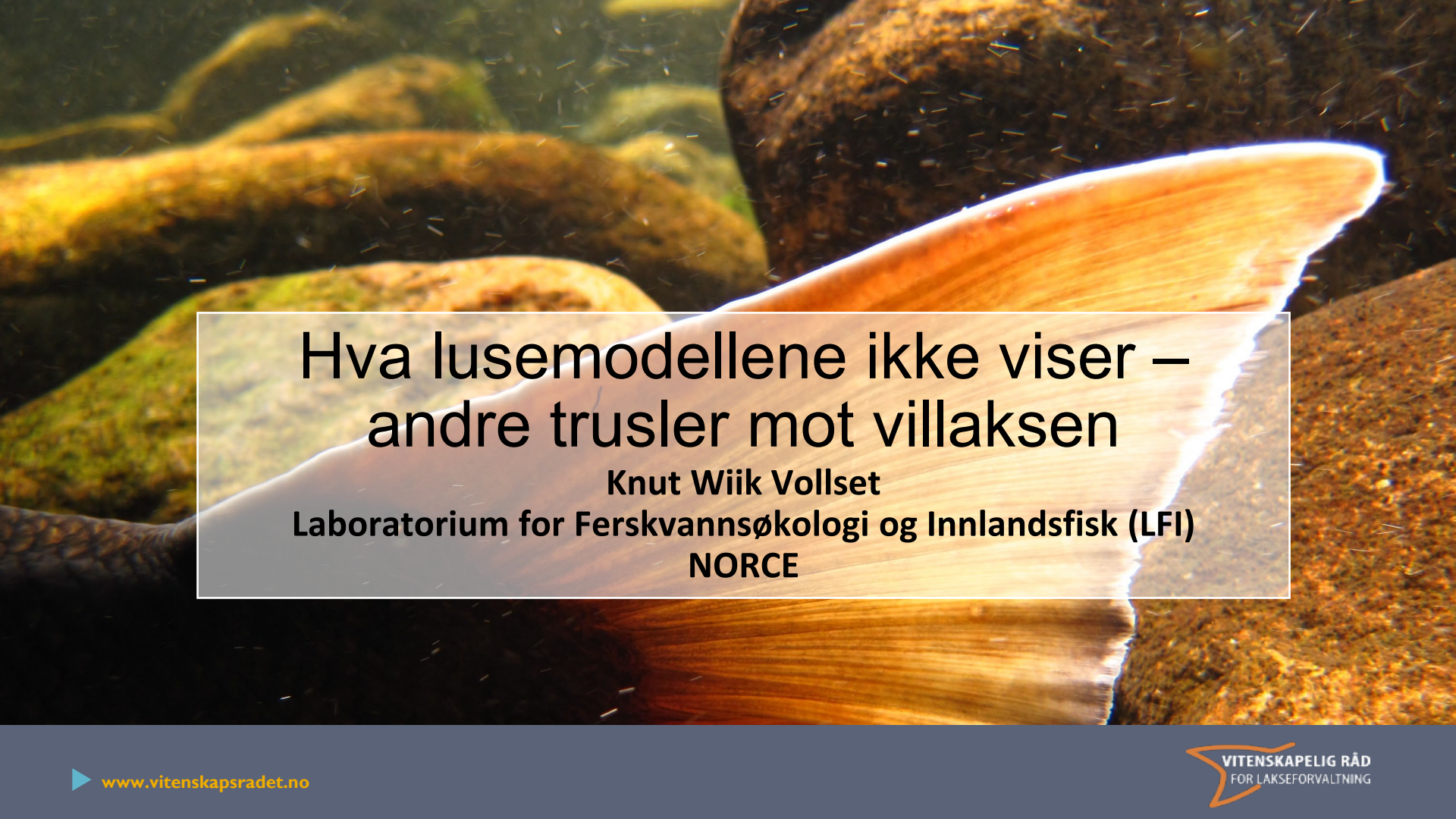




Hva lusemodellene ikke viser – andre trusler mot villaksen

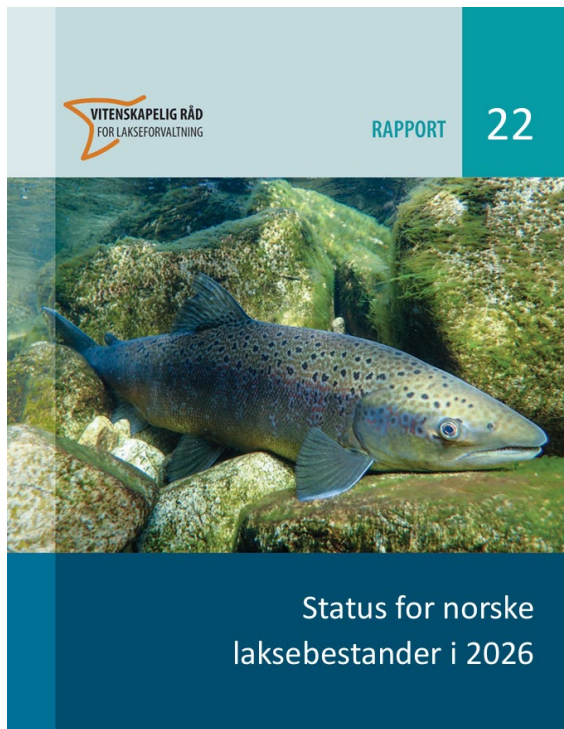
Knut Wiik Vollset

Laboratorium for Ferskvannssøkologi og Innlandsfisk (LFI)

NORCE

Vitenskapelig råd for lakseforvaltning

15 år med rådgiving til miljøforvaltningen



14 forskere fra 7
institutt/universitet



Fem hovedbudskap om villaksen

1. Laksen overlever dårligere i havet enn før
Nedgang siden 1970-tallet
2. Norge følger den samme utviklingen
Men med store regionale forskjeller
3. Vest- og Midt-Norge gjør det dårligst
Særlig elver langt inne i fjordene
4. Oppdrett og klimaendringer er blant de viktigste påvirkningene
Flere menneskeskapte påvirkninger spiller inn
5. Lakselus henger sammen med utviklingen i bestandene
Samvarierer med beregnet lusepåvirkning i trafikklyssystemet







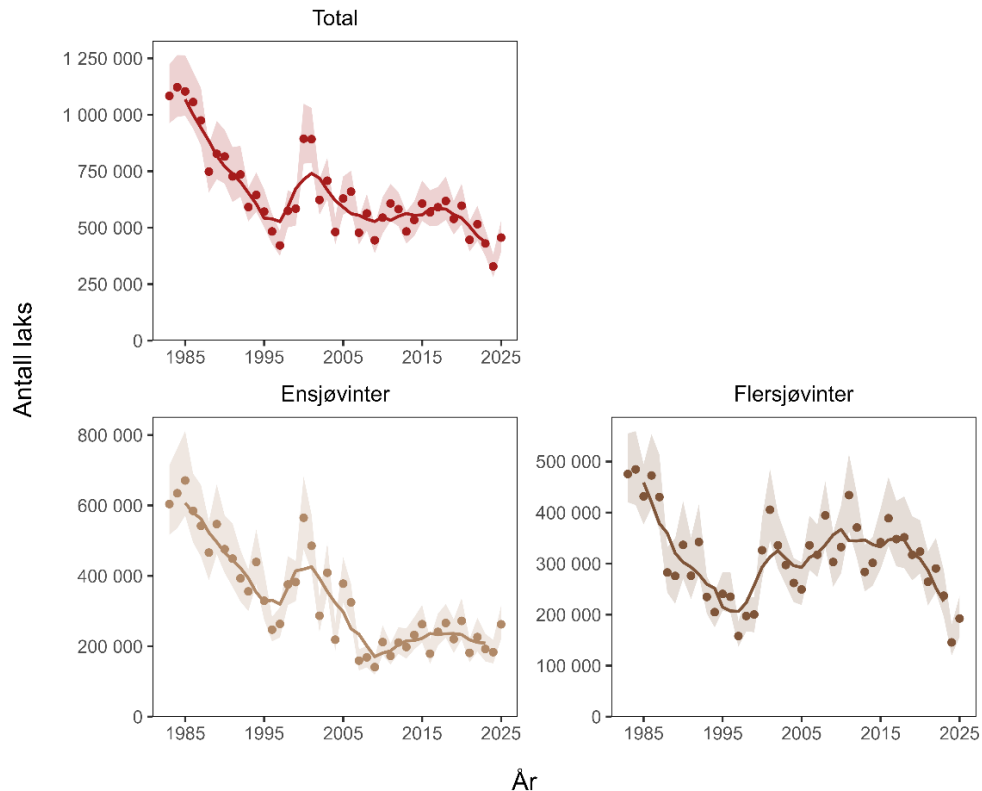
Foto: Audun Rikardsen



Status for norske
laksebestander i 2025

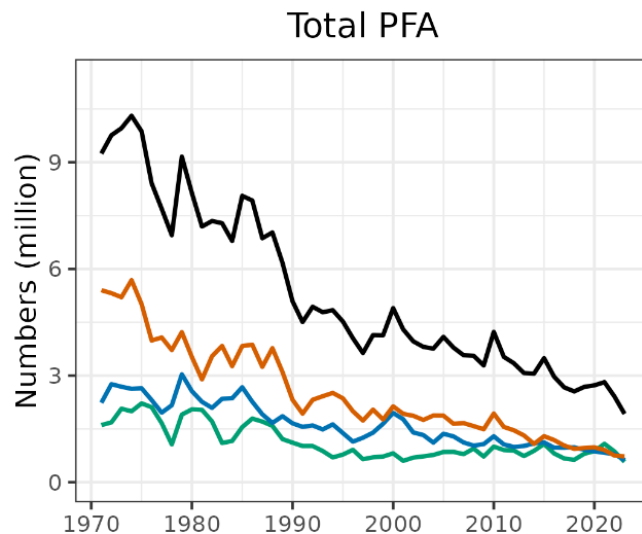
Historisk lavt nivå

Lakseinnsiget fra havet er bare en tredel av
nivået på 1980-tallet

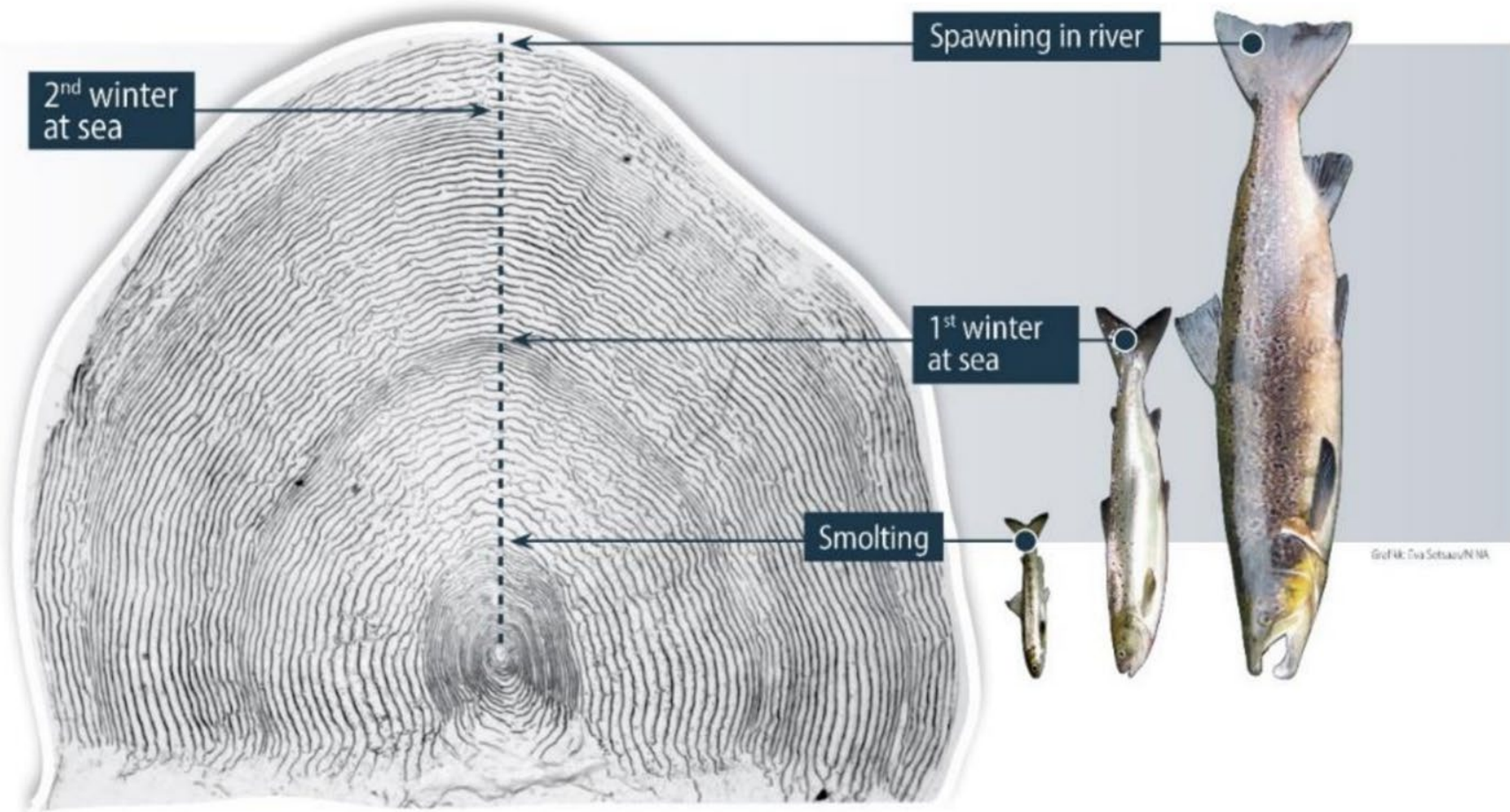


Sjøoverelvelsen har gått ned i utbredelsesområdet til Atlantisk laks

Laks i hele Nord-Atlanteren







Early marine growth (cm)

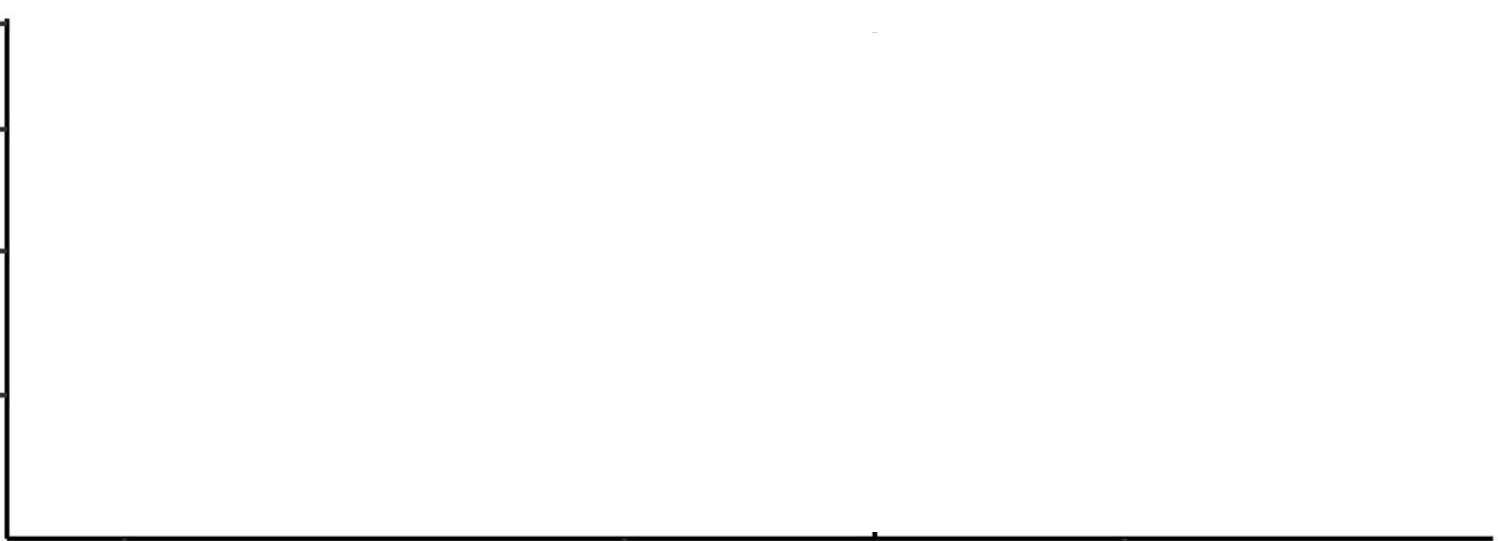
40
35
30
25

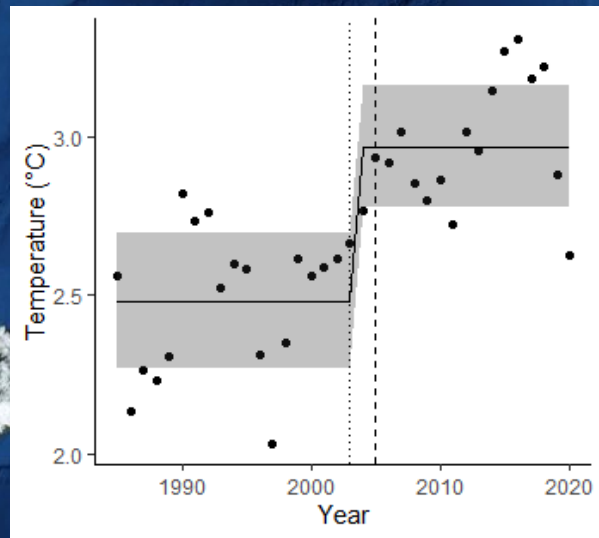
1990

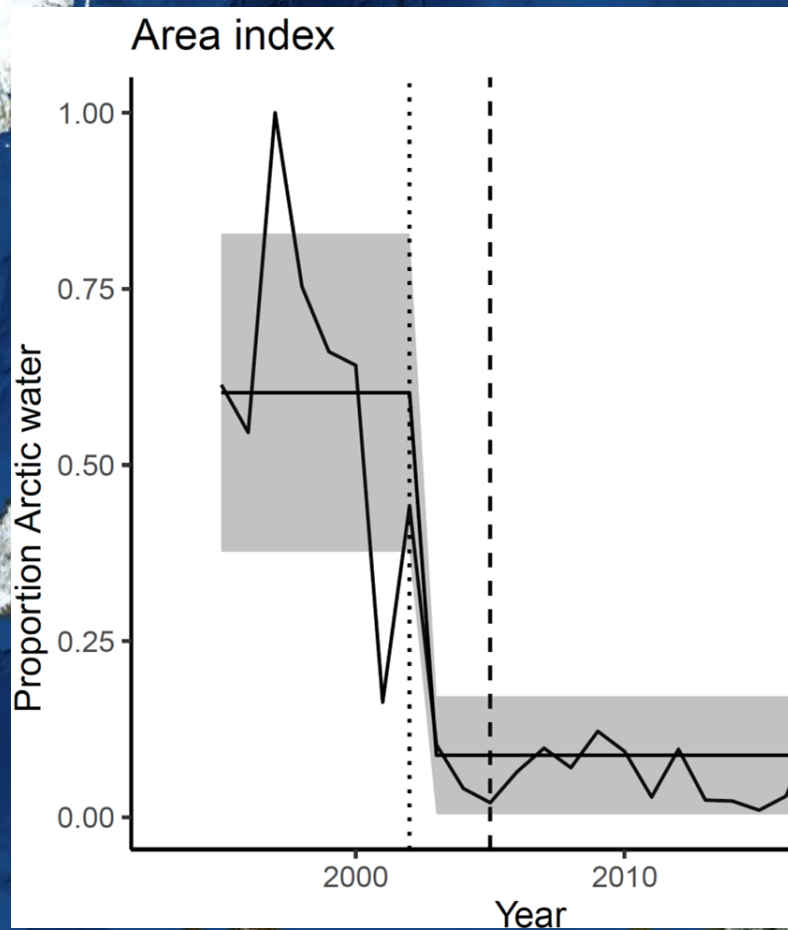
2000

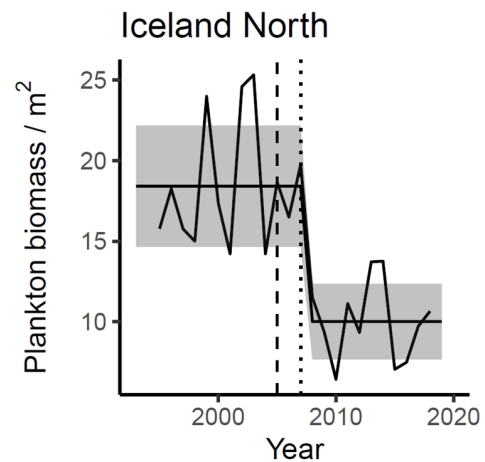
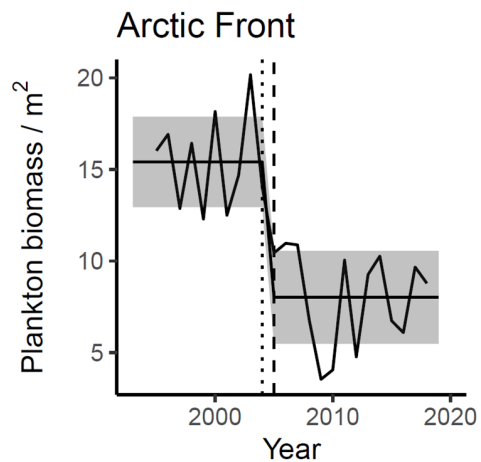
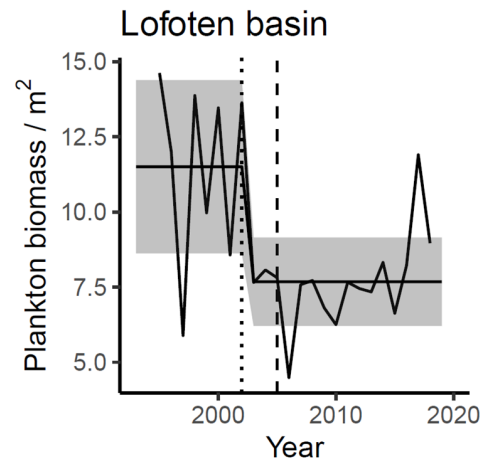
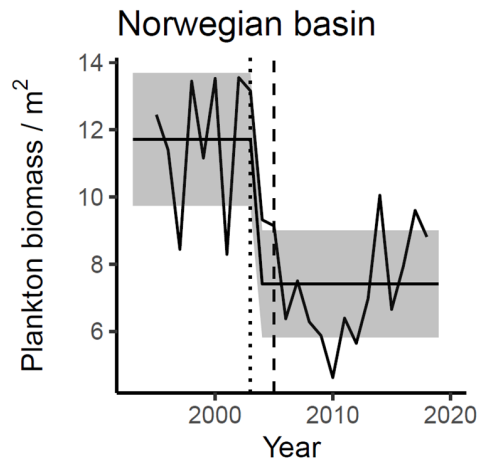
Year

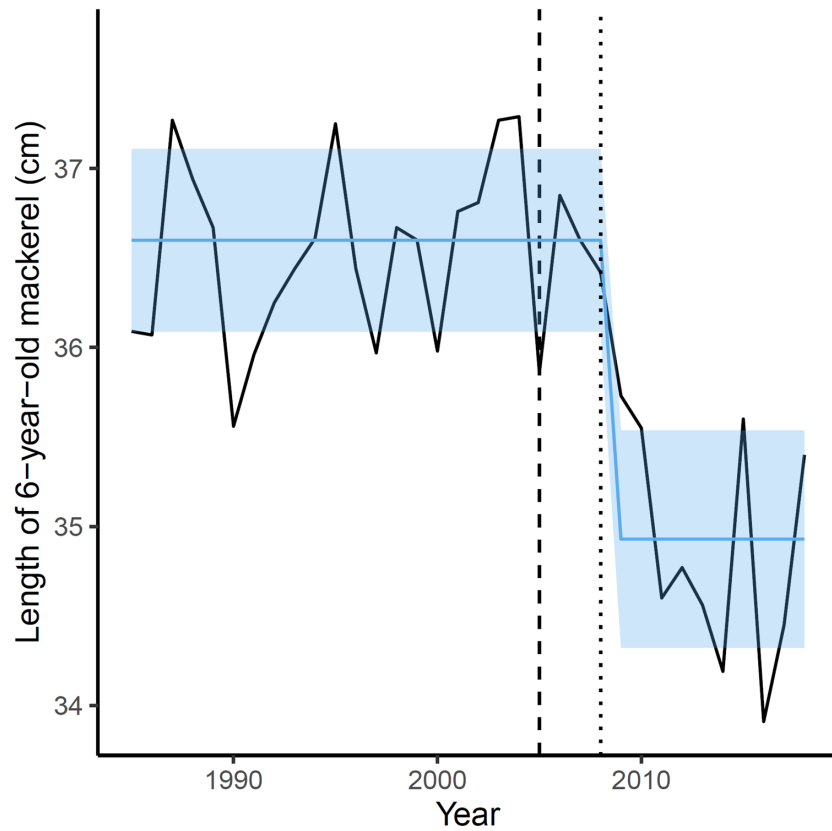
2010

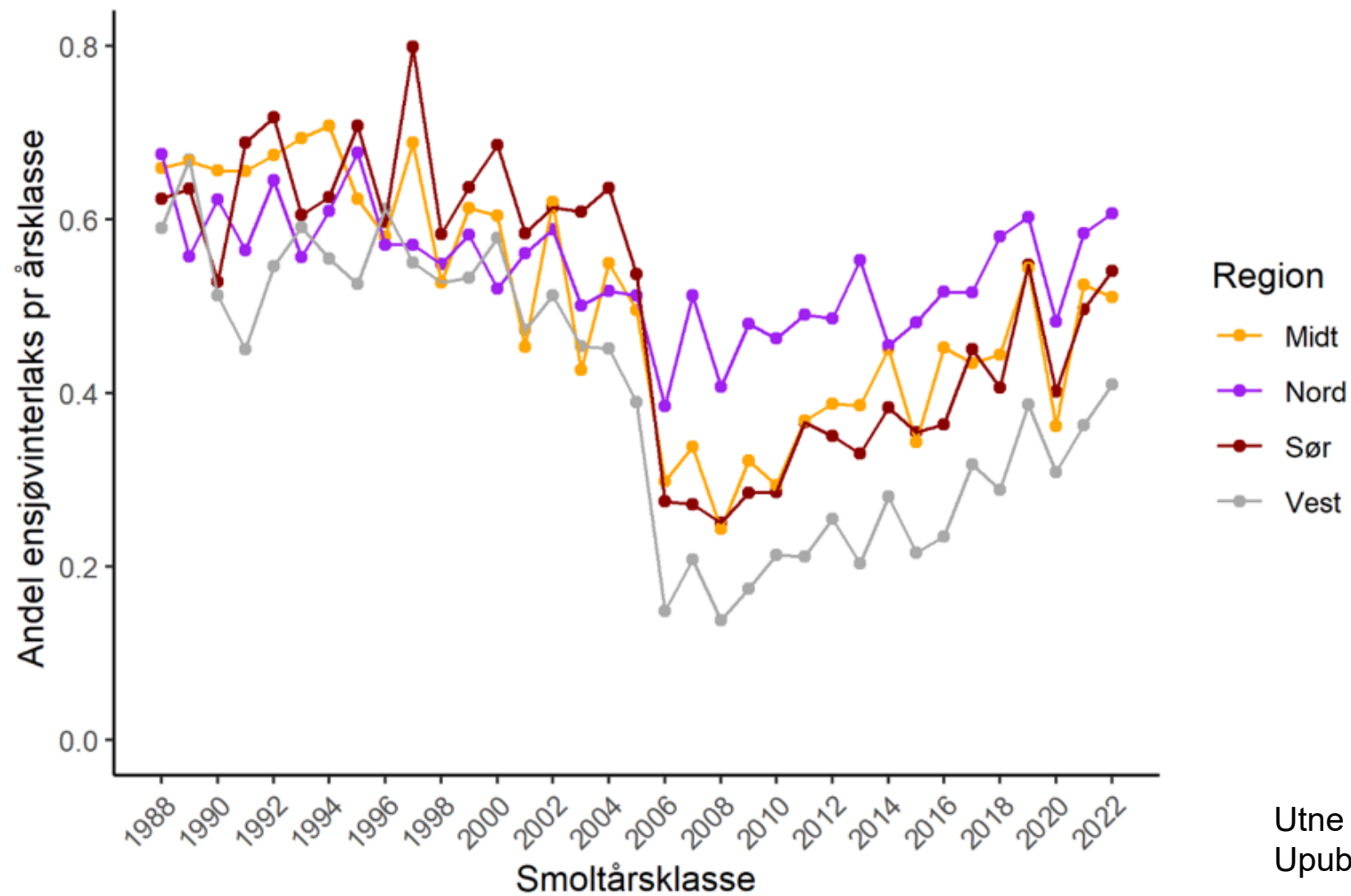








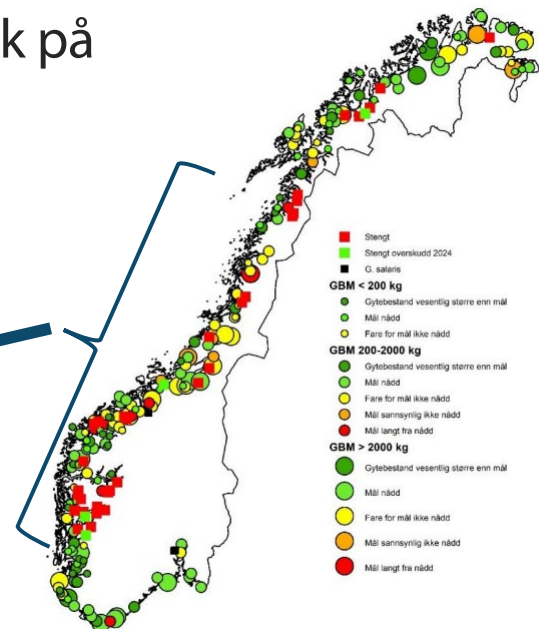
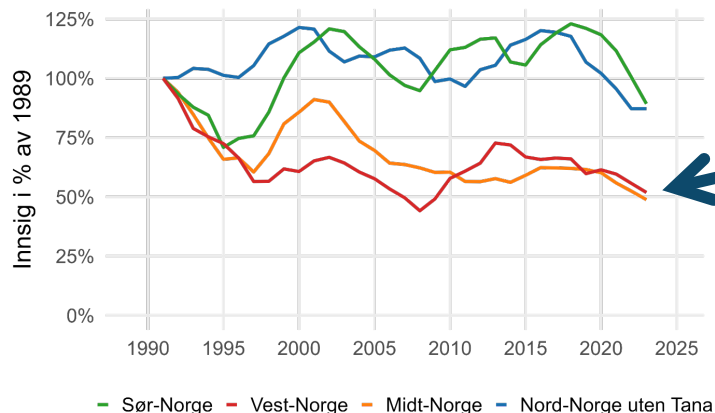




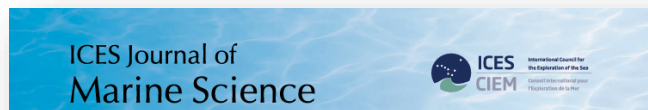
Utne mfl.
Upublisert

Nedgangen er størst i Vest- og Midt Norge

- Situasjonen særlig kritisk i indre fjordstrøk på Vestlandet



Årlig trussel vurderinger for Atlantisk laks



ICES Journal of Marine Science (2017), 74(6), 1496–1513. doi:10.1093/icesjms/est020

Review Article

The major threats to Atlantic salmon in Norway

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Forseth, T., Barlaup, B. T., Finstad, B., Fiske, P., Gjosæter, H., Falkegård, M., Hindar, A., Mo, T. A., Rikardsen, A. H., Thorstad, E. B., Vollestad, L. A., and Wennevik, V. The major threats to Atlantic salmon in Norway. – ICES Journal of Marine Science, 74: 1496–1513.

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Atlantic salmon (*Salmo salar*) is an economically and culturally important species. Norway has more than 400 watercourses with Atlantic salmon and supports a large proportion of the world's wild Atlantic salmon. Atlantic salmon are structured into numerous genetically differentiated populations, and are therefore managed at the population level. Long-distance migrations between freshwater and ocean habitats expose Atlantic salmon to multiple threats, and a number of anthropogenic factors have contributed to the decline of Atlantic salmon during the last decades. Knowledge on the relative importance of the different anthropogenic factors is vital for prioritizing management measures. We developed a semi-quantitative 2D classification system to rank the different anthropogenic factors and used this to assess the major threats to Norwegian Atlantic salmon. Escaped farmed salmon and salmon lice from fish farms were identified as expanding population threats, with escaped farmed salmon being the largest current threat. These two factors affect populations to the extent that they may be critically endangered or lost, with a large likelihood of causing further reductions and losses in the future. The introduced parasite *Gyrodactylus salaris*, freshwater acidification, hydropower regulation and other habitat alterations were identified as stabilized population threats, which have contributed to populations becoming critically endangered or lost, but with a low likelihood of causing further loss. Other impacts were identified as less influential, either as stabilized or expanding factors that cause loss in terms of number of returning adults, but not to the extent that populations become threatened. Management based on population specific reference points (conservation limits) has reduced exploitation in Norway, and overexploitation was therefore no longer regarded an important impact factor. The classification system may be used as a template for ranking of anthropogenic impact factors in other countries and as a support for national and international conservation efforts.

Keywords: classification system, management advice, *Salmo salar*, threat assessment.

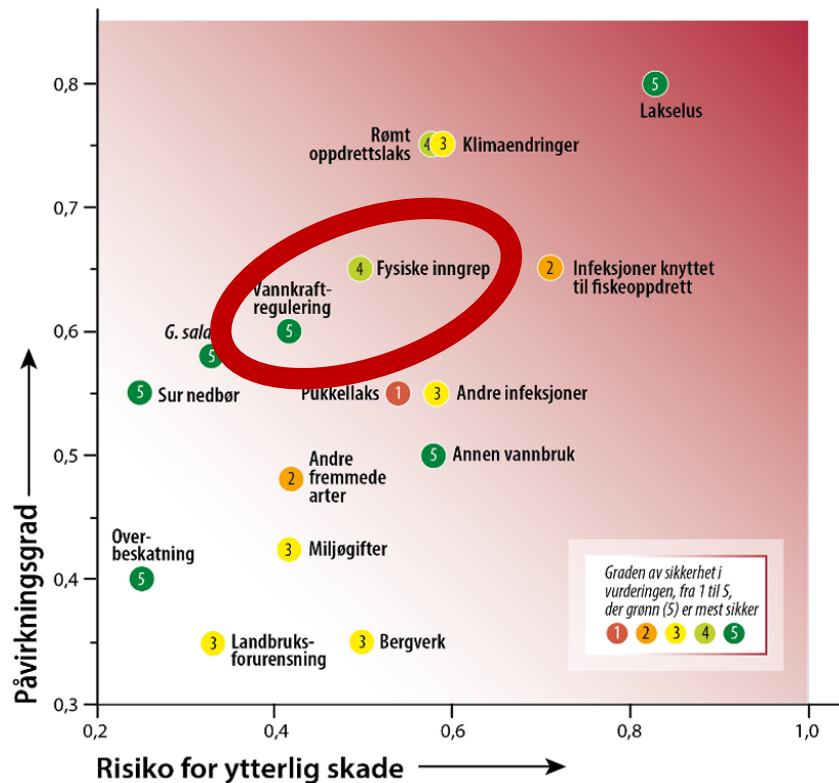
Påvirkningsgrad ↑



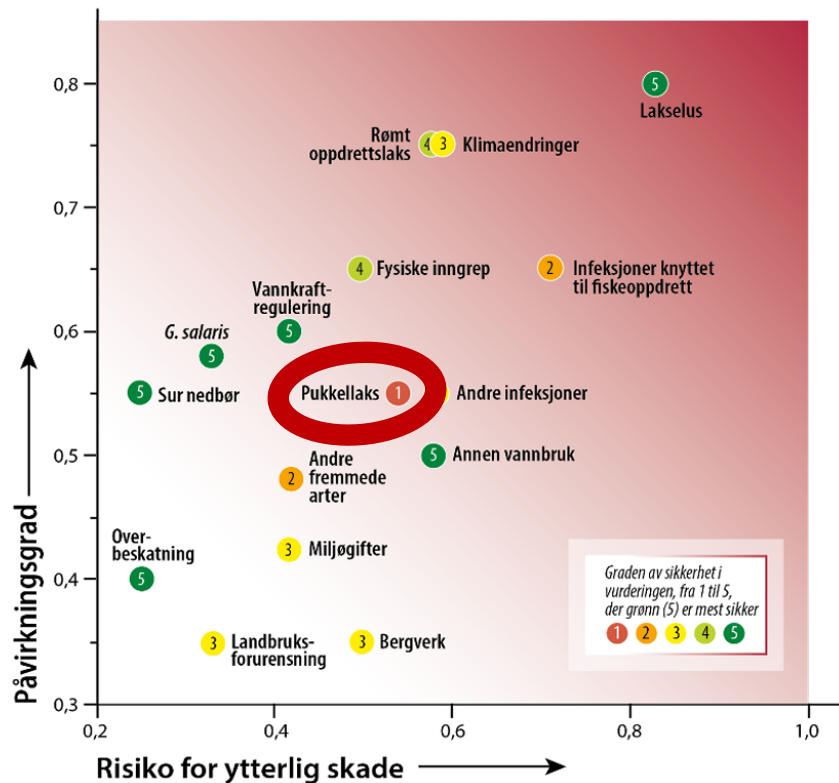
Risiko for ytterlig skade →

Dokumentasjon	Samstemthet		
	1	2	3
3	3 God/Lav	4 God/Moderat	5 God/Høy
2	2 Moderat/Lav	3 Moderat/Moderat	4 Moderat/Høy
1	1 Dårlig/Lav	2 Dårlig/Moderat	3 Dårlig/Høy

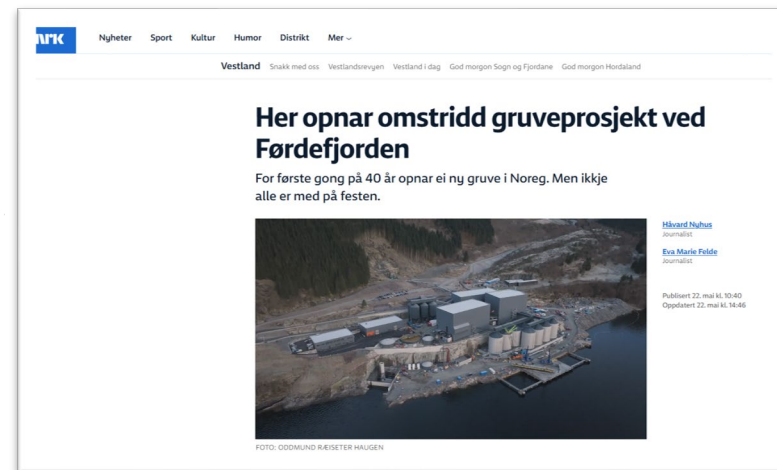
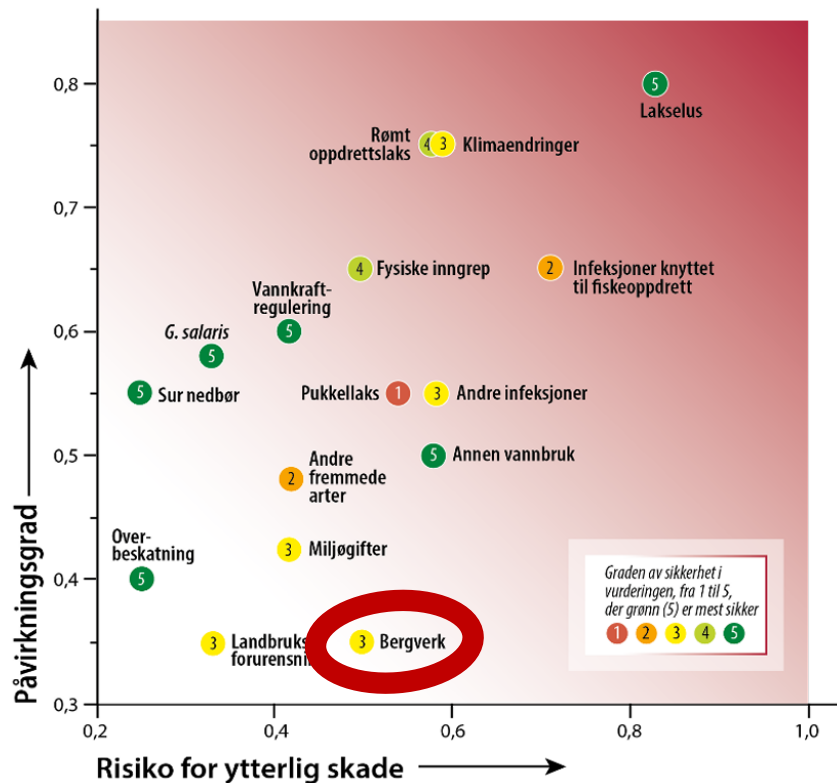
Stabiliserte trusler: Vannkraftregulering og andre fysiske inngrep



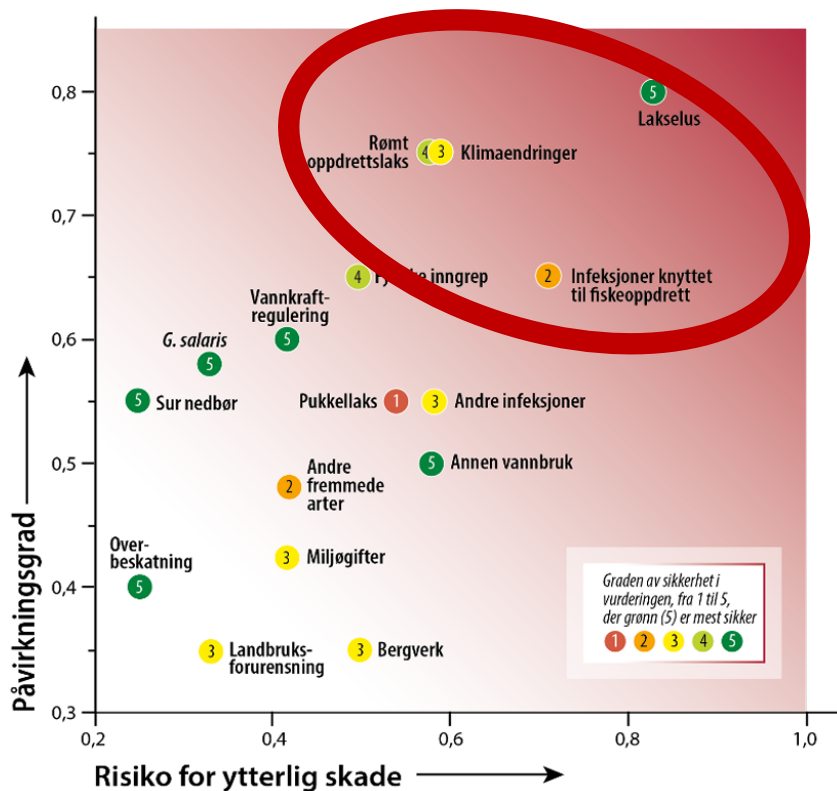
Ny trussel: Pukkellaks, som vi har dårlig kunnskap om



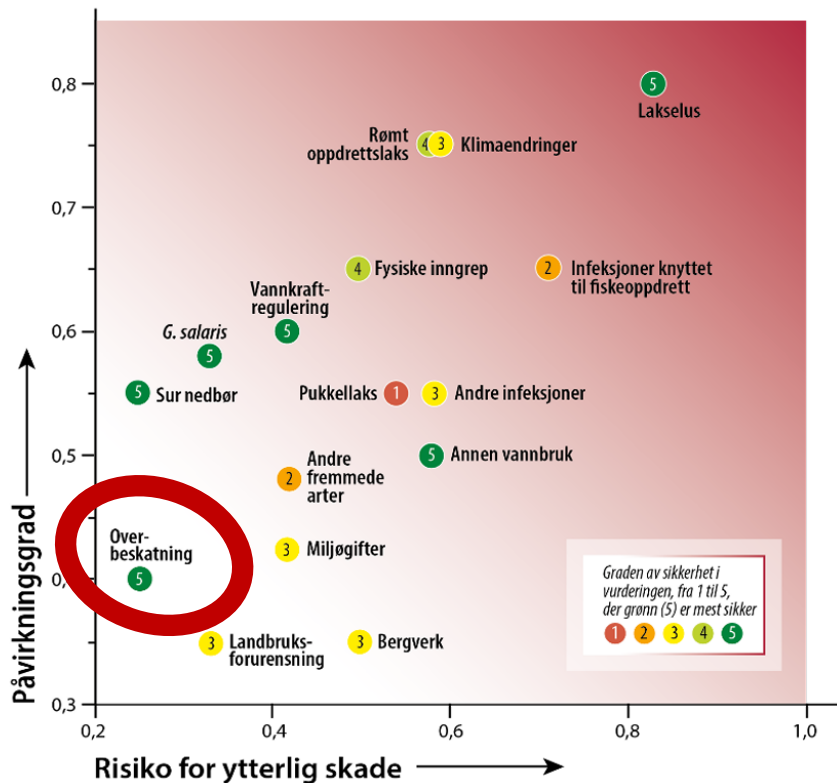
Ny interesse for bergverksindustri: bekymring for effekt på villaksen

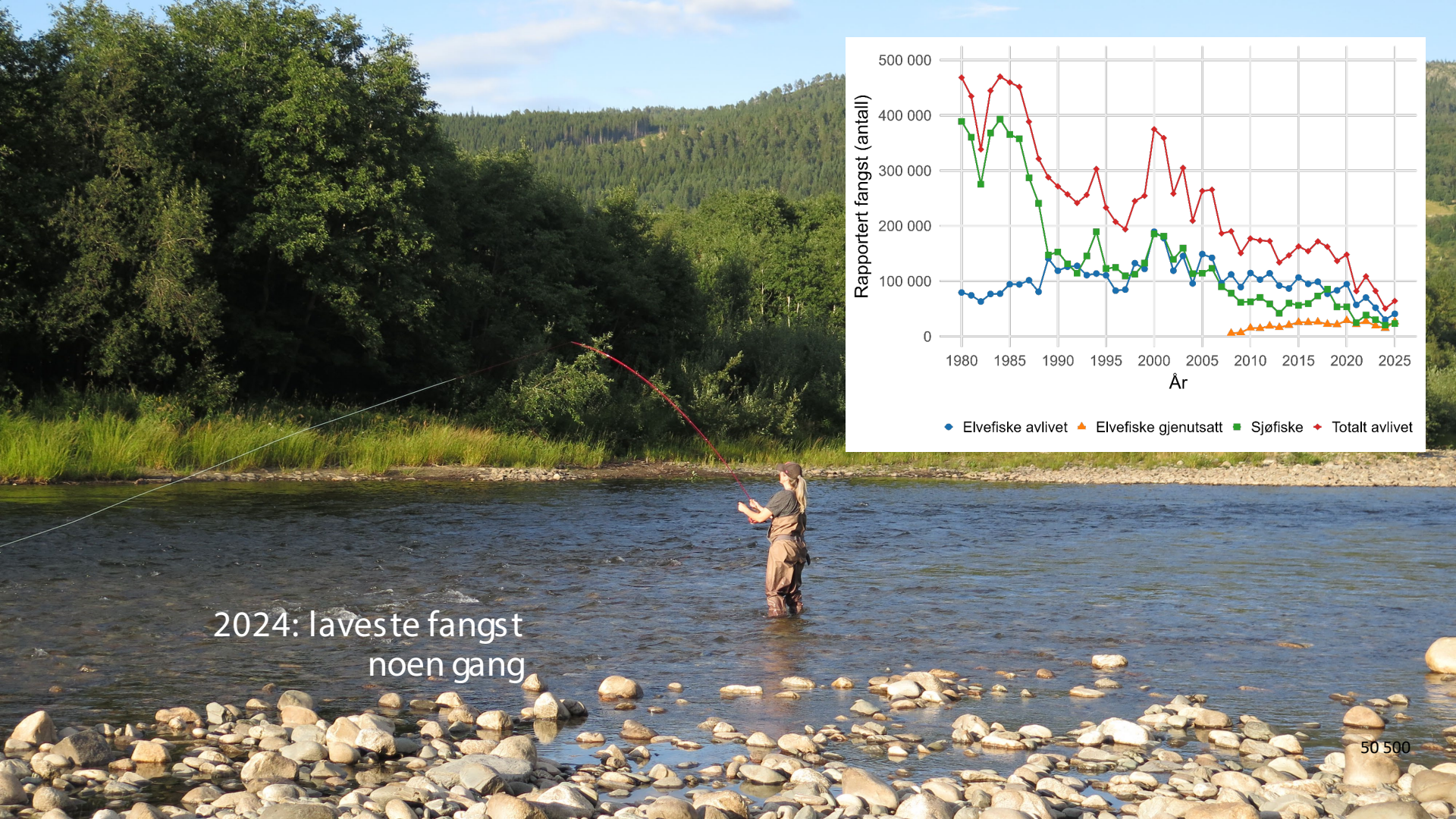


Største trusler: Lakseoppdrett og klimaendringer

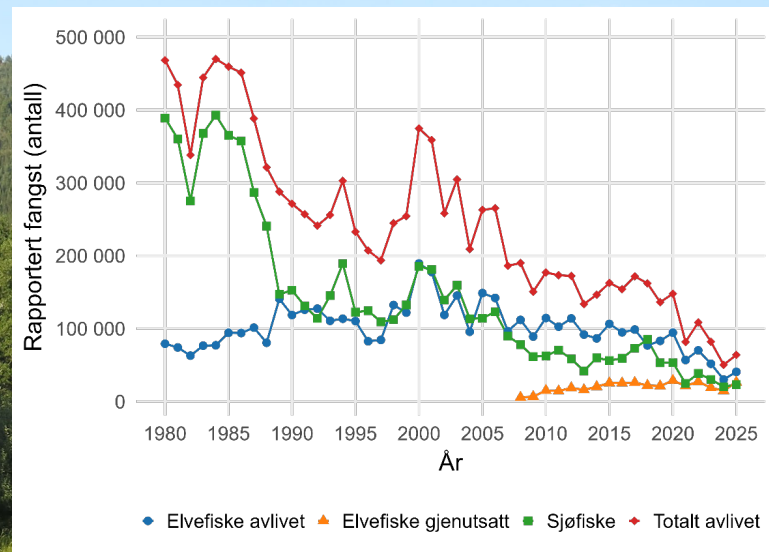


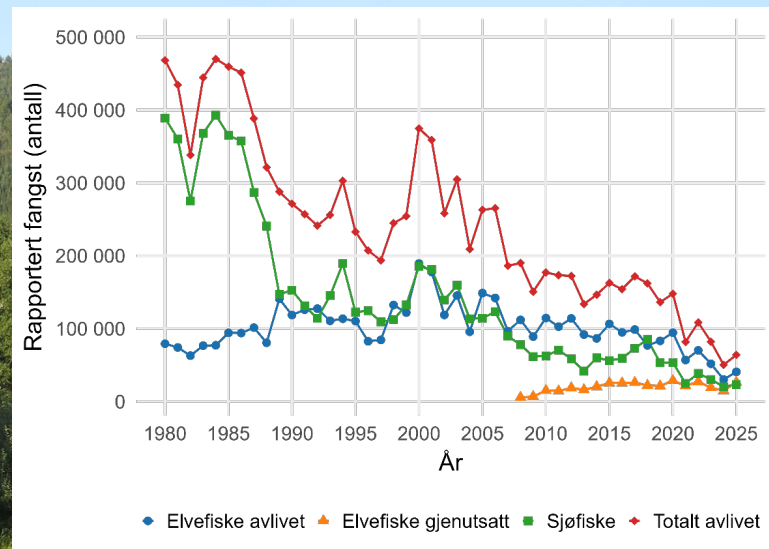
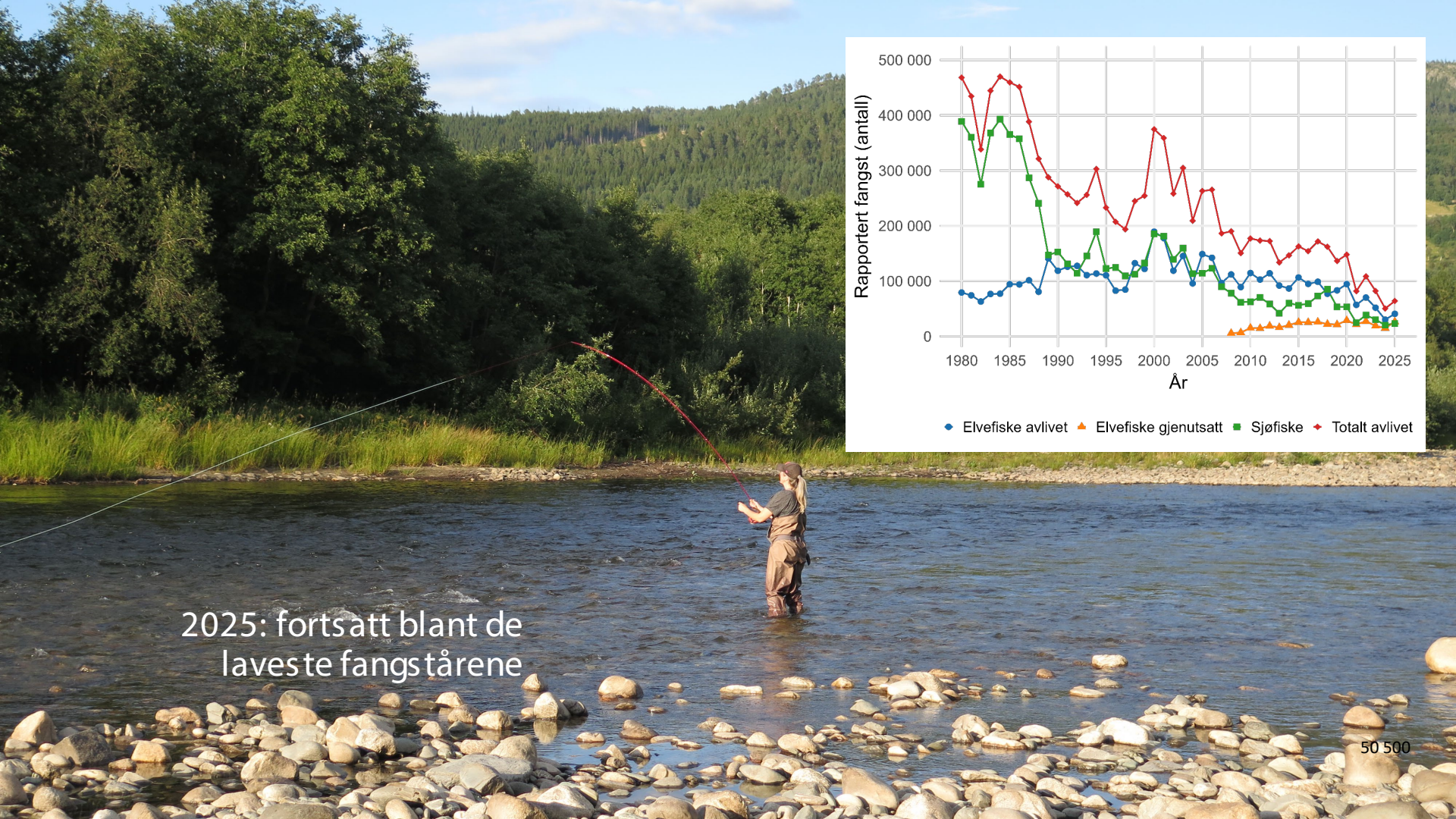
En regulert trussel: overbeskatning





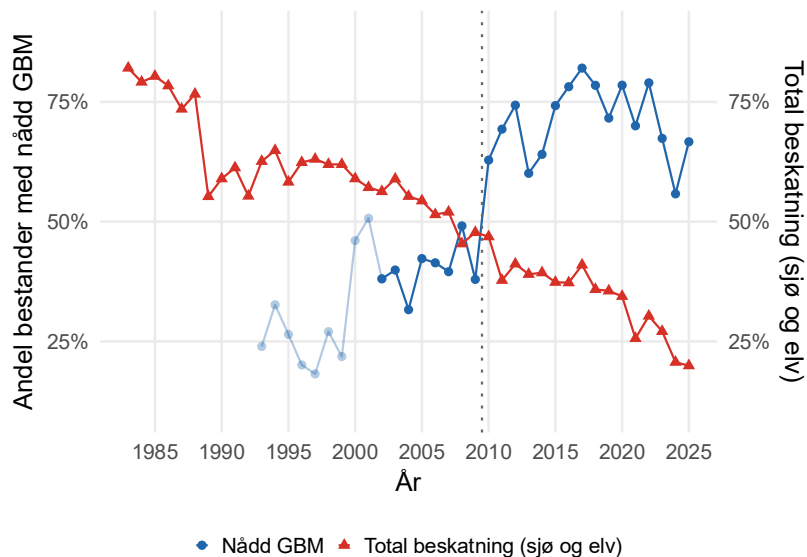
2024: laveste fangst
noen gang



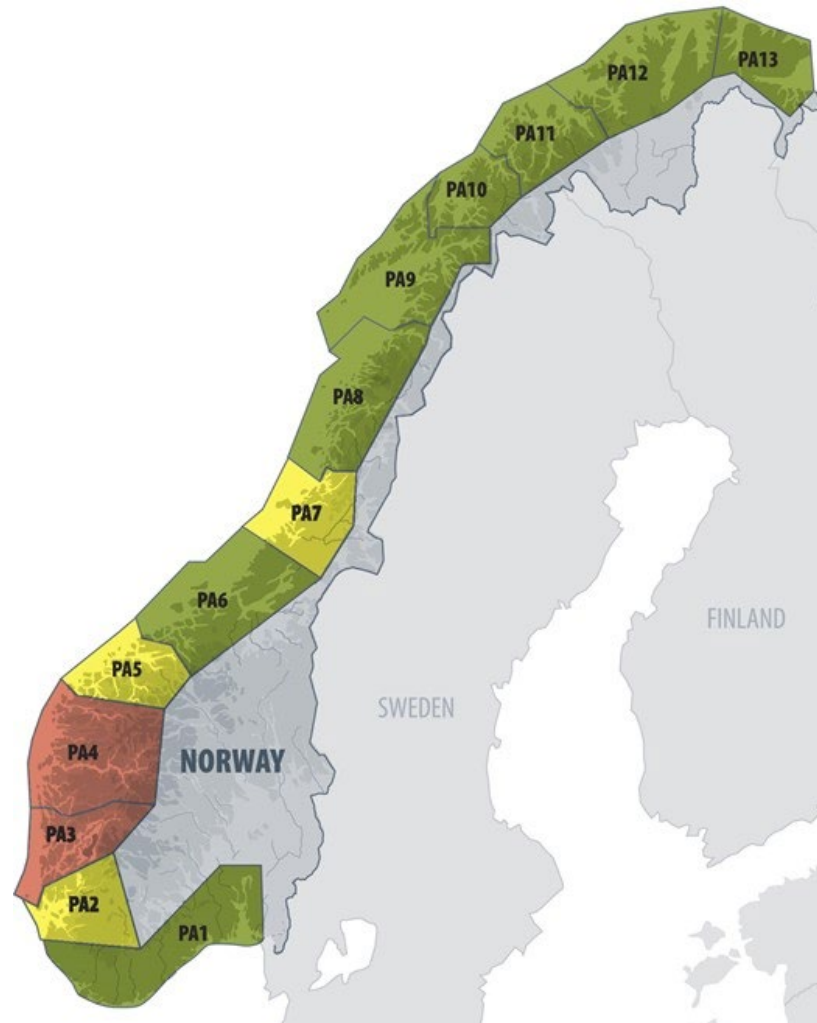


2025: fortsatt blant de laveste fangstårene

Flere fisk igjen som gyter i elvene enn før



Trafikklys vurdering 2023



Produksjonsområdebasert vurdering av
lakselusindusert villaksdødelighet i 2024

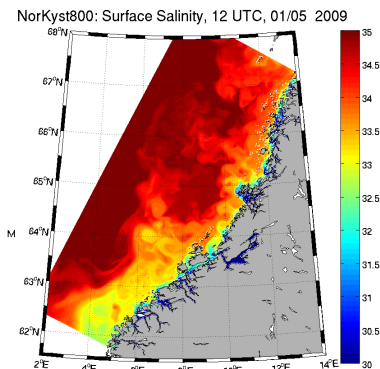
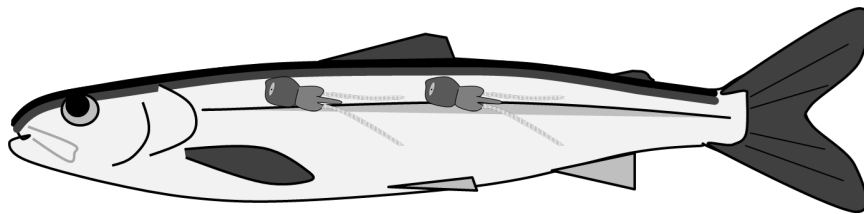


Ekspertgruppens leder og redaktør:
Leif Christian Stige, Seniorforsker ved Veterinærinstituttet (VI)

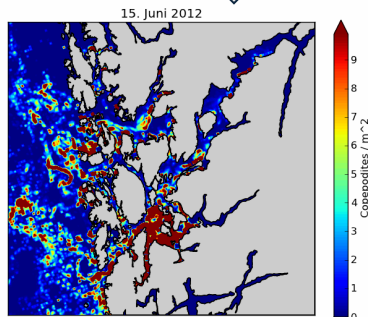
Ekspertgruppens nestleder:
Knut W. Volset, Forsker ved NORCE

Ekspertgruppens medlemmer (alfabetsk):
Ola Diserud, Seniorforsker ved Norsk
Øyvind Knutsen, Seniorforsker ved
Frank Nilssen, Seniorforsker ved
Rack

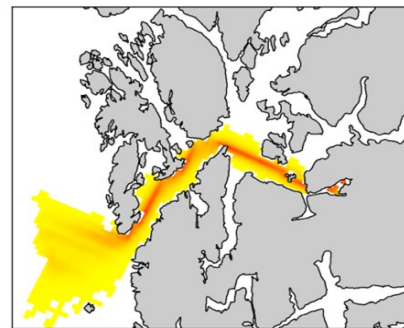
Virtuelle post smolt modeller



Fysikk



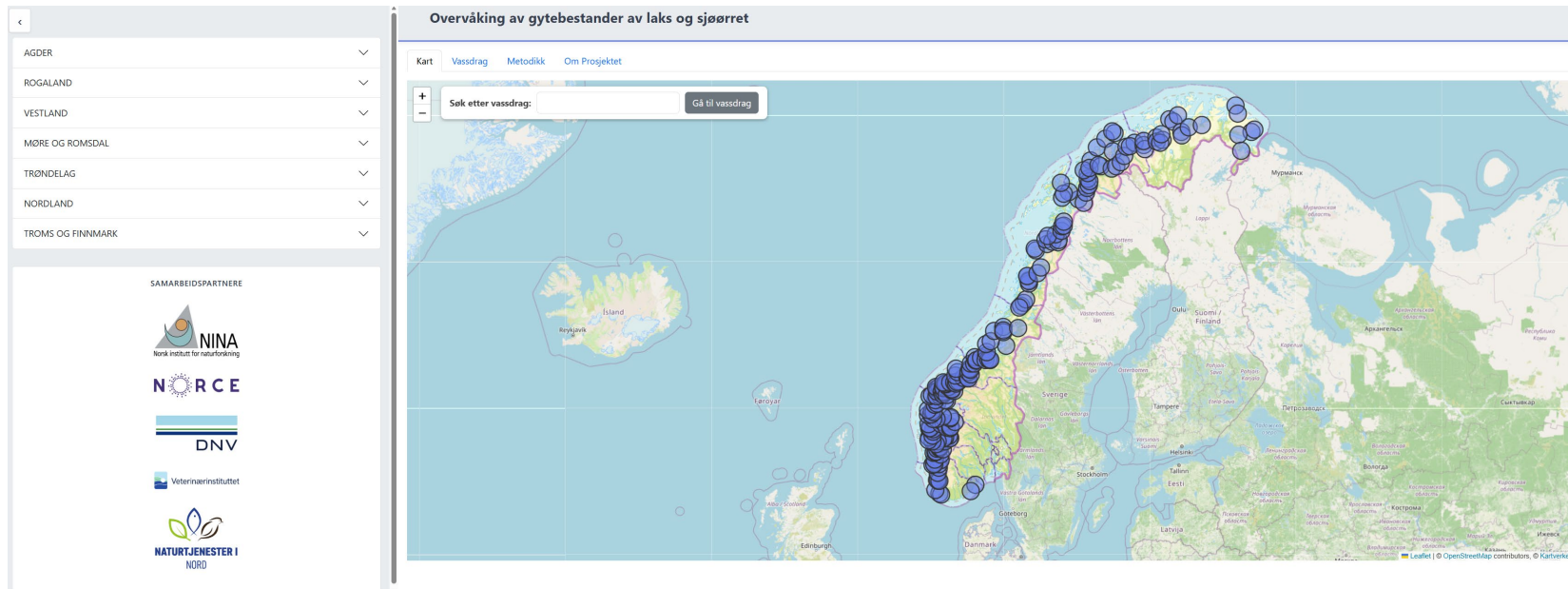
Luse partikkelspredning



Utvandringsrute

VIRTUAL POST-SMOLT MODEL

Rådata åpent tilgjengelig



Samvariasjon mellom bestand og modellerte lusedødelighet

Received: 30 May 2025 | Accepted: 14 October 2025
DOI: 10.1111/1365-2664.70212

RESEARCH ARTICLE

Journal of Applied Ecology

Effects of salmon lice on numbers and size distributions of Atlantic salmon returning to spawn in Norwegian rivers

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²Norwegian Computing Center, Oslo, Norway

³Norwegian Veterinary Institute, Ås, Norway

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Handling Editor: Paul Franklin

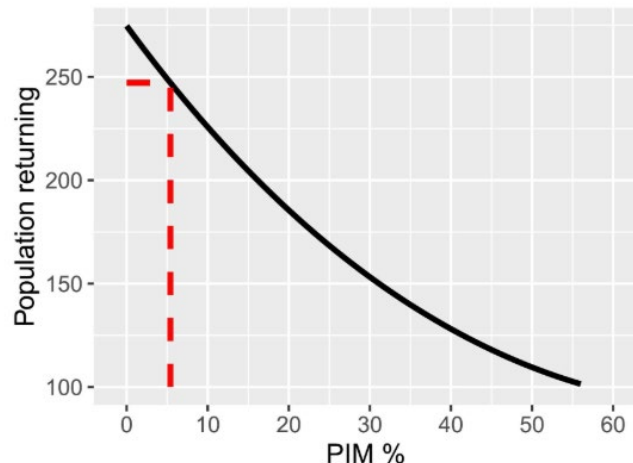
Abstract

1. Negative effects of salmon lice from salmon farms on wild salmonids have been a controversial issue for decades and concerns are expressed from virtually all areas where salmon farming coexists with important fisheries for wild salmonids. A key question is to what extent lice infestation from farms reduce numbers of wild mature salmon returning to spawn in the rivers. Here, we study counts and recreational catches of small (<3 kg), medium-sized (3–7 kg) and large mature salmon (>7 kg) returning to spawn in Norwegian rivers, in association with lice burdens on out-migrating post-smolt recruits.

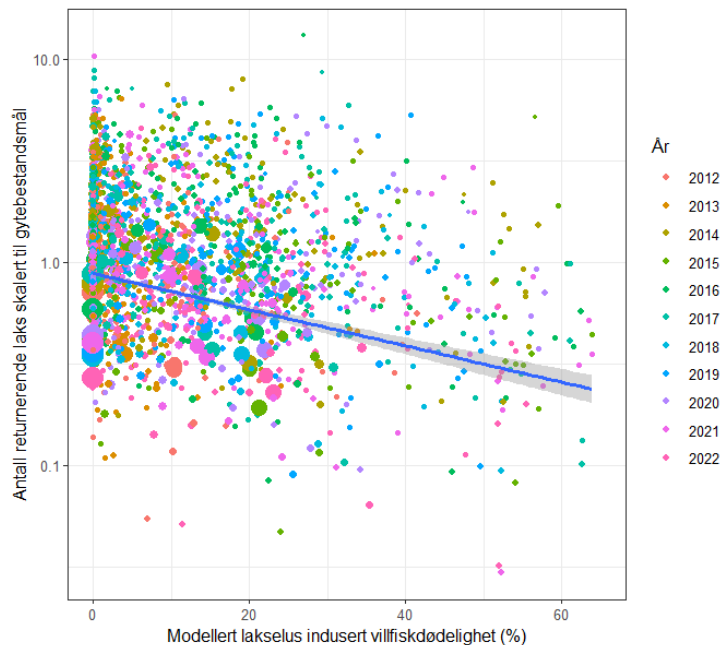
2. The expected number of returning mature salmon was modelled as a function of theoretical smolt production in the rivers, river catches one generation back in time, size-classes of returning salmon, year as a factor, a non-linear spatial effect and parasite-induced mortality (PIM) of out-migrating post smolts of salmon. PIM was attributed to small, medium-sized and large salmon assuming they spend one, two or three winters at sea (SW), respectively.

3. There was a significant negative effect of PIM on returns of one SW salmon and a negative but non-significant effect on returns of two SW salmon. For three SW salmon, the effect of PIM was significantly positive, but for comparably low numbers, implying an overall negative effect of PIM on returning salmon. The size-specific effects of PIM were manifested by decreasing proportions of one SW salmon in returning populations with increasing PIM, from ~0.6 for rivers exposed

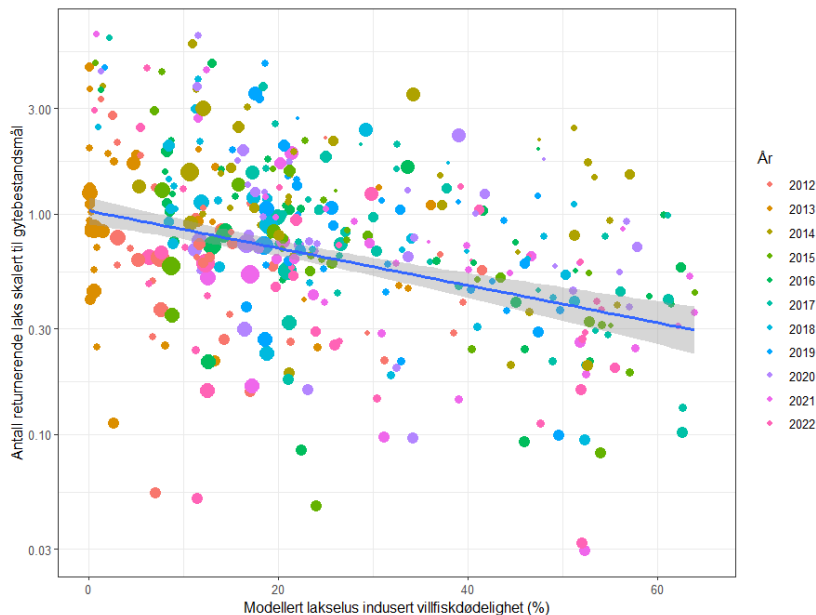
Jansen mfl. finner sammenheng mellom «lusemodellene» og hvor mange laks som kommer tilbake til elvene



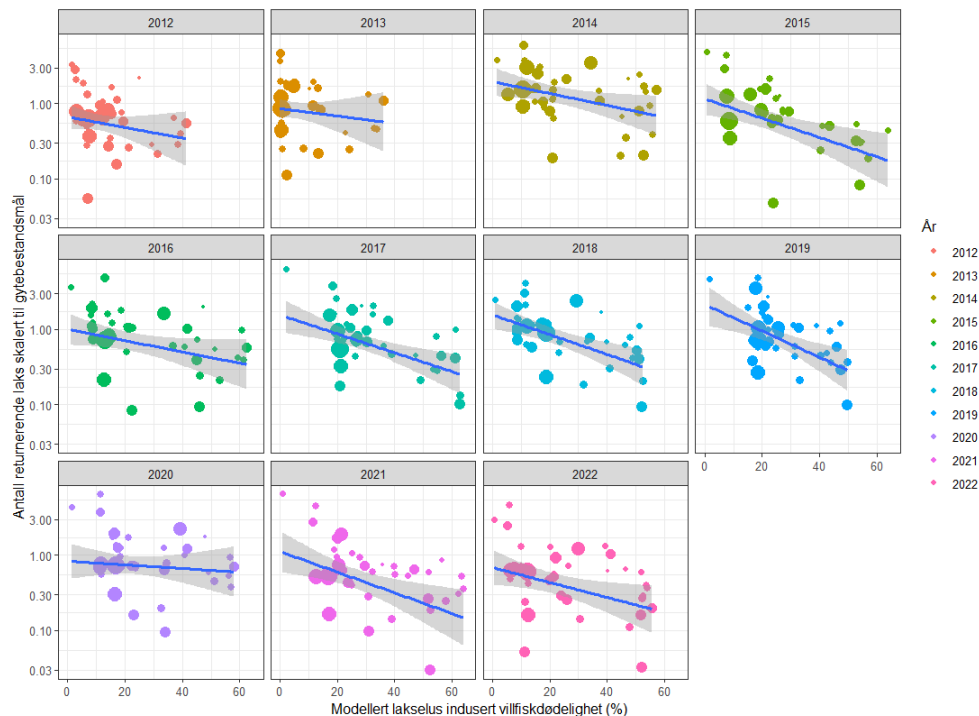
Innsigs estimer versus luseindusert dødelighet på Innsigsregion vest



Innsigs estimer versus luseindusert dødelighet på Innsigsregion vest



Innsigs estimer versus luseindusert dødelighet på Innsigsregion vest



Fem hovedbudskap om villaksen

- 1. Laksen overlever dårligere i havet enn før**
Nedgang siden 1970-tallet
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Men med store regionale forskjeller
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Særlig elver langt inne i fjordene
- 4. Oppdrett og klimaendringer er blant de viktigste påvirkningene**
Flere menneskeskapte påvirkninger spiller inn
- 5. Lakselus henger sammen med utviklingen i bestandene**
Samvarierer med beregnet lusepåvirkning i trafikklyssystemet

Tusen takk for meg!