

Extraction of nutrients from fish farms by mussel production in the Baltic



- Description of the IMTA facility
- Loss and extraction of nutrients
- Ecosystem impact – conflict and support management targets
- The R&D project Baltic Blue Growth

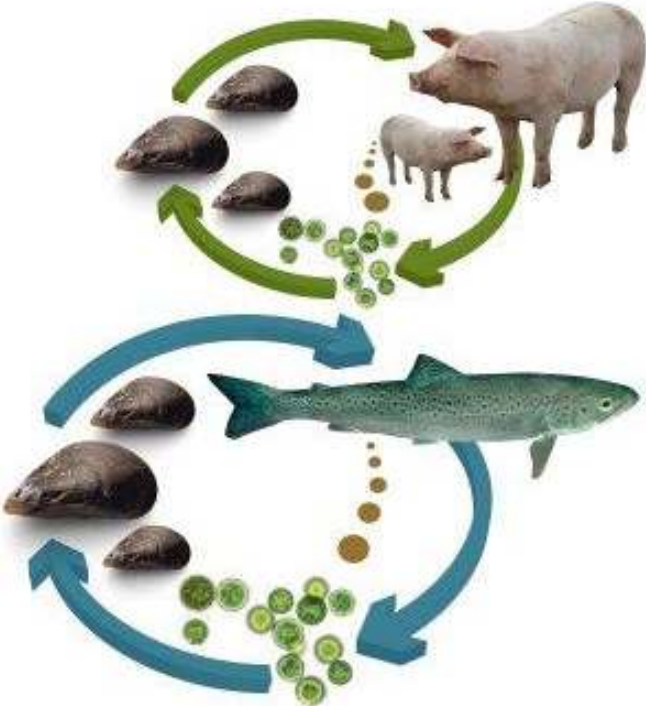
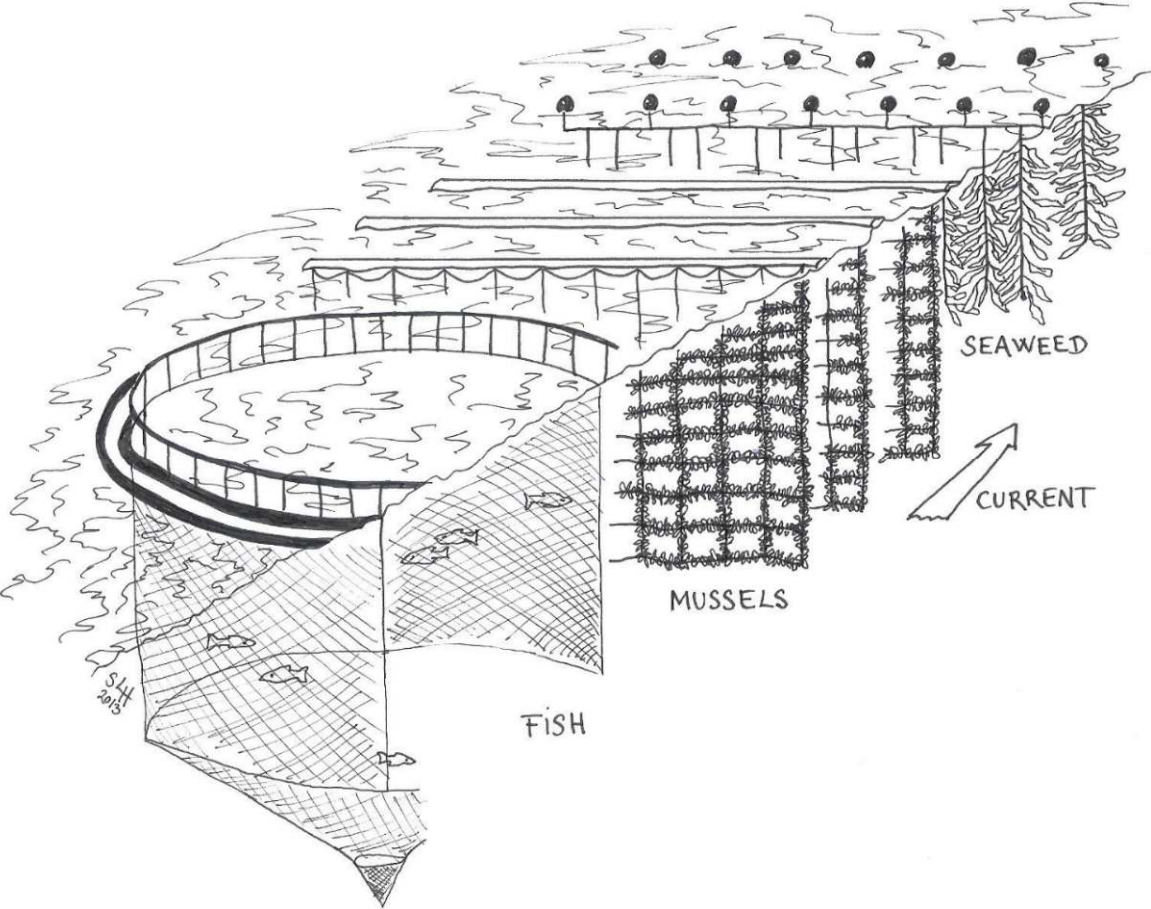
Per Dolmer, Orbicon

Susanna Minnhagen, Kalmar Sound Commission





Integrated Multi-Trophic Aquaculture BUT only 12 % of the N is incorporated in particles



SL Holdt © Holdt and Edwards 2014

Blue Mussels are filtrators



5-7 l water /h
Particles > 2-5 μm

Filtration improve transparency
of water

Loss of organic matter to the
sea bed

Moderne havbrug...

Hjarnø Havbrug har fokus på nulpåvirkning af miljøet og bruger erfarne fodremestre der tilser fiskenes velfærd... læs mere her



Lokal området

Endelave havbrug får en miljøtilladelse

Miljøministeriet har svaret på modstandernes klager og finder stadig at driften af Endelave Havbrug er inden for lovens rammer...

LÆS MERE



TV2 østjylland om tang

Hjarnø Havbrugs havbiologer fortæller om dyrkningen

Tang bruges allerede i mange produkter, og det kan dyrkes i de indre danske farvande. Se her indslaget fra TV2 østjylland med Teis og Peter fra Hjarnø Havbrug.

LÆS MERE



Kombi Opdræt

Produktion er ikke nok, der skal også udvikles...

Forskning og udvikling er fokus punkter, for at opnå nulpåvirkning af miljøet. Nyeste projekt opsamles resultaterne afsluttende i et Phd projekt.

LÆS MERE



Mød os...

helt tæt på, og find ud af hvem vi er...

Hvis du har brug for at komme i kontakt med os, er vi kun et opkald væk. kontakt Hjarnø Havbrug på:

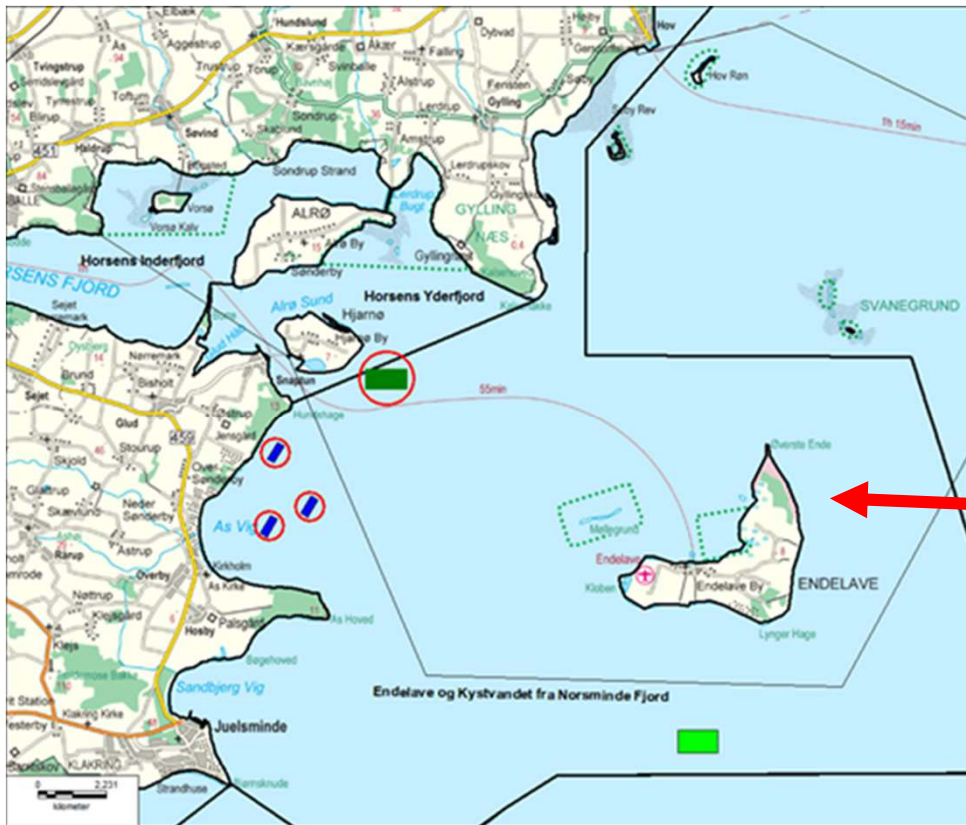
75 68 38 01

LÆS MERE

Nutrient Extraction at Hjarnø Havbrug



- 2105 t rainbow trout
- 7500 t blue mussels
 - Nutrient extraction decoupled
 - Located in same WFD water body



AQUACULTURE: Production of mussels



Smartfarm produce 20-25 t of mussels per unit



Musselfarm area= 18 ha
100 smartfarm units
20-25 tons mussels per unit
1,37 % N for small mussels
1,18 % N for large mussels

2000-2500 tons of mussels per farm

Small mussels - May to Oct

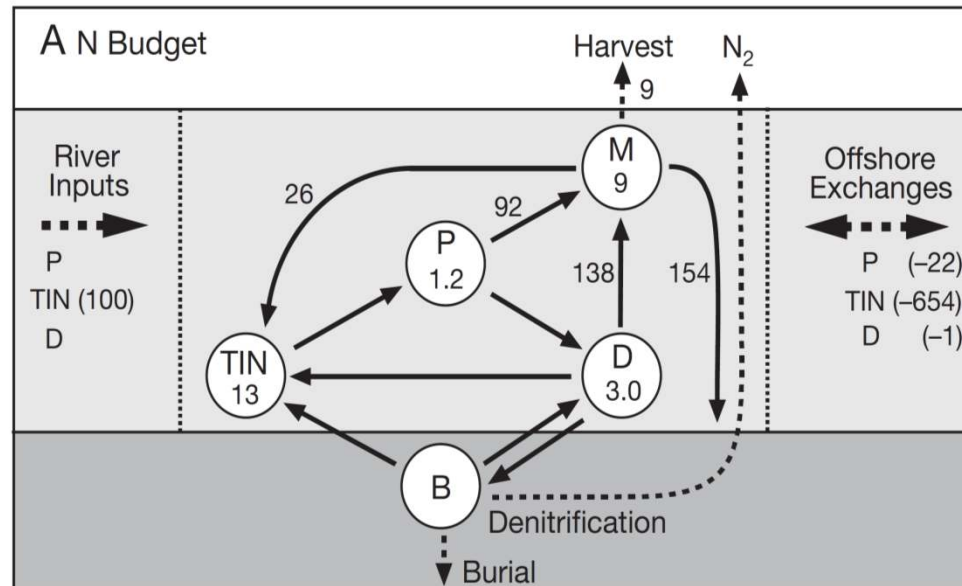
No problems with ice or eider
27-34 tons N per musselfarm
1.5-1.9 tons N/ha (x2 for longlines)

Large mussels – May to May

Mussels for human consumption
24-29 tons N per musselfarm
1.3-1.6 tons N/ha



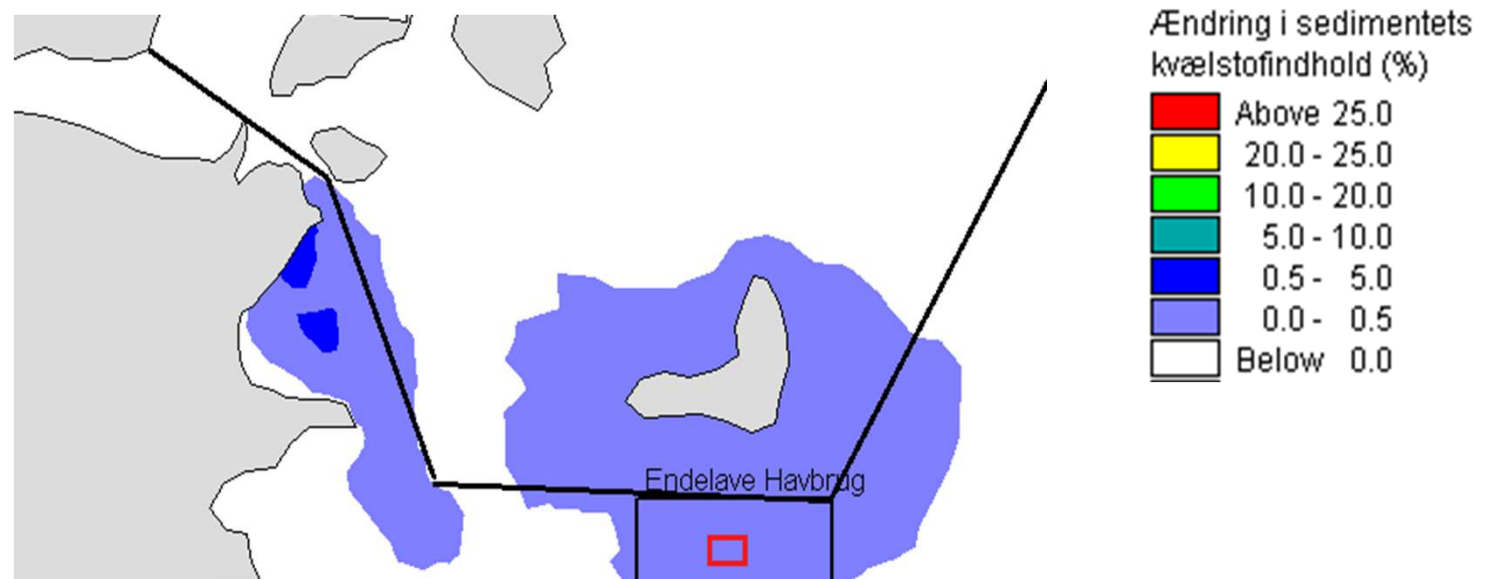
Impact on the ecosystem - sedimentation



Cranford et al (2007). Flow of N in Canadian Bay. The mussels (M) annually extract 92 t of N as plankton (P) and 138 t as detritus (D). 9 tons are harvested and 152 is lost to the sea bed.



Nitrogen in the sediment below musselfarms at Hjarnø Havbrug



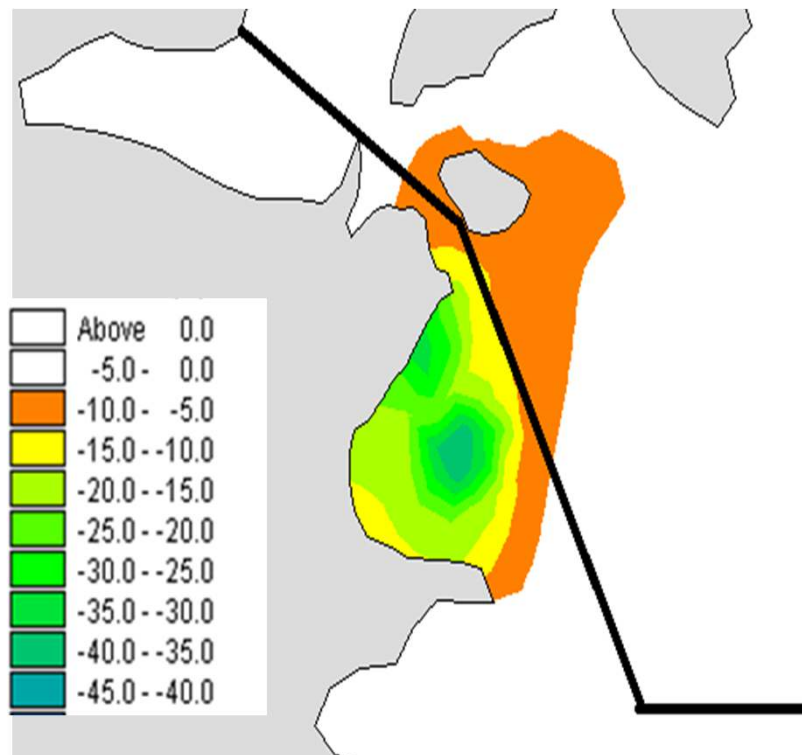
At seabeds at sites with stronger currents no impact of the sedimentation.



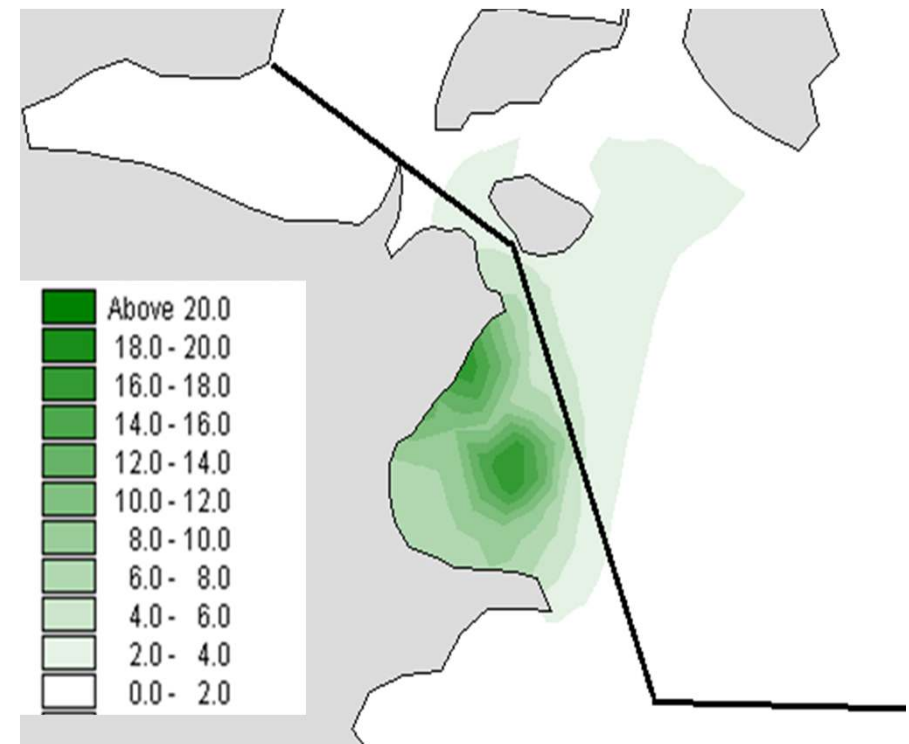
Goods and services – waterquality



Chl a



Transparency



Good and services



Reef effects



Food for Eider



Challenges for implementation of nutrient extraction by mussel farming



Optimize production at low cost

Production

Predation

Harvest

Impact on ecosystem

Development of a market for the mussels

Optimization of management - get payed for ecosystem restoration not nutrient extraction – Holistic approach

Not in my backyard – Perception, site selection and regulation





Baltic Blue Growth

Initiation of large-scale, business based, mussel farming to harvest nutrients from the Baltic Sea



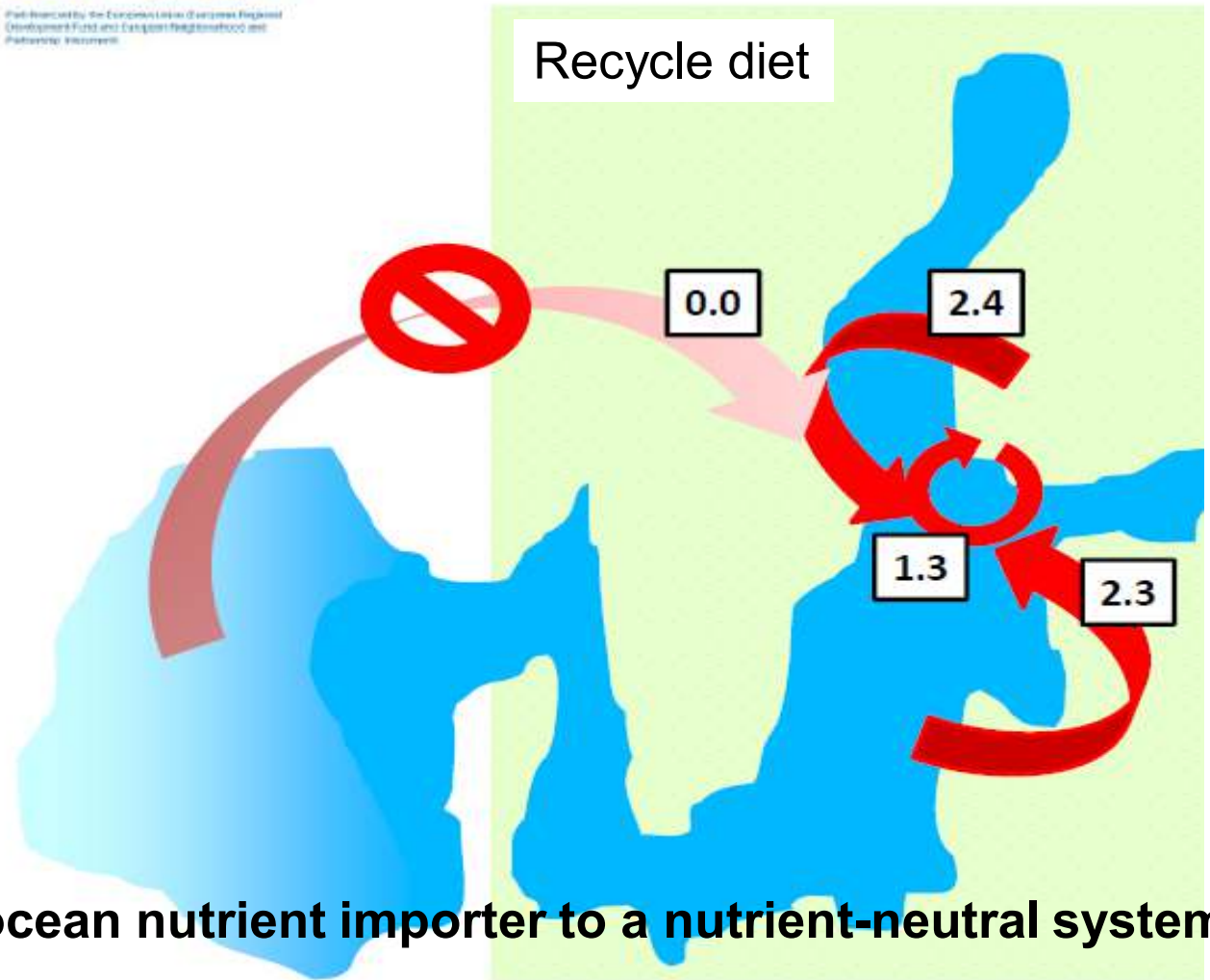
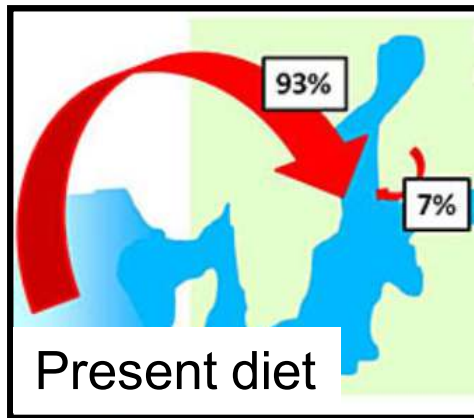
Part-financed by the European Union

Closing the nutrient loop

AQUABEST

Baltic Sea Region
Programme 2007-2013

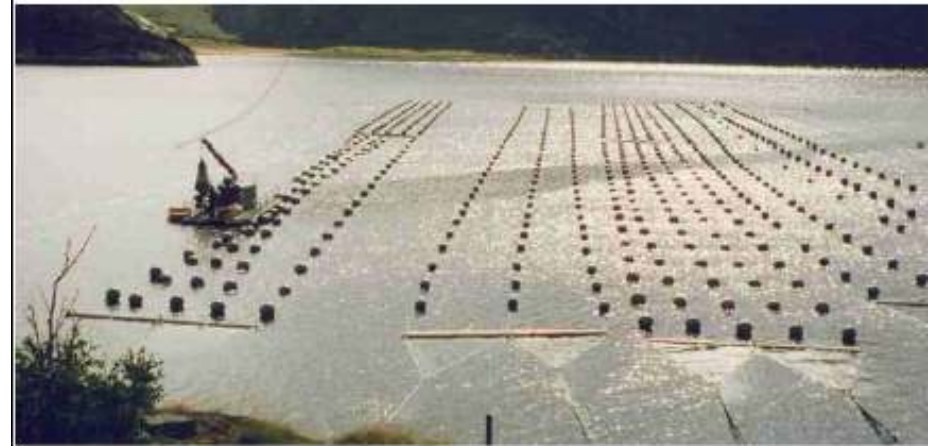
Financed by the European Union Regional Development Fund and National Authorities with National Resources



Turn aquaculture from net ocean nutrient importer to a nutrient-neutral system.

Baltic Blue Growth - Aim

We will go from pilot scale....



-to large scale
mussel farms
in the Baltic Sea!

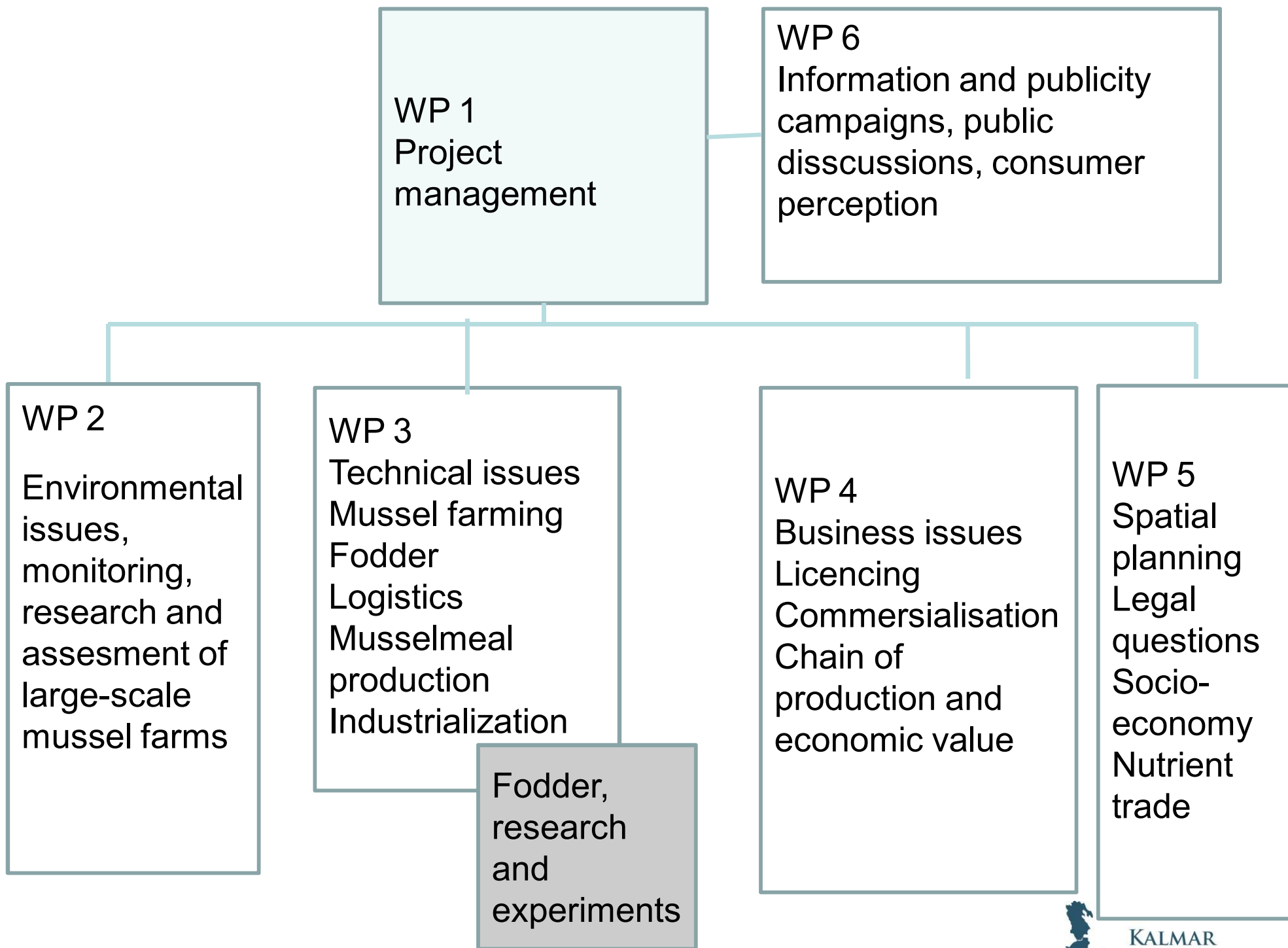


Part-financed by the European Union

Long-term goal: Large-scale processing of mussel meal to replace fish meal in aquaculture and livestock farming



Part-financed by the European Union



KALMAR

For more details, see project description from 5 May at www.kalmarsundskommissionen.se/bbg

