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Measures to control pink salmon in Northern Norway

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Statsforvalteren i Troms og Finnmark

County Governor of Troms and Finnmark

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Photo: County Governor of Troms and Finnma
Malin S. Høstmark

Female pink salmon digging in a spawning pit.
Photo: County Governor of Troms and Finnmark / Malin S. Høstmark

Content

- The situation in Northern Norway 2023
- The strategy and the measures used against pink salmon
- Dealing with the dead fish
- Use of AI to remove pink salmon
- Evaluation report – main findings
- Juvenile survey 2024
- Even-year stocks


Photo: County Governor of Troms and Finnmark / Malin S. Høstmark

Why remove pink salmon from Norwegian rivers?

- Northern Norway is a «gateway» to the rest of the North Atlantic
- By controlling the pink salmon stocks in Norway, we can prevent them from establishing in high numbers in other parts of Europe

The situation in Northern Norway 2023

Catch in 41 traps

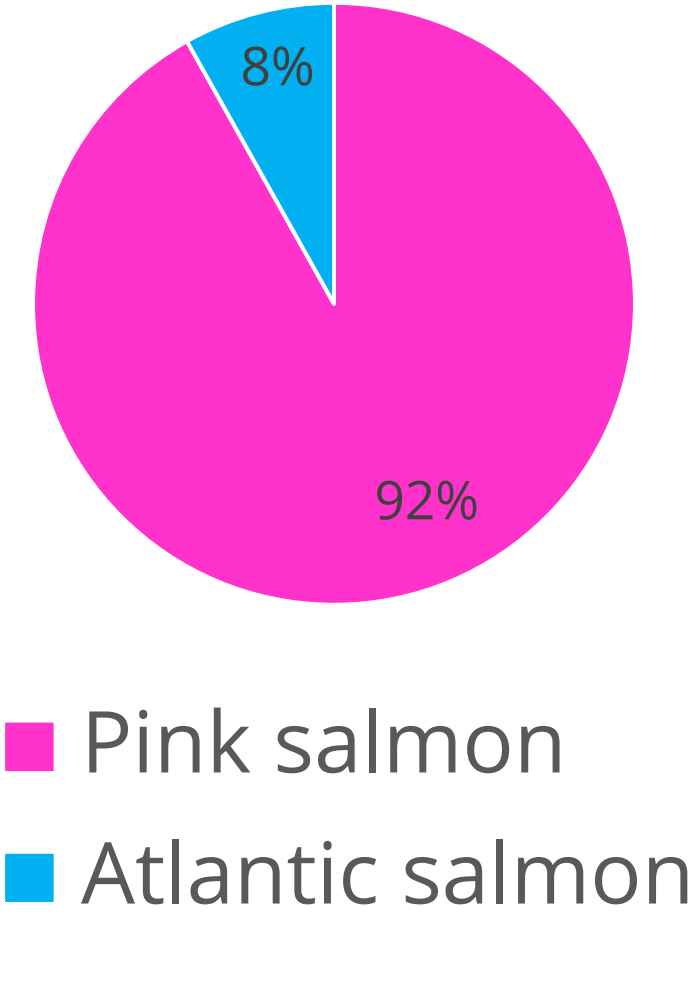
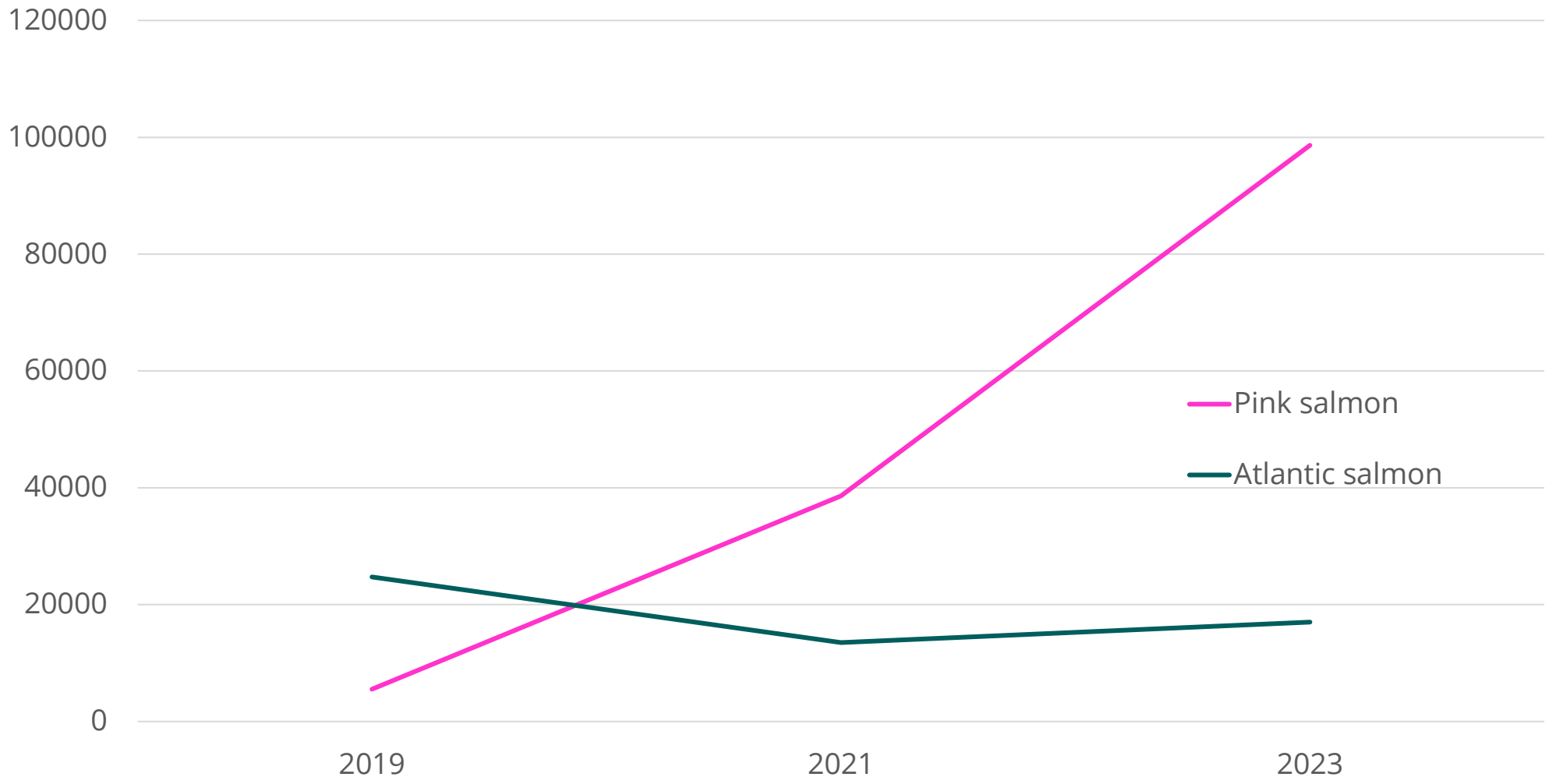
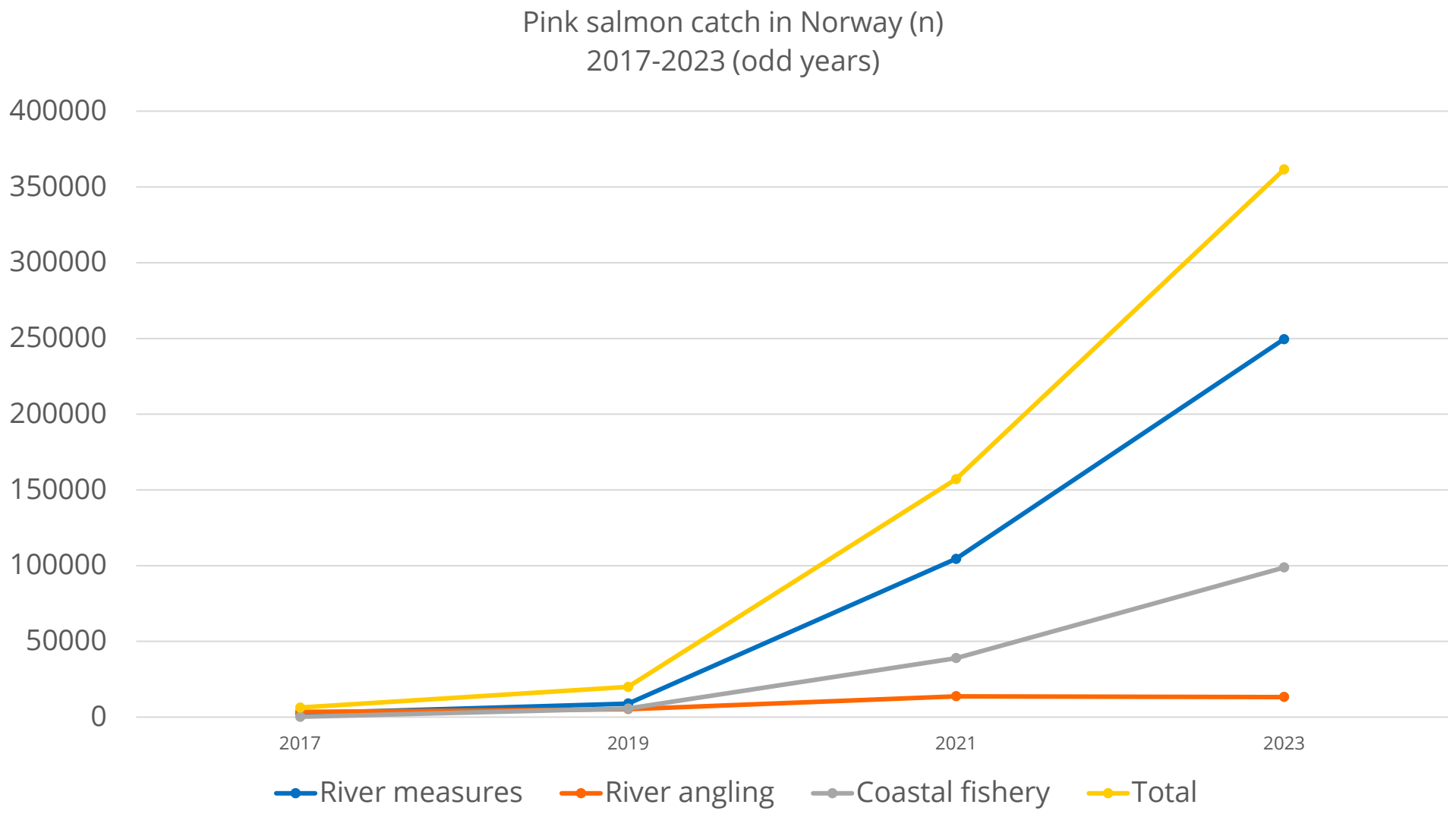


Photo: County Governor of Troms and Finnmark / Malin S. Høstmark

Coastal bag net fishery
Catch in Troms and Finnmark counties (n)
2019 – 2023 (odd years)



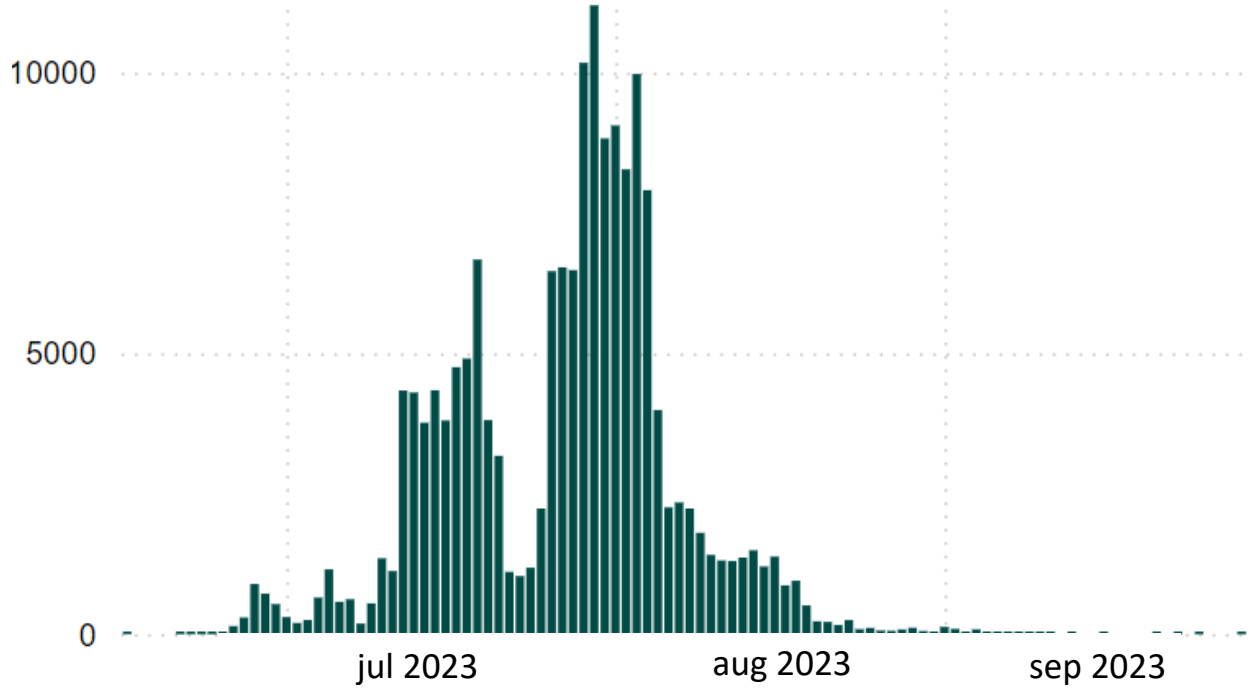
Data from Statistics Norway



Data from Statistics Norway and Norwegian Environment Agency

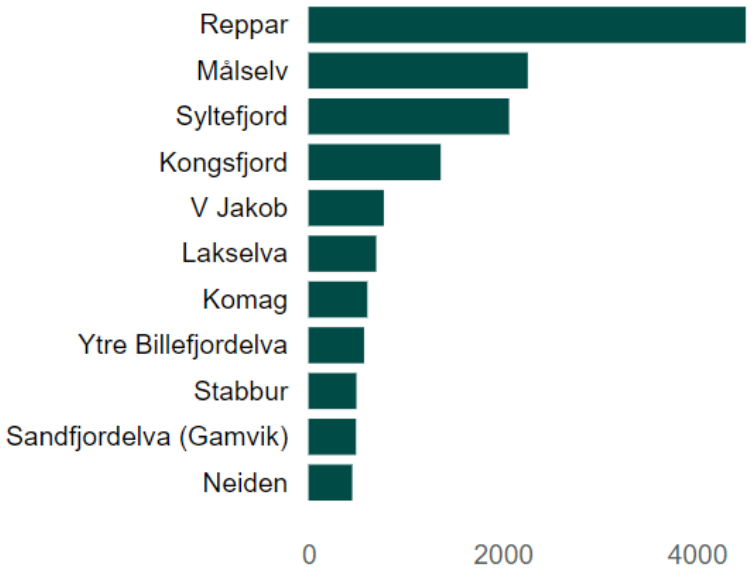
Targeted measures to remove pink salmon

- Targeted measures in 94 rivers
- In total 249 496 pink salmon caught
- 170 293 caught in traps

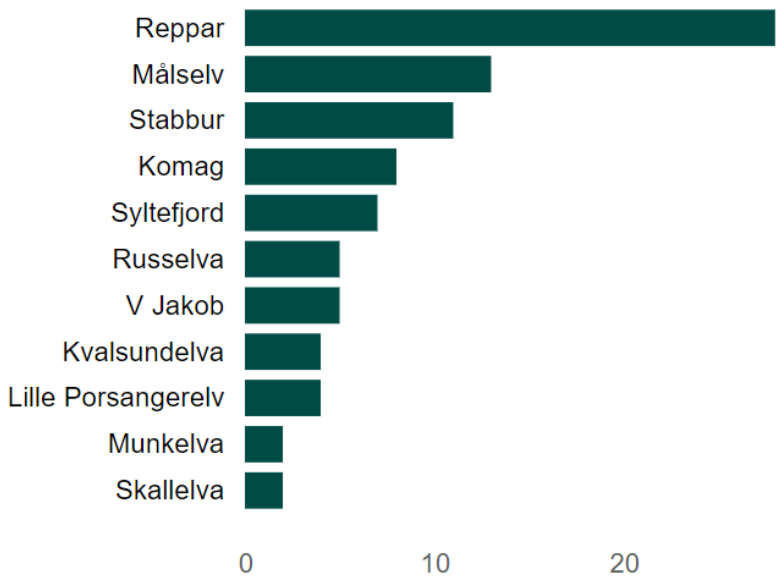


Atlantic salmon caught during removals (top 11 rivers)

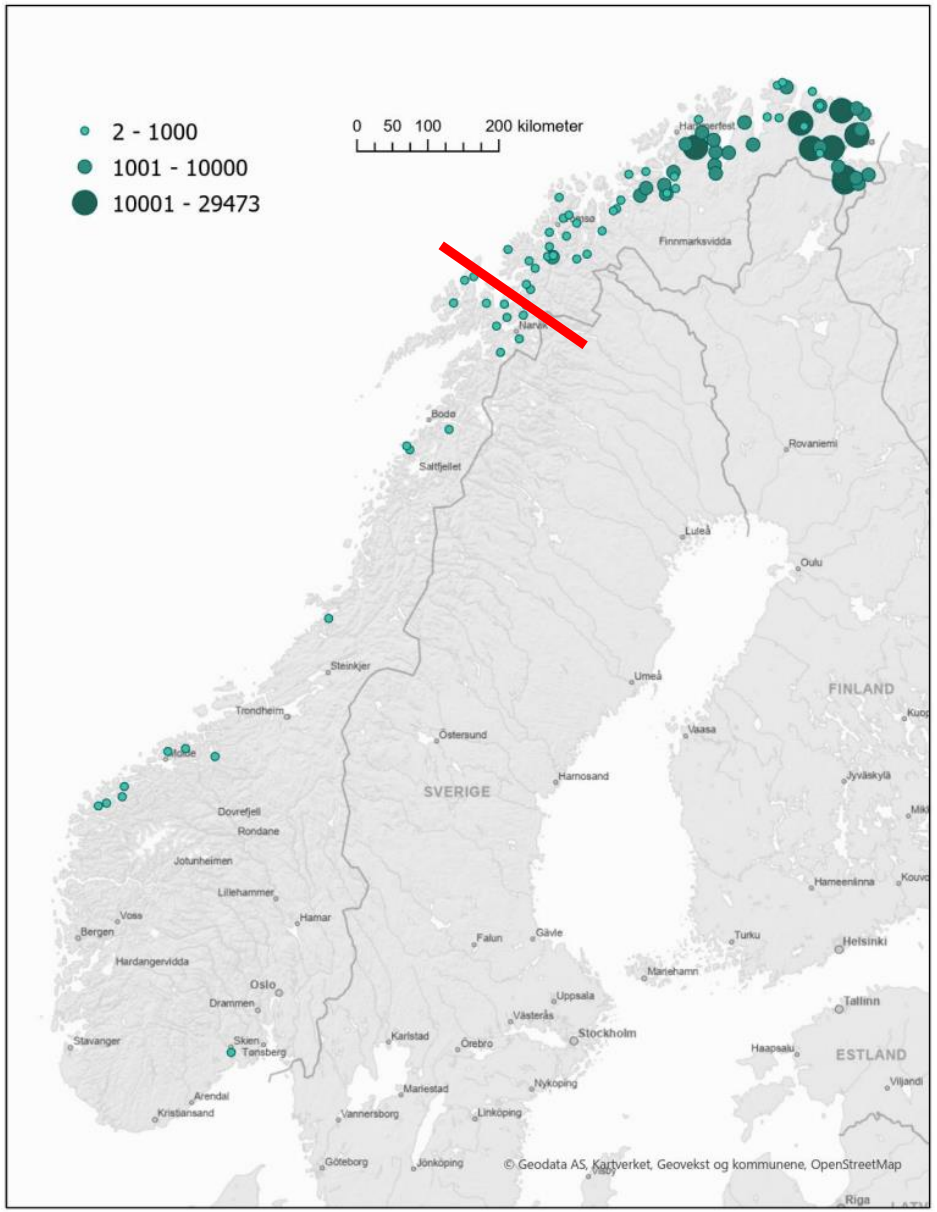
Released



Dead

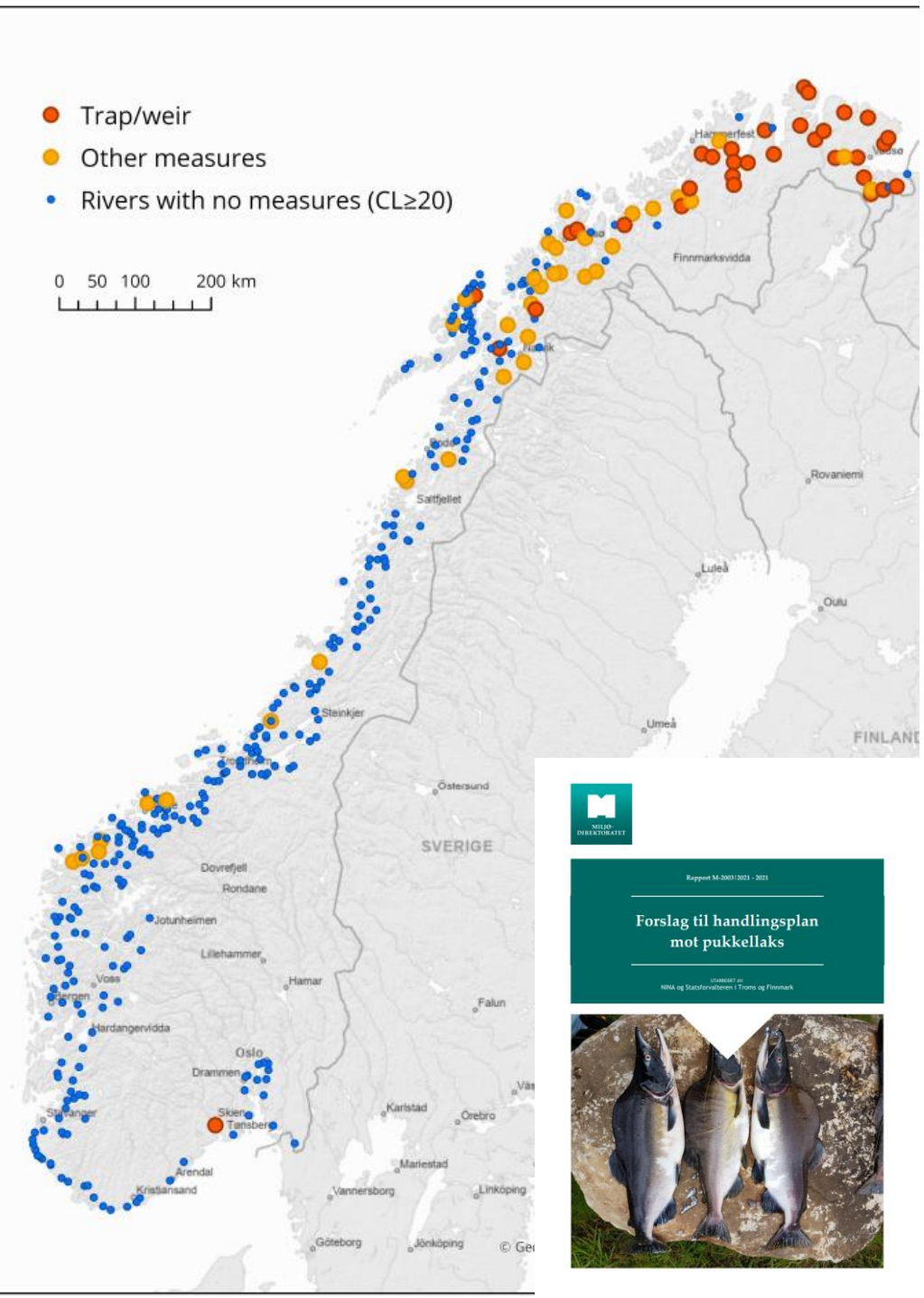


Total loss (n):	101	Caught and killed in angling in the same area (n):	11 980
Total released (n):	18 433	Caught and killed in bag nets in the same area (n):	16 999
		Total (n):	28 979



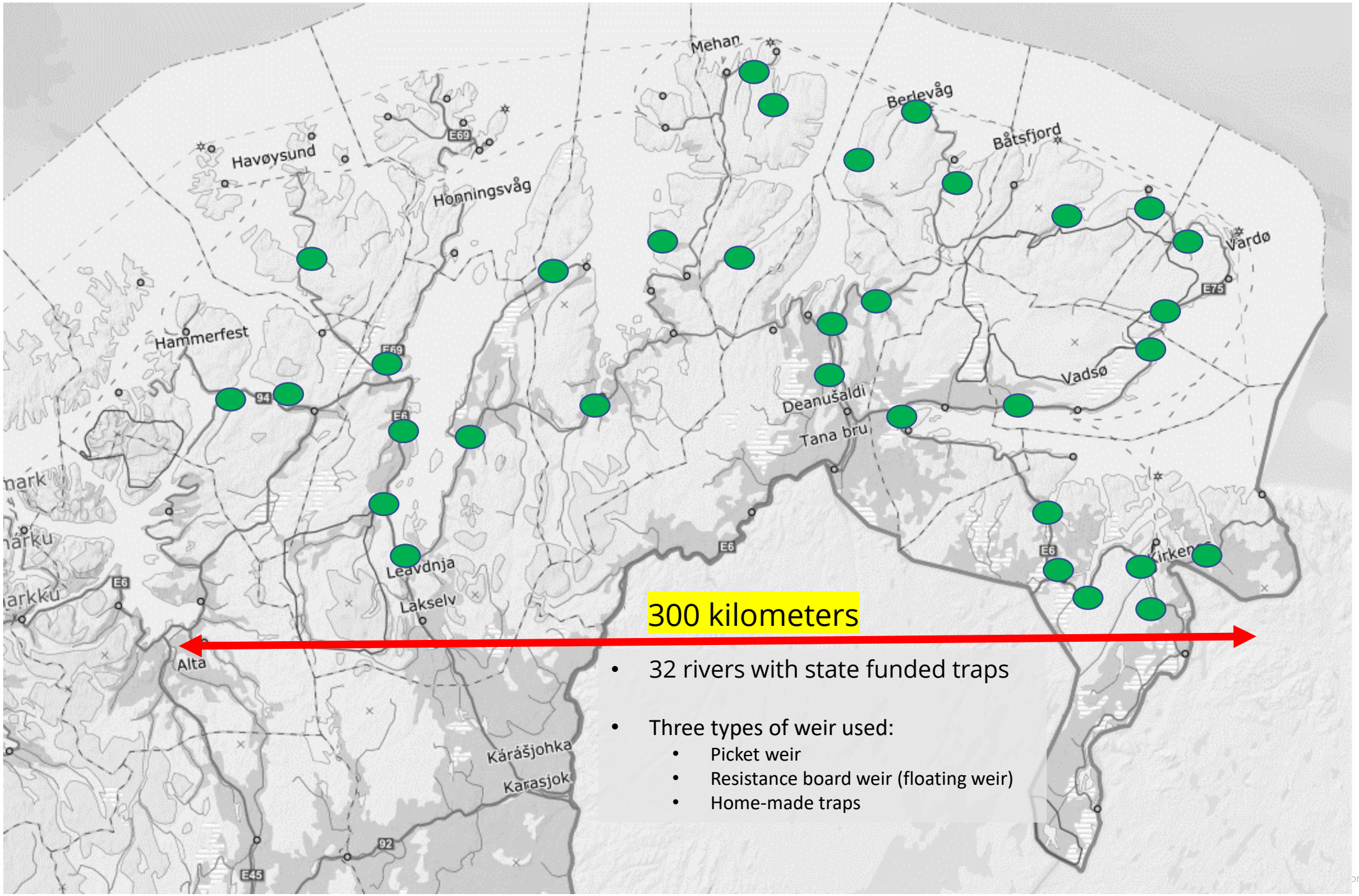
Distribution of the catches

- Highest catches in Finnmark.
- Increase from 2021 to 2023 in both Finnmark county and Troms county.
- No increase in Nordland.



Strategy:

- Physical control of the spawning migration of all fish in all salmon rivers in the target area
- State funded temporary weirs/traps, operated by local anglers' organizations
- Remove all ascending pink salmon, and at the same time release all native fish with minimal harm and delay



- 32 rivers with state funded traps
- Three types of weir used:
  - Picket weir
  - Resistance board weir (floating weir)
  - Home-made traps

Picket weirs

Photo: Eirik Frøiland

Photo: Eirik Frøiland

Picket weirs

Pros:

- Modular design – light weight aluminum components
- Easy to transport and assemble on site
- Loose individual pickets gives tight fit to riverbed
- Space between pickets can be adjusted: 25 or 30 mm

Cons:

- Less robust than resistance board weirs
- Rigid structure – works until it breaks
- Several breakdowns under flood conditions

Resistance board weirs (RBW)

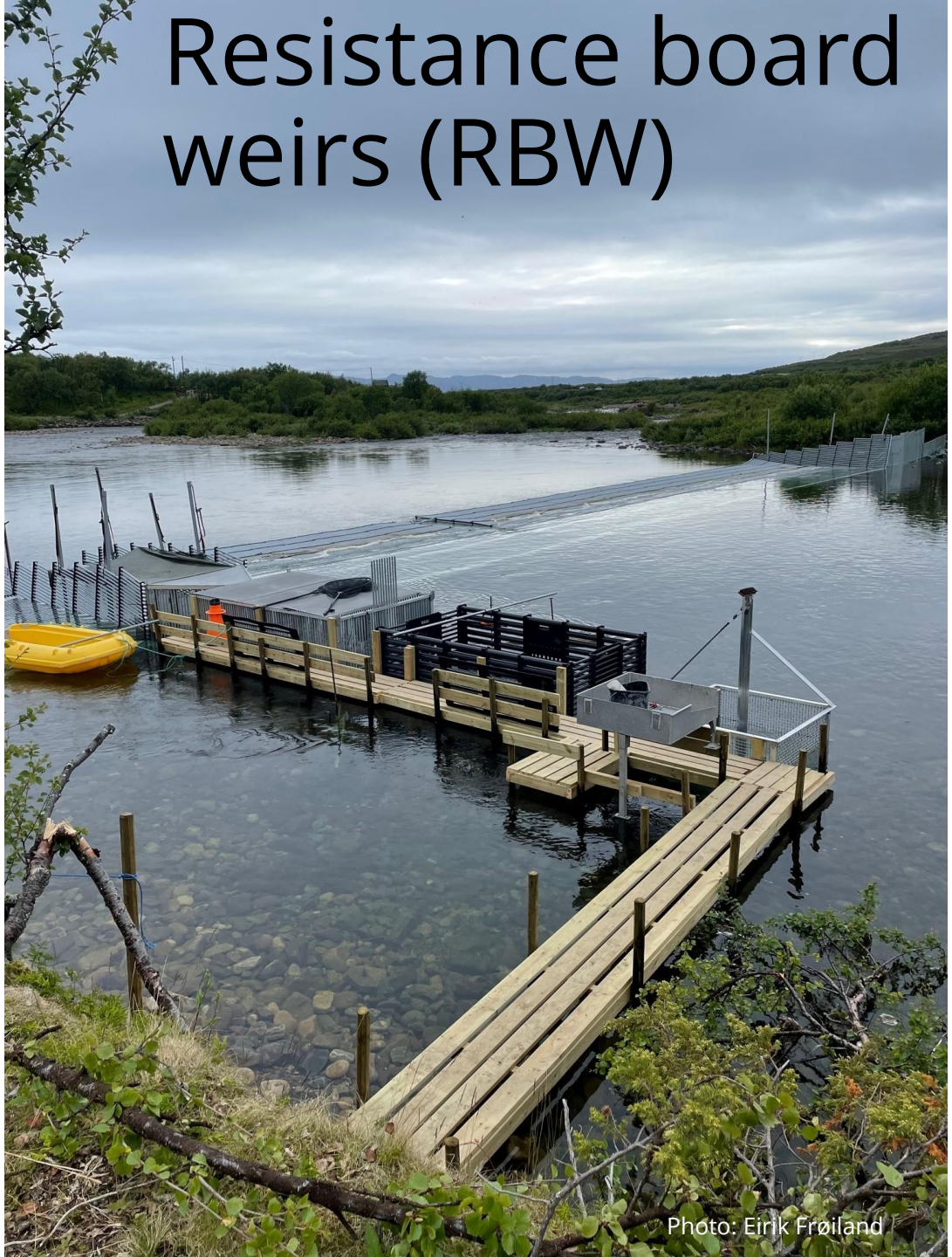
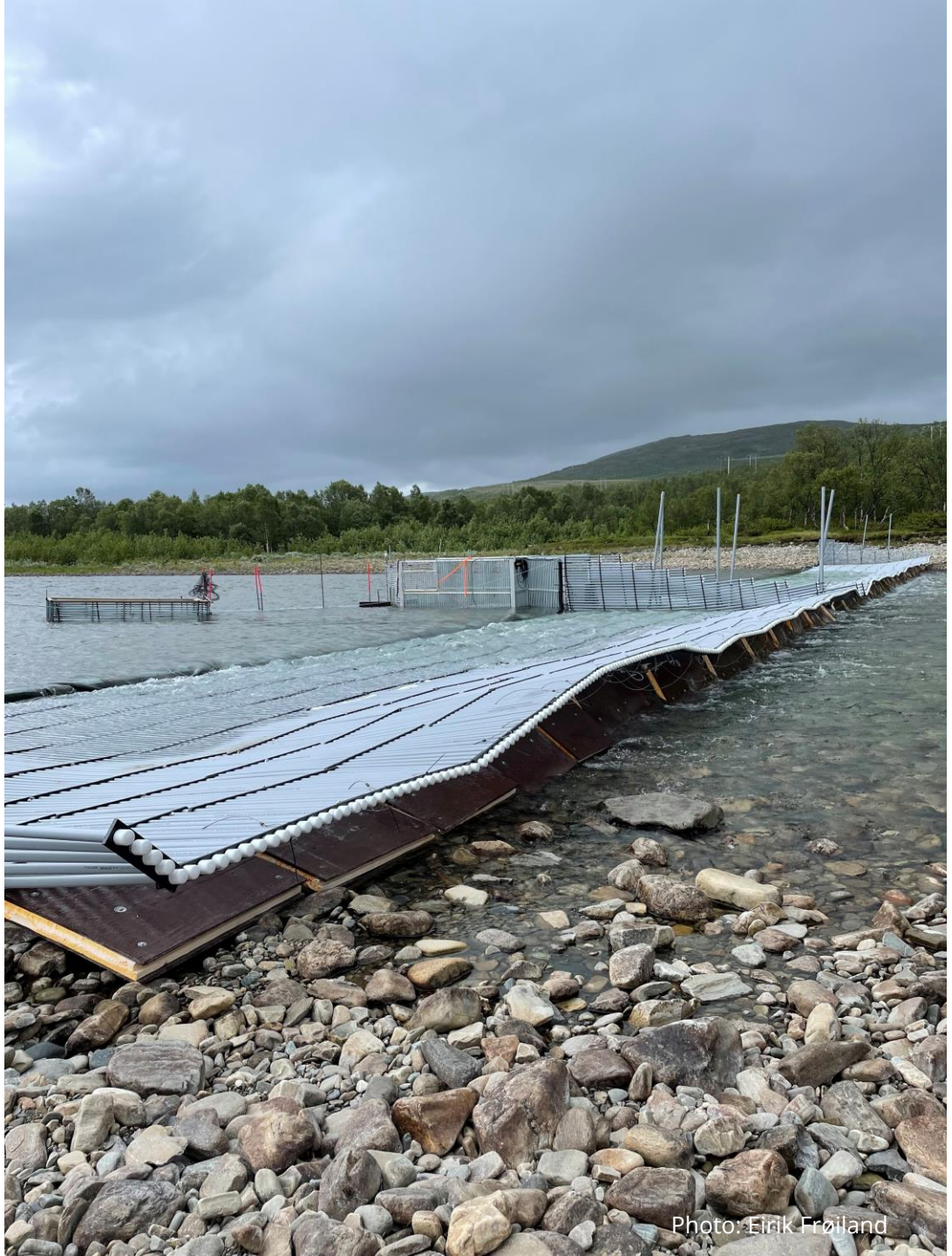


Photo: Eirik Frøiland



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Resistance board weirs (RBW)

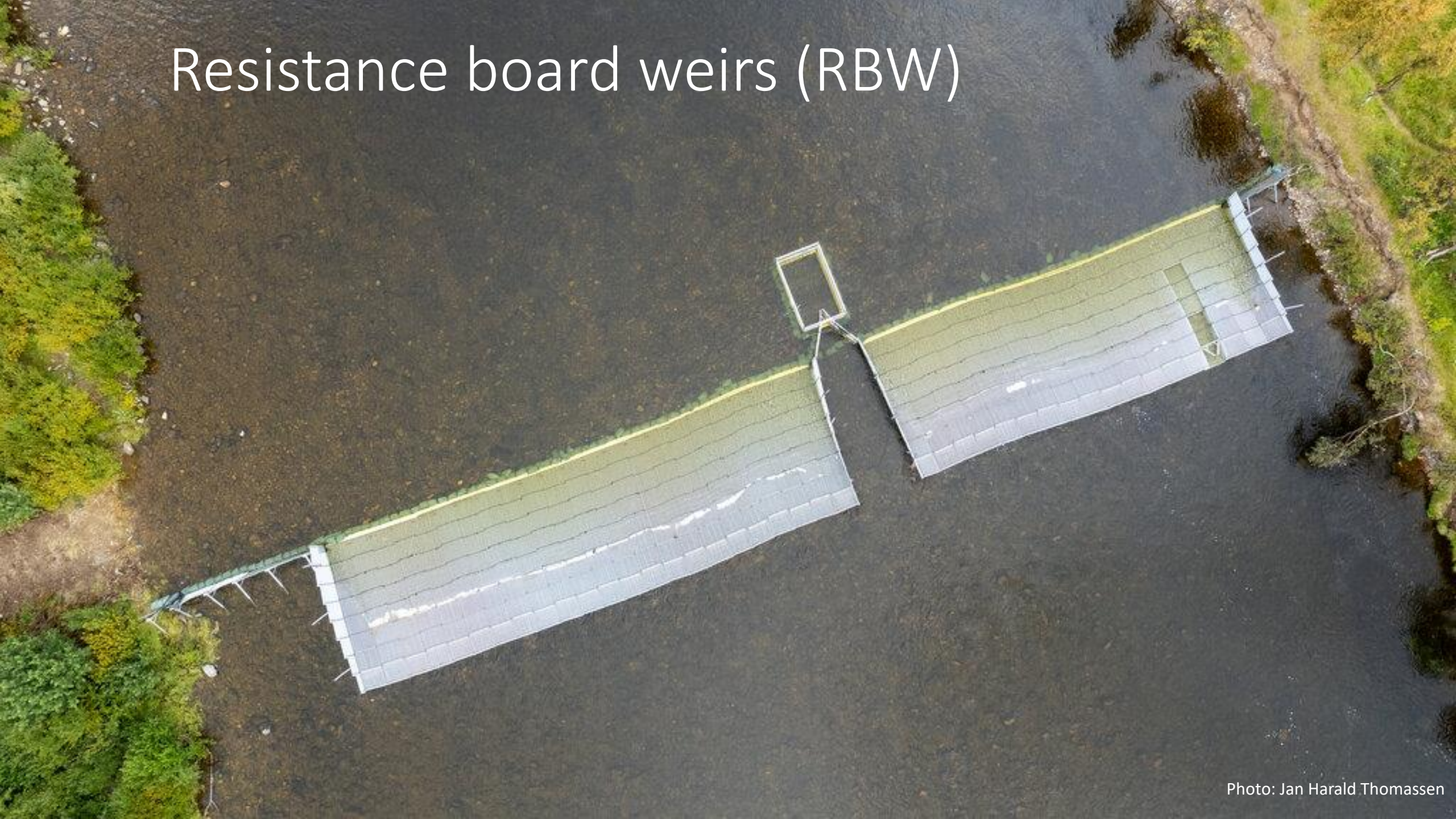

Photo: Jan Harald Thomassen

Resistance board weirs (RBW)

Pros:

- Flexible structure – can survive heavy floods
- Adapts to water level - until a certain point
- Modular design, though larger and heavier modules compared to the picket weirs

Cons:

- More expensive
- Can be more difficult to get tight fit to riverbed
- Anchoring can be a problem, both in too fine or to coarse substrate

Home-made traps

Home-made traps

Pros:

- Simple to build – the local organizations can make one themselves
- Cheap material compared to the other types

Cons:

- Fish can get caught in the net material
- Debris get caught in weir – Regular maintenance and cleaning is required for home-made traps to be functional
- Common that they collapse during flood conditions

Beach seine fishery

- In some of the rivers the pink salmon did not go into the trap
- In these cases, beach seine was used to remove pink salmon
  - Some places it turned out to be very efficient
- *Video from open Facebook group "Syltefjordelva":* https://fb.watch/nLBjGf_n7z/

What about all the dead pink salmon?

- The trapping generates tons of dead fish
  - An unsolved problem in 2021
- Solutions used in 2023:
  - Used as food commercially
  - Ensilage and biogas
  - Donated locally as food, dog food, crab bait
- Preferred solution:
  - Use the fish as food
  - Catches should not be treated as waste

Photo: Eirik Frøiland

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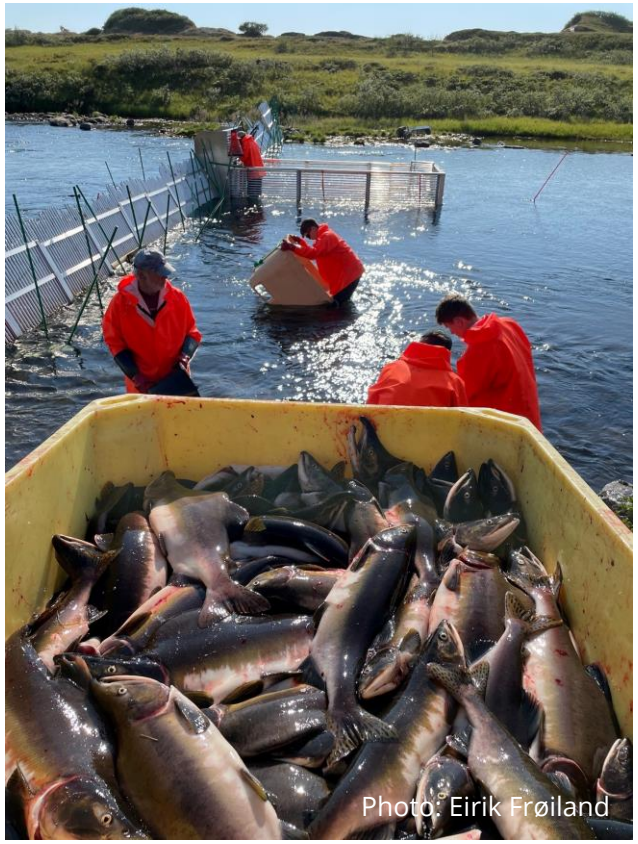
Photo: Eirik Frøiland


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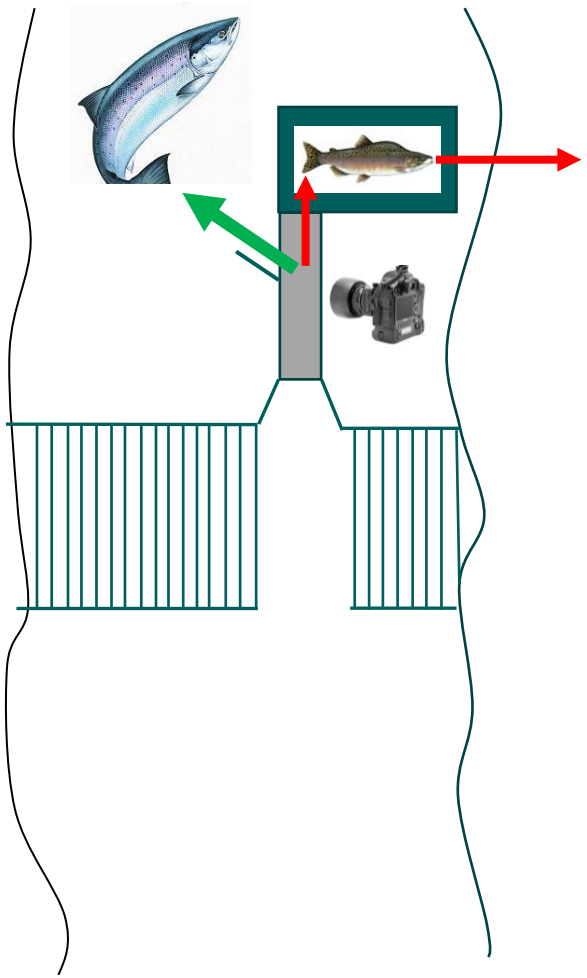
AI project



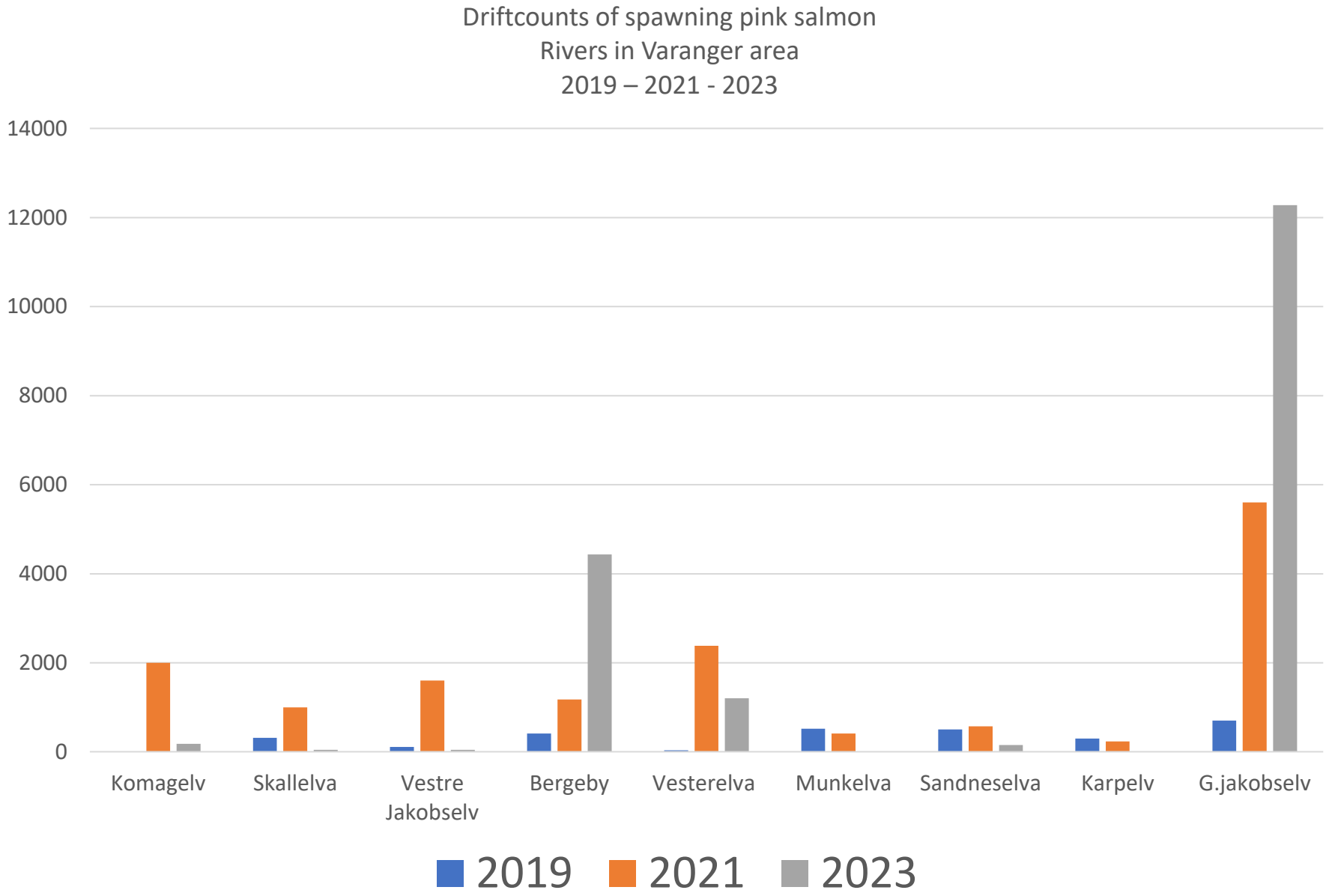
- Funded by Norwegian Research Council and Norwegian Environment Agency.
- Goal is to develop traps with automatic species recognition and sorting of fish.
- Benefits will be reduced delay and contact with the native fish, and more efficient removals of pink salmon.
- 3 different prototypes will be built in 2024 by the companies Huawei, Mohn Technology and Fishbio.
- Field testing in 2025.

Evaluation report – main findings:

- High variation in efficiency of the traps; from less than10% to more than 99% of the pink salmon was stopped and removed.
- Both in small and medium sized rivers it has beed demonstrated that it is possible to remove the pink salmon and at the same time letting the native fish pass.

Driftcounts of pink salmon upstream weirs – Varanger area 2023

River	Pink salmon removed	Pink salmon observed upstream weir	Percentage Removed/observed
Austerelva/Persfjord	1 016	275	79%
Komagelv	7 221	180	98%
Vesterelva	28 901	1 200	96%
Karpelv	3 972	3	>99%
Sandneselva	1 606	150	92%
Munkelva	14 694	0	100%
Sandfjordelva	1 405	860	62%
Vestre Jakobselv	18 122	44	>99%
Kongsfjord	5 343	5	>99%
Skallelva	12 401	46	>99%
Total	**94 681**	**2 763**	**97%**
Reference river – no measures (border river to Russia):			
G.Jakobselv – Norwegian side	0	12 280	0%

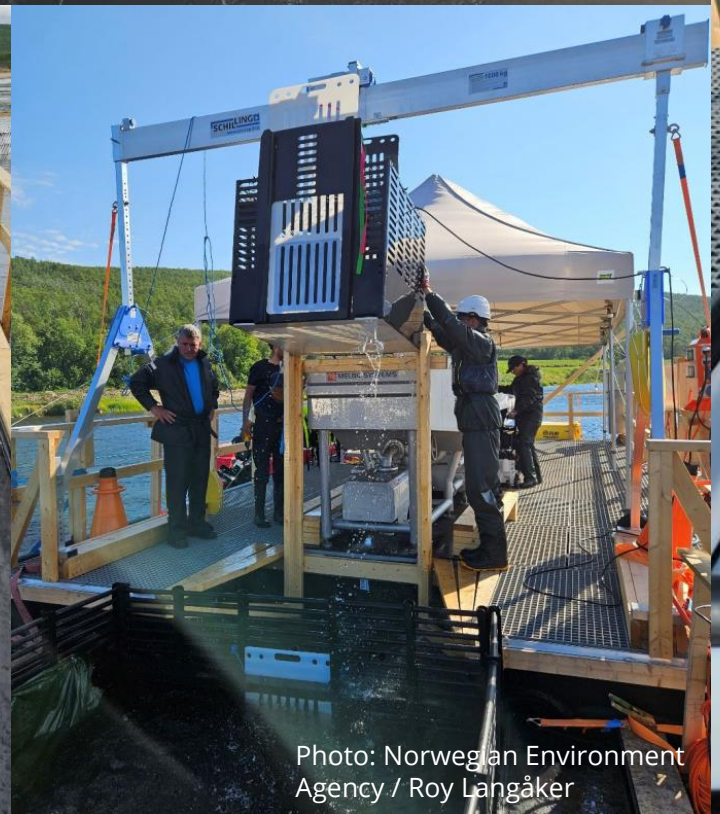

Driftcounts of spawning pink salmon
Rivers in Varanger area
2019 – 2021 - 2023
14000
12000
10000
8000
6000
4000
2000
0
Komagelv
Skallelva
Vestre Jakobselv
Bergeby
Vesterelva
Munkelva
Sandneselva
Karpelv
G.jakobselv
2019
2021
2023

Evaluation report – main findings:

- High variation in efficiency of the traps; from less than10% to more than 99% of the pink salmon was stopped and removed.
- Both in small and medium sized rivers it has beed demonstrated that it is possible to remove the pink salmon and at the same time letting the native fish pass.
- Smolt seem to pass through the fences with little delay, but more data is needed.
- Kelts have mostly left the rivers prior to installation of weirs, but those who haven’t are held back. Downstream chutes should be developed.
- In all fjord areas, one or more rivers had high number of spawners.
- Especially the largest rivers had low efficiency of the measures and substantial spawning.

Photo: Joacim Henriksen

Photo: Norwegian Environment Agency / Roy Langåker



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- In all fjord areas, one or more rivers had high number of spawners.
- Especially the largest rivers had low efficiency of the measures and substantial spawning.
- The design of the weirs and trap boxes can still be improved to minimize risk of injuries on native fish.

Juvenile survey in May 2024




Photos: County Governor of Troms and Finnmark / Malin S. Høstmark

Even-year stocks

- There will be monitoring activities in several rivers in 2024 to detect the size and development of even-year stocks of pink salmon.
  - Video and snorkeling/driftcounting.
- So far the numbers are very low.

Photos: Mohn Techology

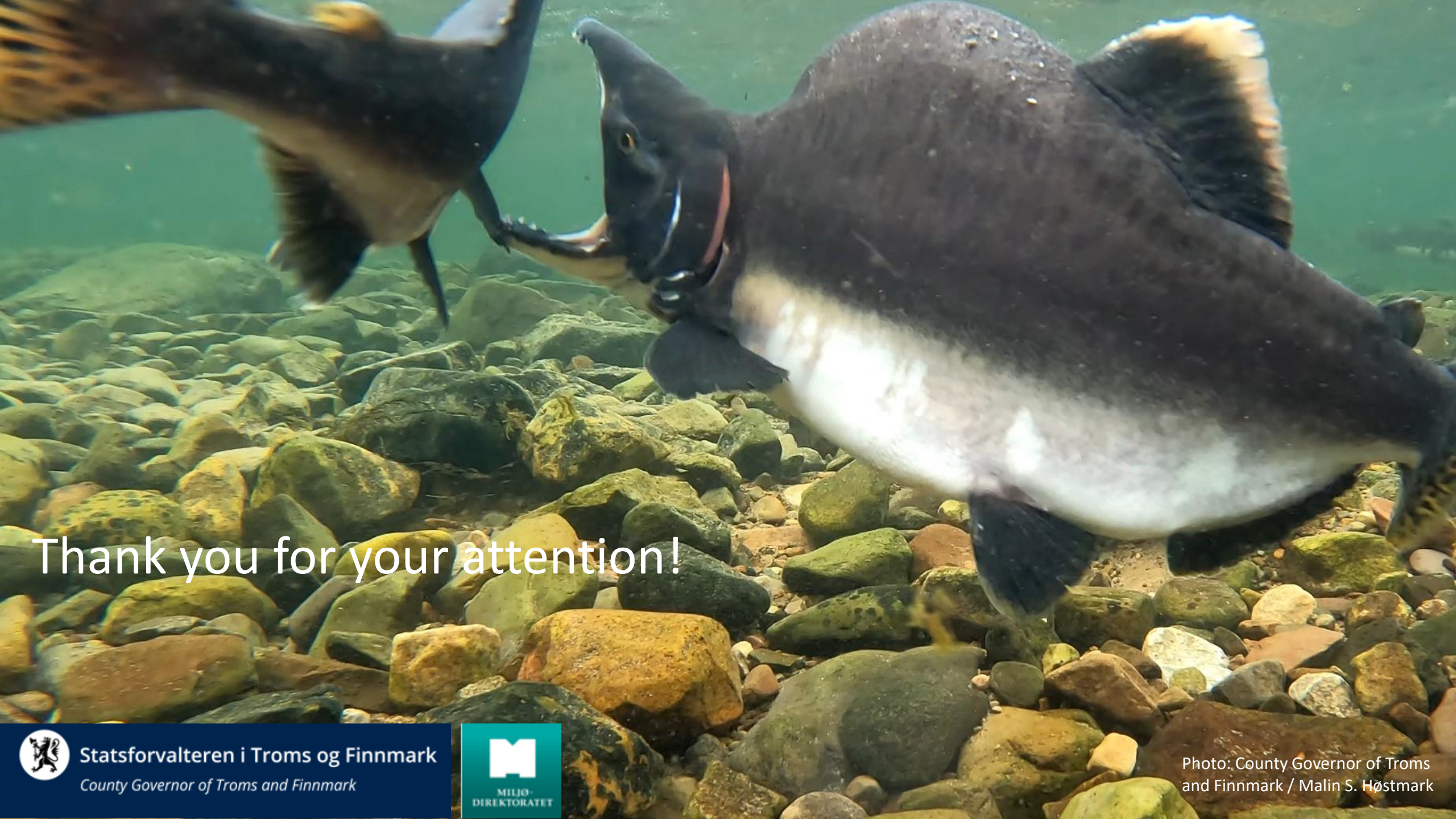
Photo: County Governor of Troms and Finnmark / Malin S. Høstmark

Conclusion

- We will stick with our strategy.
- We need to improve and develop weirs and techniques, especially for the largest rivers.
- Positive signs on singel river level, but large scale effects of the measures are yet to be shown.
- There is no alternative workforce – sufficient funding for the local landowners and angling clubs to pay the staff at the weirs is crucial.
- With a good logistical plan we can handle the catch and even make use of it.

Our success or failure in controlling pink salmon stocks can impact rivers in all North Atlantic countries

Photos: County Governor of Troms and Finnmark / Malin S. Høstmark



Thank you for your attention!

Statsforvalteren i Troms og Finnmark
County Governor of Troms and Finnmark

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Photo: County Governor of Troms and Finnmark / Malin S. Høstmark