

Fred Whoriskey's  
FIELD NOTES

# The Not-So-Great Escape

*Good news and bad on the research front: More repeat spawners on the Miramichi, a nightmare in Passamaquoddy Bay.*

**H**ard times continue for wild salmon, but the world is not coming to an immediate end. In fact, I find that there have been a number of small but encouraging rays penetrating the curtain of gloom that has surrounded us. To start with, the downward trend in the number of salmon at sea that the International Council for the Exploration of the Sea (ICES) has been reporting seems to have stopped, and in 2005 may even have reversed to a small degree. We are also seeing the reestablishment of a robust Atlantic salmon population structure on the Miramichi River. This river has gone from a virtual absence of repeat spawners to the point that it is common now to find fish coming back for a second and third spawning, and there are even a few individuals each year that are returning to the river for their seventh run! We have reason to believe that these older, more experienced fish are more successful in the business of reproduction, so the conservation measures that have rebuilt the repeat spawning component of the river will make this population more robust against future stresses. It will also position this river for a spectacular run resurgence when the factors in the ocean that are presently depressing salmon returns in general let up. The

*ASF research staff use an electroshock unit to coral escaped aquaculture fish in a New Brunswick river.*

repeat spawners are also big, and I have yet to hear an angler complain about that.

Further south, on New Brunswick's Magaguadavic River, a precious nine wild fish returned in 2005, up from the previous year's total of two. Half of these returning fish resulted directly from the experimental restoration efforts ASF have underway in the system. While it is tempting to crow about a 450% increase in returns, the reality is that we are talking about nine fish for a river that used to have 1000, so we have a very long way back. The most encouraging fact was that the 2005 season was the first time since 1992 when wild returns went up rather than down.

The Magaguadavic River has also been the place where ASF estimates the number of farmed salmon entering rivers after their escape from sea cage sites. The river is located in the heart of the East Coast Atlantic salmon aquaculture industry, making it an ideal monitoring site. The news on this front has generally been encouraging as well. The number of escapees entering the river has been dropping since 1994, when a whopping 1,200 swamped the wild run by a ratio of 10:1. By

contrast, the number of escapees hit an all time low in 2004 at 17. The salmon farmers have clearly made substantial improvements to their equipment and procedures, and deserve credit for it.

While the escape news is generally good, there have been two years in which escaped fish numbers went up rather than down, bucking the overall trend. This first occurred in 2001, and happened at the same time as the first Infectious Salmon Anemia outbreak in Cobscook Bay, Maine, a major salmon farming zone. An emergency cull was ordered. Somehow, this turmoil apparently translated into an increase in the number of escapees. These then swam the short distance over the water border between Maine and New Brunswick to the Magaguadavic River, which they duly entered.

The second exception was 2005, and these escapees have put fugitive salmon back on the radar screen, big-time. At some point late in the evening of November 9th, or possibly early in the morning on November 10th, the largest escape of salmon in the history of the New Brunswick cage culture industry occurred. It resulted from vandals attacking two farms, and slashing open the nets in 12 cages. This was the second round of vandal-

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*ASF's Mike Best examines farmed fish that were sexually mature, much to the dismay of salmon conservationists and contrary to claims by the aquaculture industry.*

ism to strike the New Brunswick salmon farming sector in 2005. Another site was attacked during the late summer, releasing perhaps 15,000 fish. No one has yet been charged with any of the crimes, although the owner of the farms has posted a hefty \$250,000 reward for information leading to the culprit's arrest. It sounds like the Wild West.

The November escape involved about 100,000 large, potentially mature fish, right at the time of the natural spawning season. If these fugitives were mature, we expected them to make a beeline for the nearest convenient river for spawning. If they mated among themselves, they could fill the juvenile habitat in these rivers with farm-origin fish, taking the rearing space away from the desperately depressed wild populations. If they hybridized with the wild fish, the resulting progeny could have enough of a farm genetic background that they would be singularly maladapted to survive in the wild. None of this is a very good recipe to help a struggling wild salmon population.

This blow fell just as we had completed a careful, geographically large-scale study in collaboration with the salmon farming industry to document the movements and fates of farmed fish "experimentally" escaped from the region's cages in low numbers during winter and spring (the storm season when most escapes normally occur). We fitted several hundred fish with sonic "pinger" tags and placed receivers in the farming area coastal zone and all of the Atlantic salmon rivers draining to the Bay of Fundy. We were out to see where and when the experimental "escapees" would crop up. The good news for wild salmon was that these fish had very high and very rapid mortality, we think mostly due to seal predation, and none were ever detected entering a salmon river to spawn. I had very recently presented these results to an international scientific conference on the interactions between wild and farmed salmon, and had closed by telling the delegates that our worst nightmare now was a catastrophic release of fish near to spawning time. I felt

eerily prescient as the news of the new, massive, November escape unfolded.

We did what we could to attempt to monitor for intrusions of these fish into local area rivers, and to remove them, but it was very difficult. Most government salmon monitoring teams in the region had already closed up their shops for the winter, and could not be reactivated. It rained heavily as the ASF team fanned out into the field to try to determine if these fish were entering rivers, and if they were mature. A combination of high water and the autumn leaf fall meant we could not deploy temporary barriers in the rivers. The water was too turbid and dangerous to snorkel, and in the end we were only able to monitor four sites on a regular basis. Escapees were present in all four, and we located 45, caught 44, and 43 of them were mature. The ripe status was contrary to the assertion in press releases from the owner of the cages that insisted that none of the escapees were mature. The press releases also said that the fugitives were disease free, but to be sure we are going to verify that by testing the fish we caught.

In 1994, we had our previous record escape of about 50,000 Atlantic salmon. This also occurred in the autumn, and released large fish, which subsequently arrived in the Magaguadavic River in large numbers during both the year of escape, and the year after. If this pattern holds for the 2005 escapes, then we are clearly going to be busy with this file in the 2006 field season.

Why the vandalism in 2005? The salmon farming industry in the region has undergone a convulsive change, with two of the three major companies in the region selling out to the third, and as a result management regimes and operating procedures changed. The take home message for me is that the periods of turmoil in the industry in 2001 and 2005 led to a breakdown in containment strategies that otherwise were working well. Knowing that this is predictable, we ought to be able to reduce future escapes by increasing containment vigilance during future periods of turmoil.

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