



VOLUNTEERS ASSESS MUSSEL POPULATIONS IN THE WILLAMETTE RIVER PHOTOS COURTESY WILLAMETTE RIVERKEEPER

West. Contrast this to the eastern portion of the U.S. where 270 mussel species are found.

Holding the shell of a Western pearlshell in his hand, Williams points to the growth rings on the ancient mussel that show its age, in a way similar to tree rings, if one were to cut into the shell and analyze it. In Oregon, freshwater mussels can't legally be plucked from their beds, and Riverkeeper had "scientific taking permits" from the Oregon Department of Fish and Wildlife for the study the group conducted this past summer.

Williams says when it comes to what's important about mussels, it's first of all "cool that these animals exist," and "it is about instant respect just given their potential lifespans." Also, he points out, mussels must interface with all of humanity's collective actions, like pollution, to stay alive.

Celeste Mazzacano is an entomologist whose invertebrate studies led her to a fascination with mussels. She says the bed along Norwood Island is notable because it has a sandy bottom but the Western pearlshell mussels that dominate it tend to like it gravelly, and she'd never seen an aggregation of mussels that big.

"It was a real wow just to see that many of our native mussels in one place," she says.

Mazzacano and her volunteers found lots of live mussels there, she said, but also lots of shells from dead mussels. "We know there's a lot of mussels here," she says, "but not much about them."

Were they only Western pearlshells? Were there any young mussels?

As it turns out, there were really no young mussels, and there were some floaters in the channel. In a study published this fall on the Norwood bed that Mazzacano did for Willamette Riverkeeper, she noted that 90 percent of the 40,000 or so mussels in the channel were older, larger mussels, with only a few younger mussels and no juveniles.

"Some time in the somewhat recent past conditions were good for mussels, so what's up here?" she asks.

Mazzacano says freshwater mussels in the Willamette, which she calls a "highly impacted river that gets a lot of abuse," haven't really been studied systematically. And people who have lived in the area a long time will say, "I remember when there were a lot more mussels in here. When I was a kid, they were all over the place."

That statement alone says something about the importance of mussels, because mussels aren't really something that stands out for many people, even people who think of themselves as river-lovers.

"They are not the sexiest animal that people take notice of," Mazzacano tells me. "But they really are engaging. It's like a treasure hunt; they're kind of cryptic."

She says she's picked up a lot of rocks, thinking she was grabbing a mussel. When she finds one, "It's a feeling of discovery."

The Liver of the River

Emilie Blevins is an endangered species conservation biologist with the Xerces Society. Like Mazzacano, she is fascinated by mussels. Butterflies and bumblebees are beautiful and attractive, she says, but mussels, burrowed into riverbeds, you don't see unless you are specifically looking for them. "They are really interesting creatures with a really complex life cycle."

And, she says, these seemingly dull little bivalves function as "the liver of the river."

A mussel can remove *E. coli*, flame-retardants, pharmaceuticals, pesticides and heavy metals, she says. It cleans water, makes sunlight penetrate the water more deeply and helps other organisms like algae grow. Mussels benefit fish, birds and the river as a whole. She compares the mussels to a wastewater treatment plant.

If you were to look down — if only the water were clear enough — you would see a dark blackish-brownish shell and, beneath that, the mussel's fleshy foot, holding it to its bed.

"That animal might have been there for 40 years,"

Blevins says, "filtering water constantly as it's flowing over it, giving it the oxygen that it needs, collecting food and filtering contaminants."

And that fleshy foot anchoring the mussel down, keeping it largely in one spot for its lifetime, also helps stabilize the riverbed.

After the mussels clean the water and extract nutrients, what is essentially their poop falls to the river bottom and feeds tiny juvenile invertebrates that become aquatic insects and other creatures, which then feed fish and birds.

Healthy mussels are a sign of river health, she says, and when they start to decline, it's time to become concerned.

Blevins points to another recent mussel study, this one done by Xerces and the Confederated Tribes of the Umatilla Indians, showing mussels have been lost from one out of five watersheds in which they once occurred in the West.

Xerces and the Umatilla created a database of mussel records from research and museum collections, historical publications, and public agency and personal records going as far back as 1834. The creation of the Western Freshwater Mussel Database took 10 years. While the work is impressive, the results are a little discouraging.

Using the criteria for the ICUN (International Union for Conservation of Nature) Red List of Threatened Species, the researchers found that the Western ridged mussel and winged floater are "vulnerable" — they have disappeared from more than 30 percent of their range, and the Western pearlshell is gone from more than 15 percent of its range and is considered "near threatened."

The U.S. Geological Survey says more than 70 percent of the continent's 302 species are extinct or imperiled. While they are ICUN listed, none of Oregon's mussels are federally listed, meaning they don't get special protections that could aid in their uncertain future. "In Oregon they are not protected other than the fact that you cannot harvest them, and you basically are not supposed to pick them up," Williams says.