

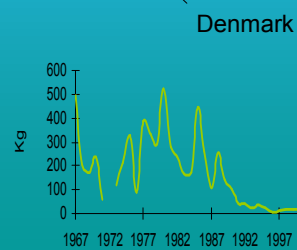
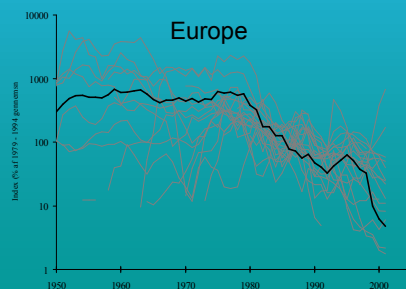
The effect of stock enhancement by elvers *Anguilla anguilla* L. in Danish fresh and salt water – two case stories.



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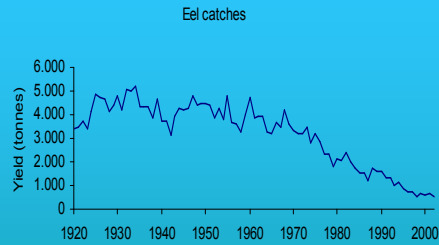
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Trends in recruitment of glass eel from Sargasso sea



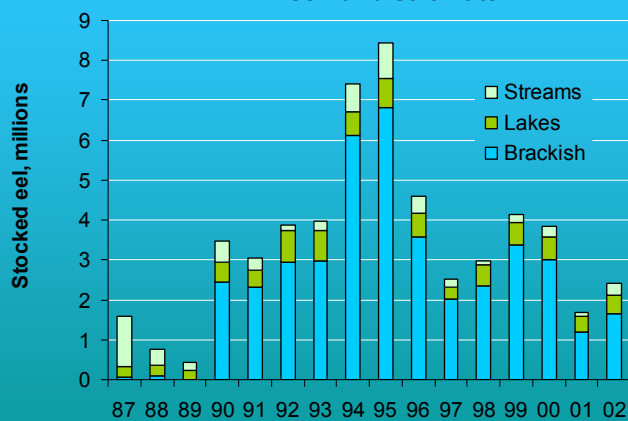
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Management option



Stock eel productive waters with glass eel imported from southern Europe.

Eel stocking 1987 - 2002 in fresh and salt water



- **Stocking studies:**
 - In small streams
 - In a brackish Fjord
- **Purpose:** The overall purpose is to assess the biological yield of the stockings in terms of growth, mortality, sex, dispersal/migration.
- **Material:** Two size groups was chosen as seed stock 3.5 gram and 10 gram eel.

Tagging eels with coded wire tags



River Madum Å

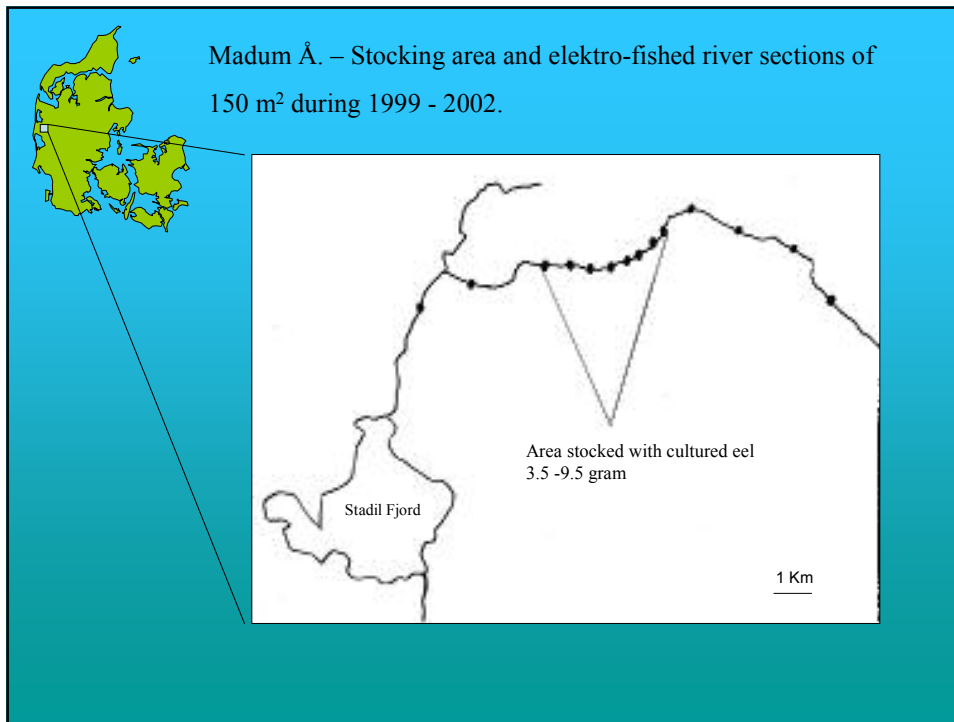
- River Madum Å is a lowland stream about 26 km long with a catchment of 90 km².
- It is unregulated and moderately polluted by nutrients and ochre.
- 2-6 meter wide and 20-100 cm deep.



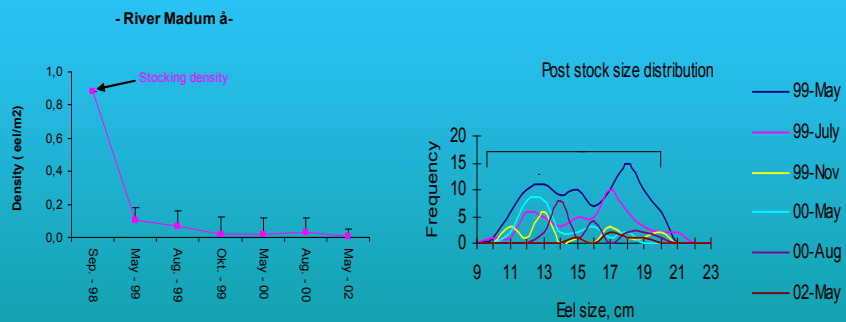
River Madum Å

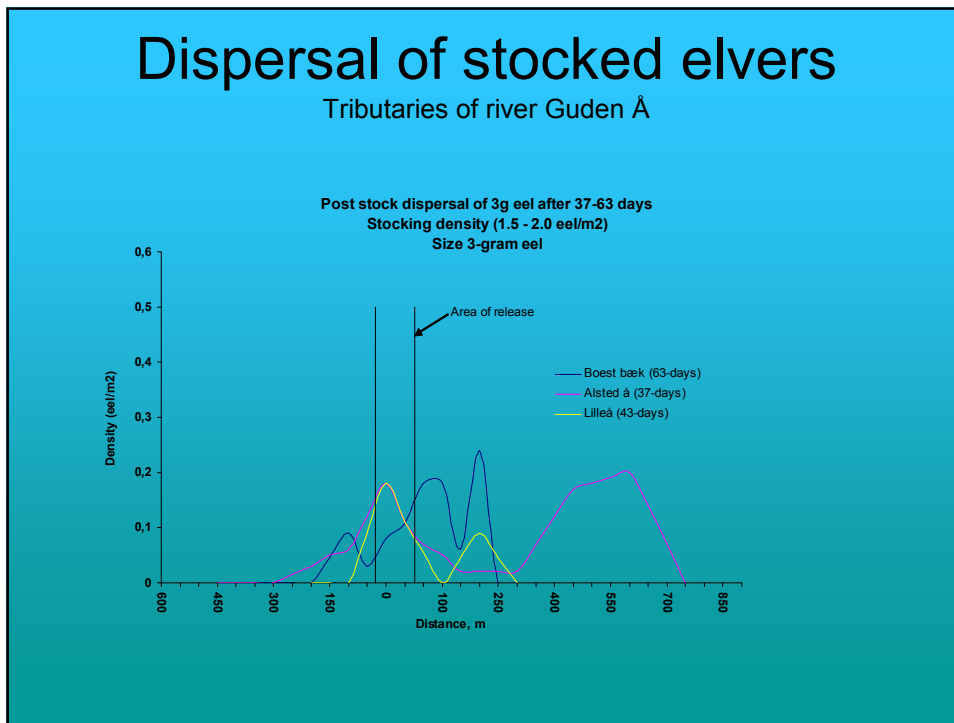
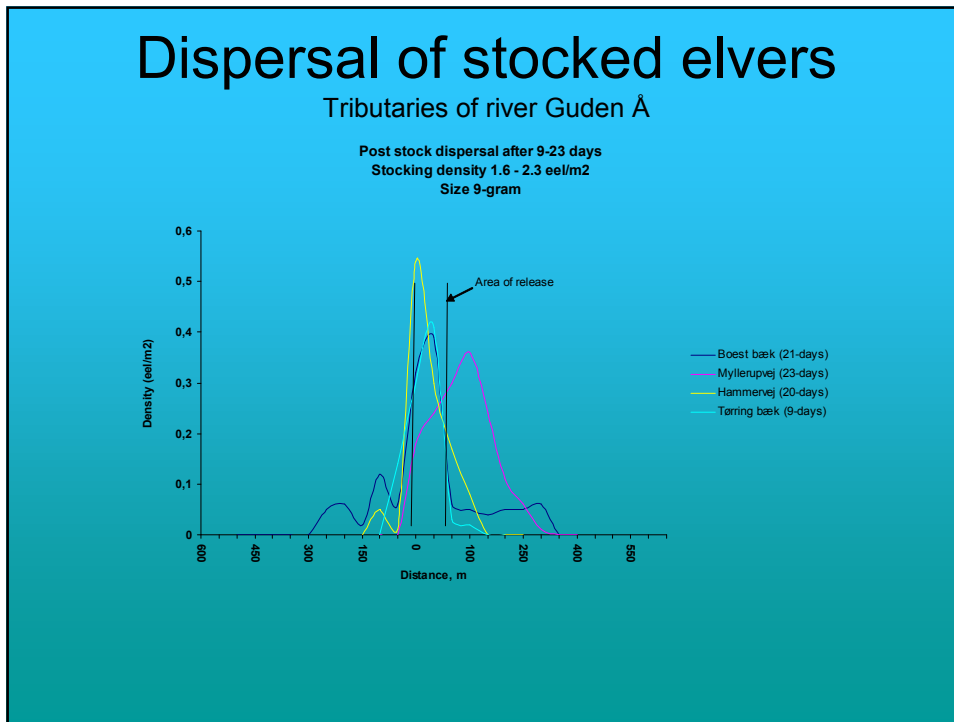
- In 1998 a 5.5 km long section of the stream was stocked with 13.000 tagged eel of size 3.5 and 9 gram.
- The eels were stocked from a sailing canoe at a density of 0.9 eel *m⁻².
- Post stock densities, growth and dispersal was evaluated by electrofishing.





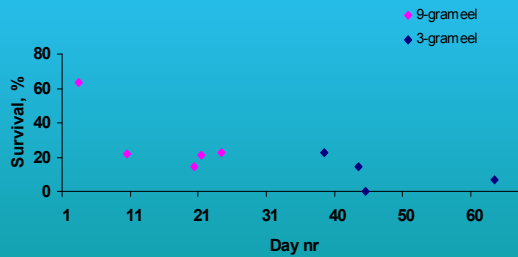
Recovery of stocked fish in River Madum





Recovery of elvers

Tributaries of river Gudenå




•Stocking Roskilde Fjord


- Roskilde Fjord is shallow mean depth is 3 meters.
- The Fjord area is 123 km²
- The salinity range is 12 - 18 ppt.
- The Fjord is polluted by nutrients but improving.
- In the 1960's about 250 tonne of eel was caught every year. The last years between 10 -15 tonnes of eel was caught.



Stocking Roskilde Fjord



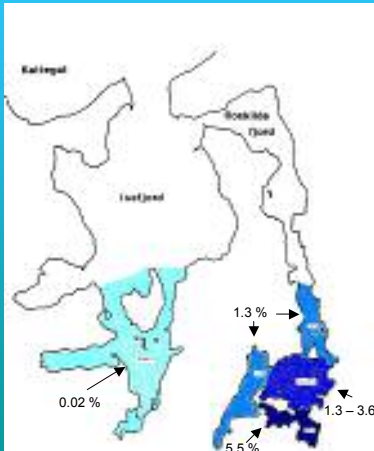


- In 1998 and 1999 a total of 100.000 CW - tagged eel of size 3 and 9 gram was stocked in the lower part of the Fjord.
- From year 2000 captured eels was checked for tags.



Stocking Roskilde Fjord

percent tagged fish in catch

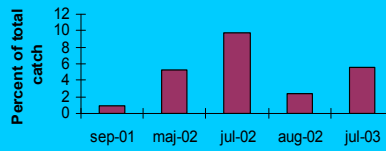


Location	Percent Tagged Fish in Catch
Lower part of the Fjord	5.5%
Other areas	0.02%
Other areas	1.3%
Other areas	1.3 - 3.6%

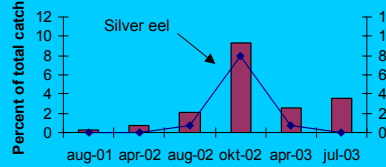
Results from stocking Roskilde Fjord

Year	size cm	No of eel examined	No of eel with tag	Tagged eel %
2000	20.0 – 35,0	763	21	<u>2.8</u>
2001	20.0 – 35,0	1.627	45	<u>2.8</u>
2002	20.0 – 35,0	2186	112	<u>5.1</u>
2001	35,5 – 45,0	1.322	7	<u>0.5</u>
2002	35,5 – 45,0	8.019	401	<u>5.0</u>
2003	35,5 – 45,0	9.329	284	<u>3.0</u>

Area 1- inside stocking area



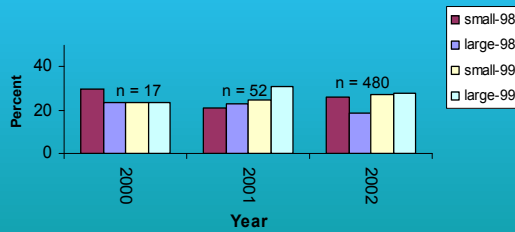
Area 2- outside stocking area



Size of seed stock

small (3-gram) or large (9-gram)??

Roskilde Fjord
batch - identification



Conclusion

- **River Madum Å**
 - Stocking eel in Madum Å did not have any significant effect on the eel population.
 - No growth was observed
 - The stocked fish either die or disperse to deeper parts of the stream.
 - Similar results are observed in other streams.
- **Roskilde Fjord**
 - Stocking eel in Roskilde Fjord has a significant effect on the size of the eel population.
 - The stocked eel has increased to catchable size (35,5 cm) within 2 - 4 years.
 - In 2002 the local catch of the tagged eel was up to 9 %.
 - Male silver eels have begun to leave the growth area.
 - Migration of yellow eel out of the stocking area has been observed but the largest concentration is still in the stocking area.

Thank you for your attention!

