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## Rise of Estrogen and Contaminants in Water

Fish in the earth's lakes and rivers have started to be exposed to an increasing amount of estrogen. The major explanation for this is the incorrect disposal of contaminants. These contaminants include natural and synthetic chemicals, pesticides, and personal care products. The most detrimental chemicals are those including estrogen from birth control pills. Ultimately, the human population is at fault for the rise in male fish showing symptoms of becoming female.

Although many believe this to be an uncommon occurrence it is actually more prevalent than they may suspect. It is as simple as a person taking a drug and their waste going into a sewer or putting something directly into a toilet. Many scientists and wildlife specialists recommend that more laws are passed in order to prevent people from flushing harmful chemicals down the toilet. They also continue to push for stricter regulations on how to dispose of chemicals in a way that is safer for the environment. Chemicals being flushed often get into our drains which contaminates our water as well.

As the years go on, the exposure of estrogen in the water of American, English, European, and Canadian lakes is ruining many fish populations. In 2008 Professor Charles Tyler from Exeter University found that a quarter of male roach fish from fifty one sites on English rivers had shown signs of feminization. In scientific terms males showing mutated symptoms of being female and being exposed to harmful chemicals is called intersex. Some types of fish are hermaphrodites which means they naturally have both female and male sex organs. Since they have both sex organs they are able to change their gender. In that case, the ability to change gender is useful for successful reproduction. However, intersex is not found in species that are hermaphroditic which makes it not useful for successful reproduction. Some of the symptoms that the scientists found in the study included eggs in their testicles. Finding eggs in male testes is also a sign of problems in the endocrine system. Most of the time when there are feminized male fish, they are also found to have hormone confusion or imbalance. These imbalances due to chemicals have not only been found in fish but turtles, frogs, and alligators. Many of the fish were found psychologically affected as well.

The rise of estrogen and other contaminants in lakes can also alter the anatomy of wildlife. Contaminates mainly damage the brain and heart. Two hundred of the many chemicals that humans have improperly disposed of have been proven to cause feminization in aquatic species. In most cases, this chemical exposure causes male fish to not breed successfully. With more and more males mutating into females, there are fewer opportunities for the species to continue developing. The level in which the fish has feminized determines how much of an impact it will leave on the population. A higher level of feminization causes the fish be be compromised and is almost impossible for them to pass on their genes. Even though these mutations are not killing the fish, there is still many fish affected. Over time the decrease in fish reproducing successfully and properly with damage the population sizes. Not only would the fish population change but other species that rely on fish for food would be affected. Whales and seals eat fish along with some mammals such as bears, and birds. In 2016 scientists from the U.S. Fish and Wildlife Service and the U.S. Geological Survey studied fish in nineteen national wildlife refuges. The smallmouth bass was the type of fish they primarily focused the study on. In North American and European lakes, thirty-seven species of feminized males have been

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discovered in the last decade.

For years people in the United States and around the world have tried to fix the polluted waters that we have created. Past presidents such as George Bush and Barack Obama have attempted to put acts in place to decrease the amount of contaminants in water for the benefit of the human population and our wildlife. Many people flush almost all chemicals they do not know how to dispose of. Sometimes the reason you are not supposed to flush a chemical is to keep yourself safe but also the animals that live in the water that you are about to contaminate. Forty percent of our rivers are polluted. That percentage is almost so high that it is impossible for aquatic life to survive or even unsafe for humans to swim in the water.

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