Cormorants and fish populations

Documentation of effects

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Main points:

1. Predation studies, coast, lakes, rivers – what have we learned and how did it affect management?

2. Where are we going, what’s missing?

Documenting the impact of predation:

- Proving things that have happened
- Lack of fish to study
- High variation from year to year
- Effect of capture, handling and tagging
- Statistical confidence in estimates

Funding for studies ??

Methods

PIT- Tags (Passive Integrated Transponder)

Acoustic tags

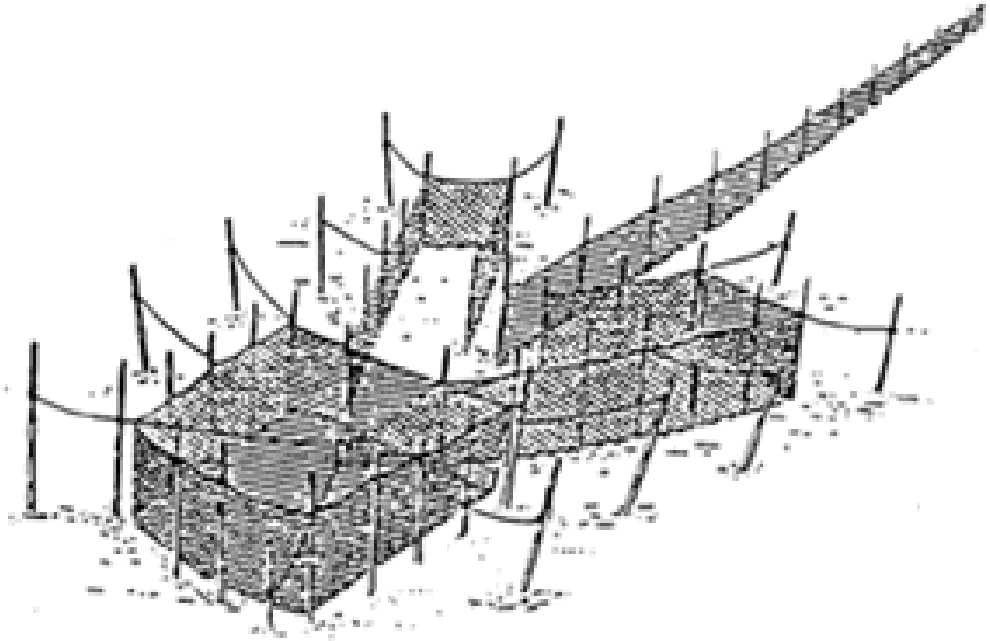
Radio-tags

Coded wire tags

Cormorant predation in pound nets was documented in 1993

Published in 1995 by C. Dieperink.

In the MP from 1997, the option of shooting cormorants close to nets was given.



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. (2019)*

Year	Number tagged	Species	Mortality by cormorants (%)	Method	Source
1997	50	Wild trout	55	Radio-telemetry	Dieprink et al. 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2016	74	Salmon (mix)	42	Radio-telemetry	Unpublished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!

Documentation of high predation on trout- and salmon smolts.

First documented in 1996 and repeatedly onwards.

From the 2002 MP it was possible to get permission to regulate cormorants in lower rivers, river-mouths and estuaries.

Cormorants in rivers – in DK from 2010/11

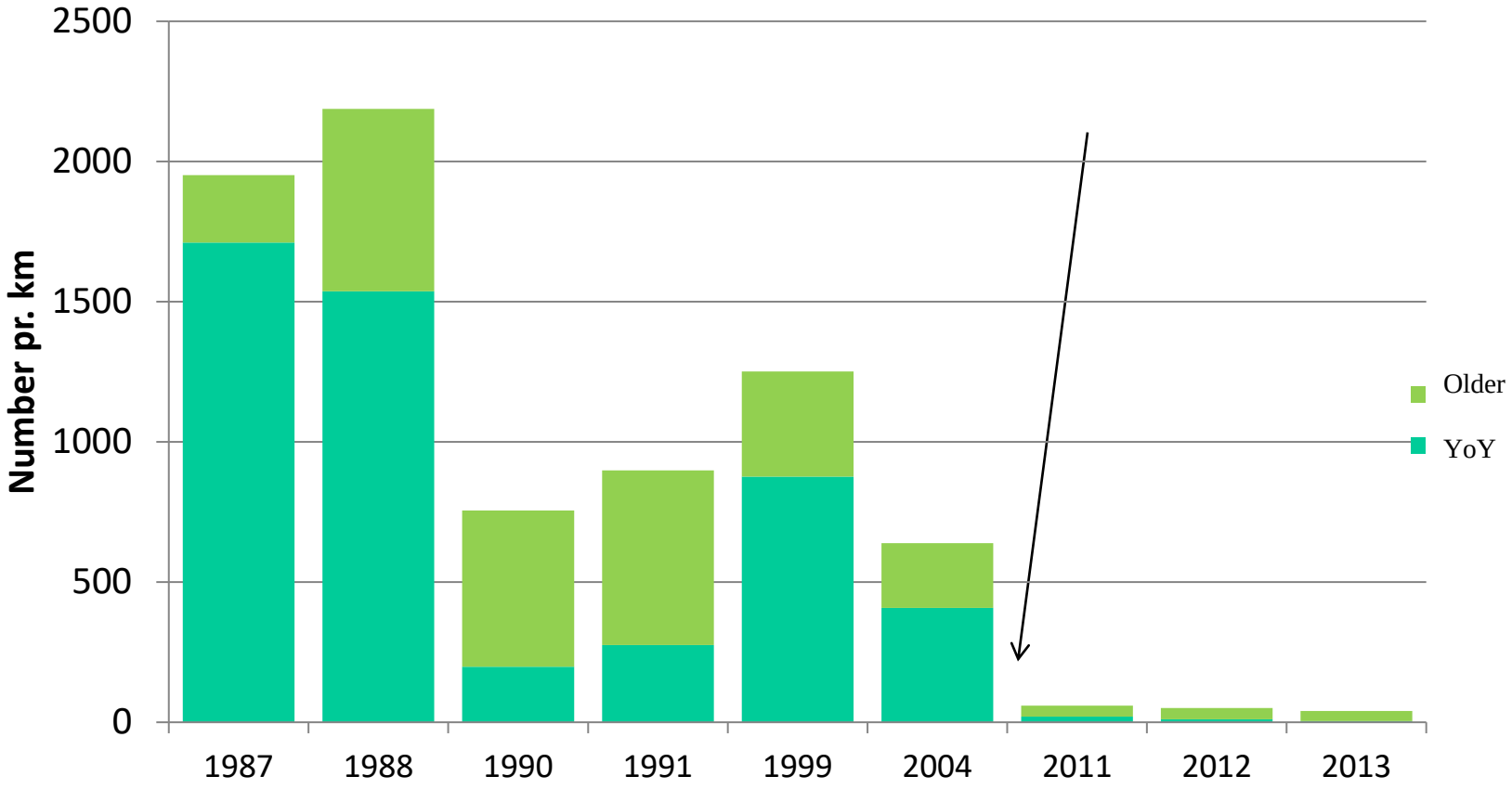
In small streams

Grayling

Grayling – Omme Å Number pr. km	2009	2010
Fry	147	0
1+	250	5
Larger	15	1
Total	**412**	**6**

Catch of Grayling by electrofishing a 2 km stretch in 2009 og 2010 (*Iversen 2010*).

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

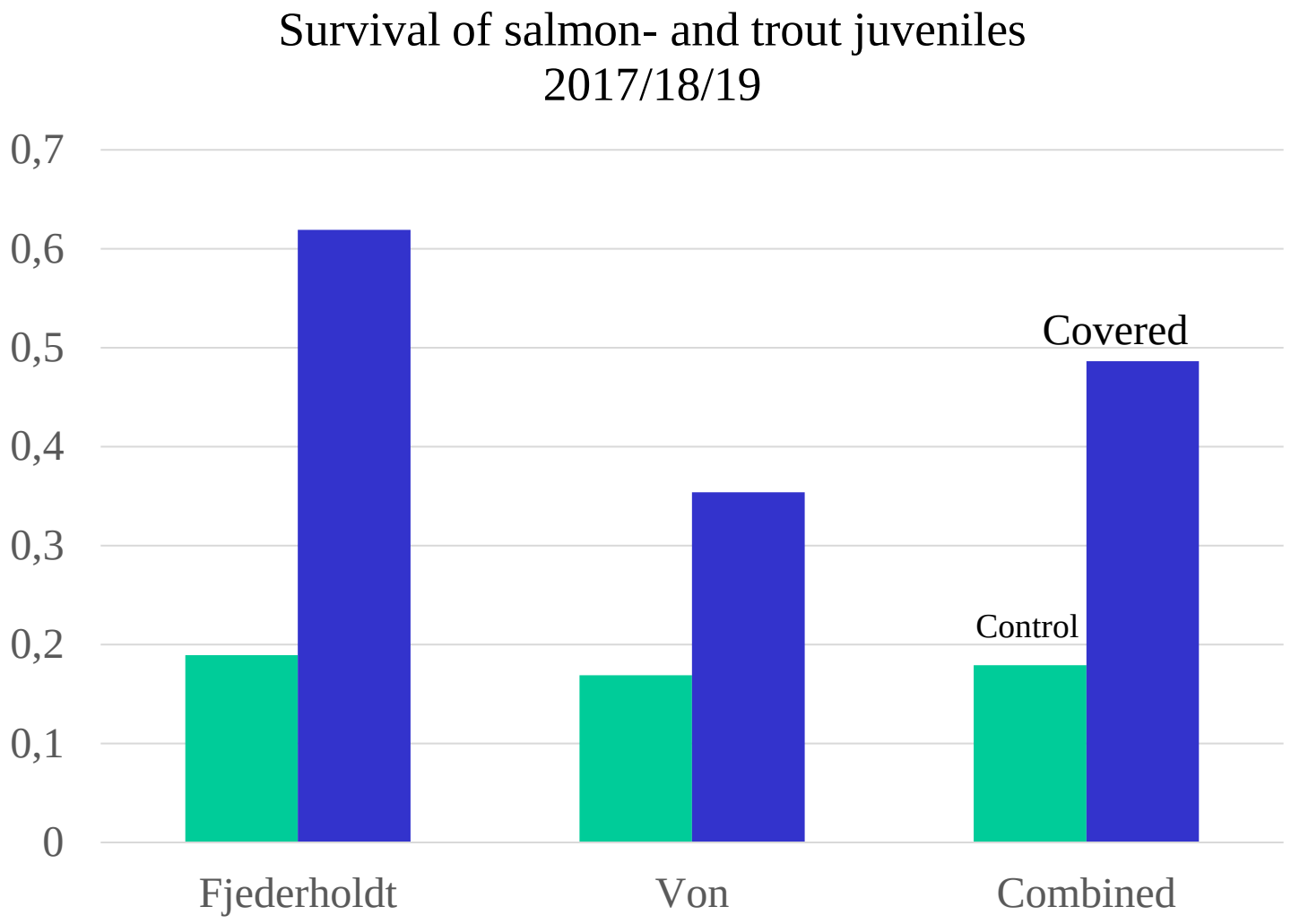
A loss of 80% of total fish biomass was estimated

Jepsen et al. 2018

Documentation on dramatic decrease in river fish caused by cormorant predation.

In the 2016 MP options for regulating cormorants in rivers and adjacent roosting sites were extended, so that angling clubs can apply for permission and hand out to hunters.

Predation in river on juvenile salmonids??


Survival of salmon- and trout juveniles
2017/18/19
0,7
0,6
0,5
0,4
0,3
0,2
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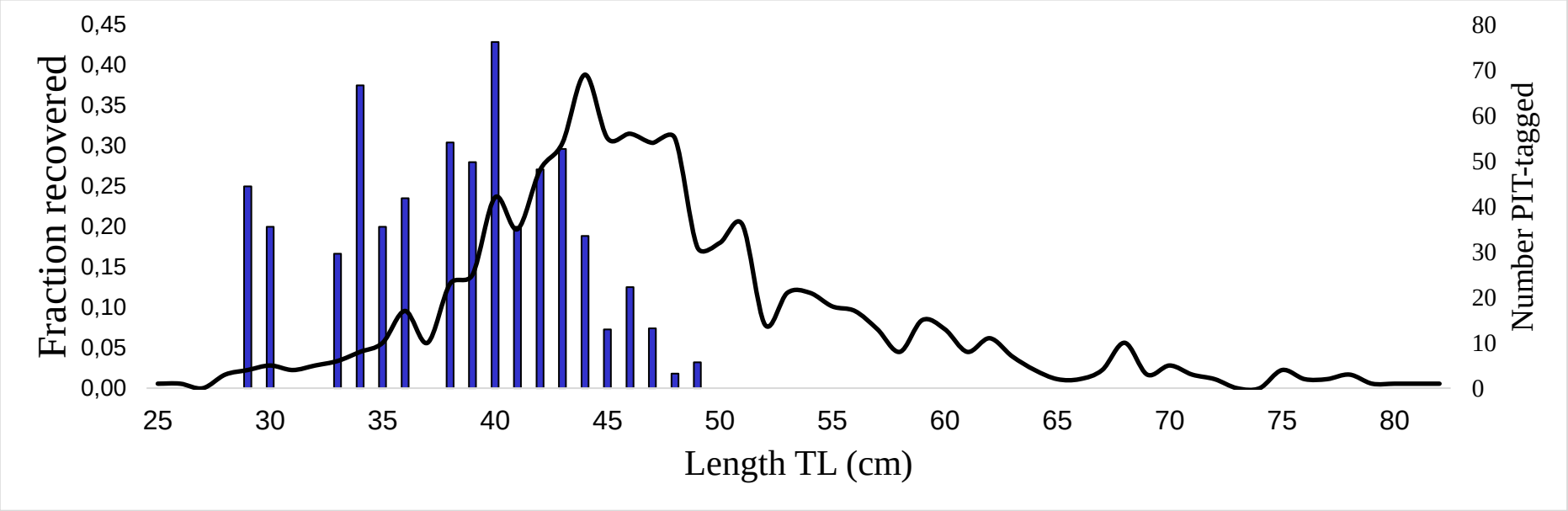
Adult sea-trout

Predation on sea-trout throughout the whole life



Predation on post spawning sea-trout

Predation on lake fish?

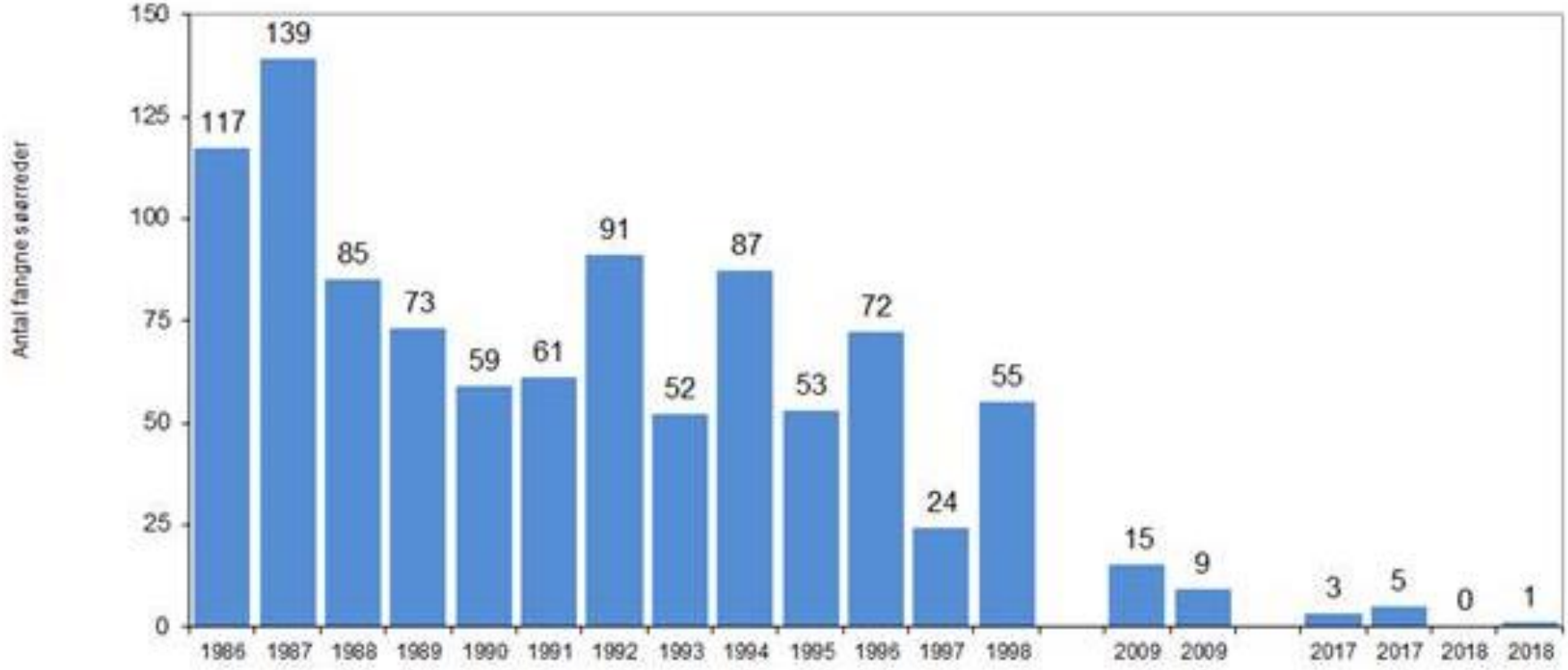
PIT studies of lake fish

More than 1000 PIT tags were found in one colony 13-20 km away

	Loldrup Lake				Viborg Lakes	
	2005	2007	2008	2009	2008	2009
Roach	19%	32%		17%	30%	24%
Bream	11%				33%	33%
Perch	**41%**			**46%**	**70%**	**45%**
Pike			**33%**	**30%**		

Minimum estimates (*Skov et al. 2014*)

No measures to protect lake fish (pikeperch, perch & pike)



Lake trout from Mossø, improved habitats but more predation

Future:

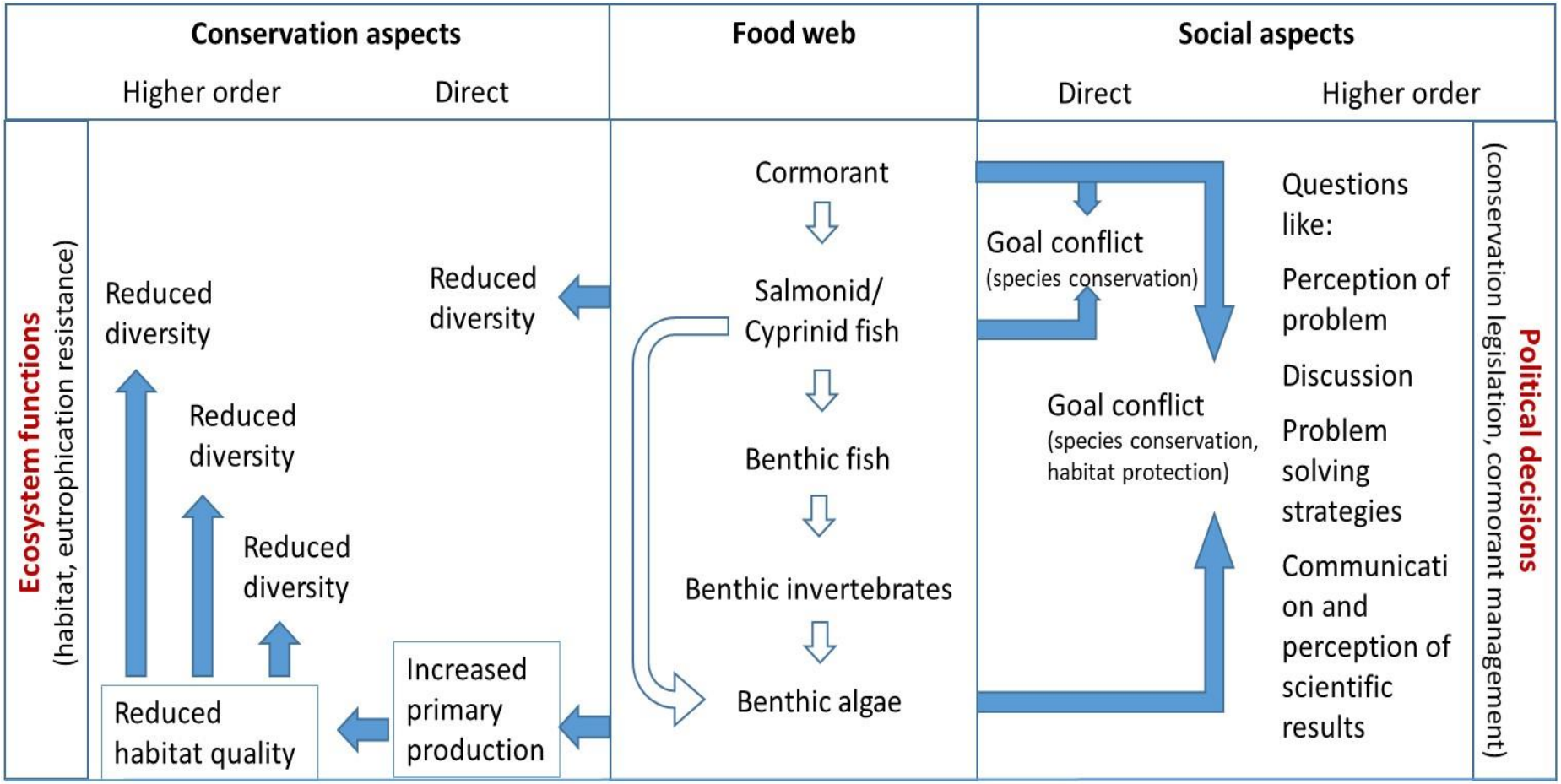
More exclusion experiments - ongoing

Predation on the coast (small sea-trout) – ongoing

Effect of cormorant predation on WFD-status – upstart

Effect of cormorant predation on coastal cod and eel – no funding

WFD – impacts of predation



BioDiversa – proposal for EU-funding?

Management measures seems NOT to be the main cause of the recent decrease of Cormorant numbers in DK.

Cold winters and lack of food

EU- management

Parliament wants action – Commission not so much

Some MS are really trying to reduce numbers

Some MS are still very protective to Cormorants

Few MS seem not to care very much (EE, LT, LV)

Parliament wants to promote a pan-EU management plan

Birds directive – derogations

EU-Parliament cormorant hearing October 2018

Status:

- We have documented severe damage from cormorants on several fish populations and fishery as well as economy

- After 15 years of increasingly tough (lethal) management we still have many conflicts

- Cormorants moved inland because of collapse in coastal fish. If that happens here, you should have a plan!

- We cannot solve the problem alone, we need Nordic cooperation – also on the management level

Thank you

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