

May/June 2005

# Environmental Update



NCCE – Onslow County Center  
Onslow County Multipurpose Complex  
4024 Richlands Hwy.  
Jacksonville, NC 28540  
Telephone: (910) 455-5873  
Fax (910) 455-0977  
<http://www.ces.ncsu.edu/onslow>

NCCE – New Hanover County Center  
6206 Oleander Dr.  
Wilmington, NC 28403-3822  
Telephone: (910) 452-6393  
Fax (910) 452-6398  
<http://www.ces.ncsu.edu/newhanover>

NCCE – Brunswick County Center  
Brunswick County Government Complex  
25 Referendum Drive (Building N)  
P. O. Box 109  
Bolivia, NC 28422  
Telephone: (910) 253-2610  
Fax: (910) 253-2612  
<http://www.ces.ncsu.edu/brunswick>

## Spring!:

Spring is finally here and plants are coming up everywhere.... including ponds. Based on the number of pond calls received by mid-April, this is going to be a busy year! So far, the following plants and algae have been seen:



**Small duckweed (*Lemna* sp.):** Duckweed is a small plant (1/16-1/8 inch) with a couple of leaves and a single root hanging underneath. Although small, they can be very plentiful and can cover a pond's surface. When they do cover the surface, the water underneath tends to be very transparent. This is because the duckweed blocks the sunlight and algae can't grow. A thick cover of duckweed also blocks oxygen transfer into the water, which makes it harder for fish to live. Duckweed likes very still or sluggish water. If there is wave action or movement, there will be less duckweed and possibly none at all. Despite its name, duckweed is not eaten by ducks.

**Parrotfeather (*Myriophyllum aquaticum*):** Parrotfeather is an attractive light green aquatic plant with feather-like leaves that is a native of the Amazon River in South America. Because of its attractive appearance, it has been sold worldwide for use in garden ponds and aquaria. It has no natural predator in the United States, and it likes the climate in the southern states and along both coasts.



Today in the US, parrotfeather is found in freshwater lakes, ponds, streams, and canals. It tends to grow in slowly moving or still water, rather than in areas with higher flow rates. Al-

though it grows best when rooted in shallow water, it can also occur as a deeply rooted or floating plant in lakes and ponds.

Infestations of parrotfeather can alter aquatic ecosystems by shading out the algae in the water column (no fish food!). In addition, the plants provide habitat for mosquito larvae. Parrotfeather is a problem in irrigation and drainage canals, and in power supply impoundments.

Virtually all parrotfeather plants in the US are female. That, however, does not prevent the plant from spreading by fragmentation. Like Mickey's broom in *The Sorcerer's Apprentice*, each broken stem will grow into a new plant. Boat motors, underwater mowing, and shoreline weedwhacking are great ways of causing this to occur even more rapidly.

If you have some in your pond or aquarium, **DO NOT** discard it in a local stream, ditch, or pond. It needs to be disposed of in such a way that it won't reach any waterways. Millions of dollars are spent each year in North Carolina in efforts to control parrotfeather infestations.

**Bladderwort (*Utricularia***

sp.): Bladderwort is usually seen as a mat of submerged, delicate, threadlike stems with small "bladders". These bladders have touch-sensitive hairs. The plant is actually carnivorous, and the bladders are where they trap their prey. Each bladder has a door with a nearby trigger. When sprung, water rushes in bringing the prey with it. Typical prey are water fleas and mosquito larvae. Enzymes in the bladder digest the food for the plant's use.



***Pithophora*:** *Pithophora* is a green filamentous algae that is nicknamed “steel wool algae” and “horsehair algae” because of its coarse texture. This algae can be seen growing in clumps on pond bottoms. The growth may range in color from lime green to dark green to greenish yellow. *Pithophora* may form large surface mats during the summer months that can interfere with or prevent fishing, irrigation or other uses of the pond. It also looks very unsightly! The surface mats occur when gas bubbles produced by the plant are trapped within the dense algal growth, causing them to float. High winds or heavy rain events may cause the mats to temporarily sink to the bottom.

***Spirogyra*:** *Spirogyra* is a filamentous green alga that has its chloroplasts arranged in a spiral pattern. It is very distinctive when seen under a microscope. In a pond, the alga appears as long, slick, stringy green “hairs”. It feels very different from *Pithophora*. It can form large mats that make a home for other algae and microorganisms, but isn't usually as extensive as *Pithophora*.

---

### **A case for detective work:**

---

Most pond calls are about having too much of something; however, one call was quite different. This particular pond owner was having a hard time getting his fish to grow. A visit to the site presented an unusual vision: transparent, tropical blue-green water. No colorant had been added to the pond. It looked like copper might be present, but a water sample sent to NCDA for a solution analysis gave the following results:

Calcium: 15.6 mg/L

Magnesium: 3.43 mg/L

Sulfur: 10.9 mg/L

Copper: 0.00 mg/L

pH: 5.49

Total alkalinity: 20 mg/L

Hardness: 53 mg/L

These values gave several clues to the unique nature of the pond. Another clue was observed in the shallow water around the pond's edges. The pond was groundwater fed and had a red “bathtub ring”. Actually, it was iron that entered the pond with the groundwater in soluble form and changed into an insoluble form (rust!) when

it came in contact with the oxygen in the pond water.

These clues allowed Dr. Harry Daniels, Associate Professor and Aquaculture Specialist at NC State University, to reach a conclusion: The pond had been constructed in acid-sulfate soils. To quote Dr. Daniels:

“He has likely built his pond on an old brackish-water swamp that is now producing mineral acidity because the soils have been exposed to air. The iron and the blue color along with the low pH are classic signs of this type of soil. Definitely out of the ordinary.”

What does this mean to the pond owner and his fish? Well... bass, yellow perch and bluegill prefer a 6.5 pH. The current 5.49 pH is at or below their range of tolerance. If he really wants to grow fish, he will need to add quite a bit of lime to the pond. This will likely need to be done yearly.

---

### **Do you want to dig a pond?:**

---

If you have been considering having a pond dug, make sure that you get all the information and permits that you will need. You may need a permit from the Army Corps of Engineers (ACOE) or NC Department of Environment and Natural Resources (DENR). There is no minimum size on a pond to require a permit. In general, if the location for the pond is NOT in a wetland and NOT in a stream, it does NOT need an ACOE permit. This would apply to an area such as the middle of a high ground field.

When contacted, the ACOE will send someone out to make a determination on the site. It will be based on such things as soils, hydrology, and vegetation. If they determine that the site is an “isolated” wetland (which CAN occur in the middle of a high ground field if it is a low spot!), ACOE likely won't require a permit but DENR may. The ACOE contact for Onslow County is:

Brad Shaver, Regulatory Specialist

910-251-4611

email: Brad.E.Shaver@saw02.usace.army.mil

There are two other permit considerations:

- ponds larger than one acre and
- any size pond that involves removing soil from the property (it's considered mining!)

These situations require a permit from DENR's Division of Land Quality. In this region, the contact is Janet Russell (910-395-3900).

When planning a pond, also take the soil type into account. Most county Soil and Water Conservation District offices and NC Cooperative Extension offices have copies of their county's soil survey. If it turns out that your planned location is an area of deep sand, loamy-sand, or otherwise well-drained soil, you may have a hard time keeping water in it unless you bring in clay for a liner.

---

### **The Coastal Habitat Protection Plan: *Caring For Our Fisheries***

---

The Coastal Habitat Protection Plan (CHPP) is a requirement of the Fisheries Reform Act of 1997. The plan identifies six habitats vital to North Carolina's fishing industry and recommends ways the people of NC can protect or restore them:

- water column
- shell bottom
- submerged aquatic vegetation (SAV)
- wetlands
- soft bottom
- hard bottom

The CHPP development process identified hundreds of management needs associated with each of the six habitats. The final management recommendations were the result of scientific studies and deliberations of the Environmental Management Commission (EMC), Marine Fisheries Commission (MFC), and Coastal Resources Commission (CRC), along with input from citizens who attended 20 public meetings.

The following is a condensed summary of DENR's recommendations:

#### **Goal 1: Improve Effectiveness of Existing Rules and Programs Protecting Coastal Fish Habitats**

Enhance enforcement of, and compliance with, CRC, EMC and MFC rules and permit conditions.

Coordinate and enhance water quality, physical habitat, and fisheries resource monitoring.

Enhance and expand educational outreach

on the value of fish habitat, threats from human activities, effects of non-native species, and reasons for management measures.

#### **Goal 2: Identify, Designate and Protect Strategic Habitat Areas**

Evaluate potential Strategic Habitat Areas by:

- coordinating, completing, and maintaining baseline habitat mapping,
- selective monitoring of the status of those habitats, and
- assessing effects of land use and human activities on those habitats.

#### **Goal 3: Enhance Habitat and Protect it from Physical Impacts**

Expand habitat restoration, including:

- creation of subtidal oyster reef no-take sanctuaries and
- re-establishment of riparian wetlands and stream hydrology.

#### **Goal 4: Enhance and Protect Water Quality**

Reduce point source pollution from wastewater by:

- increasing inspections of wastewater treatment facilities, collection infrastructure, and land disposal sites, and
- providing incentives for upgrading all types of wastewater treatment systems.

Adopt or modify rules or statutes to prohibit ocean wastewater discharges

Prohibit new or expanded stormwater outfalls to coastal beaches and to coastal shellfishing waters except during times of emergency, and continue to phase-out existing outfalls by implementing alternative stormwater management strategies.

Enhance coordination with, and both financial and technical support for, local government actions to better manage stormwater and wastewater.

Improve land-based strategies to reduce non-point pollution and minimize cumulative losses to wetlands and streams through voluntary actions, assistance, and incentives, including:

- improved methods to reduce sediment pollution,
- increased on-site infiltration of stormwater,
- incentives for low-impact development,
- increased inspections of onsite wastewater treatment facilities (septic systems),
- increased water re-use and recycling.

Visit <http://www.ncdmf.net> to learn more about the CHPP or to download a copy of the report.

---

## Upcoming Events:

---

- **Forest Roads**  
May 10 – Durham County  
May 18 – Henderson County

**Who Should Attend:** This course is designed for foresters, timber buyers, loggers and others with road construction responsibilities. It is designed to improve the skills used in timber access road planning, design and location.

For more Forestry Educational Outreach Program (FEOP) workshops, see their website at:

<http://www.ncsu.edu/feop>

**To register contact: Becky Townsend**  
(becky\_townsend@ncsu.edu) or  
call 919-515-9563.

---

- **Delineation of Piedmont and Coastal Plain Jurisdictional Wetlands**  
May 16-20 – Raleigh and New Bern

**Who Should Attend:** This course will be valuable to environmental and forestry consultants, engineers, landscape architects, appraisers, and regulatory professionals whose

work involves jurisdictional wetland determination and/or implementation of wetland mitigation. Natural resource professionals who wish for a better understanding of wetland science and wetland regulation will also benefit.

**To register contact: Becky Townsend**  
(becky\_townsend@ncsu.edu) or  
call 919-515-9563.

---

- **Ecosystem Services – The Importance of Decomposition**  
May 20 & 21 – Pisgah Forest Institute

**Details:** This course is free and is open to educators of all grades from every background, including home-school teachers and camp counselors. Participants are eligible to receive 1 CEU based on 10 Contact Hours as well as Criteria 2 or 3 credit in the North Carolina Environmental Educator's (NCEE) certification program. To learn more about the workshop or to register call 828-884-8229 or register on-line at [www.brevard.edu/pfi](http://www.brevard.edu/pfi)

---

- **WOW! The Wonders of Wetlands**  
June 13  
&  
**Wetland Plant ID for Educators**  
June 14 & 15

For more information and to register, contact Karleen Vollherbst at (410)745-9620 or by email at: [teachwetlands@wetland.org](mailto:teachwetlands@wetland.org)

---

Sincerely,



Diana M.C. Rashash, PhD  
Extension Area Specialized Agent  
Natural Resources-Environmental Education

North Carolina Cooperative Extension Service  
North Carolina State University  
Onslow County Center  
4024 Richlands Hwy.  
Jacksonville, NC 28540