

## **APPENDIX C**

# **STANDARD MITIGATION MEASURES FOR PRESCRIBED FIRE AND HERBICIDE USE**

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# STANDARD MITIGATION MEASURES FOR PRESCRIBED FIRE AND HERBICIDE USE

## Prescribed Fire Mitigation Measures

1. Prescribed fires in the riparian corridor will maintain high- and intermediate- canopy stream shade, except as needed to create or maintain canebrake communities (Forest Plan, pg. 2-55).
2. Prescribed burning, other than slash burns, will be designed to retain litter and/or duff material on at least 85 percent of the project area, excluding fire lines. Areas within which the post-burn survey identifies more than 15 percent exposed soils will be evaluated for re-vegetation to mitigate erosion effects (Forest Plan, pg. 2-55).
3. Slash burns are planned and conducted so that they do not consume all litter and duff and alter structure and color of mineral soil on more than 20 percent of the area. Steps taken to control soil heating may include use of backing fires on steep slopes, scattering slash piles, and burning heavy fuel pockets separately (Forest Plan, pg. 2-55).
4. In prescribed burning planning, use soils inventory data to identify severely eroded soils, locate any area with an average litter-duff depth of less than 1/2-inch within them and mitigate fire effects to maintain the litter and duff on these areas (Forest Plan, pg. 2-55).
5. To prevent erosion, water diversions will be installed on prescribed fire control lines during their construction. Refer to *Georgia's Best Management Practices for Forestry* handbook for standards on spacing and construction (Forest Plan, pg. 2-55).
6. All prescribed burning projects will be conducted with full adherence to USFS internal guidance for air quality and the pollution control methodologies prescribed by air quality regulatory agencies (Forest Plan, pg. 2-55).
7. For prescribed burning projects planned within areas having a non-attainment or maintenance status regarding the National Ambient Air Quality Standards (NAAQS); the USFS will demonstrate in advance that it can complete those projects in conformity with the State Implementation Plan provisions established to return the area to NAAQS attainment (Forest Plan, pg. 2-55).
8. Locate and construct fire lines to minimize mineral soil exposure in both suppression and prescribed fire operations consistent with fire danger, values at risk, operational efficiency, and applicable objectives. Compliance may include adjustments to fire line location even when the readjustment may impose into an area prescribed for less fire use (Forest Plan, pg. 2-54).
9. Fire lines which expose mineral soil are not located in riparian corridors along lakes, perennial or intermittent springs and streams, wetlands, or water-source seeps, unless tying into them as natural barriers to fire spread at designated points with minimal soil disturbance (Forest Plan, pg. 2-54).
10. Hand lines are used to create fire lines near streams to minimize soil disturbance. Water diversions are used to keep sediment out of streams. Fire lines are not constructed in stream channels, but streams may be used as fire lines (Forest Plan, pg. 3-181).
11. If necessary to cross a stream with a fire lines, crossings will be as close to right angles as possible to the stream and be stabilized and/or revegetated as soon after the fire is controlled as possible (Forest Plan, pg. 3-181).
12. When wetlands need to be protected from fire, fire lines are used around them only when the water table is so low that the prescribed fire might otherwise damage wetland vegetation or

organic matter. Where practical, previous fire lines are reused, and fire lines must cause minimal soil disturbance.

13. Smoke management guidelines are also used to enhance smoke dispersion. Burning is done when the atmosphere is thermally neutral to slightly unstable, not during pollution alerts, stagnant or humid weather, or inversions.
14. Prescribed fires are conducted under the direct supervision of a burning boss with fire behavior expertise consistent with the project's complexity. All workers must meet health, age, physical, and training requirements in FSM 5140, and use protective clothing and equipment.
15. Rehabilitation of wildfire control lines will be included as an objective of fire operational plans, will occur promptly after the burn, and will meet all other applicable standards of the Forest Plan (Forest Plan, pg. 2-55).
16. Locate wildfire control lines to avoid impacts on known heritage resources or threatened and endangered or sensitive species habitat, unless impacts to these areas are necessary for human safety. Document rationale for line location if these areas are impacted for safety reasons (Forest Plan, pg. 2-55).
17. Protect snags and cavity trees in prescribed fire operations where prescribed fire planning has identified a need for this mitigation (Forest Plan, pg. 2-55).
18. Use fuel-break construction and/or mitigation methods that: (a) leave the root mat intact, (b) do not leave bare mineral soil exposed, and (c) do not create landforms that will drain directly into ephemeral streams for 25 feet on either side of ephemeral streams. Such methods include wet lines or use of existing constructed or natural barriers. If fuel-break construction results in breaking the root mat and thus exposure of bare mineral soil and connection to an ephemeral stream, restore the fire break for 25 feet on each side of the stream with re-shaping of the soil surface and placing a soil cover in a timely manner to minimize erosion (Forest Plan, pg. 2-24).
19. Except for wildfire or escaped prescribed fire, construction of fire lines with heavy mechanized equipment in wetlands or riparian corridors is prohibited (Forest Plan, pg. 3-181).
20. Areas are not prescribed burned for at least 30 days after herbicide treatment (Forest Plan, page 2-54).
21. In all fire operations, emphasize the use of naturally occurring barriers to fire spread to the maximum extent compatible with other goals, objectives, and standards; particularly riparian area standards (Forest Plan, pg. 2-54).
22. In RCW Habitat Management Areas, protect cavity trees from fire during prescribed burning operations (Forest Plan, pg. 3-142).

### **Herbicide Application Mitigation Measures**

1. Herbicides and application methods are chosen to minimize risk to human and wildlife health and the environment. No class B, C, or D chemical may be used on any project, except with Regional Forester approval. Approval will be granted only if a site-specific analysis shows that no other treatment would be effective and that all adverse health and environmental effects will be fully mitigated. Diesel oil will not be used as a carrier for herbicides, except as it may be a component of a formulated product when purchased from the manufacturer.

Vegetable oils will be used as the carrier for herbicides when available and compatible (Forest Plan, pg. 2-9).

2. Herbicides are applied at the lowest rate effective in meeting project objectives and according to guidelines for protecting human and wildlife health. Application rate and work time must not exceed levels that pose an unacceptable level of risk to human or wildlife health. If the rate or exposure time being evaluated causes the Margin of Safety (MOS) or the Hazard Quotient (HQ) computed for a proposed treatment to fail to achieve the current USFS Region 8 standard for acceptability (acceptability requires a MOS > 100 or a HQ of < 1.0 using the most current of the SERA or Risk Assessments found on the USFS website). Additional risk management must be undertaken to reduce unacceptable risks to acceptable levels, or an alternative method of treatment must be used (Forest Plan, pg. 2-9).
3. Weather is monitored and the project suspended if temperature, humidity, or wind becomes unfavorable for correct application as shown in the following table (Forest Plan, pg. 2-9):

Application Method		Temperatures Higher Than	Humidity Less Than	Wind (at target) Greater Than
Ground	Hand (cut surface)	N.A.	N.A.	N.A.
	Hand (other)	98°F	20%	15 mph
Mechanical	Liquid	95°F	30%	10 mph
	Granular	N.A.	N.A.	10 mph
Aerial	Liquid	90°F	50%	5 mph
	Granular	N.A.	N.A.	8 mph

4. Nozzles that produce large droplets (mean droplet size of 50 microns or larger) or streams of herbicide are used. Nozzles that produce fine droplets are used only for hand treatment where distance from nozzle to target does not exceed 8 feet (Forest Plan, pg. 2-9).
5. Herbicides are applied according to labeling information and the site-specific analysis done for projects. This labeling and analysis are used to choose the herbicide, rate, and application method for the site. They are also used to select measures to protect human and wildlife health, non-target vegetation, water, soil, and threatened, endangered, proposed, and sensitive species. Site conditions may require stricter constraints than those on the label, but labeling standards are never relaxed.
6. Only herbicide formulations (active and inert ingredients) and additives registered by the USEPA and approved by the USFS for use on National Forest System lands are applied.
7. Public safety during such uses as viewing, hiking, berry picking, and fuelwood gathering is a priority concern. Method and timing of application are chosen to achieve project objectives while minimizing effects on non-target vegetation and other environmental elements. Selective treatment is preferred over broadcast treatment.
8. Areas are not prescribed burned for at least 30 days after herbicide treatment (Forest Plan, pg. 2-54).
9. Contractors ensure that their workers use proper protective clothing and safety equipment required by labeling for the herbicide and application method.
10. A certified pesticide applicator supervises each USFS application crew and trains crew members in personal safety, proper handling and application of herbicides, and proper disposal of empty containers (Forest Plan, pg. 2-11)

11. Each Contracting Officer's Representative (COR) who must ensure compliance on contracted herbicide projects is a certified pesticide applicator. Contract inspectors are trained in herbicide use, handling, and application.
12. Notice signs (FSH 7109.11) are clearly posted, with special care taken in areas of anticipated visitor use. Monitoring and inspections during and after the project would be used to ensure that proper procedures were followed.
13. Triclopyr is not ground-applied within 60 feet of known occupied gray, Virginia big-eared, or Indiana bat habitat. Buffers are clearly marked before treatment so applicators can easily see and avoid them (Forest Plan, pg. 2-10).
14. No herbicide is ground-applied within 60 feet of any known threatened, endangered, proposed, or sensitive plant. Buffers are clearly marked before treatment so applicators can easily see and avoid them (Forest Plan, pg. 2-10).
15. Application equipment, empty herbicide containers, clothes worn during treatment, and skin are not cleaned in open water or wells. Mixing and cleaning water must come from a public water supply and be transported in separate labeled containers (Forest Plan, pg. 2-10).
16. No herbicide is ground-applied within 100 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. Selective treatments (which require added site-specific analysis and use of aquatic-labeled herbicides) may occur within these buffers only to prevent significant environmental damage such as noxious weed infestations. Buffers are clearly marked before treatment so applicators can easily see and avoid them (Forest Plan, pg. 2-10).
17. During transport, herbicides, additives, and application equipment are secured to prevent tipping or excess jarring and are carried in a part of the vehicle totally isolated from people, food, clothing, and livestock feed.
18. Only the amount of herbicide needed for the day's use is brought to the site. At day's end, all leftover herbicide is returned to storage.
19. 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 (Forest Plan, pg. 2-10).
20. During use, equipment to store, transport, mix, or apply herbicides is inspected daily for leaks.
21. With the exception of treatments designed to release designated vegetation selectively resistant to the herbicide proposed for use or to prepare sites for planting with such vegetation, no soil-active herbicide is applied within 30 feet of the drip line of non-target vegetation (e.g., den trees, hardwood inclusions, adjacent stands) specifically designated for retention within or next to the treated area. Side pruning is allowed, but movement of herbicide to the root systems of non-target plants must be avoided. Buffers are clearly marked before treatment so that applicators can easily see and avoid them.
22. No herbicide is broadcast on rock outcrops or within sinkholes. No soil-active herbicide with a half-life longer than 3 months is broadcast on slopes over 45 percent. Such areas are clearly marked before treatment so that applicators can easily see and avoid them.
23. Pesticide mixing, loading, or cleaning areas in the field are located at least 50 feet from ephemeral streams.
24. No soil-active herbicide with a half-life longer than 3 months is broadcast within 25 feet of ephemeral streams. Selective treatments with aquatic-labeled herbicides are allowed. Such areas are clearly marked before treatment so that applicators can easily see and avoid them.

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**APPENDIX D**  
**BIOLOGICAL EVALUATION**

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**Biological Evaluation  
For  
Red-Cockaded Woodpecker (*Picoides borealis*) and Bachman Sparrow (*Aimophila  
estivalis*) Habitat Improvement Project  
Compartments 5, 6, and 8**

**I. Introduction**

The purpose of this biological evaluation is to document any direct, indirect, or cumulative effects of vegetation manipulation for habitat improvement on any proposed, endangered, threatened, or sensitive (PETS) species or their habitats, and to ensure that land management decisions are made with the benefit of such knowledge.

**Specific objectives of this BE are:**

- to ensure that Forest Service actions do not contribute to loss of any native or desired non-native plant or animal species or contribute to trends toward Federal listing of any species,
- to comply with the requirements of the Endangered Species Act that actions of Federal agencies not jeopardize the continued existence of a listed species or adversely modify critical habitat of federally listed species,
- to provide a standard process to ensure that PETS species receive full consideration in the decision-making process,
- to address the effects of management activities to PETS species habitat and/or potential habitat on the Oconee National Forest PETS list, and
- to incorporate any mitigation measures specifically addressing any potential impacts from management activities related of this project to PETS or their habitat or potential habitat.

**II. Project Area and Description**

The project area is located within a portion of the Oconee National Forest, called the Hitchiti Experimental Forest or Brender Experimental Forest (4,735 acres). The project area consists of Compartments 5, 6, and 8 containing 1,419 acres of National Forest land within Jones County. This project focuses on 889 acres of loblolly pine and pine-hardwood that are to have midstory control along 790 acres to be commercially thinned within those 1,419 acres. There will be 139 acres of regeneration within the 1,419 acres to meet the requirements stated within the RCW Recovery Plan. Compartments 5, 6, and 8 are located within the tentative Sub-HMA (Habitat Management Area) and are subject to the interim guidelines set by the Red-cockaded Woodpecker Final Environmental Impact Statement (RCW FEIS). The majority of the area is allocated 3.B Experimental Forest (See pages 3-138-144) RCW Management Area under the new Chattahoochee-Oconee Land Resource Plan (January, 2004), which is managed habitat for the RCW. This project area was designated for RCW management due to the proximity of existing

active RCW cluster sites to the Piedmont National Wildlife Refuge (PNWR). The Forest Service and PNWR work jointly in the management of the RCW.

The main understory vegetation is greenbrier, Virginia creeper, muscadine, blackberry, honeysuckle, winged sumac, and hawthorn. Some other species include red maple, hawthorn, winged elm, various oak species, and sweetgum. Sweetgum, maples, elms, and various hardwoods are located throughout the midstory.

### **III. Proposed Action**

The Oconee National Forest is proposing to reduce vegetation within several stands within the compartments 5, 6, and 8 where appropriate reduction of stems is required to implement the RCW EIS, by using two methods. The methods for altering the vegetation are thinning of high-density stands and regeneration of stands damaged by SPB infestation. Some stands will not have the over story removed only the midstory will be reduced by thinning and herbicide treatments. See the EA for detailed descriptions of these actions. To be in compliance with the Endangered Species Act (ESA and the Southern Pine Beetle FEIS), it is necessary to begin treating the high density stands and providing 80 acres of regeneration and 120 acres of foraging habitat within each cluster site (RCW Recovery Plan, 2003). This treatment area will include all active and inactive RCW areas, future recruitment areas, and surrounding foraging and nesting habitat. This action will meet the habitat requirements under the Recovery Plan in management for future foraging and nesting habitat for the RCW.

Other connected activities will include the following activities (See the preferred alternative):

- Prescribed burning of all Compartments
  - Recruitment Stands set up in all compartments (Areas will be determined after pine stems have been reduced; Consultation with USFWS will occur to identify the proper areas adjacent to PNWR active cluster sites. Some of the stands are not mature for inserts but some boundaries can be determined for future nest sites)
  - Herbicide treatment for noxious weeds (privet and kudzu) and midstory treatment for RCW
  - Trees will be identified for artificial cavities and can be installed in local area if we have the option to use stewardship dollars)
  - Archeological protection of cultural sites
  - Road improvements
- (Areas are described in more detail within EA)

### **IV. Purpose and Need**

The Oconee National Forest is currently listed as a secondary core population by recovery unit (Recovery Plan, 2003) with a goal of 250 or more breeding groups. The definition of recovery roles and units are described in detail within the Recovery Plan;

Section xii. The Oconee National Forest currently has 26 cluster sites. The FY 2003 Breeding season results showed that 14 of these sites were active. Within the 26 cluster sites we had 14 active nests reported. RCW cluster sites are located within Compartments 5, 6, and 8 have been identified, GPSed, and maintained by prescribed fire (3-5 year rotations), artificial cavities installed, and a midstory treatment (1998, 2004). RCW cluster sites have suffered attacks by Southern Pine Beetle due to the dense vegetation that is currently above the 40-70 basal area requirements of the RCW Recovery Plan 2003 recommendations for optimal RCW habitat (RCW Recovery Plan, pp 188-190).

Current prescription data revealed the average age within the proposed compartments is 72 years of age. The proposed project areas have high stem densities and large gaps where Southern Pine Beetle infestations have left the stands broken up with little pine regeneration. The Recovery Plan states that habitat requirements for RCW clusters sites should have adequate foraging and nesting habitat (120 acres) with regeneration (80 acres) established within a 200-acre area. Recruitment stands within Compartments 5, 6, and 8 have been identified, GPS, and maintained by prescribed fire (3-5 year rotations), artificial cavities installed, and a midstory treatment (1998). RCW cluster sites have suffered attacks by Southern Pine Beetle due to high amount of vegetation that is currently above the requirements of the RCW Recovery Plan 2003 recommendations for optimal RCW habitat. The proposed treatment areas will be thinned, prescribed burned, and midstory control applied to meet the desired future condition for RCW management following the RCW EIS.

The main understory vegetation is greenbrier, Virginia creeper, muscadine, blackberry, honeysuckle, winged sumac, and hawthorn. Some other species include red maple, hawthorn, winged elm, various oak species, and sweetgum.

Consultation was initiated on May 19, 2003 with USFWS and other cooperative agencies to review the compartment areas and agree that some action was to be taken toward improving habitat for RCW that in turn would benefit Bachman Sparrow habitat as well. Scoping letters were sent out to all members on our mailing list, May 3, 2003.

On May 19, 2003 an open house and consultation with cooperative agencies and partners occurred (See project file for details). The project file holds information on correspondence for improvements for habitat by prescribe burning, insect, vegetation control, and improvements for soil and water. All of these will contribute to a health watershed and provide habitat for the RCW and Bachman sparrow.

## **V. Species Evaluated**

There are 106 species (33 Federally listed and 73 Sensitive) on the Chattahoochee-Oconee National Forest PETS list. From this list, potentially affected species were identified by (1) reviewing their general habitat preferences, (2) consulting records of known locations of PETS species prepared by the Georgia Natural Heritage Program (GNHP) historical records, and (3) consultations with other agencies and universities as

well as reviewing data from Neotropical Migratory Bird (NTMB) Point Samples, Department of Natural Resources Bald Eagle Flights, Breeding Bird Census Routes, PETS Risk Assessment for the Oconee National Forest, and general observations.

The following species are within the range of the Oconee NF based on a review of the above sources. There are 16 species out of 106 listed from the PETS list for Chattahoochee-Oconee National Forest that may have potential to occur on the Oconee National Forest.

#### Threatened, Endangered, and Sensitive Species on the Oconee National Forest

Common Name	Scientific Name	Species Status
<b>Plants</b>		
Relict trillium	<i>Trillium reliquum</i>	E
Oglethorpe Oak	<i>Quercus oglethorpensis</i>	S
Scherwin's False Indigo	<i>Amorpha schwerinii</i>	S
Bay Starvine	<i>Schisandra glabra</i>	S
<b>Terrestrial Animals</b>		
Red-Cockaded Woodpecker	<i>Picoides borealis</i>	E
Bachman's Sparrow	<i>Aimophila aestivalis</i>	S
Migrant Loggerhead Shrike	<i>Lanius ludovicianus migrans</i>	S
Bald Eagle	<i>Haliaeetus leucocephalus</i>	E
Wood Stork	<i>Mycteria americana</i>	E
Rafinesque's Big-eared Bat	<i>Corynorhinus rafinesquei</i>	S
<b>Aquatics</b>		
Altamaha Shiner	<i>Cyprinella xaenura</i>	S
Inflated Floater	<i>Pygandon gibbosa</i>	S
Ocmulgee Shiner	<i>Cyprinella callisema</i>	S
Robust Redhorse	<i>Moxostoma robustum</i>	S
<b>Insects</b>		
Appalachian Snaketail	<i>Ophiogomphus incurvatus</i>	S
Margarita River Skimmer	<i>Macromia margarita</i>	S
T=Threatened, E=Endangered, S=Sensitive		

Of these, all but 5 were dropped from further consideration because their range does not extend into the project area or their specific habitat requirements are not found in the areas of proposed activities (See Appendix A, following the references in this document). The following presents the rationale for eliminating these species from further consideration for this proposed action.

#### Plants:

The Georgia Natural Heritage Database (July, 2003) was checked for the occurrence of Rare species information. A letter of request for TES information was sent on May 14, 2003. The letter was not answered and the database was used. This database lists the counties with the listing of rare species of concern throughout Georgia (See project file). Oglethorpe oak, Bay starvine, or Schwerin False Indigo did not appear on the list for the Jones County area. Botanical surveys conducted in 1999 or in 2004 did not show identifications of any of the TES plants listed for the Oconee National Forest. Therefore, the proposed action would not impact this species. The relict trillium is discussed more in detail in Section V since it has been identified within the Jones County area on private land. There should be no direct, indirect, or cumulative effects to these species.

### Aquatics

The Georgia Natural Heritage Database (July, 2003) was checked for the occurrence of Rare species information. On the Georgia Heritage Database the following aquatic species were listed; Ocmulgee shiner and Altamaha shiner. Our Forest Service Sensitive listing for aquatic species within the project area were listed as the Ocmulgee shiner, Altamaha shiner, and Inflated floater. The listing of the locally rare species within the Jones County area for aquatic species showed the Altamaha pocketbook (*Lampsilis dolabraeformis*), Georgia elephantear (*Elliptio dariensis*), and Four-toed salamander (*Hemidactylium scutatum*). The Georgia elephantear and Altamaha pocketbook were identified in the big waters where Falling Creek flows into the Ocmulgee. These were evaluated and dropped from consideration due to their occurrence being outside the project area greater than 15 miles north of the areas to be thinned. Caney Creek flows into Falling Creek but no mussels were identified during this survey (John Alderman, August 2002). Two sensitive aquatic species listed on the Chattahoochee Oconee National Forest were dropped due to their occurrence being outside the project area (CATT survey September 2003). Those were the Robust Redhorse, and the Inflated floater. The Ocmulgee Shiner and Altamaha shiner is further evaluated in the document. The Robust Redhorse was reintroduced into the Ocmulgee River in 2002. The DNR Stream Team surveyed several streams throughout the project area in 1998 and no listed PETS fish species were detected within the project area. The Piedmont National Wildlife Refuge has ponds of Robust Redhorse being raised for release in reintroduction in other rivers. The Piedmont National Wildlife Refuge is located north of the project area and it is likely some fish may have been washed into tributaries into the Caney Creek area. However, no surveys have identified any Robust Redhorse within the Caney Creek area. Contact with the USFWS on July 2003 to for information of any occurrences within the Caney Creek area or other tributaries showed that there were no occurrences of the species. Per conversation with Jimmy Evans August 12, 2004 no Robust Redhorse were identified north of Juliette Dam. Further surveys should be conducted to see what species might occur. There should be no direct, indirect, or cumulative effects to these species.

Altamaha and Ocmulgee shiners occur in the upper Altamaha River Drainage. This species is analyzed further in this document.

The inflated floater, a freshwater mussel, lives in soft mud and sand, and in sand bars generally found in slow moving water. This species is known to occur within the Ocmulgee and Altamaha River Drainage. This species was not detected in Wise Creek during surveys done in 1998 (per conversation with Leigh Ann McDougal, Mussel specialist with USDA Forest Service), which is 15 miles northwest of the project area. A fish survey done the Long Branch tributary, on July 21, 2000 with biologists from Georgia DNR also did not detect this species. There should be no direct, indirect, or cumulative effects to these species. Surveys conducted in August 2002, by John Alderman did not identify the inflated floater within the project area.

### Terrestrial Animals

Bald eagles occur along the seacoast and shores of large rivers and lakes. Nests are almost always located either along a shoreline or within two miles of the nearest large body of water in a live tree. Bald eagles use Lake Oconee, Lake Sinclair, and Oconee River for foraging. Some reports of eagles using the Ocmulgee River have been reported. However, no eagles have nests on national forest land (per conversation with Nick Nicholson, January 1997). The eagle appears to be a transient resident on the Ocmulgee River and Lake Oconee, using these as areas for roosting and feeding on fish. There are nesting eagles below Wallace Dam on Lake Sinclair. Rum Creek Management Area, located west of the project area, host eagle nests on Lake Juliette located approximately 5 miles from the project area. Lake Jackson is north of the project area and is a large body of water that also hosts a nesting pair of bald eagles. Based on existing information and knowledge of habitat suitability, I conclude that suitable habitat for this species does not occur within the affected area of this project. Therefore, existing information is adequate to conclude the project would have no effect, and no further inventories were conducted to support his analysis. There should be no direct, indirect, or cumulative effects to these species.

Wood storks inhabit wet meadows, swamps, marshes, ponds, and coastal shallows. They have been observed foraging on the Oconee National Forest at Dyar Pasture. The nests of wood storks are usually found in large colonies, in trees within the swamps and marshes. They are not known to use pine trees or upland forested habitat. No wood stork nest or rookeries have been observed within the area affected by this project, and none are found within the project area. Based on existing inventories, I conclude that this species is not likely to occur in areas affected by this project. Therefore, no further inventories for this species have been done in support of this project. There should be no direct, indirect, or cumulative effects to these species.

The red-cockaded woodpecker, Bachman's sparrow, and either are known to occur, or have suitable habitat, within the area affected by this project. They are analyzed in more detail within this document.

### Insects:

Allegheny Snaketail: There is much taxonomic uncertainty in this aquatic species complex, with a great deal of intergradations among specimens (Krotzer and Krotzer 1995, Vogt 1995, Tennessen et al. 1996). For this reason, some authors have chosen to refer to this complex as *Ophiogomphus incurvatus*, Appalachian snaketail (Krotzer and Krotzer 1995). The Appalachian snaketail complex (of which the Allegheny Snaketail is a subspecies) occurs in shallow riffles of low gradient streams with a sand/gravel substrate. The single Georgia record for this species was collected in 1979 near Helen, Georgia (Carle 1982) over 100 miles from this project area. There should be no direct, indirect, or cumulative effects to these species.

Margarita river skimmer - The Margarita river skimmer, a Forest sensitive species, inhabits shallow pools between riffles in undercut banks and leaf packs (S. Krotzer, pers. comm. with K. Wooster). It has been reported from North Carolina, South Carolina, Virginia, Georgia (Brick 1983) and Alabama (S. Krotzer, pers. comm. with K. Wooster). The Georgia record is a single 1939 report from Lumpkin County (Kormandy 1960). Suitable habitat for this species occurs in streams. There are a few perennial streams within the project area that will not be affected by the proposed action. According to the information obtained on this species it is unlikely that it would occur within the project area. The project area is over one hundred miles from the Georgia recorded observation of the species. There should be no direct, indirect, or cumulative effects to these species.

## **VI. Status of the Species and Habitat in the Project Area and Evaluation of Effects**

### **Relict Trillium**

The Georgia Natural Heritage Program listing by county did show the occurrence of Relict trillium within the Jones County area. Relict Trillium has been identified within the Jones County but more than 5 miles from the project area on private lands and not within the Oconee National Forest. Occurrences for this species usually will be north facing slopes within hardwood areas with mesic soils. Soils where PETS plants usually occur within the Piedmont area usually are within the Iredell soils. Iredell soils may be present within the areas throughout the Hitchiti near the Falling Creek areas. However, the project area lies east of the Falling Creek area and Ocmulgee River. Based on the information from the Georgia Natural Heritage database, district surveys, soil information, and general observations no identification of the listed species has occurred within the project area. In addition, contractor John Paul Schmidt conducted a FY 1999 plant survey (1000 acres) on the Oconee National Forest within the Hitchiti Experimental Forest with the 10 compartments in June 1999. There were no PETS plant species found within the project areas of pine and pine-hardwood habitat. Several acres that were surveyed are similar habitats including loblolly pine as the main species. Majority of the areas are upland pine and very xeric sites. A contractor conducted a plant survey (FY 2004) within some areas of concern and no TES species were located. Plant surveys were done within the areas to be thinned and no TES species were identified. Therefore I

conclude that the proposed action within the project will not adversely affect the relict trillium.

### **Red-cockaded Woodpecker**

This species currently occupies habitat on the south end of the district and the Piedmont National Wildlife Refuge within the project area. It is most abundant on the Hitchiti Experimental Forest (14 active cluster sites) and the Piedmont National Wildlife Refuge (39 cluster sites). Active cluster sites are found within Compartment 5. This species uses open pinewoods, which can be longleaf, loblolly, shortleaf, or slash. Habitat is generally of mature trees with little or no midstory (resembling a park-like stand). RCW's nest and roost each day in live pine trees. The dead pine trees (snags) created by the SPB infestation are an ephemeral foraging habitat, which will soon disappear. RCW are located in the project area and protection from further SPB infestation is necessary to provide for future foraging and nesting habitat. There are currently 5 active cluster sites and several acres of potential recruitment areas for the RCW in the project area. While infested or dead pine trees are immediately available as foraging habitat, it would soon deteriorate and not be available after the bark has fallen from the trees and can no longer harbor insects. The immediate effect of the control actions will be to cut down or remove some foraging habitat; however, long-term, this habitat would be lost along with a lot more if no action is taken. Therefore, the removal or cutting of dense trees and will result in a cumulative beneficial effect, since it would stop the spread of the SPB infestation and minimize loss of habitat. The thinning and regeneration of pine will be beneficial for the recovery of the RCW. The Proposed action would not adversely affect the RCW.

### **Bachman's Sparrow**

This species is found within open southern pine forests subject to frequent fires. The specific habitat this species prefers is large areas of well-developed bunch grass and herb layer with limited shrub and hardwood midstory. This bird has not been detected in five years of bird inventories done on the forest. Reports from the Georgia Department of Natural Resources and the PNWR found several RCW sites in the PNWR with Bachman sparrows present last year. Even though this species has not been reported on the Oconee National Forest in the past, it did occur within some RCW stands last year within the RCW areas. The proposed action might disturb a few individuals, but it is unlikely due to low density. Overall, it should be more beneficial for the Bachman's Sparrow to continue maintaining RCW habitat by doing some vegetation control and lower basal areas that done by logging activities than to let the stands become a subject of SPB infestation. Therefore, the proposed activity may directly disturb a few individuals, but the short and long term cumulative effects to the habitat may benefit the species.

### **Altamaha Shiner**

This species occurs in the upper Altamaha River Drainage, North Central Georgia. The only area where this species is found includes both the north-central Ocmulgee and Oconee Systems. The 5<sup>th</sup> level watersheds that may include this species are Oconee

River-Greenbrier Creek, Ocmulgee River-Rum Creek, Little River-Lower, and Apalachee River –Lower watersheds on the Oconee National Forest. This species of fish is listed as S2 (Imperiled) by the NatureServe database (NatureServe, 2003). Surveys conducted in September 2003 did not identify the Altamaha Shiner within this project area. Identifications were made in watersheds outside the Oconee National Forest.

The preferred habitat is rocky and sandy pools in creeks and small rivers. There is existing habitat for this species in the streams within the project area. According to Chris Skelton (Ga DNR Fisheries Biologist) identification of the Altamaha shiner was found within the Murder Creek tributary (per conversation on October 20, 2000), which is northeast of the project area within Putnam County. Fish surveys done September, 2003 show that there is potential habitat that would host the species within the locations of Apalachee-Lower, Oconee River-Greenbrier Creek, and Ocmulgee River-Rum Creek watersheds (per conversation with Craig Roghair, September 2003). Limiting factors would include the loss of water quality and high loads of sedimentation due to erosion. Currently, there is a high rate of urban development and poorly maintained unpaved road systems. Sedimentation and erosion is main cause in loss of habitat. Within the Oconee National Forest there are several hundred miles of county road systems and private land development creating the high rates of sedimentation and erosion. The Altamaha Shiner was not identified within the Caney Creek Area but within the Falling Creek tributary which is southwest of the project area approximately 5 miles (CATT survey, September 2003).

Management actions that would propose or create adverse effects would be those that disturb soil, potentially causing erosion and sedimentation levels to increase. Vegetation alterations within the watersheds would potentially increase water flow into streams. The Riparian Prescription included in the Revised Plan provides direction designed to maintain and enhance water quality. Therefore, plan implementation should have little potential for adverse impacts to individuals. Throughout the Oconee National Forest many private lands are currently in a degraded state due to increase development and agricultural use, making presence of quality habitats on national forest land increasingly important to the species. Following the State BMPs and streamside management zones will minimize any disturbance to the streams and wetlands, and should prevent any impacts to fish and other aquatic species.

### **Ocmulgee shiner (*Cyprinella callisema*)**

This species of shiner (fish) is located in small range of streams in Georgia, but common and stable in preferred habitat within the Ogeechee (uncommon) and Altamaha (locally common), river drainages (NatureServe, 2003). The 5<sup>th</sup> level watersheds that may include this species are Oconee River-Greenbrier Creek, Ocmulgee River-Rum Creek, Little River-Lower, and Apalachee River –Lower watersheds on the Oconee National Forest. This species of fish is currently listed as a S3 (Vulnerable) within the NatureServe database ( NatureServe, 2003).

This species is usually found in larger streams in open sand (usually) and/or gravel bottomed channels with water and little if any vegetation. Sandy and rocky rivers of small to medium size may also contain habitat for this species. The rivers and creeks here on the Oconee are likely to have habitat that would meet these requirements. The species has been identified by the DNR within the Ocmulgee and Altamaha River drainages. These areas of identification were several miles from the national forest. A survey conducted September 2003 by the Center for Aquatic Technology Transfer (CATT) Research Team from Asheville, North Carolina surveyed surrounding tributaries of the Apalachee, Oconee, and Ocmulgee Rivers for the species. The Ocmulgee Shiner was identified in the Caney Creek area north of the project area.

Management actions that would propose or create adverse effects would be those that disturb soil, potentially causing erosion and sedimentation levels to increase. Vegetation alterations within the watersheds would potentially increase water flow into streams. The Riparian Prescription included in the Revised Plan provides direction designed to maintain and enhance water quality. Therefore, plan implementation should have little potential for adverse impacts to individuals. Throughout the Oconee National Forest many private lands are currently in a degraded state due to increased development and agricultural use, making presence of quality habitats on national forest land increasingly important to the species. Following the State BMPs and streamside management zones will minimize any disturbance to the streams and wetlands, and should prevent any impacts to fish and other aquatic species.

## **VII. Herbicide Effects on Wildlife**

The analysis of risk of herbicide use to wildlife was conducted in a manner similar to the human health risk assessment. The basis for comparison, as suggested by the U.S. Environmental Protection Agency (EPA, 1986) in their document on environmental risk assessment, is the species LD50 and LC50 (median lethal concentration). The Region 8 risk analysis uses laboratory toxicity data on species most closely related to a series of representative wildlife and aquatic species of the National Forest of the Southeast (FEIS Vegetation Management in the Coastal Plain/Piedmont, Appendix A, p.1-10).

The active ingredient in Accord is Glyphosate. It is generally recognized to be of low toxicity in the environment. Glyphosate used in weed and shrub control does not adversely affect deer use of treated habitat areas for at least the first year after treatment. In a study to evaluate the direct effects of glyphosate on small mammals no adverse effect on reproduction, growth or survival were observed in populations of deer mice during the year following treatment. Glyphosate is slightly toxic to birds based on the

acute oral LD50 of greater than 2,000 mg/kg in bobwhite quail. Avian reproduction studies yielded no reproductive effects at dietary exposure levels of up to 1,000 ppm. Residue and metabolism studies have indicated that glyphosate is incompletely absorbed across the gastrointestinal membranes and that in the vertebrates tested, there is minimal metabolism or retention by tissue and rapid elimination of residues. It is relatively non-toxic to insects based on the 48-hour acute toxicity of greater than 100 ug/bee in honey bees (FEIS Vegetation Management in the Coastal Plain/Piedmont, Appendix A, pp. 6-8,6-9). Accord can be used around wetland areas. Rarely to herbicides reach high concentrations in aquatic systems. Glyphosate is rated moderately to slightly toxic to fish (dependent of species of fish).

Imazapyr is the active ingredient for Arsenal, used for release. It has a low order toxicity for fish and wildlife. Imazapyr is slightly toxic to mammals based on acute LD50 ranging from greater than 2,000 mg/kg in mice to greater than 5,000 mg/kg in rats. Technical imazapyr and Arsenal formulation is slightly irritating to the eyes and skin, but no teratogenic effects have been observed in rats or rabbits. Imazapyr is eliminated in the urine and feces and does not appear to accumulate in the tissues of animals. Imazapyr is characterized as practically nontoxic to birds. Acute oral LD50 of imazapyr is greater than 2,150 mg/kg (HDT) in bobwhite quail and mallards. No adverse effects have been observed at either of the doses. Imazapyr is relatively nontoxic to insects. The LD50 for honey bees are greater than 100 ug/bee (HDT), and the Arsenal formulation is greater than 25 ug/bee (HDT), no effects were observed at either of these doses (FEIS Vegetation Management in the Coastal Plain/Piedmont, Appendix A, pp. 6-9).

Triclopyr is the active ingredient on Garlon 4, used for release. It is moderately toxic to mammals based on LD50 that range from 310 mg/kg to 729 mg/kg. Based on acute oral and dietary studies, triclopyr, is slightly toxic to birds. It is relatively non-toxic to insects, based on acute contact LD50 greater than 60 ug/bee in honey bees (FEIS Vegetation management in the Coastal Plain/Piedmont, Appendix A, p.6-15). Garlon 4 and Accord have low toxicity to wildlife and decomposes rapidly in sunlight (FEIS Vegetation management in the Coastal Plain/Piedmont, Appendix C, Table 1, p. C-4). Method of application for both chemicals would be very selective. Effects on wildlife and their habitat would be little to none.

Overall effects of herbicide on wildlife including the five TES would be small and insignificant. This is due to the physical characteristics of the herbicides and the selective method of application, according to the VM FEIS. Mitigation measures are within Appendix E.

### **VIII. Cumulative Effects**

The immediate effect in the project area will be the establishment of shade intolerant, early successional species. The treated areas will allow sun light to reach the Forest floor, which in turn enhances understory herbaceous species and early successional woody species (grasses, forbs, shrubs, dogwoods, oaks etc.). Removal of undesirable

species changes the environment by increasing the penetration of light, temperature of the mineral soil, and the availability of moisture and nutrients within the area. Use of herbicides will reduce the understory species therefore giving the young pine trees sufficient nutrients, sunlight, and water to increase growth. This will produce a more succulent, but not highly preferred browse. The area will be regenerated to loblolly pine and oaks. Herbicide applications can be used to maintain or modify diversity. Herbicide applications will increase the vigor and growth of trees. Canopy closure will in time decrease the amount of shade intolerant species, and favor those shade tolerant mid-to-late successional plant species. The Forest successional stages generally determine which species will inhabit that area. Because there are no known locations of any PETS plant species in the project area, there will at this time be no long-term affects on any PETS species. If before or during treatment a PETS species is located, proper mitigation will take place immediately to protect that species.

Implementation of the Forest standards and guidelines including maximum opening size, snag/mast requirements, and water quality standard and guidelines all assist in avoiding adverse cumulative effects on PETS and wildlife species. Adherence to these standards and guidelines also assist in maintaining habitat for TES species on the Forest level. Any future action would require the appropriate analysis including cumulative effects on TES species and their habitats.

During past activities on and off the forestlands, some TES species may have been impacted. Years ago, no botanical or animal surveys were conducted, limiting the availability of information on the presence or absence of a species. Now, with availability of knowledge, surveys, and information distributed by cooperative agencies, such as the Georgia Natural Heritage Program (GNHP) and US Fish and Wildlife Service (USFWS), we are able to eliminate and determine the high-risk areas that might host PETS species. These agencies are contacted to provide information of current areas that have known PETS species or habitat with each project that involves ground disturbance as well as the NEPA requirements.

There are 4 active and 1 inactive RCW clusters near the project area, therefore RCW FEIS guideline must be followed. The proposed action would benefit the enhancement of foraging and nesting habitat for the RCW. The Bachman sparrows would receive beneficial impact in creating the availability of early successional habitat within the area. Based on the Breeding Bird Census Routes, the Forest Wide Point Samples, and historical data, the Project Area at this time does not host Bachman's Sparrow. Changes in habitat resulting from the proposed action over time alter plant species composition around the perimeters or edges. The addition of light into these areas would likely provide opportunities for species with early-successional environments.

Removal of trees creates gaps or clearings that open the forest floor to sunlight, which enhances various seed sources that benefit most wildlife and host various other plant sources. Habitat fragmentation occurs with the proposed action to cut and remove trees within the project areas providing various stages of succession throughout the Hitchiti and National Forest. Due to past occurrences of SPB spots and lightning strikes this has

been nature's way of creating early successional stages. Over a period of time these areas will move from grass/sapling stage to produce pines and hardwoods. The project area is the host of our RCW population. The past management has been limited and current prescriptions show the immediate need for improvements within the stands to improve the habitat for the RCW. According to the RCW EIS we are to maintain 120 acres of foraging habitat and provide 80 of regeneration.

Cut and Remove treatment will improve forest health, improve foraging and nesting habitat for the RCW, and provide forage and cover for other wildlife species. The proposed action will provide sufficient amounts of foraging acres for the RCW required by the RCW FEIS. Thinning the areas would help reduce future SPB attacks and create plant diversity. Some areas will be regenerated for future RCW nesting and foraging trees.

Therefore, cumulative effects from past, present, and reasonably foreseeable future actions will not adversely affect TES species.

**IX. Summary Of Determination of Effects and Mitigation Measures**

The proposed action will not adversely affect the relict trillium. The proposed action is not likely to adversely affect the RCW. Herbicide use will be implemented outside the nesting season (April 4 through July 6). The Bachman Sparrow should benefit from protected habitat associated from the proposed vegetation control activities that are proposed. Ocmulgee and Altamaha shiner will not be impacted by the proposed action.

<b>Plants</b>		
Relict Trillium	<i>Trillium reliquum</i>	not likely to adversely affect
<b>Animals</b>		
Red-Cockaded Woodpecker	<i>Picoides borealis</i>	not likely to adversely affect
Bachman's Sparrow	<i>Aimophila aestivalis</i>	beneficial impact
Altamaha shiner	<i>Cyprinella xaenura</i>	no impact
Omulgee shiner	<i>Cyprinella callisema</i>	no impact

This Biological Evaluation is based on existing available information which includes species and habitat relationships, species range and distribution, population and species occurrences derived from the past field surveys or observations. The amount, condition and distribution of suitable habitat for listed and sensitive species was also used to make determinations. This document is in compliance with guidance and direction provided in Chattahoochee-Oconee National Forest Land Management Plan (January, 2004).

A letter received on July 22, 2004, from the USFWS provided concurrence and support that the proposed action was not likely to adversely affect the RCW.

## **X. Data Sources**

USFS Plant Inventories  
GNHP Database Occurrence Records  
University of Georgia and DNR Fisheries data  
USFS Fisheries Data, CATT Survey-2003, Mussel Survey-2002  
District Monitoring Data  
Vegetation and Timber Data  
Robust Redhorse Conservation Committee Data

## **XI. Consultation With Others**

William Nightingale, District Ranger  
John Moore, Brender (Hitchiti) Forest Project Coordinator  
Rusty Rhea, Forest Entomologist  
Jimmy Rickard, USFWS Biologist Athens Office  
Cindy Wentworth, USFS Forest Botanist  
Becky Bruce, USFS Archeologist  
Leigh Ann McDougal, USFS Mussel Specialist  
John Petrick, Forest Planner  
George Bunkenhofer, Regional Office TES Biologist  
Walter Lane, GADNR Wildlife Biologist  
Tim Walker, Forest Health  
Ray Ellis, USFS Natural Resource Manager  
Tony Wild, USFS Soils Technician  
Tom Patrick, DNR Wildlife Biologist  
Nathan Klaus, Georgia Natural Resource Coordinator, GADNR Biologist  
Malcom Hodges, Nature Conservancy  
Melissa Anderson, Engineering Specialist  
Lee Kennemar, Wildlife Biologist, Department of Natural Resources

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Date: August 24, 2004

## APPENDIX A

**The following documents the review of the PETS list for the Chattahoochee-Oconee National Forests used to determine which species would be addressed in this Biological Evaluation.**

Project Name: Red-Cockaded Woodpecker (*Picoides borealis*) and Bachman Sparrow Habitat (*Aimophila estivalis*) Habitat Improvement Project

Compartments 5, 6, and 8.

Reasons species considered but eliminated from further analysis in Biological Evaluation:

1. Project area not in range of the species
  2. Species habitat does not occur in the project area
  3. Species not found during inventories
- X = Species evaluated in BE

### THREATENED AND ENDANGERED SPECIES (FY2003)

Species	Common Name	Federal Status	Reason
<b>Plants:</b>			
<i>Echinacea laevigata</i>	Smooth purple coneflower	Endangered	1
<i>Gymnoderma lineare</i>	Rock gnome lichen	Endangered	1
<i>Helonias bullata</i>	Swamp pink	Endangered	1
<i>Isotria medeoloides</i>	Small whorled pogonia	Threatened	1
<i>Sarracenia oreophila</i>	Green pitcher plant	Endangered	1
<i>Scutellaria montana</i>	Large flowered skullcap	Threatened	1
<i>Trillium persistens</i>	Persistent trillium	Endangered	1
<i>Trillium reliquum</i>	Relict trillium	Endangered	1
<i>Xyris tennesseensis</i>	Tennessee yellow-eyed grass	Endangered	1
<b>Vertebrates:</b>			
<i>Haliaeetus leucocephalus</i>	Bald eagle (nests)	Threatened	X,2
<i>Mycteria americana</i>	Woodstork (foraging habitat)	Endangered	2
<i>Myotis grisescens</i>	Gray bat	Endangered	1
Bog Turtle	<i>Trillium reliquum</i>	TSA	1
<i>Picoides borealis</i>	Red-cockaded woodpecker	Endangered	X
<i>Cyprinella caerulea</i>	Blue shiner	Threatened	1
<i>Etheostoma etowahae</i>	Etowah darter	Endangered	1
<i>Etheostoma scotti</i>	Cherokee darter	Threatened	1
<i>Percina antesella</i>	Amber darter	Endangered	1
<i>Percina aurolineata</i>	Goldline darter	Threatened	1
<i>Percina jenkinsi</i>	Conasauga logperch	Endangered	1

<b>Molluscs:</b>			
<i>Lampsilis atilis</i>	Fine-lined pocketbook	Threatened	1
<i>Medionidus acutissimus</i>	Alabama moccasinshell	Endangered	1
<i>Medionidus parvulus</i>	Coosa moccasinshell	Endangered	1
<i>Pleurobema decisum</i>	Southern clubshell	Endangered	1
<i>Pleurobema georgianum</i>	Southern pigtoe	Endangered	1
<i>Ptychobranchnus greeni</i>	Triangular kidneyshell	Endangered	1
<i>Pleurobema perovatum</i>	Ovate Clubshell	Endangered	1

**REGIONAL FORESTER'S SENSITIVE SPECIES (2001REVISION)**

Common Name	Scientific Name	Reason
<b>BIRDS</b>		
BACHMAN'S SPARROW	<i>Aimophila aestivalis</i>	X
PEREGRINE FALCON	<i>Falco peregrinus</i>	1
MIGRANT LOGGERHEAD SHRIKE	<i>Lanius ludovicianus migrans</i>	X,3
<b>MAMMALS</b>		
RAFINESQUE'S BIG-EARED BAT	<i>Corynorhinus rafinesquii</i>	1
EASTERN SMALL-FOOTED MYOTIS	<i>Myotis leibii</i>	1
SOUTHERN WATER SHREW	<i>Sorex palustris punctulatus</i>	1
<b>INSECTS</b>		
GEORGIA BELONEURIAN STONEFLY	<i>Beloneuria georgiana</i>	1
DIANA FRITILLARY BUTTERFLY	<i>Speyeria diana</i>	1
CHEROKEE CLUBTAIL DRAGONFLY	<i>Gomphus consanguis</i>	1
MARGARITA RIVER SKIMMER	<i>Macromia margarita</i>	X,3
EDMUND'S SNAKETAIL	<i>Ophiogomphus edmundi</i>	1
APPALACHIAN SNAKETAIL	<i>Ophiogomphus incurvatus</i>	X,3
<b>CRAYFISH</b>		
OCONEE STREAM CRAYFISH	<i>Cambarus chaugaensis</i>	1
A CRAYFISH	<i>Cambarus cymatilis</i>	1
CHICKAMAUGA CRAYFISH	<i>Cambarus extraneus</i>	1
LITTLE TENNESSEE CRAYFISH	<i>Cambarus georgiae</i>	1
HIAWASSEE HEADWATERS CRAYFISH	<i>Cambarus parrishi</i>	1
A CRAYFISH	<i>Cambarus speciosus</i>	1
<b>REPTILES/AMPHIBIANS</b>		
BOG TURTLE	<i>Trillium reliquum</i>	1
S. APPALACHIAN SALAMANDER	<i>Plethodon teyahalee</i> (=oconaluftee)	1
<b>MUSSELS</b>		
Common Name	Scientific Name	Reason
GEORGIA PIGTOE	<i>Pleurobema hanleyianum</i>	1
INFLATED FLOATER	<i>Pyganodon gibbosa</i>	X,3
RIDGED MAPLELEAF	<i>Quadrula rumphiana</i>	1
ALABAMA CREEKMUSSEL	<i>Strophitis connasaugaensis</i>	1
ALABAMA RAINBOW	<i>Villosa nebulosa</i>	1
Tennessee Hillsplitter	<i>Lasmigona holstonia</i>	
<b>FISH</b>		
OCMULGEE SHINER	<i>Cyprinella callisema</i>	X,3
BLUESTRIPE SHINER	<i>Cyprinella callitaenia</i>	1
ALTAMAHA SHINER	<i>Cyprinella xaenura</i>	X,3

HOLIDAY DARTER	<i>Etheostoma brevirostrum</i>	1
COLDWATER DARTER	<i>Etheostoma ditrema</i>	1
TRISPOT DARTER	<i>Etheostoma trisella</i>	1
WOUNDED DARTER	<i>Etheostoma vulneratum</i>	1
LINED CHUB	<i>Hybopsis lineapunctata</i>	1
MOUNTAIN BROOK LAMPREY	<i>Ichthyomyzon greelyi</i>	1
<b>ROBUST REDHORSE</b>	<b><i>Moxostoma robustum</i></b>	<b>X,3</b>
POPEYE SHINER	<i>Notropis ariommus</i>	1
HIGHSCALE SHINER	<i>Notropis hypsilepis</i>	1
FRECKLEBELLY MADTOM	<i>Noturus munitus</i>	1
FRECKLED DARTER	<i>Percina lenticula</i>	1
OLIVE DARTER	<i>Percina squamata</i>	1
FATLIPS MINNOW	<i>Phenacobius crassilabrum</i>	1
<b>PLANTS (Vascular)</b>		
<b>SCHERWIN'S FALSE INDIGO</b>	<b><i>Amorpha schwerinii</i></b>	<b>1</b>
GEORGIA ROCKCRESS	<i>Arabis georgiana</i>	1
GEORGIA ASTER	<i>Aster georgianus</i>	1
SPREADING YELLOW FALSE FOXGLOVE	<i>Aureolaria patula</i>	1
AMERICAN BARBERRY	<i>Berberis Canadensis</i>	1
MOUNTAIN BITTERCRESS	<i>Cardamine clematitis</i>	1
BILTMORE SEDGE	<i>Carex biltmoreana</i>	1
FORT MOUNTAIN SEDGE	<i>Carex communis</i> var. <i>amplisquama</i>	1
MISERABLE SEDGE	<i>Carex misera</i>	1
RADFORD'S SEDGE	<i>Carex radfordii</i>	1
ROAN MOUNTAIN SEDGE	<i>Carex roanensis</i>	1
CUTHBERT'S TURTLEHEAD	<i>Chelone cuthbertii</i>	1
SMALL SPREADING POGONIA	<i>Cleistes bifaria</i>	1
WHORLED STONEROOT	<i>Collinsonia verticillata</i>	1
BROADLEAF TICKSEED	<i>Coreopsis latifolia</i>	1
MOUNTAIN WITCH ALDER	<i>Fothergilla major</i>	1
SMITH'S SUNFLOWER	<i>Helianthus smithii</i>	1
HARPER'S WILD GINGER	<i>Hexastylis shuttleworthii</i> var. <i>harperi</i>	1
<b>Common Name</b>	<b>Scientific Name</b>	<b>Reason</b>
TAYLOR'S FILMY FERN	<i>Hymenophyllum tayloriae</i>	1
BUTTERNUT	<i>Juglans cinerea</i>	1
FRASER LOOSESTRIFE	<i>Lysimachia fraseri</i>	1
SWEET PINESAP	<i>Monotropsis odorata</i>	1
SMALL'S BEARDTONGUE	<i>Penstemon smallii</i>	1
MONKEYFACE ORCHID	<i>Platanthera integrilabia</i>	1
TENNESSEE LEAFCUP	<i>Polymnia laevigata</i>	1
<b>OGLETHORPE OAK</b>	<b><i>Quercus oglethorpensis</i></b>	<b>X,3</b>
ROSE GENTIAN	<i>Sabatia capitata</i>	1
PIEDMONT RAGWORT	<i>Senecio millifolium</i>	1
BAY STARVINE	<i>Schisandra glabra</i>	1
OCONEE BELLS	<i>Shortia galacifolia</i> var. <i>galacifolia</i>	1
OVATE CATCHFLY	<i>Silene ovata</i>	1
GRANITE DOME GOLDENROD	<i>Solidago simulans</i>	1
ASH-LEAF BUSH PEA	<i>Thermopsis mollis</i> var. <i>fraxinifolia</i>	1
LEAST TRILLIUM	<i>Trillium pusillum</i>	1

SOUTHERN NODDING TRILLIUM	<i>Trillium rugellii</i>	1
SWEET WHITE TRILLIUM	<i>Trillium simile</i>	1
CAROLINA HEMLOCK	<i>Tsuga caroliniana</i>	1
PIEDMONT STRAWBERRY	<i>Waldsteinia lobata</i>	1
<b>PLANTS (Nonvascular)</b>		
A LIVERWORT	<i>Drepanolejeunea appalachiana</i>	1
A LIVERWORT	<i>Pellia X appalachiana</i>	1
A LIVERWORT	<i>Plagiochila caduciloba</i>	1
A LIVERWORT	<i>Plagiochila echinata</i>	1
SHARP'S LEAFY LIVERWORT	<i>Plagiochila sharpii</i>	1
CAROLINA PLAGIOMNIUM	<i>Plagiomnium carolinianum</i>	1
PRINGLE'S PLATYHYPNIDIUM	<i>Platyhypnidium pringlei</i>	1
A LIVERWORT	<i>Radula sullivanti</i>	1

**APPENDIX E**

**HERBICIDE RISK ASSESSMENT AND  
EFFECTS ANALYSIS**

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# HERBICIDE RISK ASSESSMENT AND EFFECTS ANALYSIS FOR THE RED-COCKADED WOODPECKER HABITAT AND CANEBRAKE RESTORATION PROJECT

## Summary of Herbicide Risk Assessment and Effects Analysis

Effects of all herbicides have been assessed in the *Final Environmental Impact Statement for Vegetation Management in the Coastal Plain/Piedmont* (VMEIS). For all herbicides considered, an additional risk analysis was completed using methodology developed for the USFS by Syracuse Environmental Research Associates (SERA). The details of the risk assessment results are available in the project record. In the risk assessments, there are two terms not used in the VMEIS. These are Reference Dose (RfD) and Hazard Quotient (HQ).

- **RfD** - Derived by USEPA, this is the maximum dose in milligrams (mg) of herbicide active ingredient (a.i.) per kilogram (kg) of body weight per day that is not expected to cause injury over a lifetime of exposure. In other words, it is, in USEPA’s opinion, a “safe” lifetime daily dose. This is a conservative estimate, and is designed to be protective.
- **HQ** - This is the ratio of the estimated exposure dose to the RfD. An HQ of 1 equals exposure to the RfD; HQs less than 1 represent exposures to less than the RfD, while HQs greater than 1 represent exposures greater than the RfD. *HQs of 1.0 or less represent exposure levels that are not of concern.* HQs greater than 1.0 represent possible effects to be examined more closely. The assumptions for any exposures producing a HQ greater than 1.0 are examined to see if the exposure needs to be mitigated or avoided. For the effects on wildlife, one must remember that these effects are constructed for individuals and not populations.

For Alternatives 2, the spill plan in Appendix A of this risk assessment would be in place. Alternatives 2 also assume that all of the mitigation measures in Section 2.6 and Appendix C of this EA would be followed, as would mitigation measures in the VMEIS. Analysis done in the VMEIS is not repeated in this document.

The following tables show the basis for estimated application rates that are used in the risk analysis:

### Herbicide Application Rate Assumptions

Cut (Severed) Stems for All Applications				
Herbicide	Lbs a.i./gallon	% (Fraction) in Solution	Gallons of Spray/Acre	Lbs a.i./acre
Glyphosate	5.4	50.0%	0.65	1.8
Imazapyr	2.0	9.0%	3.0	0.6

Triclopyr (amine)	3.0	50.0%	2.5	3.75
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Foliar Spray Applications				
Herbicide	Lbs a.i./gallon	% (Fraction) in Solution	Gallons of Spray/Acre	Lbs ai/acre
Glyphosate	5.4	3.0%	8.3	1.3
Imazapyr	2.0	0.55%	15.0	0.17
Triclopyr (ester)	4.0	3.0%	17.0	2.0
Triclopyr (ester)	4.0	4.0%	12.5	2.0
Clopyralid	3.0	0.2%	44.0	0.26

For each herbicide, HQs are developed that summarize risk characteristics for workers, the general public, terrestrial animals, and aquatic species. The HQs are calculated for a central or typical exposure level, as well as upper and lower exposure levels. For this analysis, HQs derived from spill scenarios into ponds have been set to zero. The reason is that the project has mitigation measures in place (see Section 2.6 and Appendix C of this EA) that make such spills so unlikely that such an analysis would be irrelevant. These scenarios include:

- Acute/accidental exposure, contaminated water consumed by a child
- Acute /accidental exposure, consumption of fish general
- Acute /accidental exposure, consumption of fish by subsistence populations
- Acute /accidental exposure, consumption of contaminated water by a small mammal
- Acute /accidental exposure, consumption of contaminated fish by a predatory bird

HQs for the general public involving direct spray exposures to the entire body or lower legs are also considered so unlikely as to be irrelevant. These values have also been set to zero.

The following is a summary of the findings from this risk assessment for values over 1.0. A complete summary of results of the risk assessment is provided after the summary of this document.

#### Direct and Indirect Effects of Alternative 2 on Human Health and Safety

The most important HQ is the general exposure HQ for workers. These are the people most likely to have direct exposure to herbicides. According to the Forest Service Southern Region Pesticide Specialist, the central HQ best reflects a realistic upper exposure and risk for workers using required personal protective equipment and employing proper washing and hygiene habits.

Results of the risk assessment for cut surface application of glyphosate at 1.8 lbs/acre and for foliar application at 1.3 lbs/acre found that HQ's for typical exposures to humans are well under 1.0 (see process record). The upper bound for chronic exposures of a woman to contaminated fruit is above 1.0 resulting from both foliar and cut surface applications. However, the upper bound exposure is most unlikely for the following reasons:

- Herbicide application areas are signed.
- The scenario assumes contaminated fruit is eaten 90 days in a row.
- Blackberries, the only types of fruit likely to be available in any substantial quantity, are not ripe for such a long period of time.
- With cut surface application, the amount of non-target vegetation subject to spray deposition is very small.

For imazapyr and clopyralid, none of the HQs calculated for risks to workers or the general public were above 1.0.

For both the amine and ester formulation of triclopyr, results of the risk assessment found that typical exposures of workers to directed ground spray (backpack) were both less than 1.0. Although upper exposures were calculated above 1.0, the central HQ best reflects a realistic upper exposure and risk for workers using required personal protective equipment and employing proper washing and hygiene habits according to the Forest Service Southern Region Pesticide Specialist.

For both the amine and ester formulation of triclopyr, results of the HQs calculated for acute/ accidental exposure and chronic/long term exposure of a woman to contaminated fruit is above 1.0 at an upper bound. Typical exposures are less than 1.0. The upper bound exposures are most unlikely for the following reasons:

- Herbicide application areas are signed.
- The scenario assumes that contaminated fruit for long-term exposure is eaten 90 days in a row.
- Blackberries, the only types of fruit likely to be available in any substantial quantity in such an environment, are not ripe for such a long period.

Accidental exposure of a worker to contaminated gloves shows a typical HQ of 4.62 for a 3% solution and 6.29 for a 4% solution of triclopyr (ester formulation). This is unlikely to occur because the scenario assumes that the contaminated glove will be left on the skin for 1 hour. Labeling instructions and worker protection standards require proper hygiene. Contaminated gloves should be removed immediately and skin rinsed with water if contaminated.

As a result of these analyses, and given that Forest Plan Standards, project mitigation, and assumptions are met, there should be no effect to human health and safety as a result of implementing Alternative 2.

### Cumulative Effects of Alternative 2

Cumulative effects that might result from the use of herbicides on private land are difficult to assess. The use of herbicides on private land is generally for the control of woody plants near homes and in pine forests. Information about additional effects of herbicide use in an environment already impacted by industrial pollution, pesticide use,

and automobile emissions is unavailable (VMEIS, Vol. I, pg. IV-50). No other herbicide use is currently proposed within the project area or anticipated to occur within the near future. In addition, proposed treatments for release or timber stand improvement will only occur if determined to be needed after stocking checks are completed. Some sights may not require treatment, thus the proposed treatments represent the maximum, not the actual, number of acres that will be treated. For these reasons and because the effects to human health and safety are likely to be small, Alternative 2 will result in few or no cumulative impacts to human health and safety.

### Direct and Indirect Effects of Alternative 2 on PETS Species

Surveys for PETS species groups have been conducted Forest-wide by the District Biologist and plant contractors. The survey information is listed in the project file and compartment information notebook.

Habitats occurring within the project area are pine forests and woodlands, freshwater and brackish water streams, rivers, or ponds, bottomland hardwoods, and riparian forests. Refer to the Biological Evaluation (Appendix E of this EA) conducted for the project for a complete listing of PETS species occurring in the project area, associated habitats, and a detailed analysis of direct, indirect, and cumulative effects for Alternative 2.

Direct effects to PETS could occur as the result of direct contact with herbicide, or with personnel conducting mechanical and chemical control activities. Forest Plan standard mitigation measures for herbicide use state that no herbicide will be ground-applied within 60 feet of any threatened, endangered, proposed, or sensitive plant. Given that this standard is met, there would be no direct effects to any PETS plant. Additional mitigation associated with this proposal would further minimize the potential for direct effects to PETS plants. Most of the PETS animals associated with terrestrial habitats typically occur higher in the canopy and outside the range of this activity; therefore, there is likely to be no direct effect to these species, including bald eagles, wood storks, Bachman's sparrows, and Rafinesque's big-eared bat. In addition, there are red-cockaded woodpeckers (RCWs) within the project area. Active colonies are located in compartments 5. The purpose of the project is to create habitat that will support existing and future populations of this species. These birds normally forage above the level where herbicides will be applied, and therefore, would not be directly affected. There is a small chance that Bachman's sparrows, if they were nesting in an area proposed for treatment, could be disturbed by control activities. Loggerhead shrikes nest during winter when control efforts will not be occurring. There is no known nesting pair of loggerhead shrikes within the project area. Herbicide application would not occur during the RCW breeding season (April 4<sup>th</sup> through July 6<sup>th</sup>) further reducing risk. Flatwoods salamanders are fossorial, occupying positions under the ground or within the water for much of their lives, and therefore, direct effects are not likely. Application methods, including direct application to target foliage or to freshly cut stumps, would minimize the possibility for spills and/or direct contamination to non-target species.

Over the long-term, indirect effects to PETS plants are unlikely. Glyphosate and triclopyr have essentially no soil activity and are not mobile in the environment. Some non-target plants intermingled with target plants will be affected by foliar application. However, Forest-wide standards require that “No herbicide is...ground-applied within 60 feet of any threatened, endangered, proposed, or sensitive plant. Buffers are clearly marked before treatment so applicators can easily see and avoid them.” The above Forest-wide standard/guideline will protect any proposed, endangered, threatened or sensitive plants. Therefore, Alternative 2 is likely to have few direct effects to native plant species. Indirect effects to PETS animals could occur if these species were to ingest foliage or seeds contaminated with any of the chemicals proposed in Alternative 2; however, none of the chemicals would bioaccumulate in organisms.

Typical HQs associated with both foliar and cut surface applications of glyphosate for wildlife are less than 1.0. Long-term exposures of a large mammal and a large bird to contaminated vegetation have upper bounds over 1.0. The upper bound HQs are not a concern because:

- There are no large mammal threatened or endangered species on these sites. The large bird species of interest, wood storks and bald eagles, do not consume vegetation. Wild turkey diets consist mostly of insects, nuts, and berries. Releasing of hardwood stems will encourage the growth of grass and forbs that provides optimal food sources increasing brood and nesting habitat for the wild turkey (per conversation with Luke Lewis, NWTf Regional Biologist).
- The scenario assumes a diet composed of 100% contaminated vegetation from the site. This is most unlikely.
- These HQs deal with individuals, not wildlife populations. As noted above, there are no large mammal or large bird threatened or endangered species that this is likely to affect on site.
- With cut surface applications, the amount of non-target vegetation subject to spray deposition is very small.

Typical HQs associated with both triclopyr amine and triclopyr ester formulations are greater than 1.0 for the direct spraying of a small animal, acute/accidental and chronic/long-term exposure from the consumption of contaminated vegetation by a large mammal or large bird, and acute/accidental exposure of the consumption of contaminated insects by a small bird. Direct spraying of a small animal is unlikely to occur because:

- The scenario assumes 100% absorption over a 24-hour period.
- With a directed foliar application, the amount of non-target vegetation subject to spray deposition is very small.

Acute/accidental exposure and chronic/long term exposure of consumption of contaminated vegetation by a large mammal or large bird is not likely to occur because:

- There are no large mammal threatened or endangered species on these sites. The large bird species of interest, wood storks and bald eagles, do not consume

vegetation. Wild turkey diets consist mostly of insects, nuts, and berries. Releasing of hardwood stems will encourage the growth of grass and forbs that provides optimal food sources increasing brood and nesting habitat for the wild turkey (per conversation with Luke Lewis, NWTf Regional Biologist, 2004).

- The scenario assumes a diet composed of 100% contaminated vegetation from the site. This is most unlikely.
- These HQs deal with individuals, not wildlife populations. Although an individual may be affected, there will not be significant effects to the population. As noted above, there are no large mammal or large bird threatened or endangered species that this is likely to affect on site.
- Large mammals and large birds typically have fairly large home ranges. The chronic/long-term scenario also assumes that such vegetation will be consumed from the same sites for 90 consecutive days. These assumptions make the scenario quite unlikely.

HQs for acute/accidental exposure from the consumption of a contaminated insect by a small bird are not of concern because:

- There are currently several active cluster sites within the project area (compartments 5) The purpose of the project is to create and/or maintain habitat that will support existing and future populations of this species. In addition, these birds normally forage above the level where these herbicides will be applied. There should therefore be no risk to this species. Herbicide application will not occur during the breeding season (April 4<sup>th</sup> through July 6<sup>th</sup>)
- There is threatened or endangered species on these sites Compartment 5. Compartment 5 has 4 active RCW cluster sites. Bachman's sparrow is a species of viability concern that may occur in the project area. The Forest is more concerned with its habitat, however, than with individuals. None of the HQs for typical exposures for small birds exceeds 1.0 for glyphosate, imazapyr, and clopyralid. While this is not the case for triclopyr, we would not expect Bachman's sparrow to be in the types of habitat, eating the target vegetation where triclopyr would be applied. Spraying of herbicides and timber removal will be done outside the breeding season (April 4 through July 6). Informal consultation will occur with USFWS prior to implementation of project .
- These HQs deal with individuals, not wildlife populations. As noted above, there are no known threatened or endangered species on site except with Compartment 5. This only involves one area that is easily identified.
- Bat species have been considered and evaluated. The project area is outside the known or expected range of Indiana bat, but is within the range of Rafinesque's big-eared bat and the southeastern myotis. However, the proposed actions will be in pine stands and these species are usually associated with hardwoods in riparian areas. Any large hollow trees should be retained as live trees to provide potential roosts for these species. In addition to the effects described above, direct effects to birds or mammals are unlikely since these species are likely to move from the area when project activities are implemented. Although direct effects to amphibians are more likely since contact with herbicide could be absorbed through the skin and affect metabolic

activity, amphibians are likely to be under logs, rocks or leaves, making direct contact with chemicals less likely. Direct effects to other non-target plants occurring in these habitats could occur. Application methods, including direct application to target foliage or freshly cut stumps, would minimize the possibility for spills and/or direct contamination to non-target species.

### Cumulative Effects of Alternative 2 on PETS Species

There are likely to be few cumulative effects to PETS species over time as a result of implementing Alternative 2. Standards in both the Forest Plan and those associated with this proposal are designed to minimize or eliminate the potential for impacts to PETS. No other herbicide use is currently proposed within the project area or anticipated to occur within the near future, although some herbicide use is likely associated with this proposal requiring the use of non-soil active herbicide in proximity to P to occur on private lands, particularly in association with agricultural production. Given mitigation ETS and aquatic habitats and implementation of other measures for protecting PETS plants from drift and avoidance of open water, there would be no cumulative effects.

In addition, proposed treatments for release or timber stand improvement will only occur if determined to be needed after stocking checks are completed. Some sights may not require treatment, thus the proposed treatments represent the maximum, not the actual, number of acres that will be treated.

### Direct and Indirect Effects of Alternative 2 on Aquatic Species

HQs for glyphosate for acute exposure to both fish and aquatic invertebrates had calculated values greater than 1.0. However, such risks are most unlikely because glyphosate is strongly adsorbed to (bounds to the surface of) both organic matter and clay particles. Therefore, it is very immobile in the environment, and unlikely to reach aquatic habitat. Even in the unlikely event that it might reach such habitat, it would probably be quickly bound to sediment or organic matter in the stream. With the provision of riparian buffer strips on stream zones, the risk of herbicide spills or movement into stream zones is further reduced.

Results of the risk assessment for triclopyr amine formulation had calculations greater than 1.0 for acute exposure to aquatic plants. Calculations for triclopyr ester formulations were equal to 1.0. No effect will likely occur to aquatic plants because:

- Triclopyr is strongly adsorbed to (bound to the surface of) both organic matter and clay particles. Therefore, it is very immobile in the environment, and unlikely to reach aquatic habitat. Even in the unlikely event that it might reach such habitat, it would probably be quickly bound to sediment or organic matter in the stream.
- With the provision of riparian buffer strips on stream zones, the risk of herbicide spills or movement into stream zones is further reduced.

Results of the risk assessment for imazapyr for acute and chronic exposure of aquatic plants are calculated at 6.58 and 1.26, respectively, (typical exposure) for the foliar application and 19.75 and 3.78, respectively, (typical exposure) for the injection application. While imazapyr does have the potential to reach aquatic areas through runoff, such actual exposure and risk are mostly unlikely for imazapyr for the following reasons:

- Directed foliar sprays using imazapyr should be done in July or August when material washed off leaves tends not to be picked up by roots of non-target plants, allowing good selectivity. Imazapyr appears to bind loosely to clay particles and organic matter. It has relatively low soil mobility; soil activity expresses itself during the period of spring leaf expansion but applications made from late June through mid September produce little or no evidence of soil activity.
- With the provision of riparian buffer strips on stream zones, the risk of herbicide spills or movement into stream zones is further reduced. Herbicides might be able to move through the buffer, but are subject to dilution and mixing in transit. In addition, no herbicide will be applied within 100 horizontal feet of lakes, wetlands, or perennial or intermittent streams or within 100 horizontal feet of any public or domestic water source. Exclusion zones will be clearly marked before herbicide application so applicators can easily see and avoid them.
- There are no threatened or endangered aquatic plants in or near the project area. To our best knowledge, there are no known species within the proposed project sites.

#### Cumulative Effects of Alternative 2 on Aquatic Species

There are likely to be few cumulative effects to aquatic species over time as a result of implementing Alternative 2. Standards in both the Forest Plan and those associated with this proposal are designed to minimize or eliminate the potential for impacts to aquatic species. No other herbicide use is currently proposed within the project area or anticipated to occur within the near future, though some herbicide use is likely to occur on private lands particularly in association with agricultural production. Given mitigation associated with this proposal requiring the use of non-soil active herbicide in proximity to aquatic habitats, and implementation of other measures for protecting aquatic species from drift and avoidance of open water, there would be no cumulative effects.

In addition, proposed treatments for release or timber stand improvement will only occur if determined to be needed after stocking checks are completed. Some sights may not require treatment, thus the proposed treatments represent the maximum, not the actual, number of acres that will be treated.

## RESULTS OF THE RISK ASSESSMENT – DETAILED SUMMARY

Effects of all herbicides have been assessed in the *Final Environmental Impact Statement for Vegetation Management in the Coastal Plain/Piedmont* (VMEIS). For all herbicides considered, an additional risk analysis was completed using methodology developed for the USFS by Syracuse Environmental Research Associates (SERA). The details of the risk assessment results are available in the project record. In the risk assessments, there are two terms not used in the VMEIS. These are Reference Dose (RfD) and Hazard Quotient (HQ).

- **RfD** - Derived by USEPA, this is the maximum dose in mg of herbicide a.i. per kg of body weight per day that is not expected to cause injury over a lifetime of exposure. In other words, it is, in USEPA’s opinion, a “safe” lifetime daily dose. This is a conservative estimate, and is designed to be protective.
- **HQ** - This is the ratio of the estimated exposure dose to the RfD. An HQ of 1 equals exposure to the RfD; HQs less than 1 represent exposures to less than the RfD, while HQs greater than 1 represent exposures greater than the RfD. *HQs of 1.0 or less represent exposure levels that are not of concern.* HQs greater than 1.0 represent possible effects to be examined more closely. The assumptions for any exposures producing a HQ greater than 1.0 are examined to see if the exposure needs to be mitigated or avoided. For the effects on wildlife, one must remember that these effects are constructed for individuals and not populations.

For Alternative 2 the spill plan in Appendix A of this risk assessment would be in place. Alternatives 2 also assume that all of the mitigation measures in Section 2.6 and Appendix C of this EA would be followed, as would mitigation measures in the VMEIS. Analysis done in the VMEIS is not repeated in this document.

The following tables show the basis for estimated application rates used in the risk analysis:

### Herbicide Application Rate Assumptions

Cut (Severed) Stems for All Applications				
Herbicide	Lbs a.i./gallon	% (Fraction) in Solution	Gallons of Spray/Acre	Lbs a.i./acre
Glyphosate	5.4	50.0%	0.65	1.8
Imazapyr	2.0	9.0%	3.0	0.6
Triclopyr (amine)	3.0	50.0%	2.5	3.75

Foliar Spray Applications				
Herbicide	Lbs a.i./gallon	% (Fraction) in Solution	Gallons of Spray/Acre	Lbs a.i./acre
Glyphosate	5.4	3.0%	8.3	1.3
Imazapyr	2.0	0.55%	15.0	0.17
Triclopyr (ester)	4.0	3.0%	17.0	2.0
Triclopyr (ester)	4.0	4.0%	12.5	2.0

Clopyralid	3.0	0.2%	44.0	0.26
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For each herbicide, HQs are developed that summarize risk characteristics for workers, the general public, terrestrial animals and aquatic species. HQs derived from spill scenarios into ponds have been set to zero. The reason is that the project has mitigation measures in place (see Section 2.6 and Appendix C of this EA) that make such spills so unlikely that such an analysis would be irrelevant. These scenarios include:

- HH HQ2 sheet, acute/accidental exposure, contaminated water consumed by a child
- HH HQ2 sheet, acute/accidental exposure, consumption of fish general
- HH HQ2 sheet, acute/accidental exposure, consumption of fish by subsistence populations
- WL HQ1 sheet, acute/accidental exposure, consumption of contaminated water by a small mammal
- WL HQ1 sheet, acute/accidental exposure, consumption of contaminated fish by a predatory bird

HQs for the general public involving direct spray exposures to the entire body or lower legs are also considered so unlikely as to be irrelevant. These have also been set to zero.

The most important HQ is the general exposure HQ for workers. These are the people most likely to have direct exposure to herbicides. According to the Forest Service Southern Region Pesticide Specialist, the central HQ best reflects a realistic upper exposure and risk for workers using required personal protective equipment and employing proper washing and hygiene habits.

The herbicides considered for use in this EA are glyphosate, triclopyr, imazapyr, and clopyralid. HQs were calculated for the estimated application rates for this project. HQs over 1.0 are discussed below.

### **Glyphosate, Injection or Cut Stump Treatment @ 1.8 lbs/acre**

Human health HQ2 sheet, chronic exposure of a woman to contaminated fruit, upper bound HQ = 1.84. Typical exposures are well under 1.0 at a value of 0.12. Upper bound exposures are unlikely for the following reasons:

- Herbicide application areas are signed.
- The scenario assumes contaminated fruit is eaten 90 days in a row.
- Blackberries, the only types of fruit likely to be available in any substantial quantity, are not ripe for such a long period of time.
- With cut surface application, the amount of non-target vegetation subject to spray deposition is very small.

Wildlife HQ1 sheet, longer term exposure (90 days) of a large mammal to contaminated vegetation on site, upper bound HQ = 4.78. Typical exposure gives a calculated HQ of less than 1.0 at 0.51. On the same sheet, long term exposure of a large bird to

contaminated vegetation on site is calculated at an upper bound of 7.49. Typical exposure gives a calculated HQ of less than 1.0 at 0.79. These HQs (upper bound) are not a concern for the following reasons:

- There are no large mammal threatened or endangered species on these sites. The large bird species of interest, wood storks and bald eagles, do not consume vegetation. Wild turkey diets consist mostly of insects, nuts, and berries. Releasing of hardwood stems will encourage the growth of grass and forbs that provides optimal food sources increasing brood and nesting habitat for the wild turkey (per conversation with Luke Lewis, NWTf Regional Biologist, 2004).
- The scenario assumes a diet composed of 100% contaminated vegetation from the site. This is most unlikely.
- These HQs deal with individuals, not wildlife populations. As noted above, there are no large mammal or large bird threatened or endangered species that this is likely to affect on site.
- With cut surface application, the amount of non-target vegetation subject to spray deposition is very small.

Wildlife HQ2 sheet, acute exposure HQs to both fish and aquatic invertebrates are calculated at 1.67. Such exposures and risk are most unlikely for glyphosate. This is because glyphosate is strongly adsorbed to (binds to the surface of) both organic matter and clay particles. Therefore, it is very immobile in the environment, and unlikely to reach aquatic habitat. Even in the unlikely event that it might reach such habitat, it would probably be quickly bound to sediment or organic matter in the stream.

### **Glyphosate, Foliar Treatment @ 1.3 lbs/acre**

Human health HQ2 sheet, chronic exposure of a woman to contaminated fruit, upper bound HQ = 1.33. Typical exposures are well under 1.0 at a value of 0.08. Upper bound exposure is most unlikely for the following reasons:

- Herbicide application areas are signed.
- The scenario assumes that contaminated fruit is eaten 90 days in a row.
- Blackberries, the only types of fruit likely to be available in any substantial quantity in such an environment, are not ripe for such a long period.

Wildlife HQ1 sheet, longer term exposure (90 days) of a large mammal to contaminated vegetation on site, upper bound HQ = 3.46. Typical exposure gives a calculated HQ of less than 1.0 at 0.37. On the same sheet, long-term exposure of a large bird to contaminated vegetation on site is calculated at an upper bound of 5.41. Typical exposure gives a calculated HQ of less than 1.0 at 0.57. These HQs are not a concern for the following reasons:

- There are no large mammal threatened or endangered species on these sites. The large bird species of interest, wood storks and bald eagles, do not consume vegetation. Wild turkey diets consist mostly of insects, nuts, and berries. Releasing

of hardwood stems will encourage the growth of grass and forbs that provides optimal food sources increasing brood and nesting habitat for the wild turkey (per conversation with Luke Lewis, NWTf Regional Biologist, 2004).

- The scenario assumes a diet composed of 100% contaminated vegetation from the site. This is most unlikely.
- These HQs deal with individuals, not wildlife populations. As noted above, there are no large mammal or large bird threatened or endangered species that this is likely to affect on site.

Wildlife HQ2 sheet, acute exposure HQs to both fish and aquatic invertebrates are calculated at 1.21. Such exposures and risk are most unlikely for glyphosate. This is because glyphosate is strongly adsorbed to (bound to the surface of) both organic matter and clay particles. Therefore it is very immobile in the environment, and unlikely to reach aquatic habitat. Even in the unlikely event that it might reach such habitat, it would probably be quickly bound to sediment or organic matter in the stream.

#### **Imazapyr, Foliar Treatment @ 0.2 lbs/acre & Imazapyr, Injection Application @ 0.6 lbs/acre**

Wildlife HQ2 sheet, acute and chronic exposure HQs to aquatic plants are calculated at 6.58 and 1.26, respectively, (typical exposure) for the foliar application and 19.75 and 3.78, respectively, (typical exposure) for the injection application. While imazapyr does have the potential to reach aquatic areas through runoff, such actual exposure and risk are mostly unlikely for imazapyr. Directed foliar sprays using imazapyr should be done in July or August when material washed off leaves tends not to be picked up by roots of non-target plants, allowing good selectivity. Imazapyr appears to bind loosely to clay particles and organic matter. It has relatively low soil mobility; soil activity expresses itself during the period of spring leaf expansion, but applications made from late June through mid-September produce little or no evidence of soil activity. With the provision of riparian buffer strips on stream zones, the risk of herbicide spills or movement into stream zones is further reduced. 100-foot buffers would protect perennial and intermittent streams respectively, within which no herbicides would be applied. 25-foot buffers would protect ephemeral streams respectively, within which no herbicides would be applied. Herbicides could possibly move into the buffer, but are subject to dilution and mixing in transit. In addition, no herbicide will be applied within 100 horizontal feet of lakes, wetlands, or perennial or intermittent streams or within 100 horizontal feet of any public or domestic water source. Exclusion zones will be clearly marked before herbicide application so applicators can easily see and avoid them.

There are no threatened or endangered aquatic plants in or near the project area.

#### **Clopyralid, Foliar Treatment @ 0.26 lbs/acre (for Treatment of Kudzu)**

All of the calculated HQs were less than 1.0 for the proposed application rates. Even at the highest rate recommended on the label, all of the HQs were less than 1.0 for typical exposure.

### **Triclopyr (amine), Cut Surface Application @ 3.75 lbs/acre**

Human health HQ1 sheet, directed ground spray (backpack), general exposure for workers, upper bound HQ = 6.0. Typical exposures are less than 1.0 at a value of 0.98. However, the upper bound exposure is most unlikely for the following reason:

- According to the Forest Service Southern Region Pesticide Specialist, the central HQ best reflects a realistic upper exposure and risk for workers using required personal protective equipment and employing proper washing and hygiene habits.

Human health HQ2 sheet, acute/accidental exposure and long-term exposure for women, contaminated fruit, upper bound HQ = 2.33 and 6.87, respectively. Typical exposures are less than 1.0 at values of 0.15 and 0.43, respectively. The upper bound exposures are most unlikely for the following reasons:

- Herbicide application areas are signed.
- The scenario assumes that contaminated fruit for long-term exposure is eaten 90 days in a row.
- Blackberries, the only types of fruit likely to be available in any substantial quantity in such an environment, are not ripe for such a long period.

Wildlife HQ1 sheet, direct spray of a small animal shows an HQ of 3.03 for a typical exposure. This is unlikely to occur because

- The scenario assumes 100% absorption over a 24-hour period.
- With cut surface or injection application, the amount of non-target vegetation subject to spray deposition is very small.

Wildlife HQ1 sheet, acute/accidental exposure, consumption of contaminated vegetation by a large mammal and large bird, shows typical exposures of 2.15 and 3.37, respectively. These HQs are not a concern because:

- The large bird species of interest, wood storks and bald eagles, do not consume vegetation. Wild turkey diets consist mostly of insects, nuts, and berries. Releasing of hardwood stems will encourage the growth of grass and forbs that provides optimal food sources increasing brood and nesting habitat for the wild turkey (per conversation with Luke Lewis, NWTf Regional Biologist, 2004).
- The scenario assumes a diet composed of 100% contaminated vegetation from the site. This is most unlikely.
- These HQs deal with individuals, not wildlife populations.
- Compartment 5 does host four active RCW cluster sites. Bachman's sparrow is a species of viability concern that may occur in the project area. The Forest is more concerned with its habitat, however, than with individuals. The habitat for RCW is the major concern and proper care will be taken to avoid any adverse effects to the RCW or Bachman's sparrow.

Wildlife HQ1 sheet, acute/accidental exposure, consumption of contaminated insects by a small bird, shows a typical exposure HQ of 4.69. The HQ is not a concern because:

- There are four active cluster sites of RCWs within the project area. These cluster sites are within Compartment 5. The purpose of the project is to create habitat that will support existing and future populations of this species. In addition, these birds normally forage above the level where these herbicides will be applied. Herbicides will not be applied during the breeding season. There should therefore be no adverse effects to this species. Considerations will be taken to avoid any adverse effects.
- There are endangered species on these sites, within Compartment 5 where four active RCW cluster sites are located. Bachman's sparrow is a species of viability concern that may occur in the project area. The Forest is more concerned with its habitat, however, than with individuals. None of the HQs for typical exposures for small birds exceeds 1.0 for glyphosate, imazapyr, and clopyralid. While this is not the case for triclopyr, we would not expect Bachman's sparrow or the RCW to be in the types of habitat, eating the target vegetation where triclopyr would be applied.
- These HQs deal with individuals, not wildlife populations. As noted above, there are only four active cluster of RCWs within the project area.
- Bat species have been considered and evaluated. The project area is outside the known or expected range of Indiana bat, but within the range of Rafinesque's big-eared bat and the southeastern myotis. However, these actions will be in pine stands and these species are usually associated with hardwoods in riparian areas. Any large hollow trees should be retained as live trees to provide potential roosts for these species. In addition to the effects described above, direct effects to birds or mammals are unlikely since these species are likely to move from the area when project activities are implemented. Although direct effects to amphibians are more likely since contact with herbicide could be absorbed through the skin and effect metabolic activity, amphibians are likely to be under logs, rocks or leaves, making direct contact with chemicals less likely. Direct effects to other non-target plants occurring in these habitats could occur. Application methods, including direct application to target foliage or freshly cut stumps, would minimize the possibility for spills and/or direct contamination to non-target species.

Wildlife HQ1 sheet, longer term exposure (90 days) of a large mammal and a large bird to contaminated vegetation on site, typical exposure HQ = 1.9 and 2.98, respectively. These HQs are not a concern for the following reasons:

- There are no large mammal threatened or endangered species on these sites. The large bird species of interest, wood storks and bald eagles, do not consume vegetation. Wild turkey diets consist mostly of insects, nuts, and berries. Releasing of hardwood stems will encourage the growth of grass and forbs that provides optimal food sources increasing brood and nesting habitat for the wild turkey (per conversation with Luke Lewis, NWTf Regional Biologist, 2004).
- The scenarios assume a diet composed of 100% contaminated vegetation from the site. Large mammals and large birds typically have fairly large home ranges. The

scenario also assumes that such vegetation will be consumed from the same sites for 90 consecutive days. These assumptions make the scenario quite unlikely.

- These HQs deal with individuals, not wildlife populations. As noted above, there are no large mammal or large bird threatened or endangered species that this is likely to affect on site.

Wildlife HQ2 sheet, the acute exposure HQ for aquatic plants has an upper bound of 3.75 and a typical exposure HQ of 1.88. These are not of concern because:

- Triclopyr is strongly adsorbed to (bound to the surface of) both organic matter and clay particles. Therefore, it is very immobile in the environment, and unlikely to reach aquatic habitat. Even in the unlikely event that it might reach such habitat, it would probably be quickly bound to sediment or organic matter in the stream.
- With the provision of riparian buffer strips on stream zones, the risk of herbicide spills or movement into stream zones is further reduced.

### **Triclopyr (ester), Foliar Application @ 2.0 lbs/acre (3% Solution and 4% Solution)**

Human health HQ1 sheet, directed ground spray (backpack), general exposure for workers, upper bound HQ = 3.2. Typical exposures are less than 1.0 at a value of 0.52. However, the upper bound exposure is most unlikely for the following reason:

- According to the Forest Service Southern Region Pesticide Specialist, the central HQ best reflects a realistic upper exposure and risk for workers using required personal protective equipment and employing proper washing and hygiene habits.

Human health HQ1 sheet, accidental exposure of a worker to contaminated gloves shows a typical HQ of 4.62 for a 3% solution and 6.29 for a 4% solution. This is unlikely to occur because the scenario assumes that the contaminated glove will be left on the skin for 1 hour. Labeling instructions and worker protection standards require proper hygiene. Contaminated gloves should be removed immediately and skin rinsed with water if contaminated.

Human health HQ2 sheet, acute/accidental exposure and long-term exposure for women, contaminated fruit, upper bound HQ = 1.24 and 3.67 respectively. Typical exposures are less than 1.0 at values of 0.08 and 0.23, respectively. The upper bound exposures are most unlikely for the following reasons:

- Herbicide application areas are signed.
- The scenario assumes that contaminated fruit for long-term exposure is eaten 90 days in a row.
- Blackberries, the only types of fruit likely to be available in any substantial quantity in such an environment, are not ripe for such a long period.

Wildlife HQ1 sheet, direct spray of a small animal shows an HQ of 1.62 for a typical exposure. This is unlikely to occur because

- The scenario assumes 100% absorption over a 24-hour period.
- With a directed foliar application, the amount of non-target vegetation subject to spray deposition is very small.

Wildlife HQ1 sheet, acute/accidental exposure, consumption of contaminated vegetation by a large mammal and large bird, shows typical exposures of 1.15 and 1.79, respectively. These HQs are not a concern because:

- The large bird species of interest, wood storks and bald eagles, do not consume vegetation. Wild turkey diets consist mostly of insects, nuts, and berries. Releasing of hardwood stems will encourage the growth of grass and forbs that provides optimal food sources increasing brood and nesting habitat for the wild turkey (per conversation with Luke Lewis, NWTf Regional Biologist, 2004).
- The scenario assumes a diet composed of 100% contaminated vegetation from the site. This is most unlikely.
- These HQs deal with individuals, not wildlife populations.

Wildlife HQ1 sheet, acute/accidental exposure, consumption of contaminated insects by a small bird, shows a typical exposure HQ of 2.50. The HQ is not a concern because:

- There are four active cluster sites of RCWs within the project area. The cluster sites are within Compartment 5. The purpose of the project is to create habitat that will support existing and future populations of this species. In addition, these birds normally forage above the level where these herbicides will be applied. Herbicide application will not occur during the breeding season. There should, therefore, be no adverse effects to this species. Considerations will be taken to avoid any adverse effects.
- There are endangered species on these sites, within Compartment 5 where four active RCW cluster sites are located. Bachman's sparrow is a species of viability concern that may occur in the project area. The Forest is more concerned with its habitat, however, than with individuals. None of the HQs for typical exposures for small birds exceeds 1.0 for glyphosate, imazapyr, and clopyralid. While this is not the case for triclopyr, we would not expect Bachman's sparrow or the RCW to be in the types of habitat, eating the target vegetation where triclopyr would be applied. Spraying will occur outside the breeding season (April 4 through July 6).
- These HQs deal with individuals, not wildlife populations. As noted above, there are only four active cluster of RCWs within the project area.
- Bat species have been considered and evaluated. The project area is outside the known or expected range of Indiana bat, but within the range of Rafinesque's big-eared bat and the southeastern myotis. However, these actions will be in pine stands and these species are usually associated with hardwoods in riparian areas. Any large hollow trees should be retained as live trees to provide potential roosts for these species. In addition to the effects described above, direct effects to birds or mammals are unlikely since these species are likely to move from the area when project activities are implemented. Although direct effects to amphibians are more likely

since contact with herbicide could be absorbed through the skin and effect metabolic activity, amphibians are likely to be under logs, rocks or leaves, making direct contact with chemicals less likely. Direct effects to other non-target plants occurring in these habitats could occur. Application methods, including direct application to target foliage or freshly cut stumps, would minimize the possibility for spills and/or direct contamination to non-target species.

Wildlife HQ1 sheet, longer term exposure (90 days) of a large mammal and a large bird to contaminated vegetation on site, typical exposure HQ = 1.01 and 1.59, respectively. These HQs are not a concern for the following reasons:

- There are no large mammal threatened or endangered species on these sites. The large bird species of interest, wood storks and bald eagles, do not consume vegetation. Wild turkey diets consist mostly of insects, nuts, and berries. Releasing of hardwood stems will encourage the growth of grass and forbs that provides optimal food sources increasing brood and nesting habitat for the wild turkey (per conversation with Luke Lewis, NWTf Regional Biologist, 2004).
- The scenarios assume a diet composed of 100% contaminated vegetation from the site. Large mammals and large birds typically have fairly large home ranges. The scenario also assumes that such vegetation will be consumed from the same sites for 90 consecutive days. These assumptions make the scenario quite unlikely.
- These HQs deal with individuals, not wildlife populations. As noted above, there are no large mammal or large bird threatened or endangered species that this is likely to affect on site.
- Both HQs are close to 1.0 for typical exposure.

Wildlife HQ2 sheet, the acute exposure HQ for aquatic plants has an upper bound of 2.0 and a typical exposure HQ of 1.0. These are not of concern because:

- Triclopyr is strongly adsorbed to (bound to the surface of) both organic matter and clay particles. Therefore, it is very immobile in the environment, and unlikely to reach aquatic habitat. Even in the unlikely event that it might reach such habitat, it would probably be quickly bound to sediment or organic matter in the stream.
- With the provision of riparian buffer strips on stream zones, the risk of herbicide spills or movement into stream zones is further reduced.
- At a typical exposure of 1.0, this calculation implies little, if any, risk.

### **Acceptable Maximum Application Rates**

Estimated application rates are evaluated above. Maximum acceptable rates were also evaluated in the event of unusual field conditions or for reference in other projects. Readers should again note the assumed mitigation measures listed in Appendix C of this EA and the effects already discussed.

For glyphosate applied at a maximum of 5 pounds/acre typical exposure rates are all less than 1.0 except for long-term exposure of a large bird or mammal and acute exposure for

fish, aquatic invertebrates, and aquatic plants. These scenarios are unlikely to occur as explained in the effects previously discussed.

For clopyralid, all of the HQs were less than 1.0 for typical exposure at the highest rate recommended on the label.

For imazapyr typical exposure was less than 1.0 except for acute/chronic exposure for aquatic plants, similar to the effects for the proposed application rates discussed above.

Estimated application rates for triclopyr are near maximum allowable rates set forth in the VMEIS with results of the risk analysis discussed in the previous section.

**APPENDIX A**  
**PESTICIDE**  
**EMERGENCY SPILL PLAN**

NOTE: The person responsible for project planning should insure that all of the “\*\*\*\*” have been replaced with adequate and appropriate information relating to the project being implemented. Field personnel transporting or working with pesticides should familiarize themselves with this plan, as well as with the labels and Material Safety Data Sheets (MSDSs) of all pesticides to be used in a project. A copy of this plan is to be carried to the field by all crews working with pesticides; a copy is also to be kept in an easily accessible location near the telephone at the district dispatch or reception desk.

Emergency procedures to follow when a pesticide spill occurs at the work site:

**1. PROVIDE FOR CARE OF INJURED OR CONTAMINATED PERSONNEL**

Immediately determine if any personnel are injured or contaminated. Each situation may differ, but the major and immediate effort should be to assist injured personnel and minimize further contamination. Accordingly, the following must be accomplished as rapidly as possible.

- A. If a fumigant or dangerous vapor is involved, put on the appropriate respirator or breathing device. REMEMBER, this is an emergency procedure, and not intended for prolonged exposure. Since many pesticides can produce toxic fumes or vapors, always ventilate enclosed areas to prevent build-up of toxic fumes.
- B. Remove injured or contaminated personnel from the spill site to a safe area.
- C. If eyes are contaminated with a pesticide, give first priority to washing them out, using portable eyewash bottles, or if these are unavailable, any clean water. Remove contaminated clothing from affected individuals, and wash pesticides off skin with detergent and clean water. If any pesticides have been ingested, see Material Safety Data Sheet for specific first aid measures.
- D. Immediately seek medical assistance for injured and contaminated personnel. Do not leave contaminated individuals alone unless essential to secure aid. If necessary, direct a third person to stay with the injured until a physician takes charge and has been advised of the actual or possible pesticide exposure.
- E. Watch for the following symptoms of pesticide poisoning: Eye irritation, skin irritation, gastrointestinal discomfort, dizziness, headache, nausea, vomiting, diarrhea, slurred speech, muscle twitching or convulsions, or difficulty in breathing.

**2. SPILL IDENTIFICATION**

Determine product name(s) for the chemical(s) spilled and check the label and MSDS for immediate hazards. Shut off ignition sources and stop any smoking in case chemicals may be flammable. Isolate contaminated area and keep unnecessary people away.

**3. NOTIFY (Field personnel contact dispatcher/receptionist for aid)**

District Pesticide Specialist: Timothy Walker  
Office – 706-485-7110, ext 119  
Home - 706-485-9635  
District Safety Officer: Angela Marcano  
Office – 706-485-7110, ext 114  
Home - unavailable

Give the following information: All information is included in the Pesticide Emergency Spill Plan.

The District Pesticide Specialist will notify other key personnel and agencies as required (see attached notification list).

**4. CONTAIN SPILL**

Spilled pesticides must be contained as much as possible on the site where the spill has occurred. Keep spilled pesticides from entering streams, storm drains, wells, ditches, or water systems by following these procedures:

- A. Wear appropriate protective clothing. At a minimum, this will include suitable clothing for pesticide application, plus rubber or nitrile gloves and safety glasses or goggles. In addition, use coveralls or a rain suit, rubber boots or overshoes, or a respirator if extra protection is needed.
- B. Prevent further leakage from containers by repositioning them so that the damaged part of the container is above the level of the contents, or by applying rags, tape, or other materials at hand to temporarily seal the leak.
- C. Separate leaking containers from undamaged containers.
- D. Rope or flag off the area and post warning signs to keep unprotected personnel from entering.
- E. Confine the spill to prevent it from spreading. Encircle the spill area with a dike of sand or other absorbent material; rags or similar material may be used if necessary. If spilled material may flow toward sensitive areas, divert it by ditching.
- F. If the spill involves a small watercourse, dam it up to confine the spill if possible. If available, activated charcoal may be used to filter contaminated water. For larger waterways, a log boom or baled straw may be used to contain the spill. Dam or divert the flow of clean water around the spill if possible. Some pesticides (such as Glyphosate and Diquat) may be inactivated by muddying the water.
- G. If the pesticide spilled is a liquid, cover it with absorbent material (kitty litter is ideal). If the spilled pesticide is in a dry formulation, cover it with a secured plastic tarpaulin to prevent it from becoming wet or being blown away. (NOTE: Unless this material can be reused in accordance with the pesticide label, it must be disposed of as a toxic waste.)

H. DO NOT flush the spill into a ditch, sewer, drain, or off a road, since this will further spread the chemical necessitating a larger cleanup effort.

Vehicle spill kits contain necessary items for containing small spills (see attached list for items needed in vehicle spill kit). Large spills may require the use of a dozer and/or additional items from the storage facility spill kit, located at the following businesses:

- Contact: Charlie Mathis (heavy equipment)  
Address: Route 1, Box 214A, Haddock, Georgia 31033  
Phone: 478-986-3319
- Contact: Bill Coleman (heavy equipment/hay bales)  
Address: 1015 Main Street, White Plains, Georgia 30678  
Phone: 706-467-2446
- Contact: Johnny Hallman (heavy equipment)  
Address: P.O. Box 3409, Eatonton, Georgia 31024  
Phone: 706-485-6951

## **5. CLEAN-UP**

Spill containment is the objective of this emergency spill plan. Clean-up and disposal procedures are covered in FSH 2109.14, Chapter 33, Project Safety Plan; in the 1993 Emergency Response Guidebook ("Orange Book"), and in the Material Safety Data Sheets for each pesticide.

## **6. DOCUMENTATION**

Document spill type, action taken, and any needed follow-up or assistance necessary in a letter to the Forest Supervisor, with cc to Regional Pesticide Specialist.

### **SUMMARY OF CLEAN-UP STEPS**

#### **DRY SPILLS**

- a. Immediately cover powders or dusts with plastic or a tarpaulin to prevent the pesticide from becoming airborne. A fine mist of water may also be used to dampen the dust and reduce spreading. CAUTION: Too much water may dissolve the pesticide and move it into the soil.
- b. Sweep the material together, rolling the tarp back slowly as you do.
- c. Shovel the material into plastic bags or drums.
- d. Seal the bags and label them, identifying the pesticide and other contents.
- e. Store the containers of material in the pesticide storage building until the contents can be evaluated for disposal or re-use in a manner consistent with labeling.

#### **LIQUID SPILLS**

Pump or bail as much of the spilled liquid as possible into containers, then:

- a. Use absorbent material, such as commercially bagged clay, kitty litter, or sawdust to soak up the spill. Use only enough material to absorb the spill. Begin spreading the absorbent material around the edge of the spill, and work toward the center.
- b. Shovel the absorbent material and pesticide, along with any contaminated soil, into leak-proof containers.
- c. Label all containers.
- d. Store the containers in the pesticide storage building until the contents can be evaluated for disposal or re-use in a manner consistent with labeling.

### **NOTIFICATION LIST OF KEY PERSONNEL AND AGENCIES**

1. District Pesticide Specialist – Timothy Walker  
Home: 706-485-7110, ext 119  
Office: 706-485-9635
2. District Safety Officer – Angela Marcano  
Office: 706-485-7110, ext 114  
Home: unavailable
3. Name and phone number of local medical facility to be used in event of an emergency:

Greene County: Boswell Memorial Hospital	706-453-7331
Jasper County: Jasper Memorial Hospital	706-468-6411
Putnam County: Putnam General Hospital	706-485-2711
Jones County: Oconee Regional Medical Center	478-454-3500

4. Name and phone number of local fire department(s):

Greene County, City Hall: 706-453-2200  
Georgia Forestry Commission: 706-486-2466  
Jasper County, City Hall: 706-468-6213  
Georgia Forestry Commission: 706-468-6760  
Putnam County, City Hall: 706-485-2531  
Georgia Forestry Commission: 706-485-4071  
Jones County, City Hall: 478-9865433  
Georgia Forestry Commission: 478-986-3593  
(911) is available in all counties

5. Names and phone numbers of county law enforcement agencies:

Greene County Sheriff: 706-435-2222  
Jasper County Sheriff: 706-468-6213

Putnam County Sheriff: 706-485-8557  
Jones County Sheriff: 478-986-3489

6. Forest Pesticide Specialist – Ron Stephens  
Home: 770-983-0782  
Office: 770-297-3020  
(Notify if spill is larger than 5 gallons)
7. State Office of Emergency Services – Tom Bardenwarper  
Home: 770-532-0146  
Office: 770-297-3077  
(Notify only if assistance is necessary or if required by state law)
8. USFS Region 8 Spill Coordinator – Paul Mistretta  
Office: 404-347-3369  
Email: pmistretta@fs.fed.us
9. Pesticide manufacturers:  
[List emergency numbers of the manufacturers of pesticides used on the district.  
These may be found on the pesticide labels and MSDSs.]
10. CHEMTREC - USEPA number for technical assistance - 1-800-424-9300  
(NOTE: Chemicals that we normally use are generally not on USEPA's hazardous list; you may not be required to contact them. Double check the MSDS for requirements.)
11. USEPA National Emergency Response Center - 1-800-424-9346  
(Notify only if spilled chemical is on CERCLA Consolidated Chemical List)
12. Pesticide Safety Team of the National Agricultural Chemicals Association (for technical assistance) - 1-513-961-4300
13. Local sources of emergency equipment and supplies:

**Charlie Mathis:** Heavy Equipment—Route 1, Box 214A, Haddock, Georgia 31033 Phone: 478-986-3319

**Bill Coleman:** Heavy Equipment/Hay Bales—1015 Main Street, White Plains, Georgia 30678 Phone: 706-467-2446

**Johnny Hallman:** Heavy Equipment, etc.—P.O. Box 3409, Eatonton, Georgia 31024 Phone: 706-485-6951

## RECOMMENDED PESTICIDE SPILL KIT CONTENTS

### **Storage Facility Kit**

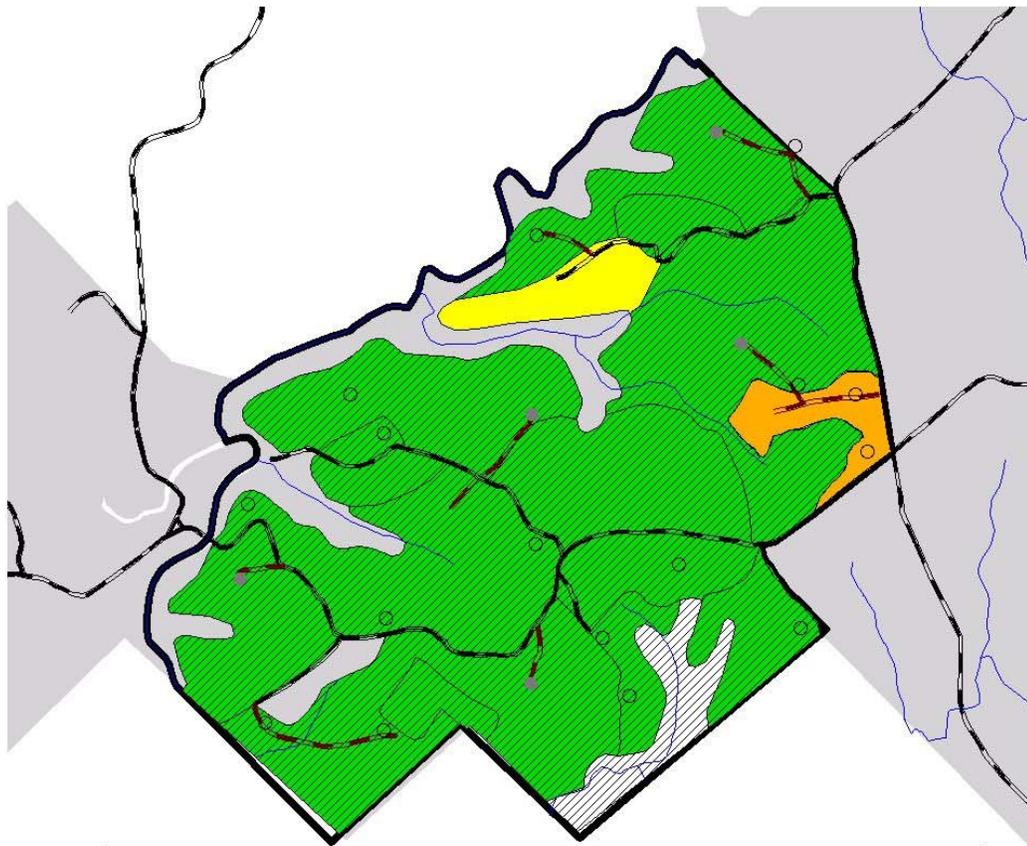
4 pairs nitrile gloves  
2 pairs unvented goggles  
2 respirators and cartridges (chemical resistant)  
2 pairs rubber or neoprene boots or overshoes  
2 pairs of coveralls or rain suits  
1 roll of flagging or engineers' tape  
1 dustpan  
1 shop brush  
1 dozen polyethylene bags with ties  
1-gallon liquid detergent  
1 polyethylene or plastic tarp  
100 feet of rope  
10 blank labels  
1 ABC-type fire extinguisher  
80 lbs absorbent material  
3 gallons household bleach  
1 square-point "D" handled shovel  
1 55-gallon open-head drum, or 50-gallon plastic trash can with lid  
1 18-inch push broom with synthetic fibers  
1 bung and 1 bung wrench for 2.5 inch and 0.75 inch bungs  
1 drum spigot  
30 ft. of .5 inch polyethylene tubing or 150 feet of garden hose

### **Vehicle Kit**

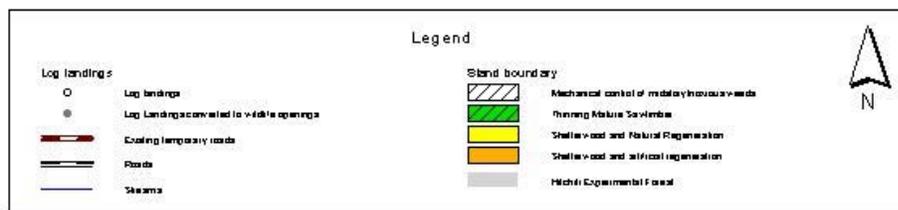
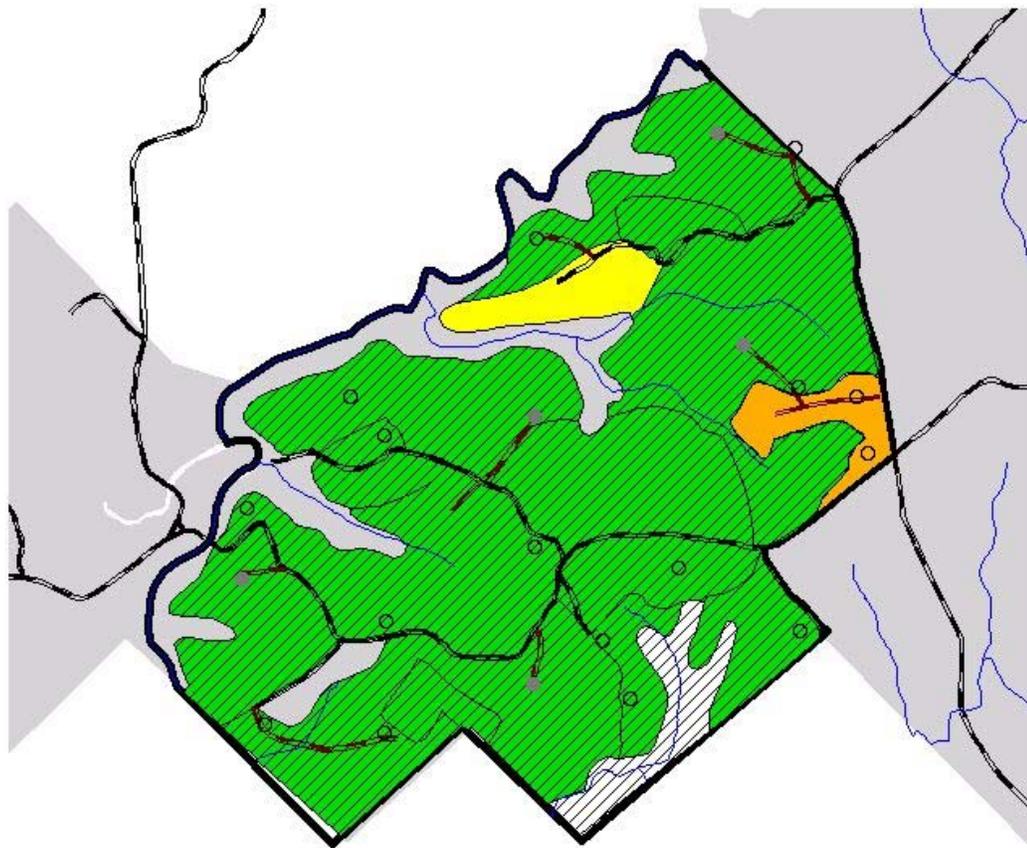
2 pairs nitrile gloves  
1 pair unvented goggles  
1 respirator and cartridges  
1 pair of rubber or neoprene boots  
1 dustpan  
1 shop brush  
6 polyethylene bags with ties  
1-pint liquid detergent  
1 polyethylene or plastic tarp  
10 blank labels  
1 ABC-type fire extinguisher  
10-30 lbs. absorbent material  
2 eyewash bottles  
1 round-point shovel  
1 portable weatherproof container for storage and transport (may also be used for cleanup)

**APPENDIX G**  
**MAPS OF THE ALTERNATIVES**

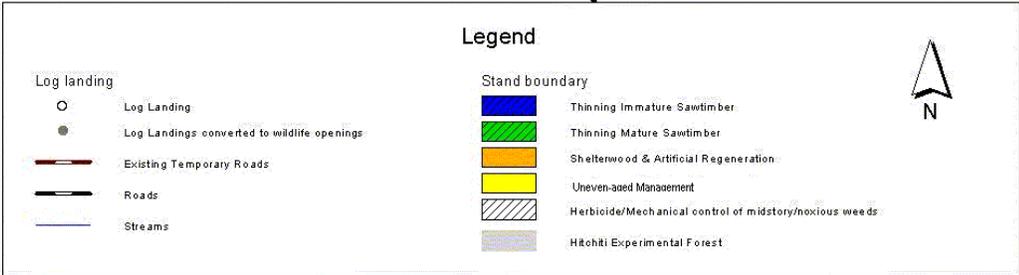
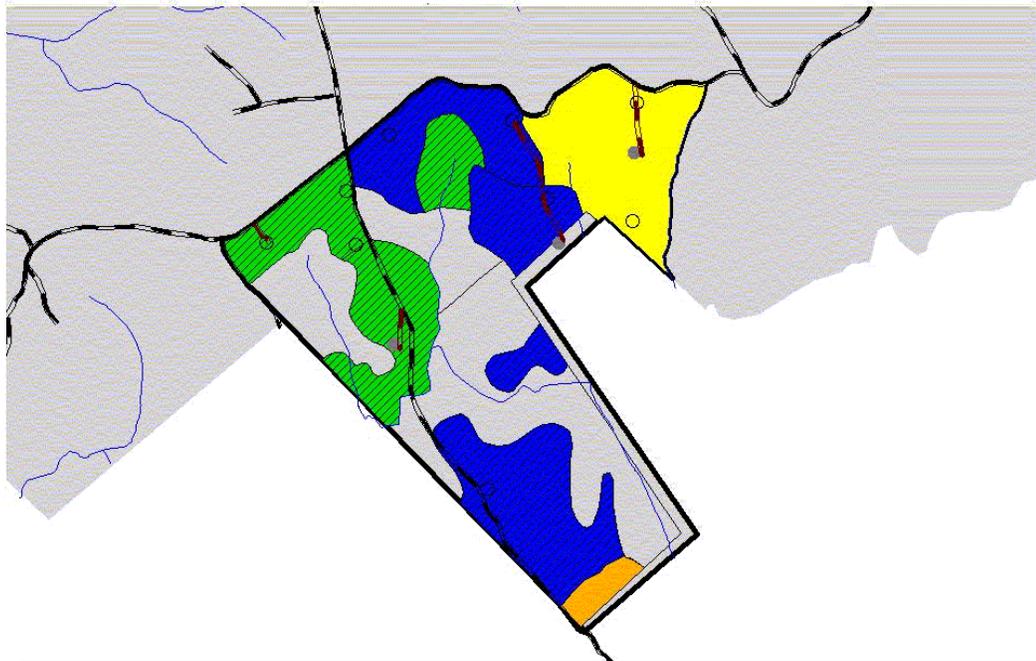
## Alternative 2 - Compartment 5



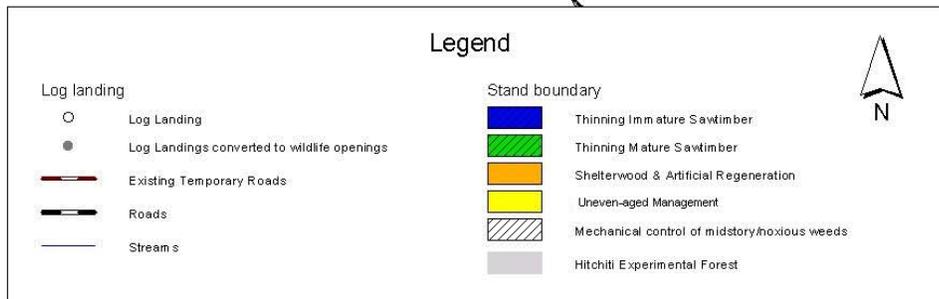
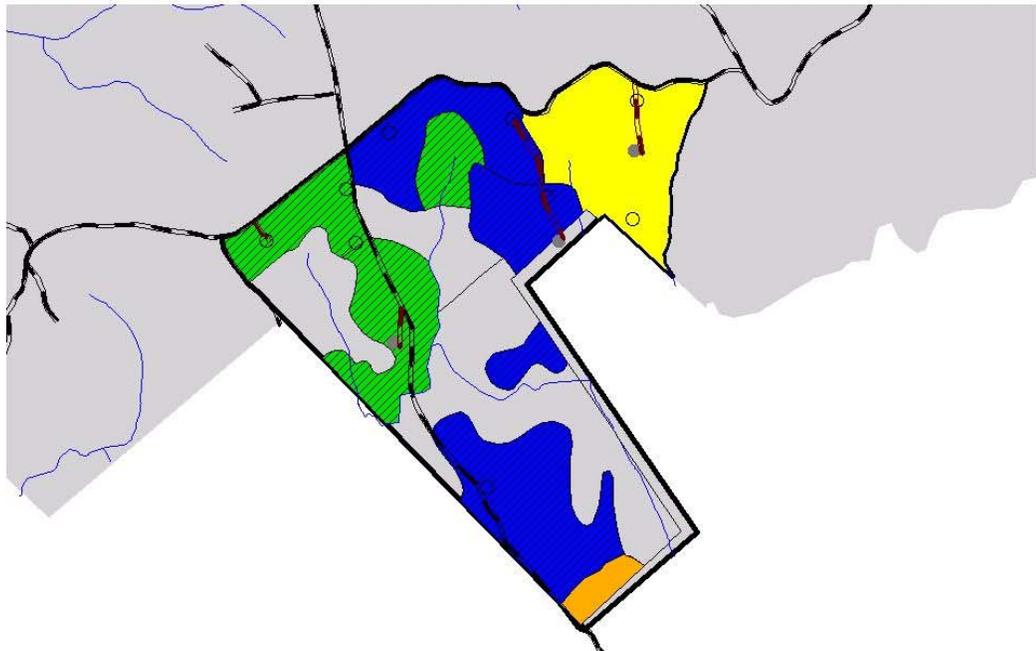
## Alternative 3 - Compartment 5



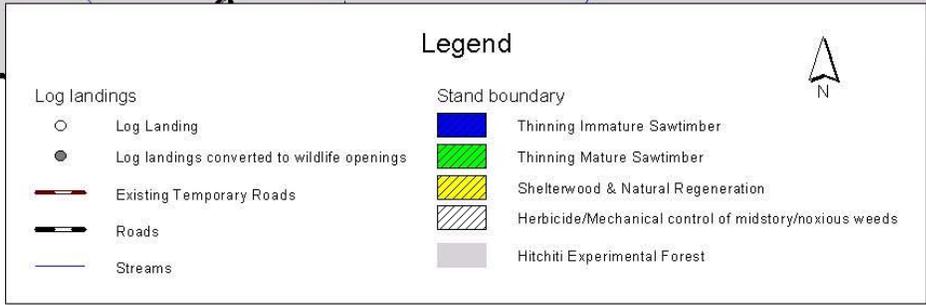
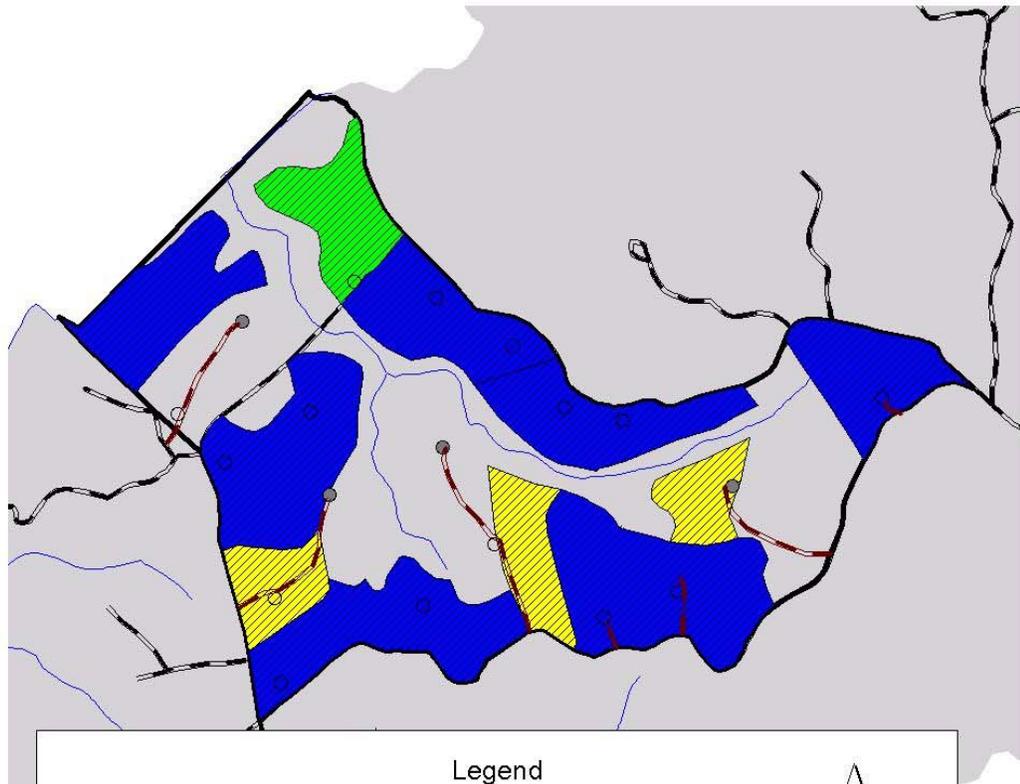
# Alternative 2 - Compartment 6



## Alternative 3 - Compartment 6



## Alternative 2 - Compartment 8



# Alternative 3 - Compartment 8

