

Crabs: Fishermen asked to take note of caught crabs that are tagged

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When they decide to go, though, the crabs leave quickly, floating and scuttling north. One of the crabs, tagged near Hammond recently, was caught not long after by a commercial fisherman in La Push, Washington.

In addition to studying the effects of dredge operations on the animals, NOAA biologists are also studying these apparent migration routes to better understand the Dungeness crab's life cycle. The tags they glue to the crabs' backs give off a coded signal and are intended to stay on a crab until its next molting.

Catch and release

On Friday, the Columbia River was smooth. The only wakes came from passing Buoy 10 fishermen intent on salmon. The Columbia River Bar, which can be a fearsome presence even on a good day, looked calm, just a scattershot of waves breaking between the arms of the North and South jetties.

After some issues with getting the epoxy mix just right, Roegner and contractors Jacob Biron, a biologist, and Brian Kelly, a boat operator — both with Ocean Associates — found their rhythm tagging five female Dungeness crab. Epoxy, tag, crab, repeat.

Crabs waiting for the epoxy to dry rested in shallow plastic bins, blowing bubbles. The researchers use female crabs because fishermen who catch them are required to throw them back, and Roegner wants these tagged crabs in the water for as long as possible.

Once the epoxy sets, the crabs were dropped over the side of the boat. They disappeared quickly in the murky water. Then Roegner and Biron lowered a hydrophone over the side to see if they could pick up signals off the tags. The machine made an open, echoing sort of whirring noise for a while before Biron heard the hollow "pings" that tell him it has registered a tag. He checked the number: It matched one of the crabs they just released. A minute later, more pings. This time it's an unfamiliar number.

"That's a sturgeon, maybe?" Roegner says. They'll see the same sturgeon numbers pop up in the estuary from year to year. Once, they got a ping on a tag that belonged to a great white shark cruising around the estuary.

Several minutes later all five crabs were accounted for, and Kelly turned the boat back toward the Warrenton Marina.

Dredge passing

The crabs tagged Friday were caught and released



Photos by Colin Murphey/The Daily Astorian

TOP: Jake Biron, left, and Curtis Roegner, right, measure Dungeness crab on the Columbia River last week as part of a study to learn how the animals adapt to changes in their environment. **ABOVE:** A small radio tag will be glued to the shell of a Dungeness crab in order to track the animal's movements in the Columbia River. **LEFT:** Fisheries biologist Jake Biron removes a Dungeness crab from a trap to study and tag the species.

on the Washington side of the river, outside of Ilwaco's Baker Bay, near a dredge disposal site. It is likely they could encounter, or already have encountered, a dredge dump.

Roegner and his team once dropped cameras down in the water attached to a lander —

it looks a bit like a barbecue grill's circular cooking grate — loaded with bait to see what happens to the crab and other animals when a dredge passes through.

Within minutes of the lander hitting bottom, the camera showed Dungeness crabs checking it out. They skittered

sideways, circled each other, poked at the bait. If crabs can be happy, these crabs were happy. Surges washed over them, making them sway and river sediment blew past in underwater clouds. But strong currents and blowing debris do not bother Dungeness; they are adapted to this environment.

They remained focused on the bait.

Then Roegner showed the dredge spoil dump from the dredge vessel *Essayons* — in slow motion, the camera at eye-level.

One minute, crabs clustered around the bait canister. The next, a cloud of dust and debris began to bloom behind them. Fish — just pale flashes trying to race ahead of the clouds — zoomed past. The crabs joined them, legs sprawling, as the dredge spoils hit them like a

storm and turned the screen black.

Traumatic? Maybe. But within half an hour or an hour, the crabs were back, jabbing at the bait. Just another day.

Roegner asks any fisherman who lands a tagged crab to write down the number listed on the tag and make a note of the date and location — coordinates if possible, but a general place name works, too. E-mail this information to curtis.roegner@noaa.gov

Salmon: 'There were not many fish out there'

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The data is preliminary, but researchers say it is clear many young coho and Chinook salmon didn't survive the migration from freshwater streams and rivers to the ocean this year, while poor ocean conditions could impact salmon returns to the Columbia River for the next few years.

Brian Burke, of the National Oceanic and Atmospheric Administration's estuarine and ocean ecology program and one of the authors of the memo, says the numbers need to be taken with a grain of salt. One research boat at one point in time can't cover all the habitat, nor can researchers know for certain that where they drop a net is where the fish are present. But, he said, "it was clear that there were not many fish out there."

More data

As they continue to process additional data — salmon's blood samples, growth hormone levels and stomach contents — Burke said their understanding of why so many juveniles apparently died could shift.

"I think the big picture is sort of settled," he said. "It's refining the 'why' rather than the 'what.'"

It's possible that with a scarcity of usual prey like anchovies, smelt and herring, "predators may have been forced to feed at higher rates on salmon," the memo states. The memo also notes anomalies throughout the area surveyed: the biomass of northern copepods — salmon growth and survival is related to the abundance of these small crustaceans — has been low since 2014; the lowest levels of chlorophyll (a proxy for phytoplankton); changes in the jellyfish population.

Michael Tehan, assistant regional administrator for NOAA's Interior Columbia Basin Office and the recipient of the memo, said the heads up provides him and the agency's policymakers, fishery managers and those involved in habitat restoration work across the basin with "situational awareness."

"Many studies have focused on the (salmon's) freshwater phase, and there has been substantially less research on salmon during ocean residence," said David Huff, estuarine and ocean ecology program manager with NOAA and another author of the memo. But, he added, the success of practices in freshwater that touch on the size, timing and abundance of migrating

salmon depends on the ocean environment.

For those involved in restoration work — or the entities that fund this work — the memo is a reminder of the complexity of a salmon's life cycle.

"People expect there to be noticeable, sometimes dramatic responses when they do conservation activities," Tehan said. But the salmon are "a product of what happened when they migrated out to the ocean" — and what kind of ocean they entered.

Without the ability to distinguish between the different ways ocean, freshwater or estuary conditions impact salmon, it's hard to say where conservation or recovery efforts are succeeding or failing, he clarified. "Large salmon returns may be mistakenly presumed to be a result of successful freshwater mitigation practices when they are in fact a function of favorable ocean conditions."

"Similarly," he added, "the effects of successful freshwater recovery actions may be masked or overridden by poor ocean conditions, leading to unwarranted changes to recovery actions."

Something different

Between persistent, unusually warm surface tem-

peratures and a strong El Nino event, the ocean hasn't been normal for the last three years.

"When you look at the whole time series, the last three years really stand out as being something different," said Jennifer Fisher, a research assistant with Oregon State's Cooperative Institute for Marine Resources Studies, which works closely with NOAA. Her group goes out on shorter-range, biweekly trips to monitor ocean conditions. The May and June cruises Burke participates in, funded by the Bonneville Power Administration, primarily look at food availability and conditions when juvenile salmon first go out to the ocean.

Still, said Burke, "It's often not just what's happening in the ocean, but because the fish live in the river and they are coming out in different conditions each year" — at different sizes, with different fat reserves or parasites — "and all of these aspects of their biology differ from year to year ... we can't just look at the ocean and say survival was really low because of x, y, z. It also matters when they come out and how they are, and those (factors) are driven by freshwater conditions."

Hesse: Funding may be slashed by the state in the near future

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As a part-time employee with a \$69,000 budget, Hesse will tangle with an industry that hauls in billions of dollars in revenue each year. The budget from the state is about one-third the amount recommended by the federal Centers for Disease Control and Prevention, and funding may be slashed by nearly 20 percent by the state in the near future, Hesse said.

"It's a shame that we're not spending money on this," Hesse said. "Every state does it. I don't really understand."

In the few months since she started the job, Hesse has helped with local non-smoking policies at Clatsop Community College and the Northwest Oregon Housing Authority.

She will soon promote a tobacco retailer's license in the county, which could cost retailers hundreds of dollars annually to renew. After finishing her initial research, Hesse plans to bring the issue to the county Board of Commissioners, which may vote to pass an ordinance establishing the license.

Hesse also hopes to see more of a non-smoking media campaign from the county. In the past couple of months, the tobacco program has helped organizations that have adopted

non-smoking laws to purchase "no-smoking" signs.

Hesse has been a tobacco coordinator for two decades. A California native, she spent seven years working for Humboldt County before moving to rural Montezuma County in southwest Colorado for a 13-year stint. The conservative nature of the county made it harder to pass tobacco prevention laws, she said.

"Doing policy work will be a lot easier here than it was there," Hesse said.

Hesse's career in tobacco coordination came by accident.

She was raising three children while working as a medical assistant with Humboldt County Public Health. The department was looking for someone who could connect with teenagers to head their tobacco program.

"That's my natural affinity," Hesse said. "It aligns with what my values are."

Hesse and her husband purchased a home in Astoria in early July. She hopes to continue her side business as a tarot card reader and also join Indivisible North Coast Oregon.

In her few months here, Hesse has noticed a similarity between Clatsop County and her previous home that she hopes will allow her to flourish in her new job.