

STEWARDSHIP

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news

Stewardship in Action

Membership in the Audubon Cooperative Sanctuary Program (ACSP) officially begins when you register in the program, but the learning, fun, and rewards of participation truly begin when you actually get started on stewardship projects. Your commitment, planning, and creativity will soon give way to exciting results for people, wildlife, and environmental quality. Here are several examples of outstanding projects and results garnered through participation in the ACSP. We hope they spark your enthusiasm for starting or continuing your stewardship efforts this year.

Griffin Industries Inc. ACSP Business Program Member Butler, KY

Over the past 2 years **Griffin Industries-Butler Division** has teamed up with local schools to work on a variety of projects and gain certification in *Outreach and Education*. Fifth-grade students from **Southern Elementary School** visited the facility and got involved



Griffin Industries, Inc.

in tree identification and biology while hiking along the industry's nature trail. Later, Griffin staff offered a workshop on attracting birds, and students built nest boxes that were subsequently mounted at the facility. In a further show of commitment to educating youth from their local community, Griffin Industries-Butler Division recently "adopted" **Phillip A. Sharp Middle School** and plans to help them develop their school as an Audubon Cooperative Sanctuary. Slated for lessons this spring are lab experiments that will use recycled products produced at the Griffin facility to relate science to real-life situations, and a poster and essay contest to employ students' artistic and writing skills to highlight the benefits of environmental stewardship. *For more information, contact Doug Buckner, Griffin Industries-Butler Division, at (800) 847-5187, extension 202.*

Stan and Catherine Waterhouse ACSP Backyard Program Member Orlean, VA

Catherine and Stan Waterhouse's certified backyard includes 64-acres of oak-hickory woodland, two creeks, and lots of habitat enhancements. Catherine and Stan apply their passion for birds, gardening, and landscaping to create flower and shrubs beds that compliment existing wildlife habitat. "It's been fun, challenging hard work (not to mention all the money

spent) to start from a clean slate 1½ years ago to what we have now," reports Catherine. With more than thirty-six varieties of mostly native trees and shrubs chosen for landscaping around the house, they have successfully attracted 95 species of birds, 20 species of butterflies, 12 different mammal species, and 10 species of amphibians and reptiles.



Catherine Waterhouse

Glendale Country Club/ Odle Middle School ACSP Golf Program/ School Program Members Bellevue, WA

A partnership between **Glendale Country Club** and **Odle Middle School** is having life-sustaining benefits for Chinook salmon, a threatened species. Superintendent Steve Kealy initiated the effort in 1991 by protecting and restoring salmon habitat in Kelsey Creek that runs through the golf course. But that

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Glendale Country Club

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Watching out for West Nile Will the West Nile Virus return with the birds?

In the fall of 1999, a disease never before seen in the U.S. struck both humans and birds in the New York City area. Known as the West Nile virus, it killed seven people and sickened fifty-nine others before the weather turned cold and the mosquito-borne disease was laid to rest. Parts of Nassau and Westchester counties and metropolitan New York City were broadcast sprayed with malathion, Anvil, and pyrethroid pesticides to kill mosquitoes

and prevent further transmission of the disease.

Several thousand birds also died. Crows appeared to be more sensitive to the disease than other birds—although this may be attributable to the fact that dead crows are simply easier to spot. A diversity of species, including blue jay, black-crowned night heron, mallard, American robin, several species of hawks and gulls, and belted kingfisher all tested positive for the West Nile virus.

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Audubon International Vision

Sometimes, when people we meet are hesitant to join the Audubon Cooperative Sanctuary Program, we hear an almost audible groan: "Oh, that sounds like such a good program, but I simply don't have time," or "I just don't need another project." Sometimes the sentiment is spoken, but more often it's left unsaid. And we both walk away unsatisfied, as if we didn't really get to the heart of the matter.

In reality, environmental stewardship isn't a project or a task or a chore; it's not about *time*. It's an *attitude* that includes the idea that the state of the environment is important. It's the *practice* of making decisions and taking actions that attempt to improve and protect the quality of the environment, or at least reduce our impact on the resources and ecosystems that sustain life.

Though being a steward challenges us to think about how our daily actions impact water, land, wildlife, and people, it also offers us an exciting way make a positive difference in the world around us. It invites life-long learning about the fascinating planet upon which we live.

As members of the Audubon Cooperative Sanctuary or Audubon Signature Program, we hope to become partners with you in your stewardship efforts. We hope to stimulate thinking and discussion, share ideas and information, and offer examples of projects that you might like to try. You can set your own pace and develop your own goals. Make a *commitment* to stewardship, and the practical application will follow.

We look forward to learning from you and improving the quality of life and the environment together.


Jean Mackay, Editor

Stewardship in Action

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was just the beginning. Steve and the grounds crew built and installed five remote salmon egg incubators to enhance salmon populations in Kelsey Creek. Glendale also purchased equipment for Odle Middle School students to hatch salmon eggs in an aquarium, then release them into Kelsey Creek on the golf course. From January through April, students monitor water temperature and pH, check eggs, and feed the fish before releasing them. In the last three years, they have raised and released more than 30,000 salmon each year. For more information on this exciting partnership, contact Steve Kealy, Superintendent, Glendale Country Club at 425-746-7947.

TPC at the Canyons
ACSP Golf Program Member
Las Vegas, NV

Maintaining an environmentally sensitive golf course in the desert is not easy, but **TPC at the Canyons**

has done an outstanding job. Reducing maintained turfgrass, selecting drought-tolerant landscape plants, and integrating natural desert terrain help the course reduce water and chemical use, while maintaining wildlife habitat. More than 100 acres of desert on the property provide habitat for some of the Mojave Desert's unique inhabitants including: chuckwalla, whiptail lizard, gecko, antelope squirrel, kit fox, and the endangered desert tortoise. TPC at the Canyon is also working with the state Department of Wildlife to get two endangered fish species, the Pahrump pool fish and razorback sucker, to inhabit their lake. For more information, contact Debbie Walthers, TPC at the Canyons 702-236-3600.



TPC at the Canyons

Watching out for West Nile

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The Mosquito-People- Bird Connection

The West Nile Virus is an *arboviral infection*, which means that it originates within insect populations—generally blood-sucking insects like mosquitoes or ticks—and undergoes changes in the insect prior to transmission. Fortunately, not all species of mosquitoes carry the disease—West Nile is primarily transmitted by the *Culex* mosquito. Unfortunately, while only a small number of *Culex* mosquitoes may carry the disease, they are generally prone to biting birds and people.

Birds can't transmit the disease directly to people, but once they become infected, the virus can be transmitted back to mosquitoes for about four to five days. During that time, birds can fly hundreds of miles, carrying the disease with them. Should they be bitten again by a mosquito, that mosquito becomes a new carrier of the disease.

Though some experts believe that the disease outbreak ended with the first frost last November, others say there is a possibility that the West Nile virus will spring up again, having been harbored in dormant mosquitoes through the winter. Thus, should the disease re-appear this spring, bird migration and disease distribution will need to be closely monitored.

The Threat of West Nile Virus vs. The Threat of Broad-Scale Pesticide Spraying

The West Nile virus generally attacks those with weakened immune systems or immune deficiency diseases. All seven victims of last year's outbreak were

elderly. While the West Nile virus is rarely fatal, its encephalitis stage is extremely damaging. Swelling of the brain may cause high fevers, headaches, uncontrollable violent seizures, and sometimes death.

Broad-scale spraying of malathion and other chemicals to control the spread of disease carries its own set of risks. Malathion's label warns against spraying near water sources or where runoff is likely to occur—a difficult if not impossible task when aerially spraying the chemical. Ironically, the pesticide has also been found to weaken the immune system (*Journal of Immunology*, 140(2)), thereby making those exposed to it more vulnerable to disease.

Should the disease re-appear, authorities will monitor its outbreak and severity and weigh controversial spraying with threats posed by the disease. If state health and environmental departments implement preventative measures outlined by the National Center for Disease Control, conducting wide-spread pesticide spraying may not be necessary.

Attracting Birds Safely

While the West Nile virus may or may not reappear this year, there are simple precautions people can take to reduce of mosquito bites and still enjoy attracting birds to their properties. These guidelines are especially relevant for residents of New York, New Jersey, and Connecticut, where West Nile appeared last fall.

- Most important, remove stagnant backyard pools or birdbaths, old tires, or rainwater barrels that invite breeding mosquitoes.
- Wear protective clothing outdoors and use insect repellents to reduce the risk of mosquito bites.
- Finally, should you find dead birds on your property with no visible sign of injury, contact your local wildlife pathology department or health department to find out whether the bird should be tested for West Nile virus.

Stewardship in the Northern Great Lakes

When M. K. “Dutch” Cragun, owner of Cragun’s Resort near Brainerd, Minnesota, decided to expand recreational opportunities for his resort guests, he didn’t just chose to build a golf course—he chose to build a course that would exemplify the natural beauty of the land and his commitment to the environment.

“We committed ourselves to be good stewards during the development process of the golf course. That meant that we had to make as little impact on wildlife habitat and water quality as possible,” reflected Dutch Cragun. “We chose to work with Audubon International because the organization is the leader in sustainable development and had the education program in place to assist us with all the issues that we would face. We required the architects bidding for our job to exceed Audubon International standards and be especially vigilant during the earth-moving process.”

Preserving the Integrity of an Ecosystem

Through the Audubon Signature Program, we got involved with Cragun in 1996, during the planning and design stages of the golf course, when environmental decision-making is crucial. Cragun’s Resort and the Legacy at Cragun’s golf course is located in the heart of Minnesota in the *Northern Great Lakes* ecological region.

Once a vast old-growth forest that stretched from the Dakotas to the Atlantic coast, second-growth hardwood forests now dominate natural plant communities in the region. Though logging occurred on the Cragun’s site during the past 150 years, the land was most recently used for recreational ski and snowmobile trails. Fortunately, wildlife remained in relative abundance, and one of our primary goals was to keep it that way.

Preserving the integrity of existing habitats on site, and looking for opportunities to expand wildlife corridors, nesting areas, and native plant communities is one of our specialties in the Audubon Signature Program. We look at everything from routing of golf holes to landscape features to future maintenance needs to help people develop their land in concert with the environment. In this case, Signature Program Director Nancy Richardson also worked closely with the Tom Kientzle, Director of Golf, and Golf Course Designer Bruce Charlton, to reconfigure golf holes and reroute the cart paths and bridges to avoid the destruction of mature trees that would provide a dramatic backdrop for the course and habitat for wildlife.

The predominant water feature on site is Stephen’s Lake, a spring-fed, 103-acre lake with large wetlands on the north and southwest sides. During and following construction, we ensured that staff employed best management practices to preserve the excellent water quality of the lake.

Restoring Wildlife Diversity

Shorelines that were disturbed during construction presented us with the opportunity to establish native grasses to provide wildlife access, nesting cover, and food along edges of preserved wetlands. Instead of traditional, non-native seed mixes, we chose big bluestem, Canada wild rye, switch grass, Indian grass, green bulrush, cord grass and wool grass.

In addition, we designated areas between golf holes to be restored to prairie habitat—22.9 acres of prairie were planted with side oats grama, blue grama, Kalms brome and prairie dropseed. A wildflower meadow of yarrow, New England aster, joe-pye weed, wild lupine, wild bergamot, ironweed and tall blazing star was also established.

With the interspersions of wetlands, lake, and healthy grasslands adjacent to the hardwood forest, songbird species and small mammals are thriving. In addition to flocks of bluebirds and gold finches, bald eagles and osprey have become common sights. Equally exciting, bobcat, gray wolves, and Blanding’s turtles, a threatened species, have been documented on the golf course as well.

When the first 18-holes at the Legacy at Cragun’s opened for golf play last year, we could see that we

had done well in turning Dutch Cragun’s stewardship commitment into reality. As we continue to work together on additional golf holes and certification for the resort, we congratulate Dutch Cragun and his staff for employing outstanding conservation measures through the Audubon Signature Program.



Cragun’s Resort

Cragun’s Resort is located in the heart of Minnesota in the *Northern Great Lakes* ecological region.

Audubon International Welcomes Howard Jack As Vice President and Chief Operating Officer

Audubon International welcomes Howard Jack as its new vice president and chief operating officer. Jack will be responsible for day-to-day operations, including legal and financial matters. Originally from the Chicago area, Jack received a B.A. in Social Science from Michigan State University and his law degree from the University of Michigan Law School. Jack spent the past 28 years in public service, working on a variety of environmental and energy issues for both federal and New York State governments.

"I'm excited to join Audubon International and have the chance to work with its dedicated and excellent staff to expand our programs even more effectively and efficiently," states Jack. He cites Audubon International's innovative approach to educating and assisting organizations and individuals in voluntary efforts to enhance and protect the quality of the environment as the key factor in attracting him to the position.



Safe for Whom?

New research suggests current water quality standards are not safe enough for amphibians

Did you know that water suitable for you to drink may be lethal for some frogs? According to recent research from Oregon State University (OSU), nitrate and nitrite exposure at levels considered safe for humans or fish is enough to kill amphibians. Moderate levels of the pollutants, in amounts often found in agricultural areas as a result of crop fertilizers, caused reduced feeding activity, physical abnormalities, paralysis and death in some tadpoles and young frogs.

The OSU scientists worked with five species of amphibians, including the Oregon spotted frog, red-legged frog, western toad, Pacific treefrog, and northwestern salamander. Levels of nitrate considered safe for human drinking water killed over half the Oregon spotted frog tadpoles after 15 days of exposure. All five species showed a similar number of deaths at levels of nitrates that were higher, but still well below those that the U.S. Environmental Protection Agency (EPA) considers safe for warm water fish and people.

This new finding is significant given the global declines noted in many amphibian populations over the past two decades. The



L. Woolbright

study also indicates that EPA water quality criteria do not guarantee the survival of some protected and endangered amphibians. (Source: *Journal of Environmental Toxicology and Chemistry*, January, 2000)

It's Nest Box Season!

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Water Quality Protection Expanded

U.S. Environmental Protection Agency Expands Controls on Polluted Runoff

The U.S. Environmental Protection Agency (EPA) recently announced a significant action under the Clean Water Action Plan to protect America's drinking water and waterways by curbing one of the greatest remaining sources of water pollution—storm water runoff. Storm water is water from rain or snow that runs off city streets, parking lots, construction sites and residential yards. It can carry sediment, oil, grease, toxins, pesticides, pathogens and other pollutants into nearby storm drains. Once this polluted runoff enters the sewer system, it is discharged—often untreated—into local streams and waterways.

A leading public health and environmental threat, storm water runoff can contaminate drinking and recreational waters. It also remains a major source of beach and shellfish bed closures. Storm water runoff washes sediment from construction sites at a rate of 20 to 150 tons per acre each year. Sediment has been identified as the single largest cause of impaired water quality in rivers and the third largest cause of impaired water quality in lakes.

EPA announced it would reduce storm water runoff from *construction sites between one and five acres* and *municipal storm sewer systems* in urbanized areas serving populations of *less than 100,000*. EPA's existing program controls storm water runoff from cities with populations greater than 100,000 and from 11 industrial categories, including construction disturbing over five acres.

Under the expanded program, sediment discharges from approximately 97.5% of the acreage under development across the country will be controlled through permits. The permits focus on *best management practices*, and each permittee will be able to select a variety of options that result in the most common sense, cost-effective plan for reducing storm water runoff on a case-by-case basis. The new rule also provides incentives for industrial facilities to protect their operations from storm water exposure. *A copy of the rule and additional information is available on the Internet at: <http://www.epa.gov/owm/sw/phase2/>.*

Stewardship In Our Backyard

Audubon International spearheads watershed protection

Audubon International's headquarters in upstate New York is situated on a 140-acre sanctuary that is bounded by a unique local resource: the Onesquethaw Creek. The creek is a prime trout stream, drinking water source, and recreational site, and provides quality riparian habitat along much of its length.

Limestone bedrock and thin soils within the surrounding watershed have given rise to caves, cliffs, and sink holes—fascinating geology that makes the creek especially sensitive to pollutants. Rain and melting snow quickly drain from the landscape into underground conduits carved in the limestone, carrying whatever pollutants the water has picked up from the land into the creek. Thus, environmentally-sensitive land development and best management practices are essential to maintaining water quality throughout this watershed.

Collaborative efforts spearheaded by Audubon International to do just that are now taking shape in the form of the Onesquethaw/Coeymans Watershed Council. The core group, which includes representatives from Trout Unlimited, the Albany County Land Conservancy, as well as local residents, geology and water quality experts, and teachers, has spent the last several months defining the group's mission, goals, and structure. We've also conducted water quality monitoring and watershed mapping to gather data about current stream impacts and evaluate potential problems.

"Though bringing diverse perspectives together to define the group's purpose and clarify how to operate were often arduous tasks, this process was critical to creating a viable, long-term watershed council," said Fred Realbuto, Director of the Audubon Society of New York State and Audubon International liaison to the Council. "We hope this is a *watershed* year for us as we expand outreach, monitoring, and protection efforts." In addition to continued watershed mapping and monitoring, the group will offer watershed tours, and prepare educational information for local residents and officials.



Limestone bedrock and thin soils within the surrounding watershed make the Onesquethaw Creek especially sensitive to pollutants.

J. Mackay

Water Quality Management Exploring Your Watershed

No matter where you live, your daily actions are inseparably linked to water. Water used for drinking, household needs, agriculture, recreation, and industrial uses that support our livelihoods is dependent upon healthy local, regional, and national water supplies. As a result, our actions have a significant impact on the quantity and quality of these water sources. By exploring the local and regional *watershed* in which we live, we can begin to increase our awareness of local watershed issues and make a valuable contribution to water quality protection.

What is a watershed?

A watershed is the *entire area of land* that drains into a specific river or river system. Water drains from the highest elevations within the watershed to the lowest, contributing to a particular stream, river, or lake. Sometimes called a *drainage basin*, a river's regional watershed includes the many smaller local watersheds of the creeks, feeder streams, lakes, and wetlands that drain into it.

How do land-use practices affect water quality in the watershed?

Your nearest stream carries water from your land and the entire surrounding landscape—including roads, parking lots, buildings, construction sites, shopping areas, dumps, and green spaces—eventually into major rivers, lakes, or groundwater. When rainwater and melted snow

What kinds of pollutants flow from non-point sources?

- Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas
- Oil, grease, and toxic chemicals from urban runoff and energy production
- Sediments from improperly managed construction sites, crop and forest lands, and eroding stream banks
- Salt from roads and irrigation practices
- Acid drainage from abandoned mines
- Bacteria and nutrients from livestock, pet wastes, and faulty septic systems
- Chemicals including nitrogen and acids from atmospheric deposition of industrial smokestacks, combustion of fossil fuels such as coal and oil, automobile exhaust, and agriculture.



Sugarloaf Golf Club, ME

A watershed is the entire area of land that drains into a specific river or river system. Water drains from the highest elevations with the watershed to the lowest, contributing to a particular stream, river, or lake.

drain off the land they carry sediments, pollutants, and other dissolved materials into the water sources in your watershed.

Because water is always moving, what happens in one area can have a significant positive or negative impact on water quality in other parts of the watershed. For instance, wetlands help to filter and clean surface water of sediments, nutrients, and toxins via a diversity of biological and physical processes. If wetlands are lost or degraded, the watershed's ability to produce clean water can be substantially reduced. Likewise, if streams are disturbed or overwhelmed by increased runoff from roads, logging, or developed areas, their banks can become unstable sources of sediments, thereby impairing water quality.

What are the primary threats to water quality?

Contrary to popular belief, industrial outlet waste pipes are not the leading cause of water pollution. It's the combined impact of many unregulated sources of pollution, or *non-point source pollution* that contributes most to water quality degradation.

The most significant sources of non-point source pollution vary greatly depending on the land uses in a given watershed. Sources including agricultural and urban runoff, parking lots and roads, and storm drains contribute heavily to watershed contamination.



GE Selkirk, NY

Land uses within a watershed, such as industry, agriculture, roads, natural areas, and residential development add up to impact the water quality of local and regional water sources.

Why is watershed protection so important?

All living things, *including people*, are inextricably linked to the watershed in which they live. Watershed protection contributes to suitable drinking water, irrigation supplies, stormwater management, recreational opportunities, wildlife habitats, and the healthy functioning of river systems. In less developed nations, water quality protection remains the cornerstone of public health. By becoming more aware of your connections to your watershed, and doing your part to reduce harmful impacts, you can make a meaningful contribution to water quality protection.

Getting Started

Step 1: Identify your watershed.

To define your watershed, identify the nearest major river to where you live. If you live in a coastal area or the Great Lakes region, the nearest major water body may be a bay, or one of the Great Lakes. This is your *regional* watershed. For example, Audubon International's headquarters lies closest to the Hudson River. Thus, we are located in the *Hudson River watershed*.

Watersheds on the Web

If you have access to a computer, these web sites can tell you what watershed you are located in and provide you with a map:

- www.ctic.purdue.edu/KYW/
- www.epa.gov/surf3/

However, it is helpful to be even more specific in identifying your watershed. What stream or creek is nearest to your property? It is into this stream that water from your land and other properties around you drains. This nearest stream is your *local* watershed. Again, using our office as an example, the Onesquethaw Creek flows through our property. Thus, we are also in the *Onesquethaw Creek watershed*.

If you have a feeder stream or creek on your property, it's easy to identify where water from your land drains. If not, take a look for streams near your property; a good clue may be as close as the nearest bridge. Consult a map for the names of local streams.

If you want to know where your wastewater or gutters drain you can call your city's Water Department or Sanitation Bureau. Your local filtration plant is another good source of water quality information.

Step 2: Explore your watershed.

Using a map of your local area, trace your local watershed stream to its source and then follow it to its final destination—the major river or other water body into which it drains. Note smaller feeder streams that enter it along the way.

Next, take a walk or drive to explore land uses within your watershed. You may want to start at the source and follow a route that intersects the waterway as it flows downstream. Stop at various points to check out water quality and note land uses and potential pollution sources along the way. Are there areas dominated by agriculture, industry, new developments, or urban centers? Are there forested or wetland parcels that provide natural filtration and wildlife habitat?

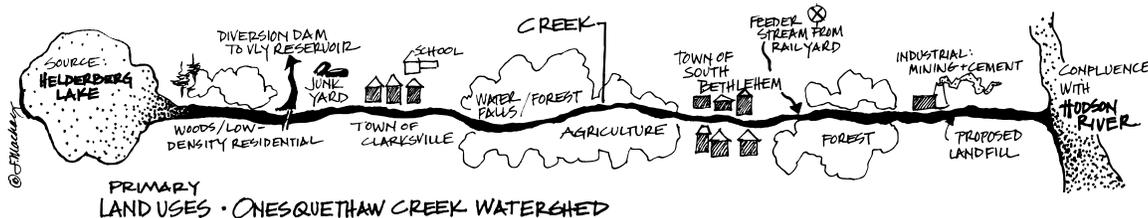
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Lake Windward Elementary, GA

Several ACSP golf course members have teamed up with local schools to evaluate water quality. Students from Lake Windward Elementary School, Georgia, observe stream water at The Golf Club of Georgia.

Water Quality Management Exploring Your Watershed *(continued)*



Making a map of your watershed is an especially good project for teachers or parents to do with kids.

If possible, observe the water quality of the final drainage place. How does water quality change as it flows through the watershed?

You can learn a lot about your local watershed by making a map of it. Your map can be based on an actual topographical map or you can make a schematic map starting at the water source and flowing to the stream's endpoint. Even a simple schematic map like the one pictured here can help you to see how land uses in a watershed may impact water quality. This is an especially good project for teachers or parents to do with kids.

Step 3: Evaluate your impact and take steps to reduce potential or actual pollution.

What you do on your property can affect water quality both on and off-site. As you begin to plan effective water management strategies, try to answer the following questions: How does water enter your property: rain/snow melt, wetland, springs? What is the lowest point or points where water settles? Does it pick up any contaminants because of your land use practices? Where does water go when it leaves the property? Does water quality improve, decline or stay the same as it moves off your land?

If you do have a stream or pond on site, you can test its water quality to see whether land uses or management practices are having an impact (*see side bar*). You can also



Students at Bluff City Elementary School, Alabama stenciled storm drains to heighten awareness of the need for water quality protection.

evaluate potential impacts based on visually inspecting and evaluating various sources of pollutants. Use the enclosed chart as a guide for some of the leading ways to avoid contaminating your local watershed.

By familiarizing yourself with your local watershed and taking steps to protect water quality, you will nurture your connection to this most vital resource. More important, you will come to appreciate how critical your efforts to maintain good water quality really are.

Water Quality Testing

Baseline water quality data for representative water bodies and water sources that may be affected by land management practices can be obtained by testing:

- Physical characteristics: tests for dissolved oxygen, pH, temperature, and specific conductivity.
- Nutrients—tests for nitrogen (nitrate and ammonia), and total phosphorus.
- Macroinvertebrates—surveys for aquatic organisms, particularly where water enters and exits the property to determine water quality in streams.
- Baseline tests should be conducted 4x/year for at least one year.
- Re-test water sources should problems occur, or one time per year.

Pollution Source	The Problem	What you can do
Your Car	Oil, gas, and other fluid leaks are all sources of watershed pollution. Auto exhaust contributes to atmospheric deposition of toxics into waterways.	Regularly check you car for leaks and repair problems promptly. Make a commitment to reduce the amount of driving you do—combine trips, carpool, walk, etc.
Chemical Storage, Use, and Disposal	Products such as gasoline, motor oil, pesticides, and fertilizers <i>must be</i> properly stored, used, and disposed of to prevent pollution. Error and carelessness often cause water quality contamination.	Be sure storage containers and storage areas are leak proof. Always store liquid chemicals <i>below</i> dry products and on metal or plastic shelves. In case of a spill, the liquid products won't contaminate the dry materials. If you choose to apply chemicals to your property, select <i>slow release</i> or <i>natural organic</i> products. These are less likely to wash into waterways. Always read and follow label directions. Dispose of chemicals and containers via hazardous waste collection, recycling, or proper disposal.
Trash Disposal	How often do you see garbage on the side of the road and in waterways? Garbage damages the beauty, health, and safety of water sources and diminishes recreational and aesthetic value. Dumping trash into waterways is against the law.	NEVER litter. Properly secure garbage cans and recycling materials for curbside pick up. Consult your local town or waste-hauler for proper hazardous waste disposal.
Parking Areas	Runoff from parking areas has a direct negative impact on water quality.	Inspect parking areas and parking lots for signs of automotive leaks. Allowing water to filter through grassy or forested areas before reaching storm drains or water sources helps to filter pollutants from parking areas.
Auto, Mower, and Small Equipment Maintenance	Spilled motor oil, gasoline, and lubricants can quickly contaminate wells and streams and damage aquatic organisms.	Use a funnel to add new oil or gasoline. Replace the lid and carefully store containers of petroleum products to avoid accidental spills. Change motor oil or fill gas away from water bodies. Dispose of used petroleum products properly. Most gas stations or oil-lube businesses will take your used oil.
Septic Systems	Failing septic systems slowly leach organic wastes. These can cause excessive algae growth. Pathogens, such as bacteria and viruses may also enter the water and cause disease.	Have your septic system cleaned every three to five years. Do not pour household chemicals down the toilet or drain—they can destroy beneficial bacteria in the septic tank. Also, keep heavy vehicles away from the system—they can crush drainage tiles. If your leach field or septic tank is old or worn out, repair or replace it.
Cleaning Products	Phosphates, chlorine, and other toxic chemicals may harm local water supplies.	Avoid buying toxic household products. Read labels and purchase phosphate-free and least toxic products that are safe for septic systems. Avoid chlorine bleach. Don't dump hazardous chemicals down the drain.
Erosion	Plowed fields, overgrazed pastures, construction, gullies, and logging can cause stream bank erosion. When soil washes into waterways, it clouds the water and degrades aquatic habitats.	Stabilize stream banks and lake shorelines. Re-establish vegetation as soon as possible whenever soil is exposed. Regrade and seed gullies to stabilize soils. Fence livestock and prevent animals from trampling in waterways. Address loss of agricultural soils due to erosion.

Landscape Renovation



Silver Dollar City

Project Title:	Landscape Renovation
Property Name:	Silver Dollar City
Location:	Branson, Missouri
Property Type:	600-acre theme park featuring an 1880s living history village; attractions and rides; and Marvel Cave, a registered U.S. Natural Landmark. The third largest cave in the U.S., Marvel Cave provides unique habitat for Gray and Indiana bats, blind cavefish, cave snails, and the Ozark Blind Salamander.

Project Description:

Several years ago, when the main highway to our park entrance was re-routed, it left the entry with broken asphalt and debris. Trees and foliage were removed to accommodate the new highway, leaving sparse natural areas. Because the entrance provides a first impression for park visitors, we wanted to naturalize and beautify the area.

Goals:

- Restore the formerly wooded area stripped from the abandoned highway and upgrade beautification at the new highway and entrance to Silver Dollar City.

Implementation and Maintenance:

Though care was taken to save as many older trees as possible when re-routing the highway, we planted oak, pine, sycamore, and other varieties of native trees to try to replace what was lost. In addition, flowerbeds and turfgrass were added to create a natural landscape at the entrance. Along the new highway, we landscaped with a variety of trees, shrubs, and flowers.

Approximately 85% of our landscape material is native to the *Ozark-Interior Plateau*, the natural region in which our property is located. This allows us to provide food and cover sources for native wildlife species and showcase regional plants for more than a million visitors who come to Silver Dollar City each year.

Regular maintenance requirements include watering, fertilization, and pruning at the entrance area and throughout the main visitor areas of the park. We add annual flowers to the flowerbeds for long-lasting color and mow the grass regularly for a neat appearance. Fortunately, we installed water lines during project construction to insure water availability to care for new and existing landscape plants.

Much of the rest of the property is natural, untouched woods with a large variety of wildlife. We leave the woods as is and do not remove dead trees, leaves or any vegetation.

Results:

Planting the entrance and highway areas eliminated erosion, increased wildlife habitat, and created a visually appealing park entrance. A few trees needed to be replaced due to drought, but overall, the new plantings are doing quite well.

This project is a work in progress and we continue to plant new trees each year. In 1999, we added 48 new trees, and ten to fifteen more are planned to go in the ground this spring.

Perspective and Recommendations:

When landscape changes need to be made, I highly recommend leaving as much natural growth as possible. Mature trees and foliage can't be replaced overnight. The impact on wildlife living in the area can be devastating due to the loss of their homes and disturbance by heavy equipment in their territory.

If we remove a tree, our rule is to plant two in its place. Whenever we add a new building, we plan what trees we're going to save, how we will replace anything that has to be taken out, and if we disturb any wildlife habitat, how we will replace that.

For more information contact:

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membership NEWS

New Golf Members

CHINA
Kau Sai Chau Golf Club, Hong Kong SAR

JAMAICA, W.I.
The Tryall Club, Hanover

ARKANSAS
Totem Creek Golf Course, Douglas

CALIFORNIA
The Ridge Golf Course, Auburn
Arnold Palmer Course—Mission Hills, Rancho Mirage
Dinah Shore Tournament Course—Mission Hills, Rancho Mirage
Pete Dye Challenge Course—Mission Hills, Rancho Mirage

COLORADO
Roaring Fork Club, Basalt
Buffalo Mountain Club, Denver
Raven Golf Club at Three Peaks, Silverthorne

CONNECTICUT
Pequot Golf Club, Stonington

DISTRICT OF COLOMBIA
D & A Associates, Washington

DELAWARE
Bear Trap Dunes Golf Club, Ocean View

FLORIDA
Hammock Dunes Club, Palm Coast
La Cita Country Club, Titusville
The Moorings Club, Vero Beach

GEORGIA
Charles Yates Golf Course, Atlanta
The New Course at Ritz Carlton, Greensboro
Highland Country Club, La Grange
River North Country Club, Macon

IDAHO
The Links at Teton Peaks, Driggs

ILLINOIS
Stonewall Orchard Golf Club, Grayslake
Gateway National Golf Links, Madison
Hidden Meadows Golf Club, Park Forest

INDIANA
Warren Golf Course, Notre Dame

MAINE
Samoset Resort, Rockport

MINNESOTA
TPC of the Twin Cities, Blaine

NORTH CAROLINA
Oak Valley, Advance
The Bald Head Island Club, Bald Head Island
Lochmere Golf Club, Cary
Devils Ridge Golf Club, Holly Springs

NEW MEXICO
Santa Ana Golf Course, Bernalillo

NEW YORK
Amsterdam Municipal Golf Courses, Amsterdam
Brookfield Country Club, Clarence
Binghamton Country Club, Endwell
Hiawatha Trails Golf Course, Guiderland
Kingswood Golf Club, Hudson Falls

OREGON
Bend Golf & Country Club, Bend

SOUTH CAROLINA
Cheraw State Park Golf Course, Columbia
Golden Bear Golf Club At Indigo Run, Hilton Head
Sea Marsh Golf Course—Sea Pines, Hilton Head
The Golf Club at Indigo Run, Hilton Head
Cassique Kiawah Island Club, Kiawah Island

TEXAS
River Place Country Club, Austin
The Golf Club of Texas, Austin

VIRGINIA
Kinloch Golf Club, Manassas

VERMONT
Okemo Valley Golf Club, Ludlow

WISCONSIN
Woodside Golf Club, Sussex

Newly Certified Audubon Cooperative Sanctuary

Golf Courses

Coyote Hills Golf Course
Fullerton, CA

Amelia Island Plantation
Fernandina Beach, FL

La Tourette Golf Course
Staten Island, NY

Riveridge Golf Course
Eugene, OR

Fawn Lake Country Club
Spotsylvania, VA

Re-Certified Golf Courses

TPC of Scottsdale
Scottsdale, AZ

Royal Poinciana Golf Course
Naples, FL

The Legend
Bellaire, MI

Woodhill Country Club
Wayzata, MN

Fiddler's Elbow Country Club
Far Hills, NJ

Old Westbury Golf & Country Club
Old Westbury, NY

Pumpkin Ridge Golf Club
Cornelius, OR

New Business Members

ALABAMA
The Eufaula Tribune, Eufaula

COLORADO
AAA, Aurora
AAA, Boulder

AAA, Colorado Springs
AAA, Colorado Headquarters, Denver
AAA, Durango
AAA, Park Meadows, Englewood
AAA, Fort Collins
AAA, Grand Junction
AAA, Greeley
AAA, Southglenn, Littleton
AAA, Southwest, Littleton
AAA, Northglenn
AAA, Pueblo
AAA, Wheatridge

MARYLAND
Bauernschmidt Manor B&B, Baltimore

MISSOURI
Dogwood Canyon Nature Park, Lampe

NEW YORK
Broccolo Tree & Lawn Care, Inc., Rochester

VERMONT
Naturalawn of America, South Burlington

Newly Certified Audubon Cooperative Sanctuary

Businesses

Griffin Industries
Ellenwood, GA

New Cemetery Members

FLORIDA
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PENNSYLVANIA
Grove Cemetery, New Brighton

WASHINGTON
Evergreen Washelli, Seattle
Mtn. View Funeral Home & Memorial Park,
Tacoma

New School Members

ALABAMA
Birmingham—Southern College, Birmingham

COLORADO
Telluride Mountain School, Telluride

FLORIDA
Lighthouse Elementary, Jupiter

IOWA
Amana Elementary, Middle Amana

NEW YORK
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Albany School of Humanities, Albany
Hackett Middle School, Albany
Phillip Livingston, Albany
School 8, Albany

TEXAS
Hidden Hollow Elementary, Kingwood

New Backyard Members

ALABAMA
Jan & James Lisenby, Ozark

FLORIDA
Sue Sjosten, Stuart

MARYLAND
James Gallion, Walkersville

NORTH CAROLINA
Shari Hasenmueller, Hamlet

NEW YORK
Charles & Jean Vejvoda, Averill Park
Margot McDermott, Queensbury
Linda Hufland, Rochester
Linda E. Wilken, Westerlo

OREGON
William D. Lyche, Bend

PENNSYLVANIA
Helga G. Cook, New Brighton

VIRGINIA
John S. Milleson, Sr., Norfolk

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Backyards

Lynda Goldschein
Watchung, NJ

ACSS of Canada

Membership News

New Golf Members

BRITISH COLUMBIA
Fraserview Golf Course, Vancouver
Langara Golf Course, Vancouver
McCleery Golf Course, Vancouver
Rupert Pitch and Putt, Vancouver

ONTARIO
Heather Glen Golf and Country Club, Ashburn
Stonebridge Golf and Country Club, Nepean

QUEBEC
Golf Saint-Raphael, Ile-Bizard

Newly Certified Audubon Cooperative Sanctuaries

Golf

St. Thomas Golf and Country Club,
St. Thomas, ON

Le Chateau Montebello,
Montebello, QC

March/April 2000

March's notorious winds mark the *battle of the seasons*, as cold arctic air clashes with warmer tropical air masses. Fortunately, spring always wins, bringing warmer weather, waves of migrating birds, lovely wildflowers, and the raucous chorus of mating frogs.

- Take a change of season hike to observe the unfolding of spring.
- Make note of bird species as they return to your area. Record spring migrants on your bird inventory.
- Visit a wetland after the first warm rain in your area to listen and look for salamanders and frogs.
- Provide a water source for wildlife. Mist-producing or drip systems that keep water moving are most attractive to birds.
- Choose native flowers, shrubs, and trees for new landscaping.
- Be cautious with fertilizer use. If you use fertilizers, choose *slow-release* varieties and follow label directions carefully to avoid over-fertilizing. Avoid spilling fertilizer on driveways or sidewalks where it can be easily washed into storm drains or other water sources.
- Earth Day is April 22—participate in local celebrations or choose a project to further your stewardship efforts.
- Fill hummingbird feeders with a solution of four parts water to one part white, refined sugar. Use the timing of local wildflower blooms as a guide for when to put out your feeder.

STEWARDSHIP news

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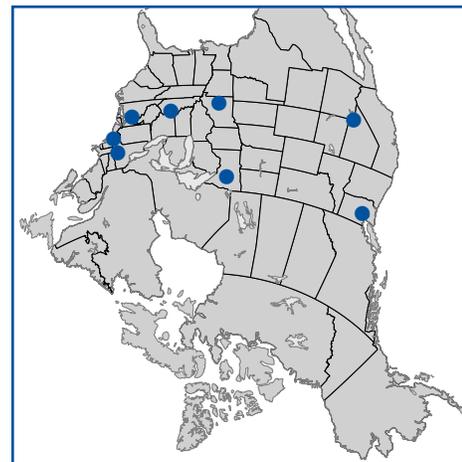
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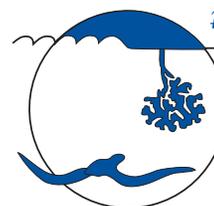
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