

“Removing and recycling nutrients from the sea – can cormorants help us in doing that?”



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WHAT DO YOU THINK, WHEN YOU SEE THIS KIND OF PICTURES?



- Looks terrible? Unpleasant animals?
- Destroying beautiful nature? Eating all our fish from the sea?
- Or; Good example of ecological opportunism!

Yes, cormorants have a bad reputation, but they can help us in nutrient removal and recycling

- Cormorant (*Phalacrocorax carbo*) is a bird, which eats only fish. Fish contains phosphorus, which ends to bird feces, called guano.
- Baltic eutrofication, followed by increase of non-commercial fish stocks, has made the rapid cormorant population growth possible.
- The fish they eat during breeding period in Finland contains more than 40 tons of phosphorus .
- Part of that returns back to the sea, but main part remains in nesting colonies. There it can be collected and recycled as nutrient
- Reason for the bad reputation is, that cormorant eats (partly) same fish species as people. Colonies also kill nest-trees by extra high nitrogen concentrations of guano, which make islands look, and also smell, unattractive.



How cormorants can help the Baltic Sea - Case in Turku

- Next to the City of Turku we have a cormorant colony of 1760 breeding pairs in 2021.
- They catch some 260 tons of fish and remove some 1400 kilos of phosphorus from the sea. Main part of this ends to the breeding colony, where it is possible to collect for recycling.
- Turku Polytechnics will next autumn test tecnics to remove nutrients from the colony after breeding and before autumn rains will start to flush phosphorus back to the sea.
- First year aim is to collect 200 kg of phosphorus. This is equal to P- content of purified waste waters of Turku WWTP during one month time.



Collection of phosphorus from cormorant colonies is an option, which could be used also elsewhere in the Baltic



- In many cormorant colonies the amount of recyclable phosphorus is big enough to motivate the recycling measures
- In Finland we have 60 colonies, out of which some 10-15 may have potential for recycling (Study is ongoing to find out more exact figures of these)
- There are cormorant colonies also in all other Baltic states, but it is unclear, how many of them are suitable for guano recycling.
- In some cases important is, that the soil at colonies is such one, that phosphorus is filtered in and permanently binded into the soil layers. This means that it is out of the water ecosystem cycles and is in this way reducing eutrofication of the sea
- Cormorant colony, covered by white guano, should be seen as local water treatment plants, which remove nutrients from the sea. They provide important ecosystem services for the healthier sea, and free of charge!

How to remove phosphorus from the sea?

- Means to remove nutrients from the sea are still very few—commercial fishing is most important
- Removal of other biomass, like non-commercial fish, reed and algae harvesting, have been tested, but with minor results
- Visionaries are planning to extract phosphorus from the bottom sediments of the sea , but that will take time to implement



Concluding remarks on Cormorant case

First

In public cormorant discussion the dominating approach has been, what kind of problems it has, may and will cause for human life.

Positive sides of cormorant ecology has not been understood or discussed.


As a result many cormorant colonies have been destroyed illegally in Finland, because cormorants has been seen as competitors and threath especially for fishing.

Many studies have, however, shown, that this is not the case. Fish stocks have not suffered due to cormorants.

Second

Public environmental or any other administration in our Baltic states is not properly prepared to manage this kind of new ecological challanges. There is lack of real actors.

Most of the Baltic sea protection actions (excluding obligatory waste water treatment), are based on project based measures. This means that they often have a short life cycle. Temporary funding can´t ensure the continuation. New thinking is needed!

An aerial photograph of a harbor area. In the foreground, a large three-masted sailing ship with white hull and brown masts is moving through the water. Below it, a smaller white ferry boat is also moving. The water is a greyish-blue color. In the background, a city with various buildings and a large industrial area with blue-roofed structures is visible. A forested peninsula with some houses is on the right side. The sky is blue with some clouds.

Thank you for your attention!