

# Conservation Watch

A Publication of the Garden Club of America

Volume XIX, Issue 5

December, 2010

**Special Issue!**

**It's All About the**



**GCA Explores Issues of Our Great Lakes**



Photos by Sue Klein and Elva Busch



From September 28th till October 3<sup>rd</sup>, 2010, members of The Garden Club of America's Conservation and National Affairs and Legislation (NAL) committees toured a portion of the Great Lakes region of the United States.

Traveling from Indiana, along the Lake Michigan shorefront in Illinois, and to within an hour's drive of Wisconsin, the group learned much about the Great Lakes region. We were based in Chicago, home to two World's Fairs, fine sports teams, famous museums, first class shopping, and beautiful public areas. We visited Millennium Park in the heart of the city, saw gorgeous plantings in public areas, and toured the Chicago River by boat through the city enjoying the spectacular architecture along it.

We learned about the rebuilding of the city following the great fire of 1871, creating a planned city that was very forward thinking for its time. There are thirty miles of lakefront in Chicago, 26 of those miles are a public lakeshore park system creating a linear park expanse that is unrivaled around the world for its



beauty and public accessibility. We learned about the "Last Four Miles" project, which will allow those remaining four miles to be part of an uninterrupted chain of shoreline parks that all residents will be able to enjoy – for walking, biking, wading and exploring.

The stories of our trip that follow will tell of success stories of the Great Lakes and significant problems that exist now and into the future. We saw huge industrial sites just outside the main part of the city, many now in decline as testament to the "Rust Belt"

existing in many of the cities of the Great Lakes. As the industrial uses have declined, the recreational use of the areas has increased. We saw woodland migratory bird stops and visited marshes that remain. We enjoyed beaches and saw the typical dune and swale topography of the shoreline. We learned of the climate action plans of cities in the region. We visited a golf course and a yacht club built on former Superfund sites. We were told that there are 43 “areas of concern” that need to be addressed along our Great Lakes and we were “up close and personal” at one of them.

We saw perhaps the world’s largest auto “graveyard” where cars go to die. And shipping container graveyards, too – some turned into housing units. We were saddened to

hear that the waste from the city now goes to places further away, like Pontiac, Michigan and to Indiana. We learned the history of the Grand Calumet River, how the water flows of rivers within the area have been changed over the decades – and the consequences, and were provided a primer on the invasive species causing serious threats to the region’s land and waters. We learned of the community of Alcott Gardens that exists inside a toxic “donut” of defiled areas.

We met many dedicated city officials, conservationists and preservationists. We met many good people of the greater Chicago area who are working hard to improve their environment. What follows are our reviews of just some of the significant topics we wish to share with our readers. Many of the lessons learned on this conservation field study trip apply to other regions of our country and so we share them. As Dave Dempsey, author of *On the Brink: The Great Lakes in the 21<sup>st</sup> Century*, has said in discussing the many issues confronting the citizens living in this region, “If there is good news, it’s the slowly rising tide of consciousness. Somehow we have to get back to the idea that this is our home and we can’t afford to destroy it.”

*Editor*



Photo by Elva Busch

## **The Preciousness of Fresh Water**

*Judy Boggess, Lake Forest G.C. (Zone XI)  
GCA Resources Committee and Field Study Trip Coordinator*

Can one really introduce people to the preciousness of anything, or must they experience it for themselves? This was where I started when the GCA committees discussed exploring the U.S. Great Lakes. Being on the shore of Lake Michigan and realizing the immensity of this precious resource was the place to start. To walk in the sand as an innocent child - and then to turn around and see the abuse



Harbor at Waukegan, Illinois  
Credit: Elva Busch

of the south Calumet area and the enormity of the work ahead - would allow garden club members to see first-hand what protection really means.

**Who owns fresh water?** Is it a right or a moral obligation to share what we have or to keep it safe only for ourselves? Must we keep it clean for others, as well as for ourselves? Should Great Lakes water be shared with communities just outside the watershed or kept for those inside this watershed? What are the legal obligations of clean-up for those companies that have polluted this resource? What can we do as citizens to preserve precious resource and what should we do? These are just a few of the unanswered questions that had been turning over in my mind.

It is these thoughts and many more that prompted me to want to explore these beautiful, majestic waters with the GCA Conservation and NAL Committees with the fervent hope that they return to their communities and continue to ponder and explore these questions themselves. The Great Lakes are indeed as precious as they are awesome. And with this issue of *Conservation Watch* we share our experiences, our research, and our call to action. As demand for freshwater soars worldwide and our planetary supplies become more unpredictable, the need for water conservation throughout the U.S., without further degrading our natural ecosystems, becomes ever more important.

"Those grand freshwater seas of ours possess an ocean-like expansiveness,  
with many of the ocean's noblest traits."

Herman Melville in *Moby Dick*

## Great Lakes Facts

### What comprises the Great Lakes?

Lake Erie, Lake Huron, Lake Michigan, Lake Ontario, Lake Superior, and Lake St. Clair.

### Volume:

6 quadrillion gallons of fresh water - one-fifth of the world's fresh surface water.  
Spread evenly across the continental U.S., the Great Lakes would submerge the country under about 9 1/2 feet of water.

### Total Area:

More than 94,000 sq. miles. (Think about combining the area of all of the Northeastern States.)

### Total Coastline:

United States and Canada - 10,900 mi.  
The coast line of Lake Michigan totals 3,288 - more than any other state but Alaska.

Reference: *Great Lakes Basin Brochure* produced by Michigan Sea Grant in 1990.

## Threats to the Great Lakes Watershed

Gretchen Downs, Country G.C. (OH) – Zone X  
GCA Conservation Committee – Vice-Chair Water, Wetlands, and the Great Lakes



Image @GLIN

The Great Lakes watershed is a vast system that incorporates more than 20% of the world's surface fresh water, and 84% of North America's fresh water. It includes eight states, 2 provinces, 130 Indian reserves and over 1500 towns and cities. The watershed is so large that if superimposed on Europe, it would stretch from the English Channel to the Mediterranean Sea to the Baltic Sea.



Courtesy of SOM

The Great Lakes region is one of the most biologically diverse in North America. It contains a variety of natural ecosystems, from alvars\* to coastal wetlands. These ecosystems are home to thousands of species of fish, wildlife and plants, many of which are found nowhere else on earth. There are over 30,000 islands in the Great lakes. The islands occur in different climatic zones and thus support a wide range of species and natural communities. Some of the species found on the islands are also found on the shoreline. However, due to the isolation of the islands some species such as the Queen Snake are found only on the islands.



Courtesy of SOM

The dark green on the above map represents forest and the lighter green is agriculture. 21% of the basin is agricultural, 42% is forest, 33% is surface water and 4% is urban. The area appears rural, but over 40 million people live in the watershed and another 20 million live in close proximity.

With the diversity of the area come the threats to the area.

### **Multiple Jurisdictions**

The multitudes of governmental jurisdictions wreak havoc in the development of one cohesive plan. Plans are being developed by the Great Lakes and St. Lawrence Cities Initiative, the Council of Great Lakes Governors, the Great Lakes Fishery Commission, Environment Canada, The Nature Conservancy USA, The Nature Conservancy Canada, the Great Lakes Commission, the Great Lakes Environmental Research Laboratory, the National Wildlife Federation, the Great Lakes Science Center, and the list goes on. The Great Lakes Compact provides for each of the eight U.S. states bordering the Great Lakes to develop their own conservation plan.

### **Uncertainty of Climate Change**

Glacial deposits formed the Great Lakes about 15,000 years ago. They have a 1% renewal rate. Lake levels have been relatively constant though the years, but there have been times of high and low levels. The warm summer months provide for more rapid evaporation of water, while the cold winter months reduce the evaporation rate and allow for ground water to replenish the water lost over the summer. The lakes depend upon this natural cycle to maintain water levels. It is unclear what would happen to lake levels if large areas of ice cover were lost due to climate change. The ice cover protects the lakes from evaporation during the winter months. Without this protection, it is feared that lake levels could drop significantly.

## **Power Generation**

The Great Lakes basin has relied heavily on fossil fuels for industry and power production. Of the 87 power plants with a capacity of at least 100 megawatts, 69 rely on fossil fuels, and of that number more than half are fueled by coal. Coal burning power plants are a major source of mercury contamination and coal ash pollution. Fossil fuel power plants emit large amounts of carbon dioxide, and use large amounts of water.

## **Invasive species**

There are over 180 invasive species in the Great Lakes watershed. Most of the species have entered through the St. Lawrence Seaway. Ballast water from the shipping industry has brought species such as the Zebra Mussel and the Sea Lamprey. There has been much concern about the Big Head and Silver Carp entering the Great Lakes via the Chicago Sanitary and Ship Canal.

[See Ruth Flournoy's article, "Invasives of the Great Lakes Region – Endangering Habitat and Economy," on page 15 of this issue.]

## **Agricultural Run-Off and Sanitary Sewer Overflows**

Nitrogen and phosphorus are necessary elements for plant and animal growth. When these elements enter the water in large quantities, they trigger toxic blooms of blue-green algae in the Great Lakes. *Microcystis* (a genus of 'blue-green algae in which the small cells are densely packed in mucilage to form irregularly shaped, often perforated colonies) frequently causes massive and unsightly blooms in Lake Erie and Lake Ontario. *Microcystis* sometimes produces toxins that can cause acute and chronic illness in humans and is a growing problem that impacts drinking water and recreation worldwide. Agricultural run-off from the heavy use of fertilizers and from large factory farms allows nitrogen and phosphorus to enter the lakes. The urbanization of the area has also contributed to the nutrient problem due to sanitary sewer overflows.

The Great Lakes and St. Lawrence Cities Initiative in collaboration with the architectural firm of Skidmore, Owings & Merrill, LLP (SOM) are providing a clear vision for the Great Lakes watershed. "We hope to combine and integrate the environmental, economic and urban 'best practices' into a clear vision and eventually a 100 year plan that respects, reinvents and renews the Great Lakes and the St. Lawrence River Region," stated our speaker Philip Enquist of SMO.

[\* An **alvar** is a biological environment based on a limestone plain with thin or no soil and, as a result, sparse vegetation. *Wikipedia*]

Sources:

[http://www.waterlink-international.com/news/id1293Phosphorus\\_Pollution\\_Research\\_in\\_Great\\_Lakes.html](http://www.waterlink-international.com/news/id1293Phosphorus_Pollution_Research_in_Great_Lakes.html)

<http://www.glerl.noaa.gov/pr/ourlakes/threats.html>

[http://www.healthylakes.org/09conference/GLR\\_2009\\_Presentations/2009.09.13\\_Healing%20Our%20Waters.pdf](http://www.healthylakes.org/09conference/GLR_2009_Presentations/2009.09.13_Healing%20Our%20Waters.pdf)

<http://www.great-lakes.net/lakes/>

## **The Great Lakes Today: The Cities Initiative & The Compact**

*Julie Johnson, Little Garden Club of Columbus (OH)  
GCA Zone X Conservation/NAL Representative*

Our Great Lakes Study Day opened with a presentation by David A. Ullrich, Executive Director of the Great Lakes and St. Lawrence Cities Initiative, a coalition of U.S. and Canadian Mayors representing more than 70 Basin communities, among them Cleveland, Toledo, Chicago, Sheboygan, Rochester and Erie. Working together, members of the Cities Initiative seek to restore and protect the Great Lakes and St. Lawrence River, which represents 20% of the world's surface freshwater, provides drinking water to



more than 40 million people and serves as the foundation of the region's economy. Or, as Ullrich optimistically proclaims: "We are the Malibu of the Midwest!"

After the glaciers melted ten thousand years ago, the Great Lakes region was under water. Native Americans were drawn to the area and later French explorers, attracted by the magnetic property of water. That magnetism is reflected today in the 20-30% price differential between inland and waterfront property. The advent of the railroad and the central geographic location of Chicago brought an explosion of growth and the beginning of trouble for the Great Lakes in the late 1800's. Sewage and effluent from a heavy concentration of people and industry was dumped into the Chicago River. The river then flowed into Lake Michigan, consistent with the principle of the day - "the solution to pollution was dilution."

In 1909 the Boundary Water Treaty was enacted creating the International Joint Commission to Resolve and Prevent Disputes. Under the terms of the Treaty, neither the U.S. nor Canada could pollute the waters to the detriment of the other. Later, following the opening of the St. Lawrence Seaway in the 1950s, an appreciation of the waters as a natural resource rather than simply a means of transportation developed. At this time the issue of invasive species was made manifest by the sea lamprey, the catalyst for the establishment of the Joint Commission on Fishery.

In 1955, eight states joined to form the Great Lakes Commission via the Great Lakes Compact. The purposes of the Compact were:

1. To promote the orderly, integrated, and comprehensive development, use, and conservation of the water resources of the Great Lakes Basin.
2. To plan for the welfare and development of the water resources of the Basin as a whole as well as for those portions of the Basin which may have problems of special concern.
3. To make it possible for the states of the Basin and their people to derive the maximum benefit from utilization of public works, in the form of navigational aids or otherwise, which may exist or which may be constructed from time to time.
4. To advise in securing and maintaining a proper balance among industrial, commercial, agricultural, water supply, residential, recreational, and other legitimate uses of the water resources of the Basin.
5. To establish and maintain an intergovernmental agency to the end that the purposes of this compact may be accomplished more effectively.

Despite the Compact's establishment, the Basin's waters continued to deteriorate. The Cuyahoga River caught fire in the early 70s, followed by fires on the Chicago, Rogue, and Buffalo Rivers, resulting in the passage of the Clean Water Act. Lake Erie was issued a death certificate. Finally, in 1973, the Great Lakes Water Quality Agreement was negotiated as a formal statement that further abuse of the environment would be stopped.



Photo by Sue Klein

But it was not until thirty years later, in 2003, that Chicago Mayor Richard Daley successfully argued that local governments should be given a greater voice in the resolution of Great Lakes and St. Lawrence Seaway matters. By forming the Cities Initiative, local governments not only are assured a voice for advocacy but a seat at the table where decisions are made. The Cities Initiative also provides a forum to share best practices. But perhaps most important, according to Ullrich, is the sense of urgency that local governments are bringing to national and international efforts to protect the Great Lakes ecosystem. Among the topics receiving intense advocacy and action are those that pertain to the threat of invasive species, particularly the Asian Carp; the growing problem of toxic algae blooms; municipal sewer overflow; habitat restoration; and adaptation strategies to cope with climate change.

[U.S. States in the Great Lakes Compact:  
Illinois, Indiana, Michigan, Minnesota, New York, Ohio Pennsylvania, and Wisconsin.]

## **Legal Means of Protecting the Great Lakes**

*Melissa McAdams, Knoxville (TN) G.C. – Zone IX  
GCA NAL Committee – Vice-Chair, Energy Sources*

Henry Henderson, Midwest Director of the Natural Resources Defense Council (NRDC), spoke to us on Great Lakes legal issues now and in the future and how the Clean Water Act (CWA) provides the primary avenue to address and correct environmental damage. The CWA is the federal law governing the discharge of pollutants to surface waters of the United States, and is the cornerstone of advocacy for protection of fresh water. Since 1972, permits are required for releases into U.S. waters and these permits require the use of the best available technology to prevent pollution. The CWA also gives citizens the right and the tools to enforce this law. Thus, the CWA is an alliance of science and democracy. Citizen involvement is a prime instigator of cleaner waters.

Under the CWA regulatory system, much of the federal law is delegated to the states to implement. Unfortunately, 63% of Illinois permits are violated, and the state has managed to enforce compliance of only 7% of those violations. Public participation in monitoring pollution and seeing that scientific values are applied is important because we cannot rely on government entities to act in all cases. The Government Accountability Office reported in a 2003 study that thirty programs that don't speak to each other govern the Great Lakes. The Great Lakes are 95 percent of the U.S. fresh surface water, and have a plethora of governing systems, including the eight states and two Canadian provinces that surround them. The problem of diversion and removal of lake water set the purpose for the Great Lakes Compact, and these ten governing bodies now have a common goal of preventing further diversion or removal.

The Great Lakes are a compromised ecosystem because of many factors. One is dirty energy, since many power plants are violating the Clean Water and Clean Air Acts. One energy company is a gigantic fish *frappuccino* - sucking in and grinding up thousands of pounds of fresh fish with the water it uses for power generation and cooling. Energy production also returns heated water to the Lakes, damaging plants and animals and losing water to the atmosphere through evaporation. One power plant dumps its coal ash directly into Lake Erie. Also, concentrated animal feeding operations' discharges are poorly controlled. Agricultural effluents from many sources are a growing problem. Toxic algae have been reported in smaller lakes and ponds. Progress needs to be continued on stopping ballast water releases. Aquatic invasives (mainly carp and mussels) are an ongoing threat. A National Oceanic and Atmospheric Administration report states that Lake Michigan has been impacted beyond the worst case scenario. Eighty percent of phytoplankton has been removed by the mussels as a fish food source so the fish are starved. The chemistry of the lakes has changed and sunlight is penetrating deeper than ever.

The new BP Refinery, under construction south of Chicago, is connected to a network of pipelines that bring tar sands oil from Canada to the U.S. According to Mr. Henderson, this is effectively a "pollution delivery system to the Great Lakes." These pipelines are stressed by the greater pressure needed to move tar sands oil and have already caused at least one significant spill. The Environmental Protection Agency has no power over pipelines and the governing agencies for them are diverse. In addition, sewer and storm water system overflows are common. Clearly, the pollution sources and pressures on the Great Lakes are huge.



BP refinery.

Photo by Robert Powers for *A Chicago Sojourn*.

When brought into play, the Clean Water Act requires on-going improvement of technology to restore and maintain fresh water. We must make the guarantees the laws give us actually work through effective water quality standards with discharge permit compliance enforced. To learn more about the efforts of the Natural Resources Defense Council, please go to [nrdc.org](http://nrdc.org).

### **Managing Water in a Big City – No Easy Task**

*Claudia Bell, Little Compton (RI) G.C. – Zone I  
GCA NAL Committee – Vice-Chair, Water and Wetlands*

A panel on the management of Chicago's municipal water system during our Great Lakes Study Day underscored the challenges faced by major cities in ensuring clean and reliable water for a growing population. Chicago is blessed with a source of fresh water at its doorstep – Lake Michigan. Nevertheless, it must be a conscientious consumer of this precious resource and comply with a Court-ordered cap on the volume it can siphon out of the Lake. In addition, Chicago is coping with deteriorating infrastructure and increasing stormwater runoff exacerbated by more intense rainfall events. These factors have prompted the city to enhance stewardship of its water resources. Recent progress on water conservation is impressive – despite a significant increase in population over the past two decades, daily water consumption has fallen close to 20%.

With praise for Mayor Daley's leadership and support on environmentally sustainable approaches, the panelists outlined the scope of the city's water management mission and highlighted several initiatives currently underway.

#### **Managing Water Resources on a Large Scale**

The Chicago Department of Water Management provides over 800 million gallons of drinking water to city residents and 125 suburban communities on a daily basis. The process starts at offshore water intake points in Lake Michigan called "cribs". These peculiar-looking structures (we saw one of them from afar during our boat trip) send water through tunnels under the Lake to two purification plants – one has the largest water purification capacity in the world and the other has the second largest. From there the water goes to 12 pumping stations, which send it out to users.

The Department is also responsible for removing the wastewater and storm runoff from the streets of Chicago via the city's sewer system and delivering the effluent for treatment to the Water Reclamation District of Chicago. In 1972, Chicago pioneered the use of deep tunnels to capture and store combined sewage accumulated during storms until it can be transferred to treatment plants as capacity becomes available. This huge and costly engineering project has come on line in stages over decades and is finally nearing completion.

### **Conserving Water Through Repairing and Revitalizing Water Infrastructure**

Like most American cities, Chicago is struggling with an aging water infrastructure that requires constant attention and investment. The city is in the midst of a multi-year capital improvement project to save water by reducing leaks in its 4200 miles of water mains. Specifically, the Department of Water Management is gradually ramping up its goal of replacing 42 miles of water mains per year to 75 per year. Also, the Department is accelerating its efforts to fix underground leaks before they result in a break, going from 400 repairs annually to a target of 900.

### **Fostering Water Conservation through Homeowner Incentives**

A relatively new program called "Meter Save" offers homeowners the opportunity to voluntarily install water meters to help them save water and thereby save money. Water charges in non-metered homes are based on various factors such as the number of plumbing facilities and building size, whereas metered homes are billed according to actual water usage. Homeowners participating in Meter Save receive a 7-year guarantee that their home water bill will be no higher than it would have been if the meter had not been installed.

### **Introducing Best Practices in Stormwater Management**

In conjunction with its Climate Action Plan, the city has been promoting "green" approaches to reduce the quantity and improve the quality of stormwater runoff. Through a series of model projects, Chicago is using stormwater Best Management Practices, including rain gardens, detention basins, rooftop gardens, and downspout disconnection. One specific example is the City Hall rooftop garden that encompasses 20,000 square feet of planted area and includes more than 150 species of native plants.

This roof system is designed to absorb one inch of precipitation. Rooftop gardens have proliferated throughout the city and Chicago claims to have the highest number of any city in America. Of course, a roof garden has benefits aside from stormwater retention; it lowers ambient temperatures in the hot summer months and provides superior insulation as well. Only time will tell whether the challenge of keeping these roof gardens maintained at the necessary level can be met.



Chicago City Hall roof garden.  
Photo from American Society of Landscape Architects.

Robert Glennon, a law professor at the University of Arizona and an expert on groundwater has stated, "We are entering an era in which demand for new water will be satisfied by reallocating and conserving existing sources."\* It is particularly important that a conservation ethic take hold in the Great Lakes region. We learned about the many ways that the City of Chicago is doing just that.

\* Annin, Peter, *The Great Lakes Water Wars*. Washington, D.C.: Island Press, 2006, pg. 274.

## Calumet: An Urban Preserve

Carol Davis, Green Spring Valley G.C. (MD)  
GCA Zone VI Conservation/NAL Representative

During our trip, the group ventured down to the southeast side of Chicago for an eye opening and thought-provoking trip. Here's a saga about this unusual region.

Industrial areas can, in fact, have green linings. The Calumet Open Space Preserve which is comprised of almost 4000 acres of parcels of varying geographic scope and size pits biological diversity against rampant industrial waste. The area partly borders the southern shore of Lake Michigan and naturalists first took note of this unusual coexistence when witnessing significant numbers and species of birds nesting in and migrating over this arc of land area straddling the Illinois/Indiana border. The area is also home to power plants, an oil refinery, numerous landfills, abandoned rail yards, closed and open steel mills, close to 1.78 million people and their supporting communities - all wreaking havoc on an historically dynamic green infrastructure and species-rich habitat. The Preserve's complex matrix of intertwined public and privately owned green space, water, urban and industrial development showcase a precarious balancing act between man and nature.



More than 14,000 years ago, a mile-high glacier piled unsorted rubble, sand and clay into ranges of hills called moraines. Lake Michigan then receded in stages forming three sandy beach ridges. The washboard effect of many cycles of beach ridge development and erosion caused a “dune and swale” formation to the land, enhancing the diversity of flora and fauna of the area. The area is trisected by the Grand and Little Calumet Rivers and encompasses several lakes including Lake Calumet. With the dramatic growth of Chicago in the early 1800s, industrialists found that the “flat waterway rich Calumet

Region was ideally suited for production processes, waste disposal and transportation.” (1) Standard Oil (now British Petroleum) built the Whiting oil refinery, Pullman erected the world's largest railroad car

manufacturing plant, and US Steel set up a mill, just to name a few. Dunes were pushed into wetlands, the mouth of the Grand Calumet River was dredged into a wider shipping channel, bridges, canals and dams redirected water flow, and a harbor was constructed. Small towns boomed. Several green tracts were privately held and dedicated to hunting and fishing, but industrial development dominated the area.

The tides turned with the waning of the Midwest's industrial dominance and the growth of overseas competition. Factories shuttered their operations and local communities were left with polluted waters and a blighted landscape. In 1980, when the threat of a large-scale metropolitan airport that would cement over part of Wolf Lake, bulldozing three small towns and dozens of wetlands, local officials and their constituents along with environmentalists banded together in opposition. Land use planners and consortiums including the Illinois Department of Natural Resources, the City of Chicago, the Cook County Government and Chicago Wilderness, took more notice of the area. Chicago's Field Museum of Natural History, under their "Environment, Culture and Conservation" scientific program, assigned botanists and biologists to research, study the area, and divide the region into management units. As a result, The Calumet Area Land Use Plan was adopted in 2002 and the idea of an "Ecopark" with different geographic parcels ranging in size from 15-600 acres took root.

Even after more than a century of abuse, "many biologists currently regard the area as containing high quality diversity – more rare and special plants, animals and other organisms than anywhere else in the Chicago region. Twenty five percent of Illinois' threatened and endangered bird species nest in the region including ospreys, common moorhens, and yellow crowned night herons." (2) On Deadstick Pond which covers 44 acres, Pied-billed Grebes nest. On the Burnham prairie unit, American bitterns and Wilson's phalaropes abound. The savannas in Eggers Woods provide wetland habitat for 7-8 pairs of yellow-headed blackbirds. Rare falcon-like jaegers have been spotted at Lake Calumet. And, on Gull Island in the Lake Calumet unit, ring-billed gulls breed behind an abandoned incinerator.



Photo by Diana Fish

Other notable facts and surprises arouse the visitor. Lake Calumet boasts over twenty species of fish. Wolf Lake, where there was formerly a Nike missile site, offers the sportsman northern pike, walleye, perch, largemouth bass and the occasional lake sturgeon. Rare animals include red bats and Franklin ground squirrels. Unusual amphibians and reptiles include Blanding's turtles, blue spotted salamanders and red-bellied snakes. Cricket frogs and Lady's-tress orchids amazingly tolerate slag - solidified industrial contaminants. On the prairie, blue flag iris and blazing stars color the landscape. On one dune and swale, sixty-nine butterfly species have been recorded including the endangered Karner Blue. The dominant emergent vegetation in the wetlands is cattails and stands of bur oak, cottonwood, and black oak populate the forests. A "Bioblitz", a timed survey involving 130 biologists and botanists, revealed over 2300 different species at Wolf Lake.

An urban preserve faces many significant challenges. Anthropologists from the Field Museum work with the predominantly Eastern European, blue collar surrounding communities to assess their changing needs and vision. Economic redevelopment is crucial to the area. One success story is the conversion of a landfill cap into the Harborside International Golf Center, an acclaimed Scottish links course. Funding for

land conservation and acquisition has come from Chicago bond issues, corporations, grants and foundations. Part of a settlement from the Sherwin Williams Co. was used to control Purple Loosestrife by subsidizing a controlled burn and release of beetles. No remedy is in sight for the pervasive Phragmites. (See story on page 15.) Twenty-eight toxic metals and chemicals were traced in Indiana Harbor on the Calumet River although the overall water quality of the region is better than fifty years ago. The O'Brien Lock and Dam was closed temporarily due to the invasion of Asian Carp. Fragmentation of habitat interferes with the successful proliferation of most species. In the lakes, dikes hamper water circulation. Illegal dumping is frequent. And, it is a daunting task to bring in new industry that would be compatible with the region's sustainability goals.

Yet, against these odds, determined coalitions in the Chicago area keep the vision alive. Ford Calumet Environmental Center, which would incorporate salvaged materials from local *brownfields*, awaits funding. A canoe launch and wildlife observation areas will enhance wetland overlooks when completed. Blueprints exist for a bike trail from the Chicago Loop (the metro transit system) to the preserve, all on protected trails, and for better-marked trails. A new waterways map is in the works and future land purchases to widen buffer zones and improve access to the Preserve are planned. Currently, students from local elementary schools participate in outdoor nature programs. The Alliance for the Great Lakes recently inventoried 166 restoration projects in the greater Calumet region. The goal, "a green infrastructure wherein the built environment sustains a healthy natural environment and nature is accessible to all residents," (3) merits replication in urban centers across the globe. The group thanks the scientists from the Field Museum for our excellent guided tour of the area.

Footnotes:

- (1) [www.GoCalumet.com](http://www.GoCalumet.com)
- (2) Bouman, Mark, "A Mirror Cracked: Ten Keys to the Landscape of the Calumet Region," *Journal of Geography*, 100: 104-110.
- (3) [www.Chicagowildernessmag.org/issues/spring2009/discovering.html](http://www.Chicagowildernessmag.org/issues/spring2009/discovering.html)

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Riddell, Jill, "Calumet Open Space Preserve," produced by City of Chicago, Dec. 2005.  
"Little Calumet and Grand Calumet River Corridor White Paper 2006," Prepared for the Illinois Dept. of Natural Resources.

## **Invasives of the Great Lakes Region Endangering Habitat and Economy**

*Ruth Flournoy, River Oaks G.C. (TX) – Zone X  
GCA Conservation Committee – Vice-Chair, Endangered Species/Ecological Restoration*

Compared to other lake systems throughout the world, the Great Lakes are relatively young at 10,000 years old. In younger ecosystems, species have had little time "to adapt to habitat and one another." This means environmental stresses can much more easily "tip the scale from abundance to extirpation." (1) Almost half of the 150 native fish of this region have either declined or disappeared, while over 185 aquatic invaders have arrived. Noxious invaders are defined by the EPA as those that have established sustained populations and can harm the ecosystem, economy or human health. In the Great Lakes this category includes a wide range of organisms such as zebra and quagga mussels, round goby, and sea lampreys. (2) The Asian bighead, black and silver carp that are now multiplying in the waters of the Mississippi River basin could be a huge problem in the Great Lakes if they penetrate the lock system which was built to join the two drainage basins over a century ago.

Prior to the arrival of the zebra and its cousin, the quagga mussel, Lake Michigan was mostly cloudy, filled with tiny organisms that provided food for the lake's creatures. By filtering the plankton, the fast-growing invasive mussel population has clarified the water. The resulting light has led to the growth of blue-green algae blooms and the reduction of the food sources for native species.

The zebra mussel, which adheres to hard surfaces like ship hulls and pipes, most likely arrived on a ship from the Caspian or Baltic Seas. Capable of reproducing so rapidly that 70,000 can occupy one square foot, they have interrupted the food cycle for the native mussels, small crustaceans called amphipods, fish and insects. Their presence has led to an increase in chemical contamination by concentrating toxins like PCBs. Feeding on polluted phytoplankton, mussels then release the contaminated matter into the sediments where other organisms feed. The round goby, another invader, is the only fish that feeds on zebras, but it displaces native fish by chasing them from their spawning spots. (3)

A native of the Atlantic Ocean, the sea lamprey was first recorded in 1835 in Lake Ontario. It attaches to fish and sucks out fluids, using an anticoagulant to keep them flowing. From 1937 to 1947 sea lampreys entered the Great Lakes as canals were being built or deepened to accommodate larger ships, reducing the fish catch in Lake Huron from 3.4 million pounds to zero. The Great Lakes Fishery Commission now uses several techniques to control this invader ranging from a larvicide, to barriers, to sterilization and trapping resulting in a 90% reduction in most areas. (4)

Asian carp were imported by catfish farmers in the 1970s to remove algae from their ponds. When large floods in the 1990s caused the ponds to overflow, the carp escaped into the Mississippi River basin. (5) This June, fear struck when one Asian carp was found beyond the electric barrier on the Chicago Ship and Sanitary Canal, only six miles from Lake Michigan. As large as three feet long and weighing up to 100 pounds, these fish pose a threat to the food supply of native fish and even threaten boaters, anglers and water-skiers. However, some experts say that the lakes, which have now been so depleted of phytoplankton by the invading mussels, may not provide suitable habitat for the Asian carp. The fear remains that the \$4.5 billion fishing industry is in jeopardy.



Asian carp photo courtesy of Chicago's Shedd Aquarium.

What can be done to keep the population of carp in check? Solutions range from educating fishermen to biological controls and even harvesting. In the next year and a half, Illinois hopes to harvest more than 30 million pounds of Asian carp, considered a delicacy in the Asian markets. The U.S. Army Corps of Engineers, the Environmental Protection Agency, the State of Illinois, the International Joint Commission, the Great Lakes Fishery Commission, and the U. S. Fish and Wildlife Service are working to install and maintain a permanent electric barrier to keep these fish out of the lakes. In July a \$2 million study was kicked off to figure out how to "slam the door" on exotic species such as Asian carp by cutting links between the lakes and the

Mississippi River watershed. This would mean closing the locks that are used to transport materials from the Great Lakes to the Gulf of Mexico. Tim Eder, the executive director of the Great Lakes Commission, is pushing for ecological separation and said, "Everything short of that is likely to fail." (6)

Just five miles inland from the Great Lakes coastline, an invasive, European version of *Phragmites australis*, known as common reed is taking over wet areas. It is fast growing and extremely aggressive, reaching about 15 feet in height. (7) Resembling Pampas grass with gray or reddish plumes, it kills native vegetation in the fragile wetlands ecosystems that comprise 300,000 acres nearby. Former richly





Invasive Phragmites photo from Michigan.gov.

biodiverse areas are now highly visible monocultures. Throughout our country, *Phragmites* “threatens wetland communities, changes hydrology, alters wildlife habitat and increases fire potential. This grass is often confused with a native, shorter *Phragmites* that is a natural component of many undisturbed tidal and freshwater marshes. The robust *Phragmites* found in ditches and disturbed wetlands is likely the invasive (rather than the shorter native) variety.” (8) Burning and herbicides are recommended controls but they create additional problems by killing the remaining native vegetation. Ideally it should be eliminated before it gets established. Those who live in affected areas need to urge elimination of this noxious plant.

[For more information, see “Asian Carp Threaten Great Lakes,” by Kathy Jones, *Conservation Watch*, Winter 2009-10, pgs. 19 – 20. Available on the GCA website.]

Footnotes:

- (1) Wayne Grady, *The Great Lakes: The Natural History of a Changing Region*, page 273
- (2) Wayne Grady, *The Great Lakes: The Natural History of a Changing Region*, page 274
- (3) Wayne Grady, *The Great Lakes: The Natural History of a Changing Region*, page 299
- (4) [http://www.seagrant.umn.edu/ais/sealamprey\\_battle](http://www.seagrant.umn.edu/ais/sealamprey_battle)
- (5) <http://www.epa.gov/greatlakes/invasive/asiancarp/>
- (6) [http://www.huffingtonpost.com/2010/07/22/asian-carp-battle-groups-\\_n\\_655785.html](http://www.huffingtonpost.com/2010/07/22/asian-carp-battle-groups-_n_655785.html)
- (7) [http://www.michigan.gov/deq/0,1607,7-135-3313\\_3677\\_8314-178183--,00.html](http://www.michigan.gov/deq/0,1607,7-135-3313_3677_8314-178183--,00.html)
- (8) [http://www.fhwa.dot.gov/resourcecenter/teams/environment/eq\\_4.cfm](http://www.fhwa.dot.gov/resourcecenter/teams/environment/eq_4.cfm)

**Garden Club Members Don Hardhats,  
Not Gardening Gloves**

*Jeanne Coors Arthur, Memphis (TN) Garden Club  
GCA Zone IX Conservation/NAL Representative*



Jeanne Arthur

My first Conservation/NAL field trip was in September to the Great Lakes region. Visions of waving fields of grain danced in my head. Little did I imagine that the trip would include a visit to an EPA Superfund Site and Waste Treatment Plant. This was no flower garden!

Waukegan on Lake Michigan has the only Illinois harbor north of and close to Chicago. The harbor had been polluted by corporations including John Mansville, tanneries, coke/gas plants, US Sugar, steel mills, Outboard Motor Corporation (OMC), and General Motors (GM). The bright spot was the yacht club where Kevin Adler (Environmental Protection Agency Project Manager) and Susie Shriver (Citizens Action Group) presented an overview of the environmental problems we were right in the middle of. The club was lovely, with views across the water of moored sailboats. Everything else was a blighted area punctuated with railroad tracks, abandoned roads, concrete and weeds, empty silos, abandoned buildings and construction shacks.

The Great Lakes region's physical geography includes peak dune swales, ravines, bottom dunes and bluffs. Lake Michigan has been impacted negatively by the 11,000,000 people that live near it. Waukegan is one of ten "hot spots" on the lake. Problems include invasives, algae and pesticides in the water; dumping; degradation of ravines; and industrial bi-products in the soil and water.

The Waukegan watershed (11.6 miles from north to south) has been identified. Stakeholder viewpoints are being shared. One goal is to educate the population on the importance of geological coastal features. A baseline inventory has been taken of threatened and endangered species and of invasives. The area is crawling with lime grass, phragmites, reed canary grass and other non-natives. Sherry Schmidt took us to the nearby coast where we saw gorgeous dunes, crashing waves, a lighthouse, and signs of reclamation and survival. The area is a contradiction in terms.

Now, back to the Superfund Site. We entered a metal two-story building, signed our names on a list (so we could be accounted for), discussed exit plans and a rendezvous spot should there be a catastrophe. We were issued hard hats and goggles. At that point, we were encouraged by reading a large sign in bold letters

### **51,000 hours without an OSHA recordable injury**



Photo by Elva Busch

Our group was escorted upstairs to a catwalk suspended ten or twelve feet, perfect for a bird's eye view into the evil looking containers below. Tiffany Gobel, an engineer, explained to us what we were seeing. There were two 85,000 gallon reactors containing contaminated ground water that was being cleaned by micro-organisms. These "bugs" eat ammonia, benzene, phenol, creosote, and arsenic that remained in the soil after the industrial manufacturing process. Water samples are taken several times daily to determine the recipe that will keep the bugs feeding at the proper rate. The "bugs" are fed food (nitrates) and air to keep them hungry. When the water leaves the reactors it passes through several filtering stages before being pumped

back into the ground. Operations are computer controlled. In the lab we saw the before and after: two beakers - one with the original brown water and one with the clear but yellowish colored treated water.

Kevin, the EPA Project Manager, is a chemist and geologist. The first testing of this site in 1974 revealed 500,000 parts per million of PCBs in the ground water. This site was one of the first listed nationally as a Superfund site after a 1980 law authorized the federal government to pay to clean up sites where there is no company to pay. The government had investigated the chain of title and determined that previous owners were no longer in business. EPA and the one viable former owner, GM, devised a plan to remove the PCBs from the contaminated sediment and soil. PCB is man-made, contains chlorine and benzene, and is used to machine pieces of metal at high temperatures.

The site was divided into a grid, each section representing soil containing one million gallons of water. Each section has wells 25 feet deep to remove the water for cleansing. To date 24,000,000 gallons of remediated water have been returned to the ground. The goal: the water returned will have one part of contaminates per million. Nitrates remaining in the returned water help re-establish the micro-organism colony in the ground allowing the water to continue to be cleaned naturally.



Photo by Suzanne Canfield

The cost for all of this at this one site? \$120-140 million for the clean up, with GM paying \$35 million. In addition, new federal funds for Great Lakes Restoration are pegged at \$479 Million. Of that, \$1.43 million is for dune and ravine restoration. The plant we were in will be dismantled when the work is finished and at that time all involved hope the Waukegan waterfront area can be de-listed as a toxic site. The EPA will leave this area, knowing the ground water, although improved, will not be suitable for drinking for another century! Our trip to Waukegan made it clear how expensive it can be when humans disrespect our environment.

[Note: As of March 26, 2010, there were 1279 Superfund sites on the National Priorities List in the United States. Sixty-one additional sites have been proposed for entry on the list. As of March 26, 2010, 341 sites have been cleaned-up and removed from the list. Source: U.S. EPA]

### **Prairie Crossing – A Suburb, with Principles**

*Sarah Young – Broadmoor G.C. (CO), Zone XII  
GCA NAL Committee – Vice-Chair, National Parks/Public Lands*

On our last day of the field trip we toured and learned about a rare phenomenon – an environmentally responsible housing development called Prairie Crossing near Grayslake, IL. We saw beautiful common areas of native prairie grasses and wetlands, the barn community center, the teaching farm, the production farm, the community garden, and the LEED certified charter environmental school. We learned about their unique system for managing stormwater runoff and saw the clean water it produces in their recreation lake. We saw the train station, with one line to Chicago and one to O'Hare Airport, within walking distance. After our trips visiting toxic waste sites and learning about a multitude of manmade problems around Lake Michigan, it was so hopeful to visit a place where human creativity has been applied in a positive and thoughtful way.

Our host for the tour was Vicky Ranney, one of the co-developers. Riding in our bus through the development with her was like visiting an idyllic small town from my childhood. The houses, designed by architects to fit the local historic vernacular, had front porches and were close enough for neighbors to visit porch to porch, giving the whole development a friendly neighborhood feeling. Instead of one acre lots where the covenants require homeowners to mow the entire acre, these homes have very small front yards and sidewalks, along with pocket parks and abundant common open space planted in wildlife-friendly native grasses.



Photo from Prairie Crossing website.

The developers hired an environmental consultant to be part of their planning team. He designed a “green infrastructure” stormwater runoff system where the rainwater runs through prairie grasses and wetlands before going into their manmade lake, Lake Aldo Leopold (named for the great Wisconsin conservationist). The lake is so clean that the Illinois Fish and Wildlife agency uses it to propagate endangered native fish, which are thriving. Dr. Michael Sands, the Environmental Team leader who also spoke to us, reports that maintenance costs for the large common areas of prairie and wetland grasses are substantially lower than the costs for the small amount of mown grass they maintain for playing fields and walkways and the cost of planting the green infrastructure is also much lower than the cost of the usual hardscape drainage systems.

Perhaps the most appealing aspect of the community is the interaction between the residents, the school, and the farm. Teachers are able to use the farm, wetlands, and prairie as outdoor classrooms and to design their science and environmental curriculum around this wonderful resource. Residents and students both use the community garden part of the farm and everyone can use the farmers’ market within the community. All are within easy walking or biking distance of the school and the houses and there is very little car traffic.

To top it off, there are miles of walking and biking trails throughout the community and common areas. What a safe and wonderful place for children to learn and grow!

To learn more about Prairie Crossing, visit their website:

<http://www.prairiecrossing.com/pc/site/press-links.html>

## **The Emerging Threat of Contamination by “Unwanted Meds”**

*Fayetta Weaver – Mill Mountain G.C. (VA)  
GCA Zone VII Conservation/NAL Representative*

Susan Boehme, Coastal Sediments Specialist with the Illinois/Indiana Sea Grants, spoke to attendees about a problem in the Great Lakes water system that is also a national issue. America’s water supplies are facing a new source of contamination in the form of Pharmaceutical and Personal Care Products (PPCP’s). Americans are using more and more cleaning agents, pills, cosmetics, and nutritional supplements. Estimates are that between 5 and 40 percent of these products in our homes are not used.

Why do we have these products around? When your physician changes a prescription, someone in your home stops taking a prescription due to non-compliance or lack of desired effect, health improves, or even death, his or her prescription drugs remain. What’s the responsible way to dispose of unwanted pharmaceutical products? **You should not pour them down the sink or the toilet.** To simply flush them away or throw them into the trash can result in their eventual presence in our water. The environmental impact can be significant. How do aquatic organisms respond to a continuous, multi-generational exposure? No one’s sure, but some of the scariest scenarios include the feminization of fish from extended exposure to estrogens and chemical changes in frogs from antidepressants! A recent

U.S. Geological survey of 139 streams documented that 89 percent were contaminated. A 2008 Associated Press research project detected low levels of pharmaceuticals in the drinking water of 24 major metropolitan areas. But, it's not wise to keep these medications in your home. There's the threat of accidental ingestion, theft, or even "medicine cabinet parties" where teens share the family's drugs to get high.

Collection events and Take Back Programs are evolving as police, schools, and the Drug Enforcement Administration (DEA) search for ways to curtail illegal and harmful activities. There's a great need for broad-based community involvement; however, there are numerous challenges to organizing these events. Because there are few safe and legal disposal sites, privacy issues, and controlled substances can only be surrendered to police officers, a simple drop-off program is not feasible. Mail-back programs exist in Maine and Texas, but they exclude the controlled substances. In Illinois, we learned, thirty counties have disposal programs and five Chicago Police Stations have designated receptacles. There are educational programs at their State Fair, billboards are used to publicize proper disposal, and there is a curriculum for teachers to spread the word. What is still needed are methods at waste water treatment facilities to better protect streams, as well as a decrease in unnecessary medicines and healthcare products, and the need for more education and outreach programs.



Photo courtesy of Takepart.com.

In the meantime, what can we do? Consider developing a conservation project in your club to organize a collection day. Your local police department may be eager to work with you and a friendly pharmacist could perhaps be recruited to identify the medicines received and determine a safe recycling destination. A savvy public relations effort could result in the removal of many pounds of PPCP's from your community. The website for the Illinois/Indiana Sea Grants program is: [www.iisgcp.org/unwantedmeds/](http://www.iisgcp.org/unwantedmeds/). You'll find detailed information on how to run a successful unwanted medicines collection event. The flora and fauna in your watershed would surely benefit! A sample program organized by a GCA club follows.

### ***Here's how one GCA club tackled this important issue:***

#### ***East Hampton Garden Club Sponsors Drug Disposal Event***

*Beverly Kazickas, Conservation Committee Chair  
The Garden Club of East Hampton (NY) – Zone III*

The Garden Club of East Hampton (NY) sponsored a two-day Drug Disposal Event this past summer. The club partnered with a local pharmacy to collect unwanted and expired medicines. The club's Conservation Committee set up and staffed a drop-off station for the public to discard their items. They collected prescription, over-the-counter, and pet medications that were disposed of in a safe and responsible manner (incineration) by a pharmaceutical company. Two very large barrels were collected. The sealed barrels had a hole that allowed items to go in but not back out. The volunteers supplied plastic ziplock bags for liquids. It takes a great deal of medication to fill a barrel!

In support of GCA's Position on Clean Water, brochures explaining the importance of our ground water and ways to protect it were distributed to those participating. The community event educated the public that these products should not be flushed down the toilet, washed down the sink, nor thrown away in the trash. What were once considered acceptable ways to dispose of medicines should be avoided as they are now proven to pollute our ground and drinking water.

Do some research in your local area and consider sponsoring a drug disposal event in your community.



Members of the Conservation Committee, Beverly Kazickas and Maralyn Rittenour, accepting a drop off.  
(Photo by Durell Godfry.)

*Beverly Kazickas, Conservation Committee Chair  
The Garden Club of East Hampton (NY) – Zone III*

[Note: If you are considering a club drug collection project, contact your state's Board of Pharmacy to learn what your state's rules for disposing of drugs are.]

### **Soil, Seeds and a Green Roof The Chicago Botanic Garden**

*Sue Klein, Program Committee Chair - Akron (OH) G.C.  
GCA Zone X Conservation/NAL Representative 2008 - 2010*

There we were, on a bus heading to the Chicago Botanic Garden to tour, not the gardens mind you, but a building, - the Rice Plant Conservation Science Center. As we entered this new building, it was



Photo by Elva Busch

interesting to note that it is a gold LEEDS (Leadership in Energy and Environmental Design) certified building. But then things really did get exciting: a huge green roof garden, a soil lab introducing some of us to the importance of mycorrhiza fungi, and the lab for the Dixon National Tallgrass Prairie Seed Bank. Not only did we hear about remarkable projects, but the young, energetic staff members showed us, hands-on, what they are doing. Very cool things.

The 16,000 square foot green roof has two sections for the 200 different species and cultivars that are being evaluated. We stood on

the rooftop and looked over the test plots with horticulturist Emily Shelton. One side is for testing regional and North American native plants, many of which have not been used for roof gardens. The other side is for non-natives and exotics, known or thought to be good. Each variety is planted in three different soil levels (four, six and eight inches deep.) Little research has been done to determine what plants work best on green roof gardens and this is “the largest, most encompassing such trial in the country,” according to the Botanic Garden. What a great resource this will be.

Perhaps the most fascinating was the soil lab. Sounds boring and dirty, doesn't it? But it's not either of those things. Dr. Louise Edgerton-Warburton introduced the GCA conservation members to the amazing microscopic mycorrhiza fungi that grow below ground around the roots of most plants. In fact, Dr. Warburton says, these fungi “are fundamental to the well-being of all aboveground communities and ecosystems.” They can outweigh all the other components in the soil!

Mycorrhiza fungi, through their own roots, transfer nutrients to plants including water, phosphorus and nitrogen. In addition, it is key in the storage of CO<sub>2</sub> underground, 2/3 in mycorrhiza and 1/3 in the soil. This is a natural form of carbon sequestration that mitigates climate change. That's how it works in nature. However, in agricultural soils damaged by improper use of fertilizer and in urban soil compromised by auto and industrial emissions, this natural system has been disturbed and does not work effectively. Dr. Warburton's says that we have to learn how to restore soil that will store carbon.



Photo by Elva Busch

Next we were privileged to enter the seed lab with huge glass windows for the public to view lab activity. Dr. Pati Vitt, the Garden's seed bank curator (and Seeds of Success manager), showed us the dried native plants she had collected recently in North Dakota. They were in pans ready for seed extraction and then identification both by this lab and later verification by the Smithsonian before they are banked.

Interestingly, most seed banks are for crop plants only, but the Chicago Botanic Garden and the U.S. Department of Agriculture save seeds of native plants. This Dixon National Tallgrass Prairie Seed Bank at the botanic garden is committed to the collection of 30 million seeds from 1,500 plants in the Midwest. The seeds, dried, frozen and banked at -20 degrees Celsius at the botanical garden, will be viable for 200 years. The chaff is tested for valuable bio-chemicals (plant-based chemicals) before it is discarded. These seeds are for long-term conservation and use in restoration projects and research. Some are sent to Kew Gardens in England and the National Center for Genetic Resources Preservation in Colorado as “back up” for catastrophes.

The green roof and soil and seed labs, with their ambitious plans, state of the art equipment, and enthusiastic staff, is where groundbreaking work is being done, not only for the Midwest region, but also for the world. We can go to a botanic garden almost any day; but this was a unique, behind-the-scene learning experience for everyone on the trip.

Sources:

Green roof garden source: [http://www.chicagobotanic.org/grow/category/conservation\\_science/greenroofgarden/](http://www.chicagobotanic.org/grow/category/conservation_science/greenroofgarden/)

Soil lab: [http://www.chicagobotanic.org/research/soil\\_lab.php](http://www.chicagobotanic.org/research/soil_lab.php)

Seed bank and lab: [http://www.chicagobotanic.org/research/seed\\_bank.php](http://www.chicagobotanic.org/research/seed_bank.php)

## **Making Connections with Open Spaces**

*Marsha Merrill, James River G.C. (VA) – Zone VII  
GCA Conservation Committee – Vice Chair, National Parks/Public Lands*

Gerald Adelman, President and CEO of Openlands\* in Chicago, is a pioneer and entrepreneur in the quest and use of open space. Perhaps his unique approach to connecting people with open space in an urban environment is due to a background in architecture and philosophy. In the 1970s he saw the 19<sup>th</sup> century Illinois and Michigan Canal as an important link to the past, yet also as a potential tool in connecting communities along the canal. Now 49 communities are connected along 120 miles of waterways. Under his leadership, the Des Plaines River Valley Association created the Illinois and Michigan Canal National Heritage Corridor in 1984. This was the first National Heritage site designation under the National Parks Service in the nation.

Mr. Adelman strongly supports regional approaches to solving problems. He believes that many partners - conservation and preservation groups, civic leaders, local, state and federal governments - working together have brought about the best results in the creation and use of open space in the urban area of Greater Chicago. Included in these groups have been the GCA clubs in the Chicago area that have contributed greatly in the Lakeshore Preserve and Ft. Sheridan projects.

In a lecture to the conservation field study attendees, he stated, "If we are going to sustain preservation, we must connect people where they live with the outdoors. This may be to trees on their street, school campuses or large public parks. Eighty percent of the U.S. population lives in metro regions and fifty percent live in cities proper. Landscapes in these areas are dysfunctional, fragmented and often poorly planned. Finding opportunities to bring nature back to larger parcels of land is important to interconnectivity."

He went on to say, "Youth, they do **not** experience nature - being over-programmed, shopping center oriented, with no thought about corridors and connections, and always moving about in cars. We need to understand the power of electronics - pod casts, YouTube, new media resources – and how they can be used to connect and to energize our youth to get them outdoors."

Ft. Sheridan, 77 acres of woodlands, bluffs and ravines on Lake Michigan in the midst of dense population, is being used to study the impacts of climate change erosion, water, and more. A fifth grade curriculum incorporates art to explore the natural features there. A unique approach by creating visual interest is helping students find new avenues to connectivity. Openlands' "Green School Programs" includes the Green Teacher Network and Building School Gardens. These programs encourage and aid teachers in curricula revolving around school gardens.

Mr. Adelman believes that facts alone will not move people to advocacy. We must get to their hearts and minds. Writing reports doesn't get things done; other tools are needed. Openlands, in partnership with the City of Chicago, and Chicago Metropolitan, a group of leading area businesses and civic leaders, used a photography exhibit in Millennium Park as a most successful tool. "Revealing Chicago: An Aerial Portrait" featured photographs of Chicago and the surrounding region in different seasons taken by photographer Terry Evans. The exhibit, consisting of over 100 large photographs taken from planes, helicopters and hot air balloons, was on view from June through October in 2005. The images were powerful and triggered many debates on land use. This process started neighborhood discussions. The



goal was not to replace what the city should be doing, but rather to get people to talk about how they could contribute. As a result, the "Tree Keeper" program was born. Now 1,300 people have been trained in this program and over a half million trees have been planted and are cared for in area neighborhoods.

Gerald Adelman continues to lead and inspire the Chicago Metro Area through his creative connections. Arts Wide Open this year blends the visual and performing arts in capturing hearts and minds teach citizens to value and connect to nature.

Openlands has created a 4,000-mile network of trails, greenways, forest preserves, and protected river corridors - and countless connections. Cities across America can learn from the examples set in Chicago in preserving and appreciating their open spaces.

\*One of the nation's oldest and most successful metropolitan conservation organizations, Openlands protects the natural and open spaces of northeastern Illinois and surrounding region to ensure cleaner air and water, protect natural habitats and wildlife, and help balance and enrich our lives.



Photo exhibit "Revealing Chicago."  
Photo Credit: Terry Evans

### **Water Facts**

Worldwide, 1.1 billion people lack clean water, 2.6 billion people go without sanitation, and 1.8 million children die every year because of one or the other, or both.

Just 3% of the world's water is fresh. Of that, most is locked in the ground, glaciers, or ice caps. That leaves about 1% for the world's 6.6 billion people. As population grows, so does demand for water - but at two or three times the rate.

Agriculture is the world's top user of water - as high as 80% in some countries - and it's perhaps the most inefficient.

Reference: "A World of Thirst," Bret Schulte, *U. S. News and World Report*, June 4, 2007.

## The Future of Freshwater

Suzanne Booker-Canfield, Ph.D., Garden Guild of Winnetka (IL) – Zone XI  
GCA NAL Committee – Vice-Chair, Climate Change

Culminating the Great Lakes Study Day, Dr. Paul Heltne, President Emeritus of the Chicago Academy of Sciences, provided a thoughtful and wide-ranging look at the future of fresh water globally. As one who has conducted field research in South Africa, Namibia, Costa Rica, Panama, Colombia, Peru, and Bolivia, Heltne spoke authoritatively about an incipient global water crisis:

- 1.2 billion people don't have access to clean drinking water.
- More than two billion people lack access to adequate sanitation.
- Five million people, mostly children, die from water related diseases each year.
- Armed conflicts over water resources are becoming more frequent.

According to Heltne, formerly on the faculty of the Johns Hopkins University School of Medicine, each day we need a minimum of twenty liters per person for cooking, cleaning, laundry, sanitation, bathing, and drinking. Yet Americans average 220 liters a day, often in the form of “embodied water,” which includes the water resource implications for all the things we use, buy, or consume.

Heltne outlined how the hydrological cycle affects the amount of freshwater available. Of the world's total water, 97.5% is in the oceans, and 2.5% is freshwater. Although not drinkable, oceans play a vital role in regulating the Earth's climate as corals and their algal symbionts take carbon dioxide out of the air and store it as calcium carbonate. This ecospheric arrangement has persisted for at least 650 million years, stabilizing the planet's seas and climate. Heltne pointed out, “water is always on the move” and that such “movement involves evaporation, which is the great free water purification mechanism of the earth.” Oceans make up about 86% of total evaporation; the remainder comes from evapotranspiration on land. Thus, most of the rain we experience on land originates in the sea. Because of the hydrological cycle, Heltne noted that Earth would never run out of freshwater; however, it may not occur in the areas it's needed.



Photo from *The Hindu* newspaper.

By 2050, Heltne envisions what may be a “perfect storm” of global water crises occurring alongside regional shortages. In addition to a global population approaching nine billion and the potential for soil depletion and decreased crop production, climate change will cause sea levels to rise, oceans to acidify, and available fresh water in certain geographical areas to diminish. Some of these effects, which may come as early as 2020, will be made worse by actions occurring now around the globe.



Kenyan dry lake bed.  
Photo from freewebs.com.

On average Southern Canada is reducing its fresh water supply by an amount equal to the volume of Lake St. Clair each year. Despite international agreements pledging to supply continuous water to the Colorado River downstream from the United States dams, “we have in many years left the Delta and the needs of Mexican farmers in the dust of a dry river bed,” according to Heltne.

If the potential for conflict on the basis for longstanding cultural or religious animosities affects the Danube, which flows through eighteen countries, the possibility of disagreement along the Tigris Euphrates system, which flows through Turkey, Syria, and Iraq, is immense. Both Turkey and Syria see control of the water as key for its future development, and their dams have “reduced the water to a trickle at Baghdad.”

Similarly, water infrastructure along the Jordan has been the target of conflict between both Israel and its neighbors. Heltne noted that the High Aswan Dam has altered the Nile very much in favor of Egypt. However, Egypt has rejected other countries’ plans for water that originates on their lands, arguing that dams on the upper tributaries would jeopardize its water supply. The Nile’s watershed drains most of Burundi and Rwanda and large parts of Tanzania, Kenya, and Uganda, with some of the Democratic Republic of Congo, which heightens the potential for conflict in these areas of scarcity.

“Hard path” water policy, often relies on inefficient infrastructure that fails to control pollution, promotes over-pumping of fossil aquifers, and promotes wasteful, frequently subsidized, usage on farms and factories. Heltne cited the Three Gorges Dam, the world’s largest, on the Yangtze as the locus of potential conflict between Taiwan and China; a plan to destroy this strategic target serves as a Taiwanese deterrent to Chinese invasion.

Such threats are not isolated. In a recent interview, Heltne noted that a new study published in *Nature* finds “nearly 80% of the world’s population is exposed to high levels of threat to water security.” Although wealthy nations manage to temporarily offset the problems through heavy investments in technology, they often imperil poorer countries. This failure to plan for water security “jeopardizes biodiversity, with habitats associated with 65% of continental discharge classified as moderately to highly threatened” (Vorosmarty et al, 30 September 2010).



Heltne emphasized that we are confronting several culture-changing conditions with overlapping effects; therefore, we need to educate ourselves and act now to begin using water efficiently; to create region-by-region, watershed-by-watershed plans; and to address the causes of global climate change. He urged us “to seek the ecospheric way: recognize that our lives are embedded in nature and behave as if our lives depend on that knowledge.”

Dr. Heltne illustrates the minimum daily water requirement for human existence.  
(Photo by Suzanne Canfield)

[Glossary of terms:

*Evapotranspiration*: the sum of water lost to the atmosphere through evaporation from the Earth’s surfaces and by transpiration from plant leaves.

*Symbionts*: an organism in a symbiotic relationship.

*Ecospheric*: relating to the Earth, its organisms, and all the environmental factors that act on the organisms.]

### **Want to Know More?**

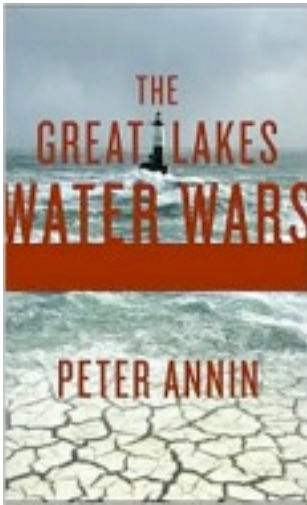
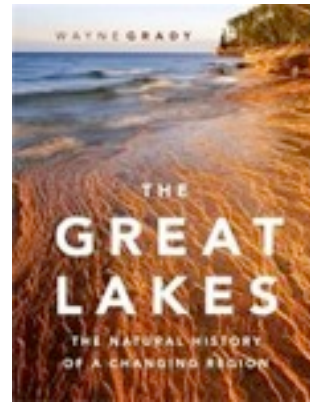
#### **Reviews of Books About the Great Lakes Region**

##### **The Great Lakes: The Natural History of a Changing Region** by Wayne Grady

The Canadian author of this comprehensive book on the ecology of the Great Lakes region has previously written about the Gobi Desert, his investigations of global warming at the North Pole, the life story of a tree, and the wilds of an urban metropolis! In this book, Mr. Grady tackles the five immense

lakes at the heart of North America containing the largest readily available source of freshwater in the world. He explores the biology and ecology of this area and the challenges of its preservation. The book is filled with beautiful illustrations of the terrain and the plant and animal life of the region. This book is a must-have for residents of the Great Lakes basin and for those interested in learning more about our freshwater seas.

*Editor*



**The Great Lakes Water Wars** by Peter Annin

This is an excellent primer for anyone wanting to learn more about the fight for Great Lakes water. Environmental journalist Peter Annin offers a very readable and comprehensive look at the issue of who owns the fresh water in the Great Lakes. He begins the book by stating that the twentieth century was the century of oil and that the twenty-first century will be the century of water. With global water shortages looming, the book describes the future of the lakes and how the Great Lakes region may be at risk.

*Editor*

[For a complete Reading List for the Great Lakes Conservation Field Study Trip, please contact the Editor.]

**Chicago Today, the Entire Great Lakes Region Tomorrow . . .  
Summing Up GCA’s Visit to the Great Lakes**

*Susie Wilmerding, G.C. of Philadelphia (Zone V)  
GCA Conservation Committee Chair*

For many years the GCA Conservation and NAL Committees have heard reports from committee members on Great Lakes issues - clean water, *fresh* water, agriculture, invasive species, successful cleanups, and sites still to be improved or preserved. These topics have drawn our attention to this area. Finally, we’ve paid a visit. We toured restoration areas in industrial zones, a planned “green community,” Superfund sites, a wastewater treatment plant that is cleaning toxic underground water, a golf course and a yacht club built on top of former toxic sites! Damaged wetlands and sites that are remnants of our industrialized age in Chicago’s “backyard,” remind us of the footprint man’s activities leaves. Protecting the 20% of the earth’s fresh water contained in the Great Lakes is a huge responsibility. Our knowledgeable speakers for our field study trip explained their efforts and the challenges this region – and the world – face.

Our inspiration, however, came from also seeing the best that Chicago has to offer. The restored downtown area is truly remarkable with beautiful streetscapes modeled on Paris complete with fabulous sidewalk plantings. Our tour of skyscrapers (in Chicago, where the term was invented), as seen from the Chicago River and dinner on a perfectly calm Lake Michigan watching the sunset, made us almost believe that Chicago never has unpleasant weather. The city's beloved Mayor Richard M. Daley has set a terrific example with his passion for creating a progressive 'green' city. Our enthusiastic hostesses Judy Boggess and Suzanne Canfield gave us a fantastic introduction to this inspiring city and its region. And for this, we thank them. We carry the lessons learned in the Great Lakes region not only to the GCA community, but also to the world at large as we begin our understanding of the global crisis ahead as places in the world run out of fresh water.



Conservation Field Study Trip Attendees.  
Photo credit: Sue Klein



A special thank you goes to hostesses Judy Boggess and Suzanne Canfield who so ably planned and led this wonderful trip. Additional thanks goes to all who attended and participated and to all the expert authors for this issue. Photographers Patricia Wall, Sue Klein, Diana Fish, and Suzanne Canfield are also thanked for being always ready to document our adventures. The Committees also wish to thank the friends of Judy Boggess and members of the Lake Forest Garden Club who made our trip so special.



Judy and Suzanne  
Photo credit: Patricia Wall

For more about this GCA trip, read Audrey Platt's article,  
"Chicago, Chicago, That Toddling Town!"  
in the Dec./Jan. issue of *The GCA Bulletin*.

Conservation Watch, a publication of The Garden Club of America, is produced by the GCA Conservation Committee. Readers' ideas, contributions, and suggestions are welcome. Letters to the Editor may be e-mailed, faxed, or mailed to the Editor and will be published as space permits.

Elva Busch, Editor

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Photo by Elva Busch



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