Cobb County Watershed Stewardship Program

Fall 2009

Volume 6, Issue 4

Editors: Jennifer McCoy
Vicki Culbreth

Adopt-A-Stream Yearly Highlights

Here at the Watershed Stewardship Program, we've always known that Cobb County volunteers consistently stand out as some of the most dedicated in the state. We were happy to see our theories confirmed in the "Yearly Highlights" section of the Adopt-A-Stream database, which gives a quick rundown of the most active groups, sites, and watersheds.

Top Monitoring Groups

Congratulations to **Eric Lee**, who is the **3rd** most active Adopt-A-Stream volunteer in Georgia! Eric monitors seven sites near Bishop Lake in east Cobb. Astonishingly, Eric has only been monitoring since December 2008 - yet he's demonstrated his commitment with an incredible 42 events since adopting these sites.

Sierra Club Cobb Centennial Group is the **8th** most active group in Georgia with 27 events this year. Sierra Club has been monitoring three sites on Rottenwood Creek since early 2000.

Most Active Sites

Sierra Club's three sites on **Rottenwood Creek** each have 9 events. **Highland Lake**, monitored by **Patricia Taylor**, also has 9 events.

Most Active Watersheds

The **Upper Chattahoochee River** is by far the most monitored watershed in the state. The **Etowah River** watershed follows as the 3rd most frequently monitored. Since Cobb shares both the Chattahoochee and Etowah Rivers with other municipalities, we can't take all the credit… but we'd like to think that Cobb volunteers are an integral part of making Adopt-A-Stream a success.

A BIG thank you to <u>ALL</u> of our Watershed Stewards!!!

Inside this issue:

Phosphorus & Fertilizers	*2-3*
Beavers	*4-5*
Calendar	*6-7*
Recommended Reading	*6*
New Watershed Stewards	*7*
2010 Stewardship Fair	*8*

Special points of interest:

- Project Learning Tree Workshop on 9/30 & 10/1
- Household Hazardous Waste Workshop on 10/15
- AAS Biological Workshop on 10/17
- AAS Bacteria Workshop on 11/14

River Phosphorus Drops Following Fertilizer Ordinance

In the mid-2000's several municipalities around the country implemented laws restricting the sales and use of lawn fertilizers containing phosphorous in hopes of reducing the amount of phosphorous runoff. Although no such restrictions exist in Georgia, newly-released TMDL (Total Maximum Daily Load) levels in Lake Allatoona reveal that an overabundance of nutrients may be causing water quality problems. Nutrients present in stormwater runoff can come from many different sources, including animal waste, fertilizers, and sewer leaks.

John T. Lehman of the University of Michigan and some of his students conducted a study on ponds and streams near Ann Arbor to determine if such an ordinance would be beneficial for water quality. The following are excerpts from their paper, "Reduced river phosphorous following implementation of a lawn fertilizer ordinance", published in scientific journal *Lake and Reservoir Management*.

Growing numbers of municipalities and state governments have adopted or are considering the adoption of restrictions on residential use of phosphorus-containing fertilizers. The actions are based on awareness that phosphorus (P) is often not a growth-limiting nutrient in many terrestrial soils, and that excessive application of the element leads to runoff and eutrophication of surfacewaters. Examples include the state of New Jersey, with over 100 municipalities affected; Sarasota County, Florida; the state of Maine; and Dane County in Wisconsin.

Aside from the environmental consciousness of the actions, little evidence exists that the bans are having a salutary effect. For example, the state of Minnesota enacted a law to regulate the use of phosphorus lawn fertilizer with the intent of reducing unnecessary phosphorus fertilizer use. The law, which went into effect in 2004 in the Twin Cities metropolitan area and statewide in 2005, prohibits use of phosphorus lawn fertilizer except in prescribed instances. However, field studies to examine the efficacy of the ban for improving surface water quality were inconclusive, a fact attributed to excessive variability in runoff data.

As part of its efforts to comply with a state-imposed phosphorus total maximum daily load (TMDL) that called for a 50% reduction in P discharges to the Huron River, the city of Ann Arbor in southeast Michigan enacted an ordinance that went into effect in 2007 to limit phosphorus application to lawns. Compliance with the lawn fertilizer ordinance depends on restriction of phosphorus fertilizer application by homeowners and lawn care services unless they have a soil test demonstrating need. The estimated effect of full compliance was a 22% reduction in P entering the river. The prediction was obtained by estimating the lawn fertilizer runoff from a creekshed within the city and extrapolating that result to all other creeksheds. [A previous study] concluded that a 25% reduction in total P (TP) would be detectable after 1 or 2 years of sampling 4 times per month. Similar percentage reductions in dissolved P (DP) would likely take 2 or 3 years, and for soluble reactive P (SRP), the time could be as long as 8 years. This paper reports the test of the *a priori* predictions after 1 year.

Study site

Our field site was a portion of the Huron River catchment in southeastern Michigan. Four stations were established on the basis of an existing historical data set at weekly and subweekly intervals. The station designated Control (CTL) was upstream from Ann Arbor and outside the jurisdiction affected by the city ordinance. Water was collected at weekly intervals from May to September 2008. Raw water was filtered on site for nutrient analysis.

Discussion

[The previous study's] median estimate of the effort needed to detect a 25% change was 8 years of weekly samples for SRP but only 2 years for TP and 3 years for DP. The results of this study after 1 year are consistent with those predictions. A reduction in SRP was detected at only one site on one date, whereas reductions were detected for both DP and TP at experimental sites with greater regularity. A summary of key findings follows:

- Decrease in TP concentration at 90% confidence were noted in 10 cases out of 15 at the experimental sites (A, B and F) during the main growing period from May to September. Moreover, a trend of reduced (mean) TP concentrations was observed at the experimental sites in 14 cases out of 15. Reductions at station B, just upstream from the [wastewater treatment plant] outfall, were more regular than at station A. Station B receives considerably .

more cumulative drainage from Ann Arbor than does station A and may therefore be more responsive. The average reduction in concentration for the 10 statistically significant cases was 28%.s in TP concentration at 90% confidence were noted in 10 cases out of 15 at the experimental sites (A, B and F)

- Reductions in concentration of DP were rarely significant at 90% confidence level at the experimental sites, although a trend of reduced monthly mean concentrations was observed at the experimental stations, with the mean reduction being 13% overall.
- The magnitudes of the DP and TP reductions at station F, downstream from the [wastewater treatment plant] outfall, were indistinguishable from DP and TP reductions measured at station B, upstream of the outfall. Combined with absence of any systematic trend in point source discharge of TP, this suggests that the detectable effect traces to nonpoint source loading.
- The upstream site CTL appeared to function well as a control site, in that no reductions in SRP, DP or TP were noted.
- The non-target variables showed no evidence of the station-specific response seen in TP and to a lesser degree in DP. Departures of specific conductance, pH and CDOM from historical conditions appeared to originate upstream of the experimental unit because they were in evidence at the control site. Consistent changes in nutrient concentrations only within the experimental unit were confined to P.
- Based on the median daily TP load carried by the Huron River at station B during May to September 2003–2005, the magnitude of the load reduction is about 5 kg P/day.

After the first year of data collection and analysis, detectable reductions have been documented for TP and, to some degree, for DP for every month from May to September. Percentage reductions are of the magnitude predicted to be detectable at the applied level of sampling effort. We can state objectively within the context of our statistical model that P concentrations were lower in 2008 compared with the reference period (2003–2005) at experimental sites upstream from the [wastewater treatment plant] outfall and therefore independent from treatment or discharge practices. These reductions were coincident with a city ordinance restricting use of lawn fertilizers containing phosphorus. In fact, the magnitudes of DP and TP reductions downstream of the outfall are not statistically different from those measured upstream, meaning that the 2 are highly correlated and traceable to nonpoint source loading.

It would be tempting to conclude that the phosphorus reductions were caused by implementation of the ordinance, and that may be the case; however, the ordinance was enacted in the context of public education efforts that encourage citizens to be more mindful of yard waste discharges into storm drains, to exert more diligence regarding buffer strips of vegetation along stream banks and to exhibit more environmental awareness in general. These multi-faceted efforts make it difficult to isolate a single cause for the changes, but the changes appear to be real and of the predicted magnitude and direction. Continued measurements are certainly in order in this watershed as well as others, but the initial results suggest that with good baseline data even relatively modest (25%) changes in nutrient load can be detected against background variation on time scales fast enough to help inform policy decisions.

Reprinted with permission from Lake and Reservoir Management,
a journal of the North American Lake Management Society

A complete copy of this article is available at

http://www.informaworld.com/smpp/content~db=all~content=a913929531

Beavers: Friend or Foe?

When European colonists first came to the New World, the beaver population numbered nearly sixty million strong. These famously busy animals altered the landscape into something that might be unrecognizable by today's citizens. They were so abundant that the Native Americans agreed to trap them in exchange for modern European tools and fabrics. In Europe, beaver hats became a popular and necessary accessory for both sexes. Pilgrims in North America turned their thick pelts into coats. Since then, their population has decreased to only a tenth of what it once was. Their decline has led to an inexplicable change in our landscape, and modern Americans may never fully understand the impact of such a loss.

Photo by Erin Feichtner

Beavers are the world's second largest rodent. There are two species in existence today - the American beaver (*Castor canadensis*) and the European beaver (*Castor fiber*). These species are distinguished by their size, head shape, and tail shape. Although they may appear similar, the species are very distinct, with the American beaver possessing 40 chromosomes and the European beaver possessing 48, which makes successful interbreeding impossible. Both species have a thick, double layer of fur, round heads, flat, paddle shaped tails, and an ungainly waddle on land. They are nocturnal and live in family groups that share the building, baby-sitting, and lookout duties.

Beavers are second only to humans for their ability to alter their landscape. They are extremely efficient engineers, building lodges in suitable ponds and lakes, and turning unsuitable habitat into something more appealing (for beavers, anyway). With their massive teeth and jaws, they fell trees and branches and drag them to strategic locations to block water flow. Holes in the dam are plugged with mud and stones, creating a wall that can turn a small stream into a large, deep pond. Contrary to popular belief, beavers do not live in the dams they build. Instead, they build a second structure called a lodge, with an underwater entrance that protects them from predators. A family unit lives in the lodge and includes the parents, year-old kits, and newborns. Beavers are vegetarian and eat the bark from trees, aquatic tubers, clover, and fruit.

In addition to their thick pelts, beavers have been historically hunted for their *castoreum*, a secretion of the scent gland that was valued for its medicinal properties. Today, *castoreum* is an important ingredient in many perfumes. By the early 1900's, beavers were almost extinct in North America not only due to hunting, but also due to the draining of their ponds for agriculture. Although their populations have increased since then, estimates of their current population only range from six to twelve million.

Many people consider beavers pests due to their knack for altering their habitat. Their dams often cause flooding and erosion problems for homeowners, who immediately call pest control companies to have them removed or eradicated. Unfortunately, this may not fix the problem since once they are removed, others will move into the empty habitat. Beavers also respond to persecution by increasing their reproductive rates. The upside to this self-regulatory breeding habitat is that they rarely over populate an area, decreasing their rate of reproduction when their numbers start to saturate the environment.

Beaver dam

Beavers are extremely beneficial because they turn meadows into rich wetlands. While this may cause the demise of some species that prefer a meadow habitat, wetlands have a very high level of species diversity since they can support both aquatic and terrestrial organisms. Wetlands also help regulate the environment by slowing erosion, filtering pollutants from groundwater, and, ironically, preventing floods. Water downstream of beaver dams is often cleaner and requires less treatment than the

waters above it. Worldwide, wetland areas are decreasing to the point where some agencies (such as the U.S. Wetland Reserve Program) who recognize the benefits of this habitat will reimburse landowners who protect them.

Beavers are also a keystone species in their environment, fulfilling a role that affects all other organisms in the ecosystem and is critical to maintaining the structure of the community. They play a major role in ecosystem succession by not only creating ponds, but by allowing grasses and shrubs to grow after they've abandoned an area. These shrubs provide shade for tree seedlings which will eventually turn the pond back into a woodland area. The trees that died as a result of the flooding provide valuable wildlife habitat. Tree species in North America are also adapted to the beaver's destructive habits. Many of them will readily send up new shoots after coppicing (cutting young trees near ground level), resulting in a richer habitat that was there previously.

Even after taking all of these benefits into consideration, it might still be difficult for homeowners to reconcile being neighbors with an animal that will turn their property into a swamp. The best solution might be to allow the animals to remain while addressing specific concerns. Flow devices and pipes can be installed that save the created wetlands while ending nuisance flooding. Individual trees can be protected by fencing. Installing wire mesh around culverts can prevent beavers from plugging up the hole, which causes subsequent flooding. If the animals must be removed from an area, live traps are the most humane methods. Kill traps may leave the suffering animal alive for hours, while snares leave them vulnerable to predators. At best, this is only a temporary solution before other individuals move into the area, and may actually cause damage to the landscape when the beavers are no longer able to repair existing dams.

A Water Level Control Device (WLCD) can help beavers and humans to coexist peacefully.
Photo by the Massachusetts Division of Fisheries and Wildlife.

As with most wildlife, ignorance about their role in nature has caused the conflict between humans and beavers. Once the role of this vital species is understood, we can begin to work with them instead of against them to restore the balance and diversity in our ecosystem.

Sources

"Beavers: Wetlands & Wildlife". Beavers: Wetlands & Wildlife Inc.. 8/2009 <http://www.beaversww.org/>.

"Nature Works". New Hampshire Public Television. 8/3009 <www.nhptv.org/Natureworks/beaver.htm>.

Outwater, Alice. Water A Natural History. New York: Basic Books, 1996.

To Do:

REMINDERS!

Watershed Stewardship Volunteers: Please visit www.cobbstreams.org and click on "Volunteer Profile Form" at the bottom of the page so we can add your group to our website!

Newsletter Recipients: Please help our program become more sustainable! Visit www.cobbstreams.org and click on the link at the bottom of the page to sign up for an electronic version of this newsletter.

Schedule of Events

Project Learning Tree for Educators

Date: Wednesday, September 30th & Thursday, October 1
Time: 5:00 pm - 8:00 pm
Location: Smith-Gilbert Gardens
Cost: Free
Call: 770-528-1482

Household Hazardous Waste Workshop

Date: Thursday, October 15th
Time: 6:30 pm – 8:00 pm
Location: Water Quality Lab
Cost: Free
Call: 770-528-1482

Adopt-A-Stream Biological Monitoring Workshop

Date: Saturday, October 17th
Time: 9:00 am - 2:00 pm
Location: Water Quality Lab
Cost: Free
Call: 770-528-1482

October 2009

Rivers Alive! Month

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			30 September	1 Project Learning Tree Workshop for Educators	2	3
4	5	6	7	8	9	10
11	12	13	14	15 Household Hazardous Waste	16	17 Biological Monitoring
18	19	20	21	22	23	24
25	26	27	28	29	30 Outdoor Classroom Symposium	31

Recommended Resources

Riffle Fish: An Evolving "Webumentary"

www.rifflefish.com

Riffle Fish is an evolving webumentary about the plants and animals that live in the riffles of rivers and streams. The on-line documentary will include new clips about the insects, mollusks, fish and amphibians that make up the riffle community. The site will also provide interviews about the science of riffle ecology and the conservation efforts to preserve their biodiversity.

Some of the current documentaries being offered by Riffle Fish include clips on lake sturgeon, rainbow darters, and blue river fish. Riffle Fish also has sister webumentary sites about frog calls, cave dwellers, and various other wildlife.

Photo by Erin Feichtner

November 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14 Bacteria Monitoring Workshop
15 America Recycles Day nrc-recycle.org	16	17	18 American Education Week | www.nea.org	19	20	21
22	23	24	25	26 Thanksgiving	27	28
29	30					

Schedule of Events

Bacteria Monitoring Workshop

Date: Saturday, November 14th
Time: 9:00 am - 12:00 pm
Location: Water Quality Lab
Cost: Free
Call: 770-528-1482

Welcome Catherine Mercier-Baggett to the Watershed Stewardship Program!

We are pleased to announce the newest member of the Watershed Stewardship staff, **Catherine Mercier-Baggett**.

Catherine attended the University of Montreal and graduated with Bachelor's degrees in Biology (1999) and Landscape Architecture (2004). She earned her Master's of Urban Planning in 2001. While in school, she worked as a research assistant analyzing water samples, identifying wetland species, and mapping stream locations, as well as teaching young students about scientific concepts. Professionally, she has worked with several companies in Montreal and Atlanta as an urban planner and landscape designer.

We are looking forward to the unique perspective and experiences Catherine has to offer and are excited to welcome her to the laboratory staff.

Welcome, New Watershed Stewards!

Richard Beard with the City of Acworth will be monitoring and marking stormdrains near Lake Allatoona.

The Donnelly Family will be marking stormdrains in their neighborhood in Kennesaw.

The **Mableton Improvement Coalition** will be marking stormdrains and cleaning up Nickajack Creek in Mableton.

Cobb County Watershed Stewardship Program

Jennifer McCoy, Program Coordinator
Vicki Culbreth, Program Specialist
Catherine Mercier-Baggett, Program Assistant

662 South Cobb Dr
Marietta, GA 30060
Phone: 770-528-1482
Fax: 770-528-1483
Email: Water_RSVP@cobbcounty.org

This is an official publication of the Cobb County Water System, an agency of the Cobb County Board of Commissioners.

Sam Olens, *Chairman*
David Hankerson, *County Manager*
Helen Goreham, *District One*
Bob Ott, *District Two*
Tim Lee, *District Three*
G. Woody Thompson, *District Four*

Cobb County...Expect the Best!

2010 Watershed Stewardship Fair

SAVE THE DATE!

Who:
All Cobb County Watershed Stewardship Volunteers

When:
January 28, 2010
6:30 - 9:00 pm

Where:
Cobb County Water Quality Lab
662 South Cobb Drive
Marietta, Ga 30060

2009 Participants shared their monitoring data with other volunteers, enjoyed refreshments, and took a tour of the water quality lab.