



Explore, enjoy, and protect the planet

CONSUMER PRODUCTS THREATEN AQUATIC LIFE:

What Citizens Can Do



All products that are taken internally, applied, or put "down the drain" have the potential to enter sewage systems or become runoff into streams, lakes, and the ocean. Everyday products such as pharmaceuticals, personal care products, laundry detergents, and pesticides contain endocrine disrupting compounds (EDCs) and other contaminants. This brochure provides guidance on how to keep them from entering waterways. Maintaining clean water, both fresh and saline, is critical to protecting not only wildlife but also human health as it is the source of our fresh drinking water. Design and construction of sewage systems to treat even some EDCs will be complicated, costly and take years; so pollution prevention is the real and immediate answer.



What You Can Do to Minimize Your Impact

Be an informed consumer. Avoid products containing the contaminants found in our waters by carefully reading the labels on the products.

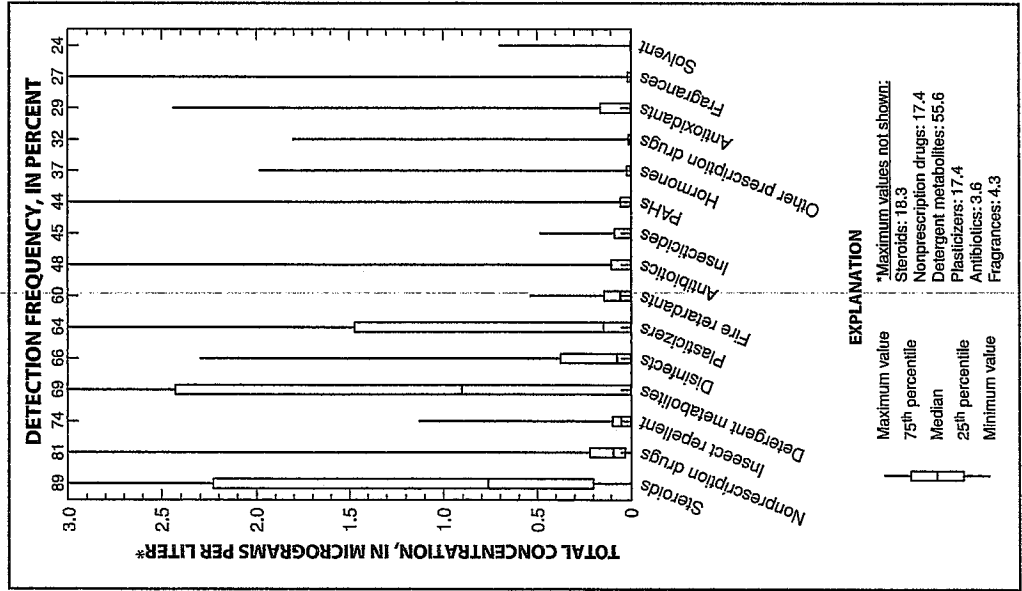
- Choose fragrance-free products.
- Purchase only the quantity you can use in a reasonable amount of time to minimize your need to dispose of unused or out-dated products.
- Dispose of expired/unused personal care products and pharmaceuticals safely. Never put unused pharmaceuticals, personal care products and over-the-counter medicines in sinks or toilets.
- Try to find "manufacturer take back" programs for unwanted medications or law enforcement facilities that will accept unwanted medications and "controlled substances." If they do not exist, work with your community to establish such programs.
- Contact your local government to find the nearest household hazardous waste disposal program, and then use it.
- Practice organic gardening and environmentally safe pest control methods to eliminate pesticide use.

For More Information

1. USGS basic information on recent studies:
<http://toxics.usgs.gov/pubs/RS-027-02/index.html>
2. Information about impacts on wildlife:
<http://www.ourstolenfuture.org/newscenter/wildlife/wildlife.htm>
3. Sierra Club SHC website: Nonylphenols —
<http://www.sierraclub.org/healthycommunities/toxics/>
4. National Institute of Environmental Health Sciences, Endocrine Disruptors: <http://www.niehs.nih.gov/oc/factsheets/pdf/endocrine.pdf>
5. Toxic Free Legacy Coalition - Safe Cosmetics Campaign in Washington State: <http://www.toxicfreelegacy.org/safecosmetics.html>

Contact: clean.water@sierraclub.org
<http://www.sierraclub.org/healthycommunities/>

In a study of organic wastewater contaminants in streams across the United States the United States Geological Survey (USGS) found low concentrations of a broad range of chemicals downstream of cities and agricultural areas. The chemicals include human and veterinary drugs, natural and synthetic hormones, detergent metabolites, plasticizers, insecticides, and fire retardants. One or more of these chemicals were found in 80 percent of the streams sampled.¹



Treating waste at a sewage treatment plant does not completely eliminate threats to the health of our waters. Because current wastewater treatment systems were designed before these contaminants were known to be harmful at such low concentrations, treatment does not effectively remove them and they persist in effluent. Other pollution sources include failing septic systems and agricultural runoff, which may contain antibiotics and other medications fed to livestock. These contaminants are difficult to identify before the waste enters streams, rivers, and lakes. Reuse of treated sewage effluent on landscaping, golf courses, and agricultural fields can contribute to the problem. Such reuse of septage, the material pumped from septic tanks, is also a concern.

Impacts On Wildlife

Biologists over the last 10 to 15 years have reported a variety of abnormalities in wildlife that include fish with both male and female characteristics, a characteristic known as intersex, and low male to female sex ratios.

USGS studies in Nevada found significant decreases in sperm counts in carp, largemouth bass and the endangered razor-back sucker. A combined lab and field study of leopard frogs implicated the herbicide atrazine in widespread feminization of males during tadpole development and metamorphosis, confirming earlier findings from the African clawed toad where extremely low levels of atrazine caused significant gonadal abnormalities in male frogs. Atrazine at very low levels damages the immune system of wood frogs, impairing their ability to resist infection by parasites.



Several common antidepressants have been found to cause development problems in fish and metamorphosis delays in frogs. Population declines in Florida alligators are linked to pesticides in agricultural runoff.²

According to researchers, these adverse effects may be linked to tiny amounts of chemical compounds coming from our pharmaceuticals and personal care products entering our water through effluents from sewage treatment plants, runoff, and leaks in sewage systems. Nonylphenol, used in some detergents and as an "inert ingredient" in pesticides, is associated with the production of egg protein in males, as well as disrupting the hormonal control of Atlantic salmon's ability to adjust to salt water during migration to the sea. Wildlife other than fish have also been affected by low levels of these water pollutants. A single exposure to nonylphenol during larval development of oysters causes disruption of sexual development, lowers survival of offspring in the next generation, and alters the sex ratio.³

What Products Are Causing These Problems?



Pharmaceuticals: Some of the following medications, prescription and non-prescription, contain endocrine disruptors: antidepressants, psychiatric drugs, replacement hormones and steroids. With the exception of over-the-counter ones, you have little or no control in choosing which medications are prescribed for you although you can ask for products that will have a minimal adverse impacts on the environment, so this list is given only as small example of medications known or suspected to be endocrine disruptors.

The Product Stewardship Institute is working with state and local governments, drug manufacturers, and health organizations to establish convenient, consistent, legal, and safe ways to dispose of unwanted medications. Their website — <http://www.productstewardship.us/> — under "Pharmaceuticals" discusses the problems and describes their work on laws and take-back programs to make this possible.

Personal Care Products: Personal care products including shampoos, toothpastes, soaps, lotions, cosmetics, and sunscreens may contain endocrine disrupting compounds in both their active and inert ingredients. Known endocrine disruptors are phthalates used in many cosmetics, synthetic musks as fragrances, parabens (chemical preservatives), nonylphenol ethoxylates (NPE), antibacterial disinfectants, insect repellants, and chemical compounds to block or screen out ultraviolet in sunscreens.⁵

Household Products: Products found in our homes may contain endocrine disruptors and other contaminants: NPE in laundry detergents and cleaners; synthetic musk fragrances; antibacterial disinfectants in hand cleaners and dishwashing detergents; phthalates in plastic packaging and items like shower curtains and baby toys; fire retardant fabrics; inert and active compounds in pesticides; and BPA, found in polycarbonate products: sports bottles, baby bottles, and 3- and 5-gallon refillable water containers. BPA was found by Centers for Disease Control (CDC) in urine samples in more than 95 percent of people studied, so it is not surprising that it is found in sewage effluent.

Endocrine Disrupting Compounds (EDCs):

All animals, including humans, rely on hormones secreted by endocrine glands to guide normal development from embryo to adulthood. Endocrine disruptors can be either synthetic or naturally occurring chemicals that block or interfere with these hormonal processes. Early life stages of aquatic species are especially vulnerable to endocrine disruption. Many of the chemicals recently found in our waters have been linked to developmental, reproductive, neural, immunological and other major problems. This is particularly true for bisphenol A (BPA) which is also linked to chromosome damage. Some changes showed up in adulthood after animals were exposed to BPA in the womb. There is concern about the additive effects of mixtures of these chemicals; sometimes combinations of chemicals create more intense reactions.⁴

Endocrine disrupting compounds are just some of the contaminants shown to cause harm to fish, shellfish, crustaceans, and other aquatic wildlife by interrupting normal growth, reproduction, and development as well as long term genetic changes. The insect repellent DEET is acutely toxic to some organisms. Pesticides are acutely toxic to many early stages, such as tree frog tadpoles. Antibiotics and antibacterials like triclosan in sewage effluent can increase the populations of antibiotic resistant bacteria in the surface waters.

We do not know a lot about how low levels of medications other than hormones affect aquatic life, but concerns about this have prompted the European government to propose ecotoxicity screening before new drugs are approved. Scientific research is ongoing to identify additional types of emerging contaminants and to adequately understand and quantify their long and short-term effects on human health and wildlife. For precautionary reasons, the release of these compounds into the environment should be limited or eliminated.

