



Cleanup Review

Compact Fluorescents & the Environment: Friend or Foe?

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DNR Adopt-a-River Assistant



Incandescent



CFL

You have probably heard of using Compact Fluorescent Lights (CFLs) to save energy, or perhaps you may have found one during a cleanup. They have been getting an

increasing amount attention from environmental groups, the media, and businesses. My family has been using them for years and I have outfitted my apartment with 15 of them. Since these light bulbs have trace amounts of mercury, as all fluorescent lights do, they are considered to be a household hazardous waste and need to be disposed of properly. Since CFLs contain mercury, you may wonder, "is this energy-saving 'solution' just going to cause more problems?"

According to the U.S. Environmental Protection Agency (EPA), CFLs use 2/3 the energy of a standard incandescent bulb and typically last 10 times longer. They also claim that if you were to replace a 60-watt incandescent with a 13-watt CFL, you could save around \$30 in energy cost during the life of the bulb. Not only do you save money, but you also reduce waste. You would have to buy and dispose of 10 incandescent bulbs to last as long as one CFL.

Another perk of CFLs is that they produce much less heat than incandescent bulbs. The extra heat produced by an incandescent bulb translates into wasted energy; therefore, since the CFL produces less heat, it uses the energy it draws much more efficiently.

Now you may wonder how, with all of the benefits, there could be an environmental drawback to this exciting energy-efficient, money-saving bulb? The answer is in the tube. While incandescent bulbs produce light by heating a filament, CFLs produce light by using electricity to cause mercury vapor (in neon or argon gas) to fluoresce in a tube. This mercury would be released directly into the environment if the bulb were broken due to mishandling or improper disposal.

Just the thought of a light bulb that contains mercury is enough to turn off some consumers. It is

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Director's Comments

Forrest L. Boe

Forrest L. Boe, Director DNR Trails & Waterways Division

“So bonded to the river that I don’t even mind the nettles.”

This is how someone recently described the fulfillment they felt when they joined the annual riverboat cleanup on the Mississippi River in Saint Paul. Being on the edge of our public waters has frequently produced a sense of wonder and excitement. Whether its Robinson Crusoe combing the beaches of the Caribbean during the pirate days, or Tom Sawyer rafting about during the steamboat era, being on or near the water has often stirred the imagination. This sense of adventure continues to draw us back. Some have said that once you get a little river mud on your hands you never think the same again.

It should come as no surprise that civilization most often arises on the edge of a water body, especially a river. Think about it: Babylon on the Tigris, Nineveh on the Euphrates, the cities of the pharaohs on the Nile, Paris on the Seine, London on the Thames, Washington D.C. on the Potomac, New York City on the Hudson. And yes, of course, Minneapolis and Saint Paul on the mighty Mississippi.

Why is everyone so fascinated with flowing water? Because water floats things, it transports things, it brings things and it takes things away. Not only is this fascination true of rivers, but it’s also true of lakes, ponds, ditches, wetlands, and bogs.

Early summer is a time of discovery. It is the time we visit some of our favorite outdoor places. It is a time when environmental change can be observed. Have conditions improved, worsened or stayed the same since our last visit? Joining or organizing a public waters cleanup is a unique way to check in with those things that “bond” us to the natural resources of our community.



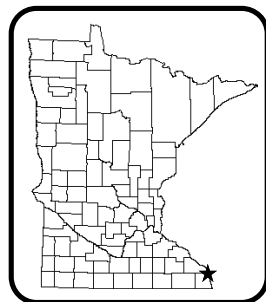
Drawing of Robinson Crusoe circa 1881

Celebrating the Importance of Water

HISTORICAL MOMENT: July 15th, 1857

Hokah

Minnesota's territorial years (1849-1857) were a time of particular interest in Minnesota as a desirable place to settle and build one's fortune. Following the U.S. Congressional Act of August 4, 1854, these lands became available for pre-emption claims by settlers. Newspapers such as the *Hokah Chief* began publishing highly favorable editorials about the water resource wonders of the new land. However, in early Minnesota, rail and water routes were extremely competitive modes of transportation. Grading for the rail line to Hokah would be completed by 1858, and a track would connect Hokah to the outside world by 1866. The first edition of the *Hokah Chief* described the benefits of moving to this town in the extreme southeastern portion of Minnesota Territory. Note the immediate tension arising between the "capitalist" and the "lover of Nature" in the following excerpt from Volume 1, Number 1 (July 15, 1857) of the *Hokah Chief*:



Travelers through Southern Minnesota must be forcibly struck with the beauty and grandeur of [Hokah's] scenery, together with the many lovely sites offering an Elysium to the capitalist and the lover of Nature. We think Hokah [is] admirably fitted by nature to become a thriving and populous town. The place was first settled in 1854. The site is at an elevation of fifty feet above the low-water mark of the Root River, overlooking a fine extent of rich bottom land, well situated for river locations for business houses.

The Southeast boundary is terminated by Thompson's Creek, a stream flowing from mountain springs some four or five miles above, and which we do not hesitate to say affords the best water power we have seen in Southern Minnesota. The creek gradually widens at its mouth into a clear, beautiful sheet of water bearing the title of Hokah Lake, having a fall of twenty-six feet, with room enough below for a large number of first class mills. A saw and grist mill are already taking advantage of the water privilege; a chair, sash and blind factory [are] soon to be erected, and a large machine shop [is] under contract.

Root River also gives an additional advantage to the place, and as flowing through a fertile country, doubtless will become a well improved thoroughfare for cheap and commodious transportation of internal products. With small expense it can be made navigable for light draught boats for fifty miles, and must be of immense benefit to the country along its shores. Just below the town, a fine boat yard is in operation, from which one steam boat has been launched this season. . . . The prospects are good for the rapid completion of the Railroad, and ere long we expect to have speedy communication with Milwaukee and the East.

On the Water



Minnehaha Creek

Featuring:

Beth Joselyn and Padriac Hyne
from the
Minnesota Land Rover Club

Padriac Hyne of the Minnesota Land Rover Club contacted the *Adopt-a-River* program in late December of 2006 about a cleanup he and a fellow club member conducted on Minnehaha Creek in Minneapolis. He and Beth Joselyn decided to do a “creek clean-up day” in early October as part of their club’s environmental stewardship mission. This is their story as told by Padriac; a classic and riveting tale of “Man versus Tire”.

A previous trip down a local creek revealed several junk tires. Beth, always being game for adventure, recalls the statement “we should come back and get the tires”, and so “creek clean-up day” was declared! Besides how hard could it be tooling down a creek on an unseasonably warm fall day?

We started the trip by setting our canoe in at the head of Minnehaha Creek. We scoured the creek bed for junked tires, unsure if our memories had deceived us in the quantities we remember. Retrieval of the first few tires was taking longer than Beth envisioned and was apparent by her yelling “pull it up, get it in the canoe!” Well, upon seeing the next tire, she yells “I got it!” and jumps out of the canoe toward the tire, jeans and all. Believing she will be more efficient in the process. She struts up to tire, bends over and “ugh!!” The tire didn’t budge... Fearful



of letting a man get the best of things, she went down again and “UGGGH!” Glancing up just in time to see the smug grin across my face, the tire finally began to move from its cemented-like state. But this was only the beginning. She still had to clean the 30+ years of heavy sludge and sediment out. Then came the dilemma of how to

remove the sludge/water from within the tire without having it just pour into the other side. After spending 20 minutes to retrieve one tire and now smelly, wet with slime, mud & sand, Beth’s romantic vision had turned into a gritty reality.



Now that we were both on the same page we continued our journey at a much slower pace. Enjoying the warmth of the sun and the peace and

serenity of nature, it was easy to lose ourselves behind the backdrop of cattails and woods. Much like taking a train that unveils the places never seen by road going travelers, we spotted a red-tail hawk in a nearby tree. It was a magnificent large bird that stood at least two-feet tall. Giving us the look of “silly humans you’re supposed to ride IN the canoe.” We also saw turtles with shells the size of a small tire, fish the length of your arm and with the girth of a large man’s thigh, and otters playing in and out of dirt tunnels, swimming gracefully with an ease of comfort and contentment. And Beth’s favorite... a backyard filled with statues of children at play.



Our mission then took an unperceived turn as our “catch” exceeded any expectations we had, and soon we were overloaded. The end of the season also brought little rain, which did not help our situation. Soon we found ourselves pushing and pulling, heaving and dragging our laden canoe through the shallow spots. Looking back, I estimate we covered roughly a mile worth of the sand and rocky creek bed this way. Our simple idea had turned into a half-day scavenger hunt, witnessing the collision of man and nature first hand! We ended our trip after about 10 miles of travel, completely exhausted but feeling as though we had accomplished a small miracle. Our final tally was 10 junk tires and one lost wallet. Next year...the next 10 miles.

If you have ever collected waterlogged tires, you can probably identify with the trials and tribulations that Padraic and Beth faced on their cleanup. Luckily they were able to get their tires to ‘Expedition Autoworks’ who graciously accepted their tires free of charge.

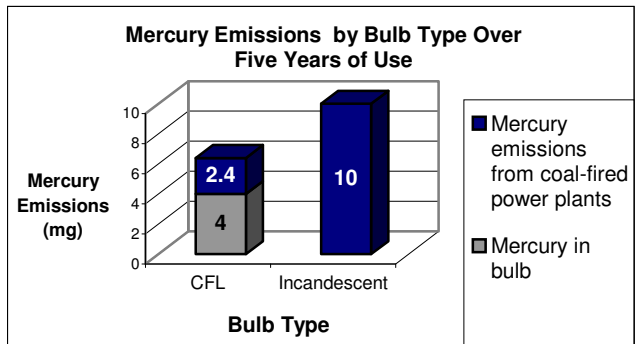
After contacting the *Adopt-a-River* program Padraic got the Minnesota Land Rover Club to pledge to adopt an 8 mile portion of Minnehaha Creek. We are happy to welcome this adventurous and steadfast group of outdoors-people to the program.

“CFL” Continued from page 1

important to understand how much mercury is actually contained within the delicate twisting tubes. According to the U.S. EPA, CFLs average about 5 milligrams of mercury, which is very insignificant when you compare it to a manual thermostat which contains up to 3,000 milligrams.

In the U.S., the number-one producer of mercury emissions is the coal-fired power plant. The U.S. EPA assesses that they produce about 40% of point-source mercury emissions. This should raise some flags. According to the Energy Information Administration, in 2005, coal-fired power plants produced 49.7% of the electricity consumed in the United States. It is important to realize that mercury is also emitted to produce the electricity used in the home!

Since mercury is being produced no matter what type of bulb you utilize, it is important to take that into consideration when deciding which type of bulb is more environmentally benign. A report issued by the U.S. EPA in 2002 surmised that over a five-year period, a coal-fired power plant would release 10 milligrams of mercury to power an average incandescent bulb, while it would only produce 2.4 milligrams of mercury to power a CFL containing 4.0 mg of mercury. This means that if this CFL were to be disposed of properly, it would only be responsible for 2.4 milligrams of mercury being released into the environment; however, if it were broken it would be responsible for only 6.4 milligrams of released mercury.



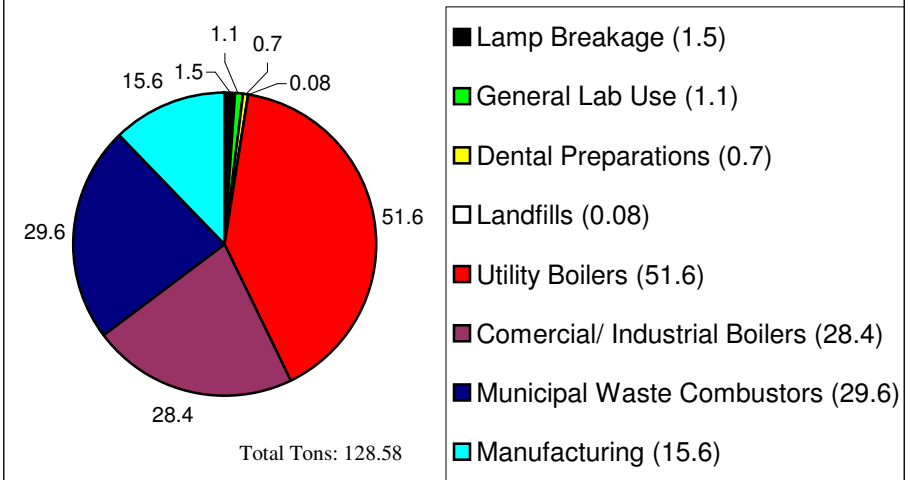
The key in keeping CFLs environmentally friendly is to assure proper disposal at a household hazardous waste collection site, which prevents the release of mercury. If they are sent to landfills, the mercury in the lamps end up in public waters and the mercury is transformed into methylmercury, which makes fish and shellfish dangerous to consume.

Looking at the big picture, it is apparent that even though CFLs contain mercury, the reduction of energy use is enough to reduce the amount of mercury pollution via household lighting. Not only that, this also reduces the amount of other emissions that are produced by all non-renewable energy sources, including carbon dioxide and smog-causing nitrogen oxide.

With the use of CFLs in households being encouraged by the EPA and mass retailers such as Menards, IKEA, and Wal-Mart, it is important to understand that CFLs are considered a household hazardous waste. Proper disposal is key to protect the environment

U.S. Mercury Emissions by Source: Tons/Year

(Data from EPA: Mercury Study Report to Congress 1997)



and public health from preventable harm associated with improper disposal. If you get your energy from Xcel, you may or may not be aware that they offer their customers ten \$0.50 coupons a year to cover the cost of CFL recycling. Visit their website at www.xcelenergy.com for more information and to get your coupons.

If you come across any intact fluorescent fixtures during a cleanup activity DO NOT throw them away with the rest of the rubbish you find. Dispose of them properly through your local household hazardous waste facility. If they are already broken, it is important to still treat them with caution as mercury may still be present. Put on a pair of gloves and pick them up carefully, then place the pieces in a sealed plastic bag and take it to your local hazardous waste pickup site.

Sources: Energy information: http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html, CFL information: <http://www.epa.gov/mercury/faq.htm>; Mercury Study Report to Congress: <http://www.epa.gov/mercury/report.htm>

CFL Disposal

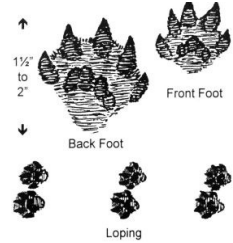
- ◇ Visit <http://earth911.org> and enter in your zip code. You can get information on where to take household hazardous waste, local recycling centers, green shopping, energy conservation, environmental education, and composting! Or, if you don't have the internet call 1-800-CLEANUP to get community-specific environmental information (It's free, and it works great!).
- ◇ Visit the Minnesota Pollution Control Agency's site at <http://www.pca.state.mn.us/oea/hhw/> or call 1-800-657-3864 and ask for the Household Hazardous Waste Program staff.
- ◇ For Xcel energy customers visit: <http://xcelenergy.com> and click "Programs & Resources" "Bulb Recycling".



Creature Feature

River Otter: *Lutra Canadensis*

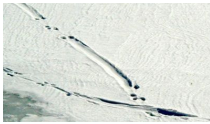
The River Otter, *Lutra Canadensis*, Minnesota's largest aquatic predator, has also been an important part of Minnesota's history. If you are lucky, you may have seen one swimming in a northern river or lake. If you are extraordinarily lucky, you may have seen one in the southern portion of the state.



Though the fur trade was vital in bringing settlers to Minnesota, it took a large toll on the river otter populations. By the 1900's it was practically unheard of to see an otter in southern Minnesota. This was not only due to trapping, but to habitat alteration as well. Fortunately, sound wildlife management, and wetland restoration, has now brought the otter population up to around 12,000, and they are becoming more common in southern areas. Today, the DNR allows 2,000 otters to be trapped annually, and require each pelt to be registered.

River otters are described as being playful child-like creatures. Adult otters weight between 20 and 30 pounds and are typically around four feet long, which includes their massive 18-inch tail. The otter's diet consists of small aquatic organisms and the occasional small terrestrial animal. Their only "aquatic" predator is the human, while on land coyotes, wolves, or bobcats may rarely prey on them.

According to DNR Research Biologist Jon Erb, there are some ways to tell if you have crossed paths with an otter. They are most commonly found in places with a consistent and abundant source of food. During winter months expect to see them in areas with some open water. The most distinguishing sign is their tell-tale slides in the snow. You probably will not see one around a lake with no inlets or outlets, or waters that are completely frozen over. Otters can be found in pretty much any aquatic environment during the spring-fall months. During these seasons you may see some tracks in the mud or stumble upon their latrine. The otter is unique in that it designates specific areas for defecation. That area is usually marked by rolled-down grass patches which are sometimes rolled into balls, dead grass, and scat of varying ages. Fresh scat usually contains fish scales or crushed shells and can be easily confused with vomit. Over time the scat dries up and looks like piles of scales or shells.



Otter slide in snow

Trapping and predation are not the only threat that the otter faces today. With their range extending more southerly, they are increasing their exposure to water pollution associated with urban development. However, a more encompassing threat is that of mercury (Hg), or specifically, methylmercury (CH₃Hg). Mercury is not a local pollutant. Since most of it comes from the air, it is transported for long distances before coming back down into land. This means that even remote areas can have mercury pollution, as do many waters in northern Minnesota.

Aquatic bacteria produce methylmercury, a neurotoxin, when mercury enters water. This methylmercury biomagnifies as it moves up the food chain. This is why we have fish consumption advisories and people, especially women of childbearing age, are advised to eliminate or limit their fish consumption from impaired waters.

The amount of contamination varies based on what an organism consumes. For example, if every sunfish has 10 units of exposure, a trout that consumes sunfish could accumulate 100 units of exposure after consuming 10 sunfish. Then a river otter that consumes trout could have 1000 units of exposure after eating 10 trout.

Otters do not have a choice on whether or not to eat aquatic organisms. It is an indelible staple of their diet, and unfortunately, like humans, they are susceptible to its harmful effects. According to the 1997 U.S. EPA Mercury Study Report to Congress, otters are ranked second, after the kingfisher, when ranked by exposure to methyl mercury. This is because the methyl mercury found in their food (fish) accumulates in their organs and tissues, and just like with humans, certain exposure levels can cause health effects including; nervous and immune system damage, genetic and enzyme system alterations, reproductive harm, and even death.

How can you help the otter and prevent mercury pollution? One thing you can do is reduce the amount of mercury emissions you are responsible for by using Energy Star appliances in your home; however, if you will be using compact fluorescents, be sure to dispose of them properly! You can also get involved in restoring and cleaning up their habitat by cleaning up trash, restoring stream banks, and educating others about the threats of mercury and urban water pollution.

Sources: <http://www.dnr.state.mn.us/snapshots/mammals/riverotter.html>; <http://www.pca.state.mn.us/publications/p-p2s4-06.pdf>; Tracks and Photograph from John Erb, DNR.; <http://www.epa.gov/ttn/oarpg/t3/reports/volume6.pdf>
.ms

“CFL” Continued from page 7 **CFL Tips**

- ◇ Use CFLs to replace the incandescent bulbs you use most frequently in your home.
- ◇ Don't use CFLs in fixtures that you frequently turn off and on (like in a bathroom), because this can lessen the life expectancy of the bulb. Recommended: 15 minute minimum usage.
- ◇ CFLs do not work with 3-way or dimmer switches unless specified.
- ◇ Before you buy CFLs have a game plan:
 - Note the wattage of the bulbs you are replacing and the type of fixture you're putting it in; be sure to get the equivalent CFL.
 - If the store has a display, note the light hues of different bulbs, Menards usually has a display for this purpose. Hues range from cool to warm.
- ◇ Know what you are getting into:
 - Educate yourself on how CFLs work, disposal regulations, and the hazards associated with mercury. The following sites are helpful in educating users and link you to other resources:
 - <http://energystar.gov> click “Products” “Lighting” “CFL’s”.
 - <http://www.lamprecycle.org/>
 - <http://www.epa.gov/mercury/>





Summer 2007 Adopt-a-River Calendar of Events

As of May 4th, 2007 * Contact organizers to verify times and locations.

June 2-10th: National River Cleanup Week

Any groups interested in conducting their cleanup during this week can register to be included in the National River Cleanup Registry through American Rivers. For information, contact American Rivers at 202-347-7550, by email at Outreach@americanrivers.org or register online at www.nationalrivercleanup.org.

June 3rd: Celebrate Lake Pepin

The festivities will take place at Hok-Si-La Park in Lake City. The event will include a presentation of river issues and information with booths in the dining hall, bird walks, children's activities, and food. A cleanup of the area is also scheduled. Activities run from 11 a.m. – 3 p.m. Please contact Joanne at jemweavers@earthlink.net or call 651-345-3855 for more information.

June 14th: 16th Annual DNR / Padelford Great Mississippi Riverboat Cleanup

Pre-registration required. A free event with live music, lunch and door prizes. Volunteers should dress appropriately for hard work along the river rain or shine. Thick-soled shoes, skin protection and a cap or hat are needed. Departure from Harriet Island in Saint Paul. Recommended for those physically fit and over age 11, with proper adult supervision. Bags and gloves will be provided. Hosted by Minnesota Department of Natural Resources and Padelford Packet Boat Company. Contact the Adopt-a-River Program by phone at 651-259-5620 or by email at megan.godbold@dnr.state.mn.us.

August 23rd — September 3rd: Minnesota State Fair

Don't forget to visit the Adopt-a-River booth at the 2007 State Fair where you will see the newest "found objects" sculpture! If you are interested in volunteering at our booth, or would like more information, call 651-259-5620.

An updated calendar of events can be viewed on the DNR's Internet Calendar of Events which can be reached through the Adopt-a-River's webpage: www.dnr.state.mn.us/adoptriver.



Photographs from the 2006 Riverboat Cleanup

Adopt-a-River Notes & News

Purple Cards: Thank you to all the groups that have sent in their purple cleanup report cards for their 2006 cleanups. As of May 4th, 2007, volunteers have reported (for 2006) 167 cleanups, spending over 12,700 hours cleaning up 127,775 pounds of trash from 520 miles of Minnesota shoreline. To date, *Adopt-a-River* volunteers have spent 240,324 hours removing over 4.9 million pounds of trash from Minnesota's public waters. Excellent work! Also, please remember that if you have completed a cleanup and not reported it to **SEND IN THOSE PURPLE CARDS**. Results can also be emailed to Megan.Godbold@dnr.state.mn.us or called in to 651-259-5620.

Send in your digital photos! Have you taken digital photos at your events? Do you have any graphic images of trash on a riverbank? If so, e-mail us your photos and they could be used in a future edition of the *Cleanup Review* or posted on the Adopt-a-River website! Send them to Megan.Godbold@dnr.state.mn.us or send us a link to your online photo album!



Free event promotion! Would you like your late summer/ fall cleanup posted in the next issue of the *Cleanup Review* or on the DNR events page and Adopt-a-River online calendar? If interested, contact the Adopt-a-River Assistant at 651-259-5620. Contact us at least 3 weeks prior to your event. Postings should include time, place, contact information, and event details. Don't forget that we can also make flyers and brochure inserts to help you with event promotion.



Dragon Fly", by artist Paul Byer, was the 13th annual found-objects sculpture for the DNR Adopt-a-River exhibit at the 2006 Minnesota State Fair last summer.

In commenting about his work, the artist said, "By using this familiar 'messenger', often seen hovering above the waters of the river, I hope to convey the river's energy and beauty, both of which are too often marred by our carelessness." This sculpture, as well as all of the past sculptures, may be viewed by visiting our website. It is currently on display at Maltby Nature Preserve in Randolph, MN.

Cleanup Review is published by the Minnesota Department of Natural Resources for the Adopt-a-River Program in the Trails & Waterways Division.

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Please direct your comments, questions, and suggestions to the editor of *Cleanup Review* at 651-259-5620 or to the Adopt-a-River Coordinator, Paul Nordell at 651-259-5630; FAX 651-297-5475; MN Toll Free: 1-888-646-6367; e-mail: paul.nordell@dnr.state.mn.us; or write to: MN DNR, Trails & Waterways Division, 500 Lafayette Road, St. Paul MN 55155-4052.

*Don't forget to visit our web site at:

www.dnr.state.mn.us/adoptriver.



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