Siting policy - Hordaland

Speaking for the Salmon

January 26. th SFU Vancouver
Production and economy

Increasing value

Growth has stopped (1.35 bill metric tonnes)

Aquaculture 7.4 billion CAD
Seafood 14.3 billion CAD
Trends challenges environment

• Salmon louse, *Lepeophtheirus salmonis*
• No further growth
• Dramatically increasing cost! Incentive for solution
- Multi resistance, lowered sensitivity of medicines
- Transformation from medicines to biological and mechanical solutions.

Source: «Sealice Research Senter Bergen»
National lice levels
New chapter in Norwegian aquaculture regulation this year

- Production (finally) based on effect on ecosystem
- Production zones (finally) water distance
- It's a Growth Regime – (5X – 2050 vision),
- But also criteria for selecting those receiving 0-growth and those who must reduce production

https://www.regjeringen.no/contentassets/6d27616f18af458aa930f4db9492fbe5/no/pdfs/stm201420150016000dddpdfs.pdf
Influence matrix maps potential for infection between each two sites.

Source: Whitepaper St. meld 16

https://www.regjeringen.no/contentassets/c9a57b93b9a04cabb67665314dc3bbd6/vedlegg-1---omraderapport.pdf
Low risk/impact

Moderate risk/impact

High risk/impact

Likely mortality < 10%

Likely mortality 10 - 30%

Likely mortality > 30%

6% Growth

Zero Growth

6% Decrease (from 2019..)

Likely mortality 10 - 30 %

Likely mortality > 30 %

6% Decrease (from 2019..)
Traffic lights based on:

- Monitoring of wild salmonids (trawl, smolt cages)
- Lice from fish farms
- Lice models
- Models for wild fish migration
- Models for mortality on wild fish
- October 2017
Main legal challenges

• Those who are in zones designated yellow or red - and have little louse - will perceive it as highly unfair that they are refused growth or have to reduce production. “Collective punishment”
• Regulations § 12 - individual exceptions:
  • If a count of no more than 0.1 lice + maximum 1 drug therapy
  • Growth in green area - not regulated – (except > than 8 violations of the limit of 0.5 lice limit)
I think and hope this will generate a lot more research and results on causality

- What is n - %?
- What if smolts with sea lice come from a different region?
- How many lice does it take to kill a post-smolt?
- What if other factors are regulating the wild stock?
Development Licenses

- Technology that the industry itself can not, or will not, take risk to realize without support. 2015 - 2017
- Given for “ree plus “carrot”.. Possible to convert to ordinary licenses for a cost of 1 600 000 CAD
- Relevant for planning, exposed versus sheltered areas
- Unique crossover engineering possibility due to layoffs in the oil industry
Technology and Development

- 46 applications
- two permits given
- six rejected

Adapted from Directorate of fisheries
Conditions

- Develop new technology
- Significant innovation
- Significant investments
- Contribute to solving environmental and spatial challenges
- Has required expertise
- Knowledge has to be open

Source: Regulation connected to law of aquaculture
The project must be closely linked to the production of fish and the production units.
Has to be innovative..
Must be possible to understand..
A totally integrated plan is endlessly complicated (except if you plan a really small island..) and should be a vision, not a goal.
LESSONS LEARNED, RECOMMENDATIONS

CZP

- Regional is a good idea, but not local level of detail in the same area...Find your "vertical level"
- Mismatch local and regional competence and expertise compared to industry expertise is challenging..
- Start with the stakeholders (better sooner than later..). Planning and Building Act in Norway is a process law..
- Be dynamic because the industry and management is (but mind, environmental protection may have a 200-year perspective).
- Mirror the process. Decide what is "untouchable" what you really don’t want to change (ex. Nature and "foodsea")
- Don’t be too precise or exclusive if not necessary, short text and fuzzy borders if possible
- Make the DSS live and useful for others and other purposes
- Make it transparent and possible to understand for politicians and the public. Avoid hidden administrative political traps (lying with maps, statistics and models).
Signs of increased sustainability

• Salmon has become a «mussel or cow», 70% lower tropic level
• Species diversification
  > Macro- micro algae's, ciona for feed and food. Very close to commercial (heterotroph algae's)
  > IMTA, Ocean forest
  > First in new technology, closed containment and land based aquaculture
  > Bigger units further offshore takes up less coastal (conflicting) areas
  > Gene editing (louse resistance & non fertile)
Use "peer reviewed" knowledge and “make aquaculture better (not great again..)”, no “alternative truths”