Alabama Natural Heritage Program

2008 Annual Report

Staff Directory & Resources

2008 Staff Directory

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Affiliated Websites

NatureServe
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The mission of the Alabama Natural Heritage Program (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 past two years have been ones of change for the Alabama Natural Heritage Program. Administration of the program transferred to the Auburn University Environmental Institute November 2006. In December 2007, the program office moved from Montgomery to the Auburn University campus. We would like to thank Huntingdon College for their generous support in providing us office space in Montgomery for the 11 years prior to our move to Auburn, and look forward to the opportunities provided by the move. The other big change for the program was the conversion of our natural heritage database platform from the Biological and Conservation Database (BCD) to Biotics in March 2008. The updated platform will allow us to more accurately represent the complex patterns of biodiversity on the landscape.

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 fauana. The comprehensive database of Alabama's natural heritage continues to grow, and provides a sound foundation for conservation efforts in the state. This report includes summaries of our projects over the past two years.

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 2007 & 2008. A large proportion of time was devoted to preparing status surveys and natural community assessments on behalf of the U.S. Fish and Wildlife Service (USFWS), with a special emphasis placed on the Coastal Plain and Appalachian Plateau. ALNHP partnered with the Poarch Band of Creek Indians and prepared a comprehensive report describing natural communities and the results of wildlife inventories conducted on their Magnolia Branch Wildlife Reserve in south Alabama. In addition, a similar report was prepared for MeadWestvaco presenting the results of surveys conducted for G1 and G2 species on their landholdings in eastern Alabama and adjacent counties of Georgia as part of the corporation's Sustainable Forestry Initiative. ALNHP has also partnered with NatureServe to acquire vegetation data of specific habitat types in the Cumberland Mountains in the northeastern portion of the state. ALNHP is also currently working in conjunction with NatureServe on behalf of the National Park Service to prepare natural community assessments for Little River Canyon National Preserve and Horseshoe Bend National Military Park. In July 2008 ALNHP entered into agreement with the Georgia Department of Natural Resources to conduct inventories for rare plants and ecological communities within the 17,000-acre Paulding State Forest west of Atlanta.

Project Summaries

Alabama Red-bellied turtle

In 2008 a survey to re-evaluate the status of the Alabama red-bellied turtle (*Pseudemys alabamensis*) was initiated, and one year of field work has been completed. This project is being funded through the Section 6 program administered by the Alabama Department of Conservation and Natural Resources; a second year of funding has been secured. Informa-

Alabama red-bellied turtle (*Pseudemys alabamensis*)

tion collected over the course of this survey is to be used to evaluate the status of this federally endangered species and for the revision of the recovery plan (funded by the USFWS).

Cahaba River National Wildlife Refuge Inventory for Amphibians and Reptiles

The Cahaba River National Wildlife Refuge is located in Bibb County; the Cahaba River bisects the refuge. Being a relatively new refuge baseline data is unavailable for most faunal groups. A baseline inventory is now underway to produce a species list of amphibians and reptiles, habitat associations, and if possible body condition parameters on select common species.

Cahaba River National Wildlife Refuge Natural Community Assessment and Rare Plant Survey

A natural community assessment and rare plant inventory of the newly established Cahaba River National Wildlife Refuge in Bibb County was finalized and submitted to the U.S. Fish and Wildlife Service in January 2008. The two-year project entailed a vegetation classification that falls within the framework of the National Vegetation Classification designed by NatureServe, ensuring that the consistency of naming and classifying natural communities is maintained on a nationwide basis. In addition to furnishing detailed community descriptions, the report also included a map depicting the boundaries of each community and offers long-term management recommendations. The rare plant component of the project has produced 21 occurrences representing 12 species currently monitored by ALNHP. Case studies for each taxon are provided, summarizing habitat preferences, life history distribution, potential threats, and management requirements.

(*Salix* spp.) / *Andropogon gerardii – Panicum virgatum – Salvia azurea* Cahaba Riverwash Herbaceous Vegetation community on the Cahaba River National Wildlife Refuge.

Captive Breeding of the Threatened Eastern Indigo Snake for Reintroduction into Alabama

This is a State Wildlife Grant funded project to determine the feasibility of captive breeding indigo snakes for release and reestablishment into south Alabama. The project was completed fall of 2008. Eggs from wild captured Georgia eastern indigo snakes (*Drymarchon couperi*) were brought into the lab at Auburn University and incubated. Female snakes were returned to their capture site. Twenty-four hatchling snakes are being reared and will be released onto Conecuh National Forest in the spring of 2009. This project was in collaboration with Dr. Craig Guyer, Department of Biological Sciences, Auburn University. Cooperators included Georgia Department of Natural Resources, Ft. Stewart, USFWS, USFS, and Project Orianne.

The report is available online from:

http://www.outdooralabama.com/research-mgmt/State Wildlife Grants/projectsfunded.cfm

Ecological Assessment of Alabama's Black Belt Prairies

The Black Belt prairies are a unique habitat complex in the state. Many of these native grasslands have been lost to development, conversion to cropland or pasture, or encroachment of eastern red cedar (*Juniperus virginiana*) due


Black Belt prairie in Sumter County, Alabama.

to lack of fire. Work has continued on our project to assess the current extent and condition of prairies in Alabama. Potential prairie areas were located using expert knowledge, aerial imagery and various GIS data layers. Potential prairie sites were visited, with extant prairies mapped, in Autauga, Dallas, Greene, Hale, Perry, Pickens, and Sumter counties. Significant prairies (relatively large area covered or relatively high quality) identified on public property included Jones Bluff (Autauga County), Cochran Recreation Area (Pickens County), and the University of West Alabama prairie restoration site (Sumter County). Significant prairies identified on private property include tracts in Autauga, Dallas, Greene, Hale, and Sumter counties. Assessments of prairies at Cochran Recreation Area in Pickens County disclosed an occurrence of the eared false-foxglove (*Agalinis auriculata*), a globally imperiled plant species last observed in Alabama in 1940.

Targets for terrestrial vertebrate species surveys were the five species identified as species of high conservation concern in Alabama's State Wildlife Action Plan which potentially are found in prairie areas – speckled kingsnake (*Lampropeltis getula holbrooki*), northern harrier (*Circus cyaneus*), short-eared owl (*Asio flammeus*), American kestrel (*Falco sparverius*), and long-tailed weasel (*Mustela frenata*). Northern harriers were observed at prairie sites in Dallas, Greene, Hale, and Pickens counties. Kestrels were not observed during surveys at any of the sites but were reported by the landowner or land manager at sites in Dallas and Hale counties. Speckled kingsnakes were captured and observed during trapping at Cochrane Recreation Area in Pickens County, Alabama, and were reported from sites in Dallas, Greene, and Hale counties.

Falkenberry Hill

Alabama Highway 21 in Monroe County has a stretch of road that descends and curves down a section of Red Hills slope, and locally this site is known as Falkenberry Hill. Plans for realigning the road to straighten a curve, by the Alabama Department of Transportation, have been in place for a number of years. The proposed route would slice through a significant Red Hills salamander (*Phaeognathus hubrichti*) population. In order to meet a USFWS requirement ALDOT funded a study designed to test whether salamanders could be successfully relocated. Initial estimates of the number of salamanders to be moved were less than 30. As the study progressed the number of salamanders encountered steadily climbed. As of this writing approximately 125 salamanders


Red Hills salamander (*Phaeognathus hubrichti*)

Harper's umbrella plant (*Eriogonum longifolium* var. *harperi*)

have been captured, measured, weighed, sexed, implanted with a PIT tag, and returned to their burrow. This represents the largest and most complete dataset and study on a single population of Red Hills salamanders. A majority of the burrows have been mapped to within cm accuracy using Trimble RTK GPS and Trimble Total Station survey equipment. Monitoring of the salamanders, by reading the PIT tags, is underway in collaboration with Dr. Kristin Bakkegard of Samford University. As of this writing the road project is under consideration but with a proposed re-routing to the west of the salamander habitat so that a minimal number of salamanders would be impacted, and plans for salamander relocation have been dropped.

Harper's Umbrella Plant Monitoring

Harper's umbrella plant (*Eriogonum longifolium* var. *harperi*) is a close relative of the commercially grown buckwheat that is generally classified as a biennial in botanical references although it frequently does not adhere to a two-year reproduction cycle. Apart from baseline data, little is known about the plant; preliminary studies conducted at Redstone Arsenal in Alabama suggest that the species may persist in a vegetative rosette phase up to five years before flowering. The taxon is currently known from 11 occurrences in north Alabama and from five sites in central Tennessee.

ALNHP has partnered with the Tennessee Department of Environment and Conservation to implement a five-year demographic monitoring effort of three occurrences in Alabama and one in Tennessee to acquire a greater understanding how its life history such as seedling recruitment, age structure, and the rate of maturity is influenced by environmental parameters. A report highlighting the results of the 5-year study was finalized and submitted in March 2008.

Inventories for G1- and G2-Ranked Vascular Plant and Terrestrial Animal Species on MeadWestvaco Landholdings in Southeast Alabama and Southwest Georgia

The second of a two-year inventory effort on MeadWestvaco landholdings has been completed, with a final report having been submitted in July 2007. During the summer of 2005, ALNHP was contracted by MeadWestvaco to conduct a detailed, systematic inventory of G1- and G2-ranked vascular plant and terrestrial animal species on their landbase in southeast Alabama and adjacent areas of Georgia. The area inventoried encompasses approximately 290,000 acres, with levels of survey intensity dictated by forest cover types. Surveys were prioritized by conducting inventories on par-

Granite outcrop in Lee County, Alabama.

cels having the greatest potential (e.g., naturally occurring cover types) to contain G1- and G2-ranked species and parcels designated as Special Areas. Twenty-two species represented by 47 occurrences of vascular plants were documented on behalf of the project, including seven occurrences of federally listed taxa. Of the eight target animal species which potentially could have occurred on the property, the only species documented on the property was gopher tortoise (*Gopherus polyphemus*). The results of the project will contribute to the general understanding of natural resources on MeadWestvaco lands, as well as provide a framework to evaluate the impacts of habitat management strategies.

Magnolia Branch Wildlife Reserve Natural Community and Zoological Surveys

ALNHP partnered with the Poarch Band of Creek Indians to conduct natural community and zoological surveys on their Magnolia Branch Wildlife Reserve in Escambia County, Alabama, and provide management and restoration recommnedations. The zoological surveys included inventory efforts for fish, gopher tortoise (*Gopherus polyphemus*), box tutle (*terrapene carolina*), aquatic turtles, and red-cockaded woodpecker. Surveys documented 39 fish species, including 6 species of conservation concern - one of which (everglades pygmy sunfish, *Elassoma evergladei*) had not previously been

Gopher tortoise (Gopherus polyphemus) burrow on Magnolia Branch Wildlife Reserve, Escambia County, Alabama.

View from Wolf Creek Overlook in Little River Canyon, National Preserve.

reported from the Conecuh Drainage, box turtles, a small population of gopher tortoises, and 10 rare plant species on the reserve. Although no sign of red-cockaded woodpeckers was detected on the reserve, portions of the reserve have the potnetial to provide suitable habitat and could serve as areas for reintroductions. A natural community assessment and rare plant inventory of the reserve was completed using a vegetation classification that falls within the framework of the National Vegetation Classification designed by NatureServe. In addition to furnishing detailed community descriptions, the report also included a map depicting the boundaries of each community, documentation of exotic plant species present, and offers long-term management recommendations.

National Parks Natural Community Assessments

ALNHP has partnered with NatureServe on behalf of the National Park Service to implement natural community assessments at Little River Canyon National Preserve, Russell Cave National Monument, and Horseshoe Bend National Military Park. Assessments and subsequent reports was completed for Russell Cave National Monument in January 2007 and Little River Canyon National Preserve in February 2008. Ongoing work is planned for 2009. The projects entail acquiring vegetation plot data that are used to produce an assessment of all vegetation

types within the parks, which is then analyzed and issued a vegetation classification in accordance with the National Vegetation Classification maintained by NatureServe. An assessment for Horseshoe Bend will be completed in 2009.

Paulding State Forest Rare Plant and Natural Community Survey, Georgia

ALNHP has entered into agreement with the Georgia Department of Natural Resources to conduct an inventory of rare plants and ecological communities within the 17,000-acre Paulding State Forest near Atlanta. The first year of a two-year project, surveys have currently identified nine plant species of conservation concern as recognized by the state of Georgia. Additional field work is planned for 2009, with an anticipated completion date, and subsequent final report, planned for June 2010.

Red Hills Salamander Habitat Delineation, Breeding Bird Surveys, and Habitat Restoration Recommendations on Commercial Timberlands

A three-year, State Wildlife Grant (Alabama Department of Conservation and Natural Resources) funded project has been completed in which Red Hills salamander (*Phaeognathus hubrichti*) habitat was delineated, burrow data

Steep, mesic, hardwood-dominated slope typical of Red Hills salamander habitat.

eastern indigo snake (*Drymarchon couperi*)

was collected to estimate density, data on the hardwood vegetative cover of Red Hills salamander habitat was collected, and breeding bird surveys were conducted. Based on the data and information gathered important sites for the Red Hills salamander (federally threatened species) were identified. Habitat management guidelines for slope habitat and restoration recommendations for ridgetops were prepared. Habitat management and restoration recommendations encompassed one salamander, two lizards, one snake, one tortoise, and 19 birds.

Report is available online from:

http://www.outdooralabama.com/research-mgmt/State Wildlife Grants/projectsfunded.cfm

Reintroduction of the Eastern Indigo Snake onto Conecuh National Forest

This is a second State Wildlife Grant project building upon the results of the feasibility study. The main goal of this AU/ADCNR program is to establish a viable population of the eastern indigo snake (*Drymarchon couperi*) on Conecuh National Forest within a 10 year time frame. This goal fits nicely within the framework of the Project Orianne and results from the AU/ADCNR endeavor will integrate with aspects of the Project Orianne such as captive propagation and research needs. Project Orianne is providing matching funds on this SWG project. Project

Orianne (The Indigo Snake Conservation Initiative), a private endeavor, is poised to accomplish wide-ranging eastern indigo snake conservation across the southeastern United States through land acquisition and management, education, captive propagation, and research.

The goal of this project is to develop a successful release technique supported through scientific methodology. Project is in collaboration with Dr. Craig Guyer, Dept of Biological Sciences, and Project Orianne, the Indigo Snake Initiative. Cooperators include USFWS and USFS.

Sharp-Bingham Mountain Preserve Inventory

Biological inventory of The Nature Conservancy's Sharp-Bingham Mountain Preserve in Jackson County has been completed. The preserve encompasses approximately 2000 acres in western Jackson County near the Madison County line and lies on both Sharp and Bingham mountains. Cradled between the mountains is large sink area encompassing Calloway, Cox, and Keel Sinks. Approximately 60 caves are known from the preserve. During the course of the inventory cave localities were refined. By the end of the project approximately 100 taxa had been documented from the caves.

Jim Godwin with a crayfish from a cave in Jackson County, Alabama.

Small-flowered Meadowbeauty Status Survey

Conducted on behalf of the U.S. Fish and Wildlife Service, a status survey on the small-flowered meadowbeauty (*Rhexia parviflora*), which entailed a qualitative rangewide assessment of the species in Alabama, Florida, and Georgia, has been completed. The project resulted in 21 new occurrences, more than doubling the previous number of occurrences known for the species. Rhexia parviflora is a fire-maintained species, which has now become globally imperiled due to a combination of fire exclusion, hydrologic alterations, and other modifications of its habitat.

small-flowered meadowbeauty (*Rhexia parviflora*)

Significant Botanical Discoveries

- Eared False-foxglove (*Agalinis auriculata*) was observed in a Black Belt prairie while conducting inventories in Pickens County during September 2007. This critically imperiled plant was last reported in the state by O.L. Justice and M.D. Whitehead from Montgomery County in October 1940.
- Munson Grape (*Vitis rotundifolia* var. *munsoniana*) was rediscovered at a site in Escambia County from which it was originally documented by Robert Kral in July 1969. Since Kral's discovery the species was not again reported from the state until July 2007. This variety of the more common

Agalinis auriculata

Vitis rotundifolia
(Photo by Jeff McMillian @ USDA-NRCS PLANTS Database)

muscadine grape assumes its greatest abundance further east, with Alabama serving as the western-most limits of the species.

- Piedmont Barren Strawberry (*Waldsteinia lobata*), a globally imperiled species, was found while conducting surveys for Mead-Westvaco in Lee County in April 2007. The discovery represents a new county record, and the second known occurrence for this spring wildflower in Alabama. Waldsteinia lobata is primarily restricted to the Piedmont of Alabama, Georgia, and South Carolina where it inhabits rocky, acidic forests along streams.

Piedmont barren strawberry (Waldsteinia lobata)

- Soft-haired Thermopsis (*Thermopsis mollis*) was discovered at one location in Jackson County, possibly representing a state record for Alabama. This spring wildflower is an inhabitant of dry forests, occurring in scattered locations throughout the southern Appalachians. The newly discovered occurrence in Alabama may constitute the southwestern-most record for the species, situated approximately 25 miles south of the nearest known sites in Tennessee.

soft-haired thermopsis (*Thermopsis mollis*)

Applied Conservation

Red-cockaded Woodpecker Safe Harbor Agreement

The red-cockaded woodpecker (Picoides borealis) is endemic to the open, mature and old growth pine ecosystems of the southeastern United States. Due to loss of suitable habitat the red-cockaded woodpecker (RCW) has experienced a precipitous decline, which prompted the species' listing as endangered in 1970, and entitles it to federal protection under the Endangered Species Act (ESA) of 1973. 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 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 prop-

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

erty in the Safe Harbor program. Copies of the brochure describing the Safe Harbor Agreement have continued to be distributed to interested individuals, as well as ADCNR and USFWS. Several organizations representing forest landowners have been contacted and offers made to make oral presentations to their members, submit articles for publication in their magazines, or exhibit at their meetings or conferences. Either a poster exhibit or a PowerPoint presentation has been presented at numerous meetings or conferences this past year. Numerous property owners have been contacted and given information regarding the program (brochures, e-mail messages, and verbal communications). Thus far, five properties have been enrolled, two others are pending, and several others have expressed interest in the program. Existing populations at one enrolled site were enhanced by the installation of artificial cavity inserts and translocation of seven juvenile birds from Fort Benning in Georgia.

Information Systems & Technology

Biodiversity Database

ALNHP maintains a comprehensive database on the location and conservation status of species and ecological communities in Alabama. In March 2008, ALNHP converted the database platform from the Biologcial and Conservation Database (BCD) to Biotics, the newest generation of NaturServe's biodiversity data management software. Biotics is a highly integrated information management system built on a sophisticated data model implemented in an Oracle database that incorporates custom applications for spatial and tabular data management. The database conversion has been a program goal for several years, and will allow us to improve the spatial representation of many occurrences in our database. Although building and improving the database has always been a primary goal of the program, securing funding to support increasing both the quanity and quality of this important program area remains a challenge. ALNHP is currently tracking 1,470 rare plants and animals (Fig. 1). There are 9,161 individual occurrences of these species and natural communities documented in BCD, with the majority of the Element Occurrence Records (EOR) being for vascular plants or mussels (Fig. 2).

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. Updates to the Alabama Inventory List were completed October 2008, with the list published and distributed to cooperators and other interested parties and posted to the ALNHP website. One change made to the tracking list this year was the addition of the counties in which each species listed hads been documented. We also redesigned our web site, with one change being the addition of a search capability for species on the tracking list. The list can be searched by species or county to generate a species county list.

Data Requests

Over the past two years, ALNHP has responded to 16 paid data requests; 52 requests from academia, conservation non-profits, government agencies, or cooperating partners; 16 requests from Na-

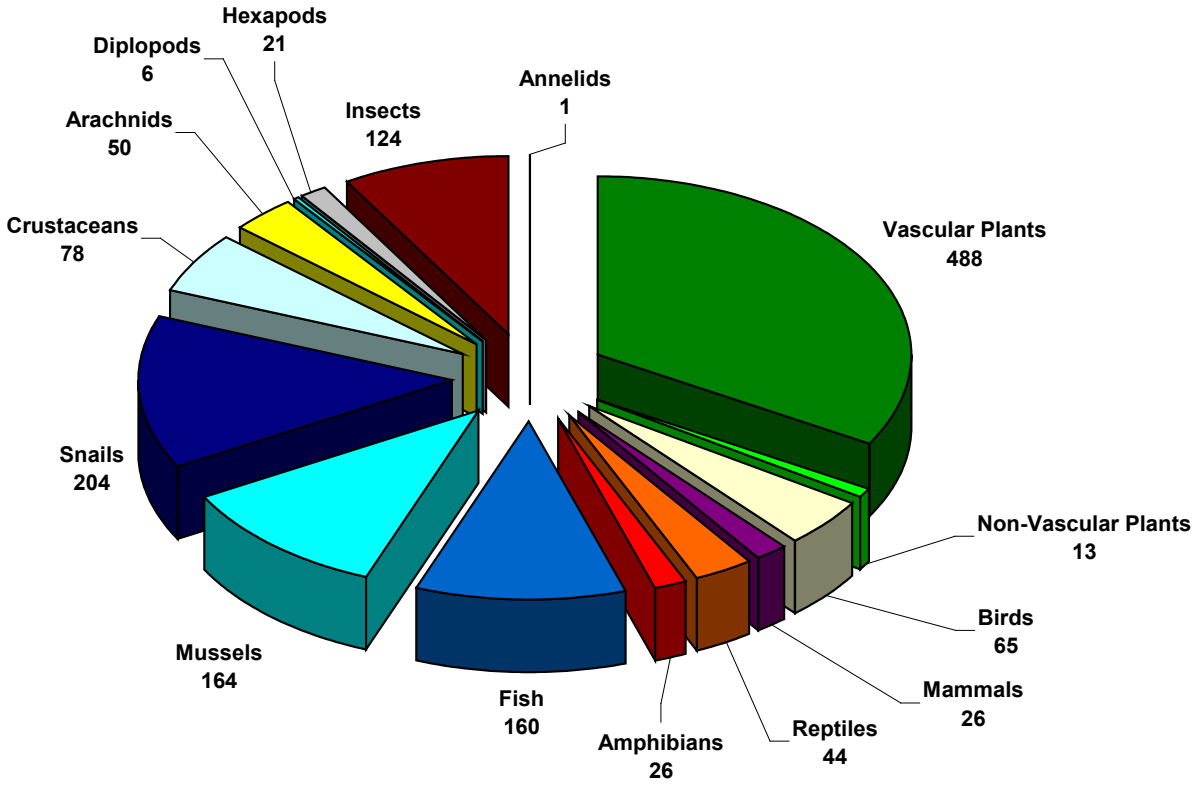

Figure 1. Number of rare plant and animal species tracked by ALNHP (total 1,470).

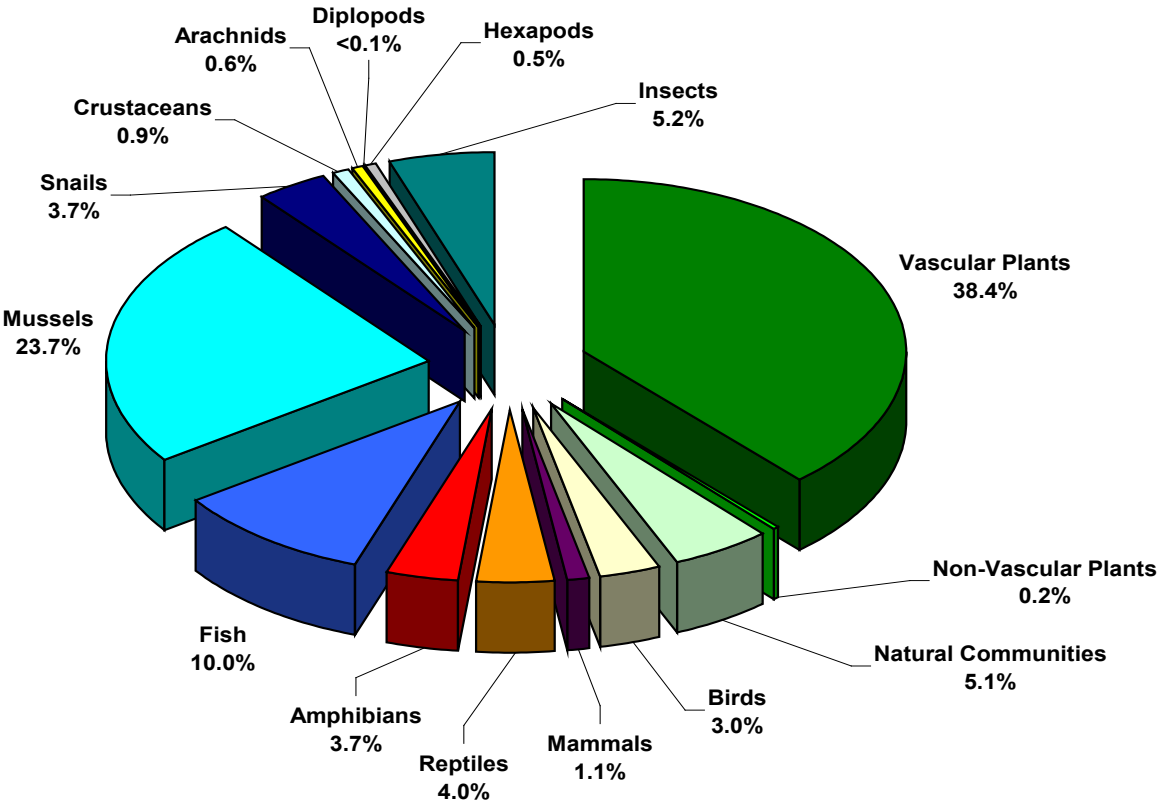

Figure 2. Percentage of 9,161 Element Occurrence Records in Biotics by major taxonomic group.

tureServe or other Heritage Network members; and 27 requests for an environmental review. The number of requests was similar to past years.

Geographic Information Systems

ALNHP has continued working to build the program's GIS capacity by acquiring software and data layers. The largest proportion of GIS work conducted was map production to support work conducted for our partners and clients. Almost all inventory work included the production of maps depicting survey results to be included in the final report, and several of the data requests we received included map production. GIS analysis also was used on several projects to prioritize areas prior to field surveys.

Publications

Peer-Reviewed and Published Articles:

Alabama Natural Heritage Program. 2007. Alabama inventory list: the rare, threatened, & endangered plants and animals of Alabama. Privately printed by the Alabama Natural Heritage Program, Montgomery, Alabama. 55 pages.

Alabama Natural Heritage Program. 2008. Alabama inventory list: the rare, threatened, & endangered plants and animals of Alabama. Privately printed by the Alabama Natural Heritage Program, Montgomery, Alabama. 88 pages.

Bailey, Mark, Bob Hastings, Eric Spadgenske, and John Stivers. 2007. Alabama's Red-cockaded Woodpecker Safe Harbor Agreement: Sehoy and Enon Plantations lead the way. Alabama Wildlife 71(2):25-27 (Summer 2007)

Hastings, Robert W. 2006. Is there a jewel in your TREASURE forest? Alabama's Treasured Forests, 25(3): 20-21 (Fall 2006).

Unpublished Project Reports:

Barbour, Michael S. and Alfred Schotz. 2007. Ecological assessment, terrestrial vertebrate surveys, and habitat restoration recommendations for Black Belt prairies in Alabama: Annual performance report. Unpublished report submitted to the Alabama Department of Conservation and Natural Resources, Division of Wildlife and Freshwater Fisheries, Montgomery, Alabama. 5 pages.

Barbour, Michael S. and Alfred Schotz. 2008. Ecological assessment, terrestrial vertebrate surveys, and habitat restoration recommendations for Black Belt prairies in Alabama: Annual performance report. Unpublished report submitted to the Alabama Department of Conservation and Natural Resources, Division of Wildlife and Freshwater Fisheries, Montgomery, Alabama. 5 pages.

Barbour, Michael, Jim Godwin, Bob Hastings, and Al Schotz. 2007. Zoological and natural community surveys on the Magnolia Branch Wildlife Reserve. Alabama Natural Heritage Program, Auburn University, Alabama. Unpublished report submitted to the Poarch Band of Creek Indians, Atmore, Alabama. 57 pages.

Godwin, James C. 2008. Biological inventory of the cave and karst systems of The Nature Conservancy's Sharp-Bingham Mountain Preserve. Alabama Natural Heritage Program, Auburn University, Alabama. Unpublished report submitted to the Nature Conservancy, Birmingham, Alabama. 40 pages.

Godwin, James. 2008. Red Hills Salamander habitat delineation, breeding bird surveys, and habitat restoration recommendations on commercial timberlands. Unpublished report submitted to the Alabama Department of Conservation and Natural Resources, Division of Wildlife and Freshwater Fisheries, Montgomery, Alabama. 286 pages.

Godwin, James, Valerie Johnson, Craig Guyer, and Marie Rush. 2008. Captive propagation of the threatened eastern indigo snake for reintroduction into Alabama. Unpublished report submitted to the Alabama Department of Conservation and Natural Resources, Division of Wildlife and Freshwater Fisheries, Montgomery, Alabama. 15 pages.

Hastings, Robert W. 2007. 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. 6 pages.

Hastings, Robert W. 2008. 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. 9 pages.

Johnson, A.F., B. Herring, A. Schotz, and Jenkins, A. 2006. Status survey for Panhandle Lily, Lilium iridollae in 2006. Florida Natural Areas Inventory, Tallahassee, Florida.

Schotz, Alfred. 2006. Eriogonum longifolium var. harperi (Goodman) Reveal, Harper's Umbrella-Plant, demographic monitoring year 4 – 2006. Alabama Natural Heritage Program, Montgomery, Alabama. Unpublished report for the Tennessee Department of Environment and Conservation. 4 pages.

Schotz, Alfred. 2007. Cahaba River National Wildlife Refuge natural community and rare plant survey. Unpublished report submitted to the United States Fish and Wildlife Service, Fort McClellan, Alabama. 33 pages + Appendices (54 pages).

Schotz, Alfred. 2007. Status report of Flyr's Brickell-bush, Brickellia cordifolia, in Alabama. Unpublished report submitted to the United States Fish and Wildlife Service, Jackson, Mississippi. 6 pages + Appendices (55 pages).

Schotz, Alfred R. 2007. Supplemental surveys for Clematis morefieldii, Morefield's Leatherflower, in Alabama. Unpublished report submitted to the United States Fish and Wildlife Service, Jackson, Mississippi. 5 pages + Appendices (20 pages).

Schotz, Alfred R. 2007. Supplemental surveys for Clematis morefieldii, Morefield's Leatherflower, in Alabama. Unpublished report submitted to the United States Fish and Wildlife Service, Jackson, Mississippi. 5 pages + Appendices (20 pages).

Schotz, Alfred R. 2008. Rangewide status assessment of the small-flowered meadowbeauty (Rhexia parviflora). Alabama Natural Heritage Program, Auburn University, Alabama. Unpublished report for the United States Fish and Wildlife Service. 7 pp. + 4 Appendices

Schotz, Alfred R. and Jim Godwin. 2007. Inventories for G1- and G2-ranked vascular plant and terrestrial animal species on MeadWestvaco landholdings in southeast Alabama and southwest Georgia. Unpublished report submitted to The Nature Conservancy, Fort Benning, Georgia. 85 pages.

Schotz, Alfred, Heather Summer, and Rickie White, Jr. 2008. Vascular plant inventory and ecological community classification for the Little River Canyon National Preserve. NatureServe, Durham, North Carolina.

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