Northwest fears that invasive mussels are headed its way

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Highly invasive mussels are lurking on the Northwest's doorstep, threatening to gum up the dams that produce the region's cheap electricity, clog drinking water and irrigation systems, jeopardize aquatic ecosystems and upset efforts to revive such endangered species as salmon.

Despite efforts to stop them, the arrival of zebra and quagga mussels may be inevitable.

Some scientists say the mussels could arrive within five years. Others say the mussels' larvae already may be spreading undetected, though no one is sure whether they'll survive or thrive in the Northwest's rivers, streams and lakes.

"They are getting closer and closer," said Jim Ruff of the Northwest Power and Conservation Council. "They are a huge concern."

The mussels are among the fastest-spreading invasive species to arrive in the United States. The invasion began in the late 1980s in the Great Lakes, probably arriving in the ballast water of freighters that had been in the Caspian Sea.

Originally from Eastern Europe and the Ukraine, the mussels now have been found in 22 states -- including California, Nevada and Utah -- and two Canadian provinces. They're in the Great Lakes and the Mississippi, Ohio, Cumberland, Hudson and a handful of other rivers. They've also

infected the Colorado River system, on which 27 million people rely for drinking water, irrigation, hydropower and recreation.

In May, a 26-foot boat on a trailer that had been on Lake Mead outside Las Vegas, on the Nevada-Arizona border, was stopped near Spokane, Wash. The mussels covered its bottom.

"If someone offered to bet me they would be in the Northwest within five years, I'd take it," said Stephen Phillips, a senior program manager with the Pacific States Marine Fisheries Commission, which was established by Washington state, Oregon, California, Idaho and Alaska to support activities that conserve, manage and develop marine resources.

The mussels reproduce prodigiously. One study cited by the U.S. Geological Survey found that a single mussel can produce 1 million eggs a year.

The fertilized mussel larvae float through the water, feeding on tiny phytoplankton and beginning to grow. Juvenile mussels attach themselves to just about anything solid, including the hulls of boats and barges, which spread them even farther.

At one Michigan power plant, the mussels were found in densities of 700,000 for roughly every square yard and in layers a foot thick. According to the USGS, navigational buoys have sunk under their weight, and small mussels have been known to get into the engine cooling systems of boats.

"The history of these mussels is they keep moving into new territory," said Fred Nibling Jr., of the Bureau of Reclamation's Ecological Research and Investigations Group in Denver. Nibling recently briefed members of the Northwest Power and Conservation Council, which

oversees the development of comprehensive plans to meet the region's energy needs and restore salmon runs.

"They will become part of our life, just like rust," Nibling said.

Power managers in the Northwest are especially concerned because the region has the most extensive hydroelectric system in the nation. Nearly half the wholesale power sold in the Northwest is produced at the 31 federal dams operated by the Bureau of Reclamation and the U.S. Army Corps of Engineers on the Columbia and Snake rivers and their tributaries.

The dams produce enough electricity to power 20 cities the size of Seattle. Among them is Grand Coulee Dam, which ranks fifth in the world in terms of energy production. Grand Coulee also has made the Columbia Basin Irrigation Project possible, which has turned roughly 600,000 acres of central Washington desert into some of the nation's most productive agricultural land.

Dam operators also are concerned that the mussels could clog fish ladders and other facilities that allow endangered salmon to bypass dams' spillways and turbines. The mussels' edges are sharp, and fish ladders could become a hazard for salmon.

"They could slice and dice the salmon," said Ruff of the Northwest Power and Conservation Council.

That's not the only problem, however.

The mussels filter microscopic organisms out of the water. An individual mussel can filter a quart of water a day. Some scientists think that the clearer water in Eastern rivers and lakes is as much a result of the mussels filtering the water as it is of environmental cleanup efforts.

The microscopic organisms are at the bottom of a complicated food chain and the invasive mussels could disturb it, affecting animals farther up the chain.

"It's a huge threat to the entire ecosystem of the Northwest if they get in here," Ruff said.

If the mussels do arrive in the Northwest, fixing the problem won't be cheap or easy.

The Coast Guard has estimated that economic losses and control efforts in states that already are infected cost $5 billion a year. Initial estimates for fighting the mussels on the federal Columbia River dams are nearly $25 million, with additional annual maintenance costs.

Most of the efforts elsewhere have focused on painting with anti-fouling marine paint or using the small, slow release of diluted chlorine to kill the mussels. But because of endangered salmon, steelhead and other species, those approaches may be too toxic and would require federal permits in the Northwest.

Other possibilities that are being tested include using bacteria, sound vibrations, ultraviolet light, electrical current, high-intensity water jets or hot water to kill the mussels. They also can be removed manually.

For now, officials are watching and waiting.

All four Northwestern states are checking recreational boats that come into the region on trailers, with special attention to those from Nevada or Arizona. Idaho has the most aggressive program: It checks every boat that comes into the state. Other states have launched similar efforts. California reportedly is using mussel-sniffing dogs.

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ON THE WEB

Bureau of Reclamation on invasive mussels: www.usbr.gov/mussels/
Aquatic invasive species: www.aquaticnuisance.org
U.S. Geological Survey on zebra mussels:
nas.er.usgs.gov/taxgroup/mollusks/zebramussel
