

Appendix D

Biological Evaluation



Appendix D Biological Evaluation

The Biological Evaluation for this project is attached.

Biological Evaluation
Of
Utility Corridor Maintenance Project

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Introduction

This Biological Evaluation (BE) documents the likely impacts on proposed, endangered, threatened, and sensitive (PETS) species from management activities proposed from southern pine beetle (SPB) suppression activities and associated regeneration on the Homochitto Ranger District.

This BE is in accordance with direction given in Forest Service Manual (FSM) 2672.41 and 2673.42. As part of the NEPA decision making process, the BE provides a review of Forest Service (FS) activities in sufficient detail to determine how an action or proposed action will affect any PETS species. PETS species, taken from both state and federal lists, are species whose viability is most likely to be put at risk from management actions.

The BE has three primary objectives: 1) Ensure FS actions do not contribute to loss of viability of any native or desired non-native plant or animal species. 2) Incorporate concerns for sensitive species throughout the planning process, reducing negative impacts to species and enhancing opportunities for mitigation. 3) Ensure that activities will not cause a species to move toward federal listing. Consideration by decision makers of the information contained in this BE will ensure that no species is placed in jeopardy by management actions.

The Regional Forester's list of "sensitive" species for the National Forests in Mississippi (USDA 2001) and National Forests in Mississippi Threatened and Endangered Species List (USDA 2002) were reviewed to devise a target list of PETS species for the Homochitto Ranger District, Homochitto National Forest. Three federally listed and 16 sensitive species are confirmed, likely to occur, or have the potential to occur on the Homochitto National Forest.

Table 1. PETS taxa recorded from or likely to occur on the Homochitto Ranger District

Common Name	Scientific Name	Status*			Occurrence
		USFWS	FS	State	
Louisiana black bear	<i>Ursus americana luteolus</i>	T		S3	Potential
Bald eagle	<i>Haliaeetus leucocephalus</i>	T		S1	Potential
Red-cockaded woodpecker	<i>Picoides borealis</i>	E		S1	Confirmed
Webster's salamander	<i>Plethodon websteri</i>		S	S3	Possible
Bachman's sparrow	<i>Aimophila aestivalis</i>		S	S3	Confirmed
Pearl blackwater crayfish	<i>Procambarus penni</i>		S	S3	Confirmed
Alabama shad	<i>Alosa alabamae</i>		S	S1	Unlikely
Crystal darter	<i>Ammocrypta asprella</i>		S	S2	Unlikely
Broadstripe topminnow	<i>Fundulus euryzonus</i>		S	S2	Unlikely
Natchez stonefly	<i>Alloperla natchez</i>		S	S2	Confirmed
Chukcho stonefly	<i>Haploperla chukcho</i>		S	S2	Confirmed
Rayed Creekshell	<i>Anodontoides radiatus</i>		S	S2	Unlikely
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>		S	S3?	Confirmed
Arogos skipper	<i>Atrytone arogos arogos</i>		S	S2S3	Possible?
A moss	<i>Trachyphium heteroica</i>		S	S1?	Confirmed
Cypress-knee sedge	<i>Carex decomposita</i>		S	S3?	Confirmed
Small's woodfern	<i>Dryopteris X australis</i>		S	S1	Confirmed

Bay starvine	<i>Schisandra glabra</i>	S	S3?	Confirmed
Fetid trillium	<i>Trillium foetidissimum</i>	S	S3	Confirmed
* See Appendix 3 for explanation of codes.				

This list is based on documented occurrences, habitat presence/suitability within or near the National Forest boundaries, and the geographic range of PETS species gathered from the records of the Mississippi Natural Heritage Program and other credible sources (i.e., literature reviews, conversations with knowledgeable biologists, etc.). See Appendices 1 and 2. Table 1 depicts the 19 PETS taxa considered in this Biological Evaluation.

Potential risks resulting from management actions were assessed by referring to available occurrence records and to information on the general biology of these species obtained from survey reports, the Mississippi Natural Heritage Program and the scientific literature.

Affected Area and Proposed Actions

The purpose of the project is to allow removal and or control of woody sprouts, briars, vines and other vegetation that interferes with access for maintenance purposes and wildlife use of utility corridors. This removal and or control of unwanted vegetation within the utility corridor or right-of-way (ROW) will be done in the safest, most cost effective, and least environmentally disturbing manner.

Utility corridors travel through all counties within the Homochitto National Forest. The project plan area includes all areas within the right-of-ways of the utility corridors on the Homochitto National Forest. Because these corridors pass through a majority of the National Forest, Township, Range and Sections are not given. Counties include Adams, Amite, Copiah, Franklin, Jefferson, Lincoln, and Wilkinson. Quadrangles include: Barlow, Caseville, Union Church, McCall Creek, Eddiceton, Kirby, Roxie, Jeannette, Knoxville, Meadville, Bude, Little Springs, Busy Corner, Homochitto, Crosby, Garden City, and Bewelcome. For locations see attached map.

Right-of-way vegetation management is necessary for providing utility transmission and distribution services and safety for utility workers. Trees and other vegetation can cause disruption of electric utilities when they grow into power line rights-of-way. Overgrown utility corridors inhibit access for maintenance and repair of utilities.

The utility corridors located on the Homochitto National Forest collectively comprise roughly 340 miles of linear wildlife habitat corridors. The existing maintenance policy for these areas has promoted the growth of woody vegetation that re-grows quickly and interferes with maintenance. These sites are unchanging, in that they continually remain as dense woody thickets dominated by species such as sweetgum, and are created by current maintenance.

Right-of-way maintenance usually involves manual/mechanical cutting and/or the use of herbicides to control vegetation. The existing maintenance strategy for utility corridors on the Homochitto Ranger

District utilizes hand tools and mowing/cutting equipment as the primary means of removal or control of undesirable vegetation. While these methods may at first seem to be more favorable than the use of herbicides, they involve certain risks and disadvantages. These methods are time-consuming and costly, may cause damage to the soil, and pose inherent health and safety risks to workers involved in utility corridor maintenance operations. Due to resprouting, hand tool or mechanical control of undesirable vegetation often requires repeated and more frequent entries for control. Repeated mechanical treatments most often result in dense thickets that are low in diversity and food for wildlife.

In contrast, herbicides can be used in a controlled manner to concentrate control on undesirable vegetation (Final Environmental Impact Statement Vegetation Management In Coastal Plain/Piedmont Volume I, II, III and the Record of Decision for the Final EIS Vegetation Management In Coastal Plain/Piedmont). Herbicides used for vegetation control generally have low human and animal toxicity. The inclusion of herbicide methods also can result in desirable wildlife habitats such as an easily maintained habitat comprised of mainly native grasses and forbs.

Before work can be started, permittees of the right-of-way, must submit a Pesticide Use Proposal to the Forest Service. This proposal must contain information such as where, when and how the work will be accomplished. This is especially important in areas that are adjacent to active red-cockaded woodpecker clusters/groups.

Herbicides will be applied to briars, vines, woody sprouts, and other vegetation that inhibits access and wildlife use of these utility corridors. Application will be by hand methods of directed foliar spray, cut surface spray, or streamline basal spray utilizing backpack sprayers, or by selective mechanical methods using specialized application equipment. This herbicide maintenance option will be added to current maintenance options, which include clearing with hand tools, tractor mowing, and cutting equipment such as powerline cutters.

The use of herbicides will be selective and generally confined to areas with a heavy briar or woody component. Mechanical applications would be utilized on areas where slopes, soil types, and vegetation allow. Mechanical methods will be limited to the use of specialized selective equipment which utilizes a mowing deck with an herbicide application chamber in which only the cut stubble is treated – for general maintenance or tractor/truck-mounted low volume directed spray for side trimming. Side trimming is selective in that the operator controls rate of application, direction of spray, timing of operation, and system on/off. Hand application methods would be used in areas not accessible to equipment. Directed foliar spray would be applied to shrubs, vines, and other low/leafy vegetation during the growing season. Where taller, woodier vegetation develops, the streamline treatment would be used, primarily in the dormant season. Cut surface or stump treatments would be used when larger woody material (≥ 3 inches diameter) is present.

The proposed herbicides to be used are Garlon 4 (triclopyr ester), Garlon 3A (triclopyr amine), Arsenal (imazapyr), Accord (glyphosate) and Drenite S (fosamine ammonium). Specific herbicides or combinations of these herbicides would be applied depending upon vegetation and site conditions.

For further enhancement of wildlife habitat, selected areas, marked green on the map and not more than a total of 80 acres, will be tractor disked and revegetated in accordance with the “Erosion Control and Wildlife Planting Guides for the National Forests in Mississippi”. Mitigation efforts for food plots

would include efforts to minimize the potential for erosion and transport of sediment to streams. Mitigations considered in the design and implementation of wildlife food plots include:

- Prohibit plots in wetlands
- Prohibit plots on high clay content soils where ridge tops converge with side slopes
- Prohibit plots on slopes greater than 20%
- Avoid areas where ridge tops converge with side slopes
- Minimize plot size where possible, break larger plots with areas of undisturbed native cover, and decrease disturbed area as slope increases
- Use multiple strips of intact native cover between disturbed areas on slopes over 12% and longer than 50 feet
- Tillage practices should follow landform contours
- Consider "No-Till" planting techniques where applicable
- Planting of wildlife crops will be done in accordance with the Mississippi Erosion control and Wildlife Planting Guide.

The basis for these management activities is the National Forest Management Act and the Forest Plan. In addition, the Final Environmental Impact Statement for Vegetation Management in the Coastal Plain/Piedmont provides technical information and parameters for herbicide use. All of these documents are available to the public and can be reviewed at the District Ranger's or Forest Supervisor's Office.

Utility corridor maintenance using herbicides would result in the positive implementation of the following goals set forth in the Forest Plan. (4-1)

1. Provide for safe public use and enjoyment of forest resources.
2. Provide a visually acceptable landscape by maintaining or upgrading the existing visual condition.
3. Provide a spectrum of dispersed and developed recreational opportunities reflective of the demands of the public.
4. Manage the land in a manner that is sensitive to economic efficiency.

Mitigation Measures

Mitigations are intended to lessen the effects of actions such that they remain within established standards that will not lead to significant direct, indirect, and/or cumulative impacts. The proposed action includes a range of mitigation measures that can be categorized as:

- Standard mitigations to protect soil productivity, water quality, visuals, and other resources in accordance with standards and guides established through forest planning. These include such measures as filter strips along streams.
- Mitigations inherent to the project implementation process, contracts, and related activities. For this project, these include activities such as requiring pre-work conferences to ensure that standards are understood.
- Mitigations associated with project design and management prescriptions. These include Forest Plan or legal direction, and locally developed enhancements in excess of Forest Plan standards. Mitigations in this category may be developed in response to scoping issues.

- Site-specific mitigations such as protection of a specific sensitive plant or group of plants. For this project, sensitive plants will be protected if found in the project area.

This project incorporates all applicable legal requirements and adheres to the Forest-wide standards and guidelines established in the Forest Plan. Management requirements necessary for achieving goals and objectives are referred to as standards and guidelines. A detailed listing of the Forest Plan standards and guidelines is inappropriate here, as they are published and established guides. However, mitigations that apply to this project are described in Appendix F for those unfamiliar with the Forest Plan. These standards meet environmental protection requirements found in the State of Mississippi Best Management Practices.

Herbicide usage in this project follows all mitigating guidelines as stated in the Final Environmental Impact Statement: Vegetation Management in the Coastal Plain/Piedmont, Volumes I and II. Examples of mitigating activities include:

- No herbicide is aerially applied within 100 horizontal feet, nor ground-applied within 30 horizontal feet, of lakes, wetlands, or perennial or intermittent springs and streams.
- No herbicide is applied within 100 horizontal feet of any public or domestic water source.
- Herbicide mixing, loading, or cleaning areas in the field are not located within 200 feet of private land, open water or wells, or other sensitive areas.

Additional standards and guidelines can be found in the Final Environmental Impact Statement: Vegetation Management in the Coastal Plain/Piedmont, Vols. I & II (VMCP/P).

Inventories

The Mississippi Natural Heritage Program database was consulted for Threatened, Endangered and Sensitive species' locations within the National Forest (Mississippi Natural Heritage Program, 2003). The Mississippi Natural Heritage Program maintains the single most comprehensive database on the location, numbers, and status of rare and endangered plants, animals, and communities of Mississippi. The District PETS database and distribution maps were reviewed to disclose areas of known populations of PETS species within the forest. The federally listed red-cockaded woodpecker is surveyed over the ranger district in 10 year sequential surveys of suitable pine and pine-hardwood habitats for new occurrences. In addition, active clusters of red-cockaded woodpeckers are surveyed annually and nest checks done during the nesting season (late April to early June). Breeding bird surveys have been conducted at over 200 permanently established points in 1994, 1995, 1999, 2000 and 2001. A comparison across years of Management Indicator Species (MIS) breeding bird abundance on the Homochitto National Forest is in preparation (Mabey, S.E., 2000, *in prep.*). Although final analysis is not complete, there is no statistically significant change in abundance noted as yet for any bird Management Indicator Species. Numerous fish samples have been taken from various streams across the forest (Ebert, D.J., R.M. Weill, and P.D. Hartfield, 1985; Ebert, D.J. and P.D. Hartfield, 1981; Johnston, C.E. and J.G. McWhirter, 1996; Douglas, N.H., 1975, Warren, M.L., S. Adams, W. Haag, J.G. McWhirter, and L.G. Henderson, 2001). Monitoring of the fish population is being conducted at the present time. When examining fluctuations within the fish data, changes in numbers cannot be tied to forest management activities (Management Indicator Species Supplement: Lotic Fish Data (1980-2002) Homochitto National Forest.

The Mississippi Natural Heritage Program conducted a rare plant inventory of the Homochitto National Forest (Gordon, K.L. and J.A. Smith, 1992) as well as an overall rare/sensitive plant and animal survey of four proposed lake sites on the Homochitto NF (Gordon, K.L., *et. al.*, 1992). A study of the vascular flora of Amite County was completed by Mac Alford (1999) and reported on sensitive and rare plants collected on and near the Homochitto NF. Two additional studies have been completed that are particularly applicable: a study of the effects of red-cockaded woodpecker management on breeding native songbirds (Burger, L.W., Jr., C. Hardy, and J. Bein. , 1998). A preliminary survey to document the floral changes due to prescribed burning and hardwood midstory removal was begun in 2000 (Doffitt, C.H., 2000). Surveys of two stoneflies, once federal candidates for listing, have been conducted on the Homochitto NF (Hardy, C.L., *et. al.*, 1994, Hargis, A.E. and M.D. Meriwether, 2002 unpublished data).

Potential risks resulting from management actions were assessed by referring to available occurrence records and to information on the general biology of these species obtained from survey reports, the Mississippi Natural Heritage Program, and the scientific literature.

Determination of Effects

Cumulative Effects

Changes in land use on surrounding private land cannot be predicted with any certainty but could include re-forestation of abandoned farmland, clearing of forest for pasture or cropland, building of homes and other structures, construction and improvement to county and private roads and others. Future activities on private lands are estimated based upon current use or condition of the existing timber. Since this management project described in the EA implements events that are temporary and mitigated for, these actions should not add to the cumulative effects of private land action.

Effects on water quality are another potential cumulative effect, which could potentially impact aquatic PETS species. Water quality modeling developed specifically for the National Forest in Mississippi is generally applied to specific areas within designated watersheds. The estimated disturbance for an analysis area is typically more than 1000% under the threshold that would be expected to adversely impact or have a cumulative effect on water quality and aquatic habitats. The estimated disturbance for this analysis should be non-existent, due to mitigation measures explained previously and because herbicides will not be applied on or near water. Therefore, this project should not add to the negative cumulative effects to water quality.

Threatened and Endangered Species

Louisiana black bear

In 1992, it was estimated that only 25 to 50 black bears still remained in the state. Black bears eat a wide variety of foods, including vegetable matter such as grasses, fruits, seeds, nuts and roots. Insects, fish, carrion, and small rodents are also eaten. Blackberry thickets, hardwood forests producing acorns and other mast and containing shrubs, fallen logs, and brush-piles are typical habitat for black bears (Mississippi Department of Wildlife Fisheries and Parks, 1995a).

A pattern of repeated sightings over time suggests a single black bear may occur on and in the vicinity of the Sandy Creek Wildlife Management Area (Adams County) of the Homochitto National Forest. Louisiana black bears are not confirmed elsewhere on this National Forest. There is a confirmed population of at least 3 bears in the general area of southern Wilkinson County. Two of these bears are radio-collared and no sightings of these tagged bears have yet been observed on the Homochitto NF.

Black bears exist primarily in bottomland hardwood and floodplain forest, although use of upland hardwood, mixed pine/hardwood and coastal flatwoods and marshes has been documented. Black bears are adaptable and opportunistic, and can survive in the proximity of humans if afforded areas of retreat that ensure little chance of close contact with humans. Other Forest management practices, in general, have much less impact on black bear than the density of roads with unrestricted traffic. Black bears could appear in any large block of forest on the Homochitto NF with limited road access but the most likely areas to anticipate new population growth would be in the southwestern quadrant of the forest (Wilkinson and Adams counties).

Direct Effects – The application of herbicide and cutting of brushy vegetation should not directly affect any bears in the area. Human activity could result in the temporary displacement of any bears within the areas. However, these effects would be temporary and minimal. The “no action” alternative will have no direct effects on the black bear.

Indirect – The application of herbicide is not likely to affect habitat suitability. Mature trees that could be used for denning will not be impacted and road density will not be increased. Therefore the “proposed action” and the “no action” should have no indirect negative effects on the black bear and their habitat.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

There is no documented observation of black bears in the analysis area, however black bears are known to move large distances and there is a possibility of a bear using the analysis area. Because the proposed actions are should have little or no impact on the black bear, it is my determination that the proposed action is not likely to adversely affect the Louisiana black bear. The “No Action” Alternative would have no effect of the black bear.

Bald eagle

Bald eagles are generally limited to winter occupancy in Mississippi. The bald eagle is a large bird that generally occurs in the vicinity of lakes, rivers, and marshes and along seacoasts. Nesting usually occurs in areas with mature trees near large bodies of water. The diet of southeastern bald eagles is

primarily fish, supplemented with reptiles, waterfowl, small mammals, and carrion. (Mississippi Department of Wildlife, Fisheries and Parks, 1995c). Bald eagles winter and breed on St. Catherine's Creek National Wildlife Refuge (approx. 30 miles to the West adjacent to the Mississippi River). Although bald eagles winter and breed on St. Catherine's Creek National Wildlife Refuge, no suitable habitat is known to occur in the forest, and this area is considered generally unsuitable habitat for the bald eagle.

Direct Effects – Because the application of herbicide and continued maintenance will not remove any mature trees and will not be sprayed near water there should be no direct effects to the bald eagle or its habitat.

Indirect Effects – Suitable nesting and feeding habitat has not been documented in the project vicinity. Consequently, the proposed activity should have no indirect effects on bald eagles.

Cumulative Effects – The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

Based on the lack of suitable habitat in the Homochitto National Forest, it is my determination that the proposed action and the no action will have “no effect” on the Bald Eagle.

Red-cockaded woodpeckers

In general, because application of herbicide will not be sprayed on any red-cockaded (RCW) cavity trees or any mature trees; the proposed project should have little if no effects on the RCW. Before work can be performed, the permit holder (of the right-of-way special use permit) must submit a Pesticide Use Proposal to the USDA Forest Service. If activities specified are adjacent to an active RCW cluster/group, work will not be allowed until after nesting and fledging season.

Direct Effects – Again, there should be no negative direct effects. The herbicide will not be sprayed on RCW cavity or nesting trees or any mature tree.

Indirect Effects – Because herbicide will be directed mainly in open areas (i.e. bug spots) that have briars and vines hanging into the trails, suitable foraging habitat should not be impacted.

Cumulative Effects – These negative impacts created by the application of herbicide should be minimal or non-existent and therefore should not add to the cumulative effects of other activities in the area.

Therefore the proposed action and the no action alternative should have a “no effect” determination on the red-cockaded woodpecker.

Forest Service Sensitive Species

Webster's salamanders

Webster's salamanders are strongly associated with moist, north-facing, mixed-hardwood slopes with rock outcrops on or near the surface (Wilson 1995). These animals are normally above ground for only a few months during the year (winter) and then underground for the remainder (Tom Mann, pers. comm. 2001). Distribution across their range is very disjunct and they have not been documented on the Homochitto National Forest. A herptile survey of four potential lake impoundment sites on the Homochitto Ranger District was conducted for 29 field days between 21 April and 18 November 1992. Utilizing past field experience with this species the surveyor searched under logs and leaf litter above streams in hilly terrain and found no specimens. The surveyor concluded that while Webster's salamander occurs in southwest Mississippi in a disjunct range pattern, its occurrence on the Homochitto Ranger District might be expected (Vandeventer, T.L., 1992). On February 3, 1998, two potentially suitable sites in Compartment 43 (north eastern portion of the district that contains rock outcrops and therefore presumably more suitable habitat) were surveyed for Webster's salamanders, but none were located. There are very few areas on the district that have rock outcrops. Therefore, very little of the district contains suitable habitat for the Webster's salamander.

Direct Effects – There are no known occurrences of Webster's salamander on the Homochitto Ranger District. However, if the salamander was to occur there is a possibility that this herbicide could impact the Webster's salamander. These impacts would occur if herbicide was sprayed directly on the salamander. Due to the herbicide application and the salamander's habitat and activity patterns (usually this salamander is above ground or near the surface in February) it is highly unlikely the salamander would be impacted. However, although slight, there could be direct effects on individuals.

Indirect Effects – As stated in the FEIS Vegetation Management In the Coastal Plain/Piedmont Vol 1 pg xii 1989, under Environmental Consequences: All herbicides and additives evaluated (including Garlon 4) meet acceptable risk standards for terrestrial and aquatic wildlife when applied using typical rates and methods. Webster's salamander habitat is most likely not going to be within areas to be sprayed. Therefore, it is unlikely that the Webster's salamander's habitat would be impacted and unlikely that there will be indirect effects to the Webster's salamander.

Cumulative Effects - Herbicide application and treatment of brushy vegetation on the right-of-ways will likely not be areas that would have potential salamander habitat, unacceptable levels of negative cumulative effects should not be created.

If the Webster's salamander were to be found present, the no action alternative would have “no impact” on this species. The proposed action, “may impact individuals but is not likely to cause a trend to federal listing or loss of viability”.

Bachman's sparrow

Bachman's sparrow is a habitat specialist. Historically, it was found in mature to old growth southern pine woodland subject to frequent growing-season fires. It is a fugitive species, breeding wherever fire creates suitable conditions. It requires a well-developed grass and herb layer with limited shrub and hardwood midstory. Ideal habitat was originally the extensive longleaf pine woodlands of the South. In the southeastern U.S. on the Coastal Plain breeding habitat usually is open pinewoods with thick cover of grasses or saw palmetto. Bachman's sparrow is able to colonize recent clearcuts and early seral stages of old field succession, but such habitat remains suitable only for a short time. These habitat

conditions are nearly synonymous to the habitat associated with red-cockaded woodpecker restoration. On the Homochitto National Forest, Bachman's sparrow populations have been observed in active red-cockaded woodpecker clusters and adjacent suitable red-cockaded woodpecker habitat where thinning of the hardwood component and regular prescribed fire has taken place. Continued management in open pine stands for red-cockaded woodpeckers and improvement of more dense stands by midstory removal techniques and aggressive prescribed fire regimes will provide beneficial habitat for the Bachman's sparrow.

Direct Effects – There should be no direct effect upon the Bachman sparrow by application of herbicide and maintenance of rights-of-way.

Indirect Effects – Because rights-of-way will be maintained in a state of early successional species (i.e. grass and forb), foraging habitat should increase. As stated in the FEIS Vegetation Management pg xii, all herbicides and additives evaluated (including Garlon 4) meet acceptable risk standards for terrestrial and aquatic wildlife when applied using typical rates and methods. Birds also appear to be no more sensitive than mammals, which have a high tolerance to Garlon 4 (Syracuse Environmental Research Associates, Inc. 1996). And because typical rates and methods are being used there should be no indirect effects on the Bachman's sparrow or on its habitat.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

The proposed action and the no action alternative will not impact the Bachman's sparrow nesting and may increase suitable foraging habitat. Therefore there should be "no impact" on the Bachman's sparrow.

Pearl blackwater crayfish

The Pearl blackwater crayfish inhabits permanent –or nearly so—streams with clear sandy bottoms. The species occupies a limited range which is confined to drainages associated with the west bank of the Pearl River and streams associated with the north shore of Lake Ponchatrain. Recent records from the Homochitto National Forest in Amite and Franklin Counties are the first records from the Homochitto River drainage (J.F. Fitzpatrick, in press). The Homochitto National Forest collections were made from water under exposed tree roots in streambanks in Tanyard Creek, Richardson Creek, Porter Creek, and Dry Creek (in the McGehee Creek drainage). (Tom Mann, Pers. Comm. 2000). An additional collection from Brushy Creek was made in 1980 (Collections Records, Mississippi Museum of Natural Science). Collection records confirm the presence of the Pearl blackwater crayfish within the Homochitto NF and it is likely that other undocumented occurrences occur on the Homochitto NF.

Direct Effects – Because the herbicide will not be sprayed in or near any water source and machinery to clear right-of-way not impact drainages there should be no direct effects on the crayfish.

Indirect Effects – Again, because the herbicide will not be sprayed in or near water, Pearl River crayfish habitat will not be impacted.

Cumulative Effects - The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

Therefore, the proposed action and no action alternative would have “no impact” on the crayfish or its habitat.

Alabama shad

The Alabama shad is an anadromous species that spawns in large flowing rivers from the Mississippi River to the Suwannee River of Florida (Office of Protected Resources, 2001). The largest existing population occurs in the Apalachicola River of Florida (Office of Protected Resources, 2001). Other notable populations persist in the Pascagoula River drainage of Mississippi and the Mobile River drainage of Alabama. The fish enter freshwater during the spawning season (January to April) when water temperature reaches 19 to 22 degrees Celsius. Spawning is known to occur over sand, gravel, and rock substrates in a moderate current (Office of Protected Resources, 2001).

The decline of the Alabama shad in Alabama has been blamed on the construction of a series of high lift navigating dams in the Alabama and Tombigbee Rivers, which block spawning migration (Office of Protected Resources, 2001). Other threats to the shad include poor water quality and commercial and navigational dredging of sand and gravel from river bars used for spawning (Office of Protected Resources, 2001).

Currently the closest known population of Alabama shad was collected from the Amite River in Amite County, Mississippi (Mississippi Museum of Natural Science, Pers. Comm. 8/13/01). It is possible, but highly unlikely, for the Alabama shad to be in the Homochitto River drainage (Mississippi Museum of Natural Science, and Southern Research Station, Pers. Comm. 8/13/01). If the shad were utilizing the Homochitto River, it would be restricted to the main stem.

Direct Effects – Because the proposed actions are not within the Amite River drainage or on the main stem of the Homochitto River, no direct effect on the Alabama shad will be possible.

Indirect Effects -- Because the proposed actions are not within the Amite River drainage and the herbicide will not be sprayed near water and machinery used to clear right-of-way will not impact drainages, no indirect effect on the habitat of the Alabama shad will be possible.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

Because the proposed actions (and the no action alternative) are well away from both the Amite and Homochitto Rivers (main stems), there will be “no impact” on the Alabama shad.

Crystal darter

The crystal darter is known from the Pascagoula, Pearl, and Tombigbee drainages in the Gulf of Mexico basin and from the Bayou Pierre and Homochitto River systems in the Lower Mississippi drainage. It is

represented in the Homochitto River drainage by a single collection in 1973 at the Highway 98 Bridge south of Bude (Ross, Stephen T. Pers. Comm.). Since that time, no other collections of this species have been made from the Homochitto drainage. Crystal darters inhabit clean sand and gravel beds with swiftly flowing water in large rivers. The streams within the forest are too small to be inhabited by this species and therefore are not classified as suitable habitat for this species.

Direct Effects – Because the proposed action would be well away from the main stem of the Homochitto River, and the herbicide will not be sprayed on or near water, no direct effect on the crystal darter will be possible.

Indirect Effects – Again, because the herbicide will not be sprayed on or near water and machinery used to clear right-of-way will not impact drainages there will be no indirect effects to the darter.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions to create unacceptable levels of negative cumulative impacts.

Therefore the proposed action will have “no impact” on populations of this species.

Broadstripe topminnow

The broadstripe topminnow is found only in the Lake Pontchartrain Drainage and in the Amite and Tangipahoa River systems. Dr. Stephen Ross, fisheries biologist at the University of Southern Mississippi, confirmed that broadstripe topminnows are not considered potential residents of the Homochitto River drainage. Only a very small portion of the Amite watershed is located on the Homochitto National Forest. Based on this, the analysis area does not contain suitable habitat for this species.

Direct Effects – None

Indirect Effects -- None

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

Therefore the proposed action will have “no impact” on populations of this species.

Natchez and chukcho stoneflies

Nymphs and adults of both the Natchez and chukcho stoneflies are associated with small, clear, cold, and unpolluted streams. These streams are usually 1-4 meters in width, with full overstory canopy and sandy gravel substrate (Hartfield 1993). They are weak fliers and will usually remain near the water from which they emerge as nymphs. Present surveys seem supportive of Brown and Stark's (1995) suggestion that both species are endemic to southwest Mississippi. Surveys for Natchez and chukcho stoneflies have been conducted in streams of the Homochitto Ranger District. Sixty-six stream sites in

the Homochitto National Forest were sampled for adult stoneflies. Natchez stoneflies were found at 23 sites and the Chukcho found at 9 sites.

During the Spring of 2002, selected streams in Analysis Units 16 and 17 were sampled for these stoneflies using both black light traps and sweep nets. These surveys were conducted between April 15 and April 19 and involved 8 sample sites in Analysis Unit 17 and 3 in Analysis Unit 16. Analysis Unit 17 had recent (FY2000) timber sale activity and Analysis Unit 16 had no recent timber sale activity. One station (157) in Analysis Unit 17 had neither Natchez nor chukcho stoneflies collected. One station in Analysis Unit 16 (153B) and two in Analysis Unit 17 (107L & 155A) had only Natchez stoneflies collected. These four stations were in the upper ends of their respective watersheds and were not considered representative stonefly habitat. Seven stations (2 in Analysis Unit 16 and 5 in analysis Unit 17) had both species collected (Hargis, A.E. and W.D. Meriwether, unpublished data 2002).

Direct Effects – Because the herbicide will not be sprayed on or near water and machinery used to clear right-of-ways will not impact drainages there will not be any direct effects to the larval stoneflies.

Indirect Effects – If the hardwood canopy over the creeks were to be removed, stream degradation through heating of the water column and desiccation of the streamside zone could indirectly affect the stoneflies. However, the herbicide will not be sprayed on or near water, therefore there should be no indirect effects to the stonefly habitat.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

Because the herbicide will not be sprayed on or near water or vegetation adjacent to water the proposed action and no action alternative would have “no impact” on the Natchez and chukcho stoneflies.

Rayed creekshell

Although the range of the rayed creekshell covers portions of five southeastern states (Alabama, Florida, Georgia, Louisiana, and Mississippi) its occurrence is sporadic. Museum records suggest that historically it was seldom collected in large numbers, and today it is unusual to find more than a few individuals at a site. Now this mussel is considered to be of special concern due to reductions in both the number of sites where it historically occurred as well as a decline in the number of individuals found per occurrence (NatureServe Explorer, 2002). Threats to this species include sedimentation as a result of bank destabilization, runoff from agriculture and roads and overall stream modifications. This species is known from large rivers, however, most collections are from small to medium-sized creeks where it occurs in mud, sand, or gravel substrates in slow to medium currents (NatureServe Explorer, 2002). The immature form is parasitic, however species of host fishes are not known.

This species of mussel has not been found on the Homochitto National Forest and it is not known from the Homochitto River, into which most drainages on the Homochitto National Forest flow. However, this species is known to occur in the Amite River watershed, which overlaps a very small portion of the Homochitto National Forest.

Direct Effects – No direct effects are expected because only small portions of this drainage are located on National Forest land and herbicide will not be sprayed in or near water.

Indirect Effects – No indirect effects are expected. Again, this is expected because only small portions of this drainage are located on National Forest land and the herbicide will not be sprayed on or near water.

Cumulative Effects – Cumulative effects derived from all action and no action alternatives will not affect this species habitat. Therefore, our effects will not be adding to the cumulative effects occurring in the Amite River watershed.

This project will have “no impact” on the rayed creekshell.

Rafinesque's big-eared bats

While Rafinesque's big-eared bats may use a variety of habitats for foraging, their distribution is most likely tied to suitable roosting habitat such as abandoned buildings, abandoned mines and wells, beneath concrete road bridges, trees with loose bark, and trees with cavities extending upward from the opening. In general, the high densities of insects found around bodies of water (such as streams and ponds) are very important foraging habitat for this bat species.

In 1991, a colony of Rafinesque's big-eared bats was observed roosting in an abandoned house on a small private inholding of land within the Homochitto National Forest (J.A. Smith, Pers. Comm., 1992b). On June 7, 2000, one male Rafinesque's big-eared bat was found under a concrete bridge out of 15 bridges surveyed (Trousdale, A.W. and D.C. Beckett, 2000). Because current inventory methods for the Rafinesque's big-eared bat are neither feasible nor effective for determining definitive information on the number and location of individuals, and because the project is expected to have insignificant effects, site-specific inventory was deemed to not be necessary. It was assumed that Rafinesque's big-eared bats were or could be present in the study area and the effects of management on the species were analyzed.

Direct Effects – Because the clearing of the right-of-way has no nesting or roosting habitat and because herbicide will only be used to spot spray individual plants and according to the Risk Assessment Report (Syracuse Environmental Research Associates, Inc. 1996), mammals have a high tolerance to Garlon 4 there should be no direct effects to the bat.

Indirect Effects – Because no mature trees will be sprayed and water will not be sprayed, roosting and foraging habitat should not be affected. Therefore, this project should have no indirect effects on the Rafinesque's big-eared bat.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

Because herbicide will not impact roost trees and because mammals have a high tolerance to Garlon 4 the no action and proposed action will have “no impact” on populations of the species.

Arogos skipper

The Arogos skipper is a small butterfly with a wingspan about 1 to 1 1/4 inches. This species is found only in native grasslands, including prairies, savannahs, and bogs. The butterfly is rare and local in distribution. The larval foodplant is bluestem grasses in the Midwest and northern New Jersey, lopsided indiagrass in Florida, toothache grass along the Gulf Coast, and Pine Barrens reedgrass in the Carolinas and southern New Jersey. The adults feed on nectar from flowers such as blazing star, purple vetch, dogbane, stiff Coreopsis, purple coneflower, green milkweed, and ox-eye daisy among others.

There has been a recent concern about the survival of this species and a status survey has been commissioned by the U.S. Fish and Wildlife Service to determine if listing, as an endangered species is appropriate. In the vicinity of the Homochitto, historical collections exist for both Hinds and Copiah counties. Forest Service personnel spent over seven person-days collecting all species of skippers in seemingly suitable habitat on the Homochitto Ranger District in grassy portions of nineteen sections scattered throughout the forest (between August 22 and September 6, 2001). None of the specimens collected were the Arogos skipper (Marc Minno, Pers. Comm., 2001).

Direct Effects – The greatest threat to the survival of the Arogos skipper, if indeed it is part of the District's fauna, is the burning of large contiguous blocks of grassland for which no refugia are retained, not timber harvest (Minno, M., Pers. Comm., 2001). The herbicide will not be used on grasses, as they are desirable along the utility corridors. Therefore the insect should not be sprayed.

Indirect Effects – Because Garlon 4 does not kill monocots (i.e. grasses), butterfly foraging habitat will not be impacted. Therefore, there should be no indirect effects to the butterfly.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the Homochitto National Forest to create unacceptable levels of negative cumulative impacts.

Because the Arogos skipper is not confirmed to occur on the Homochitto Ranger District, and because the management proposed is anticipated have no impacts to the skipper, the proposed action and no action alternatives will have “no impact” on the butterfly.

Trachyxiphium heteroicum

Trachyxiphium moss is a slender, green, flaccid, rather shiny moss growing in mats with an interesting, if confusing, distribution. This small moss was for many years considered to be endemic to wet forests on soil and logs at moderate elevations (up to 5500 feet) in the Puebla and Veracruz states of Mexico. It was not known to occur outside of Mexico until August, 1969 when it was collected growing on a wet, rotted log in a spring seep at Clear Springs Recreation Area, Homochitto National Forest. Between 1969 and 2000, it had been collected only two other times in the United States: both from Washington Parish, Louisiana. All currently known collections from the southern United States come from man-made habitats: an artificial lake in Mississippi; and concrete culverts around springs in Louisiana (Crum and Anderson, 1981). In September 2000, a concentrated effort was undertaken to confirm this species continued occurrence on the Homochitto. The original collector was contacted in order to develop a

refined search image. Dr. Reese provided valuable information on the specific microhabitat required by this species and a better verbal description of the site of the first collection. It was re-collected from the original location in September 2000. Its current status on the Homochitto is being investigated. Although at least six other spring seeps seemingly suitable have been investigated, the moss has been collected only one other time on the Homochitto. Based on research to date, it seems that this moss is associated with decaying wood in springs and spring seeps. The specific type of seep seems to be of a type that has water flowing year-round. Current flow is obvious and mosses dominate the lowest level of the ground cover, although there are patches of bare sand and gravel present. There have been no spring seeps of this type located during field surveys between 1998 and 2001. Collections of mosses were made in 2001 but this moss was not collected.

Direct Effects – Because the herbicide will not be sprayed on or near water (the moss requires permanent water source) and because machinery to clear right-of-way will not impact any drainages or wet areas the moss should not be directly affected.

Indirect Effects – Because spring seeps and other wetland types are avoided, there should be no indirect effects on *Trachyziphium heteroica*.

Cumulative Effects -- Because the impacts to streamside management zones should be minimal and the project should not contribute to other unconnected actions within the Homochitto National Forest, there will not be unacceptable levels of negative cumulative impacts.

Therefore, the proposed action and no action alternative will have “no impact” on the discussed species.

Cypress-knee sedge

The cypress-knee sedge is an aquatic sedge that is usually associated with cypress trees, logs, or knees. It occurs in areas of permanently flooded cypress timber. Frequently the cypress-knee sedge may occur on floating or partially submerged rotting logs or stumps and may form dense tussocks. It has been found in all light conditions from full sun to dense canopy. Associated species may include: baldcypress (*Taxodium distichium*), swamp black gum (*Nyssa biflora*), red maple (*Acer rubrum*), possum haw (*Viburnum nudum*), buttonbush (*Cephalanthus occidentalis*), bogmoss (*Mayaca fluviatilis*), marsh St.-John's-wort (*Triadenum walteri*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis* ssp, *spectabilis*), and netted chain-fern (*Woodwardia areolata*). The present distribution of cypress-knee sedge is poorly understood partially because of the inaccessible nature of the habitat and the generally inhospitable nature of southern swamps in mid-summer (snakes and mosquitoes) (Bryson, Charles. 2001. pers comm.). The cypress-knee sedge has been collected from at least four sites on the Homochitto RD and with additional survey new sites will undoubtedly be added.

Direct Effects – Because the sedge will not be affected by the herbicide and its habitat will not be sprayed with herbicide or impacted with machinery used to cut right-of-way, there will be no direct effects to this species.

Indirect Effects – Because suitable will not be impacted by this project, no indirect impacts to the cypress-knee sedge is likely.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the Homochitto National Forest to create unacceptable levels of negative cumulative impacts.

The proposed action will avoid wetlands and all water sources; therefore, there will be “no impact” for the discussed species. The no action alternative will also have “no impact” on this species.

Small's wood fern

The Small's wood fern occurs in moist to wet woodlands (shaded seeps and bald cypress swamps) comprised of several species of deciduous hardwoods and sweetbay, sometimes with baldcypress and dwarf palm. Associates include: sweetgum, swamp black gum, tulip poplar, loblolly pine, cinnamon fern, royal fern, lizard's tail, poison sumac, American holly, red maple, switchcane, and netted chain fern. This species is known to occur on the Homochitto Ranger District, but only in a few locations. An extensive survey to locate additional populations in seemingly suitable habitat on the forest has been conducted without additional populations being located (J.A. Smith, 1995). No populations of this species were located during site surveys in 1998 and 2001. No management activities are planned for areas of seemingly suitable habitat.

Direct Effects – Because no management activities will take place within seemingly suitable habitat, no direct effects are expected.

Indirect Effects – Because suitable potential habitat is being protected, no indirect impact on the species is expected.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

The proposed action and all alternatives should have “no impact” for the discussed species.

Bay Starvine

The bay starvine is associated with deep, moist drainages with dense canopies near perennial and large intermittent streams. Based on existing forest a survey, bay starvine, appears fairly well distributed and habitat may be included in the areas to be sprayed. Therefore some individual plants may be negatively impacted by the herbicide.

The bay starvine may be locally abundant on steep slopes beneath deciduous hardwoods (beech-magnolia) and occasional pines, usually midslope or lower, and less commonly found on floodplains along the bases of mixed hardwood slopes. Associates: American beech, spruce pine, shortleaf pine, white oak, Darlington oak, hophornbeam, southern magnolia, bigleaf magnolia, pyramid magnolia,

cucumber tree, sourwood, tulip poplar, sweetgum, horse-sugar, American holly, florida anise, sebastian-bush, Elliotts blueberry, sliky camelia, witch hazel, wild ginger, partridge-berry, melic grass, variable panic grass, narrow-leaf sedge, hirsute sedge, striate sedge, and christmas fern. Although bay starvine may be most abundant in small areas of the forest where more light than normal is hitting the forest floor due to windthrow or other mortality of single trees, the recommended management is to maintain a forest cover with as little disturbance as possible, avoid clear-cuts and thinnings, protect from fire, and minimize or restrict vehicular traffic.

Direct Effects – Individual plants could be lost if plant is sprayed with herbicide.

Indirect Effects – Habitat should not be impacted by selective spraying of herbicide, therefore there should be no negative indirect effects to this species.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

The no action alternative would have “no impact” on this species. The proposed action “may impact individuals but will not likely result in a trend towards federal listing or a loss of viability” for the discussed species.

Fetid trillium

The fetid trillium has a wide range of reported habitat preferences: ravines, floodplains, low ground, in rich woods, even on roadsides and shoulders, in silts, sandy-alluvium, and loess soils. It is often locally abundant in rich soils on steep slopes in the shade of mixed pine-hardwoods and less commonly on low ridges, in well drained soils. The fetid trillium also occurs in floodplains in mixed hardwood forests. Associates may include: short leaf pine, loblolly pine, longleaf pine, spruce pine, American beech, white oak, tulip poplar, bigleaf magnolia, pyramid magnolia, sourwood, flowering dogwood, witch hazel, American holly, red maple, Florida anise, Elliotts blueberry, wild azalea, partridge-berry, long-leaf spikegrass, and yellow jessamine, green-dragon, jack-in-the-pulpit, wild sweet William.

The species seems tolerant of a wide range of soil moisture and soil types from low swampy woods to high, dry bluffs and ravine slopes. Fetid trillium was found by J. A. Smith “on all sites that I have covered during my endangered plant survey” (J.A. Smith, Pers. Comm., 1992a).

Direct Effects – Individual plants could be lost if plant is sprayed with herbicide.

Indirect Effects - Habitat should not be impacted by selective spraying of herbicide, therefore there should be no negative indirect effects to this species.

Cumulative Effects -- The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

Therefore, the proposed action “may impact individuals but will not likely result in a trend towards federal listing or a loss of viability” for the discussed species. The no action alternative would have “no impact” on this species.

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APPENDIX 1.

**Threatened and Endangered Species
National Forests in Mississippi
4 April 2002**

Group	Scientific Name	Common Name	Federal Status	TNC Global	TNC State	Possibility of Occurrence on Homochitto NF
Amphibian	<i>Rana capito sevosa</i>	Mississippi Gopher Frog	E	G1	S1	Outside known range/no suitable habitat
Bird	<i>Grus canadensis pulla</i>	Mississippi Sandhill Crane	E	G5T1	S1	Outside known range/no suitable habitat
Bird	<i>Haliaeetus leucocephalus</i>	Bald Eagle	T	G4	S1B/S1N	Potential
Bird	<i>Picoides borealis</i>	Red-Cockaded Woodpecker	E	G3	S1	Confirmed
Fish	<i>Acipenser oxyrhynchus desotoi</i>	Gulf Sturgeon	T	G3T1T2	S1B/S1N	Outside known range/no suitable habitat
Fish	<i>Percina aurora</i>	Pearl Darter	C	G1	S1	Outside known range/no suitable habitat
Fish	<i>Scaphirhynchus albus</i>	Pallid Sturgeon	E	G1G2	S1	Outside known range
Invertebrate	<i>Fallicambarus gordonii</i>	Camp Shelby Burrowing Crawfish	C	G1	S1	Outside known range/no suitable habitat
Invertebrate	<i>Pleurobema decisum</i>	Southern Clubshell	E	G1G2	S1/S2	Outside known range
Mammal	<i>Ursus americanus luteolus</i>	Louisiana Black Bear	T	G5T2	S1	Potential
Plant	<i>Apios priceana</i>	Price's Potato Bean	T	G2	S1	Outside known range/no suitable habitat
Plant	<i>Isoetes louisianensis</i>	Louisiana Quillwort	E	G1	S1	Outside known range
Plant	<i>Lindera melissifolia</i>	Pondberry	E	G2	S2	Outside known range
Reptile	<i>Drymarchon corais couperi</i>	Eastern Indigo Snake	T	G4T3	S1	Outside known range/no suitable habitat
Reptile	<i>Gopherus polyphemus</i>	Gopher Tortoise	T	G3	S2	Outside known range/no suitable habitat
Reptile	<i>Pituophis melanoleucus lodingi</i>	Black Pine Snake	C	G4T3	S2	Outside known range/no suitable habitat

Appendix 2

**Forest Service Sensitive Species
National Forests in Mississippi
7 August 2001**

Group	Scientific Name	Common Name	TNC Global	TNC State	Possibility of occurrence on Homochitto NF
Amphibian	<i>Plethodon websteri</i>	Webster's salamander	G3	S3	Outside of known range / Suitable Habitat Present
Bird	<i>Aimophila aestivalis</i>	Bachman's sparrow	G3	S3?	Confirmed Present
Crustacean	<i>Fallicambarus danielae</i>	Speckled burrowing crayfish	G2	S2	Outside of known range / No Suitable Habitat
Crustacean	<i>Fallicambarus gordonii</i>	Camp Shelby burrowing crayfish	G1	S1	Outside of known range / No Suitable Habitat
Crustacean	<i>Hobbseus attenuatus</i>	Pearl rivulet crayfish	G2	S2	Outside of known range / No Suitable Habitat
Crustacean	<i>Procambarus barbiger</i>	Jackson Prairie crayfish	G2	S2	Outside of known range / No suitable Habitat
Crustacean	<i>Procambarus fitzpatricki</i>	Spiny-tailed crayfish	G2	S2	Outside of known range / No Suitable Habitat
Crustacean	<i>Procambarus penni</i>	Pearl blackwater crayfish	G3	S3	Confirmed Present
Fish	<i>Alosa alabamae</i>	Alabama shad	G3		Potential / At extreme periphery of range / No Suitable Habitat
Fish	<i>Crystallaria asprella</i>	Crystal Darter	G3	S2	Potential
Fish	<i>Etheostoma raneyi</i>	Yazoo darter	G2	S2?	Outside of known range / No Suitable Habitat
Fish	<i>Fundulus euryzonus</i>	Broadstripe topminnow	G2	S2	Not Present
Fish	<i>Notropis melanostomus</i>	Blackmouth shiner	G2	S2	Outside of known range / No Suitable Habitat
Fish	<i>Noturus munitus</i>	Frecklebelly madtom	G3	S2	Outside of known range
Fish	<i>Noturus stigmosus</i>	Northern madtom	G3	S1	Outside of known range
Fish	<i>Percina lenticula</i>	Freckled darter	G2	S2	Outside of known range / No Suitable Habitat
Insect	<i>Alloperla natchez</i>	Natchez stonefly	G2	S2	Confirmed Present
Insect	<i>Atrytone arogos arogos</i>	Arogos skipper	G3G4T1T2	S2S3	Possible / Habitat possibly suitable
Insect	<i>Haploperla chukcho</i>	Chukcho stonefly	G2	S2	Confirmed Present
Mammal	<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	G3G4	S3?	Confirmed Present
Mollusk	<i>Anodontooides radiatus</i>	Rayed creekshell	G3	S2	Potential / At extreme periphery of range / Habitat possibly suitable
Mollusk	<i>Eliptio arca</i>	Alabama spike	G3Q	S3	Outside of known range
Mollusk	<i>Obovaria unicolor</i>	Alabama hickorynut	G3	S3	Outside of known range /

Group	Scientific Name	Common Name	TNC Global	TNC State	Possibility of occurrence on Homochitto NF
Mollusk	<i>Plethobasus cyphus</i>	Sheepnose	G3	S1	Outside of known range /
Mollusk	<i>Pleurobema beadleianum</i>	Mississippi pigtoe	G2G3	S3?	Outside of known range /
Mollusk	<i>Pleurobema rubrum</i>	Pyramid pigtoe	G2	S1	Outside of known range /
Mollusk	<i>Quadrula cylindrica</i>	Rabbitsfoot	G3T3	S1	Outside of known range /
Mollusk	<i>Strophitus subvexus</i>	Southern Creek Mussel	G3	S2	Outside of known range /
Nonvasc. Plant	<i>Trachyxiphium heteroicum</i>	Trachyxiphium moss	G2G3	S1	Confirmed Present
Reptile	<i>Pituophis melanoleucus lodingi</i>	Black pine snake	G4T3	S2S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Agalinis pseudaphylla</i>	Shinner's false foxglove	G2?Q	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Agrimonia incisa</i>	Incised agrimony	G3	S2/S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Amsonia ludoviciana</i>	Louisiana bluestar	G3	SH	Outside of known range
Vascular Plant	<i>Arabis patens</i>	Spreading rockcress	G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Aristida simpliciflora</i>	Southern three-awn grass	G2	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Botrychium jenmanii</i>	Dixie grapefern	G3G4	S1?	Outside of known range / Suitable Habitat Present
Vascular Plant	<i>Calopogon multiflorus</i>	Many-flower grass pink	G2G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Carex baltzelli</i>	Baltzell's sedge	G3	S1	Outside of known rang / No Suitable Habitat
Vascular Plant	<i>Carex decomposita</i>	Cypress-knee sedge	G3	S3?	Confirmed Present
Vascular Plant	<i>Carex impressinervia</i>	Ravine sedge	G1G2	S1	Outside of known range / Suitable Habitat
Vascular Plant	<i>Cleistes bifaria</i>	Small spreading pogonia	G3G4	S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Coreopsis nudata</i>	Georgia tickseed	G3?	S1S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Crataegus ashei</i>	Ashe hawthorne	G1	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Crataegus triflora</i>	Three-flower hawthorne	G2	S1	Outside of known range / No suitable Habitat
Vascular Plant	<i>Desmodium ochroleucum</i>	Cream tick-trefoil	G2G3	S1S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Dryopteris X australis</i>	Small's woodfern	HYB	S1	Confirmed Present
Vascular Plant	<i>Juglans cinerea</i>	Butternut	G3G4	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Lachnocaulon digynum</i>	Pineland bogbutton	G3	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Lindera subcoriacea</i>	Bog spicebush	G2	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Linum macrocarpum</i>	Spring Hill flax	G2?	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Macranthera flamma</i>	Flame flower	G3	S3?	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Marshallia trinervia</i>	Broadleaf Barbara's buttons	G3	S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Myriophyllum laxum</i>	Loose watermilfoil	G3	S1	Outside of known range / Possible habitat

Group	Scientific Name	Common Name	TNC Global	TNC State	Possibility of occurrence on Homochitto NF
Vascular Plant	<i>Penstemon tenuiflorus</i>	White-flowered beardtongue	G3?	S2S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Pieris phyllireifolia</i>	Climbing fetterbush	G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Pinguicula planifolia</i>	Chapman's butterwort	G3?	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Pinguicula primuliflora</i>	Southern butterwort	G3G4	S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Platanthera integra</i>	Yellow fringeless orchid	G3G4	S3S4	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Polygala hookeri</i>	Hooker's milkwort	G3	S2S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Polygala leptostachys</i>	Slender spike milkwort			
Vascular Plant	<i>Pteroglossaspis ecristata</i> (=Eulophia ecristata)	Giant Orchid	G3G4	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Quercus oglethorpensis</i>	Oglethorpe oak	G3	S2?	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Rhododendron austrinum</i>	Orange azalea	G3	S2S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Rhynchospora crinipes</i>	Hairy peduncled beakrush	G1	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Rhynchospora macra</i>	Large beakrush	G3	S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Ruellia noctiflora</i>	Night flowering ruellia	G2	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Sarracenia leucophylla</i>	Crimson pitcherplant	G3	S2S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Schisandra glabra</i>	Bay starvine	G3	S3?	Confirmed Present
Vascular Plant	<i>Silene ovata</i>	Blue Ridge catchfly	G2G3	S1S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Spiranthes longilabris</i>	Giant spiral ladies'-tresses	G3	S2S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Tridens carolinianus</i>	Carolina fluffgrass	G3		Outside of known range / No Suitable Habitat
Vascular Plant	<i>Trillium foetidissimum</i>	Fetid trillium	G3	S3	Confirmed Present
Vascular Plant	<i>Trillium pusillum</i>	Least trillium	G3	S1	Outside of known range / Suitable Habitat
Vascular Plant	<i>Uvularia floridana</i>	Florida bellwort	G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Xyris chapmanii</i>	Chapman's yellow-eyed grass	G3	S2?	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Xyris drummondii</i>	Drummond's yelloweyed grass	G3	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Xyris louisianica</i>	Louisiana yelloweyed grass	G3	S3?	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Xyris scabrifolia</i>	Harper's yelloweyed grass	G3	S1S2	Outside of known range / No Suitable Habitat

Appendix 3

STATUS CODES

Federal Status

- E - Endangered
- T - Threatened
- S - Forest Service Sensitive

State Ranks

- S1 - Critically imperiled in state because of extreme rarity (very few individuals or acres) or because of some factors making it especially vulnerable to extinction.
- S2 - Imperiled in state because of rarity or because of some factor(s) making it especially vulnerable to extinction.
- S3 - Rare or uncommon within state.