Study: Prescription drugs affecting wild fish

By Amina Khan, Los Angeles Times

A common psychiatric drug may be affecting the feeding behavior of wild fish as it filters out of our bodies, through our toilets and into treated wastewater that is released into natural water sources, according to a new study in the journal Science.

The findings, which examined the effect of trace levels of the anti-anxiety medication oxazepam on wild European perch, have implications for the survival rates of fish and the way in which human pharmaceuticals may affect the delicate food web in aquatic ecosystems.

Scientists have known for years that such “micropollutants” end up in natural waterways like streams and rivers after being flushed through human systems into wastewater. But current research hasn’t really looked at whether psychotherapeutic drugs can affect the behavior of aquatic creatures, the authors noted – which is surprising, because a common class of anti-anxiety medications known as benzodiazepines works by binding to receptors that are found in a wide range of animals.

To test one such drug’s effect, the researchers took fish that were hatched in the wild and exposed them to either low concentrations of oxazepam (1.8 micrograms per liter) or high concentrations of the drug (910 micrograms per liter) for seven days.

These “personality changes” clearly had an effect on feeding

behavior as well – fish on oxazepam ate more zooplankton and did so faster than their peers, quickly depleting the food source. In the short term, this might sound like an evolutionary advantage for the perch – but the increased boldness also means they may be taking riskier behaviors, making them more vulnerable to predators.

And regardless, eating all that zooplankton may allow the zooplankton's food source, algae, to run unchecked, resulting in algal blooms that suck the oxygen out of the ocean and create dead zones devoid of aquatic life.

The researchers' findings could well reflect reality in waters worldwide: Their low concentrations in the lab were roughly equivalent to levels found in wild fish in the River Fyris in Sweden. And they found that the fish's muscle tissue held more than six times that amount, evidence that the drug was building up over time.

The study may require humans to rethink the idea of pollutants, lead author Tomas Brodin, a researcher at Umea University in Sweden, said at a news conference Thursday at the American Association for the Advancement of Science meeting in Boston.

"It's a global issue," Brodin said. "We find these concentrations all over the world – and it's quite possible, even probable, that these behavioral effects are actually happening as we speak."