



ASF Tracking Atlantic Salmon – a Timeline

Excessive mortality during migration is one of the most significant problems currently facing wild Atlantic salmon. Fewer and fewer return from their ocean feeding grounds to their natal rivers to spawn.

ASF, working with private enterprise, VEMCO, DFO, and other partners, pioneered technology to track migrating salmon using sonic transmitters.

ASF's goals are to:

- Determine smolt and adult salmon migration patterns
- Identify critical habitats and feeding areas
- Determine impacts of birds, seals and other predators
- Estimate losses of smolt in fresh water and estuaries
- Correlate fish movements with environmental variables, notably water currents and temperatures
- Determine when and where mortality occurs

Background

1994 - 1998

Developed technology to track post-smolt migration routes and distribution at sea

Became first to implant post-smolts with sonic transmitters

Utilized receiver units to track post-smolts from rivers in SW New Brunswick into the Bay of Fundy (BoF)

1999 - Implanted uniquely-coded transmitters into smolts and tracked them from Big Salmon River into the BoF
Monitored smolt survival and movements for up to 3 months over a 50km stretch of the Bay

2000 - Developed and tested a new live-catch crawl, based on a Norwegian design, in the Bay

Captured and screened post-smolts for diseases and parasites (none were found)

2001 - Deployed 200 tracking receivers around the BoF
Followed wild salmon smolts for several months at sea. Captured 127 post-smolts in second trawling season; some had been previously marked by river researchers
Examined (for the first time in 30 years) BoF smolts for general health, growth, etc.

2002 - Tracked autumn Miramichi River pre-smolts through winter, using sonic telemetry

Determined distances these little-understood fish moved from their home rivers

Used sonic telemetry to identify their over-winter habitat during their last year in the river

2003 - Tracked Miramichi smolts downstream to saltwater; the first time this had been done. Found 91% successfully survived from the headwaters to the head of tide, but only 43% made it through the estuary and out to sea

2004 - Tracked smolt in the Miramichi and Restigouche
Confirmed, Miramichi smolts had a high survival rate in freshwater and suffered a major loss in the estuary; slightly more than half the fish exiting the estuary to the sea

2005 & 2006 - Expanded research into Quebec's North Shore; the St-Jean (Cote-Nord), York, Cascapedia; and the Gulf of Maine

Tested for north to south variations in smolt survival

Deployed receivers in lines across the entire Bay of Chaleur to explore the Bay's post-smolts potential use of the Restigouche as a nursery area

Discovered:

- 22% of Restigouche River smolts tagged in the headwaters died before reaching the head of tide; 40% died in the estuary (Baie des Chaleurs); 38% reached the sea
- 90% of Miramichi smolts survived to the estuary; 64% reached the sea

2007 - Tracked salmon from New Brunswick and Quebec rivers to the Strait of Belle Isle (SoBI) (approximately half way to Greenland) for the first time

Continued tracking in the Miramichi, Restigouche, Grand Cascapedia

2008 & 2009 - Tracked smolt from Rivière St-Jean (Côte Nord), Miramichi, Restigouche, Grand Cascapedia and Western Arm Brook in Northern Newfoundland. (Western Arm Brook fish are of particular interest because they mature usually as grilse, salmon that return after just one year at sea.)

Compared movements of smolt that mature as grilse to those of Greenland migratory populations which first mature after two years at sea

Tracked smolt from the acid-rain impacted West River Sheet Harbour, NS, as part of a larger effort, to document how fish in the river are responding to ASF and the Nova Scotia Salmon Association's actions to reduce the level of acidity in the watershed

Confirmed remarkable synchrony of the smolt migration (smolt passed through the SoBI during a very narrow window during July and smolt from the Miramichi, Cascapedia and Restigouche Rivers moved through together)

Found a positive correlation between the size of a smolt class leaving a river in a given year and the fraction of smolt that survive to exit the river estuary, meaning the more fish making the migration, the more likely they are to survive to the sea

Noted a difference in movements with fish likely to mature as grilse lingering in the SoBI, while the 2 SW salmon passed through

Upcoming in 2010 - Tracking work will continue on an expanded basis. Through the Ocean Tracking Network, a line of receivers is to be deployed across the Cabot Strait, between Newfoundland and Nova Scotia, thus wiring both exits of the Gulf of St. Lawrence. ASF remains a leader in developing the tracking program, in concert with its partners in the private sector and government.