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Waterfowl Management Plan

Lake Restoration Task Force

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Proposal to Enact a Waterfowl Management Plan for Furman Lake

Submitted by:

The Lake Restoration Task Force

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The Lake Restoration Task Force:

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Background:
Furman Lake is home to a large population of resident waterfowl. These birds are a beloved component of the Furman landscape, and visitors from the Greenville community have long enjoyed family outings to "Furman State Park" to feed the ducks. However, the waterfowl populations are now so large that they are having a significant negative impact on the ecology and aesthetics of the lake environment; principally by contaminating the water and surrounding lawns with their feces. The appropriate population density for waterfowl is estimated at 2 individuals per acre[1]. On 3 July 2006, there were 362 waterfowl on 28-acre Furman Lake[2]; six times the appropriate density for a lake this size. A Canada goose produces ¼ lb. - 2 lbs. of feces/day[3], so even a very conservative estimate means that the lake environment receives over 100 lbs. of waterfowl feces daily. The feces are probably contributing to the extraordinarily high bacterial counts in the lake. Recent analyses show that fecal coliform bacteria counts, and total coliform bacteria counts, exceed federal EPA and state DHEC limits for recreational waters[4]. In fact, some bacterial counts were *30-50 times higher* than these limits[4]. The bacteria in the water and the feces on the lawns, walkways, and benches around the lake represent a potential human health concern. In addition, the feces and nitrogenous waste affect the ecology of the lake. Nitrogen concentrations in the feeder creeks are atypically high[5], and excess nitrogen and phosphorus from waterfowl waste and surface run-off are probably feeding the growth of algae and cyanobacteria. These ugly algal blooms fuel the growth of decomposing bacteria that produce a foul odor around the lake. In order to help reverse these effects, we propose the following waterfowl management plan.

Goal:
The goal of this plan is to reduce the population of waterfowl on Furman Lake to appropriate levels (50 bird maximum). This should reduce bacteria in the lake and surrounding environs, it should reduce the growth of algae, it should reduce the human health risks associated with *E. coli* contamination, and it will help restore the aesthetics of the lake environment.

Strategies:
The overall strategy is to reduce the attractiveness of Furman Lake as a residence for waterfowl, particularly Canada Geese. Keys to this strategy are: 1) changing aspects of the habitat; and 2) reducing the availability of food. Other methods are also presented that can be employed if these initial steps prove ineffective.

1) Changing the habitat: The nationwide explosion in Canada Geese populations has stimulated considerable research into the habitat preferences of geese and the modifications that are necessary to discourage their presence. Geese prefer open water habitats that are easily accessible from shore. They also prefer habitats where feeding areas and water bodies are in close proximity[6]. Furman Lake provides ideal goose habitat; the large open water is surrounded by lawns mown to the water line, affording easy access between feeding areas and the water. Recommended changes are:

- establish a border of vegetation, at least 12"-18" high, around the lake.
- place an 18" high rope-line along the retaining wall, where a plant border is unfeasible.
- These changes can be made in the context of a broader Lake Restoration Plan.

2) Reduce food availability: The waterfowl populations feed on algae in the lake, grasses at lakeshore, and bread provided by lake visitors. Changes to the habitat described above will reduce the amount of lakeside lawn and should reduce food availability somewhat. However, two other changes are recommended:

- stop mowing the grass within the paved walkway perimeter. Although this will produce more feed in the short term, the growth will eventually exceed 18" and the lawn will eventually transition, through natural succession, to other less palatable grasses and perennial herbs. This transition could be stimulated by replacing these lawn grasses with native flowering perennials that are both inedible and beautiful.
- strongly discourage the public from feeding the waterfowl. While we understand the long cultural history of "feeding the ducks" at Furman Lake, the surplus food is a major factor in maintaining the surplus population of waterfowl. We believe that an educational approach, in which the public is asked to join Furman in addressing this problem, can be an effective and socially sensitive way to achieve this end.

3) Other Methods: There are several other methods that Furman has used in the past and may continue to use in concert with the methods mentioned above. In addition, there are a few other recommendations that have proven effective in other situations:

- continue the relocation of Canada Geese from Furman Lake to Lake Hartwell. This is important because geese will return to breeding grounds year after year; and they can live to be more than 20 years old. So, moving geese before they mate and nest is an important way to change their site fidelity. However, this relocation must continue to be performed by people with the appropriate permits, such as representatives of the SC DNR or Wildlife Service.
- egg addling. Shortly after laying, eggs can be rotated or "addled" to stop the development of the early embryo. Again, however, this requires the appropriate permits.
- spraying. There are several commercially available repellants that can be effective against Canada Geese. If other efforts fail, this method might be considered.
- shooting. A last recourse would be to consider shooting geese to reduce populations. Greg Yarrow is a Wildlife Depredation Specialist at Clemson University and he would be willing to help us in this case.

Implementation Plan:

We recommend the following co-ordinated approach involving habitat modification, food reduction, geese relocation, and public education. ***It is critical that we begin as soon as possible, so that waterfowl are encouraged to migrate from the lake during the fall migration***.

1) Fall 2006:

- Allow the vegetation within the paved walkway perimeter to regrow.
- Begin a public education campaign to explain our objectives and to discourage public feeding of the waterfowl. This should involve:
  - signs or pamphlets at the lake entries with educational information (see next page).
  - flyers distributed to Furman students, staff, faculty, and alumni.
  - announcements at sporting events to educate the public about this policy change
  - public programs for kids, by Furman students, to sensitize the next generation (and their parents) to these issues.
  - articles in local print media and interviews on local TV

Example of a possible placard and/or pamphlet, for distribution at the lake entry points.

(Placards/signage would contain an appropriate subset of this information, to be determined by the Marketing Dept.)

"A Vision for a Healthier Furman Lake"

Our lake is not well. There are smelly mats of algae in the water, there are goose feces ("poop") in the water and surrounding lawns, and there are too many bacteria ("germs") in the water. As part of our "Year of the Environment" celebration and to demonstrate our continuing commitment to environmental sustainability, Furman is committed to improving the health and beauty of our lake so that we all can continue to enjoy it for years to come. In order to do this, we are allowing the plants along the lakeshore to grow, and we are discouraging people from feeding the geese and ducks.

"Why Aren't They Cutting the Grass?"

The lake has a problem with algae – it has too much! In the summer, thick mats of algae grow in the lake, which results in offensive odors when the algae decay. The algae grow because nutrients run off the surrounding lawns and 'fertilize' the algae in the lake. More plants along the lakeshore and stream banks will absorb these nutrients, and the algal growth should decline.

"Why Can't We Feed the Ducks?"

A lake this size should support about 50 waterfowl. Furman's population usually exceeds 200. This large population produces at least 100 lbs. of "poop" per day. The nutrients and bacteria in this waste pollutes the water and lawns, feeds the algae, and presents a human health risk. Also, bread is not healthy for the ducks; it fills their belly with low-nutrient food. Without extra food, the waterfowl will move on and migrate as they should.

So, Please Help Our Lake!

Please excuse the weeds; they will eventually grow into a beautiful border of wildflowers that will attract butterflies and songbirds.

And Please Don't Feed the Waterfowl!

- Bread is bad food for the geese and ducks;
- Their feces pollute the water and surrounding landscape;
- Their feces contain bacteria is unhealthy for you and other people.

For more information, please contact Dr. Wade Worthen at 294-3390 or worthen@furman.edu

2) Winter and Spring 2007:

- Continue the public education campaign
- Continue the revegetation project
- Begin a larger Lake Restoration Project that will involve restoring the riparian zones along the streams that feed Furman Lake.

Assessment:

In addition to the environmental benefits and health benefits that will occur as the waterfowl population is reduced, there are also significant pedagogical benefits that are possible. Most of these involve measuring the efficacy of the implementation plan: do waterfowl populations decline, and how does this decline affect water quality? These questions will be addressed by Furman students and faculty in laboratory exercises and independent research projects.

In fact, several studies are already planned. For example, Dr. Min-Ken Liao of the Biology Department will be continuing her studies of the Furman Lake bacteria. She will be assisted by a research student, Walsh Thomas for the 2006-07 academic year. Drs. Brannon Andersen (EES Dept) and Greg Lewis (Biology Dept) will have students in their courses studying the nutrient content of the lake. Dr. Wade Worthen (Biology Dept) will have students in his non-majors biology course contributing to Dr. Liao's bacterial study. In addition, as Faculty Fellow for the Associated Colleges of South, Dr. Worthen will conduct weekly surveys of the waterfowl populations. Two students will assist Dr. Worthen in their capacity as ACS student interns, and they will monitor the success of the publicity campaign to reduce public feeding. They will walk the lake twice each week and explain the new policy to people who are feeding the waterfowl. They will also conduct educational programs for children. These studies will describe whether the program is having the anticipated effects on waterfowl populations, bacterial populations, nutrient loading, and human behavior.

Future students will also be involved in monitoring the lake. These assessments will be used to determine the efficacy of the plan and the need to employ any of the additional reduction methods.

References:

1. R. Ahle, SC DNR. 2006. Personal communication with W. B. Worthen and R. Eggenspiller.
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3. Canada Goose Management. 2006. http://www.canadagoosemanagement.com/Links.html.
4. M. K. Liao. 2006. Unpublished data collected Spring-Summer 2006.
5. G. P. Lewis. 2006. Unpublished data collected Summer 2006.
6. SePRO Corporation. 2006. http://www.flightcontrol.com/management.htm.