

An underwater photograph showing a large, dense school of Atlantic salmon swimming in greenish, slightly murky water. The fish are silvery with dark spots and are oriented in various directions. In the background, a dark vertical structure, possibly a part of a fish farm or research facility, is visible. The overall scene conveys a sense of a large, active fish population.

Social enrichment for Atlantic salmon

Enrich Fish task 2.1.

Welfare aspects of group size

- Salmon are territorial in small groups, but schooling in large groups
- Small groups should give more damages and higher stress levels, at least for subdominant fish
- Which group size/density is large enough?

3 Rs

- Reduction: As few fish as possible
- Refinement: Optimal environment
- Is few fish optimal?
 - Welfare
 - Relevance (a 4th R)

Find a balance between «Reduction» and «Refinement»

Three experiments

- Different behaviour at different stages
- Therefore the experiment must be made with all stages

- Pre-smolts (50 g)



- Smolts (100 g)



- Post-smolts (1000 g)

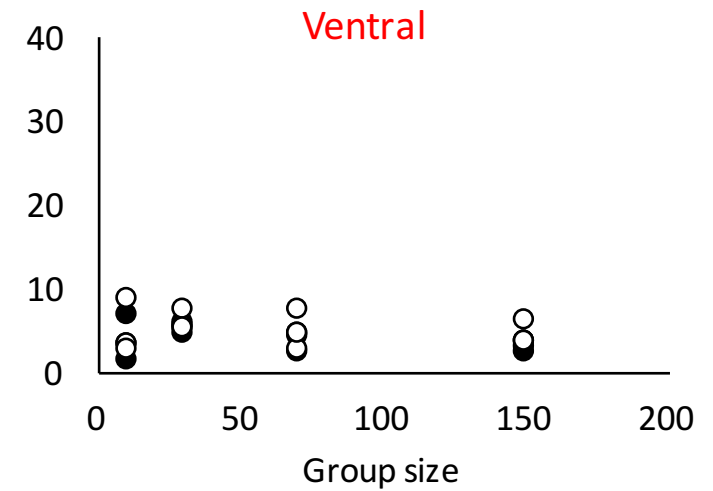
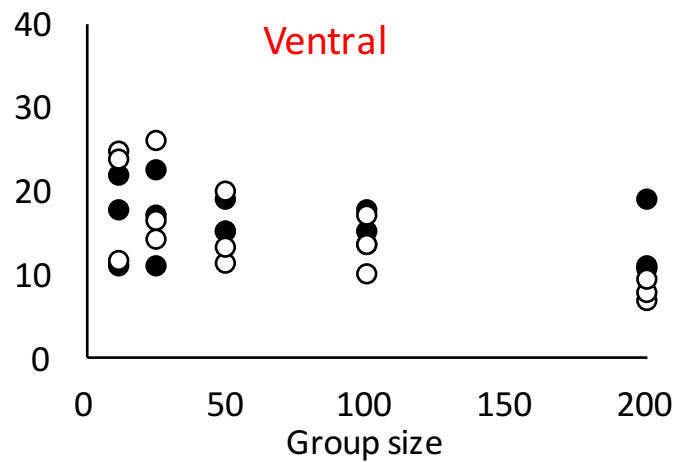
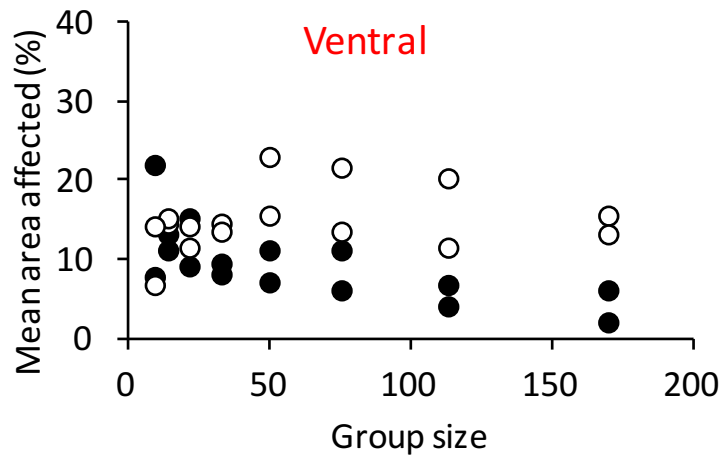
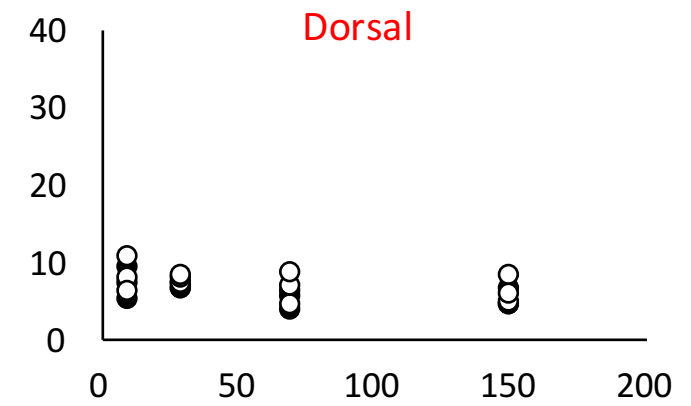
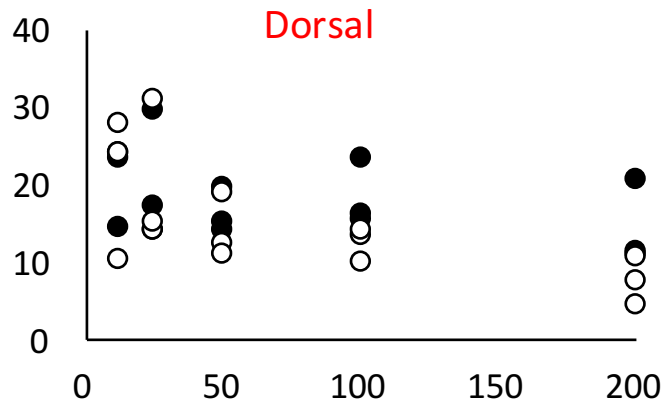
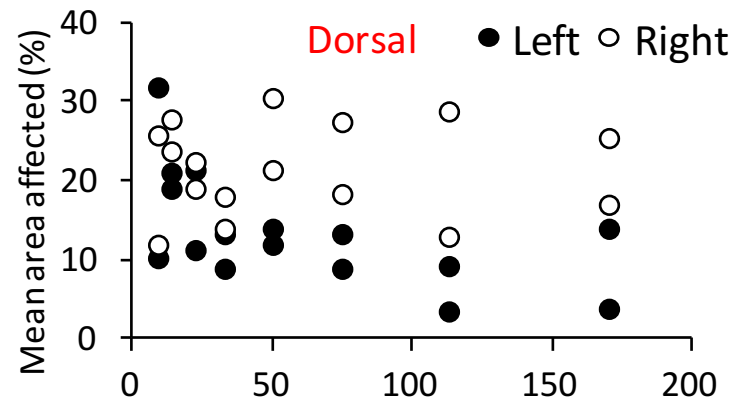


Scale loss

Pre-smolts

Smolts

Post-smolts



Fin erosion

Pre-smolts

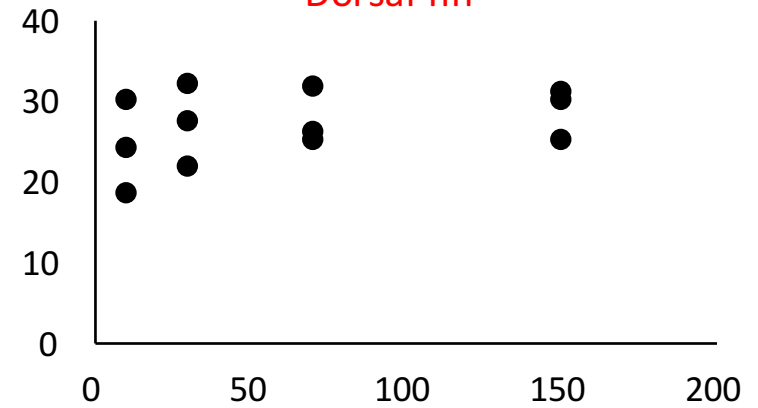
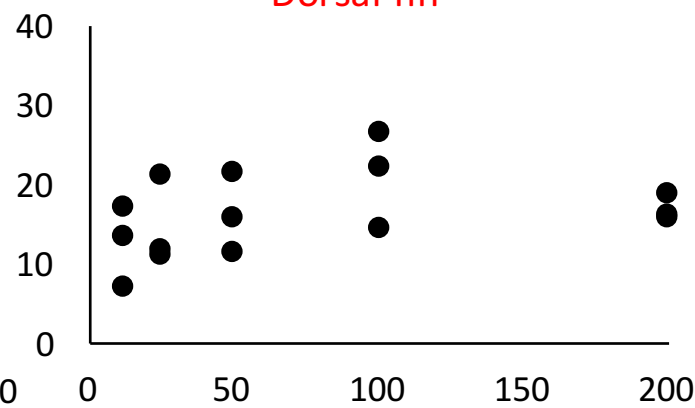
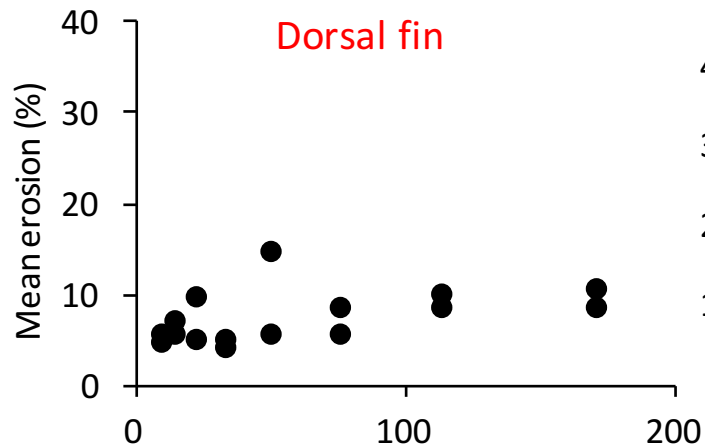
Smolts

Post-smolts

Dorsal fin

Dorsal fin

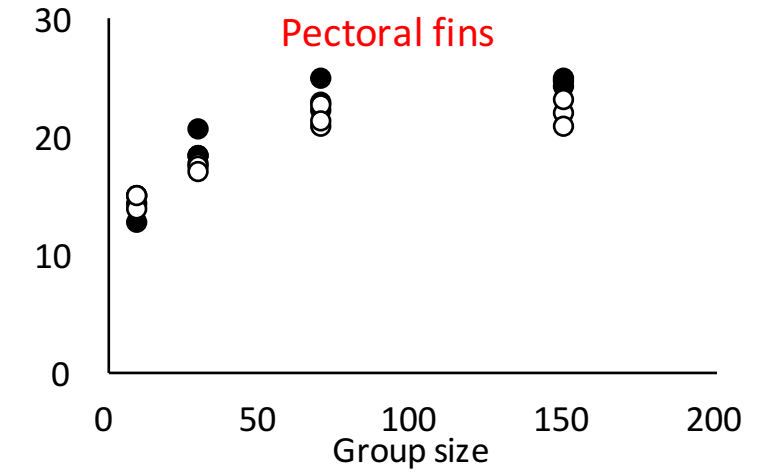
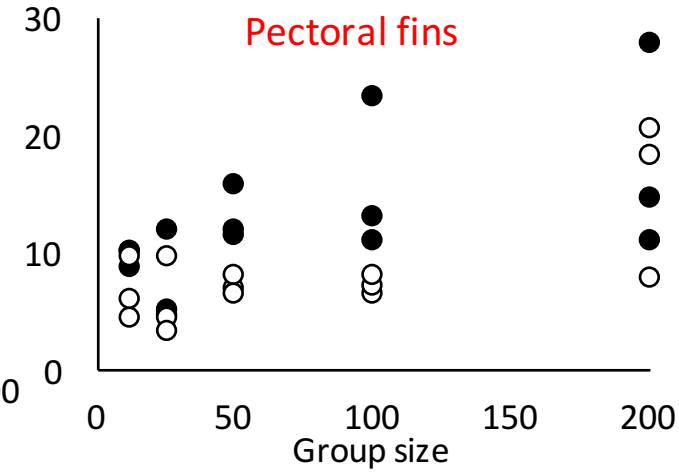
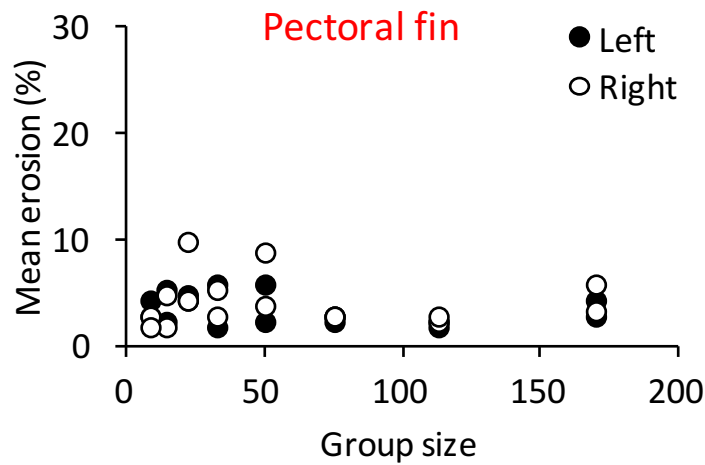
Dorsal fin



Pectoral fin

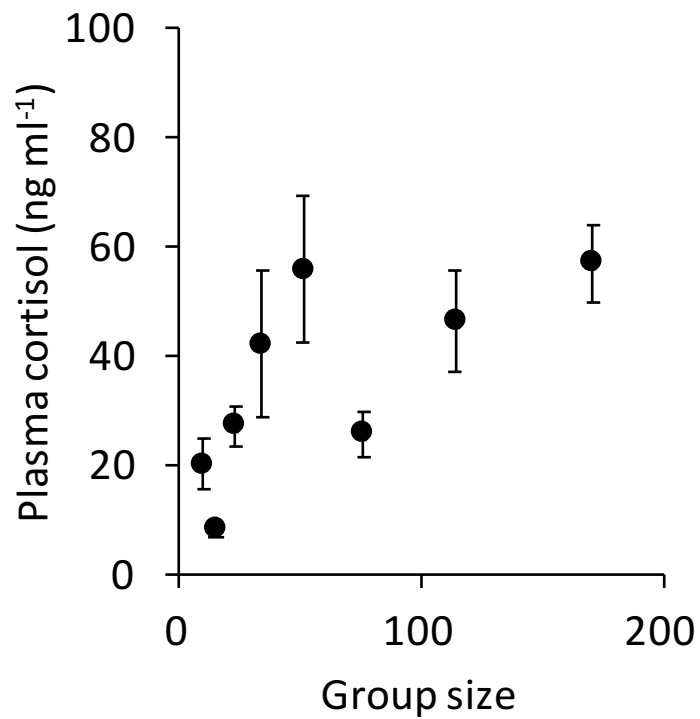
Pectoral fins

Pectoral fins

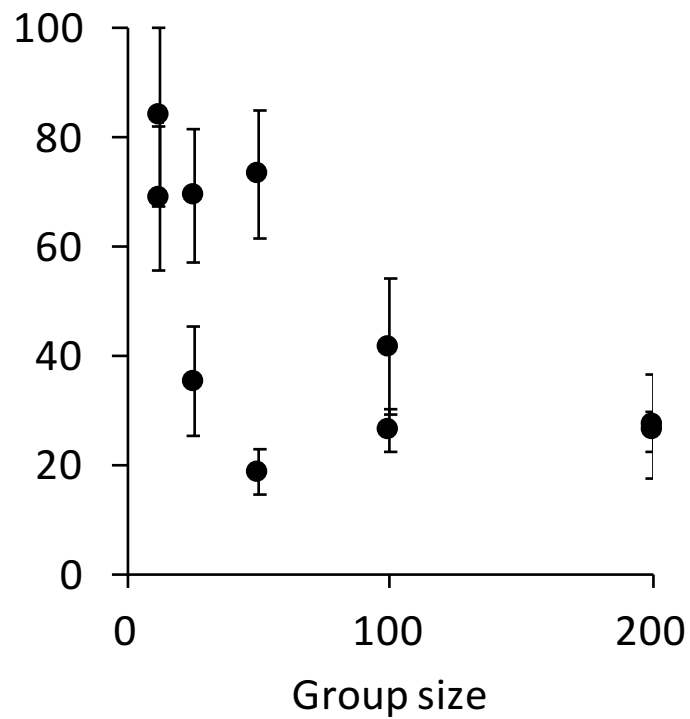


Baseline plasma cortisol

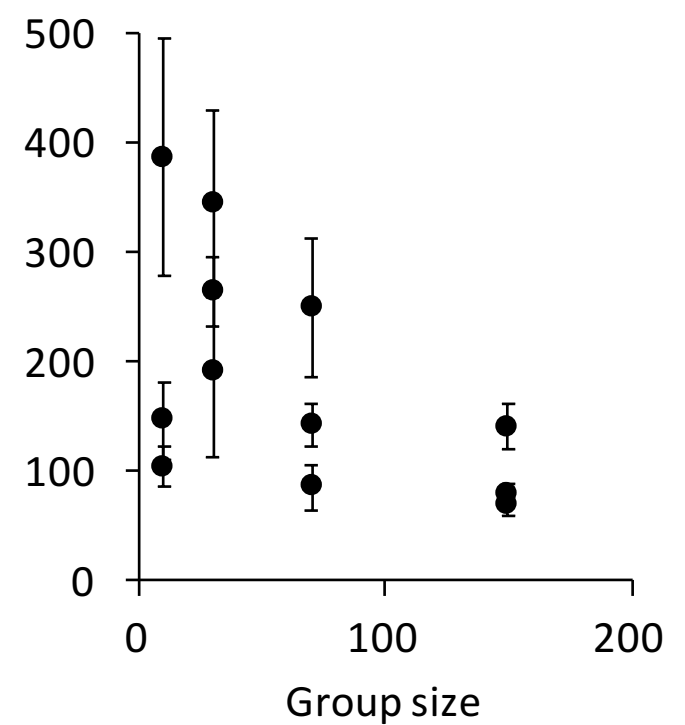
Pre-smolts



Smolts

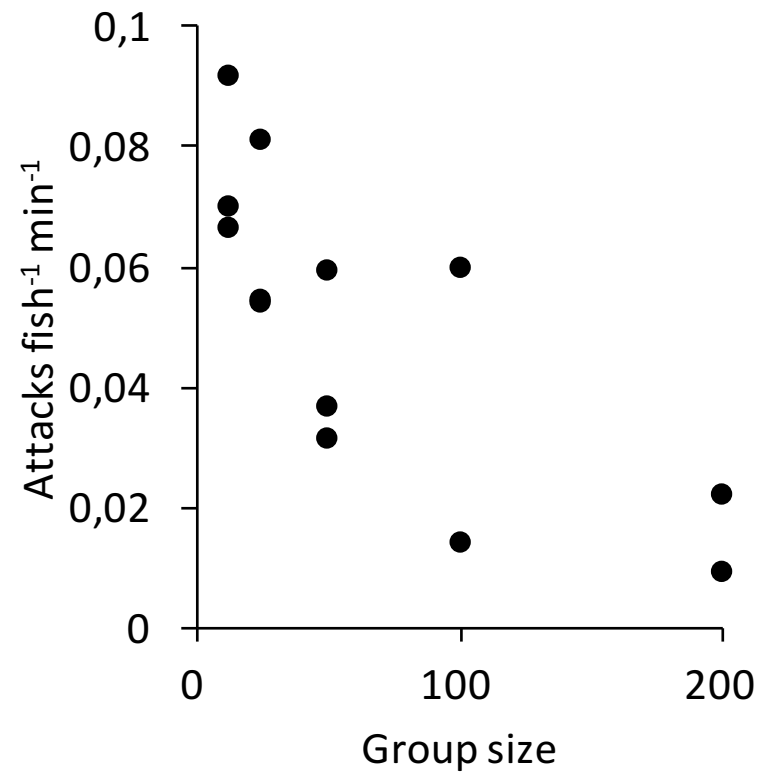


Post-smolts



Aggression

Smolts



Summary

- Scale loss decreases with group size
- Erosion of pectoral fins increases with group size (smolts and post-smolts)
- Baseline plasma cortisol increases with group size in pre-smolts, but decreases with group size in smolts and post-smolts
- Aggression level decreases with group size (in smolts)
- Generally less between-tank variation in the larger groups