ENVIRONMENTAL ASSESSMENT

For

Wildlife Food Plot Renovation

Within Four USFS Districts

on the Chattahoochee-Oconee National Forest

Including Brasstown, Toccoa,

Tallulah and Chattooga Districts

October 2002

Agencies: Georgia Department of Natural Resources
Wildlife Resources Division
USDA Forest Service

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CHAPTER I

PURPOSE OF AND NEED FOR THE PROPOSAL

A. NEED

The Georgia Department of Natural Resources, Wildlife Resources Division (WRD), Game Management Section is conducting environmental analysis to reduce invasive plant and insect species by using herbicides and insecticides on approximately 700 acres of existing state maintained, wildlife food plots on the Chattahoochee National Forest. The 500 small plots (averaging only 1.4 acres each) proposed for treatment are located on 8 Wildlife Management Areas (WMAs), WRD personnel will complete the environmental analysis and conduct the fieldwork.

No more than 100 sites (140 acres) will be treated in any given year and will take at least 5 years to treat all plots. (See Appendix A). The treatments are necessary to rehabilitate wildlife food plots that have been taken out of effective production by white grubs (beetle larvae), noxious weeds or both.

B. PURPOSE

The Georgia Wildlife Resources Division, Game Management Section operates a system of 12 wildlife management areas comprising 365,000 acres on the Chattahoochee-Oconee National Forest under a Memorandum of Understanding with the U.S. Forest Service (see Appendix B). One habitat management technique used to improve long-term food supplies of these areas for wildlife is the installation of agricultural openings. At present, there are approximately 700 acres of openings on 4 Northeast Georgia Districts of the Chattahoochee Forest WMAs. Most of these food plots are planted in high quality grass-clover mixtures, which have been proven to provide substantial food supplies to wildlife species such as white-tailed deer, wild turkeys, ruffed grouse, songbirds, black bears, cottontail rabbits, furbearers, small mammals, and others. This is particularly true in large, heavily forested areas of the Southern Appalachian Mountains where wildlife populations are so dependent on widely fluctuating hard mast crops (Wentworth 1989, Wentworth et al. 1992).

In addition to the state installed wildlife openings on WMAs, the U.S. Forest Service also plants and maintains several hundred acres of openings to grasses and clover. These openings act as a buffer to the natural food supply that is affected by mast failures and harsh winters.

Currently, about half of the WRD plots are being invaded by

noxious weeds such as fescue, johnsongrass, sericea lespedeza, foxtail grass, crabgrass or Bermuda grass or white grubs of June beetles, Japanese beetles, and chafer beetles. Degree of infestation ranges from moderate to severe on these fields with a common scenario of crabgrass or fescue covering up to 100% of the plot and grub densities as high as 10 to 12 per square foot in fading clover fields. Over the next 5 years, we expect all of our acreage (700 acres) to become infested.

The proposed action is required to renovate food plots infested with weeds or white grubs. The weeds quickly out-compete clovers and grasses which are highly beneficial to wildlife and render the food plot valueless to wildlife. The grubs destroy the root system of grasses and clover in the food plots and eventually completely destroy the entire stand reducing it to bare soil or allowing annual grasses and weed species to invade. From original establishment of new openings, it takes about 3 or 4 years for the weed densities and grub populations to build up to levels, which are severely detrimental to the survival of the food plants. After this period, their presence is easily noted by reduced vigor and growth of the stand, spotty dying of large areas, invasion of noxious weeds, increased mole activity and skunk diggings - all indications of severe weed problems or high grub density. If the field is not treated in the interim with herbicides and/or pesticides the majority of the stand dies over a period of several months and usually reverts to crabgrass or fescue.

The benefits of food plots to wild turkey and ruffed grouse populations are generally well known to wildlife managers. Both species benefit from the high quality forage and seeds as well as from the insects attracted to the openings. Food plots as a deer management tool has been the subject of some debate in the past, but recent research done in Georgia, Alabama, Mississippi, Texas and Louisiana, shows that cool season grasses and clovers provide both for a greater harvest of deer and a way to meet nutritional deficiencies of deer in poor habitats. They are particularly valuable to deer populations in winter when native foods are dormant and following poor acorn crops when no high quality backup food supply is available (Wentworth et al. 1992, Kammermeyer et al. 1993).

Loss of clover/grass stands from weed and grub infestations in wildlife management area food plots can be predicted to cause a decrease in the nutritional plane of our deer herds, a loss of body condition and reproductive potential, and reduced harvest (Davis, et al. 1988; Johnson, et al. 1987; Kammermeyer and Moser, 1990; Wentworth, 1989). Our own research indicates a strong

relationship between deer harvest and the acreage of wildlife openings on these WMAs (Kammermeyer and Moser 1990). Lowered deer populations are a likely occurrence but this is less well documented than reduced harvest.

C. PROPOSED ACTION

Area managers of 8 northeast Georgia WMAs (Blue Ridge, Chattahoochee, Chestatee, Coopers Creek, Lake Burton, Lake Russell, Swallow Creek and Warwoman), were asked to identify 10 to 18 acres of unproductive wildlife food plots containing fescue, crabgrass, Bermuda grass or foxtail grass for treatment in 2003 (See Appendix A). Fescue is usually the dominant problem. If caught in early stages, spot spraying a 1% solution of Roundup or Poast using backpack sprayers can control fescue clumps. Otherwise, in the appropriate seasons when fescue is vigorously growing, we will apply glyphosate at 1.5 lbs a.i.per acre in sprayers pulled by tractor, truck or 6 wheel ATV. In one to three weeks after application, a clover-small grain mix will be planted by a no-till grain drill into the dead fescue sod to re-establish a clover stand utilized by a minimum of 54 species of birds and 14 species of mammals (Parker et al. 1995). If crabgrass, Bermuda grass, johnsongrass, sericea lespedeza or foxtail grass (warm season forbs or grasses) are the predominant weed species, then the same procedure will be used except the ideal timing changes to mid to late spring and a grain sorghum mix is drilled instead of clover. If there is a moderate but declining clover component (40-70%) left in the field amidst the weed species, then a grass selective herbicide, sethoxydim at 6 oz.a.i. (1 qt. Formulated Poast)per acre mixed with 80% Sevin (Carbaryl) at 2 lbs.a.i.per acre and applied by boom sprayer in mid-spring or late summer will be used to selectively kill grass/weed combinations as well as the white grub complex (Japanese beetle and June beetle larvae) which often contribute to complete elimination of valuable wildlife forages like clover. The plot then will be drilled with clover or winter grains, or simply allowed to fill back in with existing clover that recaptures the ground vacated by the dead weed species.

Wildlife Resource Personnel (Wildlife Biologists and Wildlife Technicians) all have certified private pesticide applicators licenses and will apply the chemicals themselves strictly according to label directions. If contractors are involved with sprayer trucks, WRD personnel will be on site to insure proper application. Pesticide application will include an extensive record keeping and monitoring program, which is already in place

at each site for planting, fertilizing and lime application. For pesticide use, the Wildlife Resource Department personnel will add treatment dates, application rates, total quantity applied, current weather conditions, along with next day predicted weather, a weekly evaluation, and an annual evaluation. A comment section will also be maintained in the record keeping process.

D. SCOPE OF THE ANALYSIS

The first-level decisions made in the LRMP will not be re-decided in this EA. This EA will focus on making a second-level decision that helps to carry out the LRMP. The LRMP is incorporated by reference in this EA. The analysis in Section III is linked to the Final Environmental Impact Statement (FEIS) for the LRMP by tiering. Tiering simply means that we build upon the analysis in the FEIS without repeating it and then focus that analysis, if it applies, to the proposal. The FEIS that accompanies the LRMP identifies cumulative effects associated with a range of activities needed to implement the LRMP.

In addition to the LRMP, there are other programmatic documents that establish additional goals, objectives, standards and guidelines for management of the Forests. In July 1989, the Regional Forester approved the Record of Decision (ROD) and the Final Environmental Impact Statement (FEIS) for Vegetation Management in the Appalachian Mountains which identifies the methods and tools available for vegetation management on the forests. Through various Regional Environmental Impact Statements, risk assessments of the pesticides considered have been completed. Sevin was examined in detail in Region 8 Gypsy Moth EIS (see Appendix D). The analysis described in this Environmental Assessment is tiered to these FEIS documents which are incorporated by reference (USDA 1987). This EA analysis is tiered to that FEIS which is incorporated by reference.

These programmatic documents may be reviewed at the Chattahoochee-Oconee National Forest, Supervisor’s Office located at 1755 Cleveland Highway, Gainesville, Georgia.

E. DECISION TO BE MADE

The decision that will be made by Responsible Official from this

environmental assessment is whether food plot renovation with herbicide and pesticide should occur, **OR** whether an alternative method of renovation that would also meet the purpose and need and respond to issues should be chosen, **OR** whether no renovation should be performed in these food plots at this time (No Action).

The Responsible Official can also choose to implement portions of the alternatives by selecting one alternative for a food plot and another alternative for a different area so long as the management decision has been disclosed in this Environmental Assessment.

F. SCOPING AND ISSUES

The Gainesville Chattahoochee-Oconee Supervisor's Office used the following process of scoping and issue development to ensure that the Deciding Officer is fully aware of the issues and how the issues have been addressed in the environmental analysis:

On November 6, 1998, a scoping letter was sent to individuals, organizations, and adjacent landowners who could be potentially interested or affected by this proposed action. The letter contained basic information about the project area, the proposed action, internally identified issues and the environmental assessment process in general, and asked for input into this proposal. Comments were received from the following:

11-18-98 - Morgan Summerville (Appalachian Trail Club) - letter
02-05-99 - David Govus - letter

On December 14, 1998 and February 18, 1999 ID team members reviewed all internal and external responses to issues related to the food plot renovation project. The ID team grouped the issues by common resource and cause and effect relationship. The ID team identified significant issues that needed to be studied in detail in the EA. The ID team then developed a range of alternatives and proposed mitigation measures that would address the identified issues while fulfilling the purpose and need for the proposal. The project file contains documentation of this scoping process and public involvement including letters of response to Summerville and Govus (also see Appendix E).

In February 2002, because the document had been revised, a new public comment period was granted. There were a total of 55 responses, which beside the general forest users, included organizations: Quality Deer Management Association; National Wild

Turkey Federation (two Chapters); Georgia Council of Trout Unlimited; Georgia Forest Watch; Southern Appalachian Biodiversity Project; Rabun County Wildlife Management Association; The Ruffed Grouse Society; University of Georgia.

No new issues were identified and concerns were addressed in personal letters to each individual (Project file).

SIGNIFICANT ISSUES - Based on the scoping process and internal review, a list of significant issues and determination of how those issues could best be addressed were developed. Significant issues are those that have wide geographic effects, long-term effects, or are controversial and stir public interest.

The significant issues have been used to develop various alternatives to the proposed action, appropriate mitigation measures and monitoring (included in Chapter II). The significant issues will be measurable where possible in order to compare the environmental effects for the proposed action and other alternatives (in Chapter III).

The significant issues are presented by resource and identify who in the scoping process identified the issue.

1. Water Quality

Will the herbicides and insecticide proposed for food plot renovation leach into the groundwater and subsequently affect humans and wildlife? This issue was identified by the Georgia Department of Natural Resources.

This issue is addressed in several ways. An alternative has been developed that uses a method other than herbicide. Table 3 in Chapter II lists the mitigating measures that address this issue and which would become part of the proposed action for each alternative. They are identified in the Forest Plan for protection of water quality (Amendment 5), mitigations required by the Vegetation Management EIS (VMEIS) and the Georgia Best Management Practices (BMP's) for forestry. And the discussion of effects of herbicide use on water quality is analyzed in Chapter III.

2. Wildlife and Fisheries Habitat

a) Will the proposed herbicide and insecticide use cause adverse effects on wildlife, neo-tropical migratory birds, and insects from eating or coming in contact with plants or insects treated with herbicide? b) Are the food plots really beneficial to

wildlife and what would be the effects on wildlife habitat from the proposed action? c) Will the proposed herbicide use cause adverse effects on aquatic species in the project area? David Govus and the Wildlife Resources Division identified this issue.

a) Mitigation measures as found in the Vegetation Management EIS for the Appalachian Mountains would be prescribed for the use of herbicides and carbaryl to protect workers, wildlife, water, and the general public. b) The proposed method is selective food plot renovation, as opposed to blanket renovation of all sites in order to minimize effects on wildlife populations. The effects are analyzed in Chapter III. c) This issue is addressed by developing an alternative that does not propose herbicide use, by prescribing mitigation measures for the protection of aquatic habitat, and by the analysis in Chapter III.

3. Proposed, Endangered, Threatened and Sensitive Species (PETS)

Will the proposed herbicides or Sevin use cause adverse effects on threatened and endangered species? The Wildlife Resources Division identified this issue.

This issue is addressed in the analysis in Chapter III, proposed mitigation measures and by developing an alternative that does not propose herbicide or carbaryl use.

4. Human Health

What are the human health risks associated with herbicide or Sevin use for this project? The Forest Service and Sommerville (ATC) identified this issue.

Mitigation measures listed in Chapter II as found in the Vegetation Management EIS for the Appalachian Mountains would be prescribed for the use of herbicides to protect workers, wildlife, water, and the general public. In addition, this issue has also been further addressed by developing a viable alternative that prescribes no herbicides and by the analysis of human health risk in Chapter III.

Non-significant issues

1. Will the proposed food plot renovation have an effect on potentially occurring **historic or cultural sites**? (Forest Service)

The proposed food plot renovation treatments do not involve ground-disturbing activities that could potentially affect cultural sites. Food plot sites have already been reviewed and approved (pursuant to Section 106 of the National Historic Preservation Act) under category #5 of the Memorandum of Understanding Between USDA Forest Service and Georgia State Historic Preservation Office Concerning the Management of Historic Properties on the Chattahoochee-Oconee National Forests (Wynn et al.1994).

2. Economics, can WRD afford to continue with mechanical renovation of food plots? Repeated plowing and soil exposure and replanting is expensive and manpower intensive. Personnel are unable to keep up a renovation rotation due to budget constraints.

G. PERMITS, LICENSES AND ENTITLEMENTS

Proposed application of these herbicides and Sevin would not require the applicator to have a Georgia Department of Agriculture private pesticide applicators license. However, WRD personnel supervising the work on site will have the above private pesticide applicators license. The proposed action is consistent with the Forest Plan.

CHAPTER II

ALTERNATIVES CONSIDERED(INCLUDING THE PROPOSED ACTION)

This chapter presents alternatives for the food plot renovation project, including the proposed action and summarizes the differences among them. The proposed action is restated and titled Alternative 2. Alternative 1 is the No Action Alternative. The WRD team developed Alternative 3 in part to respond to the significant issues.

The scoping process resulted in four significant issues that were grouped by common resource. These issues, described in Chapter I, are:

1. Water Quality
2. Wildlife and Fish Habitat
3. PETS species
4. Human Health

The ID team developed reasonable alternatives to the proposed action including no action. They assembled the alternatives and eliminated some from detailed study because they did not meet the purpose and need or were infeasible, speculative or illegal. These alternatives represent different ways to accomplish the objectives that comprise the purpose and need and address the significant issues identified during the scoping process.

A. ALTERNATIVES NOT CONSIDERED IN DETAIL

1. Treat all 700 acres at 500 sites in one year. This alternative was not considered feasible due to manpower and budget constraints. Also, each food plot is in some stage of rotation and progression from weed free to weed infested and every stage in between. Annual re-evaluations are required to determine the level of infestation and prioritize chemical application to concentrate on the worst plots for five successive years.

2. Use other chemicals. For pesticides, this was addressed in Appendix D and basically all other potential pesticides were eliminated from consideration because of higher toxicity to wildlife, either birds or mammals. For herbicides, there are others that would be appropriate such as Tordon, Banvel, or Paraquat but these are more toxic than Roundup or Poast and were quickly eliminated from consideration. We concentrated our recommendations around use of the two herbicides having the lowest health and environmental risks associated with their use.

B. ALTERNATIVES CONSIDERED IN DETAIL

The ID team selected three alternatives, including the proposed action and no action, to be studied in detail. They represent clear choices between uses of natural resources in the project area. Any alternative considered in detail must be implementable.

These alternatives are described and compared in terms of their activities, how well they fulfill the purpose and need, and how well they address the significant issues. This summary is presented in the Alternative Comparison section of this chapter. The environmental analysis and effects of each alternative are presented in Chapter III.

This section describes these alternatives in more detail including the proposed action. General mitigation measures are presented that apply to all alternatives plus any needed mitigations that may be specific to one or more of the alternatives.

ALTERNATIVE 1 (NO ACTION)

The Wildlife Resources Division would not implement release treatments for the 700 acres under consideration. Custodial management outside the scope of the proposed action (wildlife habitat improvement, law enforcement, etc.) would continue at the present level.

Although Alternative 1 does not meet the purpose and need for action in these areas, it is consistent with the Forest Plan. The Plan only permits action to take place, it does not mandate that action must occur at a specific location or at a specific time. This alternative is required by the National Environmental Policy Act (NEPA) and is a viable alternative for selection by the Responsible Official.

The no action alternative provides a baseline for comparison and analysis of other alternatives. It also addresses the public issues raised as a result of possible changes to the project area due to food plot renovation.

No mitigation measures would be applied for Alternative 1 - No Action.

ALTERNATIVE 2 (PROPOSED ACTION)

The proposed action alternative was prepared by the WRD staff as a way of achieving the desired future condition in the project area as described in the Forest Plan. As described in Chapter I, the proposed action would meet the goals and objectives of: (1) managing for ecosystems that will allow for the sustainable growth of renewable resources, including healthy wildlife populations, (2) in an economically efficient manner, and (3) maintaining or enhancing plant and animal diversity by managing for increased high quality wildlife food supplies on suitable sites.

The following issues (numbers correspond to the five numbered issues in Chapter I) that were raised by the Forest Service, WRD, or scoping analysis were addressed when developing the proposed action. The proposed action was then used to get public comment and generate public issues.

1. **Water quality** is protected by prescribed mitigation measures that provide for riparian protection zones, and by the use of selective renovation methods which result in using minimal amounts of herbicide or pesticide per acre.

2. **Wildlife and fish habitat** are protected by following Forest Plan S&G's and mitigation measures found in the VMEIS.

3. **Effects on PETS** species would be evaluated through a Biological Evaluation and appropriate measures taken to protect populations on site.

4. **Human health** is protected by following all label instructions and mitigations for the protection of workers and the general public found in the VMEIS.

Food plot renovation would be done on a maximum of 140 acres per year (700 acres in a five-year period) using one of two herbicides glyphosate or sethoxydim by hand (backpack sprayer) or boom sprayers depending upon the severity of the weed infestation. In the early stages of fescue invasion of clover stands, clumps colonize the field and may only number 1-50 isolated clumps in a 1 acre plot. These can be controlled by use of a directed foliar spray of either Roundup or Poast. Directed spray would not significantly impact surrounding vegetation, even that growing as close as one meter to the treated clumps. Drift and runoff are obviously prevented. Treatment is most

effectively accomplished in early spring and late summer when target noxious vegetation is vigorously growing.

A second scenario involves a more extensive invasion of grass weeds such as fescue, crabgrass, foxtail grass, bermudagrass, or other highly competitive grasses taking over and out-competing clover stands. An application of sethoxydim (grass selective herbicide) using boom sprayers applied at a concentration of 6 oz.a.i. per acre (1 qt. formulated Poast) in 20 to 40 gallons of water per acre would kill competing grasses without injuring the existing clover. This is best accomplished in early to mid-spring. If white grubs are also present in significant densities (as determined by shovel soil inspection, skunk diggings or unusually soft ground from mole and grub trails), then the decision will be made if appropriate to mix 2 lbs/acre of Sevin 80S with the Poast tank mix to control grubs (see Appendix D for Sevin analysis and alternatives). Crabgrass and grub invasions most often occur at the same time and place concurrent with each other with both out-competing the clover simultaneously.

A third scenario would be an application of glyphosate through boom sprayer of 1.5 lbs.a.i. per acre in 20-40 gallons of water per acre to kill an entire area where weedy vegetation has totally overtaken the clover stands. The plot would then be plowed up and replanted or no-till drilled using a grain drill in one to 3 weeks after herbicide application. Likely timing of these applications would be in late winter, late spring or late summer. Weed species involved would include fescue, bermudagrass, crabgrass, foxtail grass, poison ivy, smartweed, sericea lespedeza or johnsongrass.

Locations of spraying would occur in all 8 WMAs previously mentioned with no more than 140 acres being treated on all WMAs combined in any given year. In the five year period, no more than 70 acres would be treated on any given WMA. On an average 25,000 acre WMA, this amounts to less than .07% of the land area being treated per year.

Mitigation Measures that Apply to Alternative 2

The WRD proposes to mitigate the environmental effects caused by Alternative 2 by adhering to the Regional and Forest-wide standards and guidelines (S&Gs) for forest management practices and the mitigations found in the Appalachian Mountain Vegetation Management Final EIS (VMEIS). The ID Team assembled a list of specific mitigation measures for this and all other alternatives. The mitigation measures listed in Table 1 and Table 2 would be followed in this alternative.

Table 1: Mitigation Measures For All Plots in Alternative 2.

Mitigation Measure	Mitigation Source	Plots
Use only Forest Service-approved pesticides in accordance with the labels. Use the lowest effective application rate to protect workers, wildlife and the public. Use selective methods to minimize non-target effects.	LRMP 4-25 #4 VMEIS VOL I, II-61-63	All
Workers handling herbicides or pesticides will follow guidelines for safety including wearing required personal protective equipment as specified on the label.	VMEIS VOL I, II-64-65	All
Post signs informing the public that the stand has been treated with pesticides.	VMEIS VOL I, II-65 #16	All
Pesticide will not be applied within 60' of a known PETS species.	VMEIS VOL I, II-66 #21	All
Pesticide will not be used within 100 feet* of a perennial or intermittent stream or within 100 feet of a domestic water source. This exceeds the current guideline standards in the VMEIS (which was incorporated into the LRMP), and was based on public input early in the analysis process.	VMEIS VOL I, II-67 #25; *Chatt-Oconee decision based upon public input	All
Pesticide will not be broadcast within 100 feet of private land or 300 feet of a private residence.	VMEIS VOL I, II-65 #17	All
A spill plan will be prepared by the WRD and kits to implement cleanup, if necessary, will be available on-site during pesticide renovation activities.	VMEIS VOL I, II-67 #27-32	All

Table 2. Mitigation Measures That Apply To Plots in All Alternatives.

Mitigation Measure	Mitigation Source	Plots
Use standard recommended clover mixes to meet specific wildlife needs, including diversity, production of cool season forage and high quality vegetation; specific soil and water protection needs.	Various Research Studies and Documents	All

ALTERNATIVE 3 (MECHANICAL ALTERNATIVE)

Alternative 3 would meet the goals and objectives of: (1) managing for ecosystems that will allow for the sustainable growth of renewable resources, but would sacrifice quantity and quality of wildlife populations, and (2) maintaining or enhancing plant and animal diversity by managing food plots mechanically on suitable sites.

The following issues (numbers correspond to the four numbered issues in Chapter I) were addressed when developing Alternative 3.

1. **Water quality** is protected by prescribed mitigation measures that provide for riparian protection zones, but is compromised by the use of manual renovation methods only.

2. **Wildlife and fish habitat** are protected by following Forest Plan S&G's and by proposing only manual renovation methods.

3. **PETS** plant species do not exist on the 500 sites proposed. Any nearby populations would be protected and a Biological Evaluation would be prepared. Effects to PETS species would be minimized by using only the manual renovation methods in all food plots.

4. **Human health** is addressed by not proposing any herbicides or pesticides in this alternative. While there is decreased risk from pesticide related potential problems, worker risk is increased from accident due to mechanical or manual equipment.

Only manual and mechanical renovation methods would be used on 140 acres annually in this alternative (Table 3). This method entails plowing with turning plow, disk harrows, hydraulic harrows, or rototiller a minimum of twice per plot and replanting a tall wildlife mix such as grain sorghum to shade out noxious weed species. This procedure is repeated for a second or third year to continue to reduce weed competition and grub populations until finally a clover mix is no-till drilled or broadcast into the dead grain sorghum to re-establish a clover stand. In most cases, however, longevity of the new clover rotation is shortened greatly (usually only one to two years) before the weeds and grubs re-invade the plot and take over again. The grain sorghum rotation then must be repeated again, entailing more plowing and replanting.

Table 3. Alternative 3 - Plot Descriptions and Release Method (see Appendix A).

Wildlife Management Area	Average Acres Per Year	Current Condition	Management Objective	Method of Release
Upper Blue Ridge	10-14	Fallow-infested with fescue and/or crabgrass	clover/ grass mixture	plow twice and plant year 1, plow again and plant year 2
Lower Blue Ridge	10-14	Fallow-infested with fescue and/or crabgrass	clover/ grass mixture	plow twice and plant year 1, plow again and plant year 2
Chattahoochee	10-14	Fallow-infested with fescue and/or crabgrass	clover/ grass mixture	plow twice and plant year 1, plow again and plant year 2
Coopers Creek	10-14	Fallow-infested with fescue and/or crabgrass	clover/ grass mixture	plow twice and plant year 1, plow again and plant year 2
Lake Burton	10-14	Fallow-infested with fescue and/or crabgrass	clover/ grass mixture	plow twice and plant year 1, plow again and plant year 2
Lake Russell	10-14	Fallow-infested with fescue and/or crabgrass	clover/ grass mixture	plow twice and plant year 1, plow again and plant year 2
Swallow Creek	10-14	Fallow-infested with fescue and/or crabgrass	clover/ grass mixture	plow twice and plant year 1, plow again and plant year 2
Warwoman	10-14	Fallow-infested with fescue and/or crabgrass	clover/ grass mixture	plow twice and plant year 1, plow again and plant year 2
TOTAL	**140**			

Mitigation Measures that Apply to Alternative 3

The District proposes to mitigate the environmental effects caused by Alternative 3 by adhering to the Regional and Forest-wide standards and guidelines (S&G's) for forest management practices and the mitigations found in the Appalachian Mountain Vegetation Management Final EIS (VMEIS). The ID Team assembled a list of specific mitigation measures for this and all other alternatives. The mitigation measures listed in Table 2 and Table 4 would be followed in this alternative.

B. MITIGATION MEASURES

Each of the alternatives adheres to all Forest-wide standards and guidelines in the current amended Forest Plan (pages 4-12 to 4-49) and the specific Management Area 11 standards and guidelines (MA 11, pages 4-90 to 4-94) and Management Area 16 standards and guidelines (MA 16, pages 4-107 to 4-110). Mitigation measures either reduce a negative environmental effect or act to enhance a positive effect to bring the area closer to the desired condition. This EA also adopts the mitigation measures found in the Vegetation Management FEIS for the Appalachian Mountains in Volume I (pages II-46 to II-68) as required by Appendix C of the Record of Decision. Management requirements and mitigation measures are applied on the ground to assure that treatments accomplish their objectives and produce fewer adverse environmental effects and more benefits.

Table 4: Mitigation Measures That Apply to Alternative 3.

Mitigation Measure	Mitigation Source	Plots
Keep exposure of bare plowed dirt to a minimum length of time to reduce erosion and prevent soil movement into streams during heavy rainfall events.	S&Gs	All

C. STANDARD MONITORING MEASURES THAT APPLY TO ALL ALTERNATIVES

Wildlife Biologists or Wildlife Technician IV will monitor all spraying activities at the project level. No construction will be involved. WRD Wildlife Technicians or Biologists will perform all work.

For this project proposal, monitoring activities include:

1. WRD personnel with certified pesticide applicators license will administer and perform herbicide and pesticide applications during the implementing of food plot renovations. Vegetation will be checked for amount of herbicide applied and type of vegetation treated. Weather will be monitored as well as amount of herbicide used on each area. Wildlife Resources Division certified pesticide handlers will mix the herbicide or pesticide solution prior to application to ensure correct amount of concentrate has been added.

D. COMPARISON OF ALTERNATIVES

The alternatives are compared based on a summary of the actual treatments proposed, the need for the proposal (objectives), and how well the issues are addressed and analyzed in Section III, Environmental Consequences and Cumulative Effects. When reviewing and comparing each alternative, be alert to the trade-offs represented by each alternative by noting how well an alternative meets the stated objectives and how well it addresses the issues. Table 5 summarizes the proposed action and alternatives in terms of actions and treatments. Table 6 compares the proposed action and alternatives according to how they address the purpose and need. Table 7 compares the estimated environmental effects that the proposed action and alternatives would have based on the significant issues.

Table 5: Summary of Alternatives 1 Through 3.

RELEASE METHOD	ALT. 1 (acres)	ALT. 2 (acres)	ALT. 3 (acres)
None	140	0	0
Herbicide or Pesticide	0	140	0
Manual	0	0	140

Table 6: How the Alternatives Address the Purpose and Need.

Desired Condition	Alt. 1	Alt. 2	Alt. 3
Ecosystem management maintains productive forest communities; including high quality wildlife food plots for cool season forage to reduce the winter stress period.	**No**, highly productive food plots acreage and existing and potential wildlife species would decline.	**Yes**, highly productive food plot acreage would continue at an increased level.	**Yes**, highly productive food plot acreage would continue at a reduced yield.
Use an economically efficient renovation method.	**N/A**	**Yes,** would require only one cost-effic ient treatment per plot.	**No**, all plots would require more than one treatment at 4-5 times the cost per acre over a 2-year period.
Manage for a diversity of plant and animal species including those requiring agriculture, early succession and a cool season food supply.	**No**, grazers, insect users and edge species would decline.	**Yes**, plant and animal species diversity would be maintained, including clover stands utilized by many species.	**Yes**, plant and animal species diversity would be maintained, but at a reduced level.

Table 7: How the Alternatives Address the Significant Issues

Issue	Alt. 1	Alt. 2	Alt. 3
Chance **Water Quality** will be adversely affected	None	Low due to less soil disturbance and small amount of herbicide or pesticide used and applied mitigation measures.	Low, but slightly increased due to increased level of plowing and soil disturbance
Chance **Wildlife & Fish Habitat** will be adversely affected by pesticide use	None	Low due to small amount used and applied mitigation measures.	None
Chance herbicide use will cause adverse effects on **PETS**	None	Low due to small amount used and applied mitigation measures.	None
Chance release treatments will affect **human health** and safety	None	Low due to small amount of herbicide used and applied mitigation measures.	Medium due to greater chance of accident with tractor and increased plowing.

CHAPTER III
ENVIRONMENTAL CONSEQUENCES

This section describes the potential consequences (impacts or effects) on the environment for each alternative described in Section II - Alternatives Considered - on selected environmental resources. The intent of this section is to provide the scientific and analytic basis for the comparisons between the alternatives.

This resource analysis section is tiered to the Vegetative Management FEIS for the Appalachian Mountains and the Chattahoochee-Oconee National Forests Land and Resource Management Plan FEIS. and the Nursery pesticide RA (USDA 1987).

Discussed below for each resource are the direct, indirect, and cumulative effects for each alternative. Direct effects upon resources are those occurring at the same time and place as the triggering action. Indirect effects are those occurring at a later time or distance from the triggering action. Cumulative effects are those that consider past, present, and reasonably foreseeable actions (including those actions on privately owned lands).

Mitigation measures are designed to minimize the effects of actions upon resources and were discussed in Section II - Alternatives Considered - for each alternative. This discussion below takes into consideration all mitigation measures being implemented prior to or during proposed activities. Each resource will discuss additional mitigation measures, if needed, for resource protection. Monitoring discusses activities to insure mitigating measures are protecting the resource.

A. Herbicide and Insecticide Information for Alternative 2 Analysis

A general overview of the characteristics of each herbicide can be found in either the Vegetative Management FEIS for the Coastal Plains/Piedmont, Volume I, page II-31 for glyphosate or pages SE1 to SE23 in Pesticide Background Statements, Volume III. Nursery Pesticides, USDA Agriculture Handbook Number 670 for sethoxydim.

A general overview of the characteristics of Sevin can be found in Human Health Risk Assessment for the use of pesticides in USDA

Forest Service Nurseries (FS-412) and in Neurology, Volume 7, Number 1, Spring 1986 pages 247-332. In this journal article (Sevin, a Toxicological Review and Risk Analysis), Sevin was determined to be among the safest of all pesticides in Neurotoxicity, Developmental Toxicity, Mutagenicity, Oncogenicity, Immunotoxicity and Human Exposure. Also, see Appendix D for a complete review of Sevin/Wildlife implications.

B. Cumulative Effects Common to all Alternatives

For all alternatives, cumulative effects analysis consists of a ½-mile radius around the plot edges, including private and public lands surrounding each plot. Maps can be found in Appendix A. The information for privately owned lands was acquired from 1992 aerial photographs available at the district office. Private lands are considered even though very little of it would fall within the circles.

Past - Much of the private land surrounding the proposed project consists of forested lands, pastures and home places. The timbered lands have various aged stands and vary from pine to hardwood forest types. About 30% of the area lies on private lands. Activities on private lands can only be estimated. Private landowners probably have used some type of herbicide to manage their pastures and home lawns. Homes have probably used pesticides to rid their pets and homes of pests.

On National Forest lands, wildlife food plots have received a variety of treatments. The WRD manages the food plot system on a rotational basis. Past activities occurring within the cumulative area include: controlled testing of Poast and Sevin on selected plots or Lower Blue Ridge WMA (Jones Creek and Turner Creek drainages) and Chestatee WMA (Chestatee River drainage). This preliminary test was very successful at rejuvenating clover plots but further use was terminated by rejection of an EA prepared in 1991.

Present - The present analysis includes 2002 through 2008. Activities known to occur within this time frame on public lands include prescribed burning, wildlife food plot construction or maintenance, trail construction and reconstruction, and recreation management activities.

Some private landowners in the area are expected to control invasive plants and grubs within their pastures and farmlands using pesticides or by plowing and reseeding.

Foreseeable Future – The Foreseeable future ranges from 2004 to 2011 and the best estimate as to the future land desires of both private and public lands. Public land management practices within the area should remain constant in number and in application. Private pastures and farm lands would be expected to be managed in the same manner as occurring in the present, but the loss of habitat on private lands by home building is a foreseeable activity that may occur.

C. Ecological Components

1. Water Resources - Significant Issue #1

The water analysis is tiered to the Vegetative Management FEIS for the Appalachian Mountains, Volume I, page IV-102 thru IV-122. Also, Volume II of the FEIS, and Appendix D provides additional analysis for water quality.

Spatial Boundary - water resource analysis focuses on the watershed boundaries. The cumulative analysis considers an area within 1/2 mile of the treated plots. (See wildlife management area maps in Appendix A).

Time Boundary - The time of analysis on the watersheds within the project area is five growing seasons beginning with the spring of 2003 and ending in the fall of 2008.

Current Environment - Each plot is within an Order 2 or 3 watershed. Each watershed has had some forest resource related activities such as soil and water restoration, prescribed burning, wildlife habitat improvements, and timber harvesting. Order 2 streams are either perennial or intermittent, with intermittent streams flowing over 60% of the time. Order 3 streams are generally perennial streams.

Perennial streams exist in proximity to areas proposed for treatment. Of the 8 WMAs on 4 USFS districts, all contain perennial streams. Intermittent streams and ephemeral streams also occur within the immediate treatment areas; however, application methods and rates can be used which minimize impacts of herbicide application. Mitigation measure stating no herbicide application within 30 feet on either side of a perennial or intermittent stream, minimizes any adverse effects to the water resource.

The major stream courses associated down stream of the project areas include Toccoa River, Etowah River, Chestatee River, Broad River, Chattahoochee River, Hiwassee River, Tallulah River and Chattooga River. The State has designated beneficial uses for rivers and streams in the Rules and Regulations for Water Quality Control with these creeks designated as fishing. This fishing designation has requirements for dissolved oxygen, pH, bacteria and temperature. Downstream uses for the watersheds include recreational activities, i.e. boating, swimming, fishing, etc. No municipal water sources are located within 1 mile of the proposed plots. The streams mentioned above are primary and secondary trout streams (with primary streams supporting a self-sustaining population of trout). Herbicide application will not occur within 100 feet of any primary trout streams. The proposed activities will not create adverse impacts if appropriate application procedures and standards and guidelines are implemented. This would include retaining existing riparian vegetation, and minimizing erosion and sediment movement into adjacent streams.

Issue: Will the herbicides or Carbaryl proposed for food plot renovation leach into the groundwater and subsequently affect humans and wildlife?

Alternative 1 (No Action): There would be no potential for direct, indirect or cumulative effects to public land from herbicides or carbaryl.

Alternative 2 (herbicide or Sevin alternative): (See Appendix D) The potential for water quality (surface and ground water) contamination, in this alternative, is slight due to the direct application of the herb/pesticides. The foliar applications of herbicide or insecticide in the small food plots (less than 5 acres each) are easily controlled. No herbicide would be applied within 100 feet of any perennial or intermittent streams, or within 6 hours prior to a predicted rain event; thus reducing the chance of drift and movement in the soil which may contaminate water.

Water pollution by an herbicide or pesticide can occur if bad/poor storage, transport, application, clean up and/or container disposal methods occur. Apart from the risks related to safe handling and storage, herbicide can move within a forested watershed in a myriad of ways via the hydrologic cycle, soil processes and plant metabolism. The hydrologic cycle is the primary transport mechanism with runoff, leaching and ground water serving as the principal processes. (See Appendix D for

further information).

The dispersed nature of herbicide or pesticide application in combination with the low frequency of use and low application rates should present a low risk of pollution to ground water.

Detailed information regarding the cumulative effects of herbicide applications on water quality is lacking (Neary et al. 1993). Any chemical contamination of water quality should be short-term based on the low concentrations measured in streams during previous studies (Neary et al.1993; VM-FEIS Appendix C). On-site degradation processes and stream water dilution should result in a quick dispersion of herbicide residues. Long-term water quality would actually be improved by the use of herbicides since they do not create sedimentation as compared to mechanical treatment methods, which repeatedly expose bare soil. See Appendix D for potential impacts of Sevin on water resources.

Downstream beneficial effects will not be adversely affected or impaired as a result of this alternative verses mechanical (plowing up the grass and exposing mineral soil). Mitigation measures, in conjunction with the dispersed nature of application on very small acreages and the low application rates (2 lbs/acre for carbaryl; 1.5 lbs/acre for glyphosate; 6 oz./ac.a.i. for sethoxydim), will serve to lessen the potential adverse effects of the herbicides/pesticide. The half-life of carbaryl is 3-10 days, glyphosate has an average of 61 days and sethoxydim has an even shorter half-life (7 days)(USDA 1989). See labels available in the project file for more details.

Alternative 3 (mechanical treatment): The potential for surface water quality contamination from mechanical treatment is somewhat increased compared to Alt 2 and offers the increased chance for water quality pollution from siltation and runoff. This occurs from plowing at least once a year verses once every 5 years for the herbicide/pesticide application. This alternative could create increased erosion. If plowing is followed by heavy rainfall before vegetative cover is established in two to three weeks, runoff and siltation can occur. Generally, DNR plowing or soil disturbing activities occur in September, a dry month in north Georgia, but exceptions do occur.

Mechanical treatments should have no discernible effect on downstream beneficial uses. Mitigation measures in conjunction with a low potential for water quality pollution will minimize on-site and off-site effects.

Cumulative Impacts - Based on the information provided in

Cumulative Effects section for the past, present and reasonably foreseeable future activities the following cumulative analysis is provided for each alternative.

Alternative 1 - Past - None of the past activities combined with proposed activities would create any adverse cumulative impacts to the water resource.

Present - Since no management activities would be occurring with this alternative, no present cumulative impacts are expected to occur.

Foreseeable Future - Alternative 1 combined with foreseeable future activities would not cause adverse impacts to the water resource or the environment.

Alternative 2 - Past - Since carbaryl decomposes rapidly (half-life of 3-10 days) and so does sethoxydim and glyphosate,(7 and 61 days half-life, respectively) there is no chance of them accumulating in the environment. Therefore, there would be no adverse impacts with past activities.

Present – Glyphosate, sethoxydim and carbaryl do not readily move in the soil. These pesticides remain in the area they are applied. Based on the analyses in the risk assessments cited and the rates proposed for use, no adverse impacts are expected from the proposed activities.

Foreseeable Future - Based on the past and present statements, there would be no adverse impacts in the foreseeable future. If another herbicide application is proposed and implemented for these same plots the following year, pesticide applied in the current application would have degraded completely (the half-lives of the compounds) and no longer be of significance; none would be available to accumulate with the subsequent application.

Alternative 3 - Past - Sediment recovery from plowing activities usually takes approximately 3 weeks to establish cover vegetation on all expose soils. The mechanical applications would not create negative cumulative effects when combined with past activities.

Present - The greatest affect to watersheds may occur temporarily if heavy rains occur soon after plowing. However, mechanical application under this alternative would not add sediment to the water resource cumulative effects.

Foreseeable Future - As time passes, water resources will recover

from disturbances until the next plowing cycle. The amount of ground disturbing activities occurring in the future would determine the affects on water quality. If activities continue at the present rate, intermittent plowing with increased risks to the water resource would be expected in the foreseeable future.

Monitoring - Water quality monitoring activities are planned for this project.

2. Floodplains and Wetlands

From the soil surveys for counties in Georgia produced by the Natural Resource Conservation Service, none of the soil series identified meet the criteria for hydric soils. Although Toccoa soils (Toc) are listed as occurring on floodplains, it does not have hydric characteristics. No soils having hydric characteristics occur within the project areas.

3. Wild and Scenic River Eligibility

Currently the Chattooga River is the only designated Wild River on the Chattahoochee National Forest. Several rivers on the Forest are eligible for study to become part of are part of the Wild and Scenic River System. Of those mentioned at the beginning of the water resource effects discussion, several have been identified as potentially eligible for inclusion. However, no ill effects to any existing or potentially eligible wild and scenic river would occur from any of the 3 alternatives. See appendix C for list of eligible streams in the locales. Row crop agriculture (grain sorghum or corn) is not allowed within 1/4 mile of a designated Wild River, (See FSH 1909.12, Ch.8). The river segments under consideration for wild designation do not have food plots within 1/4 mile. Standards for Scenic or Recreational Rivers allow all of the agricultural practices currently utilized by WRD.

4. Cultural Resources - Non-significant Issue

The cultural resource analysis is tiered to the Vegetation Management FEIS for the Appalachian Mountains, Volume I, page IV-132.

Spatial Boundary - The boundary of analysis for cultural resources is the plot boundaries for treatment and their access points from main county or forest service roads.

Time Boundary - The analysis period for disturbance activities to cultural resources for this project does not apply. Effects to cultural resources is mainly concerned with ground disturbing activities which are proposed in alternative 3 with this project. However, all 500 food plots have previously been inspected and found to contain no significant cultural resources.

For cultural resources to be impacted ground-disturbing activities must occur, such as digging or plowing within the top 6 inches of soil. Ground-disturbing activities are planned with this EA for Alternative 3, but all sites have already been approved by archaeologists. Activities are either manual application using chain saws, brush axes, or some other cutting tool, or herbicide application with backpack applicators.

A data check of known cultural resources has occurred using prior survey data for the project area. All known locations of sites to be protected will not be affected by this project with any of the alternatives.

Once cultural resources have been located and determined eligible for protection, the sites are recorded and marked accordingly. Any time a management activity is proposed, known sites to protect are reviewed and/or further surveying of cultural resources are conducted. With regards to private property, it is unknown if landowners conduct specific cultural resource surveys to determine if sites exist on their property. Cemeteries or old home sites are probably protected due to the above ground evidence, however prehistoric sites are normally unknown except through surveys. As far as National Forest lands, past, present, or foreseeable future activities within these stands and/or surrounding areas would not affect cultural resources.

Monitoring - Monitoring is done through on-site inspections and post-project evaluations. The area would also be monitored by biologists.

D. Biological Resources

1. Diversity

The diversity analysis is tiered to the vegetation section in the Vegetative Management FEIS for the Appalachian Mountains, Volume I, pages IV-31 through IV-67.

Spatial Boundary - Diversity analysis gauges impacts on the

immediate project areas for species diversity, community diversity, successional diversity, and old growth characteristics. The cumulative analysis, analyzes impacts within ½-mile of each project area.

Time Boundary - Effects to diversity are analyzed for the length of project implementation, or five growing seasons (until the fall of 2008).

Introduction --- Biological Diversity (Biodiversity) has been defined as the variety of life in an area, including the variety of genes, species, communities, ecosystems, and processes through which individual organisms interact with one another in their environment (Salwasser 1990). The recent surge of concern over biodiversity is not limited simply to a desire for variety. The practical objective of biodiversity is to assure that sufficient diversity exists in gene pools, populations, species, communities, and ecosystems to provide for the continued existence of each entity, the potential for future adaptations, and options for future use by man.

The earth is a very complex system (dynamic) in space and in time. The first concern to us is the risk of loss of those components of the system that are in the most immediate danger. This is a question of viability. Those ecosystems, communities, species, and/or gene pools that are at immediate risk of loss should receive the highest priority. These entities are commonly classified as threatened or endangered and are most familiar to us as Threatened or Endangered Species (T&ES).

For those entities that are not at risk of immediate loss, the issue then becomes one of allocation. The determination of a desirable mix in time and space of those components that are viable, becomes a political issue. Determinations of allocation are made through existing processes that involve public involvement, analysis of alternatives, and selection of a preferred alternative.

Biodiversity (biological diversity) was addressed in several ways in the Forest Plan, and the step-down to the project level is not very difficult to make. It is of utmost importance to stress that biodiversity is planned and assessed at the Forest level, with needed changes implemented at the project level. Although the different aspects of biodiversity can be subdivided as finely as desired, the most significant parts are: Species Diversity, Community Diversity, Successional Diversity, and Old Growth.

Plant and animal species found in the Forest were identified in

the planning process. More than 2000 species of plants, and 500 species of animals were found to inhabit the Forest. While the specific habitat requirements of all species is not perfectly known, it can be deduced that the large size of the Forest, with its wide range of vegetative communities would continue to support these species into the future. It is neither necessary, nor possible for all acres to be suitable for all species at once. Therefore vegetative changes due to management are not a threat to species diversity as long as species viability is considered in the overall plan. In natural systems there is a similar pattern of species change in response to natural events which alter succession.

When stepping down to the project level, additional procedures reduce the risk of depressing species diversity. Project Management Indicator Species (MIS) are selected from the Forest MIS list. Any Forest level MIS that is within range of the project is automatically selected as a Project MIS. Furthermore, upon the recommendation of a biologist or other informed professional, additional MIS may be designated. Following this procedure, any species in need of management consideration can be considered as a Project MIS.

Community diversity is most often affected by activities through changes in forest type attributed to management. This often surfaces as the forest conversion issue. The LRMP addresses this issue by: (1) setting caps on the pine component that will comprise the Forest in the long run; (2) by making rational decisions regarding management type using soil suitability guides; (3) by considering the effects of changes in forest types on wildlife objectives; and (4) by requiring that management activities not eliminate any of the current 44 forest types. In addition, planning regulations require that vegetative manipulation meet objectives for wildlife, fish, and other resources. The ability of an alternative to meet objectives for resources other than timber is a basis used by the Deciding Officer in his/her decision.

Successional diversity refers to the plant and animal communities that inhabit or utilize habitats of different successional stages. Early successional habitats contain dense cover, high fruit and browse production, and vertical structure necessary for many bird species. Late successional stages produce abundant dens and hard mast, with complex structure, which improves with age. All stages are necessary to maintain plant and animal diversity.

The aggregation of the Forest into the seventeen various management areas (LRMP) resulted in the creation of 40 distinct areas of potential old growth covering 186,726 acres. These blocks average about 4,668 acres in size and are often connected by corridors. In addition to the 40 areas, there are over 50 others covering 15,000 acres scattered across the Forest in small blocks. In all, over 27% of the Forest is classified as either not available or not appropriate for timber production. This pattern of old-growth habitats scattered among blocks of land containing early successional vegetation insures the perpetuation of species diversity in the Forest, and provides one of the best patterns of biodiversity management to be found in the eastern United States.

2. Wildlife, MIS, PETS and Locally Rare Species

Current Situation ---The plots proposed for food plot renovation and the surrounding lands provide high quality habitat for both game and non-game wildlife species. Game species present in this portion of the Forest include deer, turkey, squirrel, grouse and bears. Populations of these game species on the project area range from high to low. As with most of the Forest, quail populations are low in the project area. Non-game species such as mammals, reptiles and amphibians, and songbirds, including many neo-tropical migrants are present on the area.

The plots proposed for renovation are all fading out of wildlife production. They provide an abundance of browse, edge and insect production. They provide important food sources for species such as deer, turkey, bears and numerous songbirds, small mammals, and other wildlife (Parker et al. 1992).

Based on Georgia Natural Heritage and Forest Service records, no PETS or Locally Rare plants are known to occur in or near the sites proposed for food plot renovation. Given the past history and the disturbed nature of these sites, no PETS or Locally Rare plants are likely to occur on these sites. Discussion of PETS and Locally Rare wildlife and aquatic species can be found in the Wildlife and Fisheries Habitat sections, respectively.

Management Indicator Species --- To evaluate the effects of management practices on plants, animals, and fisheries, the Management Indicator Species (MIS) concept is used. Each MIS selected for the project represents many other species with similar habitat requirements. MIS have been selected because population changes to those species indicate the effects of management activities on the habitat for all the represented

species. The following table lists MIS selected for this project. These species were selected because the LRMP had used that species as a Forest-level MIS and it is in the geographic range of the project, or it is in addition to the Forest-level MIS due to the site-specific needs identified for this project.

The Forest has recently compiled all available population and habitat data for the 20 Forest-wide MIS (Chattahoochee-Oconee NF's MIS Report, 2000). Of the 20 Forest-wide MIS, 12 were selected for the Wildlife Food Plot Renovation Project. The following is a brief summary of the Forest-wide status and trends for each of these species. More detailed results are given in the report cited above. These Forest-wide trends are useful in putting the project-level effects into perspective.

Yellow Lady's Slipper: As a result of project-level botanical surveys, the number of known yellow lady's slipper populations on the forest has increased since 1991. The forest will continue to conduct plant inventories on sites proposed for ground-disturbing activities. New populations of yellow lady's slipper have been and will continue to be documented and mapped as stated in the forest monitoring plan. Management of this species consists of protection of all populations of 10 or more individuals from all direct or indirect impacts. These measures, along with the increased availability of suitable habitat will ensure the continued viability of yellow lady's slipper on the forest.

Pileated Woodpecker: Bird survey data demonstrates that pileated woodpecker populations have been relatively stable on the forest during the last decade. The availability of older hardwood forest habitats favored by this species has increased, and this trend is expected to continue as the forest ages. As a result, stable to increasing populations of pileated woodpeckers and continued viability on the forest is expected.

Black Bear: Black bear numbers have increased and are beginning to stabilize after 20 years of growth, according to bait station survey results. Based on harvest records and bear and human encounters, state biologists have concluded that bears are nearing carrying capacity on the Chattahoochee NF. Increased acres of older hardwood stands, sustained hard mast production, and enhanced soft mast production through forest management activities—such as prescribed burning and timber harvest—have contributed to improved black bear habitat on the forest. Information from harvest records and bait station visitation rates shows the black bear population to be very healthy and viable on the forest. However, reduction in forest management (early successional habitat) may result in reduced soft mast

availability in the future. This could, in turn, reduce habitat quality for black bears, especially in years of low acorn abundance.

Gray Squirrel: Results from squirrel harvest indices and regional assessments indicate that gray squirrel densities have remained very stable throughout the region during the last 15 years. However, squirrel population levels vary greatly from year to year and largely reflect the quantity of available hard mast. Gray squirrel habitat is abundant on the forest (upland and cove hardwoods that are 50 years and older) and has increased in availability during the last 15 years (CISC data). By using this information, it can be concluded that gray squirrel viability is being maintained throughout the Chattahoochee-Oconee NFs. No significant changes are expected in the future, although some increase in habitat capability is likely due to continued maturation of the forest.

Acadian Flycatcher: Bird data demonstrates that Acadian Flycatcher populations have been relatively stable on the forest. Preferred riparian habitat is maintained on the forest on all projects through implementation of stream protection standards and guidelines. These measures will ensure continued viability of this species on the forest.

Brook Trout: Rangewide, there is some concern about acid rain and global warming effects on brook trout. However, there is no current evidence that these factors are presenting a problem in Georgia streams at this time. Recent surveys of a number of brook trout streams yielded population numbers that were at or above Forest Plan population objective numbers. This native fish remains a game fish in Georgia, further indicating the population is healthy and viability is not a concern on the Chattahoochee NF.

Brown Trout: Recent surveys of a number of brown trout streams yielded population numbers that were at or above Forest Plan population objective numbers, indicating that populations are strong and healthy and that the life history needs of this trout are being met on public lands. This resident trout is a game fish, which is harvested throughout north Georgia, supporting an excellent fishery. Viability is not a concern for resident brown trout on the forest.

Rainbow Trout: From samples of rainbow trout taken on a number of streams on the Chattahoochee NF, population levels remain healthy with fluctuations normally occurring from time to time. This resident trout is a game fish that is harvested throughout north

Georgia and therefore, viability is not a concern. Most rainbow trout populations are in excellent condition, which indicates the habitat and water quality needs are being met for this trout.

White-tailed Deer: The habitat capability model for the forest shows a slight decrease in deer browse availability during the past 10 years. This is due to a decline in the amount of forested early successional habitat. However, white-tailed deer are very adaptable. Game harvest regulations and habitat improvement techniques—such as forest thinnings, prescribed burning, and wildlife opening development—have helped create healthy deer populations throughout Georgia. Deer harvest data indicates that populations in the mountains and ridge and valley are stable to increasing with some fluctuations primarily due to differences in the annual mast crops. Piedmont harvest data shows higher overall deer densities, and State regulations have been liberalized to help reduce population numbers to within habitat capability levels. Overall, viability is well sustained for white-tailed deer on the Chattahoochee-Oconee NFs. The forest will continue to monitor deer densities; and deer populations are expected to remain relatively stable in the near future.

Ruffed Grouse: Ruffed grouse populations on the forest generally have declined during the last two decades, as they have throughout the Southern Appalachians. Much of this decline is attributable to reduced availability of hardwood shrub-seedling habitat due to reductions in timber harvest levels. Although this trend is expected to continue, habitat conditions created from timber management and natural disturbance are expected to be adequate to ensure continued viability of ruffed grouse on the forest.

Wild Turkey: Wild turkey populations have increased on the forest during the last 15 years. Both non-habitat and habitat-related factors have contributed to this increase. Turkeys have benefited from management activities (such as prescribed burning), which enhances brood habitat and soft mast production, and the development and maintenance of wildlife openings by GADNR and Forest Service personnel. These practices, along with anticipated increases in oak mast availability, will ensure continued viability of wild turkey populations on the Chattahoochee-Oconee NFs.

Indigo Bunting: Bird survey data demonstrates that indigo bunting populations have been relatively stable on the forest during the last decade, as have the shrub-seedling successional habitats favored by this species. Declining timber harvest levels likely will result in a reduction in the future

availability of these habitats, which could impact population levels of indigo buntings. However, we expect some timber harvests for forest health reasons, coupled with openings created by natural disturbance to be adequate enough to ensure continued viability of indigo buntings on the forest.

TABLE 8: MIS Habitat Needs and Existing Habitat.

MIS Species & Category	Basic Habitat Requirements	Habitat Objective
Yellow Lady Slipper (PETS Species) Late-successional species	Poorly known; typically found in moist, fertile woods - especially coves and north facing slopes.	Survey all high risk habitats and protect all significant populations through mitigation.
Pileated Woodpecker specialized habitat requirements and ecological indicator; Mid- to late-successional species	Large snags for nesting; smaller snags and logs for foraging; variety of tree species.	Create/maintain approx. 170 snags/sq. mi. 18" DBH and larger. Provide late successional habitat.
Gray Squirrel ecological indicator; hunted. Mid- to late- successional species	Hard mast in fall/winter; soft mast, buds, fungi in spring/summer; den trees.	Hard mast capability 100 lb/ac minimum, 150lb/ac optimum. 256 small and medium size den trees/sq. mi.
Acadian Flycatcher- Ecological Indicator of riparian corridor habitat	Moist deciduous forests with moderate understory, generally near streams	Protect riparian habitat through use of Standards and Guidelines
Deer early-successional species; hunted	adequate levels of browse, soft mast and hard mast.	Hard mast capability 100 lb/ac min.; 150 lb/ac optimum. 16.4 lb/ac browse and soft mast capability, minimum.
Turkey early to late-successional species; hunted	Food - hard mast, seeds, soft mast, fruits, insects; Cover for nesting and escape- dense low growth, dense poles or saplings.	Hard mast capability 100 lb/ac minimum, 150 lb/ac optimum. Grass openings for broods. Regeneration areas for nesting.
Indigo Bunting ecological indicator; early-successional species; Neo-tropical	Brushy weedy or grassed openings with vegetation less than 15 ft high with scattered snags throughout.	Maintain openings well dispersed in 0-10 age class with scattered standing trees.

migrant	Food - insects, seeds, berries, grains.	standing trees.
Brook, Brown & Rainbow Trout Water quality indicator; fished	Require cool, clear water with clean stream bottoms and good oxygen levels. Streams with good escape and resting cover and good insect population are needed.	Max temp 75F. Maintain water quality; create cover where lacking.
Black Bear Ecological indicator; hunted; specialized habitat; late successional species	Require diverse food supply - hard and soft mast, insects, succulent plants, tree or ground dens.	Hard mast capability of 100 lb/acre minimum. 150 lb/ac optimum, 16.4lb/ac soft mast capability. 13-22 den trees/sq mi 36" DBH or larger.
Ruffed Grouse Hunted; Early-successional species	Food - Fruit, insects, buds and catkins. Cover for escape, nesting and broods. Herbaceous areas for bugging.	Well-dispersed regeneration areas 0-20 years old. Optimum habitat 7-15 years old.

Alternative 1 --- No food plot renovation activities would be undertaken in this alternative. Current levels of high quality cool season forage would be greatly reduced in the short-term. Over time, there would be a permanent loss of these important food sources and declines in the wildlife populations that use them as the stands revert to weeds. This alternative would deteriorate existing habitat conditions for some Forest MIS, such as grouse, deer, turkey, indigo bunting and black bear. All other MIS would not be affected either directly or indirectly by this alternative. Cumulatively, all past and present forest practices, along with this alternative, would be compatible with maintaining MIS populations on the Forest.

Alternative 2 --- In this alternative, 140 acres per year would receive a food plot renovation using herbicides or insecticide (foliar treatment). This would have beneficial short-term and long-term effects on some MIS wildlife habitat. Short-term effects would be immediate as newly planted clover quickly reaches high production and high quality levels.

Because of the selective nature and small scale of the treatment, the effects of the herbicide or insecticide application on non-target species would be minimal (see Appendix D).

In the long term, this alternative would provide greatly increased high quality wildlife food supply in the treated plots (see Appendix D).

This alternative involves the direct foliar application of the herbicides. Expected application rates are 1.5 pounds and 0.4 pounds a.i./ac for glyphosate and sethoxydim, respectively. If 80% Sevin is used, the application rate of carbaryl will be 2 lbs a.i./ac. Expected application rates for gylphosate are within the typical rates used for the wildlife risk analysis as found in Table 7-3, p.7-6 in the Vegetation Management FEIS, Volume II. At these rates, the estimate of herbicide exposure for wildlife via dermal, ingestion, and inhalation routes is well below the 1/5 LD50 (indicating low risk) for all species analyzed (Veg. Mgt. FEIS, Vol. II, pgs.8-19) (Appendix D). Expected application rates for sethoxydim are within the typical rates used for the toxicity analysis found in pesticides background statements, Vol. III. Nursery Pesticides USDA Forest Service, Ag. Handbook No. 670.

Sethoxydim is classified as a slightly toxic compound, which is very short-lived in the environment and shows little mobility in the soil (Pesticides Background Statements, Vol. III. Nursery Pesticides USDA Forest Service, Ag Handbook No. 670 and Nursery Pest Management, FEIS, USDA Forest Service, March 1993.

Expected application rates for carbaryl are within the typical rates used for the wildlife and human risk analysis found in Cranmer (1986). The product is very safe, has an acute oral LD50 in the range of 307-986 mg./kg and an acute dermal LD50 of greater than 2,000 mg/kg and an acute dermal LD50 of greater than 2,000 mg/kg. (Smith 1987). Carbaryl half-life in the soil is about 7-10 days. There have been no reports of wildlife die-offs resulting from carbaryl application (Smith 1987). Carbaryl is slightly toxic to fishes and highly toxic to honeybees (Von Rumker et al. 1974). Available information indicates low acute and chronic toxicity to wildlife, low environmental persistence and no reported wildlife die-offs associated with its use (Smith 1987).

Management Indicator Species and their habitat objectives have been addressed in this alternative by the following (change relative to Current Conditions):

Yellow Lady's Slipper - Suitable habitat for this species is not present in the plots to be treated, and no yellow lady’s slipper plants are found within the project treatment area. Therefore, both direct and indirect effects for this species would not be

expected. Cumulatively, past and present forest practices and this proposed treatment would be compatible with maintaining populations of this plant species.

Pileated Woodpecker - Habitat capability is maintained by protecting existing snags. Neither a direct or indirect effect on this species is expected. Cumulatively, past and present forest practices and this proposed treatment would be compatible with maintaining populations of this bird.

Black Bear - Habitat capability under this alternative should be enhanced by maintaining high quality clover production in the treated plots. Long-term habitat capability should also be enhanced by ensuring future vigor and productivity in these plots. As food plots become more productive under this alternative, black bear would derive positive effects, both directly and indirectly, from the addition of a more diverse forage base. Cumulatively, past and present forest practices and this proposal would be compatible with maintaining black bear populations on the Forest.

Gray Squirrel - Current habitat capability is low in these plots due to lack of hard mast capability. Long-term habitat capability is not impacted. Therefore, under this alternative, there would be no direct or indirect effects on this species. Cumulatively, past and present forest practices and this proposal would be compatible with maintaining adequate gray squirrel populations.

Brook, Brown and Rainbow Trout - Habitat capability is maintained by protecting riparian areas and enhanced by reducing potential for soil movement. Overall, direct and indirect effects should be maintained under this alternative. Cumulatively, past and present forest practices along with this proposal would be compatible with maintaining trout populations on the Forest.

Acadian Flycatcher – Habitat Capability is maintained by protecting riparian areas through use of Standards and Guidelines. Since no riparian corridors are impacted by this alternative, there would be no direct or indirect effect on this bird species. Cumulatively, past and present forest management and this proposal would be compatible with maintaining Acadian flycatcher populations on the Forest.

Deer - Habitat capability is greatly enhanced by restoring highly productive stands of high quality cool season forage. Long-term habitat capability is enhanced by ensuring future year-round food

supply within these plots. Therefore, both direct and indirect effects would be positive and local deer populations would be expected to be maintained or even increased as carrying capacity allows. Cumulatively, past and present forest practices and this proposal would be compatible with maintaining deer populations on the forest.

Grouse - Habitat capability is enhanced by the edge, by clover forage and insects for brood rearing. Therefore, both direct and indirect effects of this alternative would result in enhanced benefits for ruffed grouse. Cumulatively, past and present forest practices along with this alternative are compatible with sustaining ruffed grouse populations on the Forest.

Turkey - Habitat capability is enhanced by restoring highly productive stands of high quality cool season forage. Long-term capability is enhanced by ensuring virtual year round food supplies in these stands both for forage and brood-rearing. Therefore, both direct and indirect effects to eastern wild turkey would be expected to be positive. Cumulatively, past and present forest management along with this proposal would be compatible with maintaining or even increasing populations of wild turkey on the Forest.

Indigo Bunting - Habitat capability is enhanced by providing increased levels of clover plots with associated increase in insect food supply. Therefore, both direct and indirect effects would be expected to be positive to this bird, which prefers open areas and forest edge. Cumulatively, past and present forest management and this proposed alternative would be compatible with maintaining or even increasing indigo bunting numbers on the Forest.

Alternative 3 --- In this alternative, 140 acres per year would be renovated using farm implements. The effects of this alternative would be similar to Alternative 2. Because all renovation work would involve plowing and replanting for two years, and weeds and grubs rapidly re-invade after plowing ceases and therefore, overall food supply would be greatly reduced.

Management Indicator Species and their habitat objectives have been addressed in this alternative by the following (change relative to Current Conditions):

Yellow Lady's Slipper - Suitable habitat for this species is not present in the plots to be treated. Therefore, as in alternatives 1 and 2, both direct and indirect effects would be neither

positive nor negative. Cumulatively, past and present forest practices and this treatment would be compatible with maintaining populations of this plant.

Pileated Woodpecker - Habitat capability is maintained by protecting existing snags. As in alternative 1 and 2, neither a direct or indirect effect on this species is expected. Cumulatively, past and present forest practices and this proposed treatment would be compatible with maintaining populations of this forest bird species.

Black Bear - Habitat capability is somewhat reduced by lowering food production in the treated plots. Long-term habitat capability is decreased because of quick reinvasion of weeds and grubs. Food plots would help provide some forage but to a lesser extent than alternative 2. Therefore, both direct and indirect effects to the black bear would be expected to be minimal. Cumulatively, past and present forest practices and this proposal would be compatible with maintaining black bear populations on the Forest.

Gray Squirrel - Current habitat capability low in these food plots due to lack of hard mast capability. Long-term habitat capability is not impacted. As in alternatives 1 and 2, there would be no direct or indirect effects on this forest dwelling species. Cumulatively, past and present forest practices along with this proposal would be compatible with maintaining populations of gray squirrels on the Forest.

Brook, Brown, and Rainbow Trout - Habitat capability is maintained by protecting riparian areas. Forest BMPs would protect soil and water disturbance concerns. Overall, direct and indirect effects should be neutral and trout populations would be maintained where they occur. Cumulatively, past and present forest practices along with this proposal would be compatible with maintaining trout populations on the Forest.

Acadian Flycatcher – Habitat Capability is maintained by protecting riparian areas through use of Standards and Guidelines. As in alternative 1 and 2, no riparian corridors are impacted, so there would be no direct or indirect effects on this bird species. Cumulatively, past and present forest management along with this proposal is compatible with maintaining Acadian flycatcher populations on the Forest.

Deer - Habitat capability is reduced because of lowering food production and lack of cool season food supply. Long-term habitat

capability is reduced by changing from clover to grain sorghum for two years. Although some positive direct and indirect effects on deer will be expected under this proposal, it would be less than those expected under alternative 2, but more than those under alternative 1. Deer populations would be maintained as carrying capacities allow. Cumulatively, past and present forest practices and this proposal would be compatible with maintaining deer populations on the Forest.

Grouse - Habitat capability is reduced by changing from clover to grain sorghum for two years. Long-term habitat capability is reduced because of lowered production and quick re-invasion of weeds and grubs. Habitat created for this forest bird is better than that provided in alternative 1, but it is less than that provided in alternative 2. Both direct and indirect effects of this alternative would be somewhat beneficial for ruffed grouse. Cumulatively, past and present forest practices along with this alternative are compatible with sustaining grouse populations on the Forest.

Turkey - Habitat capability for this MIS is reduced by lowering food production and such as the cool season food supply. Long-term habitat capability is reduced by changing from clover to grain sorghum for two years. Some forage benefit is expected from this alternative and it would be better that alternative 1, but less than that provided from alternative 2. Both direct and indirect effects to the eastern wild turkey would be expected to be somewhat positive. Cumulatively, past and present forest management along with this proposal would be compatible with maintaining populations of wild turkey on the Forest.

Indigo Bunting - Habitat capability for this bird is slightly reduced by providing fewer insects than that produced in alternative 2, both in the short and long term. Edge effect would provide somewhat positive direct and indirect effects compared to alternative 1, but less than the positive effects created under alternative 2. Cumulatively, past and present forest management practices along with this proposal would be compatible with maintaining indigo bunting populations on the Forest.

Proposed, Endangered, Threatened and Sensitive (PETS) Species and Locally Rare Species

PETS and Locally Rare animals with potential to occur near these

plots and the surrounding forest include Diana fritillary butterfly, Rafinesque's big-eared bat, Etowah darter, Parrish crayfish, Oconee stream crayfish, holiday darter, mountain brook lamprey, wounded darter, olive darter, Margarita River skimmer, Alleghany snaketail, Edmund’s snaketail, and the northern pine snake.

The Diana fritillary butterfly is a sensitive species that occurs throughout the Southern Appalachians, inhabiting pine and deciduous forests near streams. Violets serve as the host plant for larvae. Roads and other openings in moist woods are believed to provide nectar plants for the butterfly. Many of the nectar plants are associated with early successional habitats or forest edges. There are historic reports of this species in White, Union, Fannin, Habersham, and Rabun Counties. It has recently been observed in a variety of habitats throughout the Forest. Because it uses a variety of forest types including both pine and hardwood forests of varying successional stages, nearly the entire Forest, including the proposed plots provide suitable habitat. The proposed herbicide and insecticide applications are a direct foliar application. It is unlikely that this species would be directly impacted during application but some mortality may occur from subsequent contact with carbaryl on blooms. Indirect impacts of herbicides would not likely occur to the larval host plants (violets) through drift. Because of the method and rate of application, impacts of carbaryl on butterflies and impacts of herbicides on non-target plants would be minimal when 100 acres per year are treated on a 760,000 acre Forest. Given that the project plots contain no habitat specifically required by this species and that most of the Forest provides suitable habitat, the minor loss of the violets, if it does occur, would not affect this species under either alternative 2 or 3.

The Rafinesque’s big-eared bat is a sensitive species that hibernates primarily in caves and old buildings, usually near permanent water (Webster et al. 1985). Harvey (1992) states that maternity colonies are primarily found in old buildings, and are found rarely in caves and mines. There are no caves, mines, or old buildings present in or near the wildlife openings to be renovated. In the summer, male big-eared bats may roost in hollow trees (Harvey, 1992). Trees for roosting are present throughout the Chattahoochee National Forest. However, there are no hollow trees or roosting habitat within the wildlife openings or project area. Forest Service research has conducted bat mist netting across the Chattahoochee in July and early August, 2001. Some of the sites were in the general vicinity of the proposed project. The Forest Service sensitive species, Rafinesque’s big-

eared bat was not found during any of the mist netting. For these reasons, primarily the fact hibernation and maternity habitat, and roosting habitat is not present in the vicinity of the openings. Alternatives 1, 2 or 3 would not have any impacts to the Rafinesque big-eared bat.

Aquatic Species

The U.S. Fish and Wildlife Service recently listed the Etowah darter as Endangered. It is endemic to the upper Etowah River system in north Georgia. The Etowah darter is not known from ant of the Etowah tributaries on the Blue Ridge WMA. However, this species is known to occur in the Etowah River, 2 miles down stream of several wildlife openings on the Blue Ridge WMA. Due to the location of the openings on flat terrain, protective streamside buffers and mitigations, no effect from any of the alternatives is expected.

The Parrish crayfish is a sensitive species that is restricted to the headwaters of the Hiawassee River. The Swallow Creek WMA lies within the Hiawassee River watershed. It is not known to occur in any of the Hiawassee River tributaries on the WMA, but could occur downstream of the Swallow Creek WMA. Since the locations of the openings are on flat terrain with protective streamside buffers and mitigation measures in place, no impacts to this species is expected.

The Oconee Stream crayfish is a sensitive species known from the tributaries of the Savannah River in Oconee County, South Carolina and Rabun County, Georgia (Hobbs 1981). Hobbs (1981) reported that it was not found in more recent collections of other tributaries of the Warwoman Creek and other Chattooga River tributaries, but he suggests it likely occurs in a number of lower tributaries of the Chattooga River, perhaps near Warwoman WMA. Due to the flat terrain, protective streamside buffers and mitigations, no impact to this crayfish is expected from any of the alternatives.

The holiday darter (sensitive species) species complex is known from the upper headwater streams of the Conasauga, Coosawattee, and Etowah systems (Freeman 1992). The holiday darter is not known from any of the Etowah River tributaries on the Blue Ridge WMA. However, this species is known to occur in the Etowah River about 2 miles down stream of several wildlife openings on the Blue Ridge WMA. Since the locations of these openings are on flat terrain with streamside buffers and mitigation measures in place, no impact to this darter is expected under any of the alternatives.

The mountain brook lamprey is a sensitive species that occurs in the Tennessee and Cumberland River drainages. It is known to occur in the Hiawassee River, downstream of the Swallow Creek WMA, and is also known to occur in the portion of the Toccoa River within the Blue Ridge WMA and downstream of the Coppers Creek WMA. Because the openings occur on flat terrain with streamside buffers and mitigation measures in place, no impacts are expected to this lamprey under any of the alternatives.

The wounded darter is a sensitive species known in Georgia only from an isolated population in the Toccoa River, but also occurs in the Little Tennessee system in North Carolina and Tennessee (Freeman 1992). The wounded darter is known to occur in the portion of the Toccoa River within the Blue Ridge WMA and downstream of the Coopers Creek WMA. Since the locations of these openings are on flat terrain with streamside buffers and mitigation measures in place, no impact to this darter is expected under any of the alternatives.

The olive darter is a sensitive species that occurs in Georgia in two tributaries of the Tennessee drainage, the Little Tennessee and Toccoa Rivers (Freeman 1992). It is known to occur in the portion of the Toccoa River within the Blue Ridge WMA and down stream of the Coopers Creek WMA. Due to the locations of the openings on flat terrain with protective streamside buffers and mitigation measures in place, no impacts to this darter are expected under any of the alternatives.

The Margarita River skimmer is a sensitive species that inhabits shallow pools between riffles in undercut banks and leaf packs during some of its life cycle. Suitable habitat for this species occurs throughout the Forest, including some of the small streams near existing wildlife openings. Since the locations of the openings occur on flat terrain with protective streamside buffers and mitigations measures in place, no impacts to this insect are expected under any of the alternatives.

The Appalachian snaketail (sensitive species) complex occurs in shallow riffles of low gradient streams with a sand/gravel substrate during some of its life cycle. Suitable habitat for this species occurs throughout the Forest, including some of the small streams that occur near existing wildlife openings. Due to the location of the openings been on flat terrain with protective streamside buffers and mitigations in place, no impacts are expected to this insect from any of the alternatives.

The Edmund’s snaketail is a sensitive species that occurs in

shallow riffle of low gradient streams with a sand/gravel substrate. Some of the streams near wildlife openings on the Chattahoochee WMA could provide habitat for Edmund's snaketail during a portion of its life cycle. Since the locations of the openings are generally on flat terrain with protective streamside buffers and mitigation measures in place, no impact to this insect species is expected under any of the alternatives.

All threatened, endangered and sensitive species are discussed in greater detail in the Biological Evaluation for this proposed project (Appendix F).

Locally Rare Species (See Appendix G for list)

Locally rare species for the Chattahoochee are those that are secure throughout their distributional range, but often they are rare in Georgia. This rarity is sometimes due to the species being on the edge of their range.

A locally rare species that has the potential to occur within the project area is the northern pine snake. It is associated with xeric, sandy, forested areas, often dominated by Virginia pine and upland mixed pine-hardwood forests where they spend most of their time underground (Mount 1975, Martof et al. 1980). The snake uses a variety of successional stages from regeneration areas to mature stands. Wilson (1995) classified younger successional stages (grass, sapling, poletimber) as suitable habitat and sawtimber stage as marginal habitat. The northern pine snake is known from Banks, Burke, Dawson, Lumpkin, Paulding, Pickens and White Counties. Additional counties with records of snake's occurrence are Cherokee, Cobb, Gilmer, Gwinnett and Rabun (Williamson and Moulis 1994). The major means of mortality is that of being run-over on highways. In addition, approximately 132,670 acres of the Chattahoochee are in the 0 to 50 year-old pine, mixed pine-hardwood or upland hardwood sites. These sites would generally constitute the more xeric, grass, sapling, poletimber forests believed to be primary habitat for the snake. This snake does not prefer wildlife openings to forage, but might occur along the edge of some of these areas. These openings already exist and receive annual maintenance activities such as mowing. The proposed renovation activities would probably cause individuals to disperse into the upland forested areas, which is more preferred habitat. Therefore, the alternatives are not expected to have an impact of this snake.

The star-nosed mole is a locally species that prefers low, wet ground near lakes or streams (Burt and Grossenheider 1964). This species is also near the edge of its range in northeastern Georgia. For these reason, this mole would not be expected to be impacted by any of the alternatives.

The longtail shrew is also a small mammal that has a limited range in Georgia and it is mostly associated with forested environments (Burt and Grossenheidner 1964). It is therefore unlikely that this species would be found within any of the wildlife openings in these alternatives.

Other locally rare species either do not have habitat preference for the wildlife openings involved with this project, or these species and their habitat will be protected by streamside buffers and mitigation measures.

3. Fisheries Habitat- Significant Issue #2

The fisheries analysis is tiered to the vegetation section in the Vegetative Management FEIS for the Appalachian Mountains, Volume I, pages IV-102 through IV-122.

Current Situation --- The stands proposed for food plot renovation are in the Etowah, Chattahoochee, Broad River, Tallulah, Chattooga, Toccoa, Nottley, Hiawassee, and Chestatee River watersheds. These plots generally are in the headwaters of these stream systems. Streams where present near these plots all are small and are unlikely to contain significant fish populations. However, the larger streams downstream of these stands contain fishable populations. Primary game fish present in these streams are rainbow and brown trout. Common non-game associates include creek chubs, stonerollers, and banded sculpins.

Several sensitive aquatic species are known to occur in the above River watersheds, downstream of several of the project areas. Sensitive fish species are listed in the Biological Evaluation in Appendix F, and were discussed previously. Several Locally rare aquatic species could found within streams near the wildlife openings to be treated. Due to streamside buffers, location of openings with regard to terrain and topography (relatively flat), and mitigation measures, there will be no impacts to the Locally Rare species (Appendix G).

Alternative 1 --- No food plot renovation activities would be undertaken in this alternative. Therefore, this alternative would maintain existing aquatic habitat conditions.

Alternative 2 --- In this alternative, 140 acres would receive a renovation release using herbicides or insecticide (foliar treatment). The resultant vegetative changes discussed above would have no impact on aquatic habitat. No herbicide would be used within 100 feet of perennial or intermittent springs and streams, which far exceeds the 30 foot minimum (VMFEIS Vol.I, II-67 #25) found sufficient to insure the protection of aquatic habitat. The expected application rates are within the typical rates used for the aquatic risk analysis for Roundup in the Vegetation Management FEIS, Vol. II. At these rates there is no significant risk of acute adverse effects to aquatic species as a result of drift (VMFEIS, Vol. II, p.8-21). The same is true for Poast (Nursery Pest Management, FEIS, USDA Forest Service, March 1993) and Sevin (Smith 1987). Therefore, because of the method (direct foliar) and rate of application of these herbicides, along with streamside buffers and mitigation measures in place, it is unlikely that there would be any adverse effects or impacts to any aquatic species, including PETS and Locally Rare species.

Alternative 3 --- In this alternative, 140 acres would be renovated using tractor and implements. The renovation could have a potential impact on aquatic resources because ground disturbance is involved. A heavy rainfall event 0-21 days after plowing could move a silt-load into the headwaters of nearby streams. However, due to the relatively flat terrain of the openings and streamside buffers and mitigations, no impacts or effects to any aquatic species is expected.

Cumulative Effects --- Past, present, and reasonably foreseeable future actions influencing fish habitat include timber harvest, road construction, recreational use, and agricultural and development activities on private land. All projects on the Forest follow Forest-wide standards and guidelines. These include specific guidelines that meet or exceed State Best Management Practices (BMP's) that must be used on all projects to ensure the protection of water quality and aquatic habitat. These include: the establishment of a logging equipment limitation zone which prohibits the use of logging equipment within a minimum of 40 feet of any defined stream channel; an erosion protection strip which prohibits major ground disturbing practices such as roads and log landings within a minimum of 80 feet of defined stream channels, and the establishment of a shade protection strip on all perennial streams. Additionally, there are requirements in the Forest Plan and timber sale contracts for road construction activities such as the quantity of gravel required, type and frequency of road drainage structures, and requirements for the re-vegetation and stabilization of exposed

soils. Forest-wide water quality standards and guidelines would be followed on this and all future projects in the project area to maintain water quality.

All herbicide use on the Forest must follow the management requirements and mitigation measures outlined in the Vegetation Management FEIS for the Appalachian Mountains. As discussed above, no herbicide would be used within 100 feet of perennial or intermittent springs and streams. Glyphosate and sethoxydim are metabolized by bacteria and photodegrade rapidly (VMFEIS, Vol II, p. C-15, C-16). Half-life of carbaryl is 7 days. Because of these characteristics, proposed methods and rates of application, and associated mitigating measures, there would be no cumulative effects of herbicides or carbaryl to aquatic species. (See further discussion of Cumulative Effects of Sevin in Appendix D).

No PETS plants or locally rare plants are found within any of the wildlife food plot openings proposed for treatment. These openings have been previously maintained by various agricultural and vegetative management techniques, and are now almost completely covered in rank fescue, lespedeza and other weed species of little benefit for wildlife use. Therefore, Alternatives 1 and 2 will have no effect (or impact) on any PETS or locally rare plant species.

No PETS or locally rare animals are known to occur within any of the wildlife openings proposed for renovation treatments. In addition, no aquatic PETS or locally rare species will be effected or impacted due to mitigation measures and BMPs in place that will ensure that no herbicide or grub control chemical will come in contact with streams and rivers.

Cumulative Effects

Implementation of Forest standards and guidelines and VMEIS guidelines all assist in avoiding adverse cumulative effects to PETS and locally rare species. Adherence to these standards and guides also assists in maintaining habitat for PETS and locally rare species at the Forest level. Surveys have been and continue to be conducted in portions of the Forest to determine presence and distribution of various small mammals, birds, amphibians and reptiles, aquatic species, and PETS and locally rare plants. The Georgia National Heritage Program records are checked for known occurrences of PETS and locally rare species in project areas, and close contact is maintained between the Heritage biologists and Forest Service biologists for sharing of new information. Forest Service records and biologists and records from other agencies are also consulted for occurrences. Future management

activities and project locations will be analyzed utilizing any new information available on PETS and locally rare species. Effects to federally listed species will be avoided. For Forest sensitive and locally rare species, mitigating measures will be implemented to maintain habitat for these species on the Forest, and to prevent future listing under the Endangered Species Act. These strategies will assist in avoiding adverse cumulative effects to PETS and locally rare species and their habitats.

No PETS or locally rare plants were found within any of these existing wildlife openings proposed for renovation. Therefore, the proposed action is not likely to result in adverse cumulative effects to the smooth coneflower or any other federally listed plant species, and as discussed previously, no sensitive or locally rare plants will be impacted.

On a periodic basis, the Forest evaluates Forest Plan management practices to determine how fully objectives have been met and how closely management standards have been applied. This monitoring and evaluation program contains several items designed to evaluate the implementation and effectiveness of water quality standards and guidelines, which help protect the aquatic resource. These items include water quality, riparian area management, and erosion control compliance. Monitoring of these items is accomplished through functional assistance trips, integrated resource reviews, specific data collection and analysis and daily site visits by the resource specialists to specific projects. In 1999, the Forest made field visits with the US Environmental Protection Agency and the Georgia Forestry Commission to a random sample of projects for the purpose of reviewing the adequacy of implementation and effectiveness of the Forest’s standards and guidelines for water quality.

In the Annual Monitoring and Evaluation Report, the items listed above were all found to be in compliance with the goals, objectives, management area direction and standards and guidelines of the Forest Plan. This illustrates that the water quality standards and guidelines that are being implemented on the Forest are effective in protecting the existing aquatic habitat and associated species. These Forest-wide water quality standards and guidelines as well as Georgia State BMP’s will be followed on all Forest Service lands to maintain water quality and prevent adverse impacts to aquatic species. Therefore, past, present, and reasonably foreseeable future actions will not result in adverse cumulative effects to any aquatic PETS or locally rare species.

For the reasons discussed above, past, present and reasonably

foreseeable future actions in the project area are not expected to result in any adverse cumulative effects to PETS or locally rare plants, or terrestrial or aquatic vertebrate or invertebrate species.

E. Social and Economic Factors

1. Human Health and Safety - Significant Issue # 4

The health and safety analysis is tiered to the Vegetative Management FEIS for the Appalachian Mountains, Volume I, pages IV-2 thru IV-31. Also, Volume II, Appendix A analyzes risk to human exposure and health. Also, it is tiered to the Region 8 Gypsy Moth EIS analysis risk with Sevin. Additional data and references for Sevin are in Appendix D.

Spatial Boundary - The analysis area for public health and safety lies within the food plots. Cumulative impacts analysis lies within ½-mile of the plot boundaries, see maps in Appendix A.

Alternative 1: The no action alternative would have no impact on workers or public safety.

Alternative 2: A risk assessment to human health concerning the use of herbicides has been prepared, and is part of the VMFEIS. Both herbicides and carbaryl were analyzed in the Human Health Risk Assessment for the Use of Pesticides in USDA Forest Service Nurseries USDA Forest Service FS-412, 1987. Glyphosate and sethoxydim were classified as slightly toxic and carbaryl was listed as moderately toxic. Human risk assessments purposefully overestimate doses expected from routine applications. The risk assessment was designed to err on the side of safety. In reality, the workers and the public are likely to receive lower doses than estimated. This EA is tiered to the information provided in both the VMFEIS and the HHRA for the use of pesticides in USDA Forest Service Nurseries. An additional risk assessment to human health concerning the use of Sevin has also been prepared and is found in Neurotoxicology, 7(1):247-332 (1986). (Also see Appendix D.) To summarize, the risk to public health for the proposed action was considered insignificant in nearly all scenarios analyzed. Table 5-15, page 5-20, Appendix A of the VMFEIS details the margins of safety for typical and maximum exposures for the public and workers. Maximum scenarios are based on assumptions that, acting together, greatly magnify the estimate of risk (see Appendix A of the VMFEIS).

Worker safety has also been studied. Under typical scenarios (following appropriate precautions and safety measures), the risk to worker safety is rated low. In the case of maximum exposures or spills, the risk to worker safety is rated from low to high based on the method of application. The maximum exposure risk is managed with appropriate safety measures or cleanup after an accident.

The studies indicated that the chemicals (glyphosate, sethoxydim, and carbaryl) tend not to accumulate in animal tissue. Nor did the studies indicate that the application of the herbicides as proposed would present any risk from a synergistic effect when combined with other chemicals.

One accident has been reported related to herbicide use in the Southern Region of the Forest Service over a four-year period studied in the VMFEIS. This involved an employee using a backpack applicator slipping and twisting an ankle.

This alternative does not present any unusual circumstances which would indicate that public or worker safety would be affected any more than that indicated by the VMFEIS (see Appendix D).

The effects on human health and safety from food plot renovation may influence persons who could be exposed, either the forest workers who must enter treated areas who are performing the application, or forest visitors who may be in the areas where work has occurred. Pesticide handlers may be at risk of exposure to herbicides during application by coming in contact with treated vegetation or through accidental spills from mixing and filling of equipment. They may also be at risk of exposure to tractors and farm implements during mechanical renovation of food plots. Forest workers and visitors may be at risk of exposure to herbicides through contact with treated vegetation, drinking water contaminated with herbicides, or by eating fruits and berries contaminated with herbicides.

Inert ingredients are chemicals used with the active ingredient in preparing a herbicide formulation. They are used to provide a carrier for the active ingredient and facilitate the effective application of the herbicide. Effects of inert ingredients are usually measured through tests of the herbicides as formulated products. The possibility that herbicidal formulations pose greater risk to the environment than their components is largely a self-serving hypothesis. Where acute toxicity data are available formulated products have been demonstrated to pose less risk than active ingredients alone. Inerts in herbicides have undergone categorization according to their suspected toxicity

and predicted risks. No specific concern exists with inerts (FEIS Veg. Mgt. Vol.II, pp. 3-46 through 3-47 and HHRA for the Use of Pesticide in USDA Forest Service Nurseries.

Risk is hazard plus exposure multiplied by the probability of the exposure. Hazard was evaluated for: (1) acute toxicity - effects from a single dose; (2) sub-chronic toxicity - effects of a small dose received daily over about 30 days; (3) chronic toxicity - effects from a small dose received daily over a long period of time. Exposure was evaluated for: (1) typical situation - average dose from exposure during routine operations; (2) maximum situation - highest probable dose from exposure at highest rates of application, maximum number of hours/day and maximum days/year; (3) accident situation - dose from direct exposure by spill onto individual or into drinking water. Risk was based on a margin of safety of 100 for humans. The No Observable Effect Level (NOEL) for laboratory animals - which is the dose that can be given to laboratory animals and cause no visible effects in acute testing - was used as a base. The NOEL was divided by the dose resulting from the exposure from each one of the three exposure situations for each herbicide and each application method used in the Southern Region of the Forest Service and for both workers applying herbicide and the public. If the NOEL divided by the dose results in a number greater than 100, a chemical is considered to pose an acceptable risk for the general population. Risk is considered to be insignificant when the result was a margin of safety of 1000 or greater. Risk is low when the margin of safety is between 100 and 1000 (Veg. Mgmt. EIS, p. IV-3 to IV-10).

The active ingredients in Roundup and Poast - glyphosate and sethoxydim, respectively, have a low order of toxicity to man and wildlife (Material Safety Data Sheets, 1991). The same is true for Sevin (Cranmer 1986). For workers applying glyphosate and sethoxydim as manual foliar spray, risk is insignificant for the typical situation. Only in accidental spills directly onto workers applying either glyphosate or sethoxydim was the 100 margin of safety not met. Berry pickers were at insignificant risk of effects from foliar spray of glyphosate and sethoxydim even if fruiting plants had been sprayed and fruit was eaten unwashed using typical application rates. The same is true for Sevin (Smith 1987).

Additional measures are taken to further protect the public and private property during the use of herbicides. Herbicide or Sevin applications will not occur within 100 feet of private property, 300 feet of private residences, or 100 feet of wells and drinking sources. Only one of these plots was in the

vicinity of any National Forest trail systems, therefore, most of the general public that visits National Forest lands will not be affected. Hunters and casual visitors would potentially be affected within 30-days of the application, until the herbicide has degraded or for 7 days until the Sevin has degraded.

Mitigation Measures - To protect human health, no herbicide application would occur within 100 feet of private property or 300 feet of private residence. Notice signs are posted to warn visitors of the herbicide application that has recently taken place in the food plots allowing them to determine if they wish to enter the area or not.

Certified crews will have soap and wash water available, eye wash bottles and a first aid kit in field during applications. Contractor and State Employees will ensure that workers use proper protective clothing and safety equipment as required by the label. Additionally, accident preplanning will be conducted prior to applications. Emergency spill plans will be prepared, and in the unlikely event of a spill, the spill will be quickly contained and cleaned up, and the appropriate agencies and persons promptly notified (USDA, VMEIS 1989).

Alternative 3: The VMFEIS discusses worker safety for manual (and other) methods of vegetation management beginning on page IV-27 and following. Accidents over a four-year period in the southern region were studied. There were no vegetation management-related fatalities reported for the four-year period, but fatality records were available back as far as 1976. Four vegetation-management related deaths were reported in this period. Two were related to tree felling and two were fire-related.

Plowing and planting require more tractor work than herbicide application and drilling. Thus, workers are at more risk with extra plowing due to the equipment in use and conditions in which they work and longer tractor hours required.

Cumulative Impacts- Based on the information provided previously for the past, present and reasonably foreseeable future activities, the following cumulative analysis is provided for each alternative.

Alternative 1 - Since no management activities would be occurring with this alternative no cumulative impacts to human health and safety would occur. Past, present and reasonable foreseeable future activities listed previously may cause some human health

and safety problems, but not through the combination of activities in Alternative 1. Those problems would be direct or indirect results of individual projects.

Alternative 2 - Past - Herbicide or carbaryl application as proposed and past activities would not cause adverse effects to the public health and safety. Residues from past uses in treated plots have been broken down by sunlight and soil micro-organisms. Residues from any present uses will have degraded before any of the uses considered in this EA would take place.

Present - Public health and safety would not be adversely impacted through the herbicide or carbaryl application taking into consideration other activities that might be implemented within the cumulative zone around the stands.

Foreseeable Future - There will be no adverse impacts to human health and safety in the foreseeable future under this alternative. Future uses of herbicide or carbaryl application may occur, but the proposed herbicide degrades rapidly and do not accumulate in the environment. Also, because of very limited mobility in the environment of the herbicides considered, any herbicide use in this project area would not combine with effects from private or Forest Service use in other compartments nearby. Therefore, no adverse impacts to human health and safety are expected to occur.

Alternative 3 - Past - There would be no cumulative impacts to public health and safety from past activities combined with this alternative.

Present - Additional tractor work in the 5-year period between 2003 and 2008 within the cumulative zone would have greater affect on human health and safety.

Foreseeable Future - there may be adverse affects to human health and safety in the foreseeable future under this alternative.

Monitoring - during implementation of project, on-site supervision by certified pesticide application ensures all guideline and procedures are closely adhered to.

2. Economics - Non-significant Issue

Existing Situation - cost effectiveness of the proposed project would not be apparent until a future time after the realized value is lost. This can be viewed as foregone opportunity cost.

Alternative 1, No Action - Since no management applications are proposed, no costs would occur with this alternative. However, future loss of high quality food supply would result and loss of revenue would occur since WRD loses their existing investment and no renovation of food plots are proposed. Loss of wildlife food plots cause loss of both populations and hunting opportunity with this alternative as noxious weeds increase in the respective areas and out-compete wildlife plants. Value of lost investment includes $1,000 per acre for initial clearing and establishment costs plus an average $150 per acre per year for maintenance (materials and labor). If average age of the plot is 10 years then maintenance costs are $1,500. Total costs are $2,500 per acre for 700 acres for a total lost investment of $1,750,000. Each acre of high quality clover produces 5 to 8 more live white-tailed deer (an important MIS species) on the Forest and one and

one half hunter harvested deer (Kammermeyer and Moser 1990). Replacement costs for a live deer are $500 each (totaling $2,500 per acre (5 deer) times 700 acres lost equals an additional $1,750,000. Value of a dead deer is $2660 (see Appendix B, Table 3). Value of a dead deer per acre is $2660 x 1.5 deer = $4,000. Value of dead deer on the forest is $4,000 x 700 acres or $2,800,000 annually over a 20-year period. Thus abandonment of 700 acres of food plots on the Chattahoochee National Forest would have cost $59,500,000 for deer alone over the past 20 year period. Bears, turkey and other MIS species are much more difficult to estimate. Combined, they may equal or exceed the deer value. WRD obviously does not want to lose its investment or the economic stimulus provided to communities by hunting of white-tailed deer and other game species dependent upon food plots.

Alternatives 2 and 3 - Enhancement in wildlife food supply (both quantity and quality) occurs. Expected costs for these alternatives are higher than the no action alternative due to the nature of the work. Also, plowing methods will require at least two successive annual treatments to insure temporary renovation, increasing the costs and risks above that of a herbicide or Sevin alternative. The competing vegetation and persistence of grubs dictates repeated plowing to renovate the plot. Risk to workers would be higher with repeated plowing versus herbicide applications.

Cumulative Effects - The No-Action alternative would have the greatest cumulative impact. This would allow quick deterioration of 700 acres of food plots and cause resource damage. Alternatives 2 and 3 both allow for control of vegetation. Alternative 2 has the lowest cost, with improved plot vigor and quality. Alternative 3 costs more and has more site specific impacts since the treatment would be done repeatedly at increased risk to workers and greater potential for soil movement and resource damage.

Comparison of Costs: This cost is presented on a per acre basis (Table 9). These costs may not be exactly what the WRD would pay at the time the work is actually done due to fluctuations that occur in the costs of doing business. Examples of this would include, but are not limited to; changes in the price of fuel, changes in the price of hourly equipment rates, fluctuations in the price of chemicals, or changes in labor costs.

Assuming the herbicide is applied to each stand at the maximum

rate of 2 qts a.i./ac of glyphosate or 6 oz. a.i./ac of sethoxydim for foliar treatment, Alternative 2 would require about 70 gallons of Roundup or 35 gallons of Poast plus 35 gallons of crop oil to complete the 140 acres of foliar application.
The current cost of herbicides and crop oil (Peptoil) are based on the current market price in October 2002. The herbicide prices are as follows:

Roundup	$ 46.60 per gallon
Poast Plus	$ 52.45 per gallon
Peptoil	$ 7.50 per gallon
Sevin 4F	$ 25.25 per gallon

Our budget process in the past has determined an overall average cost of combined tractor work of $50 per acre including salary, travel time, depreciation of equipment used in food plot work (including tractor and all implements). For this analysis to be accurate, a finer breakdown is necessary based on the time it takes to complete a specific operation per acre. The following list should reflect real conditions as closely as possible: spraying with 10 ft. booms ($35/acre), no-till drilling with 10 ft. Drill ($35/acre), broadcasting seed or fertilizer ($25 /acre), plowing ($70/acre), covering seed with drag or disks ($50/acre).

The following table is provided as a comparison of costs between the alternatives.

Table 9: Comparison of Costs

Activity	**Alt. 1**		**Alt. 2**		**Alt. 3**	
	Acres	**$/acre**	**Acres**	**$/acre**	**Acres**	**$/acre**
Spray and Drill	0	$0	140	$70	0	$0
Plow twice, broadcast and cover	0	$0	0	$0	140	$190
Total Labor and Equipment	**0**		$9,800		$26,600	
Herbicide Costs:						
			Gallons	**$/gal**		
Roundup	**0**		70	$46.60		

Poast+Peptoil Carbaryl	**0** **0**	35+35 $59.95 35 $25.25	
Total Herbicide Costs (assume) half of acreage needs Roundup and half gets Poast + Peptoil and Carbaryl	**0**	**$3,l22**	**0**
Total Annual Project Costs	0	**$12,922**	**$26,600**
Total 5-year Project Costs	0	**$64,610**	**$133,000**

NOTE: These costs are estimated. The plowing and replanting (Alternative 3) requires the treatment to occur over several years since the weeds and grubs return. Therefore, the repitition of costs of Alternative 3 would add another $26,600 or more for conventional (each additional) plowing and planting needed.

Summary of the Relationship Between Short-Term and Long-Term Productivity

The food plot renovation being considered would provide an additional 17,000 lbs/acre (dry weight) forage for a minimum of 54 species of songbirds and l4 species of mammals at an annual rate of 140 acres renovated per year, thus adding an additional 2,300,000 lbs. of high quality forage (1198 tons) produced for wildlife every year at an economical cost of one half cent per pound (Kammermeyer et al.1993, Parker et al. 1992). High quality food plots are consistent with the Chattahoochee-Oconee Land and Resource Management Plan and are designed to provide a healthy, productive wildlife populations for the future. By implementing the Forest Plan standards and guidelines applicable to the proposed action, the long-term productivity of soil, water, vegetation and wildlife would be maintained or enhanced (based on supporting analysis in the LRMP FEIS, p. 4-60).

The standards and guidelines associated with each alternative are designed to assure long-term productivity. The monitoring plan will help to verify that the effects of short-term use are accurate and that the effects did indeed not impair long-term

productivity (LRMP FEIS p. 4-40).

Summary of Irreversible and Irretrievable Commitment of Resources

An irreversible commitment of resources refers to resources that are renewable only after a long period of time (such as soil productivity) or are non-renewable resources (such as cultural resources and minerals). There would be no irreversible commitment of resources under any of the alternatives in this analysis. An irretrievable commitment of resources refers to losses of productivity or use of renewable resources. This represents opportunities foregone for the period of time that the resource cannot be used (Veg Mgt FEIS IV-147, LRMP FEIS 4-60 and 61). There are no irretrievable commitments of resources as a result of any alternatives.

Civil Rights
None of the alternatives considered would affect the Civil Rights of any individual.

IV. List Of Agencies and Persons Consulted

Dr. Randy Hudson, Extension Entomologist, UGA, Tifton - letters enclosed in Appendix A. There is no effective non-chemical alternative available for treatment of grubs.

Dr. Beverly Sparks, Extension Entomologist, UGA, Athens - letter on file at WRD: Appendix A. Milky spore disease does not work under field conditions.

Dr. Don White, Research Zoologist, USDI, USFWS, Athens - personal communication 3/91. In extensive years of field study and experience with pesticides and wildlife, he has never observed or documented a die-off involving Sevin.

Dr. Greg Smith, in his book Pesticide Use and Toxicology in Relation to Wildlife: Organo-Phosphorous and Carbamate Compounds. Numerous studies have evaluated the potential impact of carbaryl use on wildlife species, and there have been no reports of wildlife die-offs resulting from carbaryl application.

Dr. Randy Davidson, Veterinarian and Diagnostician, Southeastern Cooperative Wildlife Disease Study, Athens. -

Personal communication 3/91 - His lab has never observed or diagnosed a single case of wildlife toxicity from Sevin (Carbaryl). This period of time covers over 30 years.

Dr. Wilbur Dellinger, Veterinarian, South Hall Veterinary Clinic, Atlanta Hwy., Gainesville. - Personal communication 3/9l - They use Sevin widely in their practice, sell it for use on dogs and cats, and have never encountered a problem with toxicity of Sevin in domestic animals. This is true despite the fact that cats can be very sensitive to chemicals.

Dr. Jim Hanula, U.S. Forest Service Entomologist, Athens, Georgia. In a telephone call from Larry McSwain on October 27, 1991, Dr. Hanula stated that during his tenure with the Connecticut Extension Service he researched the incidence of milky disease in Japanese beetle grub populations. Natural infection rates were low and he does not believe the disease organism would give grub control in our wildlife openings. He also mentioned the problem of obtaining quantities of the disease organism from commercial sources.

Mr. Carl Redmond, Entomologist with Biosystem Company, Gahonna, Ohio. Mr. Redmond conducted graduate research at the University of Kentucky on the casual agent for milky disease (Bacillus popilliae). Mr. Redmonds research indicated that the milky spore formulations failed to reduce Japanese beetle populations in either field plots or laboratory experiments.

Mr. Paul Mistretta, Regional Pathological Program Manager and Pesticide Specialist for USDA, Forest Service, Southern Region, Atlanta, GA.

Mr. Randy Bryant, USDA, Forest Service Regional HAZMAT Coordinator, Atlanta, GA.

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Appendix A

2003 Treatment Sites
Total is 140 Acres
on 71 Sites

Appendix B

Memorandum of Understanding
Between
Department of Natural Resources,
Wildlife Resources Division, State
Of Georgia and the
United States Department of Agriculture Forest Service

Appendix C

Wild and Scenic Rivers

Appendix D

Issues and Concerns Regarding the Use of Pesticides

I. Issues and Concerns Regarding the Use of Pesticides

The following is a list of agency concerns public issues which could be raised regarding white grub control:

1. There is a general concern regarding the use of all chemicals on the Forest. Some publics perceive all chemicals as bad for the environment. While this is also a serious concern of DNR and the U.S. Forest Service, there are certainly some very low risk chemical pesticides on the market today, which can solve specific pest problems without adverse environmental impacts. All chemicals should not be lumped in the same category. To exclude all chemicals from use in carefully regulated applications eliminates some useful tools for wildlife and forest management.

2. With pesticide use, there is a concern that birds will ingest the emerging, dying grubs in large quantities and be subject to toxicosis. This has never been a problem in the past with use of Sevin. No secondary die-offs or lasting ill-effects have ever been documented with carbaryl(see Environmental Impacts section). As an added precautionary measure, appropriate scare tactics can be used to frighten away birds if problems do occur following treatment.

3. Questions have been raised that chemical spray directed at grub control will also eliminate grasshoppers, an important food source for some wildlife. Timing of spraying to avoid peak grasshopper numbers can be used to avoid this problem. Spraying of insecticide could be done in April, May, August, or September, while grasshopper adult numbers peak in June and July. Besides, plots average less than 2 acres in size and are quickly repopulated with grasshoppers from surrounding areas if any losses should occur.

4. There is a concern that honeybees will be killed by pesticide application. Judicious use of any chemicals will be made and at least one person directly involved in the spraying will have a pesticide applicators license. Spraying will not be conducted during any bloom stages to reduce contact with bees. If necessary, plots can also be sprayed just before dark in the evening when bee activity is very low. Lingering toxicity of carbaryl is minimal (see Alternatives Considered section).

5. Some agency personnel feared runoff into streams and contamination of water supplies. By using a directed spray of liquid formulation at the rate of only 20 to 50 gallons per acre on a dry upland site, chance of runoff is extremely low. Carbaryl has a short residual life on treated crops. It remains at the

application site where it is absorbed into the soil and taken into the plant and metabolized (Groth et al. 1998). Insecticidal properties are retained for 3-10 days, and it has a short residual life of less than 2 weeks (Groth et al. 1998). Extreme flooding immediately following application would have to take place for any runoff of carbaryl to occur.

II. Alternatives Considered

The following additional alternatives were considered but eliminated from further consideration:

Alternative 4 - Use of Diazinon, Dursban, or Orthene

This alternative is less desirable for grub control because these chemicals are more toxic to wildlife than Sevin 80S. LD 50 of Diazinon for mallard ducks is 3.54 mg/kg (pheasants is 4.33 mg/kg). It is a good alternate product for managing white grubs but it can be toxic to grub eating birds. LD 50 of Dursban for mallard ducks is 75.6 mg/kg (pheasants is 17.7 mg/kg). There are no remaining labels supporting use on food plots and it is currently unavailable for purchase. LD 50 of Orthene for mallard ducks is 350 mg/kg (pheasants is 140). It is simply not as effective as Carbaryl. LD 50 of Sevin for mallard ducks is >2179 mg/kg) and for pheasants if >2000 mg/kg (Tucker and Crabtree 1970, Smith 1987). The cost of a single application of any of the above chemicals ranges from $22 to $34 per acre.

Alternative 5 - Use of Milky Spore Disease

Milky spore reportedly attacks only Japanese beetle grubs and not green June beetle grubs. Most of our fields are infested with green June beetle and possibly chafer beetle grubs as well as Japanese beetle grubs. To selectively remove Japanese beetle grubs from our plots without reducing other grub species would be of inconsequential benefit. Moreover, recent research at the University of Kentucky (Redmond 1990) failed to substantiate the effectiveness of milky disease in field tests even on Japanese beetle grubs. Redmond’s (1990) research, along with the field work of Dr. Jim Hanula at the Connecticut Extension Service, both indicate no grub population declines with milky spore infections. Redmond’s (1990) thesis abstract states there was no significant reduction in grub population or increase of milky spore disease prevalence after two generations of grubs. A single application of milky spore costs $120 per acre for materials alone. Dr. Jim Hanula stated that obtaining enough good material (live bacteria)

for our needs would be difficult. He cited one situation he knew of where a commercial suppliers' product didn't even contain the casual agent of milky disease.

Alternative 6 - Use of Diatomaceous Earth or Nematodes

Application of Diatomaceous earth (Perm-Guard) in 400 gallons of water per acre was suggested as an alternative. The effectiveness of this product is unproven for grub control on large acreages. Experimental work is also being conducted using nematodes to control grubs. Neither product has been demonstrated to be successful at controlling white grubs at the present time.

III. Environmental Impacts

Alternative l - Treatment with Sevin (Carbaryl)

Sevin 80S (Carbaryl) is approved by the EPA for use by the general public according to label directions for use in protecting a variety of crops and ornamental plants. It is approved for use to protect a variety of birds and mammals from insects. The product poses very low toxicological risk, has an acute oral LD 50 in rats of 307-986 mg/kg and an acute dermal LD 50 of greater than 2,000 mg/kg.

Quoting from Smith (1987), "Carbaryl (Sevin) is a broad-spectrum, widely used insecticide...When administered orally, carbaryl is rapidly metabolized and is not stored in tissues...It is non-persistent in the environment and half-lives in soil are about 7-10 days." Numerous studies have evaluated the potential impact of carbaryl use on wildlife species, and there have been no reports of wildlife die-offs resulting from carbaryl applications. Carbaryl is slightly toxic to fishes and highly toxic to honeybees (Von Rumker et al. 1974). Available information indicates low acute and chronic toxicity to wildlife, low environmental persistence, and no reported secondary wildlife die-offs associated with its use (Smith 1987).

Damage to fisheries is a very remote possibility. When carbaryl is applied to dry uplands in solution with 20-50 gallons of water per acre, it is quickly absorbed into the soil, virtually eliminating runoff into streams. Potential honeybee mortality will be prevented by spraying clover stands before and after bloom stages when bee use of openings is very minimal. Also, even though a certified pesticide applicators license is not

required to apply carbarly, all of our personnel (Biologists and Area Managers on WMAs) either have a license already or will be working under direct supervision at the site of someone who is licensed. This will insure proper application and treatment. Overall, the least environmental impact of all effective chemical alternatives will occur from use of Sevin 80S. According to Don White (Research Zoologist with USDI, Fish and Wildlife Service; Athens, Georgia), during his many years of field experience with pesticide/wildlife, he has not encountered any wildlife mortality due to toxicity from Sevin. Dr. White states that Sevin is among the safest of all organo-phosphates available on the market today.

Alternative 2 - Mechanical Renovation

The environmental impacts of mechanical renovation would not be serious. Extra disking of existing grub-infested food plots would increase the erosion potential of these fields and possibly cause extra silt runoff into nearby trout streams if any heavy rain events occurred during the ground preparation phase. However, as stated previously in the Alternatives Section, mechanical renovation is ineffective at reducing grub damage and annual plowing and planting of wildlife openings on the Forest is cost prohibitive (about $200 per acre per year or $140,000 total for 700 acres).

Alternative 3 - No Action

Loss of clover/grass plantings by the no action alternative would cause decreases in habitat carrying capacity and population size for many wildlife species. Addition of food plots in an Arkansas study (Rogers 1980) essentially doubled the deer population density. Increases in wild turkey populations related to establishment of food plots have been documented in several studies including a Virginia study (McGinnis and Ripley 1962) and a Pennsylvania study (Wunz 1990). Songbird species (including Neo-tropical Migrants) diversities and densities were greater in and around managed forest openings in several studies including those by Clawson (1980) and Landers (1987), and Parker et al. (1992).

In summary, there is strong evidence in the literature that abandoning management of high quality clover/grass wildlife openings (food plots) would lead to decreased populations of several wildlife species including game and non-game species. The Game and Fish Division does not believe it to be public interest to take no action to prevent the loss of already

established clover/grass stands in wildlife openings. Of all the potential environmental impacts discussed in this report, the impact resulting from no action in this case appears to be the most severe in terms of loss of wildlife carrying capacity and population densities and species diversities which are currently associated with our high quality food plot program. Application of safe pesticides covered in this report could not cause the wildlife impacts that will result from abandonment of our current food plot management practices.

Alternative 4 - Use of Other Pesticides

There are several effective agricultural chemicals approved for control of grubs. Dursban 2EC (not available), Diazinon 4EC, and Acephate (Orthene Table Al.). Unfortunately, all are more toxic than Sevin. Through various Regional Environmental Impacts statements, risk assessments of the pesticides considered have been completed. Dursban (Chlorpyrifos) was examined in detail in Region 8's Southern Pine Beetle EIS. Complete information is contained in Appendix C of the Final Environmental Impact Statement for the Suppression of the Southern Pine Beetle, Southern Region, 1987. Orthene (Acephate) was examined in detail in Region 8's Gypsy Moth EIS. Complete information is contained in Appendix C of the Final Environmental Impact Statement for the Suppression of the Southern Pine Beetle, Southern Region, 1987. Orthene (Acephate) was examined in detail in Region 8's Southern Pine Beetle EIS. Complete information is contained in Appendix C of the Final Environmental Impact Statement for the Suppression of the Southern Pine Beetle, Southern Region, 1987. Orthene (Acephate) was examined in detail in Region 8's Gypsy Moth EIS. Complete information is contained in Appendix H - Plain Language Summary of the Health Risk Analysis of the Gypsy Moth Suppression and Eradication Projects, Final Addendum to the Final Environmental Impact Statement as Supplemented, Southern Region, 1985. Diazinon currently does not have a risk assessment. However it is listed under Toxicity class III (moderately toxic, LD50 201-1,000 mg/kg). It is relatively safe for mammals but highly toxic to birds (Smith 1987). Half-lives in the soil are 4-6 weeks. We do not recommend use of this chemical because of the potential for birds to ingest dying grubs as they emerge and receive lethal doses of the chemical. Table 2 summarizes toxicity classes, documented mortality, and half-life of pesticides under consideration for use. For our purposes, we would automatically exclude from consideration any pesticide in toxicity classes I and II. These exclude from consideration any pesticide in toxicity classes I and II. These exclude from consideration Dursban, Proxol, and Oftanol and leaves 3 possible chemical choices which are classed as moderately toxic-Sevin,

Orthene or Diazinon. A discussion of LD50 levels of these pesticides is contained under Alternative 1. Of course, these toxicity levels are determined from laboratory tests by oral dosages under controlled conditions. Nevertheless, Orthene and Diazinon are obviously more toxic to birds than Sevin.

A final consideration is half-life in the soil and documented mortality of any wildlife in the field. Half-life of Diazinon at 4-6 weeks is reason for some concern but the most detrimental problem with Diazinon is its toxicity to birds. There have been documented die-offs of geese and ducks (Smith 1987). Orthene has a very reasonable half-life (0.5-4 days) but has also been implicated by circumstantial evidence in some possible bird mortality (Smith 1987). Sevin has a reasonable half-life (7-10 days) and has never been implicated in any wildlife mortality despite numerous studies (Smith 1987).

Alternatives 5 - Use of Milky Spore Disease

Biological control is often selective and can control a single species without impacting others. This selectivity usually works to great advantage, but with milky spore disease, selectivity is a negative factor since green June beetle grubs are not controlled by milky spore. This fact alone precludes its use on our plots since it cannot be used in conjunction with any chemical pesticides. Also, there is a body of evidence which indicates that Milky spore disease is either not as virulent as it once was, or that grubs have become resistant to it, or both (Savos 1987.) Recent research failed to document any significant reduction in Japanese beetle grub populations following applications of milky disease (Redmond 1990). Until such a time when milky spore is shown by scientific research to be effective against Japanese beetles or until such a time when a biological control is developed for green June beetles, we are forced to eliminate it from consideration despite its potential for low environmental impact.

Alternative 6 - Use of Diatomaceous Earth or Nematodes

Neither of these treatments has any known detrimental impacts on non-target species or the environment. However, neither has been demonstrated to be effective in controlling white grubs in large scale projects. Until further research documents their effectiveness, however, they cannot be considered in a program to control grubs. Nematodes are not yet available commercially for grub treatment in clover/grass fields and the expense of this treatment is prohibitive.

Appendix E

Letters Received from Public During Scoping

Appendix F

Biological Evaluation

Appendix G

LOCALLY RARE SPECIES

BIRDS:

COMMON NAME	SCIENTIFIC NAME
Cedar Waxwing	*Bombycilla cedrorum*
Common Raven	*Corvus corax*
Cerulean Warbler	*Dendroica cerulea*
Least Flycatcher	*Empidonax minimus*
Willow Flycatcher	*Empidonax trailii*
Peregrine Falcon	*Falco peregrinus*
Red Crossbill	*Loxia curvirostra*
Rose-breasted Grosbeak	*Pheucticus ludovicianus*
Golden-Crowned Kinglet	*Regulus satrapa*
Red-breasted Nuthatch	*Sitta canadensis*
Winter Wren	*Troglodytes troglodytes*
Golden-winged Warbler	*Vermivora chrysoptera*
Canada Warbler	*Wilsonia canadensis*

MAMMALS:

Southern Appalachian Woodrat	*Neotoma floridana haematoreia*
Appalachian Cottontail	*Sylvilagus obscurus*
Longtail (or Rock) Shrew	*Sorex dispar*
Red Squirrel	*Tamiasciurus hudsonicus*
Star-nosed Mole	*Condylura cristata*

REPTILES/AMPHIBIANS

Green Salamander	*Aneides aeneus*
Hellbender	*Cryptobranchus alleghaniensis*
Coal Skink	*Eumeces anthracinus*
4-Toed Salamander	*Hemidactylium scutatum*
Mudpuppy	Necturus maculosus
Alabama Map Turtle	*Graptemys pulchra*
Map Turtle	*Graptemys geographica*
Northern Pine Snake	*Pituophis m. melanoleucus*

CRAYFISH:

Hiawassee Crayfish	*Cambarus hiwasseensis*
A Crayish	*Cambarus manningi*

FISH:

Whitetail Shiner	*Cyprinella galactura*
Blotched Chub	*Erimystax insignis*
Greenfin Darter	*Etheostoma chlorobranchium*
Coosa Darter	*Etheostoma coosae*
Greenbreast Darter	*Etheostoma jordani*
Redline Darter	*Etheostoma rufilineatum*
Rock Darter	*Etheostoma rupestre*
Snubnose Darter	*Etheostoma simoterum*
Banded Darter	*Etheostoma zonale*
Bigeye Chub	*Hybopsis amblops*
Speckled Chub	*Macrhybopsis hyostoma*
River Redhorse	*Moxostoma carinatum*
Burrhead Shiner	*Notropis asperifrons*
Rainbow Shiner	*Notropis chrosomus*
Tennessee Shiner	*Notropis leuciodus*
Silver Shiner	*Notropis photogenis*
Tangerine Darter	*Percina aurantiaca*
Bronze Darter	*Percina palmaris*
Dusky Darter	*Percina sciera*
River Darter	*Percina shumardi*
Muscadine Darter	*Percina sp.cf.macrocephala*
Riffle Minnow	*Phenacobius catostomus*
Brassy Jumprock	*Scartomyzon brassieus*
Greater Jumprock	*Scartomyzon lachneri*

PLANTS:

Mountain Maple	*Acer spicatum*
Shining Indigo Bush	*Amorpha nitens*
Carolina Anemone	*Anemone Carolina*
Zigzag Aster	*Aster prenanthoides*
Wild Hyacinth	*Camassia scilloides*
Manhart’s Sedge	*Carex manhartii*
Broadleaf Sedge	*Carex platyphylla*
Purple Sedge	*Carex purpurifera*
Rough Sedge	*Carex scabrata*
American Chestnut	*Castanea dentate*
Indian Paintbrush	*Castilleja coccinea*
Golden Saxifrage	*Chrsosplenium americanum*
Carolina Thistle	*Cirsium carolinianum*
Yellowwood	*Cladrastic kentuckea*
Spreading Pogonia	*Cleistes bifaria*
Curlyheads	*Clematis ochraleuca*
Sweet Fern	*Comptonia peregrina*

Pale Corydalis	*Corydalis sempervirens*
Fraser Sedge	*Cymophyllus fraserianus*
Yellow Lady’s Slipper	*Cypripedium calceolus*
Squirrel Corn	*Dicentra Canadensis*
Bleeding Heart	*Dicentra eximia*
Ground Cedar	*Diphasiastrum tristachyum*
Leatherwood	*Dirca palustris*
Shooting Star	Dodecatheon meadia
Log Fern	*Dryopteris celsa*
Goldie’s Wood Fern	*Dryopteris goldiana*
Fringed Gentian	*Gentianopsis crinita*
Rock Rose	*Helianthemum bicknellii*
Cow Parsnip	*Heracleum lanatum*
Crested Coral Root	*Hexalectris spicata*
Appalachian Fir Clubmoss	*Huperzia appalachiana*
Rock Clubmoss	*Huperzia porophila*
Golden Seal	*Hydrastic Canadensis*
Largeleaf Waterleaf	*Hydrophyllum macrophyllum*
Blue Ridge St. Lohn’s Wort	*Hypericum buckleyi*
Naked Fruit Rush	*Juncus gymnocarpus*
Ground Juniper	*Juniperus communis depressa*
Sheep Laurel	*Kilmia Carolina*
Sand Myrtle	*Leiophyllum buxifolium*
Southern Twayblade	*Listera australis*
Kidney-Leaved Twayblade	*Listera smallii*
Ground Pine	*Lycopodium clavatum*
Climbing Fern	*Lygodium palmatum*
Broadleaf Bunchflower	*Melanthium latifolium*
Virginia Bluebell	*Mertensia virginica*
Indian Olive	*Nestronia umbellula*
Dwarf Ginseng	*Panax trifolius*
Silverling	*Paronychia argyrocoma*
Swamp Lousewort	*Pedicularis lanceolata*
Broadleaf Phlox	*Phlox amplifolia*
Large Purple-Fringed Orchid	*Platanthera grandiflora*
Fringeless Purple Orchid	*Platanthera peramoena*
Small Purple-Fringed Orchid	*Platanthera psycodes*
Spotted Mandarin	*Prosartes maculatum*
Fire Cherry	*Prunus pensylvanica*
Choke Cherry	*Prunus virginiana*
Virginia Mountain Mint	*Pycnanthemum virginianum*
Staghorn Sumac	*Rhus typhina*
Dwarf Palmetto	*Sabal minor*
Red Elderberry	*Sambucus racemosa pubens*
Canada Burnet	*Sanguisorba Canadensis*
Purple Pitcher Plant	*Sarracenia purpurea*
Bottomland Skullcap	*Scutellaria nervosa*
Three-Toothed Cinquefoil	*Sibbaldiopsis tridentate*

Biltmore Carrionflower	*Smilax biltmoreana*
White Goldenrod	*Solidago ptarmicoides*
American Mountain Ash	*Sorbus Americana*
Hardhack	*Spirea tomentosa*
Oval Ladies’ Tresses	*Spiranthes ovalis*
Hedge Nettle	*Stachys nuttallii*
Mountain Camellia	*Stewartia ovata*
Rosy Twisted-Stalk	*Streptopus roseus*
A Meadow Rue	*Thalictrum steeleanum*
Dwarf Filmy Fern	*Trichopmanes petersii*
Tufted Club Rush	*Trichophorum cespitosum*
Starflower	*Trientalis borealis*
Pale Yellow Trillium	*Trillium discolor*
Barksdale Trillium	*Trillium sulcatum*
Horse Gentian	*Triosteum aurantiacum*
Bearberry	*Vaccinium erythrocarpum*
American False Hellebore	*Veratum viride*
American Dog Violet	*Viola conspersa*
Turkeybeard	*Xerophyllum asphodeloides*
Ozark Bunchflower	*Veratrum woodii*