

Chapter IV. ACTION PLAN

The Action Items identified here are drawn from recommendations made in the preceding section of this report. Action Items from the previous report that are still appropriate are included as ongoing. These Action Items encompass changes to all program areas deemed necessary to better implement the Forest Plan or changes to the Forest Plan deemed necessary to meet current policy or public expectations.

Action Items are divided into three parts: 1) Those actions that *do not* require change to the Forest Plan, 2) those items that *do* require change to the Forest Plan, and 3) those Forest Plan amendments planned in the near future.

A. Actions Not Requiring Forest Plan Amendment or Revision

1. **Action:** Treat fire dependent ecosystems with low intensity, short return interval fire which reflects historical fire occurrence. This activity will continue to be conducted under Regional and Forest prescribed fire parameters.

Responsibility: Forest Fire Staff

Completion Date: The Forest will continue to treat as many acres as possible with prescribed fire.

2. **Action:** Continue to support research examining factors affecting turkey and quail populations on National Forests in Mississippi. Also continue to work with Mississippi Department of Wildlife, Fisheries, and Parks to identify and implement habitat improvement projects for game species, especially turkey and quail. Assess additional methods for supplementing monitoring on quail population trends on national forest land. Reexamine current habitat management for quail and turkey and modify as indicated.

Responsibility: Forest Wildlife Staff

Completion Date: Ongoing

3. **Action:** Develop a habitat analysis program to track changes in gopher tortoise habitat based on soil type and vegetative needs. Continue to cooperate with U. S. Fish and Wildlife Service in refining the resurvey protocols for gopher tortoise. Implement the resurvey of gopher tortoise in 2007 to continue monitoring

gopher tortoise populations. (Last survey completed in 2002.)

Responsibility: Forest Wildlife Staff and Chickasawhay and De Soto District Rangers.

Completion Date: Fiscal year 2007

4. Develop habitat capability models for key species and species groups for Forest Plan revision effort.

Responsibility: Forest Wildlife Staff

Completion Date: Winter 2004

5. Continue to explore options (Memorandum of Understanding or other agreement) for working more closely with the Mississippi Heritage Program to improve sharing of data and expertise related to sensitive species.

Responsibility: Forest Wildlife Staff

Completion Date: Fiscal year 2005

6. **Action:** Continue current management and monitoring of lake and stream fish populations. Develop efficient methods for monitoring stream health over time.

Responsibility: Forest Wildlife Staff

Completion Date: Fiscal year 2005

7. **Action:** Using results of stream monitoring, refine thresholds and coefficients used in the cumulative effects model for predicting expected sediment load resulting from project proposals.

Responsibility: Forest Watershed Staff

Completion Date: Ongoing

8. **Action:** Implement a collaborative and aggressive, cross-disciplinary team approach to conduct effective watershed analyses. Develop specific, objective-driven, monitoring plans to guide future monitoring activities. Utilize partnerships to expand monitoring network and include sites on private lands. Examine desirability of adding additional parameters, such as total suspended solids, hardness and metal contents, to chemical analyses

Responsibility: Forest Hydrology Staff

Completion Date: Fiscal year 2005

9. Continue to survey visitors using the guidance of the National Visitor Use Monitoring (NVUM) protocols to ensure we have valid data about our Recreation visitors and their activities. Monitor trends in recreation use over time utilizing the National Visitor Use Monitoring Program.

Responsibility: Forest Recreation Staff

Completion Date: Not Applicable. NVUM is a recreation survey monitoring tool designed to continue in to the future to evaluate changes in visitor use. Continue to survey visitors using the guidance of NVUM protocols to ensure collection of valid data about recreation visitors and their activities. Monitor trends over time.

10. Finalize and implement project-level planning that uses Recreation Opportunity Spectrum (ROS) and Scenery Management System (SMS) criteria to meet or exceed resource management goals. Accomplish this by scheduling regional training for a forest-level cadre that will train district personnel. The goal will be to have resource personnel trained in using both ROS and SMS and to monitor the implementation of resource management practices.

Responsibility: Forest Recreation Staff

Completion Date: Fiscal year 2005

11. Develop methods for monitoring and tracking natural regeneration success.

Responsibility: Forest Timber Staff

Completion Date: Fiscal year 2005

B. Actions Requiring Amendment or Revision of the Forest Plan

1. Action--Address numerous needs for change (see list below) by beginning formal revision of the Forest Plan. Develop a detailed outline of the process to be followed and an Action Plan to guide early stages. First steps will include developing and beginning implementation of a public involvement plan, and publishing a Notice of Intent to Revise in the Federal Register. Include in the Notice of Intent a description of the most critical

issues to be addressed during revision as a starting point for public dialogue.

Responsibility--Planning Staff provides lead with all employees involved.

Completion Date—A detailed outline of the revision process has been completed and approved by the Regional Forester. A public involvement plan has also been completed along with a Notice of Intent to Revise which was published in the Federal Register in September 2003. Current schedule for completion of the Forest Plan is September 2006.

Items To Address During Forest Plan Revision

The following items to address during Plan revision have been identified from a variety of sources, including this and previous monitoring and evaluation reports. They are listed here as a collection point for reference during the revision process.

- Adjust regeneration projections to incorporate more fully all constraints and coordination needed to manage other resources. Also, during revision, incorporate current constraints and yield information in to projections of sale volume. Consider Pine Hardwood management guides for all districts.
- Reexamine the role of natural regeneration in light of new policy and current issues.
- An evaluation of stocking standards for the longleaf component of yellow pine plantations is needed. Determine appropriate longleaf stocking standards in mixed conditions for inclusion in the Forest Plan revision. Evaluate stocking standards for all plantings especially for specific habitat needs where the current Forest Plan standards are not necessary or desirable.
- Reexamine the issue of forest type conversion and the role of mixed pine/hardwood and mixed pine management. If still desirable, develop monitoring methods that distinguish among reasons for forest type changes.
- Reexamine the effects of forest health factors on the ability to provide goods and services and to achieve desired future conditions.
- Reexamine and incorporate integrated pest management principles into standards and guidelines.
- Incorporate changes in national policy and direction including the move to Ecosystem Management, and

the Natural Resource Agenda, which emphasizes watershed health and restoration, sustainable forest management, forest road management, and recreation.

- Consider economic effects on stability of local communities.
- Address impacts from off highway vehicles (OHVs).
- Revise estimates of timber yields and harvest potential.
- Indicate when converting one forest type to another through timber management actions is appropriate.
- Define the balance between natural regeneration (seeding or sprouting) and planting to establish new forest stands.
- Account for, and develop guidelines to minimize, forest losses to pine beetles and weather.
- Revise monitoring and evaluation requirements (see 1997 Monitoring and Evaluation Report).
- Consider recommended changes to standards and guidelines as identified in the 10-year Review of the Land and Resource Management Plan.
- Provide better descriptions of desired future conditions for various areas on national forests.
- Reflect dramatic declines in use of range.
- Address effects of increased use of growing season fire.
- Incorporate increased emphasis on managing for red-cockaded woodpeckers and fire-dependent open-pine ecosystems, including finalizing boundaries for Habitat Management Areas.
- Address headcutting of national forests streams as a result of downstream channelization.
- Incorporate guidelines for controlling noxious weeds such as kudzu and Cogon grass.

- Implement the regional strategy for old growth management during Forest Plan revision.
- Provide for increasing numbers of threatened, endangered, and sensitive species, such as Louisiana quillwort, gopher tortoise, and gopher frog.
- Provide for declining neotropical migrant birds.
- Reexamine standards and guidelines for fireline construction.
- Reexamine management indicator species and their role, incorporating a “coarse/fine filter” approach to maintaining biological diversity. During Plan revision, monitoring of habitat trends (as a tool for assessing species viability) should be strengthened. Include more detailed direction on the abundance of each habitat desired for landscapes across each of the national forests. Reexamine definitions of habitat types to be monitored and the appropriateness of species selected to represent each. Combine with more focused (or “fine filter”) monitoring for those species or groups most at risk and species of direct interest, in an overall strategy for ensuring viable populations of all species.
- Effect of growing populations and urbanization, particularly along the coast and in north Mississippi, on all programs. During Forest Plan revision reexamine recreation demands, particularly in expanding population areas such as the Gulf Coast.
- Reexamine opportunities for additional Wilderness in the Forest Plan revision process.
- Consider effects to economic stability of communities and businesses with ties to national forest programs.

C. Amendments to be Completed

1. Amendment Description: Amendment 16, an amendment to clarify survey and inventory needs for threatened, endangered, and sensitive species during preparation of Biological Evaluations for project planning has been completed. Amendment 16 was issued in September 2002. No current need for amending the Forest Plan is identified.

APPENDIX A

REPORT PREPARERS

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APPENDIX B

FOREST PLAN AMENDMENTS

A total of 16 amendments have been made to the Land and Resource Management Plan (or Forest Plan) since its approval in September 1985. The amendments are listed in chronological order and briefly described here.

Amendment No. 1 was issued in August 1986. It corrected some omissions in the original plan. Also, as a result of dialogue with the Mississippi Chapter of the Sierra Club and others, it added a standard that required areas to be bedded for site preparation be examined by a botanist, and identified a 300-acre study area (Sandy Creek) on the Homochitto National Forest. This amendment additionally revised the resource summary for minerals to recognize the low probability of lignite coal mining on the Forest. Finally, changes were made to the LMPs Environmental Impact Statement (EIS) to add additional responses to comments on the use of pesticides and bedding.

Amendment No. 2 was issued in April 1987. This amendment incorporated the findings of the Final EIS for the Suppression of the Southern Pine Beetle (SPB). It included control methods and procedures for SPB in wilderness, in or near red-cockaded woodpecker cavity clusters, and in the general forest area.

Amendment No. 3 was issued in September 1987. It made minor changes in the management of perennial and intermittent stream side zones. It permitted the use of low-intensity fire within these zones, thereby reducing the need for fire-control lines adjacent to them during prescribed burning operations. It also clarified that lakes are to be protected by filter strips as are perennial streams. This amendment additionally allowed for oil and gas developments within streamside zones, if they could not be located elsewhere, when other resource values were properly protected.

Amendment No. 4 was issued in June 1988. It placed restrictions on the use of off-road vehicles on the Delta National Forest. General forest area on the Delta National Forest is closed to off-road vehicles unless posted as open.

Amendment No. 5 was issued in September 1988. It refined decision criteria for managing pine-hardwood forest types on the Homochitto Management Area. The Forest Plan's original language simply called for no net increase or decrease in the acreage of pine-hardwood forest. The amendment continued that expectation, but specified soils

information as the determining factor for management decisions.

Amendment No. 5A was issued in August 1990. It added Appendix P to the Forest Plan. This appendix outlines the 20-step implementation process that guides individual projects from their initial identification through final execution and monitoring.

Amendment No. 6 was issued in February 1989. It incorporated management requirements contained in the Final EIS on Vegetation Management in the Coastal Plain/Piedmont. The amendment primarily incorporated Exhibit A, "Management Requirements and Mitigation Measures," from the Regional Forester's 1989 Record of Decision. Most changes to the Forest Plan were in Chapter 4 and Appendix M and ranged from additional requirements for site-specific analysis to a revised procedure for determining the minimum width of stream side filter strips.

Amendment No. 7 was issued in June 1989. It outlined a 3-phase process for developing new regional direction for the management of the red-cockaded woodpecker and continued the immediate actions taken by a policy letter issued on March 27, 1989. That policy and this amendment were parts of Phase 1: immediate and short-term actions to avoid adverse effects on red-cockaded woodpecker populations and preserve future management options.

Amendment No. 8 was issued in May 1990. It implemented Phase 2 in the development of a long-term RCW management strategy and was marked by the issuance of "Interim Standards and Guidelines for the Protection and Management of RCW Habitat within 3/4 Miles of Colony Sites" by the Southern Region. Similar to Phase 1 policy, the Interim Standards and Guidelines were aimed at preserving future options until a new, long-range management direction was developed and analyzed (Phase 3). It emphasized habitat maintenance and improvement within a 3/4-mile zone around woodpecker cavity clusters.

Amendment No. 9 was issued in August 1991. It was a project-level decision that required a Forest Plan amendment to designate an uneven-aged demonstration project on the Strong River Ranger District. This amendment was necessary because the Forest Plan at that time allowed only even-aged forest management.

Amendment No. 10 was issued in July 1993. It recommended designation of two Research Natural Areas (RNA's): the Nutmeg Hickory RNA on the Bienville

National Forest and the Granny Creek Bay RNA on the De Soto National Forest (299 and 120 acres, respectively). Both areas were allocated to Analysis Area Not Suitable 10. Beyond this, the amendment corrected computational and topographic errors discovered while adjusting analysis area acreage totals.

Amendment No. 11 was issued in April 1994. It incorporated recommendations developed through the "Limits of Acceptable Change" (LAC) process as management direction and guidance for the Black Creek and Leaf Wildernesses, as well as the Black Creek Scenic River Corridor (including sections within the original study area that were not selected for designation). Through the allocation of "Opportunity Classes," the LAC process identified desired future conditions, management goals and objectives, management practices, and standards and guidelines for these areas and their associated developments.

Amendment No. 12 was issued in August of 1994. It incorporated the Record of Decision for the military training use of national forest lands at Camp Shelby. This decision continued the permitted use of approximately 116,000 acres of national forest land, but increased the restrictions on military use within the Leaf River Wildlife Management Area (LRWMA). Although these restrictions excluded tracked-vehicle maneuvers on the LRWMA, additional acres were provided elsewhere. Amendment 12 increased the allocation in the Forest Plan's Analysis Area Not Suitable 2 by 4,370 acres.

Amendment No. 13 was issued in February 1995. It authorizes use of an uneven-aged management for demonstration projects throughout the National Forests in Mississippi. Amendment 13 also incorporated the Chief's policy memos dated June 4 and June 25, 1992, regarding ecosystem management, as Forest Plan direction.

Amendment No. 14 was issued in June 1995. It represents part of the final step in the three-phase red-cockaded woodpecker management strategy. It was included in the Record of Decision of the Final EIS for the Management of the Red-cockaded Woodpecker and its Habitat on National Forests in the Southern Region (RCW/EIS), which provides regional guidance on management of this endangered species. The ROD requires affected Forests to incorporate the new direction into their Forest Plans, through amendment or revision. Amendment 14 was designed to

bridge the gap until the Forest Plan revision or further amendment can be accomplished. Toward that end, it designates tentative RCW Habitat Management Areas (HMAs) and tentative population objectives. It also continues the interim standards, adopted by Amendment 8, for areas within 3/4-mile of active and inactive RCW clusters. Finally, for areas within HMAs, but outside the 3/4-mile circles, this amendment leaves current Forest Plan standards and guidelines in effect with the exception that silvicultural methods and practices are limited. Available options include thinning, two-aged shelterwood, and uneven-aged management by either single-tree or group-selection methods. Clearcutting is allowed, but only to restore Longleaf or other desirable native pines to appropriate sites occupied by species less suitable for RCW. Currently, over 367,000 acres are designated within tentative HMAs on the Bienville, De Soto, Chickasawhay, and Homochitto Ranger Districts. The accompanying population goal is 1,595 active clusters.

Amendment No. 15 was issued in July 1998. It relates to authorized military training activities on the De Soto National Forest. Amendment 15 allocates additional acreage (600 acres) to the Not Suitable 2 Analysis Area and adopts management direction and conditions of approval contained in the Record of Decision for Final Supplemental EIS Supplement No. 1 to the FEIS Military Training Use of National Forests Lands Camp Shelby, Mississippi, Final Site Selection and Authorization for Implementation of Proposed G. V. (Sonny) Montgomery Range, Camp Shelby Training Site.

Amendment No. 16 was issued in September 2002. It provides direction for the preparation of site-specific Biological Evaluations (BEs) including inventory requirements for Proposed, Endangered, Threatened, and Sensitive (PETS) species for the National Forests in Mississippi to make the process of conducting BEs more efficient and consistent throughout the Southern Region of the Forest Service. This amendment changes portions of the Mississippi National Forest Land and Resource Management Plan, Amendment # 6 which incorporated management direction from the *Final EIS, Vegetation Management in the Coastal Plain/Piedmont* in 1989. Determination of when project-level inventory information should be gathered will be made based on the direction now contained in the Regional supplement to FSM 2672 (February 13, 2002.)

APPENDIX C

Forest Plan Revision Updates

The existing Forest Plan for Mississippi was approved on September 16, 1985. On December 14, 1999, a Notice of Intent to revise the Forest Plan was published in the Federal Register (FR 69686, December 14, 1999). However, Forest Plan revision efforts were delayed due to changes in national planning priorities and reduced funding. Subsequently, a revised Notice of Intent was published in the Federal Register (FR 55576, September 26, 2003). The (revised) Notice of Intent provided public notice that the revision for the National Forests in Mississippi was again underway, updated the December 1999 projected schedule for Forest Plan revision, and afforded an opportunity for additional public comments on the scope of the analysis to be included in the draft Environmental Impact Statement (EIS).

The Forest Service utilizes a two-stage decision making process. The decisions embodied in the Forest Plan represent the first stage and focus on management area: 1) vision (desired conditions), 2) strategy, and 3) design criteria (standards). The vision for a national forest or grassland is developed through a collaborative process. The vision is demonstrated through a series of desired conditions. The description of these desired conditions forms the primary guiding decision of the plan. The desired conditions describe the ecological, economic and social attributes that characterize or exemplify the outcomes of land management.

The plan also contains a number of decisions that outline the strategy the forest will use to achieve these conditions including the following:

- Objectives that are statements of measurable, time-specific outcomes pursued through the activities of forest management consistent with achieving the desired conditions.
- Suitable and unsuitable uses appropriate to specific land areas of the national forest or grassland.
- Special designations (such as Wilderness or Research Natural Areas) and other management areas may be designated to provide for specific management direction.
- Design criteria or standards that provide sideboards or limitations to management.
- Monitoring that identifies what questions need more information and what performance measures will be used to evaluate these questions. Evaluation of progress in meeting the desired future conditions and objectives of the plan is the core of the monitoring strategy.

The plan does not include every decision or analysis that affects forest management. The Forest Service directives system provides a substantial component of the “how to” direction of forest management. Assessments at both broad and watershed scales provide context for both Forest Plan and project decisions. Other planning efforts (Fire plans, roads analysis) build on the direction contained in Forest Plans to provide more direction for specific agency operations. Project planning is the final process for determining what is done on the ground consistent with the decisions of the Forest Plan.

The purpose of a Forest Plan is to set a context for project development. The authorization of site-specific activities within a plan area occurs through project decision-making, the second stage of forest planning. Project decisions must comply with National Environmental Policy Act (NEPA) procedures and must include determination that the project is consistent with the Forest Plan decisions. Projects may be proposed to respond to demands by the public, or as part of a Forest Service program. A project might be needed because of a discrepancy between current conditions and desired conditions. When a project is proposed, it is first checked against the suitable use and use strategy descriptions. If the project is an allowable use, then appropriate and relevant design criteria are incorporated. The proposed action is then analyzed using appropriate NEPA procedures. If the project is not consistent with plan direction, the project may be redesigned or a plan amendment may be considered. A project is designed and implemented with appropriate monitoring measures. After the project is completed, it should be evaluated against desired conditions and the anticipated objectives described in the plan.

The plan revision process will focus on three primary elements:

- 1) Vision
 - a. A description of the Forest including its distinctive roles and contribution to the area.
 - b. Identification of desired conditions (both Forest-wide and for specific localities) and related monitoring measures.
- 2) Strategy
 - a. Description of lands suitable for multiple uses, and strategies for classifying those uses.
 - b. Special area designations.

- c. Prospectus that indicates the future course or direction of change in programs.
 - d. Monitoring actions.
- 3) Design Criteria
- a. Standards governing the implementation of projects and activities contemplated in the plan strategy.
 - b. References to other sources of direction and guidance.

A 3- year revision schedule has been established. Under our current timeline a draft revised plan will be available for public review in November 2005 with a final plan published

in December 2006. Publication of the draft plan is a distinctively measurable waypoint in the revision process, however it is not intended to be the first opportunity for public involvement. The public is invited and encouraged to begin participation now in development of the draft revised plan. An electronic inbox has been established to receive public input on related plan revision topics at Mississippi_Plan@fs.fed.us. Also, plan related information will be posted on the following website: <http://www.southernregion.fs.fed.us/mississippi/> . as it becomes available throughout the plan revision process.

APPENDIX D

2000-2003 MONITORING AND EVALUATION REPORT REFERENCES

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APPENDIX E

RESEARCH FINDINGS AND NEEDS

Current Research

Because the ecosystems entrusted to our care are extraordinarily complex, the best in scientific information is critical to developing successful management strategies. Because of the value of this information to us, we strongly encourage use of national forests as sites for research. We collaborate frequently with researchers. In some cases we are able to pool resources and funds. Following are brief descriptions of some of the research occurring on National Forests in Mississippi, along with summaries of results where available.

Feasibility of Black Bear Reintroduction: For the past several years, researchers at Mississippi State University have been examining the feasibility of reintroducing black bears to areas in Mississippi. Elements of their studies have included summarizing historical and current distribution of bears in the state, development of population monitoring techniques, tracking movements and habitat use where bears currently exist, and surveying public attitudes about bear reintroduction. Current research is focused on determining habitat suitability of potential reintroduction sites, which include National Forests. Researchers desire to conduct pilot translocations of bear in the future. It is important to stress that no decision to reintroduce black bears has been made by any entity involved. Funding has come from Mississippi Department of Wildlife, Fisheries and Parks, the Forest Service, the Department of Defense, and the Mississippi Gap Analysis Project, among others.

Louisiana Quillwort Ecology: Researchers at the University of Southern Mississippi began work in 1996 with Forest Service biologists to study the ecology of the endangered Louisiana quillwort, a primitive seedless plant (related to ferns) that grows in or near shallow blackwater streams on the De Soto National Forest. Research was focused on determining plant associates and the physical characteristics of sites where the plant occurs as well as factors affecting reproduction. Although the early project with the University of Southern Mississippi has ended, research continues on Camp Shelby Training Site as well as the DeSoto NF and involves partnerships with The Nature Conservancy and the Mississippi Military Department. Current research and monitoring activities is investigating the effects of military training and other land use activities on the Louisiana quillwort.

Loblolly Bay Ecology: The Forest Service participated with researchers from the University of Southern Mississippi in a study of the ecology of loblolly bay, a small evergreen tree found in wetlands of the De Soto National Forest. Research focused on documenting distribution, plant associations, and life history, including identification of pollinators. Results were published on this important project in a 1999 Master's Thesis from the University of Southern Mississippi: *Studies of the Life History and Habitat of Loblolly bay (Gordonia lasianthus L. (Ellis) in South Mississippi.*

Red-cockaded Woodpecker Foraging Habitat: Red-cockaded woodpecker use of habitat for foraging was the subject of a study from 1997 to 1999 on the Bienville National Forest. The study was conducted by Mississippi State University in cooperation with the Forest Service and the Mississippi Museum of Natural History. Objectives of this 3-year study were to characterize foraging habitat selected by red-cockaded woodpeckers at both the individual tree and stand levels, by season, and to relate foraging habitat characteristics to reproductive success. The research suggested that RCWs were remarkably flexible with respect to habitat selection and reproductive success. It also suggested alternative methods of habitat management activities that will be incorporated in Forest Plan revision.

Forest Management and Neotropical Birds: The Tombigbee National Forest (TNF) lies adjacent to Noxubee National Wildlife Refuge (NNWR). Scientists at Mississippi State University designed a study to examine bird communities in differing management regimes. Methods included point counts and mist netting of forest birds. A thesis at Mississippi State University was written by Chris J. Reynolds in 2001 detailing the results of this study: *Forest management practices in pine-hardwood ecosystems of north-central Mississippi: Effects on avian community dynamics and conservation.* The management regime of the NNWR was aimed primarily at endangered species and waterfowl management. The Management regime of TNF while having a responsibility for endangered species and sensitive species management was oriented more toward vegetative management. Initial observations suggested a marked difference in hardwood stands found on the two areas. The bottomland hardwood stands on NNWR generally flooded annually, whereas those on TNF flooded rarely. There were also differences in the older age classes on NNWR and an increase in tree fall creating large gaps in the forest canopy. Differences in bird communities in the mature pine forest were attributed to the active RCW management on NNWR.

Gopher Frog Ecology: The Mississippi gopher frog (*Rana sevosa*) was listed as endangered under the Endangered Species Act in December 2001. At the time of listing the species occurred in only one pond located on the southern portion of the De Soto National Forest. In 2004, visual surveys documented two additional sites, both outside of USFS lands. Further investigation will be necessary to determine the size and viability status of the populations at the new sites. Research focused on the demographics and ecology of Mississippi gopher frogs with the use of drift fences and egg mass surveys is ongoing. This research is being conducted by scientists from University of New Orleans in cooperation with the US Fish and Wildlife Service, the Forest Service, and the Mississippi Department of Wildlife, Fisheries, and Parks.

Black Pine Snake Ecology: The black pine snake (*Pituophis melanoleucus lodingi*) was listed as a Regional Forester's Sensitive Species in 2001 and was listed as a candidate species for consideration under the Endangered Species Act in 1998. Forty seven percent of all historic records and 68% of Mississippi records occur on the De Soto National Forest. The National Forests in Mississippi began a project in 2003 to better define the range and status of black pine snakes on the De Soto National Forest. The results are located in the *Summary Report for the Black Pine Snake on the De Soto National Forest*. The Forest Service is also cooperating with researchers from the University of Southern Mississippi and The Nature Conservancy to continue investigations into the ecology of black pine snakes. Research is focused on documenting distribution, life history, and habitat use through visual surveys, radio-telemetry and drift fence studies.

Growth Physiology of Red Oaks: Research conducted by the Southern Research Station examined the physiological aspects of twig and acorn growth of red oaks in bottomlands on both the Delta National Forest in Mississippi and the Kisatchie National Forest in Louisiana. Photosynthesis, respiration, flowering, and fruiting were studied using tower structures erected around selected mature oak trees. This research was implemented to assess factors affecting tree health and seed production. The fieldwork for this research has been completed and is being documented in a paper.

Growth and Survival of Planted Oaks: Research by the Southern Research Station in Stoneville, Mississippi, is examining survival and growth of planted oaks on the Delta National Forest. This research is designed to assess the importance of overstory trees, light levels, and competition control on planted oak seedlings. This research should provide information useful in maintaining desirable oak species on this National Forest. This research is ongoing.

Bottomland Hardwood Forest Health: Decline of forest health in oak stands is of increasing concern across the South. Several research projects conducted by the Southern Research Station address this issue. One establishes long-term monitoring plots to assess changes in forest health over time, including plots on the Delta National Forest. Other studies are developing methods for detecting wetwood bacteria in red oaks, and examining the role of wood-boring wasps as vectors of wood decay fungi. Still another study is examining the effects of timber management practices on the incidence of insects and diseases that affect hardwood forests. The N.F. in Mississippi is working with Forest Health and Protection unit to complete hardwood health evaluations on the Holly Springs, Tombigbee and Delta Ranger Districts. This evaluation will consider Oak decline and Red Oak Borer concerns. These results will assist in developing management favorable to long-term forest health. This research is ongoing.

Restoration of Bottomland Hardwood Ecosystems: The Southern Research Station is examining methods for restoring bottomland hardwoods on abandoned agricultural land in the Mississippi Delta. The Delta National Forest serves as a control site for comparing with conditions found on sites under restoration. Factors being studied include changes in soil properties, ecology of multiple species tree plantings, small mammal communities, and use by birds of prey. This research is ongoing.

Long-term Soil Productivity Research: The National Forest Management Act of 1976 and its implementing regulations require the Forest Service to monitor management practices to detect significant declines in soil productivity. In response to this requirement, Forest Service research and national forest staffs collaborated to initiate a national, long-term soil productivity study associated with timber harvest activities. Three installations were established on the National Forests in Mississippi in 1991. Each installation consists of nine, 1-acre plots that represent all possible combinations of three levels of compaction (none, moderate, severe) and three levels of organic matter removal (bole only, total tree, and total above-ground biomass). In January 1994, loblolly pine seedlings were planted and will be periodically monitored over the next 60 years. Information gathered will be used to develop models for use by land managers and to establish threshold values for soil quality and productivity monitoring. Results from this research effort will help the Forest Service address public concerns about the effects of timber management on long-term soil productivity. Results from 2-year and 5-year tree height and diameter at breast height (dbh) measurements indicated loss of growth for "total tree & forest floor removal" when compared to "bole only removed." Compaction has not had a significant effect on tree height and dbh. Scheduled fiscal year 2004 sampling of

10-year tree heights and dbh measurements should better ascertain trends related to long-term soil productivity. Determining what happens to growth over the next several years or decade is the purpose of this long-term soil monitoring project.

Woody Debris Decomposition: A new study was initiated in September of 1997 cooperatively between the National Forests in Texas, Louisiana, and Mississippi and the Southern Research Station. The study is called "Role Of Course Woody Debris Decomposition In Sustaining Long Term Soil Productivity Of Managed Loblolly Pine." The primary objectives of this study are to 1) quantify and model the decomposition process of loblolly pine logs and branches along a climatic gradient in the southern US; 2) determine the biotic and abiotic factors governing the decomposition process; and 3) initiate guidelines for managing woody debris in the context of sustaining enhanced productivity of managed loblolly pine. The study was installed in January 1998 on the Chickasawhay Ranger District, De Soto National Forest. Currently, we are measuring the rate of mass and nutrient loss from sawtimber and branch-size coarse woody debris. The results are not published because the data is still being collected and evaluated.

Prehistory of the Gopher Farm: Researchers at University of Southern Mississippi are working in cooperation with Forest Service archeologists to excavate prehistoric cultural remains, including lithic, ceramic, and feature deposits, on the Gopher Farm, a 200 acre area characterized by deep bare white sands located on the Chickasawhay Ranger District of the De Soto National Forest. Some of the excavation work has been completed. This project represents the first major archeological research performed in southeast Mississippi. Results are contributing to understanding of how prehistoric groups adapted to local environments. Two publications of this work have been made: 1) Scot Keith's Master of Science Thesis, *Settlement and lithic organization from the Paleoindian through Late Woodland at Sandhill Site (22Wa676), Southeast Mississippi*, and 2) *OCR Dating of Prehistoric Features at the Sandhill Site (22Wa676), Southeast Mississippi*, by the same author in *Mississippi Archeology* 3(2):77-114. This research is ongoing.

Recreational Uses: The National Visitor Use Monitoring program has been implemented. This program is designed to survey visitors' use of the national forests. These visitor surveys (NVUM) will be repeated every 4 years. This will be an ongoing project.

Research Needs

Some questions are too complex to answer with relatively simple monitoring projects. More in-depth research projects are needed. Following are topics identified by staff on the National Forests in Mississippi needing research attention.

Fire

- Examine effects of growing season burning on vegetation composition and diversity including important wildlife food plants, bird productivity (including wild turkey and neotropical migrants), and soil nutrient status. A cooperative agreement between the National Forests in Mississippi and the University of Mississippi has been completed. A three-year study is being implemented to consider this forest management topic.

Engineering

- Investigate new low cost, low impact temporary stream crossing techniques.
- Improve techniques for reducing sediment from forest roads.
- Investigate methods to prevent beavers from clogging culverts.
- Design structures to prohibit spillway loss of high value fish species.

Recreation

- Continue to investigate in more detail the expectations and desires of forest visitors on National Forests in Mississippi through the NVUM surveys and accompanying analysis.

Timber

- Verify Forest Vegetation Simulation (FVS) growth and yield model for traditional and non-traditional silvicultural systems.

Wildlife and Fish

- Continue to investigate habitat requirements and effectiveness of management techniques for the red-cockaded woodpecker.
- Continue to investigate habitat requirements and effectiveness of management techniques for the gopher tortoise.
- Continue to investigate the status and habitat requirements of the black pine snake on Forest Service lands.

- Determine the status and habitat requirements of forest bats occurring on the National Forests in Mississippi.
- Develop an Index of Biotic Integrity, or some similar measure, for assessing health of streams on the National Forests in Mississippi.
- Assess culverts at stream crossings forest-wide for passage of fish and other aquatic organisms.

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