

## // NATURAL BREEDING = HEALTHIER FISH STOCKS!

### Like Breeds Like

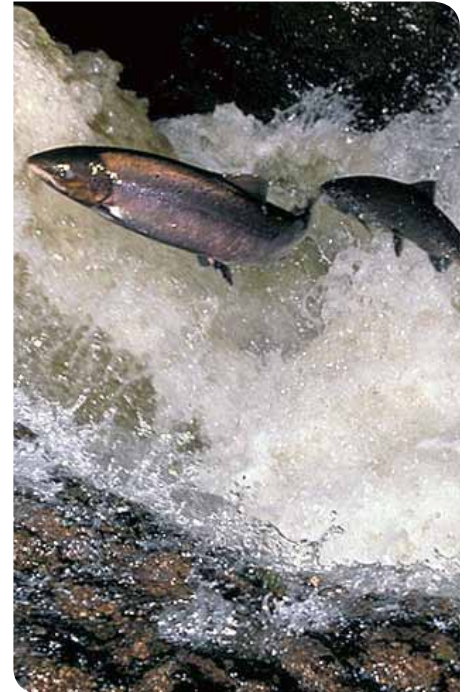
Breeding is important for wild salmon and sea trout just as it is for dogs and farm animals. Each breed differs heritably in important traits, affecting what they are suited for, and these traits are maintained by mating like with like and avoiding mixed breed crosses and keeping each breed as a distinct breeding population.

### Inbreeding

Mating close relatives reduces genetic variability in offspring exposing heritable defects that reduce the ability of individuals to survive and reproduce successfully. In the wild this is seldom a problem. However, it can become one in stocking programmes based on artificial matings and needs to be avoided.

### Smolt Releases

Rearing offspring in hatcheries beyond the egg stage increases survival but helps weak fish to survive and breed, weakening the overall breeding stock. Furthermore, the fish are also less fit because they have fed on a less healthy unnatural diet and not learned to deal with wild conditions. Thus even fish with a good inheritance have reduced fitness and are less likely to return after release than wild fish.



## River Dee

Spring salmon



Upper Dee

Summer salmon



Lower Dee

## Take Care!



## Concern!



### Wild Breeding Stocks

Most river stocks are composed of multiple distinct breeding populations, whose fish are different in their character in ways that are important to their survival and ability to reproduce successfully in their natal streams and on their marine feeding migrations, though this is not generally obvious from their superficial appearance.

However, research shows that it is true with regard to things such as timing of adult and smolt runs, ability to deal with extremes of water quality (e.g. low pH) or with parasite infections (e.g. *Gyrodactylus salaris*).

### Mixing stocks

Mating individuals from adaptively different wild breeding populations can produce offspring with mismatched maternal and paternal gene sets that are adapted to neither the maternal or paternal environments and generally unfit; a much smaller proportion can be expected to survive and breed successfully.

In the wild this is seldom a problem but it can be a problem where broodstock from different breeding populations are interbreed, due to habitat changes (e.g. easing of a natural obstacle such as a waterfall) cause previously isolated populations to interbreed, or due to fish farm escapes.