

Enhancing Amphibian and Reptile Biodiversity on Golf Courses Through Use of Seasonal Wetlands

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Objectives:

1. Collect census data and conduct experiments related to amphibian and reptile use of seasonal wetlands and compile results into a wetland design and management plan for existing and future golf courses.

Start Date: 1999

Project Duration: 3 years

Total Funding: \$70,383

In the third year of our study, we continued sampling the amphibians and reptiles that use wetland habitats on golf courses in the Central Savannah River Area (CSRA) of South Carolina and Georgia. We compared these survey data from golf courses to species surveys at nearby (off-course) seasonal wetlands.



Several small frog species need seasonal wetlands that do not contain fish or larger frogs and toads that prey upon them.

Two courses sampled have on-course seasonal wetlands, which allowed us to compare amphibian diversity on these courses to the other three courses that do not have seasonal wetlands.

We installed partial drift fences with pitfall traps at the seasonal wetlands on the River Club and Pine Ridge courses. This trapping technique has provided additional information on the species that utilize these wetlands. Unfortunately our two years of sampling has occurred in the middle of a four-year regional drought, which has reduced the numbers of animals using

seasonal wetlands. Despite this shortcoming, our data demonstrate convincingly that seasonal wetlands on a landscape provide habitat for a variety of species that do not occur in permanent wetlands.

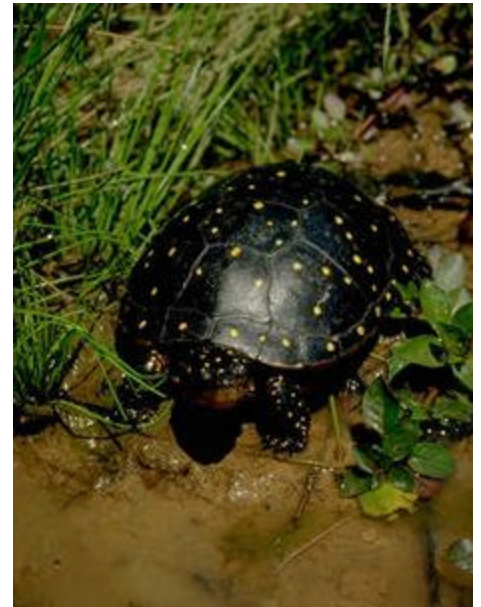
To date, we have found 19 amphibian species on golf courses compared to 26 at our comparison wetlands. On the courses themselves, the two with seasonal wetlands had 16 species, and those with only permanent wetlands had 11 species. Once again our data show that most of the wetlands we sampled on golf courses harbored large populations of numerous fish species, and consequently these same wetlands contained only a select few amphibian species that can tolerate the presence of fish.

The difference between the two species lists (courses with and without seasonal wetlands) results primarily from the presence of amphibian species that prefer fish-free wetlands on the courses that have seasonal wetlands. Examples of these species are *Ambystoma opacum* (marbled salamander), *Ambystoma maculatum* (spotted salamander), and *Gastrophryne carolinensis* (eastern narrow-mouthed toad).

Our remaining efforts in this project will focus on management recommendations



The spotted salamander is an example of an amphibian that prefers fish-free wetlands.



Like amphibians, many reptiles use seasonal wetlands for breeding.

for the USGA. We contacted two other researchers who have conducted Wildlife Links projects on amphibians, Dr. James Howard (Humboldt University) and Dr. Peter Paton (University of Rhode Island), and they will work with us to provide management guidelines based on their research. This compilation of recommendations will be presented to the USGA on a CD-ROM.

Summary Points

- Most of the wetlands sampled on golf courses harbored large populations of numerous fish species and consequently these same wetlands contained few amphibian species.
- A greater variety of amphibian species was found in both on-course and off-course seasonal wetlands compared to permanent lakes and ponds.
- A compilation of recommendations for seasonal wetlands management is being developed.