

# Conservation Committee Report

Volume 10 Issue 3

By Jack Walters, ACSL Conservation Chair

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## The Conservation Pledge

I give my pledge as an  
American to save  
and faithfully defend from  
waste,  
the natural resources of my  
country;  
the soil, the water, the air,  
the minerals, the plant life and  
the wildlife.

This is my Pledge!

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## *Drugs in Water Hurt Fish and Wildlife*

On this brisk, glittering morning, a flat-bottomed boat glides across the massive reservoir that provides Las Vegas its drinking water. An ominous rumble growls beneath the craft as its two long, electrified claws extend into the depths.

Moments later, dozens of stunned fish float to the surface.

Federal scientists scoop them up and transfer them into 50-quart Coleman ice chests for transport to a makeshift lab on the dusty lakeshore. Within the hour, the researchers will club the seven-pound common carps to death, draw their blood, snip out their gonads and pack them in aluminum foil and dry ice.

The specimens will be flown across the country to laboratories where aquatic toxicologists are studying what happens to fish that live in water contaminated

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## **Siemens Westinghouse Pioneering Advanced Fuel Cells, Cleaner More Efficient Power Plants**

Siemens Westinghouse Power Corporation, Pittsburgh, PA, is conducting a solid oxide fuel cell (SOFC) project. Fuel cells are an environmentally clean, quiet, and highly efficient method for generating electricity and heat from natural gas and other fuels. They are vastly different from other power systems. A fuel cell is an electrochemical device that converts the chemical energy of a fuel directly to usable energy - electricity and heat - without combustion. Solid oxide fuel cells use ceramic electrolytes (yttria-stabilized zirconia) and operate at about 1,000 degrees Celsius. The solid-state nature, the potential to reform gaseous fuel within the cells, and the high operating temperatures offer advan

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## Drugs in Water Hurt Fish and Wildlife

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with at least 13 different medications — from over-the-counter pain killers to prescription antibiotics and mood stabilizers.

More often than not these days, the laboratory tests bring unwelcome results.

A five-month Associated Press investigation has determined that trace amounts of many of the pharmaceuticals we take to stay healthy are seeping into drinking water supplies, and a growing body of research indicates that this could harm humans.

But people aren't the only ones who consume that water. There is more and more evidence that some animals that live in or drink from streams and lakes are seriously affected.

Pharmaceuticals in the water are being blamed for severe reproductive problems in many types of fish: The endangered razorback sucker and male fathead minnow have been found with lower sperm counts and damaged sperm; some walleyes and male carp have become what are called feminized fish, producing egg yolk proteins typically made only by females.

Meanwhile, female fish have developed male genital organs. Also, there are skewed sex ratios in some aquatic populations, and sexually abnormal bass that produce cells for both sperm and eggs.

There are problems with other wildlife as well: kidney failure in vultures, impaired reproduction in mussels, inhibited growth in algae.

"We have no reason to think that this is a unique situation," says Erik Orsak, an environmental contaminants specialist with the U.S. Fish and Wildlife Service, pulling off rubber gloves splattered with fish blood at Lake Mead. "We find pretty much anywhere we look, these compounds are ubiquitous."

For example:

\_In a broad study still under way, fish collected in waterways near or in Chicago; West Chester, Pa.; Orlando; Dallas; and Phoenix have tested positive for an array of pharmaceuticals — analgesics, antibiotics, antidepressants, antihistamines, anti-hypertension drugs and anti-seizure medications.

\_That research follows a 2003 study in northern Texas, where every bluegill, black crappie and channel catfish researchers caught living downstream of a wastewater treatment plant tested positive for the active ingredients in two widely used antidepressants — one of the first times the residues of such drugs were detected in wildlife.

\_In several recent studies of soil fertilized with livestock manure or with the sludge product from wastewater treatment plants, American scientists found earthworms had accumulated those same compounds, while vegetables — including corn, lettuce and potatoes — had absorbed antibiotics. "These results raise potential human health concerns," wrote researchers.

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## Drugs in Water Hurt Fish and Wildlife

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—Blood and liver samples of bull sharks in Florida's Caloosahatchee River, a nursery area for juvenile bullsharks and home to six wastewater treatment plants, are being tested for the presence of an array of medications this winter. Of the first ten sharks sampled, nine tested positive for the active ingredient in an antidepressant.

—And in Colorado's Boulder Creek, 50 of the 60 white suckers collected downstream of Boulder's wastewater treatment plant were female, compared to about half of them upstream.

Elsewhere in the world — from the icy streams of England to the wild game reserves of South Africa — snails, fish, even antelope, are showing signs of possible pharmaceutical contamination. For example, fish and prawn in China exposed to treated wastewater had shortened life spans, Pacific oysters off the coast of Singapore had inhibited growth, and in Norway, Atlantic salmon exposed to levels of estrogen similar to those found in the North Sea had severe reproductive problems.

More than 100 different pharmaceuticals have been detected in surface waters throughout the world.

"It's inescapable," said Sudeep Chandra, an assistant professor at University of Nevada, Reno who studies inland waters and aquatic life. "There's enough global information now to confirm these contaminants are affecting organisms and wildlife."

While some researchers have captured wildlife and tested it for pharmaceuticals, many more have brought wildlife into their laboratories and exposed them to traces of human pharmaceuticals at levels similar to those found in water, aquatic plants and animals.

The results have been troubling.

Freshwater mussels exposed to tiny amounts of an antidepressant's active ingredient released premature larvae, giving the next generation lower odds of survival; in a separate lab study, the antidepressant also stunted reproduction in tiny fresh water mud snails.

When researchers slid hydras — a tiny polyp that under a microscope looks like a slender jellyfish — into water tainted with minute amounts of pharmaceuticals, their mouths, feet and tentacles stopped growing. While the hydras are minuscule, the implications are grave: Chronic exposure to trace levels of commonly found pharmaceuticals can damage a species at the foundation of a food pyramid.

Tiny zooplankton, another sentinel species, died off in the lab when they were exposed to extremely small amounts of a common drug used to treat humans suffering from internal worms and other digesting parasites.

In a landmark, seven-year study published last year, researchers turned an entire pristine Canadian lake into their laboratory, deliberately dripping the active ingredient in birth control pills into the water in amounts similar to those found to have contaminated aquatic life, plants and water in nature.

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## Drugs in Water Hurt Fish and Wildlife

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After just seven weeks, male fathead minnows began producing yolk proteins, their gonads shrank, and their behavior was feminized — they fought less, floating passively. They also stopped reproducing, resulting in "ultimately, a near extinction of this species from the lake," said the scientists.

While the Canadian study was prompted by human intervention, similar die-offs have occurred in the wild.

In Pakistan, the entire population of a common vulture virtually disappeared after the birds began eating carcasses of cows that had been treated with an anti-inflammatory drug. Scientists, in a 2004 study, said they eventually determined that the birds' kidneys were failing.

"The death of those vultures — the fact that you could get a complete collapse of a population due to pharmaceuticals in the environment — that was a powerful thing," said Christian Daughton, an EPA researcher in Las Vegas. "It was a major ecological catastrophe."

In November, at the annual Society of Environmental Toxicology and Chemistry meeting in Milwaukee, 30 new studies related to pharmaceuticals in the environment were presented — hormones found in the Chicago River; abnormalities in Japanese zebra fish; ibuprofen, gemfibrozil, triclosan and naproxen in the lower Great Lakes.

Many of those studies refer to the heralded research at Lake Mead. There, on a recent morning, Steven Goodbred struggled to hold a large wriggling carp with both hands. On the outside, the carp looked fine, vibrant and strong, but the U.S. Geological Survey scientist assumed the worst.

"Typically we see low levels of sex steroids, limited testicular function, low sperm count, that kind of thing," he said slipping the fish into a holding tank and closing the lid. "We'll have to wait and see about this fellow."

These carp live, eat, reproduce and die at the mouth of what amounts to a 30-mile-long drainage system that starts within the toilets and sinks of the casinos, hotels and homes of Sin City.

Some 180 million gallons of effluent are discharged into the channel each day from three wastewater treatment plants. The daily sewage discharge is expected to increase to 400 million gallons a day by 2050.

The USGS and U.S. Fish and Wildlife Service tracked the channel from its origins, before the inflow from the sewage plants, to where it empties into Las Vegas Bay in the lake. Their findings: The amount of endocrine-disrupting compounds (including hormone treatments and other chemicals affecting reproduction) increased more than 646 times.

Not far from the mouth of the drainage channel — amid the fishing boats and sightseeing tours — water is sucked into a long pipe, destined for a drinking water treatment plant, then Las Vegas — thus beginning the cycle all over again.

Other communities in Nevada, as well as locales in California and Arizona, also draw on Lake Mead.

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## Drugs in Water Hurt Fish and Wildlife

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"Lake Mead is a fortuitous worst-case scenario" for study, said environmental toxicologist Greg Moller, holding a bottle of Lake Mead water he planned to take back to his lab at the University of Idaho. "You've got the wastewater, you've got the documented impact on wildlife, and you have drinking water uptake."

Although more than eight million tourists, including 500,000 anglers, visit the reservoir annually, there are no warnings about the contaminants. No signs. No advisories.

That's not unusual. Scientists have been finding pharmaceuticals in hundreds of other public waterways across the nation and throughout the world — almost always without public fanfare, as documented in the AP investigation.

At the same time, scientists are looking for remedies. In Las Vegas, just off the Strip at the Desert Research Institute, microbial biologist Duane Moser optimistically held a tray of increasingly murky test tubes.

"We put a little bit of estrogen in here, and then we added a particular bacteria, and guess what? The bacteria are consuming the estrogen," he said. Someday, perhaps, scientists will be able to use these special bacteria to clean estrogen out of contaminated water.

"It's early, but it's promising," he said.

National Writer Martha Mendoza reported from Lake Mead, while writers Jeff Donn, based in Boston, and Justin Pritchard, based in Los Angeles, also contributed. The AP National Investigative Team can be reached at [investigate@ap.org](mailto:investigate@ap.org)

Source: By JEFF DONN, MARTHA MENDOZA and JUSTIN PRITCHARD (AP)

## Siemens Westinghouse Pioneering Advanced Fuel Cells

tages over other systems. The solid electrolyte eliminates problems of electrolyte containment and migration and allows for various designs. Westinghouse has been a leader in solid oxide fuel cell technology since the late 1950s.

### High-Temperature Tubular SOFC Development

In August 1997, DOE extended the SOFC research and development effort with Westinghouse Electric Company for an additional five years. This research will provide a pathway for low-cost commercial production of tubular SOFCs. The current five-year development effort has a total value of \$211.13 million, with DOE supplying \$101.62 million. This extended effort will help provide a pathway toward commercial markets.

Source: U.S. DOE

**GOV. RENDELL SAYS CONTINUED RUN-UP IN OIL PRICES UNDERSCORES NEED FOR ENERGY INDEPENDENCE STRATEGY CAUTIONS HIGHER ENERGY PRICES ADD TO THREAT OF A SLOWING ECONOMY**

Governor Edward G. Rendell warned that, in the absence of a comprehensive strategy to move Pennsylvania and the nation towards energy independence, the continued increase in oil speculation that resulted in another record price for crude oil will have devastating consequences for families, businesses and the economy.

The Governor said that with oil trading at \$106 per barrel today, the General Assembly should move to pass his Energy Independence Strategy quickly when it returns to session next week.

“The price of energy continues to go up, and that is causing concern for more and more families and businesses,” said the Governor. “As a nation, we’re facing an economic slowdown and a declining dollar. Unless we do something to control these prices, it’s only going to make matters worse.

“Today’s news that oil is closing in on a record \$106 per barrel—the third straight record-setting day, in fact—means motorists will soon be paying more at the pump. And when fuel prices go up, so do the prices of everything else we buy because it costs more to manufacture and transport goods. That’s tough news to swallow for many families whose budgets are already stretched thin.

“We need to stop sending billions of our hard-earned dollars overseas every week, to the cartel of oil-rich nations, and start investing that money here at home in alternative fuels,” said the Governor. “Our consumers and businesses also need tools to conserve energy and use it more efficiently. We can grow our economy, create jobs, and save Pennsylvania consumers \$1 billion every year on their energy bills if the legislature passes the Energy Independence Strategy I put forth more than a year ago.”

The Governor’s PennSecurity Fuels Initiative, part of his Energy Independence Strategy, is now before a special session of the legislature. The plan calls Pennsylvania to produce and consume nearly 1 billion gallons of homegrown, renewable transportation fuels annually, including ethanol, biodiesel and coal-derived fuels—a target amount that will equal the amount of fuel Pennsylvania is expected to import from the Persian Gulf region by 2017. The House of Representatives overwhelmingly approved Governor Rendell’s proposal in June (138-60). It has yet to be acted on in the Senate.

Crude oil for April delivery reached \$105.97 per barrel today on the New York Mercantile Exchange.

The Energy Independence Strategy would require utilities to provide customers with service at the lowest possible cost and invest in cost-effective conservation measures before building more expensive generation plants that pollute the environment or stringing high-voltage transmission lines through Pennsylvanians’ backyards. Utilities would be required to provide smart meters that tell consumers exactly how much electricity is being consumed at any given time and at what cost. Smart meters tell consumers how much energy is being used at any particular time, and how much that energy costs — enabling customers to use less electricity during peak times when it is most expensive, which can save up to 15 percent on annual electricity costs.

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**NEED FOR ENERGY INDEPENDENCE STRATEGY CAUTIONS HIGHER ENERGY PRICES****(continued)**

Overall, the Governor's strategy would cut Pennsylvanian's electricity bills by \$10 billion over 10 years.

For more information on the Energy Independence Strategy, visit [www.depweb.state.pa.us](http://www.depweb.state.pa.us), and click on the "Fueling Energy Savings" icon.

Source: PA DEP

## GOVERNOR RENDELL COMMENTS ON US DOE DECISION ON TRANSMISSION LINES

Governor Edward G. Rendell expressed disappointment as he responded to the U.S. Department of Energy's decision to deny requests to rehear the federal government's Mid-Atlantic Transmission Corridor designation.

"News from Washington is another disappointment for our citizens and another blow to commonwealth's long-standing right to regulate the construction of transmission lines within our borders," said Governor Rendell. "While we'll continue to review this decision, the people of Pennsylvania can rest assured that we're committed to using every available avenue to challenge this decision. It's not right that these lines will cross our land and diminish our property values, but deliver no real benefits to most areas of the state."

At the Governor's direction, the Department of Environmental Protection filed an application for rehearing, of the DOE's Oct. 5 order designating the Mid-Atlantic corridor, which includes 52 of the commonwealth's 67 counties.

The commonwealth cited the following reasons for its request:

The Federal Powers Act requires that any corridor be narrowly drawn and limited only to those areas that are experiencing electric energy transmission constraints or congestion. In many parts of the 52 Pennsylvania counties affected, that is not the case. The DOE failed to consider any alternatives prior to designating the corridor.

DOE never prepared an environmental impact statement prior to making its decision as required in the National Environmental Policy Act. The federal government neglected to consult with the commonwealth in a timely fashion while studying transmission congestion, and failed to consider the state's comments.

The DOE abused its discretion in choosing to designate the corridor.

Source: PA DEP

## NEW WEB SITE AIMS TO INSPIRE PENNSYLVANIANS TO CONSERVE, PROTECT, ENJOY NATURAL RESOURCES

Governor Edward G. Rendell today announced the search for Pennsylvanians who make everyday efforts to conserve natural resources to share their stories and get inspiration from others through the new iConserve Pennsylvania initiative.

“You can’t pick up a newspaper today or have a conversation with your neighbor that doesn’t touch on issues like the Earth’s climate warming, how energy bills are taking a toll on household budgets, or that kids don’t play outside anymore,” Governor Rendell said. “Even small actions, when taken collectively, can make a difference; but it’s sometimes hard for individuals to sort through all of the information to figure out what steps we can take.

The iConserve Pennsylvania initiative’s Web site, [www.iConservePA.org](http://www.iConservePA.org), can help by providing a place for people to share their stories about conservation, get tips, learn why Pennsylvania’s natural resources are so special, and be inspired to start with simple steps,” the Governor said.

The new effort is being introduced this week at exhibits that reach the thousands of visitors at the Philadelphia Flower Show and the Pennsylvania Garden Expo in Harrisburg.

PA iCons—people who already do things in their everyday lives to help address alarming environmental trends—are featured on the Web site. Twelve “founding” iCons demonstrate some conservation practices needed to combat Pennsylvania’s core environmental challenges. Others are encouraged to share their conservation story by filling out a profile with their own tips, stories and favorite places in Pennsylvania.

“As a family, we practice conservation in many ways from buying organic and local, to biking to work and using florescent light bulbs, however, we are most passionate about reducing consumption,” said Sarah Ruppert, of Nazareth, one of the 12 founding PA iCons. “We found that by recycling/reusing everything from water bottles, toys, clothing, furniture, and even household appliances we minimize our footprint and save money!”

The Department of Conservation and Natural Resources administers the [iConservePA.org](http://iConservePA.org) Web site.

“We are at an important crossroads for the environment, much as Pennsylvanians were 100 years ago when mountains were stripped of their woodlands, and waterways were choked with debris, sediment and pollution,” Department of Conservation and Natural Resources Secretary Michael DiBerardinis said. “Our issues are different, but the future of our natural resources still depends on how we react to them now.”

Web site visitors can subscribe to a free monthly electronic newsletter that will include fun facts and green tips. Also featured are simple commitments, next steps and lifestyle change ideas that can help anyone become familiar with conservation, grow their interest, and take action.

Secretary DiBerardinis said iConserve Pennsylvania will eventually expand to include partnerships with organizations and businesses that want to become more active in promoting conservation and stewardship of the state’s natural resources.

Visit [www.iConservePA.org](http://www.iConservePA.org) to explore why conservation is needed and what each person can do to make a difference.

Source: PA DCNR