# Alabama Natural Heritage Program[SM]

# 2011 Annual Report

# Staff Directory & Resources

## 2010 Staff Directory

Jim Godwin
Aquatic Zoologist
jgodwin@alnhp.org
(334) 844-5020

Al Schotz
Botanist/Community Ecologist
aschotz@alnhp.org
(334) 844-5019

Michael Barbour
GIS Analyst
mbarbour@alnhp.org
(334) 844-5017

## Location

Alabama Natural Heritage Program
1090 South Donahue Drive
Auburn University, AL 36849

Fax: (334) 844-4462

**Websites**

ALNHP Primary Web Address:
www.alnhp.org

Affiliated Websites

NatureServe
www.natureserve.org

Auburn University Environmental Institute
www.auei.auburn.edu

The mission of the Alabama Natural Heritage Program[SM] (ALNHP) is to provide the best available scientific information on the biological diversity of Alabama to guide conservation action and promote sound stewardship practices. ALNHP is administered by the Environmental Institute at Auburn University. Established by The Nature Conservancy in 1989, it is one of a network of such programs across the United States, Canada, and Latin America, collectively known as the Natural Heritage Network (NHN). As a member of the NHN, ALNHP is represented by its membership organization NatureServe. NatureServe works to aggregate data from individual Network Programs and is dedicated to the furtherance of the Network and the application of Heritage data to biodiversity conservation.

Natural Heritage Programs have three broad functions:

- to collect information on the status and distribution of species and natural communities,
- to manage this information in a standardized way, and
- to disseminate this information to a wide array of users.

Natural Heritage Programs use a standardized information management system to track biodiversity data including taxonomy, distribution, population trends, habitat requirements, relative abundance, quality, condition, and viability. ALNHP provides the following services: biodiversity data management, inventory, biological monitoring, site prioritization, conservation planning, Geographic Information System services, and land management expertise.

# Affiliations

The mission of the Auburn University Environmental Institute is to serve the state, nation, and global community by providing leadership and coherence in all university areas of environmental instruction, research, and extension/ outreach. The goal of the Environmental Institute is to promote, coordinate, and implement multi-disciplinary programs and activities to meet the environmental needs of the University, state, and nation. There are several ways in which the Institute works to meet these goals.

By supporting and coordinating interdisciplinary teams, programs, or specialized centers, the Institute creates a new forum for environmental research and education. The associated faculty program promotes the work and research across many disciplines which may not ordinarily coordinate investigative efforts. The Institute also serves the faculty by increasing information and access to extramural funding, and developing proposals and other means for improving the quality of environmental education and research at Auburn University. The Institute serves as a source of information concerning funding, through public and private monies, of new and innovative research opportunities. It is additionally important to increase the effectiveness of Auburn University educational programs, curriculum, and professional opportunities for all students in all academic fields related to the environment, such as through lecture series and sponsored annual conferences.

NatureServe is a non-profit conservation organization that provides the scientific information and tools needed to help guide effective conservation action.

NatureServe represents an international network of biological inventories - known as natural heritage programs or conservation data centers - operating in all 50 U.S. states, Canada, Latin America and the Caribbean. NatureServe and its network of natural heritage programs are the leading source for information about rare and endangered species and threatened ecosystems. Together we not only collect and manage detailed local information on plants, animals, and ecosystems, but develop information products, data management tools, and conservation services to help meet local, national, and global conservation needs. The objective scientific information about species and ecosystems developed by NatureServe is used by all sectors of society - conservation groups, government agencies, corporations, academia, and the public - to make informed decisions about managing our natural resources.

## Introduction

The Alabama Natural Heritage ProgramSM (ALNHP) has had a productive and successful year. The program staff continue to conduct in-depth surveys for imperiled species in Alabama and to produce quality reports and publications on the state's diverse flora and fauna. The comprehensive database of Alabama's natural heritage continues to grow, and provides a sound foundation for conservation efforts in the state. One of the highlights from the year was ALNHP's receipt of a Conservation Impact Award for our project "Reintroduction of the Eastern Indigo Snake onto Conecuh National Forest" from NatureServe's Member Program Conservation Achievement Awards. This highly collaborative project has become a high profile project for ALNHP and our project partners. This report includes summaries of our projects over the past year. Thank you for your interest in and support of ALNHP and our efforts to protect Alabama's rich biodiversity.

## Inventory

### Botany & Community Ecology

The botany/community ecology component has been actively involved presenting lectures, conducting field surveys, and preparing reports for several projects in 2011. A large proportion of time was devoted to preparing status surveys and conducting five-year reviews of federally-listed plants on behalf of the U.S. Fish and Wildlife Service (USFWS). ALNHP is also currently working in conjunction with the National Park Service to conduct an inventory of vascular plants on the Cane River Creole National Historical Park and prepare an account of historic vegetation within the Cane River National Heritage Area, Louisiana. It is anticipated that these two projects will guide Park Service policies involving land management, conservation priorities, future research, and public relations. NatureServe also partnered with ALNHP to prepare an ecological assessment of longleaf pine woodlands on U.S. Forest Service lands in an effort to better guide management policies. In September 2011 the ALNHP entered into agreement with JMR Architecture of Montgomery to institute a comprehensive plant inventory of the Fort McClellan Army National Guard Training Center on Pelham Range near Anniston. This project will span two growing seasons, with an anticipated completion date of September 2013.

### Project Summaries

**Alabama Red-bellied Turtle**

Surveys of the Alabama red-bellied turtle (*Pseudemys alabamensis*) continued during 2011, completing the fourth year of data collection. Information collected through this survey is being used to evaluate the status of this federally endangered species, revise the IUCN account, and for revision of the recovery plan (funded by the USFWS); a draft revision of the recovery plan has been submitted to USFWS. Since the 1990s most studies of the Alabama red-bellied turtle have taken place in the Mobile-Tensaw Delta. The long-term accumulation of data has now allowed an analysis of a numerical trend of trapped turtle numbers. Using catch per unit effort (CPUE) as a measure analysis of data indicate that turtle number in the Mobile-Tensaw Delta have not changed significantly

Alabama red-bellied turtle (*Pseudemys alabamensis*)

Black Warrior waterdog (*Necturus alabamensis*)

from the 1990s to 2011. Funding for this project has been through the Section 6 program administered by the Alabama Department of Conservation and Natural Resources. Section 6 funding has been secured to continue this project for a fifth year. Current study will address the phylogeography across the range of the Alabama red-bellied turtle. Population centers in Alabama include Bon Secour River, Fish and Magnolia rivers of Weeks Bay, Mobile-Tensaw Delta, Dog River, Fowl River, Bayou la Batre, and in Mississippi the lower Escatawpa and Pascagoula rivers, and lower Biloxi River.

**Black Warrior Waterdog**

Known from only about a dozen locations, the Black Warrior waterdog (*Necturus alabamensis*) is a species endemic to the Black Warrior River system of Alabama. Occurring only above the Fall Line, the range of the Black Warrior waterdog mimics that of another Black Warrior endemic, the flattened musk turtle. The USFWS is reviewing the status of the waterdog and the present study is to provide information on the status of the salamander; the Black Warrior waterdog is a permanently aquatic salamander. This study is being funded by the Jackson, Mississippi Field Office of USFWS.

**Carpenter's Groundcherry Status Survey**

A range-wide status assessment of the Carpenter's ground-cherry (*Physalis carpenteri*) is in progress, resulting in four new occurrences of this globally imperiled

Carpenter's ground cherry (*Physalis carpenteri*)

plant. To date, surveys have been conducted throughout the range of the species, with supplemental field work planned for Georgia, Mississippi, and Louisiana during the spring of 2012. The project, funded through the U.S. Fish and Wildlife Service, will provide critical information pertaining to population dynamics, habitat characteristics, and disturbances and potential threats to determine viable conservation efforts for the species. A final report will be submitted to the USFWS in June 2012.

**Ecological Assessment of Longleaf Pine Woodlands on Forest Service Lands**

In July 2011, ALNHP through contractual agreement with NatureServe, began field assessments of longleaf pine stands within U.S. Forest Service landholdings from Alabama to Texas to gather data defining ecological

Longleaf pine forest

condition and necessary management needs. The purpose of the project was to identify the key indicators and rapid assessment protocols to be applied for assessing, managing and monitoring longleaf ecosystems across the Southeast. The project also entailed performing an initial comparison between the rapid assessment indicators that were collected, expert field calls taken at the same time, and derived stand/aerial imagery-derived data to pave the way for integrating the rapid assessment protocols into existing methodology. The final outcome of the study was to efficiently create an accurate snapshot of the ecological integrity of longleaf-dominated stands on USFS lands.

**Map Turtles of the Choctawhatchee River System**

Map turtles were first discovered in the Choctawhatchee River of southeastern Alabama by ALNHP staff in 1997. Up to this time the lack of map turtles from this river system represented a gap in the distribution of this group across the drainages of the Gulf of Mexico. Later survey work revealed that both Barbour's map turtle (*Graptemys barbouri*) and Escambia map turtle (*Graptemys ernsti*) were to be found in the Pea and Choctawhatchee rivers. The co-occurrence of two broad-headed species of *Graptemys* in a river system is unique. *Graptemys* tend to exhibit a drainage specific pattern of distribution, i.e. map turtle species are typically endemic to a single drainage. Until the discovery of map turtles in the Choctawhatchee river system, *G. ernsti* was thought to be endemic to the Conecuh-Escambia river system to the west. A taxonomic study is currently underway to examine the taxonomic status of these map turtles and determine their specific status.

Escambia map turtle (*Graptemys ernsti*)

Mohr's Barbara-buttons (*Marshallia mohrii*)

**Mohr's Barbara-buttons Status Survey**

A status survey on Mohr's Barbara-buttons (*Marshallia mohrii*) in Alabama and Georgia, funded by the U.S. Fish and Wildlife Service, will begin in May 2012. The purpose of the survey will be to furnish an updated, range-wide assessment of the species to systematically analyze population dynamics, to characterize general habitat requirements, and to ascertain apparent disturbances and potential threats. Known only from Alabama and Georgia, this relative of the daisy and dandelion is currently represented by a small number of widely distributed populations across the central and northern portions of Alabama and adjacent Georgia. The species inhabits limestone glades, prairies, and gravelly stream margins, having now become globally imperiled due to a combination of residential development, incompatible timber harvesting, quarrying, trash disposal, and other modifications of its habitat.

Red Hills salamander (*Phaeognathus hubrichti*)

**Red Hills Salamander (*Phaeognathus hubrichti*) Studies**

*Falkenberry Hill Activity Study*

In 2008 a study on a population of Red Hills salamanders (*Phaeognathus hubrichti*) in Monroe County was initiated in which all burrows were identified and mapped, with a significant number of Red Hills salamanders being captured, measured, weighed, sexed, implanted with a PIT tag, and returned to their respective burrows. With completion of this short-term study the essential elements of a long-term study were in place, thus beginning in January 2010 monthly trips have been made to the site to collect activity and movement data on the PIT tagged salamanders. Using a PIT tag reader and antenna capable of detecting a tag as deep as 30 cm underground an entire year of data, taken once a month, has been gathered on activity and movements of Red Hills salamanders. This Red Hills salamander activity study will continue through September 2012 with funding from the USFWS. A second component of the study will be a fine-scale genetics assessment of the population with comparison to two other sites, one contiguous and one separated by an anthropogenic barrier. This project is in collaboration with Dr. Kristin Bakkegard of Samford University and Dr. Rulon Clark and Shannon Hoss of San Diego State University.

*Population Genetics*

The population genetics study on the Red Hills salamander to examine the effect of disturbance upon population variability and burrow clustering was completed this year. The project was range-wide and compared genetics and burrow densities from 7 buffered, or undisturbed, and 8 un-buffered, or disturbed, sites. Habitat disturbance and poorly buffered slope habitat was shown to negatively affect burrow density, burrow clustering, and body condition. This study was done in collaboration with Dr. JJ Apodaca of Florida State University, and funded through the Alabama Department of Conservation and Natural Resources with a Section 6 grant.

*Habitat and Density Analysis*

The Alabama Department of Conservation and Natural Resources, through a Section 6 grant, is funding a habitat analysis study on the Red Hills salamander. Between 2004 and 2008 ADCNR funded a State Wildlife Grant project to delineate Red Hills salamander habitat patches on timber lands. Through the SWG project data was collected on salamander burrow density, tree and shrub species and coverage, slope angle and aspect, and other habitat variables. The current Section 6 project is to analyze these data from gathered form approximately 30 sites across the range of the Red Hills salamander. These analyses will be conducted by Dr. David Steen who is on a post-doc in the Department of Biological Sciences.

**Reintroduction of the Eastern Indigo Snake onto Conecuh National Forest**

This is an ambitious, long-term project with the goal of establishing a viable population of the eastern indigo snake (Drymarchon couperi), an apex predator long absent from Alabama, on Conecuh National Forest. To achieve this goal, in 2008, 2009, 2010, and 2011 gravid female snakes were captured in Georgia, returned to


eastern indigo snake (*Drymarchon couperi*)

Auburn and maintained in the lab until laying eggs. Once having laid eggs the female snakes were returned to their place of capture. The eggs, 3 clutches in 2008 and 7 clutches in 2009 and 2010, and 3 in 2011 were incubated in the lab to obtain the indigo snakes needed for the reintroduction project. To understand the activities of newly released snakes a radio-telemetry study is being done, and while hatchling indigo snakes are quite large they are not large enough for the implantation of a radio transmitter of the needed size. Thus, the young snakes must be held in the lab for at least a year to gain size and mass. The first release onto Conecuh National Forest occurred in June 2010 with snakes born in 2008. A total of 17 snakes were released, all with an implanted radio transmitter. Tracking the snakes with radio-telemetry will allow us to assess survivability and test the release techniques.

In the spring of 2011 six snakes from the 2010 release were recaptured for radio transmitter replacement with a unit that will provide about 2 years of usable life. These snakes were returned to the wild once weather permitted. The second release took place in late-spring 2011. Twenty-one snakes with radio transmitters and 10 without were set free. As in the previous year initial survivability was high and no snakes were lost until a few weeks had passed. Study of the radio telemetered snakes is providing data for two graduate student masters degrees. One thesis will focus on survivorship, home range, and a comparison of soft vs. hard release techniques. The second thesis topic will examine snake usage of burned vs. unburned habitats. Both students are under the direction of Dr. Craig Guyer in the Department of Biological Sciences.

Collaboration is a key to this endeavor involving Auburn University (ALNHP/Environmental Institute & Department of Biology), Alabama Department of Conservation and Natural Resources (ADCNR), The Orianne Society (formerly Project Orianne), U.S. Forest Service, U.S. Fish and Wildlife Service, Georgia Department of Natural Resources, Zoo Atlanta, and Ft. Stewart (US Army). Funding for the project is through a State Wildlife Grant administered by ADCNR with The Orianne Society providing matching funds. Zoo Atlanta's contribution is presently housing and rearing the 2010 and 2011 snakes.

Copy of the final report may be found on the Outdoor Alabama website: http://www.outdooralabama.com/research-Mgmt/StateWildlife Grants/projectsfunded.cfm

**Vascular Plant Inventory and Ecological Community Assessment at Cane River Creole National Historical Park, Louisiana**

A vascular plant inventory and ecological community assessment of the Cane River Creole National Historic Park in Louisiana was completed in December 2011. The two-year project entailed surveying the properties of two historic plantation homes located in the Cane River region near Natchitoches. Nearly 220 species representing 77 plant families have been documented as part of the study and four natural communities identified. The ultimate goal of the project is to deliver the information described in the report to all interested parties, to inform land management, conservation priorities, and

future research at the Park, and to ensure that future generations of visitors will visit a park that is ecologically and historically intact. Conducted in conjunction with the foregoing project is an inventory of historic vegetation in the Cane River National Heritage Area. The final product of the project will contribute to the baseline knowledge of historically significant plant species by providing reliable information regarding the role of how each species has influenced the history and culture within the boundaries of the Heritage Area. It is anticipated that use of the final report will enable the National Heritage Area commission personnel to produce a user-friendly visitor guide to native and culturally significant plant species throughout the Heritage Area region.

**Vascular Plant Inventory of the Fort McClellan Army National Guard Training Center on Pelham Range**

In September 2011 ALNHP entered into an agreement with JMR Architecture of Montgomery to conduct a comprehensive plant inventory of the Army National Guard Training Center, a 17,000-acre parcel of land on Fort McClellan near Anniston. The project will span two growing seasons, with a final report to be completed in 2013. While the main focus of the project is to document all species of vascular plants, the final product will also include documentation of taxa monitored by ALNHP, an account of rare or otherwise significant ecological communities, and maps depicting the locations of rare species and important natural communities.

### *Significant Botanical Discoveries*

- Blue Scorpion-weed (*Phacelia ranunculacea*) was observed along a steep slope overlooking the Alabama River at Prairie Bluff in Wilcox County in May 2011. The discovery represents the second occurrence reported for the state, with the first discovery having been made further downstream in Monroe County, in 2006. The species assumes a broad but curious distribution that is primarily centered about the Mississippi and Ohio River drainages in Arkansas, southeastern Missouri, western Tennessee, southern Illinois, southern Indiana, and northwestern Mississippi. The discovery of this taxon in southern Alabama represents a significant range extension of nearly 260 air miles southeast of its nearest population in Bolivar County, Mississippi.
- Hall's Bulrush (Schoenoplectus hallii) was newly discovered for the state from Dallas County while exploring a series of isolated wetlands south of Selma in August 2010. Widely scattered across several mid-western states, the species is represented by only a small number of occurrences in the Southeast.

## Applied Conservation

**Red-cockaded Woodpecker Safe Harbor Agreement**

In order to encourage landowners with existing or potential RCW habitat to manage their lands in order to conserve RCW populations, the U.S. Fish and Wildlife Service (USFWS) and

red-cockaded woodpecker (*Picoides borealis*)
(Photo by Jim Hanula)

the Alabama Department of Conservation and Natural Resources (ADCNR) has implemented a Red-cockaded Woodpecker Safe Agreement in Alabama. Under a Safe Harbor Agreement, the landowner agrees to carry out activities expected to benefit red-cockaded woodpeckers, but no added federal restrictions will be imposed should the numbers (or occurrences) of the species expand beyond a "baseline" level when the agreement is entered into.

ALNHP is working with ADCNR and USFWS to encourage forest landowners to enroll property in the Safe Harbor program. Copies of the brochure describing the Safe Harbor Agreement have continued to be distributed to interested individuals. Numerous property owners have been contacted and given information regarding the program (brochures, e-mail messages, and verbal communications). Annual monitoring reports were submitted for the nine properties enrolled in the program. During 2010-11, two additional agreements were prepared and sent to the property owners for their consideration.

## Information Systems & Technology

### Biodiversity Database

ALNHP maintains a comprehensive database on the location and conservation status of species and ecological communities in Alabama. The Biotics database is supported by funding through our inventory and conservation planning projects. Although building and improving the database has always been a primary goal of the program, securing funding to support this important program area remains a challenge. ALNHP is currently tracking 1,843 (1,462 if not including Caddisflies, + 88 natural communities) rare plant and animal taxon (Fig. 1). There are 7,153 individual occurrences of these species and natural communities documented in Biotics, with the majority of the Element Occurrences (EO) being for vascular plants or mussels (Fig. 2).

Following the conversion of our database to Biotics in March 2008, we have been working on improving our database compliance with the Benchmark Data Content Standards (BDCS) for natural heritage data. This past year's efforts focused on updating State Protection Status to reflect the changes made in Alabama's Nongame Regulation, conducting a quality control check of Other Status where information on a species' status on the State Wildlife Action Plan Species of Greatest Conservation Need list is stored, and redigitizing records imported from our old Biological and Conservation Database to improve the spatial representation of the records. We will continue working to improve the database with the goal of meeting all BDCS goals. The focus in the coming year will be redigitizing data imported from BCD to improve the spatial representation and improving EO Rank completeness and quality.

One of the important tasks each heritage program performs is the regular compilation of a Rare Species Inventory List for the state that ranks each element tracked by the program based on the number and quality of occurrences. Our revised Alabama Inventory List was published March 2011, with the list distributed to cooperators and other interested parties and posted to the ALNHP website.

### Data Requests

Over the past year, ALNHP has responded to 22 paid data requests; 37 requests from academia, conservation non-profits, government agencies, NatureServe, other Heritage Network members, or cooperating partners; and 14 requests for an environmental review. The number of requests was similar to past years.

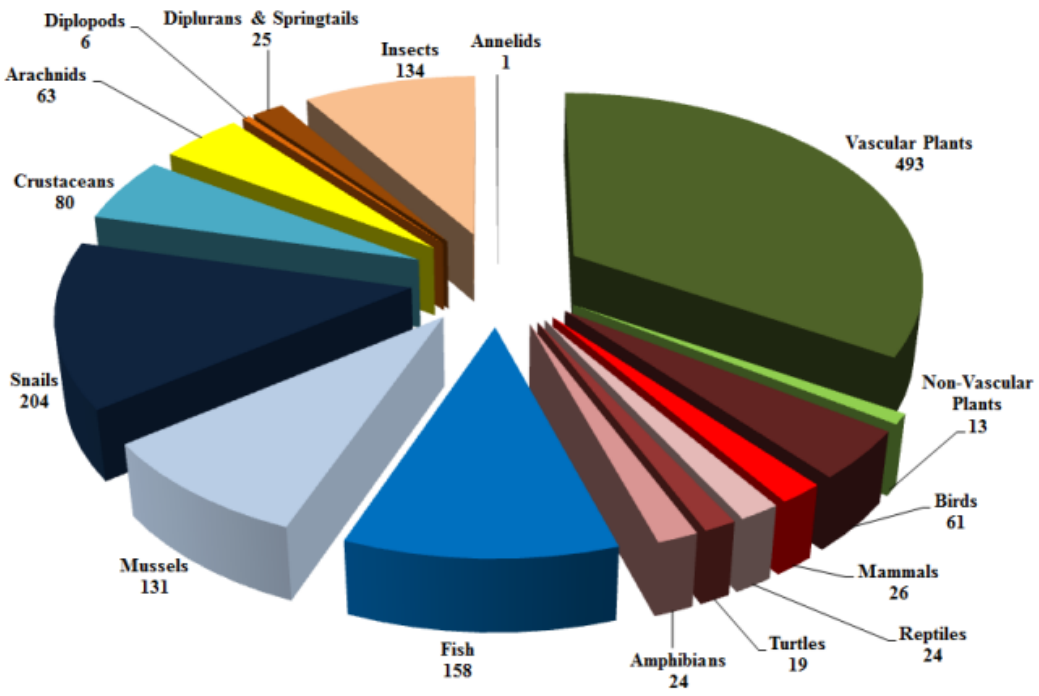


Figure 1. Number of rare plant and animal species track by ALNHP (total 1,454).

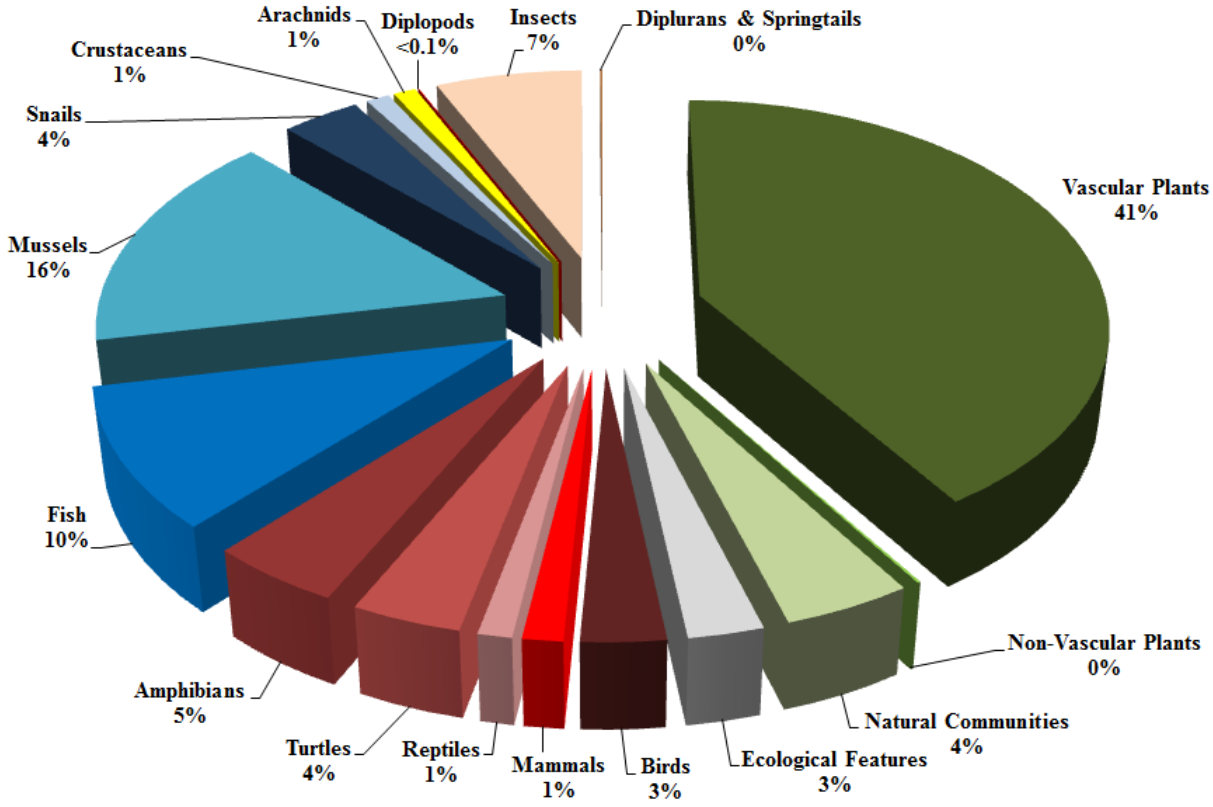


Figure 2. Percentage of 7,168 Element Occurrences in Biotics by major taxonomic group.

## Publications

**Published Articles:**

Godwin, Jim and Mark Sasser. 2011. Return of the eastern indigo. Outdoor Alabama 83(3):18-23 (July 2011).

**Unpublished Project Reports:**

Godwin, James C. and J.J. Apodaca. 2011. Comparison of Red Hills Salamander (Phaeognathus hubrichti) Populations Between Undisturbed and Disturbed Sites. Unpublished report submitted to the Alabama Department of Conservation and Natural Resources. 18 pp.

Godwin, James C. 2011. Reassessment of the Status of the Federally Endangered Alabama Red-bellied turtle (Pseudemys alabamensis). Unpublished report submitted to the Alabama Department of Conservation and Natural Resources. 56 pp.

Godwin, James, Michael Wines, Jimmy Stiles, Sierra Stiles, Craig Guyer, and E. Marie Rush. 2011. Reintroduction of the Eastern Indigo Snake (Drymarchon couperi) into Conecuh National Forest. 2008-2011. Final Report submitted to The Alabama Department of Conservation and Natural Resources and The Orianne Society. 103 pp.

Hastings, Robert W. 2012. Final report for implementation of the safe harbor plan for the endangered Red-cockaded Woodpecker in Alabama. Unpublished report submitted to the Alabama Department of Conservation and Natural Resources, Division of Wildlife and Freshwater Fisheries, Montgomery, Alabama. 14 pages.

Schotz, A. 2011. Inventory of federally listed and sensitive plant and select animal species on U.S. Army Corps of Engineers landholdings along the Alabama River. Unpublished report for the United States Fish and Wildlife Service. 18 pp.

Schotz, A. 2011. Status assessment of Dalea foliosa (Gray) Barneby, the leafy prairie clover, in Alabama. Unpublished report for the United States Fish and Wildlife Service. 17 pp., including 3 Appendices.

Schotz, A. 2011. Status update and conservation initiative for the whorled sunflower (Helianthus verticillatus) in Alabama. Unpublished report for the United States Fish and Wildlife Service. 20 pp., including 2 Appendices.

Schotz, A.R. 2011. Vascular plant inventory and ecological community classification of the Oakland and Magnolia Plantations, Natchitoches Parish, Louisiana. Unpublished report for the National Park Service. 89 pp., including 3 Appendices.