

## Flushed drugs cause concern

### Effects on marine life remain unknown

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Antidepressants, painkillers, birth control hormones, antibiotics and caffeine might make life a bit easier for humans, but scientists doubt they're doing much good for fish, worms and other creatures that live in waters increasingly tainted by these substances.

Little is known about the effects of drugs and household chemicals after they are flushed down the toilet – either in the form of unused pills or in traces of medicines and compounds that have been processed by the body. But growing concern by scientists prompted the U.S. Fish and Wildlife Service and American Pharmacists Association to launch a campaign last month to help keep these chemicals out of waterways.

"We're at relatively early stages of understanding," said Fish and Wildlife Service spokesman Joshua Winchell. "What we're really trying to do is get in front of this issue, to nip this in the bud."

No public agency in the Inland Northwest tests for pharmaceuticals or related chemicals in drinking water supplies – it's not required by law and tests would be expensive. Some experts also believe the region is relatively safe because of its headwaters location and the fact that nearly all drinking water here comes from deep underground.

To test the safety of drinking water following sewage spills, the Idaho Department of Environmental Quality has occasionally sampled groundwater from the aquifer for caffeine, said Steve Tanner, who manages the agency's drinking water program for North Idaho. Caffeine is a common indicator of sewage contamination. It has not shown up in groundwater samples, Tanner said.

Rob Lindsay, water resources manager for Spokane County, said the aquifer appears to be providing a safety shield. "We are blessed to have such a system," he said.

But Lindsay said he would feel safer if more was known about long-term effects of these low levels of chemicals or if the county tested for them. "I wouldn't say there's not a need. I would say that if I had a lot more budget I could work with, I would love to be looking at things like that."

Traces of pharmaceuticals, hormones and antibiotics have been found in the Spokane River, as well as 80 percent of the other 139 rivers and streams sampled by the U.S. Geological Survey for a study published in 2002. Water from the Spokane River flows into portions of the aquifer downstream from Post Falls.

The levels were low, but that doesn't mean the water is safe, said Phillip Dickey, staff scientist for the Washington Toxics Coalition. Little research has been done to understand what happens to frogs or trout, for instance, that spend their lives in water tainted with caffeine or hormones.

"For a lot of these chemicals, we don't know what level is harmful," Dickey said. "You really have to look at the cumulative effects."

Dickey said he was surprised by a study published this month by the King County Department of Natural Resources and Parks showing the presence of 11 endocrine-disrupting chemicals in Seattle-area waterways. The chemicals, which include plasticizers and synthetic human hormones, have been linked to gender changes in aquatic organisms, including a recent case where a species of male freshwater fish were found to be carrying eggs.

"It's a real wake-up call," he said. "We need to understand better where these things are coming from and also how to assess the impacts."

One chemical popping up in water samples nationwide has been triclosan, the active ingredient in anti-microbial hand soap. The chemical is not removed by sewage treatment plants. It ends up in rivers or on crop fields. "It doesn't seem like a good thing to be indiscriminately dumping something like that into an ecosystem," said Dickey, who uses bar soap in his home.

Hormones, painkillers and other compounds are not only discharged from sewage treatment plants into rivers but also end up in leftover solids dumped onto agricultural fields, according to a 2006 study conducted by Chad Kinney, an assistant professor of chemistry at Eastern Washington University. Kinney and his fellow researchers found "substantial concentrations" of 55 contaminants in samples taken from treated sewage. After being treated, the solid sewage is either spread on farm fields or dumped in landfills.

Pharmaceuticals were most common, followed by detergents, steroids and fragrances, according to Kinney's research.

Removing the compounds is costly and not required by law, but this could change as more research is done. California is beginning to monitor endocrine disrupters in water supplies. The United Kingdom is also beginning to pay close attention to the levels of these compounds in treated wastewater, said Remy Newcombe, chief technology officer and co-founder of Bluewater Technologies, a Hayden company that's now developing cost-effective technology capable of removing the substances from wastewater.

"We know they are affecting the development and reproduction of organisms out there," said Newcombe, a geophysicist and environmental engineer. "It makes you wonder, what type of effects will show up in us?"