

Further Resources

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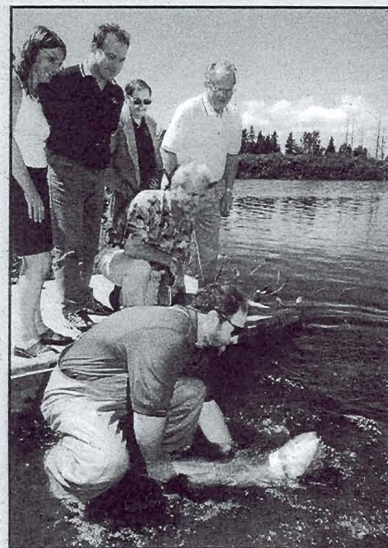
Sonic Tracking of Endangered Atlantic Salmon

Fred Whoriskey

The Atlantic salmon (*Salmo salar*), once numerous in East coast North America, has now declined to the point that the species is at risk of extinction in the southern third of its range. In a desperate conservation effort, biologists are turning to hatcheries (a.k.a. live gene banks) to try and bolster the endangered populations. In hatcheries, food is plentiful and there are no predators, so large numbers of fish can be reared rapidly for population supplementation. However, fish in hatcheries adapt both physically and especially behaviorally to the captive environment, and may have a difficult time of survival when released to the wild.

In theory, a promising salmon live gene bank strategy is to allow fish to develop in captivity up to maturity, then to release them to rivers to spawn. In this approach, you gain the survival benefits of a hatchery program, and although the adults are "hatchery" fish to some degree, their progeny will grow up fully "wild." For the method to work, the adults must have enough "wild" behavior in them to survive, find a spawning ground, and mate.

My colleagues and I have been running an experiment (Magaguadavic River, New Brunswick, Canada) to see if hatchery-reared adult salmon will show normal reproductive behavior once they are released to the wild. The study fish were released



Jim Martin releasing adult salmon.

Courtesy of Fred Whoriskey.

after being surgically fitted with acoustic transmitters. Receivers at fixed locations in the river let us track individuals. We were asking:

1. Do hatchery fish, released at normal river entry times for Atlantic salmon (July and August), move to spawning areas in time for the October spawning period?
2. Will upriver movements be different if the fish are released singly and have to face predators and other threats alone, or liberated in groups (3–5 fish)?
3. Will the fish consort with kin, or avoid them and the possibility of inbreeding?
4. Are wild juvenile salmon numbers improved by the introduction of these adults?

Initial tracking results showed that being in a group seemed unimportant for upriver movements. Fish released with companions dispersed and made their way alone upstream at the same rates that single fish moved. Most disappointing was the fact that instead of heading to spawning grounds, virtually all the gene bank fish peeled off from the main river into a tributary where they congregated through the spawning season, near the water discharge pipe from a local hatchery. Clearly their hatchery experience somehow overrode what should have been natural spawning behavior.

Fortunately, we had kept some fish in reserve back in the hatchery. These we trucked upriver in October and released them directly onto spawning areas. Preliminary tracking results showed that they generally stayed where released, or if they moved it was to other spawning sites in the headwaters. We received reports of spent fish being captured by anglers, so at least some mated. We will be monitoring the river for the presence of juvenile salmon from the spawning of these fish in upcoming years, and use DNA profiling to determine what, if any, inbreeding occurred.

Further Resources

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Methods

Zen in the Art of Monkey Watching

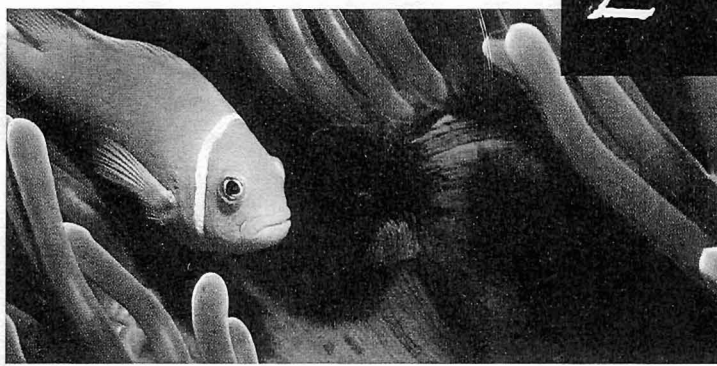
“I use the term focal animal sampling to refer to any sampling method in which all occurrences of specified (inter)actions of an individual . . . are recorded during each sample period. . . Once chosen, a focal individual is followed to whatever extent possible during each of his sample periods.”

FROM JEANNE ALTMANN, 1974



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