The conflict between cormorants and fisheries

FACTS AND MANAGEMENT

Niels Jepsen  DTU Aqua, Silkeborg

Merimetso - Helsinki 2016
Main questions:

1. Overview of the development of the cormorant conflict in Denmark

2. How the cormorants have moved from the coast to freshwater, could this happen in Finland?

3. The Danish cormorant management plan and our experience with it

4. How we apply article 9 of the birds directive; especially how we interpret "to prevent serious damage"
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 may very well start to move inland in Finland.
- If they do you must be ready to respond
- We cannot solve the problem alone, we need Nordic cooperation
Population status - brief

Predation studies, coast, lakes, rivers – what have we learned?

Management – MP and the long lasting conflict

Questions and discussion
How to use the site

1. To add your sighting, first select whether you are recording cormorants, mergansers or goosanders or a colony of birds. A colony is a group of birds that are living in one regular location.
2. Complete the other details of your sighting as accurately as possible.
3. When you have entered all your details, click on the "PLACE" button.
4. Move your mouse cursor over the map and drop it in the approximate area where your sighting took place.
5. Once the pin is dropped, you can zoom in by double clicking, scrolling your mouse wheel or by using the zoom slider. As you go, drag and drop your pin, to ensure that the position is as accurate as possible.
6. Zoom as close as you can to the position of your sighting. Sometimes switching the map to 'Terrain' will help you identify the exact spot.
7. When you are happy with your selected location, move your mouse cursor off the map and click 'SUBMIT' on the form.
8. That's it! Your sighting will be added as soon as we approve it - this is usually within a few hours but might take a bit longer.

Don't forget to bookmark this site, keep your eyes peeled and come back every time you want to report a sighting.

It's really important to let other anglers know about the site so please use the links at the top to add this to your Facebook and Twitter then use the envelope icon to email a link to all your friends so they can do their bit too.
Kormoran und Fischbestand—
eine unendliche Geschichte?

Oktober 2009
Cormorants are eating nearly 20 million baby salmon a year on East Sand Island, a tiny man-made Oregon island. *(Jamie Francis/The Oregonian)*
Conflict: Conservation of a healthy cormorant population and conservation of harvestable fish stocks

*Fish enough for predators and anglers*
Colonies 2014

Current max number of birds: 250,000

Current min number of birds: 15,000
Development in breeding stock (pairs) in Denmark 1973-2015
Who has the problems?

- Pound-net fishers
- Recreational net fishers
- Anglers
- Biodiversity?
The story - brief

- 80’ies – 90’ies – Traditional pound net fishing disappeared
- Then coastal fish (and fishing) was heavily reduced
- Relatively few, large colonies
- Heavy predation on sea-trout and salmon smolts
- Large colonies started to collapse (2002-2008)
- More, but smaller colonies
- More birds overwintering (mostly from Sweden and Finland)
- 2009/10 change of behaviour, birds going inland, less shy
- Recent years – much more problems in rivers, brooks and lakes
- Grayling, resident trout and North Sea Houting are threatened
Coast:

Eelpout (*kivinilka*) disappeared, very few left

Documented impact on flounders (*kampela*)

Documented impact on eel (*ankerias*)

Documented high impact on salmon (*lohi*)
Number of nests in colony, catches of flounder and eel
10,000 eel were cw-tagged and released in 2003 and 64,000 CW tagged 1-year salmon were released in Skjern River.
4,000 flounders (7 – 20 cm) were caught and cw-tagged in 2004
Pellet collection
Recovery of cw tags from salmon smolts from cormorant pellets collected April through June 2003
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 the available 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.
Estimated fish-consumption (Total 12595 t)
The current predation pressure from Great Cormorants on river fish populations is judged as being generally high. In particular Grayling, Salmon and larger (resident) Brown Trout are being predated upon during winter at apparently unsustainable levels in some rivers. Some populations of Grayling are presently very close to local extinction. Results have also demonstrated high predation pressure from Great Cormorants on lake fish populations, in particular Trout and Perch.
Cormorants in our streams – a new phenomenon
Two cold winters
2009-10
2010-11
Catch of Grayling by electrofishing a 2 km stretch in Omme Å 2009 og 2010 (Iversen 2010).

<table>
<thead>
<tr>
<th>Grayling – Omme Å</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number pr. km</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fry</td>
<td>147</td>
<td>0</td>
</tr>
<tr>
<td><strong>1+</strong></td>
<td>250</td>
<td>5</td>
</tr>
<tr>
<td>Larger</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>412</td>
<td>6</td>
</tr>
</tbody>
</table>
Grayling (*harjus*)
Grayling density in 1.5 km stream. Cormorants were first seen in 2007, but in larger numbers after 09/10.
In an ongoing study, 25 grayling (32-36 cm) were radiotagged in October.

No loss until a cold week in late January, where birds showed up and 8 of the tagged fish were taken.
Trout
Trout
Salmon spawning-run - River Skjern

Effect of in-river predation?
Predation on lake fish
### PIT studies of lake fish

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

<table>
<thead>
<tr>
<th></th>
<th>Loldrup Sø</th>
<th></th>
<th></th>
<th></th>
<th>Viborg sørerne</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
<td>2007</td>
<td>2008</td>
<td>2009</td>
<td>2008</td>
<td>2009</td>
<td></td>
</tr>
<tr>
<td>Roach (särki)</td>
<td>19%</td>
<td>32%</td>
<td></td>
<td>17%</td>
<td>30%</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Bream (lahna)</td>
<td>11%</td>
<td></td>
<td></td>
<td></td>
<td>33%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Perch (ahven)</td>
<td>41%</td>
<td></td>
<td></td>
<td>46%</td>
<td>70%</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>Pike (hauki)</td>
<td>33%</td>
<td>30%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Minimum estimates (*Skov et al. 2014*)
Large perch (>25 cm) are more vulnerable (> 40%)
Large pike (> 30 cm) are more vulnerable (50%)
Other studies:

• Impact of cormorants on flounder population in Kattegat

• Ecologic modelling for the Limfjord (Eco-path)

• Hald Sø lake trout (20 – 50 % of smolts eaten)

• Sea-trout smolt in Funen (massive loss)

• Trout and salmon smolts in Randers Fjord (no big impact)
Conclusion:

Significant impact on fish populations in Rivers, Lakes and coast Documentation (by many methods) that predation from cormorants is the *main regulating factor* for many fish stocks.

Effects include:

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

*For Art. 9, we have enough documentation to apply derogations*
Management
Ministry of Environment

Cormorant-group: Stakeholders, managers, experts

National cormorant management-plan since 1997:

• Egg oiling

• Prevention of new settlements

• Protective Shooting (fishers and hunters)
The cormorant group meets regularly and consists of:

*Ministry of the environment (Naturstyrelsen)*
Anglers (DSF)
Commercial fishers
Recreative net fishers (Fritidsfiskere)
Animal protection (Dyrenes Beskyttelse)
Hunters (DJF)
Ornithologists (DOF)
Ministry of agriculture and fisheries
Bird expert (T. Bregnballe, ÅU)
Fish expert (N. Jepsen, DTU)
Adaptive management

- MP provides the framework

- Loss in poundnets – fishermen were permitted to shoot cormorants at nets (1000 m)

- Loss of smolts – anglers were permitted to shoot cormorants during smolt migration

- Cormorants foraging in the rivers – protective shooting was initiated

- Now it will also be possible to shoot at night roosting sites
Permissions granted to regulate (shoot) in rivers
Oiling off eggs
Ringkøbing Fjord
Nest numbers 2001-2011 in a regulated colony - Ringkøbing

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

Human - Wildlife Conflicts in Europe
Fisheries and Fish-eating Vertebrates as a Model Case
Series: Environmental Science and Engineering
No conservation issue
No recreational value
No commercial value
Feelings

Conservation
Biodiversity
Recreational value
Commercial value
Cultural history
Feelings
Thank you
The North Sea houting

Monitored by e-fishing and gill netting – PIT tagging
LIFE project (2006 – 2012):

Budget of 13.4 million Euros

- Two hydroelectric power plants and 11 other weirs (fish farms) have been removed, giving 120 km of lost river habitats to the NSH

- Channelized river sections have been re-engineered (21 km)

- Establishment of 470 ha of new nursery area
Status 20014

• Ribe Å: The population has been followed (PIT tagging) for many years. Since 2011 very few individuals have been seen.

• Varde Å: Same situation as Ribe. In 2012, we could not catch one fish in the whole system.

• Vidå: Still holds a decent population, but much smaller than in 2011.

Where’s the problem???