

Oral Statement of  
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Before The  
Senate Committee On Energy and Environment, Oregon State Legislature

SB 526: Prohibits the sale of new clothes washers that are not equipped with a microfiber filtration system, beginning January 1, 2030.

My name is Dr. Susanne Brander. I am an Ecotoxicologist and Associate Professor at Oregon State University, and because I am on research sabbatical currently, I am providing a written testimony in lieu of providing it in person.

I have been studying microplastics and microfibers for over a decade. During this time, our lab, as well as others in the same research field, have demonstrated that microfibers are the most abundant type of human-generated particle found in marine and aquatic samples in the Pacific Northwest. This includes commercial fishery species (rockfish, lingcod, pink shrimp, razor clams) and prey species that are fed upon by the species we consume (lantern fish, mysid shrimp, copepods). In some cases, the microfibers ingested by species such as gray whales or piscivores like salmonids and tuna are predicted to be on the order of millions per day (whales) or per year (piscivores), based on what is known about their dietary requirements and feeding behavior. Evidence from lab studies with microfibers made from polypropylene, polyester, and nylon results in negative impacts on zooplankton, including reduced growth, oxidative stress, and changes in behavior that can affect their ability to thrive in the wild. Synthetic fibers may be more damaging than natural fibers such as cotton, because of the chemicals they contain, because they are difficult to excrete, and because we now have evidence that they can break down into nanoplastics, which move around within organisms more easily, causing inflammation and other long-term impacts. Human-generated cotton fibers can also cause reduced growth in certain species. The issue of reduced growth, also referred to as food dilution, is a serious concern because it means important prey items may be smaller in size. For organisms such as gray whales that need millions of small prey items daily, this could mean a reduction in the number of calories available for animals already stressed due to climate change and habitat loss.

All told, this is a serious concern, particularly since it was recently found that six Oregon commercial fishery species all contained primarily fibers in their edible tissues. This demonstrates another route of exposure to humans, in addition to other routes such as inhalation from indoor air (fibers from laundry, carpeting, furniture), and exposure from other food sources. While research on the effect of microfibers on human health is in earlier stages in comparison to that on aquatic and marine organisms, we know from studies in mammals that microscopic particles cause a whole host of impacts inside the human body, from inflammation to potential effects on the microbiome and on reproduction. Given that a single load of laundry can generate up to 9 million microfibers, and we know that washing and drying clothing is one of the largest sources of microfibers in the marine and freshwater environment, it would be prudent to include filters on

washing machines, as has already been proposed in other states (e.g. California) and put into action in some European countries. This would prevent microfibers from getting into effluent and also from getting into biosolids, which are applied across the state of Oregon for agricultural purposes. This simple step towards reducing fiber contamination in our waterways and along our coastlines would promote the health of iconic species like whales and salmonids, and the ecosystems that support them, and would protect our food and water supplies.

## References

- Baechler, Britta R, Elise F Granek, Scott J Mazzone, Max Nielsen-Pincus, and Susanne M Brander. "Microplastic Exposure by Razor Clam Recreational Harvester-Consumers along a Sparsely Populated Coastline." *Frontiers in Marine Science* 7 (2020): 588481.
- Biefel, F., J. Geist, R.E. Connon, B. Harper, and S.M. Brander. "Interactive Effects between Water Temperature, Microparticle Compositions, and Fiber Types on the Marine Keystone Species *Americamysis Bahía*." *Environmental Pollution* 348 (May 1, 2024): 123906. <https://doi.org/10.1016/j.envpol.2024.123906>.
- Geyer, Roland, Jenna Gavigan, Alexis M. Jackson, Vienna R. Saccomanno, Sangwon Suh, and Mary G. Gleason. "Quantity and Fate of Synthetic Microfiber Emissions from Apparel Washing in California and Strategies for Their Reduction." *Environmental Pollution* 298 (April 1, 2022): 118835. <https://doi.org/10.1016/j.envpol.2022.118835>.
- Granek, Elise F, Summer D Traylor, Alexandra G Tissot, Paul T Hurst, Rosemary S Wood, and Susanne M Brander. "Clothes Encounters of the Microfibre Kind: The Effects of Natural and Synthetic Textiles on Organisms." In *Polluting Textiles*, 63–99. Routledge, 2022.
- Hutton, Sara J, Lauren Kashiwabara, Erin Anderson, Samreen Siddiqui, Bryan Harper, Stacey Harper, and Susanne M Brander. "Behavioral and Molecular Effects of Micro and Nanoplastics across Three Plastic Types in Fish: Weathered Microfibers Induce a Similar Response to Nanosized Particles." *Frontiers in Toxicology* 6 (2024): 1490223.
- Lasdin, Katherine S, Madison Arnold, Anika Agrawal, H William Fennie, Kirsten Grorud-Colvert, Su Sponaugle, Lindsay Aylesworth, Scott Heppell, and Susanne M Brander. "Presence of Microplastics and Microparticles in Oregon Black Rockfish Sampled near Marine Reserve Areas." *PeerJ* 11 (2023): e14564.
- Siddiqui, S, SJ Hutton, JM Dickens, El Pedersen, SL Harper, and SM Brander. "Natural and Synthetic Microfibers Alter Growth and Behavior in Early Life Stages of Estuarine Organisms." *Frontiers in Marine Science* 9 (2023): 2671.
- Torres, Leigh G, Susanne M Brander, Julia I Parker, Elissa M Bloom, Robyn Norman, Jennifer E Van Brocklin, Katherine S Lasdin, and Lisa Hildebrand. "Zoop to Poop: Assessment of Microparticle Loads in Gray Whale Zooplankton Prey and Fecal Matter Reveal High Daily Consumption Rates." *Frontiers in Marine Science*, 2023.
- Traylor, Summer D, Elise F Granek, Marilyn Duncan, and Susanne M Brander. "From the Ocean to Our Kitchen Table: Anthropogenic Particles in the Edible Tissue of US West Coast Seafood Species." *Frontiers in Toxicology* 6 (2024): 1469995.