

How fish can tell us what we are doing wrong

'Fish are the canaries in the mine shaft,' SFU biologist says as university hosts symposium aimed at finding new ways to track pollution

By Randy Shore, Vancouver Sun, May 18, 2010



Vancouver Sun Files / The way that sea lice jump from one salmon to another was a key discovery in a study of an infestation of the parasite in the Broughton Archipelago. (Photograph by: Bill Keay, Vancouver Sun)

Fish can tell us about the environmental stressors that are depleting their numbers in B.C. and around the world, if we can just figure out what they are saying, according to an organizer of an international symposium on fish behaviour.

"Fish are the canaries in the mine shaft," said Felix Breden, chairman of SFU's biology department. "They can help us learn much more about climate change and human impacts on the environment."

"The missing sockeye in the Fraser River are obviously telling us that there is a problem," he said, citing B.C.'s most infamous ecological mystery.

More than 100 scientists who have gathered at Simon Fraser University this week are pooling their knowledge to find novel ways to use observed fish behaviour to monitor pollutants in the environment.

Projects at SFU studying the effects of environmental estrogens and estrogen mimics (which mimic the action of the body's natural estrogen) are getting sobering data about what constitutes a safe level of such pollutants, Breden noted.

"They were having trouble finding a concentration low enough that it wouldn't have an effect on the fish," said Breden. "The genes governing reproduction are so sensitive that even the tiniest amount would turn on some of the genes they were watching."

Sometimes real sleuthing is required to determine just whose behaviour bears watching.

While studying the effects of sea-lice infestation on salmon in the Broughton Archipelago, researcher Brendan Connors found that it wasn't so much the behaviour of the salmon that was telling. Rather, the unexpected acrobatics of the sea lice were key to the puzzle.

Pink salmon that return to salt water soon after hatching are particularly susceptible to sea-lice infestation because of their small size. In-water pens of farmed Atlantic salmon in the Broughton area are believed to release large amounts of sea-lice larvae that directly attack the pinks, said Connors, a behavioural ecologist.

"We were watching the behaviour of pinks and how sea lice influenced their interactions with other salmonids, such as coho, which feed aggressively on them," he said. But it wasn't so much what the pinks did, but the sea lice. "

A by-product of some of our early experimental work was [finding out] that sea lice are adept at jumping off of the pink salmon as they are being eaten and attaching themselves to the coho that were eating them," he said. "The infected pinks were passing on a portion of their parasite burden to the coho."

Connors and his associates examined the coho returns to watersheds in the mid-coast region to see how their health compared to that of coho populations that were feeding in areas further from known outbreaks of sea lice.

"What we showed was that their populations have suffered and were depressed during a period that coincided with elevated sea-louse infestations," he said. "We can see how the behaviour of juvenile salmon is influenced by a human activity, which is fish farming, and what the consequences of that are."

The 2010 Ecological and Evolutionary Ethology of Fishes symposium continues to May 20.

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