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

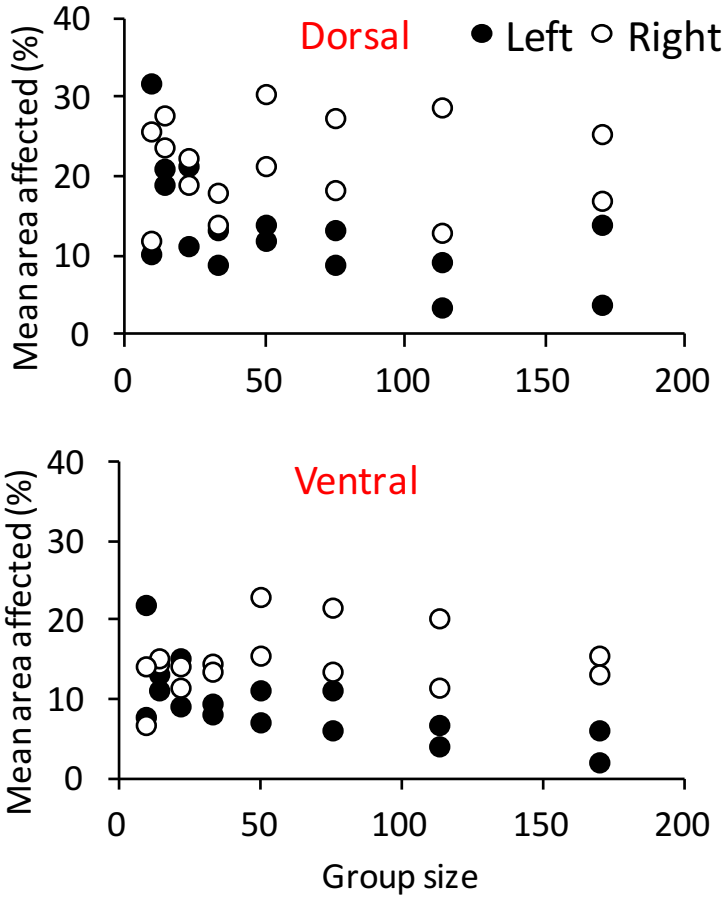
- Pre-smolts (50 g)

- Smolts (100 g)

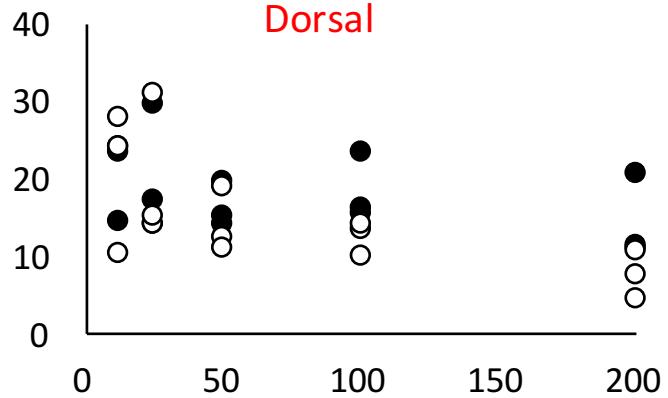
- Post-smolts (1000 g)

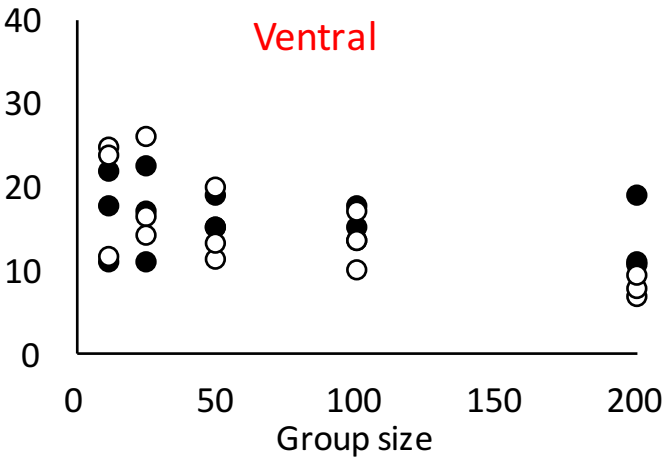
Scale loss

Pre-smolts

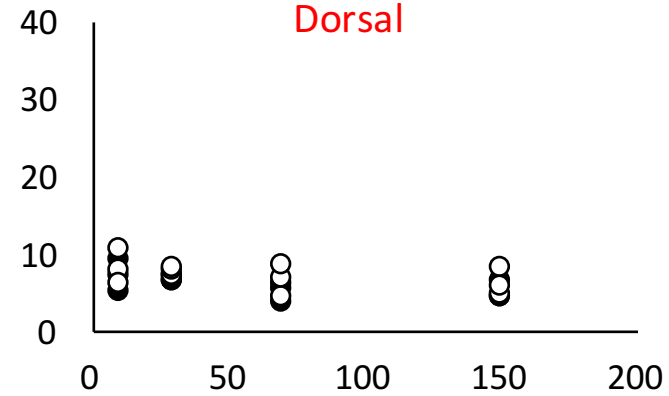


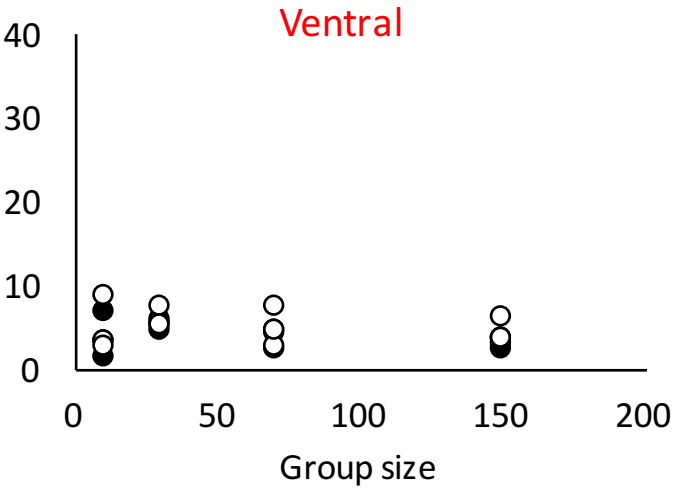
Smolts



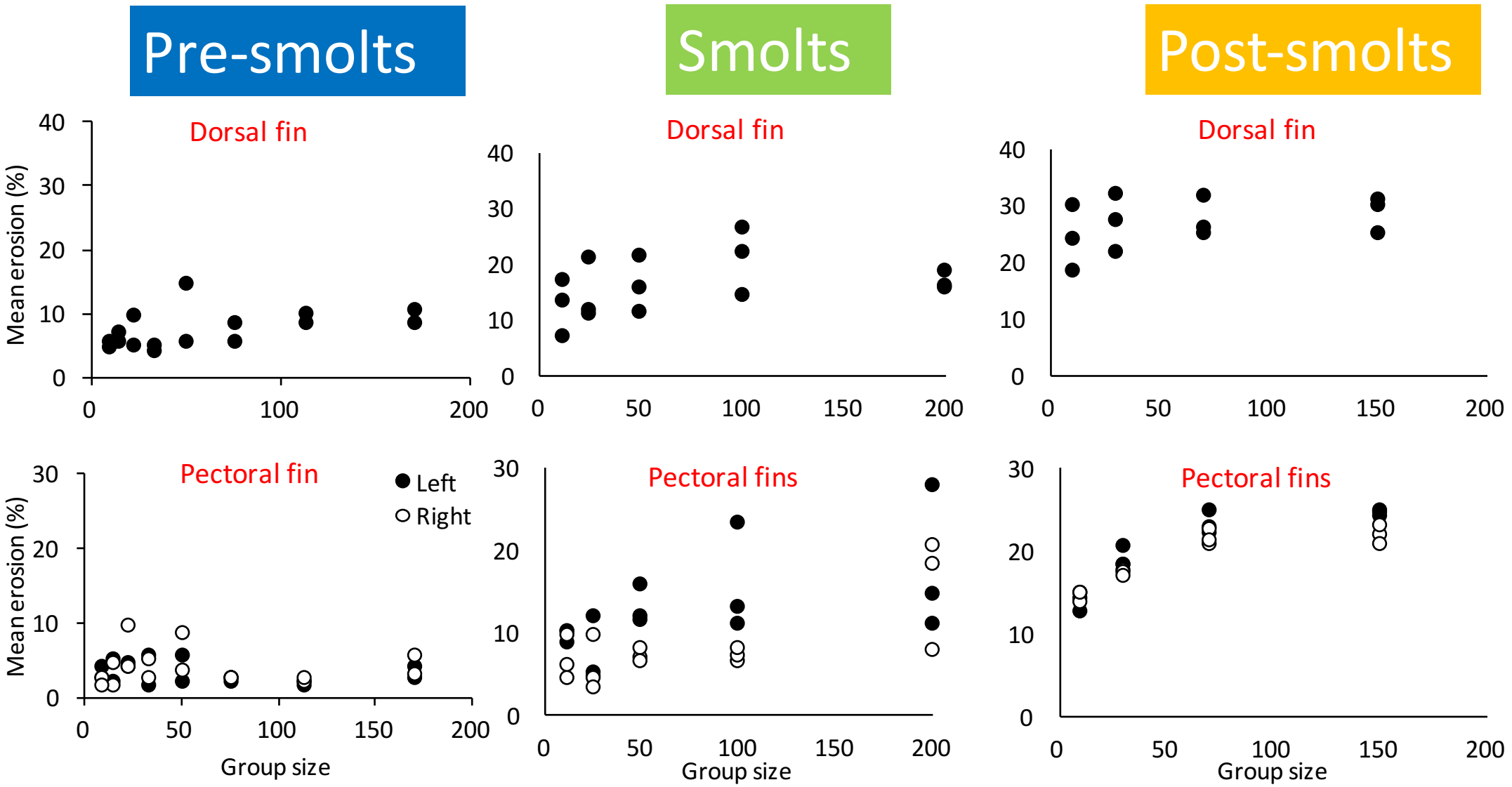


Post-smolts

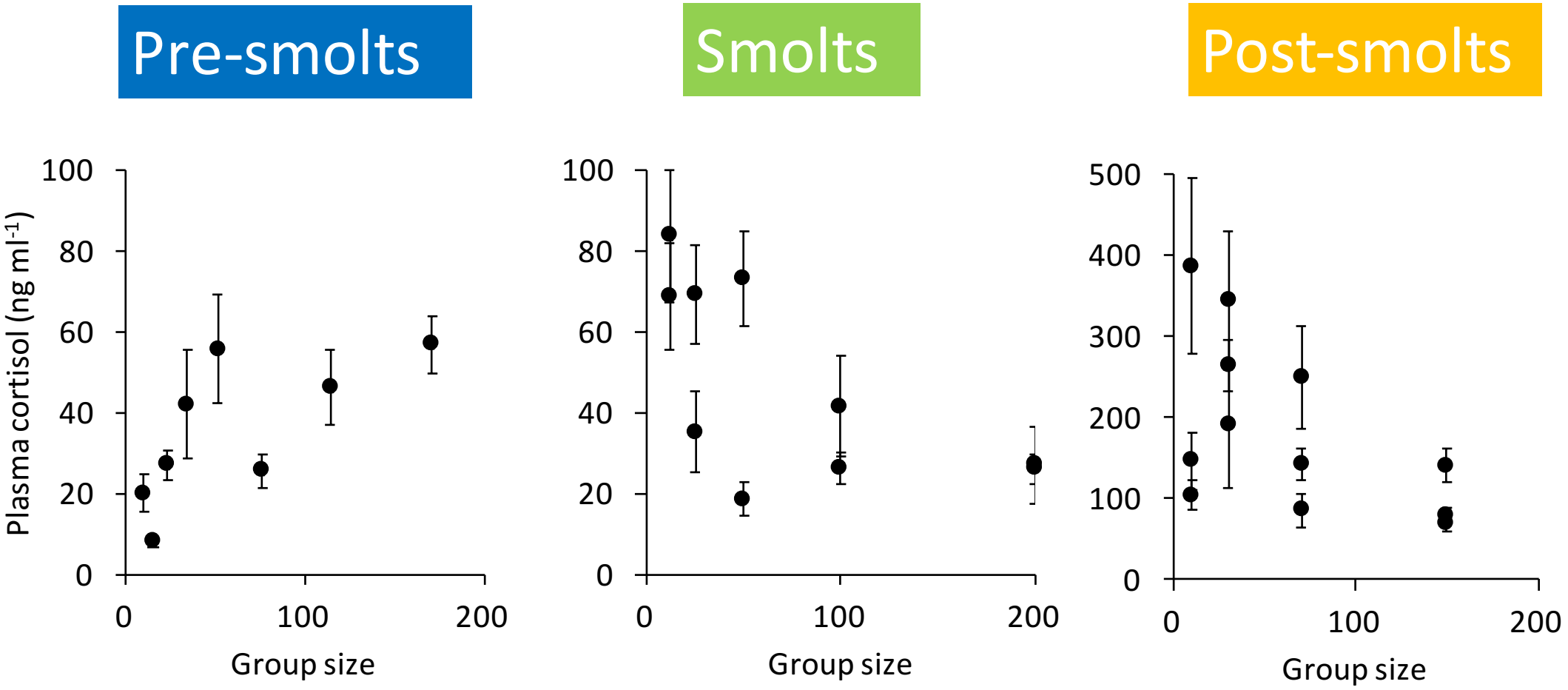




Fin erosion

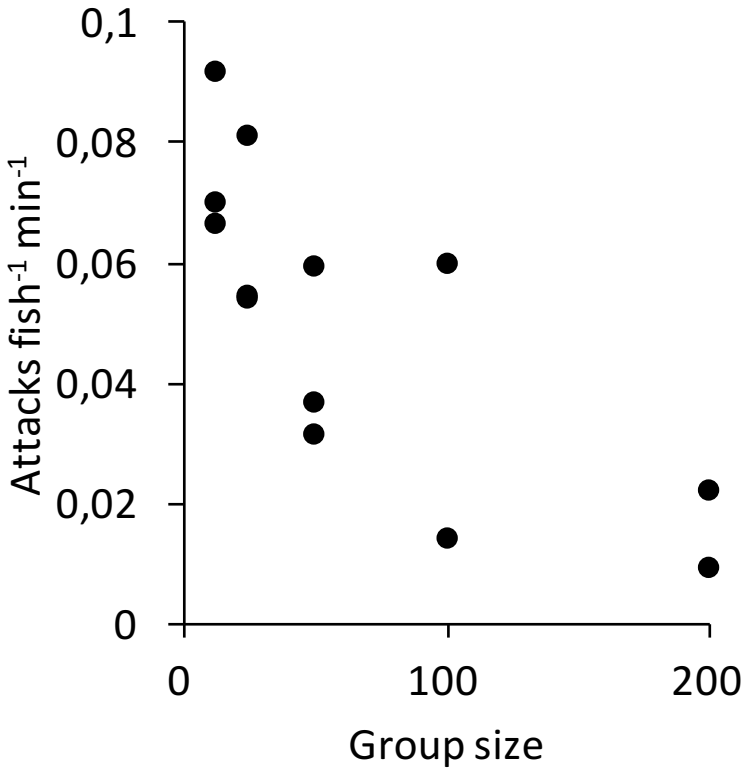

Pre-smolts
Smolts
Post-smolts
Dorsal fin
Dorsal fin
Dorsal fin
Pectoral fin
Left
Right
Pectoral fins
Pectoral fins
Mean erosion (%)
Mean erosion (%)
Group size
Group size
Group size
0
10
20
30
40
0
50
100
150
200

Baseline plasma cortisol



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