

# Size selection in sea trout: effect of migratory cost

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## Aim

Study the relationship between migratory distance in fresh water and adult size of sea trout



## Hypotheses

It has been observed that mean body length of sea trout spawners increases with migratory distance from the sea to the spawning site (L'Abée-Lund 1991). This may be because (1) large sea trout ( $> 30$  cm) spawn far from the sea, (2) small sea trout ( $\leq 30$  cm) is lacking in upstream areas and spawn closer to the stream mouth.

We tested these two hypotheses in ten natural sea trout stream at approximately the same latitude ( $59^{\circ}\text{N}$ ) in southern Norway. The migratory distance in fresh water (from river mouth to spawning place) varied between 0.2-45 km.

## Results

There was significant positive correlation between body length of the sea trout and migratory distance in fresh water (figure 1 a,b). The size of the spawners increased with the distance from the sea to the spawning site. We found significant correlation between the body length of the smallest sea trout and migratory distance. In the longest stream ( $> 20$  km) no sea trout spawners were smaller than 30 cm.

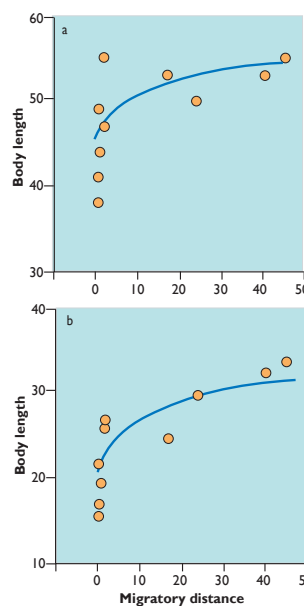
However, large sea trout ( $> 55$  cm) spawned close to sea as well as in upstream areas. For instance, the largest trout (78 cm) in the sample spawned 300 m above brackish water, and there was no significant correlation between body length of the largest trout caught and migratory distance in fresh water (figure 2). The first hypothesis was rejected.

## Conclusions

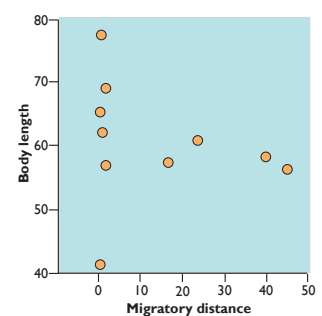
Large sea trout spawn at variable distances from the sea, whereas small sea trout do not migrate far upstream for spawning. This is in agreement with our second hypothesis. Relative to own energy resources the cost of long upstream migrations is probably greater for small than large trout so they do not migrate far upstream for spawning.

## Reference

L'Abée-Lund, J.H. 1991. Variation within and between rivers in adult size and sea-age at maturity of anadromous brown trout, *Salmo trutta*. Can. J. Fish. Aquat. Sci. 48, 1015-1021.



**Figure 1**  
Correlation between body length ( $L$ , cm) of sea trout size and migratory distance in fresh water ( $D$ , km): (a) Migratory distance and body size of the 10% largest trout:  $L = 46.15D^{0.044}$ ,  $r^2=0.59$ ,  $df=8$ ,  $P<0.01$  and (b) migratory distance and body size of the 10% smallest trout  $L = 21.63D^{0.1058}$ ,  $r^2=0.77$ ,  $df=8$ ,  $P<0.001$ .



**Figure 2**  
Relationship between body length (cm) of the largest trout caught and migratory distance in fresh water (km). There was no significant relationship.

