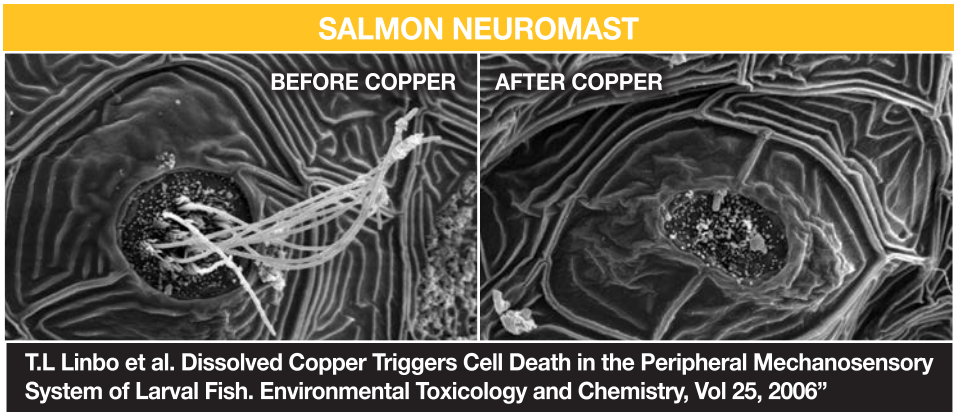
BEST PRACTICES

Salmon and Copper

What do copper and salmon have in common? Though the Copper River salmon is considered one of the tastiest salmon, there is another relationship that salmon have with copper, which is not positive. Copper, the metal, is commonly found in brake pads. Every time drivers push their brake pedals, tiny amounts of copper fall onto streets and parking lots. Stormwater runoff eventually carries these tiny particles into streams and Puget Sound, where salmon become exposed.

Numerous studies conducted in the Pacific Northwest have shown that dissolved copper from brake pads can confuse salmon returning to spawn. Dissolved copper impairs a salmon's sense of smell, which they rely on to find their natal streams, form social dominance hierarchies, find the best spawning mate, and even to find food. Even small, sub-lethal amounts of copper can impact a salmon's olfactory system, which it relies on to send chemical information from its nose to its brain.



T.L Linbo et al. Dissolved Copper Triggers Cell Death in the Peripheral Mechanosensory System of Larval Fish. Environmental Toxicology and Chemistry, Vol 25, 2006"

Until recently, researchers did not realize copper can also impact a young salmon's ability to avoid predators. This finding is supported by an Oregon State University/NOAA Fisheries study, which showed that juvenile coho exposed to concentrations of copper within the lower range of urban runoff, failed to initiate predator avoidance. Juvenile salmonids typically avoid predators by slowing their swimming speed so they appear to be still in the water. The exposed juvenile salmonids continued to swim, which made them more susceptible to predation.

The Washington Department of Ecology estimates at least 70,000 pounds of copper is carried by stormwater into Puget Sound each year (DOE Pub. No. 08-10-084, Addendum 2).

The good news is that, in 2010, Washington passed Senate Bill 6557 mandating a reduction in the amount of copper used in automotive brake pads. The bill bans the sale of brake pads with more than 5% copper beginning in 2021. In addition, beginning in 2014, the bill bans the sale of brake pads that contain more than trace amounts of lead, chromium, cadmium, asbestos and mercury.

A unique partnership was formed to initially study this issue in the San Francisco Bay Area in 1996. Known as the Brake Pad Partnership, it consisted of brake manufacturers, stormwater agencies and environmental groups. The study concluded that copper from automotive brake pads was indeed the "single greatest contributor to elevated copper levels in urban creeks." The Brake Pad Partnership concluded that mandating the phased reduction of copper for use in brakes would be the fairest and most cost-effective action.

The auto industry and brake pad manufacturers are on board with reducing the amount of copper in brake pads, but it will be nine more years before the ban begins. If we continue our driving habits of today, another 630,000

pounds of copper could wash into Puget Sound before the ban begins. In addition, the bill allows for the sale of already manufactured brake pads with copper levels higher than 5% through 2031.

Every time you apply the brakes on your car or truck, copper is falling to the ground, then is carried to our creeks and streams, impacting salmon habitat across Puget Sound.

How can you help reduce the amount of copper washing into Puget Sound? The best way is to drive less. This could mean carpooling, walking, riding a bike or taking the bus. Remember, every time you push the brakes on your car or truck, copper is falling to the ground, so the less you drive the less copper that drops from your brake pads. Who knows, years down the road the salmon you see swimming by you may have avoided being eaten by a predator because you and others like you decided to carpool or take the bus.

Resources:

- www.copper.org/environment/copper-brake.html
- www.suscon.org/bpp/index.php
- www.ncel.net/
- www.ecy.wa.gov/programs/wq/stormwater/industrial/iswgpdraftpubcom/2007/pugetattach2.pdf
- www.ncbi.nlm.nih.gov/pubmed/16519324

Source: Stream Team News, Winter 2012