For salmon, a deadly sea - Mark Hume on New Landmark Study

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by Mark Hume

A landmark migration study on the West Coast that tracked thousands of young salmon as they swam down rivers and then went out to sea has upended one of the longest-held tenets of fisheries science.

Until David Welch and his colleagues surgically implanted more than 3,500 young salmon with electronic tags, it had been believed the high mortality afflicting salmon happened mostly in river estuaries as fish made the transition from fresh to salt water.

But Dr. Welch, president of Nanaimo-based Kintama Research Services Ltd., said an array of listening posts strung for more than 1,500 kilometres along the coast allowed researchers to follow the fish as they migrated out of B.C. rivers and headed north, swimming an average of 20 kilometres a day.

“The scientific body for a century has said the marine survival problems are happening very early in the life history. Now we are measuring that and saying, ‘Sorry, it doesn’t look like that.’ Most of the mortality is happening more than a month after entering the ocean,” said Dr. Welch, who published new research on the subject this week after gathering data for several years.

The study made use of a marine telemetry array called POST, for Pacific Ocean Shelf Tracking, which picks up signals from electronic tags surgically placed inside the body cavities of young salmon, most of which are about 150 millimetres in length when released.

Once in the ocean, the main body of fish headed up Georgia Strait, on the east coast of Vancouver Island, while a smaller number went out Juan de Fuca Strait and up the west coast of the island.

The fish – sockeye, steelhead, coho and chinook – mostly survived the early stages of their migration and were tracked for four to six weeks until they were lost after passing the last POST array.

“Most of the mortality happened beyond the north end of Vancouver Island. Now, whether they dropped dead from sea lice one day past where we [last] measured them or some other disease problem, or whether it was some place two years out in the ocean, we can’t resolve that – it’s just

that we know most of the mortality happened beyond the Strait of Georgia, in the Queen Charlotte Sound area," Dr. Welch said.

The study estimates one-eighth of the mortality occurred in Georgia Strait and seven-eighths occurred after passing northern Vancouver Island.

There has been speculation that fish farms, which are concentrated in ocean channels near the northern end of Vancouver Island, might be exposing migrating wild fish to sea lice and disease.

But Dr. Welch said his study doesn't shed any light on that controversy.

"I do want to emphasize that our results do not say the fish farms did play a role, it's just that the fish passed the salmon farms and at some point after that, died," he said.

Dr. Welch said he is currently helping to design a study that will use the electronic-tag technology to directly examine the issue of whether migrating salmon are impacted by fish farms.

A small number of the tagged salmon carried extra batteries, which were turned off after about a month and then turned on again two years later. Among that group, two fish were picked up again by the POST array when they returned as adults.

Dr. Welch said it was an exciting development, because it revealed the remarkable synchronicity of migrating salmon. Heading north, the two fish left Georgia Strait one week apart – two years later they returned to Vancouver Island only 12 hours apart, and within two hours of each other re-entered the Fraser River.

Dr. Welch gave a partial preview of his research to the Cohen Commission earlier this year, but the detailed paper was published this week in the Proceedings of the National Academy of Sciences of the United States.