Migration and survival of Atlantic salmon smolts in a river and a fjord: the effects of different release strategies from a hatchery

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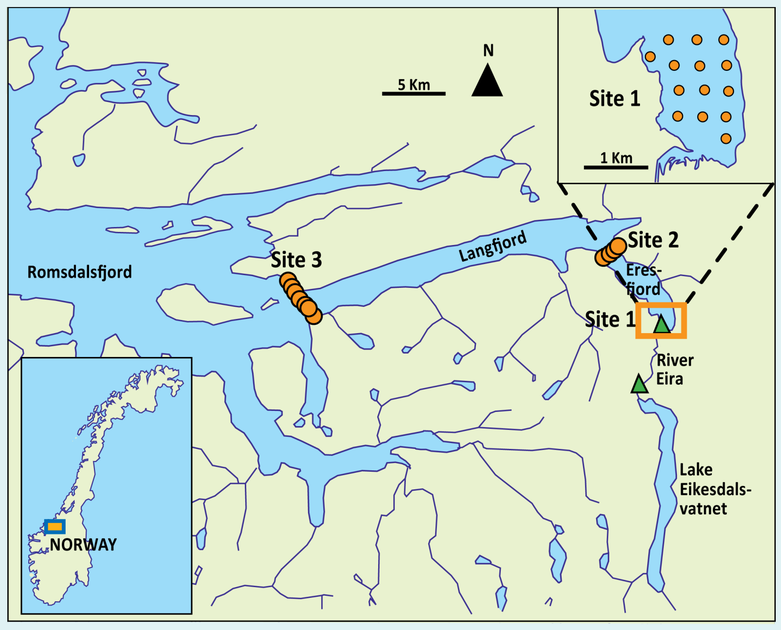

Aim and methods

Declines in wild Atlantic salmon populations have led to the widespread release of hatchery-reared salmon smolts as a mitigative strategy.

Aim of study:

- **To compare the success of three smolt release strategies.**

Hatchery-reared acoustically tagged smolts were released in the river mouth (one group, n = 33) and 9 km upriver (two groups, n = 66) ( ). The smolts were recorded by receivers (●) at three sites in the fjord. Depth tags were used to distinguish between live smolts and tags being in the stomach of predators that had eaten tagged smolts.

Results

A large proportion of the smolts were lost in the river (64%), likely due to predation or reduced motivation to migrate.

The group exposed to a longer transport time and direct release in the river did not differ in survival or migration from the group allowed to acclimate for 48 h in a river net pen.

Mortality in the marine environment did not differ among groups. Marine mortality was 37% during the first 2 km, with at least 25% due to predation by marine fishes. The total marine mortality over 37 km was 68%.

Conclusions

The large immediate loss of smolts after release in the river, emphasises the need for improving smolt production and riverine release strategies.

Hatchery-reared smolts (pictured left, top) are often much larger and have a higher fat content than wild smolts from the same stock (pictured left, bottom). Hatchery regimes producing a more ”natural or ecological” smolt may improve the success of hatchery-releases.