

# SHORE STEWARDS NEWS

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## Fish and Pharmaceuticals

In the last few years we've seen an increasing number of news articles about medications ending up in our streams, lakes, and bays. My favorite comic on the topic shows one salmon confiding in the other that while the Viagra makes him want to swim upstream, the Prozac is making him too tired. When medicines aren't fully processed by our bodies, the residue makes its way to our waste water treatment plants which aren't designed to remove medications and do an incomplete job at best. Medicated livestock are another source. Excess or unprocessed compounds are excreted from their bodies and can enter our waterways with agricultural runoff.

For years one recommended way to dispose of expired or unwanted drugs was to flush them down the toilet. But because drugs are highly soluble in water (so that they will work well in our bodies), this method of disposal is adding to the overall drug load in our environment.



The problem is not really new. Modern and increasingly sensitive water quality tests have brought new awareness of the qualities and quantities of pharmaceuticals loosed into the world. And new research on the consequences to fish, frogs, and other aquatic organisms has uncovered troubling trends.

In 1999 and 2000, the U.S. Geological Survey (USGS) tested 139 streams in 30 states throughout the U.S. for the presence of 95 chemicals including medicines:

- 80% of streams contained 1 or more of these chemicals
- 50% of streams contained 7 or more chemicals
- 34% of streams contained 10 or more chemicals

Of these 95 chemicals:

- 33 are known or suspected to be hormonally active
- 46 are pharmaceutically active (have the ability to affect living matter)

## Medications Might be Good for You, but They Can be Bad for Fish

In another recent USGS study, scientists sampled fish populations in streams receiving treated wastewater in the Boulder Colorado area. They found that the fish downstream of the wastewater outfalls showed signs of endocrine disruption including low male-to-female sex ratios in their overall populations, and individuals having both male and female reproductive organs.

In a laboratory experiment that exposed fathead minnows to treated wastewater from a major metropolitan area, USGS scientists and their colleagues found that the male minnows started producing female egg-yoke protein.

Researchers at the National Institute of Standards and Technology, Hollings Marine Laboratory in Charleston, S.C., found that the female mussels exposed to Prozac at the concentrations found in lakes and streams released their larvae too early - before the larvae were ready to survive on their own.

The concentrations of the compounds responsible for these effects are very small, and you should know that there are no reported human health effects from pharmaceuticals in our waterways.

## **In the Future, More People will be Taking More Medicine**

As our population ages and we take new and improved medications we will see increasing amounts of medicines in our waste water. Overhauling our wastewater treatment plants to remove these compounds would cost billions of dollars and take years to complete. No one wants to suggest we forgo our blood pressure, cholesterol, and birth control medications, so what can we do to address the problem now?

### **Medication Take Back Programs**

The most promising solution is medication take back programs. Throughout the country, local and state governments are cooperating with pharmacies and conservation organizations to develop drug return programs. The concept is very simple - you bring your unwanted medications back to the pharmacy. There they are gathered up and shipped off for proper disposal by incineration.

In Washington State, a coalition including the Washington Board of Pharmacy, the King County Local Hazardous Waste Program, Snohomish County Solid Waste Management Division, the Northwest Product Stewardship Council, Seattle-King County Public Health, and the Washington Department of Ecology launched a pilot return program modeled after B.C. Canada's take back program. Group Health and Bartell Drugs pharmacies became return locations for non-narcotic medications in seven counties across the state: Burien, Renton, Redmond, Spokane, Everett, Olympia, and Silverdale.

The program was intended to run from 2006 to 2008 and even though the pilot program has officially ended, the participating pharmacies are continuing to serve as return sites. As of March 2009, nearly 21,000 pounds of unused medication had been collected! That's a lot of pills.

The fish and frogs aren't the only beneficiaries of these efforts either. According to the Washington State Department of Health, medications account for the most common poison exposure in the US. To find a drug return program in Washington State, you can visit the Unwanted Medicine Return Program website: <http://www.medicinereturn.com/return-your-medicines/return-locations>

Or you can fill out the online query at the Washington State Department of Ecology at [1800recycle.wa.gov](http://1800recycle.wa.gov). The search engine is a little counter-intuitive but you'll be looking for a "drop-off" service, for "residential use", select your county, choose "household hazardous waste" as the material category and then "pharmaceuticals" in the last drop down menu (pew). If you get stuck you can call the Department of Ecology for help at, (you guessed it) 1-800-recycle!

### **An Idea Whose Time Has Come**

In the US, drug return programs are sprouting up in places like California, Missouri, Maine, and Florida and a diversity of models are being tried out. In San Mateo County California, permanent collection boxes are installed at police stations. This program allows residents to drop off legally prescribed controlled substances in addition to over-the-counter and other prescription medications at any time, year round. So in addition to being pretty convenient, this take back program keeps unused narcotic medicines from falling into the hands of a thrill seeking teenager or a dumpster diving addict.

In Maine, residents can also dispose of controlled substances in addition to their other medications but they mail it in instead of dropping it off. Medication mailers are available at numerous pharmacies. When sent they go directly to Maine's Drug Enforcement Agency for proper disposal.



In Clark County Washington, non-controlled substances can be dropped off at numerous pharmacies including Fred Meyer, Safeway, Rite-Aid, and Long Drugs as well as all transfer stations. And if none of those are convenient for you, you also bring your medicines to the counties' mobile household hazardous waste collection events.

But for sheer convenience none of these programs beats the deal you get in Kentucky if you are unable to drive. A sheriff or deputy will come to your home to pick up your unwanted medications for you!

To learn more about efforts around the country, visit the Take Back Networks website at <http://www.takebacknetwork.com/>, and look for "local efforts."

Looking beyond our borders it's interesting to note that laws in Europe and many Canadian provinces require that manufacturers collect and dispose of unwanted drugs.

### **No Take Back Program Near You?**

In my neck of the woods, Bellingham WA, the nearest drop off location is some 60 miles out of my way and you might find yourself similarly left out of the loop. What are we to do? Well, one thing is certain, we don't want to flush them down the toilet. Instead the Unwanted Medication Return Program recommends the following:

For chemotherapy drugs, contact your prescribing medical office to see if they will accept the drug. For all other drugs, they recommend that rather than flushing them down the drain, you follow these steps:

- 1) Keep the medication in its original container.**
- 2) Modify** the medications to discourage consumption. Options include adding a small amount of water to pills or capsules to dissolve them or mixing them with an unappealing substance such as coffee grounds or kitty litter.
- 3) Seal and conceal.** Tape the container lid shut with tape, place in a sealable bag, and then place in a non-transparent container to ensure that the contents cannot be seen.
- 4) Discard.** Discard the container into the garbage away from kids or pets. Do not place in the recycling bin.

Wrapping and sealing the medicines in a bag is important because leachate from landfills can also carry medications to our streams, lakes, and bays.

To learn more about the research cited in this article or the drug take back programs described here visit the websites listed below.

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*To view archived copies of past Island County Shore Stewards Newsletters, go to [www.shorestewards.wsu.edu/island/newsletter/](http://www.shorestewards.wsu.edu/island/newsletter/)*

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