

## Meet The FOLKS Board Members:

**Carl Dunn** is originally from Northern New York State and he and his wife Jacqui found their way to Greenville in 1962. They have owned property and have had a dwelling on Lake Keowee since 1970. Their dock is #18! Carl and his wife live full time on Kelly Creek Bay in Pickens County. Carl retired in 2004 as Senior VP Legal of Canal Insurance Company, Greenville SC and continues to consult in the insurance industry.



**Dot Jackson** thinks of herself as “an amalgam of timber by the board foot and cotton by the bale, a product of the Keowee Valley.” Her folks intruded on the Cherokees in the 1700s European migration. Her lifelong career in newspapers drew her to the mountain regions of the Carolinas, Georgia, Virginia and Tennessee, where she covered murder trials, snake-handlings prayer meetings, and some of the hardest-fought environmental battles of our times, including the clean-up on the twelve mile basin. She was co-founder of the Birchwood Center for Arts and Folk Life, at the foot of Table Rock and lives there as on-site manager.



**Matt Huddleston** is an ecotoxicologist with ENTRIX, Inc. environmental consultants and an adjunct research professor at Clemson University in the departments of Forestry & Natural Resources and Environmental Engineering & Earth Sciences. He received his B.S. and M.S. in biology from Eastern Kentucky University and Ph.D. in environmental toxicology from Clemson. Matt works on a variety of water resources and water quality issues in the southeastern U.S. and currently is working on the Cane Creek 319 Project. He lives in Pickens County.

## **Drought Situation**

Ben Turetzky

In late October, I attended the Lake Hartwell Association Annual Meeting in Anderson With between 400 and 500 very concerned and unhappy area residents attending; the major topic for the evening was a presentation from the Corps of Engineers (COE) on the drought situation in the Savannah River Basin. (A copy of the latest news release from the COE also appears in this Sentinel.)

The basic situation is that in the absence of rain, the water level in Lake Hartwell continues to drop at an increasing rate. The COE noted that there would not be any foreseeable releases from Lake Keowee as Duke will be (now has) bringing the lake down for maintenance on the water intakes starting in late October through the end of 2008. The water to bring it down will be pumped up and stored in Lake Jocassee and then released back to Lake Keowee when the maintenance is complete.

The expectation is that Lake Hartwell will drop to a level of 25' below full pond. As you drive by Lake Hartwell it is very hard to believe that it hasn't yet reached that 25' level. Recent articles in the Seneca Journal and Anderson Independent had photos showing old bridges which haven't been seen in decades as well as a sanitary waste treatment plant effluent pipe well above the water line.

The drought has really been ongoing for the past 10 years and we have to come to recognize that water conservation must be a constant part of our lives. In that regard, you will continue to see articles like the one in this Sentinel, pointing out new water-saving devices including shower heads, toilets and other such devices as they are commercially developed.

Sometime during November, the COE will have completed their impact analysis of the request made by South Carolina and Georgia to reduce outflow from Lake Hartwell from the current rate of 3600 cubic feet per second (cfs) down to 3100 cfs. In terms that most of us recognize, that is a reduction of 33 million gallons/day (mgd)! This quantity is roughly the amount that Greenville withdraws and treats a day; it is roughly twice what the Oconee County water systems withdraw a day.

Oconee and Pickens Counties are growing and will require more water in the future; Greenville is growing rapidly and they have provided for their growth through the Interbasin Transfer (IBT) from Lake Keowee which allows for up to 150 mgd to be withdrawn; Pickens County has contracted with Clemson University for a future water requirement study; There must be sufficient fresh water in the Savannah River Basin to dilute the treated effluent coming from municipal and industrial wastewater treatment plants; There must be sufficient flow above the City of Savannah to block salt from migrating up to the intake of the City of Savannah water treatment facility; Many of the attendees at the Lake Hartwell Annual Meeting could not understand why no water is being released from Lake Keowee; A new Comprehensive Water Bill will be resurfaced in the coming Legislative session.

All of these facts and more not mentioned here, make it imperative that the issues of water withdrawal, allocation and conservation be addressed. The "Water Quantity" element of the FOLKS Mission is becoming more and more important.

## The President's Corner

Bill Graham

As we wind down a busy 2008 we can see the important and exciting challenges ahead and I want to tell you about both the 2008 highlights as well as what we look forward to in 2009.

One of our major efforts for the past three years has been the EPA/DHEC Cane Creek/Little Cane Creek 319 Grant. One of our early major findings was that the City of Walhalla Sanitary Wastewater System was the major contributor to the impairment. As we continue to survey and test we are finding additional leaks which DHEC is working closely with Walhalla Utilities to repair. We have identified and shared in the repair cost of twenty-two (22) failed septic systems; we are working with livestock operators to share in the cost of the installation of Best Management Practices (BMP's) to keep livestock out of streams; and we have been working with BSA Troop 45 in Walhalla to identify and mark two hundred and fifty (250) storm drains in an effort to make residents aware of the fact that anything poured down them goes into Cane Creek and ultimately into Lake Keowee. One of the real exciting aspects of this grant is that using some FOLKS' and DHEC grant funds, we have worked with three laboratories (Clemson and EPA in Athens GA) on three different methods of "Source Identification" of impairment – i.e. human, cow, chicken etc. Our technical partners in this work include the Clemson Extension Service, NRCS (the National Resources Conservation Service) and the Clemson Environmental Science Department.

Another major effort in the educational outreach area is our Low Impact Development Demonstration Project which includes: a rain garden; native plant beds; a pervious concrete parking lot with an underground stormwater collection system leading to 2000 gallons of underground water storage to be used for drip irrigation of plants in the rear of the property; and an equipment shed with a 200 square foot "green roof". Our partners here include the Clemson Extension Service, the Clemson Horticulture Department and the Hamilton Career Center second year carpentry students who are building the storage shed.

On the water quality issue, our testing continues to show very low levels of Chlorophyll, indicating that Lake Keowee has very low nutrient (Phosphorus and Nitrogen) levels.

In the legislative area, we continue to press for lake-friendly local legislation in both Oconee and Pickens County; we supported the Oconee County Zoning Enabling Ordinance with lake overlays; vigorously supported the new DHEC septic system setback regulations which resulted in an increased setback from waterbodies from 50' to 75'; and in the area of water quantity and allocation, we have been active in the support of a new South Carolina Water Law.

On the land preservation front, we actively participated with the Nature Conservancy and Upstate Forever in the successful effort to secure approximately 1000 acres including Historic Stumphouse Tunnel and Issaquena Falls as public open space.

You can readily see that "our plate is full", as it needs to be because all of these efforts are critical to keeping Lake Keowee and its watershed clean, healthy and beautiful. Even in the absence of major grants from EPA, we know that there are many more failed septic systems in Oconee and Pickens Counties and we need to identify and help get them repaired; we have to develop literature and educate the public about Low Impact Development processes; and we are exploring the expansion of our water quality monitoring program into phosphorus measurements.

As always, our success depends heavily on your continuing membership, financial support and volunteering. In this regard, the Board of Directors has approved an increase in family

memberships to \$35 starting with Membership Renewal Notices sent out beginning January 1, 2009. Please consider leveraging your renewal by checking whether your employer or former employer has a matching grant program <http://www.pacn.org/corpmatchinglist.htm>

**Corps of Engineers – Savannah River Basin  
NEWS RELEASE**

**Evaluation continues in river  
flow reduction assessment**

Release No: 08-39 October 31, 2008

Planners and environmental specialists with the Army Corps of Engineers continue their evaluation of a request to reduce water discharges from the J. Strom Thurmond Dam on the Georgia-South Carolina border.

The states of Georgia and South Carolina requested the Corps of Engineers to reduce outflows from the Thurmond Dam from the current 3,600 cubic feet per second (daily average) to 3,100 cfs to retain more water in the three reservoir system on the upper Savannah River. The Corps of Engineers began an expedited public comment period that ended Oct. 27. State officials had requested a flow reduction from Nov. 1, 2008, through Feb. 28, 2009.

Due to the large number of comments and due to requirements to allow other agencies and governments a full 30-day comment period, the decision on reducing outflows can be completed no earlier than mid- to late November.

“Our commitment is to follow the letter and spirit of the law and thoroughly evaluate this change,” said Col. Ed Kertis, the commander of the Savannah District of the Army Corps of Engineers. The Savannah District operates Hartwell, Russell and Thurmond dams.

The on-going drought in the Southeast has led to record low levels in the reservoirs managed by the Savannah District. District officials voluntarily reduced the outflow from the Thurmond Dam to 3,600 cfs in October 2007. In mid-August the reservoirs reached drought contingency level 3 which limited outflows to 3,600 cfs.

## LAKE KEOWEE WATER QUALITY

Bill Miller

The waters of Lake Keowee and Lake Jocassee are the cleanest and clearest in South Carolina and they have been that way for nearly 20 years. The reason for this is that they contain very low concentrations of nutrients containing phosphorous and nitrogen which produces very slow rates of algae growth and high concentrations of dissolved oxygen. Both of these properties are characteristics of healthy, “oligotrophic” lakes typically found in remote, undisturbed or conserved areas not yet developed by people. The rapid development of Lake Keowee’s shoreline in recent years clearly presents a departure from these natural conditions and poses a threat to its water quality in that many more potential sources of nutrients have been introduced.

A well-documented database of Lake Keowee’s water quality history already exists so in principle, changes in the Lake’s properties should be readily apparent when and if they occur. Duke Energy has conducted monthly water quality measurements from the time the lake was filled as part of their Oconee Nuclear Station (ONS) licensing requirements. In addition, SC DHEC also monitors water properties related to public health on a monthly basis and the Seneca and Greenville Water Companies have obvious interests in imposing quality control on their products. These water quality data sources, however, are not always readily available to the public and FOLKS has historically felt the need to conduct its own parallel studies. Lake clarity measurements were made by FOLKS volunteers at nearly a hundred locations around the Lake beginning in 1994 and the “Tile Project” – a program intended to provide early warning of increased nutrient levels at selected vulnerable locations – is now in its 11<sup>th</sup> year. These efforts have been reported on previously and updates will probably appear again soon; this article, however, will be limited to an updating of work undertaken more recently.

In the fall of 2006, I reported in the Sentinel the initiation of a new FOLKS’ water quality monitoring effort. The additional program consisted of measurements of Chlorophyll a (Chl a) in water samples collected at 17 or 18 sites around the Lake. The work began in the spring and results were compiled and reported through the summer months. Chl a is a direct indicator of algae concentrations produced by nutrient pollution. It is measured by filtering a sample of water taken directly from the Lake and measuring the Chl a in the suspended solids extracted on a filter paper. We now have nearly 3 years of data from 18-20 sites, a total of almost 500 separate analyses. With few exceptions – notably in Cane Creek – the reported results have been very good, rarely exceeding 3 milligrams of Chlorophyll per cubic meter of water (parts per billion or ppb). The sampling program continues to the present time and a few more sampling sites have been added along the way to provide broader coverage; overall, the results continue to reflect very low concentrations of nutrients and improved conditions – at least for Chl a - at Cane Creek.

The results for the last 3 years are summarized in Table 1: the lake-wide averages can be seen to be fairly constant at around 2 ppb. The highest values observed

in 2006 and 2008 came from Cane Creek; the 2007 maximum occurred at Stamp Creek Landing on the Little River.

Table 1. Chlorophyll a Lake-Wide Averages and Maximums

Year	Chl a Concentration, ppb		
	Lake wide Average	Maximum Observed	Average Maximum
2006	2.25	7.14	3.52
2007	1.85	3.92	2.83
2008	2.00	5.40	3.03

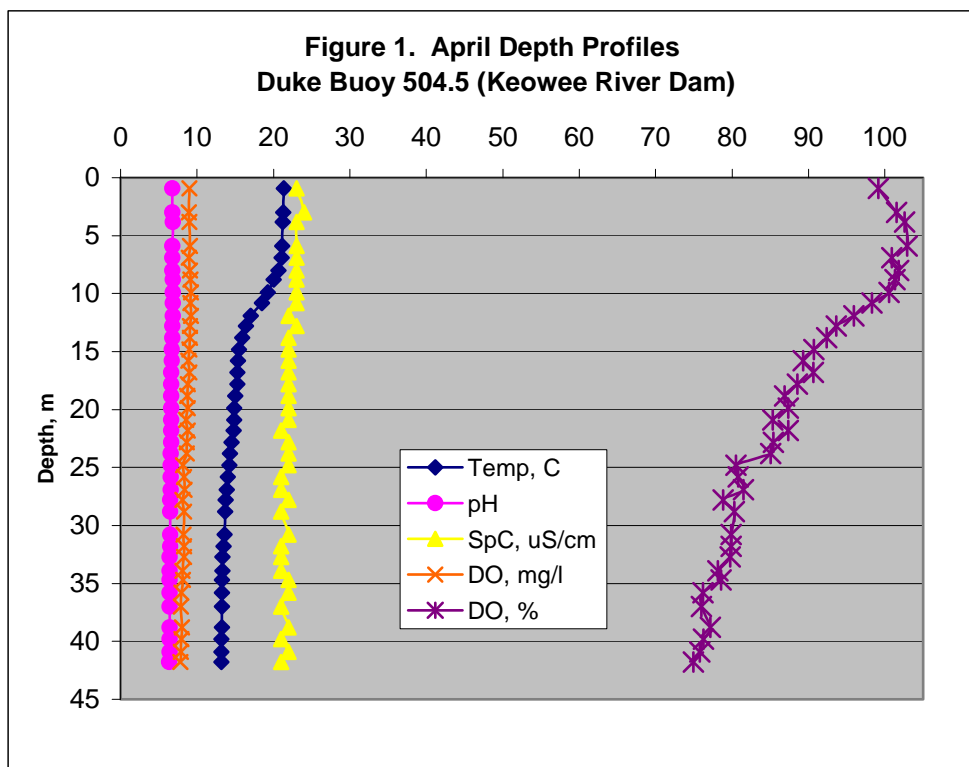
It should be noted that the 5.40 ppb level at Cane Creek in 2008 was one of only 2 values obtained there all year that exceeded 3 ppb and in 2007 there were no values at Cane Creek exceeding that threshold. By contrast, in 2006, there were 8 samples above 3 ppb so things do seem to be improving. The improvement is probably the result of repairs made to the Walhalla sewer system, which had been overflowing after heavy rains. Remediation of pollution sources in the Cane Creek watershed is still being pursued by FOLKS and Clemson U. under the EPA/DHEC 319 Grant Program for the improvement of impaired streams. The most recent report of progress on that effort was recently given by Bob Swank, the Program Manager and appeared in the 2008 March/April Sentinel.

In the 2006 Sentinel Water Quality article, besides describing the new Chl a monitoring program we also reported our *intent* to supplement our monitoring activities with additional water quality analyses. A Hydrolab Corp. hydrosonde device that measures pH, dissolved oxygen (DO), Specific Conductivity (SpC) and temperature (T) was acquired and is now being periodically deployed. The instrument is lowered into the water from a boat or a bridge and provides profiles of the above four quantities as functions of depth from the surface to the bottom. Duke Energy also performs these measurements (as well as Chl a monitoring) monthly. Their profiles are acquired at the white and red buoys marked "Research" located at various positions in the Lake, mostly in deep water above the now inundated Keowee and lower Little River stream beds. None of the Duke data are available to us, unfortunately, and FOLKS interests extend to regions of the Lake that Duke doesn't visit and which are more likely to be compromised before the main channel streams – such as tributaries like Cane Creek.

John Hains discussed at length the need for depth profile information, especially in Lake Keowee, in his "Practical Limnology" articles for the July/August and September/October editions of the Sentinel. He pointed out that movements of water in the Keowee/Jocassee/Bad Creek reservoir complex combined with the enormous amounts of water being warmed and circulated by the ONS stir up the Lakes' contents - especially the water in Lake Keowee - in a unique and as yet only partly understood manner. The depth profiles reveal some of these effects and eventually such data will

become crucial input to computer models with which we will be able to better predict and explain changes in the Lake's properties. Some examples of these data will demonstrate some of the phenomena involved.

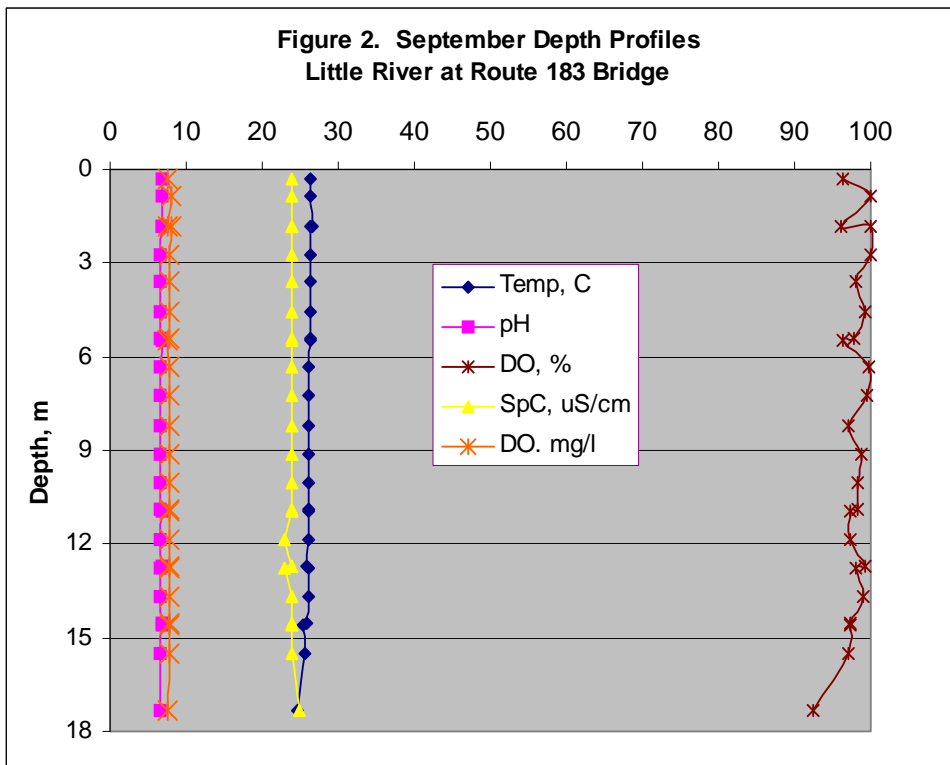
Figure 1 displays profiles obtained in April at a point just upstream of the Keowee River dam. This is a time when the Lake is just beginning to get warm. How recently and how much water had been released from the dam and how recently and how much water had been added upstream from Jocassee, how much rain had fallen and when and how many reactors were circulating cooling water at the ONS are all factors that influence these results. I have not yet tried to compile that information let alone correlate it with changes in the observed profiles. That is a task surely better left to the professional limnologists like John Hains and his colleagues. A couple of things are apparent, though, that I think are worth noting. First, there are really only 2



temperatures, 21°C from the surface to about 10 m depth and 13°C at lower depths. Second, the dissolved oxygen concentration is nearly constant at 8-9mg/liter; the percent saturation decreases because the temperature goes down and oxygen is more soluble in colder water. The pH and conductivity are also nearly constant. This water is essentially chemically homogeneous.

Figure 2 shows the profiles in the shallower water below the Route 183 bridge in September when the water is considerably warmer. Not only is this water chemically

homogeneous, it is at a constant temperature of about 26°C all the way down to the bottom at 18m. This water appears to be perfectly mixed. Whether or temperature gradients will appear as winter approaches remains to be seen. I can only hope for a few warm days in January to find out. I'll be in touch.



## Land Use Regulation Update in Oconee and Pickens Counties

Bill Graham

The Oconee County Council took an important step forward, consistent with the County Comprehensive Plan on Thursday, November 6<sup>th</sup>. The Oconee County Zoning Enabling Ordinance (ZEO) - 2008-18 was passed on third reading. Although an implementation date of May 1, 2009 was included, Council President George Blanchard noted that passage showed legal legislative intent.

The Ordinance, as passed, included both the Lake Overlays (Keowee and Jocassee) which have provisions as follows: 1300 feet from full pond measured perpendicularly from the shoreline; maximum building height of 65' and a maximum single-family density of four (4) units per acre. It would appear that the extended implementation date was an effort to have some time for the new council to consider further adjustments and develop implementation procedures.

The new council members have stated that they do not favor the overlays and would remove them from the ZEO but that the ZEO would remain in effect. *As we currently understand the process*, Individual "Planning Districts" (Current Fire Districts) will be able to petition for the development of a zoning plan for that district by filing a petition with 15% of the landowners signing. The petition would trigger the development of a proposed plan by the Planning Department with the input of a landowner committee. There would then be a public meeting and a vote (or survey of some sort) of the landowners as to whether or not they want Zoning. If that vote or survey gets the "yes" votes of a majority of the landowners (or those voting?) the matter would go to the County Council where there would also be public hearing(s) and the plan, as submitted, or as modified by the Council?, would be voted on by the County Council because it is not constitutional for zoning to be implemented by referendum in South Carolina. As you can well see from this description of the process (as we currently understand it), there is a need for the development of implementation procedures.

The Ordinance – 2008-18 can be viewed at:

[http://www.oconeesc.com/council/2007/Pending\\_Ordinances/10\\_3\\_2008%20ZEO%20DRAFT.pdf](http://www.oconeesc.com/council/2007/Pending_Ordinances/10_3_2008%20ZEO%20DRAFT.pdf).

Interestingly, almost concurrent with this action by the Oconee County Council, the Pickens County Council, in a workshop on November 3rd to review changes to their existing Development Standards Ordinance, continued down a path to eliminate the current 65' height restriction that applies to all construction in Pickens County.

There have been many public meetings in Oconee County with lots of input but with the large lot developments with many being second homes there is not a corresponding public outcry against high rise condo construction along the shoreline in Pickens County.

## Practical Limnology: What lies beneath – part 1

By Dr. John Hains, Clemson University

If the residents on Lake Keowee will glance one lake downstream, they will see an alarming image. OK, yes the Lake Hartwell elevation is at historic lows. That's not what I'm writing about. Look all along the shoreline and you can see the white skeletons of millions of individuals of an invasive species, *Corbicula fluminea* (aka Asiatic clam). These are everywhere, including Lake Keowee. And no, we don't know of serious negative impacts to the ecosystem as a result. But they are a powerful demonstration of what an invasive can do if given the opportunity. Of course, anyone who has noticed the extent of growth of Kudzu knew that already.

This fall, anyone who had visited some of the coves near South Cove and perhaps elsewhere, and who had looked very carefully into the water, might have noticed remarkable creatures, freshwater jellyfish (*Craspedacusta sowerbi*), swimming in the last stage (medusa) of its annual cycle. This is not alarming (and these have been in Lake Keowee since it was built, I observed them back in 1972) but rather they are fascinating and beautiful. They are wonderful creatures that most of us have never noticed but they are there nevertheless.

*Craspedacusta* is a predator, consuming small animals such as zooplankton. It has all of the characteristics of jellyfish we see in the oceans, although their sting isn't sufficient to harm us. *Corbicula* is a bivalve that resides in the sediments and derives nourishment by filtering food particles (plankton and seston) from the overlying waters. These are both wonderful creatures. There are many, many more – and perhaps more on the way.

*Corbicula* was introduced into the Northwest early in the 20<sup>th</sup> century and its expansion across the continent was perhaps the most rapid expansion of any non-indigenous species - ever. But as I suggested, this is mostly a cautionary tale and *Corbicula* was able to do as well as it did because it was confronted with habitats for which it was well-adapted and a niche that was not filled by indigenous species. This is a story about habitat and niche in Lake Keowee and how these two concepts apply to the lake's maintenance and quality.

For those who are not familiar with the concepts, there is a useful analogy to the workplace: 'habitat' is where you work and 'niche' is your occupation. Most of us who have occupations and workplaces realize they are often related.

The ecological reality is more complex. Habitat is easy to understand. It is usually described in physical terms (for example, depth or temperature) or chemical terms (pH, chemical concentrations). For fish, habitat is often described by upper or lower temperature limits as well as lower limits for dissolved oxygen concentrations. Fishermen also understand that food and spawning habitat are also important. This is an important reason for monitoring programs to measure these habitat characteristics (temperature and dissolved oxygen) carefully.

Niche is more difficult because it is an inherent property of the species, not the habitat. Niche incorporates every capability of the species, including the ability to compete with others for each and every resource. The number of factors describing

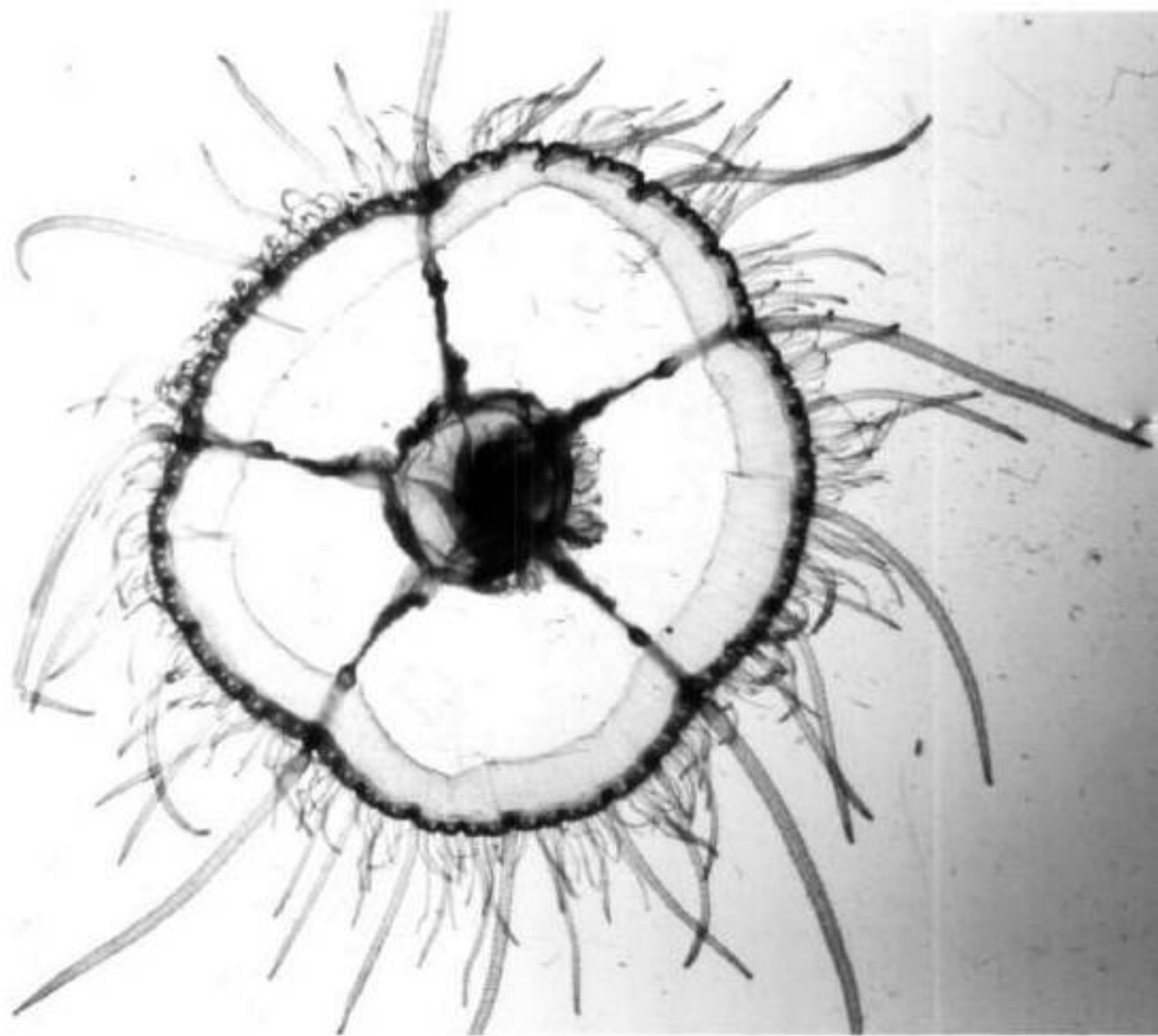
niche, therefore, is almost limitless...thus confusing its meaning for many non-professionals (and a few professionals). Moreover, there are two ways to view niche: 1) the fundamental niche is purely theoretical and really does take into account every potential interaction with the environment, and 2) the realized niche in which the environment has applied limitations on those potential interactions. The realized niche is the best fit of the potential of the fundamental niche to the available habitat. What does this really mean?

An invasive species with broad abilities to exploit resources will tend not to be limited in its expansion unless it is limited by disease or consumption by a herbivore or predator. The ability of *Corbicula* to exploit different habitats combined with reservoir construction to allow widespread expansion. Its indigenous predators are not present on this continent and the 'adopted' predators are not sufficient to limit its growth. Therefore it has expanded successfully to nearly all waters, especially in our region.

A similar situation exists for the invasive aquatic plant, *Hydrilla*, which has also been introduced into Lake Keowee, perhaps intentionally. This plant is limited by light and nutrients. Nearly every part of Lake Keowee that is shallow enough to allow light penetration to the bottom is capable of supporting its growth. Because Lake Keowee has abundant deep water, this plant is unlikely to infest the huge expanses that it has in other, shallower, lakes. But *Hydrilla* and *Corbicula* should be instructive.

Lake Keowee is an artificial lake. Its creation also provides habitat for exploitation by organisms. Lake Keowee's water clarity, complex water motions, nutrient concentrations, thermal characteristics, and related factors – as well as changes to these – define the habitats for everything living in the lake. In one sense, if a terrestrial habitat has been artificially impounded to make a reservoir, nearly everything that grows in it can be considered an invasive of some sort, perhaps even the indigenous species. And where it is difficult to predict the growth and species of natural lakes, this is even more difficult for reservoirs that are even more complex and have existed for much shorter times. And unpredictability is one more reason for careful monitoring of the lake. A reservoir is almost certain to change continuously through its existence, and to change even more rapidly than natural lakes of similar qualities.

In Lake Keowee, what lies beneath is affected by, perhaps controlled by factors we can measure, monitor, and predict. But the numbers and identity of the life that lies beneath is not that simple. And we will explore these in more 'depth' next time in part 2.



## Welcoming Winter Birds to Your Landscape

Lisa Wagner, Director of Education  
South Carolina Botanical Garden

At the South Carolina Botanical Garden, our diverse habitats of gardens, woodlands and forests, meadows, ponds and streams support a variety of resident birds and provide good stopover habitat for migrants, as they pass through in fall and spring. We also welcome many winter resident species that find hospitable habitats here.

In our home landscape, Tim and I have created (and continue to add) as much habitat diversity as we can, by planting trees and shrubs of varying heights, mixing evergreens and deciduous shrubs and trees, creating perennial borders full of flowers that support insects (and in turn insect-eating birds), and offering water in a bird bath and shallow saucers. Supplemental foods provide extra nourishment; I put out black oil sunflower seeds for the seed eaters, niger thistle for the goldfinches, and suet for the woodpeckers and chickadees.

In the 15 or so years that we've lived in the Upstate, we've transformed our 'yard' from being a relatively sterile place of lawn and a few large trees to a lively and vibrant garden of largely native trees, shrubs and flowers, which support a variety of different insects, birds, and other wildlife (check out <http://www.naturalgardening.blogspot.com> for observations about our garden).

Outside the Hanson Nature Learning Center at the Garden, the holly hedges are favorites of our winter (and year-round) resident birds. The hedges provide berries for winter feeding (usually cedar waxwings, robins, and mockingbirds) in addition to excellent shelter and cover. Fall lessons on birds have Sprouting Wings kids (in our after-school program) eagerly checking the nearby feeders for Carolina wrens, Carolina chickadees, and northern cardinals, and other common 'backyard' birds that visit seed feeders.

In fall, white-crowned sparrows arrive for their winter stay and their rustling sounds in the frost-bitten swamp sunflowers always catch my attention. Goldfinches like to forage for seeds in the remnants of summer flowers, too, working to collect the remaining seeds, often acrobatically. Their dull fall and winter plumage is nothing like their bright yellow breeding season colors. The white-crowned sparrows forage for seeds on the ground, poking around in the leaf litter. I often see them in groups, sometimes joined by an eastern towhee or two kicking the leaf litter. They scuffle around a bit like the towhee, kicking the litter, bringing up seeds to eat. Their distinctive striped heads identify them as white-crowned sparrows.

During late fall and winter robin flocks enjoy dogwood and holly berries, among other fruits. I've seen dogwoods rustling with robins loudly eating the ripe fruits, calling melodiously in the process. We have resident robins here, as well as northerly groups that come south for the winter. Robins are an adaptable species, so have flourished in our backyard gardens, lawns, and parks. Look for them flocking as winter wanes and spring approaches on grassy areas and lawns.

To increase bird diversity in your landscape, diversify your landscape by adding native plants, increasing layers (canopy, mid-level, and understory), and using mixed-species plantings rather than mass plantings of single species.

There are many excellent native plants to include in a bird-friendly landscape.

I love this bird-friendly list from Janet Marinelli's article 'Songbird Hedges—An Antidote to the Stockade Fence' in *Plants & Gardens News*, Volume 16, Number 3, Fall 2001, Brooklyn Botanic Garden. The article is available at [http://www.bbg.org/gar2/topics/wildlife/2001fa\\_songbird.html](http://www.bbg.org/gar2/topics/wildlife/2001fa_songbird.html).

Also, CU's Home and Garden Information Center has an excellent factsheet about Attracting and Feeding Songbirds (HGIC 1700), available at <http://hgic.clemson.edu>

#### **Canopy trees:**

- \* Oaks, *Quercus* species
- \* Black gum, *Nyssa sylvatica*
- \* Southern magnolia, *Magnolia grandiflora*
- \* Sweetbay magnolia, *M. virginiana*

#### **Vines:**

- \* Virginia creeper, *Parthenocissus quinquefolia*
- \* Wild grape, *Vitis spp.*

#### **Shrubs:**

- \* Spicebush, *Lindera benzoin*
- \* American elderberry, *Sambucus canadensis*
- \* Chokeberry, *Aronia arbutifolia*
- \* American beautyberry, *Callicarpa americana*
- \* Mapleleaf viburnum, *Viburnum acerifolium*
- \* Arrowwood, *V. dentatum*
- \* Smooth viburnum, *V. nudum*
- \* Rusty haw, *V. rufidulum*
- \* Possumhaw holly, *Ilex decidua*
- \* Inkberry holly, *I. glabra*
- \* Eastern red cedar, *Juniperus virginiana*
- \* Willows, *Salix* species

#### **Understory trees:**

- \* Flowering dogwood, *Cornus florida*
- \* Pagoda dogwood, *C. alterniflora*
- \* Sassafras, *Sassafras albidum*
- \* Hackberry, *Celtis occidentalis*
- \* Dahoon holly, *Ilex cassine*
- \* Yaupon holly, *Ilex vomitoria*
- \* Staghorn sumac, *Rhus typhina*

#### **Nectar plants for Ruby-throated Hummingbirds:**

- \* Eastern columbine, *Aquilegia canadensis*
- \* Coral bells, *Heuchera americana*
- \* Cardinal flower, *Lobelia cardinalis*
- \* Jewelweed, *Impatiens capensis*
- \* Swamp azalea, *Rhododendron viscosum*
- \* Coral honeysuckle, *Lonicera sempervirens*

**Note:** Native plants support roughly 10 to 50% more wildlife species than non-native plants, according to recent accounts (Douglas W. Tallamy. 2007. *Bringing Nature Home: How Native Plants Sustain Wildlife in Our Gardens*. Timber Press.) Plants feed birds in many different forms: seeds, fruits, nuts, acorns, cones, buds, twigs, leaves, flowers, nectar, and sap. In addition, plants support nutritious animals such as insects and spiders, which are vitally important for raising young. With a diversity of native plants, your landscape can support birds with food sources throughout the year.

In the summer and fall, fruit-eating birds prefer lipid-rich fruits, such as spicebush, magnolia, sassafras, and dogwood, because it helps them build up their fat reserves. Fruits that persist over the winter often have a lower fat content, and are apparently tastier after freezing and thawing. These include chokeberry (*Aronia* spp.), sumac (*Rhus typhina*), hawthorn (*Celtis* spp.), juniper 'berries,' bayberry, and winterberry. Many of these will persist through early spring.

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[www.clemson.edu/scbg](http://www.clemson.edu/scbg)

Natural Gardening blog:  
[naturalgardening.blogspot.com](http://naturalgardening.blogspot.com)

## WaterSense Labeled Toilets

Reprinted from <http://www.epa.gov/watersense/pubs/toilets.htm>

Ben Turetzky

Toilets are by far the main source of water use in the home, accounting for nearly 30 percent of residential indoor water consumption. Toilets also happen to be a major source of wasted water due to leaks and/or inefficiency. WaterSense, a program sponsored by the U.S. Environmental Protection Agency (EPA), is helping consumers identify high performance; water-efficient toilets that can reduce water use in the home and help preserve the nation's water resources.

Recent advancements have allowed toilets to use 20 percent less water than the current federal standard, while still providing equal or superior performance. The WaterSense label is used on toilets that are certified by independent laboratory testing to meet rigorous criteria for both performance and efficiency. Only high-efficiency toilets that complete the third-party certification process can earn the WaterSense label.

Over the course of your lifetime, you will likely flush the toilet nearly 140,000 times. If you replace older, existing toilets with WaterSense labeled models, you can save 4,000 gallons per year with this simpler, greener choice. WaterSense labeled toilets are available at a wide variety of price points and a broad range of styles. EPA estimates that a family of four that replaces its home's older toilets with WaterSense labeled models will, on average, save more than \$90 per year in reduced water utility bills, and \$2,000 over the lifetime of the toilets. Additionally, in many areas, utilities offer rebates and vouchers that can lower the price of a WaterSense labeled toilet.

Unlike some first-generation, "low-flow" toilets, WaterSense labeled toilets combine high efficiency with high performance. Design advances enable WaterSense labeled toilets to save water with no trade-off in flushing power. In fact, many perform better than standard toilets in consumer testing.

Whether remodeling a bathroom, starting construction of a new home, or simply replacing an old, leaky toilet that is wasting money and water, installing a WaterSense labeled toilet is a high-performance, water-efficient option worth considering. **If every American home with older, inefficient toilets replaced them with new WaterSense labeled toilets, we would save nearly 640 billion gallons of water per year, equal to more than two weeks of flow over Niagara Falls!**



# Membership Update & Donations & Endowment Contributors

By Jim Hamilton, Membership Chairman

Welcome and thank you to the new members and those who have renewed at a higher membership level since the September October 2008 Sentinel, through October 30, 2008. **If you would like to help increase our membership in your community by becoming a Community Contact, please call Maryjo at the office to find out how easy it is.**

We thank the **Cliffs Communities** for their first year dues sponsorship of new Cliffs Communities' owners and also thank **1<sup>st</sup> Choice Realty** for their novel sponsorship program where they sponsor clients and direct that the first year dues be apportioned 50/50 between the endowment and operating funds.

## **New Members:**

Nancy & Richard Allan, Kellye & Allen Bradshaw, Earl & Eileen Gunsallus, Mary & David Mansfield, Barbara Merchant, Catherine & Ed O'Brien, Ann & Jack Puleo, Vivian & Richard Sepler, Steve Streblow, Joyce & Mike Tarman, Pamela & David Turner, Curtis Wald.

## **New Student Members:**

Patrick Hull, William Hull, Christa Jordan, Luke Lampe.

## **New & Renewing Patron Level Members:**

Bill Blackwood, Deborah & William Galinsky, Helen & Brian Gunnlaugson, Mitch & Judith Harhai, Kristin & John Hunter, Sam & Jingle Robinson, Clifford Roy, Blair Stanicek.

## **When you renew please consider stepping up to the next level: Patron - \$100 Sponsor - \$250**

Here is a way to make your dues and or contributions to the endowment fund multiply. Among the list of companies that have matched FOLKS' members contributions are: Pfizer Dominion Foundation, IBM, BellSouth, and Robert Wood Johnson Foundation. However, many companies encourage their employees to participate in a matching gift program. Through such programs, any donation made by an employee (or retiree in many cases) is matched by the company. The programs vary from company to company so check the link below to see if your company is included. If so, please contact the HR Department to get the details and any necessary forms:

<http://www.pacn.org/corpmatchinglist.htm>

## **FOLKS Business and Corporate Members**

By Dick Millward

We are very proud of the expanding business and corporate membership in FOLKS. Under Dick Millward's leadership, a committee has been working hard to enlist their support. We appreciate their support and know that they will appreciate your patronage. When you do so, please thank them for supporting FOLKS.

### **Corporate Members**

**1st Choice Realty**

**BB&T Bank**

**Carolina First Bank**

**City of Seneca**

**Cliffs Communities**

**Crescent Communities**

**Duke~ World of Energy**

**ITRON**

**John Hamrick Real Estate**

**Keowee Key Property Owners Assoc.**

**Lake Keowee Chrysler LLC**

**Michelin North America**

**Prudential C. Dan Joyner Realtors**

**Seneca Daily Journal/Messenger**

**The Reserve at Lake Keowee**

**Yoder's Building Supply, Inc.**

### **Business Members**

**Allstate Insurance – Greg Wales Agency**

**Aesthetics, Inc.**

**A.G. Edwards**

**Archadeck Of Clemson**

**Arnold Group**

**A' Set Custom Baths & Kitchen Design**

**Bob Hill GMAC Realty**

**Donald Brink, CPA**

**Britton & Co. Real Estate Develop.**

**Carolina Real Estate**

**Classic Lighting & Design, Inc.**

**Colonial Acres Nursery**

**Earth Design, Inc.**

**English Homes**

**Financial Dynamics, Inc.**

**Goldie & Associates (Lab)**

**Greenville Rental, Inc**

**Greg Sosebee & Associates**

**Gwinn's Tire & Alignment**

**Harding Waterfront**

**Harris Marine**

**Hartwell Lake Properties**

**Head Lee Nursery**

**ING Financial Partners**

**J.C. Sports**

**Jocassee Outdoor Center**

**Jocassee Real Estate**

**Keowee Mountain Inc.**

**Kingfisher Maps, Inc.**

**Kroeger Marine Construction, Inc.**

**The Market at Keowee Towne**

**McCall Brothers Diving**

**Merrill Lynch Clemson - Mark Roe**

**Mr. Mulch**

**Natural Natives, Inc.**

**Northwestern Supply**

**Ponderosa Storage**

**Perry and Sally Rogers Real Estate**

**Round Mountain Bottling Company**

**Seneca National Bank**

**Strickland Marine**

**Spearman Brothers Collision Repair**

**Superior Dock Systems**

**The Happy Berry**

**The Investment Center**

**The Lake Company**

**Trees Unlimited/Shorescapes**

**Ware Properties LLC**

**WaterLinks Realty**

**Zone 7 Inc.**