### Cormorants and fish populations DOCUMENTATION OF EFFECTS



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History of fish/cormorant research in Denmark

Which effects have been documented on the coast ?In rivers?

New results from projects since 2018

Why Nordic cooperation is needed

# **Results from Ringkøbing Fjord 2000 – 2004**

*Telemetry* (2000, 2002): Salmon smolts, 40 - 50 % of tags were recovered from one colony.

*CW-tagging* (2003, 2004): 25 % of tagged salmon smolts were eaten during the 3-weeks smolt migration period.
40 - 50 % of tagged eel were eaten in one year.
All (100%) of tagged flounders eaten in 15 days

*Pellet analyses*: 30,000 salmon smolts, 1.4 million flounders, 38,000 eel were eaten.

Jepsen et al. 2010

### Smolt predation by cormorants from Jepsen et al. (in press)

Year	Number tagged	Species	Mortality by	Method	Source
1997	50	Wild trout	55	Radio-telemetry	Dieprink et al. 2001
1997	50	What trout	55	Rudio telemetry	Dieprink et ul. 2001
1997	50	Hatchery trout	67	Radio-telemetry	Dieprink et al. 2001
2000	17	Wild trout	24	Radio-telemetry	Dieprink et al. 2002
2000	51	Wild salmon	48	Radio-telemetry	Dieprink et al. 2002
2002	51	Salmon (mix)	40	Radio-telemetry	Baktoft 2003
2001					
2003	64,500	Hatchery salmon	23	CW-tagging	Jepsen et al 2010
2003	-	Salmon (mix)	> 60*	Pellet analyses	Sonnesen 2007
2005	10,000	Hatchery salmon	31	CW-tagging	Jepsen et al 2010
2005	58	Salmon (mix)	53**	Acoustic telemetry	Koed 2006
2005	42	Trout (mix)	88**	Acoustic telemetry	Koed 2006
2008	4363	Wild trout	45***	PIT-tagging	Jepsen et al. 2014
2008	5009	Wild trout	42***	PIT-tagging	Jepsen et al. 2014
2010	5900	Hatchery trout	72***	PIT-tagging	Thomsen 2013
2014	1400	Wild trout	22***	PIT-tagging	Jepsen et al. 2014
2016	74	Salmon (mix)	42	Radio-telemetry	Unpublished
Mean			47		

47% fewer smolts = 47% fewer salmon coming back!

### Consumption of fish from the Baltic Sea – $kg/km^2/year$



## Cormorants in rivers – a new phenomenon in DK



# Grayling







# Grayling



Grayling density in 1,5 km stream.

25 grayling (32-36 cm) were radiotagged in October.

River with very few cormorants

Only two tagged grayling survived

A loss of 80% of total fish biomass was estimated





Jepsen et al. 2018

# In-river Predation on juvenile salmonids











Pilot studies 2020-2021:

Covered and control stretches in:

- Gryde Å
- Råsted Lilleå
- Vejle Å
- Binderup Å

We observed a 75-95% reduction in the fish population on all stations from October to March. Cormorants observed (camara) in all stations, including covered.



NB: "Normal survival": 75-85%





## Adult sea trout









Villestrup sea-trout kelts



Recovery of PIT-tags revealed that cormorants took over 50% Of trout under 50 cm



Lake – trout, spawning population



Lake trout redds vs cormorant nests in the local colony

# **Conclusion**:

Impact on fish populations in rivers, lakes and coast. Documentation (by different methods) that predation from cormorants is now the *main regulating factor* for many fish stocks. *This is also the case for wild populations in restored, unimpacted rivers* 

Effects include:

- Economic loss (commercial and recreational fishing)
- Cultural loss
- Biodiversity loss
- Problems in reaching WFD requirements (lack of fish)

DK is using §9-derogations to the full? extent, but with little effect. We tried to deal with conflicts locally, but need help. How can we protect out threatened fish populations? Nordic knowledge base

Much of the damage in DK rivers are caused by wintering birds, mainly coming from Sweden.

All our cormorants are part of the same pan-EU population.

The conflicts are very similar in the Nordic countries.

If all documentation must be produced locally, management will trail far behind.

A shared burden of proof would benefit the process and save ressources.

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#### Human - Wildlife Conflicts in Europe

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