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Service

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# Environmental Assessment

## Soldier Bay Analysis Area

Wakulla Ranger District, Apalachicola National Forest  
Wakulla County, Florida

T3S R4W, T4S R4W

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## SUMMARY

The Forest Service proposes to treat approximately 2,330 acres of forestland in the Soldier Bay Analysis Area. The proposed action would include treatments such as hazardous fuel reduction, thinning of slash and longleaf stands, clearcuts of stunted slash pine, groundcover restoration, applying herbicides for site preparation and pine release, erosion control, planting of longleaf pine in clearcut stands, and reconstruction of a trailhead. Connected actions necessary to implement the proposed actions would include landline maintenance, road construction, reconstruction, or maintenance and temporary trail detour during harvesting operations. These actions are needed to reduce the wildfire risk on lands adjacent to private property and to move the analysis area from its existing condition to the desired condition described in the Revised Land and Resource Management Plan for the National Forest in Florida (Forest Plan). This project is not authorized under the Healthy Forest Restoration Act (HFRA). In addition these actions would aid in maintaining a healthy forest and improve future red-cockaded woodpecker (RCW) habitat.

The Soldier Bay Analysis Area is located in Compartments 312, 326, and 328 in sections 20, 21, 29, 33, and 34 of Township 3 South, Range 4 and sections 3,4, 8, 9, 10, 11, 14, 15, and 16 of Township 4 South and Range 4 West, Wakulla County, Florida (Figure 1).

In addition to the Proposed Action this environmental assessment (EA) evaluated the following alternatives:

- Alternative A – No Action
- Alternative C – No Herbicide, which utilizes mechanical equipment and prescribe fire instead of herbicides for site preparation, groundcover restoration, pine release, and hardwood control.

Based upon the effects of the alternatives, the responsible official will decide whether or not to improve forest health and future habitat for proposed, endangered, threatened, and sensitive (PETS) species as described in the Proposed Action and whether or not to control hardwoods with herbicides or another method such as prescribed fire or by other mechanical means.

The implementation of this project would improve forest health, reduce hazardous fuels buildup, restore native tree species, improve PETS species habitat, promote an increase in average diameter of trees, reduce the abundance of hardwood stems, encourage a grassy herbaceous understory, and enhance recreational opportunities on the Florida National Scenic Trail.

## INTRODUCTION

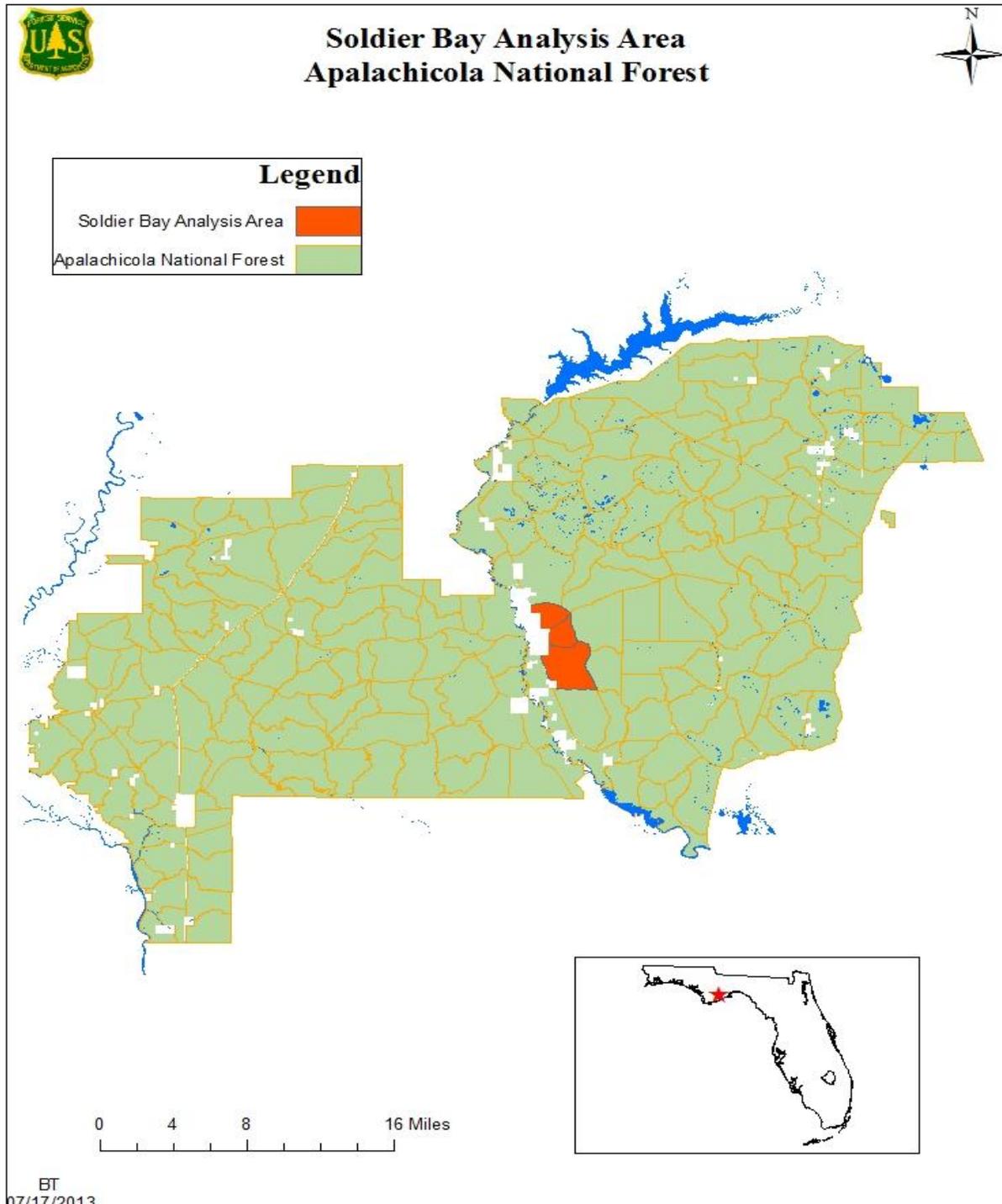
The Forest Service has prepared this EA in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This EA discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives.

This EA is tiered to the Final Environmental Impact Statement Record of Decision for the Land and Resource Management Plan for the National Forests in Florida (1999) and The Apalachicola Five Year Prescribed Burn EA. These documents are available for review by request from the District Office or online at the following web addresses:

Forest Plan <http://www.fs.usda.gov/detail/florida/landmanagement/?cid=STELPRDB5269793>

Prescribed Burn EA [http://www.fs.fed.us/nepa/nepa\\_project\\_exp.php?project=35380](http://www.fs.fed.us/nepa/nepa_project_exp.php?project=35380)

**Figure 1. Project area map**



## Background

Much of Wakulla County is forested, has high fuel load levels, and has seen numerous historical fire events. In 2011 the Apalachicola National Forest, in cooperation with local, regional, state, and federal agencies, approved the Wakulla County Community Wildfire Protection Plan. The plan addresses the challenges of fire protection in the wildland urban interface and plans for reducing wildfire vulnerability in Wakulla County, Florida. The primary goal under the plan is to protect public health and safety by decreasing wildfire risk in the county by (1) using a risk analysis to find areas at significant wildfire risk and (2) prioritize these areas in fuel reduction projects and initiate them.

The Soldier Bay Analysis Area was entered on the 5-Year Vegetation Management Plan for the Apalachicola National Forest because its proximity to local private communities and potential wildfire risk. The analysis area lies between the Smith Creek community and the Bradwell Bay Wilderness thus serving as a buffer for wildfires originating or spreading through the wilderness. An interdisciplinary approach was used to evaluate areas and propose treatments to move the areas toward a desired future condition with lower fuel levels. These would be the typical silvicultural treatments prescribed to move stands toward the future desired condition for the Longleaf/Slash, Adaptive Management, RCW Management (7.1) Management Area.

## Purpose and Need for Action

Chapter three of The Forest Plan describes forest wide standards and guidelines used throughout the National Forests in Florida. FI-12 states that the forest will “Evaluate all naturally occurring wildland fires within wilderness for appropriate response goals and objectives of the National Forests of Florida (USDA 1999b, pg 3-4). According to the U.S. Census the population of Wakulla County is identified as one of the nation’s fastest growing counties. Nearly 98% of the county’s population lives in unincorporated areas. This provides challenges when addressing wildfire risk and protecting homes where wildland fuels are present. The primary purpose of this project is to reduce fuels in the wildland urban interface and to improve future habitat for threatened and endangered species. Given the analysis area’s proximity to the Bradwell Bay Wilderness and the associated wildfire history, there is a need to treat overstocked stands with excessive wildfire fuels to protect the surrounding urban interface. A need also exists to maintain and improve habitat conditions for threatened and endangered species.

## Existing Condition

The Soldier Bay Analysis Area contains approximately 6,589 acres and is located entirely within the Longleaf/Slash, Adaptive Management, RCW Management, Management Area (MA. 7.1). A description of the management objectives and resource conditions in this MA is found in the Forest Plan (p. 4.37-4.40). The Forest Plan describes this management area as containing a mosaic of plant communities which vary depending on moisture conditions.

In 2010 the National Forests in Florida initiated a project with the Florida Natural Areas Inventory (FNAI) to identify and delineate historical natural communities of the Apalachicola National Forest. In 2011-2012, FNAI biologists generated a GIS-based historical natural community map based on multiple years of georeferenced aerial photography, soil surveys,

LiDAR digital elevation models, vegetation plots, element occurrences of rare species and natural communities and ground-truthed GPS points (FNAI 2012). Historical vegetation was categorized according to FNAI's guide to Florida natural communities (FNAI 2010, available online at <http://www.fnai.org/naturalcommguide.cfm>). Based on this information it has been determined that historically the project area contained 4,300 acres of mesic flatwoods, 2,000 acres of swamps, 160 acres of sandhills, and approximately 70 acres of wet prairies (see Figure 5). Mesic flatwoods are some of the most widespread biological communities in Florida, accounting for 30-50% of the state's uplands (FNAI 1990). They occur on moderately to poorly drained terrain. During periods of rain water frequently accumulates on the surface and inundates most of the stand.

The treatment stands contain slash pine stands that range between 27 and 106 years old. The younger slash stands (24-55 years) have an average Basal Area (BA) of 102 square feet per acre. These stands, many being plantations, have little to no herbaceous groundcover component and are dominated by woody shrub species. Mesic flatwoods are closely associated with and usually grade into wet flatwoods or scrubby flatwoods (FNAI 1990). In wetter flatwood sites, the understories are dominated by gallberry, sweetbay, fetterbush, titi and other woody species along with sparse grasses and flowering plants. The lack of adequate herbaceous groundcover in conjunction with heavy woody component makes burning these stands increasingly difficult. During periods of drought, the heavy fuel loading in these stands pose a threat to the surrounding Smith Creek community if a wildfire were to occur. Mature slash stands (>55 years old) have an average BA of 80 square feet per acre and present the similar groundcover and understory conditions as younger stands. Longleaf pine stands proposed for treatment range from 38 to 106 years old with an average BA of 75 square feet per acre.

Typical forested wetland species such as black gum, cypress, red maple, titi and wax myrtle occur throughout the drainages and swamps of the project area. Encroachment of titi and other wetland shrubs into more open habitat has occurred due to insufficient frequency and intensity of fire. The lowlands and hardwood stringers along the watercourses are in good condition.

The analysis area includes 151 acres of stunted slash pine plantations. The limited needle cast and woody component of these stands results in ineffective prescribed burning. The stunted slash plantations are in poor condition and not growing well as evidenced by their small crowns and stagnated diameter growth (see Figure 2). Clearcutting these stands is the optimal method of restoring longleaf due to the lack of mature seed producing longleaf pine and herbaceous groundcover presently in the stand. Shelterwood or seed-tree cuts would not fully restock the stand with longleaf pine. Seedlings would be outcompeted by woody plant species. There are portions of these stands that have adequate herbaceous groundcover (Figure 2 left picture) while other areas are patchy. In instances where groundcover is more herbaceous the proposed action calls for planting under stagnated slash pine to minimize damage to groundcover.

The transportation system of the area includes approximately 28.9 miles of designated system roads, 11.2 miles of system roads that are closed to the public, and 10.6 miles of non-system routes, which are also closed to the public. Roads in the analysis area are in fair to poor condition with several exhibiting severe erosion problems.

The 1,300-mile Florida National Scenic Trail (FNST) is the only national scenic trail designated by Congress, that explores the tropical and subtropical regions and can be enjoyed by adventures year-round. Approximately four (4) miles of the FNST leaves the Bradwell Bay Wilderness Area and continues west to traverse through compartment 328 of the analysis area. Bradwell Bay West Trailhead consists of structures such as fencing and a kiosk/signage without any designated parking.

Other general indicators of forest health conditions include the diversity and amount of sensitive animal species. The most recent survey indicates there are four active RCW clusters that utilize at least part of the analysis area as foraging habitat.

**Figure 2. Pictures of stunted stand in compartment 312 stand 18**



Figure 3. Wildfire History Map

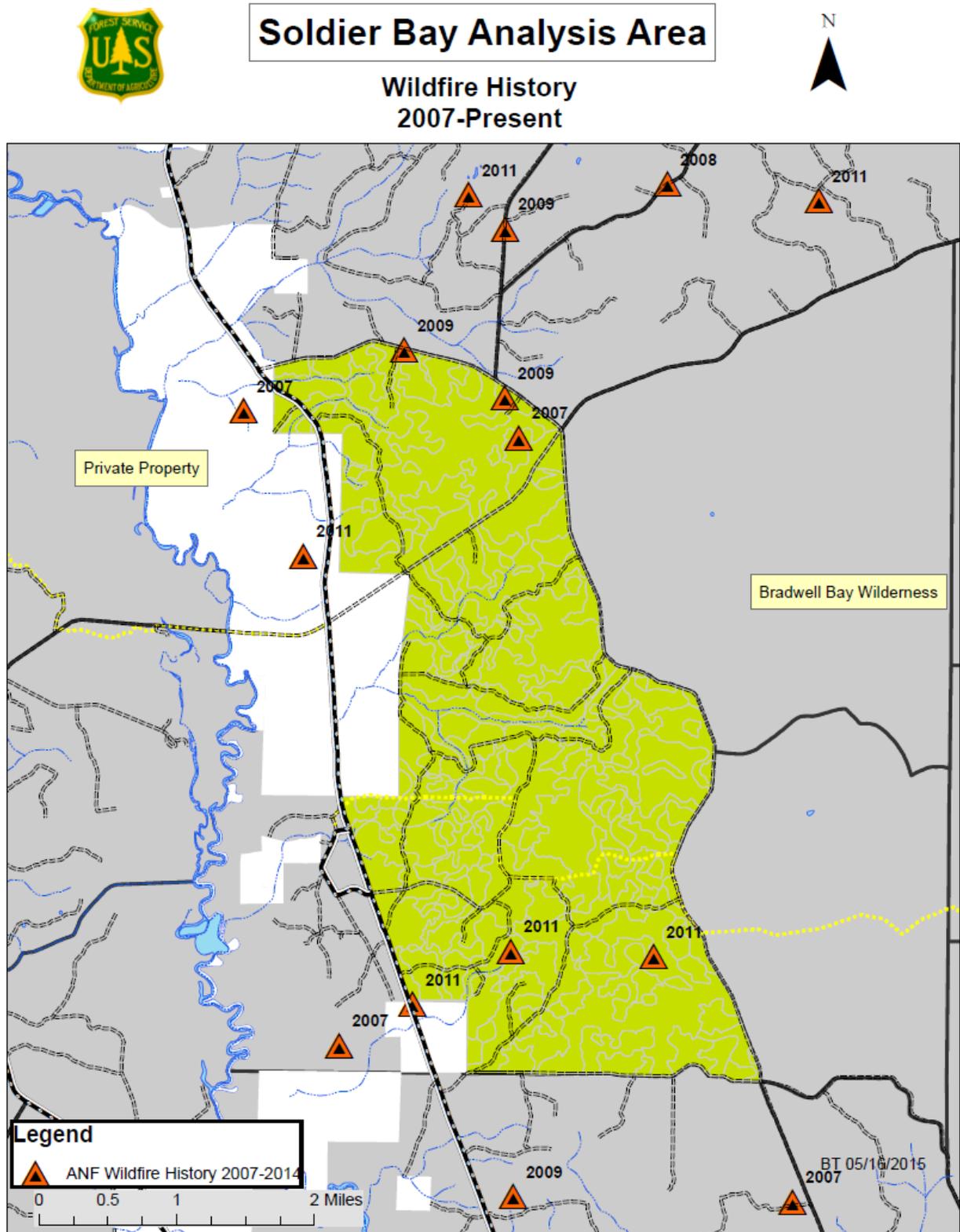


Figure 4. Soldier Bay basal area based on Lidar observations

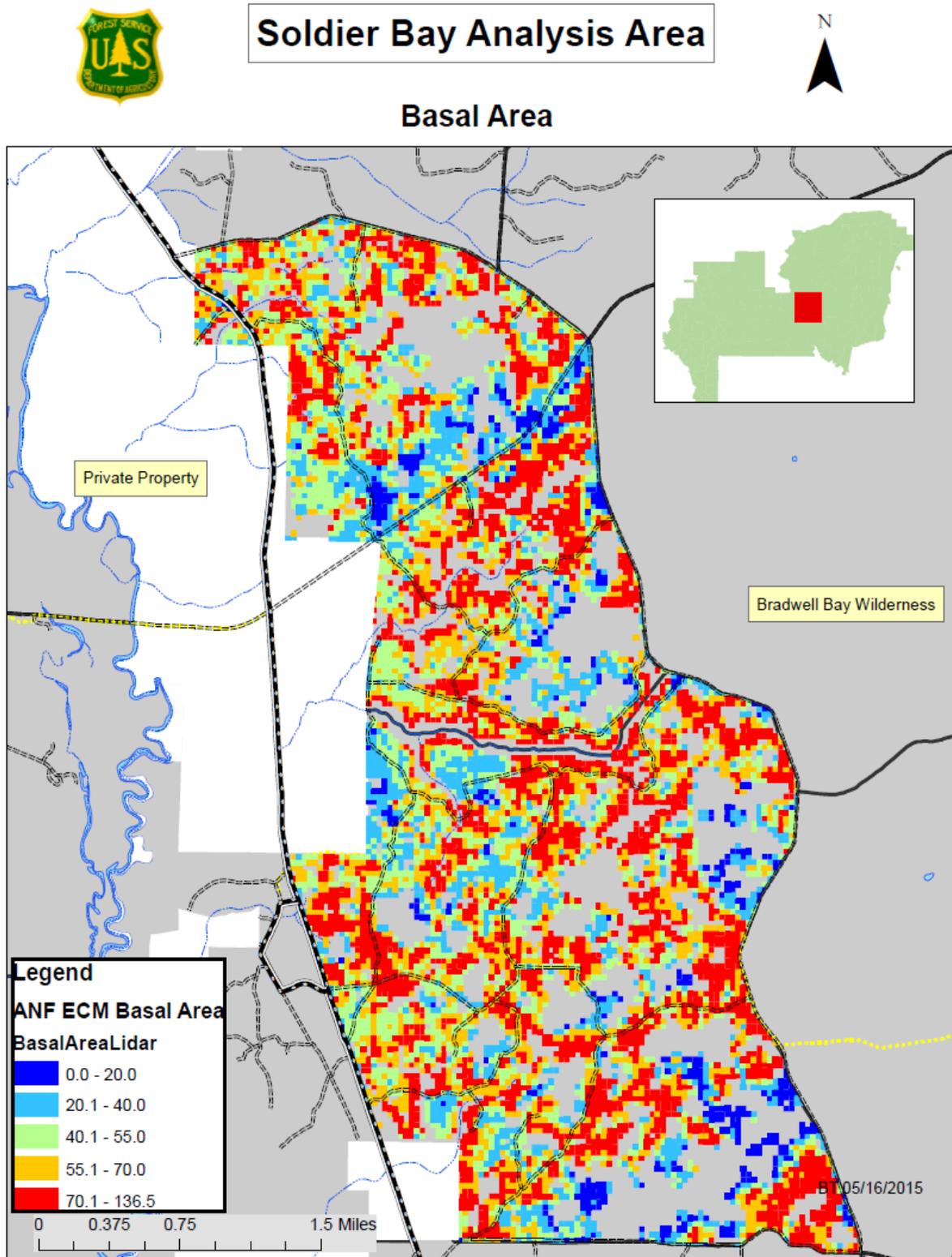
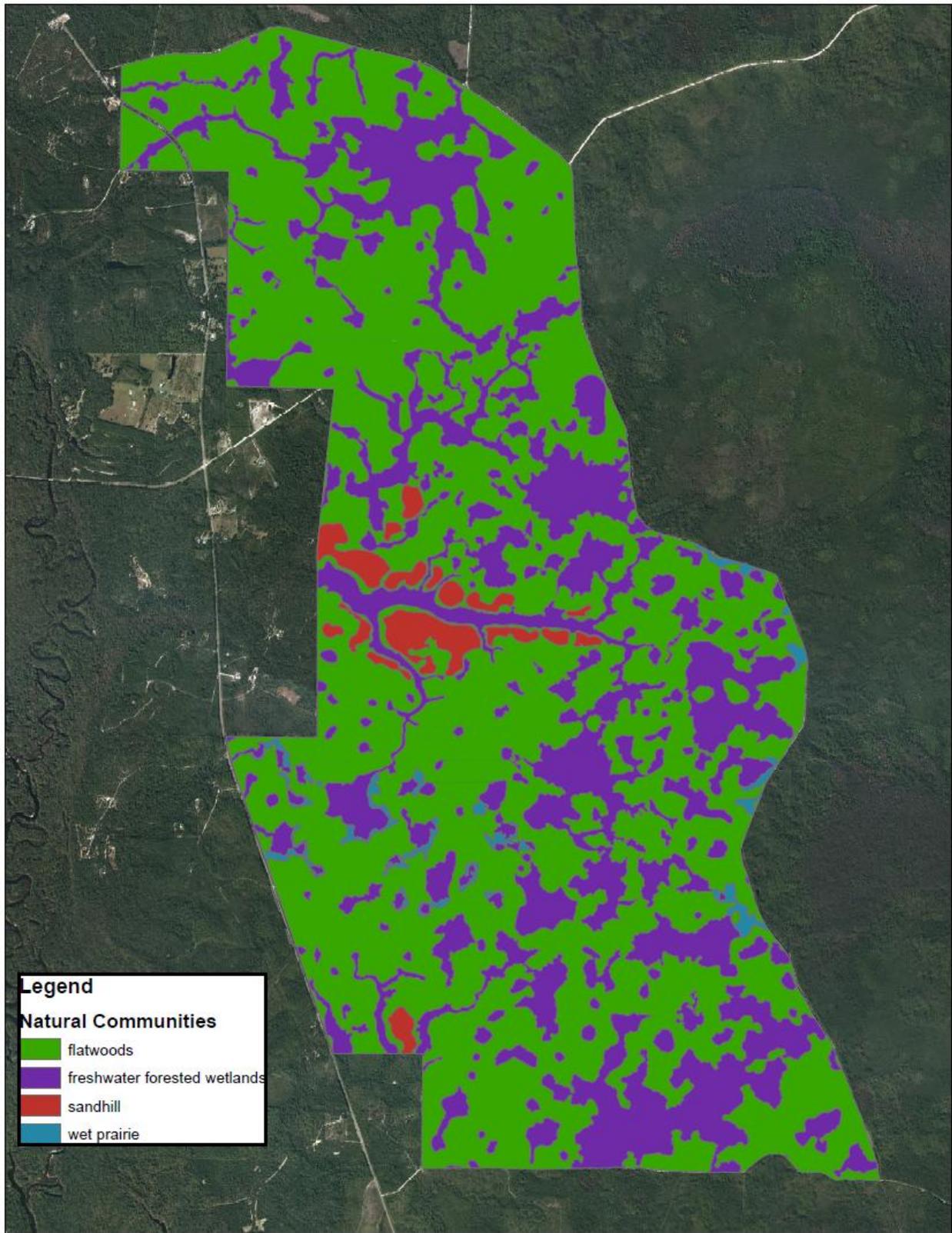


Figure 5. Spatial distribution of historical communities within the Soldier Bay Analysis Area



## Desired Condition

The objective of these management actions is to redirect the forest system in the analysis area toward a future condition with a forest structure and self-sustaining functioning system while continuing to protect the wildland urban interface. In proposed thinning areas the next two decades will result in the creation of mature slash and longleaf stands that will provide excellent habitat conditions for numerous plant and animal species on the forest (USDA 1999b). During the next two decades following site conversion and reintroduction of native longleaf pine, the project area will consist of trees that are more open with less woody vegetation in the understory growing well and trending towards healthy mature, longleaf stands. The groundcover will provide adequate fuel to carry fire during prescribed fire operations. The ability to prescribe burn in conjunction with lower stocking in stands will allow the analysis area to serve as a fuel break to protect local communities from wildfire. Mature flattop longleaf and slash pines with woodpecker cavities are seen throughout the pine forests. As the forest ages, there will be more opportunities to provide two-aged patches of slash and longleaf pine. Even-aged patches of longleaf pine restoration up to 80 acres may continue to occur.

Approximately two-thirds of the project area is classified as historical flatwoods, and the desired conditions for MA 7.1 and 7.2 are most applicable to these stands. Mesic flatwoods are characterized as “an open canopy forest of widely spaced pine trees with little or no understory but a dense groundcover of herbs and shrubs” (FNAI 1990). Vegetation structure in these areas will be managed to meet the criteria for Good Quality Foraging Habitat as described in the Recovery Plan for the red-cockaded woodpecker (*Picoides borealis*), Second revision (U.S. Fish and Wildlife Service 2003, p. 188-189) while also recognizing the need for multiple-use management including timber harvest.

The different plant communities co-existing within the area are not separated by sharp boundaries, but change from one type to another gradually in response to fluctuations in water level and fire history. Occasionally fires may also enter wetlands and the plant species typically found in these low lying areas are dependent on the occasional removal of dead plant material and reduction of fire intolerant shrubs and trees provided by the regular disturbance. Vegetation patterns like this are primarily the result of fire, including prescribed fire, as well as hydrology and management activities such as timber harvesting. The pine canopy will be open and park like. A natural component of the ecosystem, stumps and downed trees will continue to be scattered throughout the forest (USDA 1999b). Dead woody material is a result of natural tree thinning from ground fires and will provide numerous habitat values such as nesting and foraging sites for wildlife. There are snags, downed trees, and lightning-struck trees. Much of the area would have old-growth conditions at any one time.

Most of the roads in the area will continue to have native surfacing and will be rough and irregular even after the proposed management actions. In low areas, navigable roads will usually have ditches and are above the surrounding grade. Many drainage points that cross roads will continue to have low-water rock crossings making passage easier. However, travel with low-clearance vehicles will be generally difficult, with the irregularity of the road surface and occasional changes in overall road quality. In some circumstances, roads will also have an artificially improved sand-clay surfacing, will be higher than the surrounding grade, and have

ditches. In low areas, these may have culverts or bridges (USDA 1999a). These roads may not be stable during bad weather conditions, but will be generally more navigable than the native surfaced roads discussed previously. However, rutting, roughness, and dust will be present most of the time and a high clearance vehicle will still be recommended. There will be a few higher-quality roads with limerock surfacing or pavement. These are stable and smooth all the time, have little dust or roughness and will be accessible by most vehicles.

The quality of soil, water, and air will be high. Smoke from prescribed fire will occur but with no adverse effects to the environment. Wet areas will show little to no evidence of draining, vehicular activity, or manipulation (USDA 1999b).

## Proposed Action

To meet the purpose and need the Forest Service is proposing the following treatments:

- Thinning of approximately 2062 acres of longleaf and slash pine stands.
- Conducting fuel reduction treatment of approximately 1434 acres using herbicide and/or mechanical equipment to aid in the wildfire protection of private property.
- Site conversion of 151 acres of slash pine and convert to longleaf pine.
- Site prep of 92 acres using herbicide and/or mechanical equipment.
- Ground cover restoration treatments on 92 acres.
- Planting 151 acres of longleaf pine seedlings.
- Mechanical and/or herbicide release of 151 acres of longleaf pine seedlings.
- Restoring eroded soils on temporary roads and log landing where necessary.
- Reconstruction of FNST trailhead to allow for approximately 3 parallel parking spaces.

The construction of 3 parallel parking was added to the proposed action after further discussion with the interdisciplinary team. It was not included in the previous publication of the draft EA during the 30 day notice and comment period.

## Decision Framework

Given the purpose and need, the deciding official will review the proposed action and other alternatives in order to make the following decisions:

- Which alternative best meets the purpose and need for the proposal?
- How each alternative addresses the issues developed by the interdisciplinary team and through public involvement?
- Which alternative or combination of alternatives to implement?

## Public Involvement

This proposal was listed in the Schedule of Proposed Actions for National Forests in Florida beginning the 4th Quarter of Fiscal Year 2014. Initial scoping was completed in November 2014 by sending a letter and treatment map to the forest scoping list requesting comments on the draft proposed action and posting of project documents to the National Forests in Florida website.

A 30 day notice and comment period was initiated December 14, 2015 with the publishing of a legal notice in the *Tallahassee Democrat*. All comments received have been compiled and included in appendix A.

During this phase of public involvement the final EA (this document) and draft Decision Notice are being posted to the National Forests in Florida Webpage. A legal notice published in the *Tallahassee Democrat* will initiate the 45-day Objection Period pursuant to 36 CFR 218. Letters or emails announcing your opportunity to object will be sent to concerned citizens, adjacent landowners, organizations, and other agencies that have submitted timely, specific written comments regarding the project during previous comment periods (i.e. scoping and notice and comment periods). Issues to be raised in objections must be based on previously submitted specific written comments regarding the proposed project and attributed to the objector, unless the issue is based on new information that arose after a designated opportunity to comment (36 CFR 218.8).

## Identifying Issues

The Forest Service identifies issues to aid in setting the scope of actions and alternatives for a particular project. Issues are defined as unintended effects that may occur from the proposed action and alternatives (FSH 1909.15). Non-issues include those which are:

- outside the scope of the proposed action,
- already decided by law, regulation, Forest Plan, or other higher level decision,
- irrelevant to the decision to be made,
- conjectural and not supported by scientific or factual evidence,
- addressed with minor project design modifications of the Proposed Action which when considered alone would not result in a clearly defined alternative to the Proposed Action, or do not include measurable effects for comparison.

Issues identified by the IDT include:

1. The use of herbicides is a management activity that could cause potential environmental and human health impacts.
2. Timber harvest and mechanical fuels reduction operations impact the congressionally designated Florida National Scenic Trail.

## ALTERNATIVES

This chapter describes and compares the alternatives considered for the Soldier Bay Analysis Area. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

### Alternative A - No Action

Under the No Action Alternative, on-going activities such as prescribed fire, road maintenance, and treatment for non-native noxious and invasive weeds would continue. None of the activities described in the Proposed Action would occur.

## Alternative B - Proposed Action

The Forest Service is proposing to reduce fuels in the wildland urban interface, improve ecosystem function and increase future habitat for threatened, endangered, and sensitive species. These actions are designed to move the analysis area closer to its future desired condition for Longleaf/Slash Pine, Adaptive Management, RCW Management Area (7.1). Detailed descriptions of the proposed treatments are as follows:

- First or intermediate thinning of approximately 2062 acres of slash and longleaf pine stands. Stands will be thinned to 40 BA to reduce fuels, open the forest canopy, and promote the establishment of herbaceous groundcover species.
- Conversion of 151 acres of stagnant off-site slash pine plantations to longleaf pine. Approximately 92 acres will be converted using clearcuts with reserves. All on-site longleaf pine will be reserved during clearcut operations. Approximately 59 acres will be converted by underplanting longleaf under existing stagnated slash pine.
- Restore groundcover by hand planting or seeding wiregrass on 92 acres.
- Conducting fuel reduction treatments on approximately 1434 acres using herbicide and/or mechanical equipment to promote herbaceous groundcover growth and reduce wildfire heavy fuels. The herbicides hexazinone, triclopyr, and glyphosate will be used in combination as needed to reduce woody fuels throughout the stand. The combination of herbicide would give the Forest Service full flexibility in addressing woody understory response following timber harvest. If the herbaceous response is favorable herbicide would not be applied. The hexazinone treatments will be applied on a 6'X6' spot grid at a rate of 3 quarts per acre. Triclopyr and glyphosate will be foliar applied. Glyphosate will be applied as directed by the label. This will not be a broadcast application of herbicide but rather a targeted spot treatment, as needed.
- Site prep of 151 acres using herbicide and/or mechanical equipment using triclopyr, glyphosate, and/or hexazinone. This will not be a broadcast application of herbicide. Treatments will be done by application on a 6'X6' spot grid, strip application, or spot foliar treatment, as needed and in accordance with Forest Service guidance and herbicide labels.
- Planting of 151 acres of longleaf pine seedlings.
  - Longleaf seedlings will be released (if needed) mechanically with brush saws and/or with the herbicide triclopyr.
- Restoring eroded soils on temporary roads and log landing where necessary.
- Reconstruction of FNST trailhead for adequate parking for 3 passenger vehicles parallel to Forest Road 314 and trail maintenance such as hazard tree removal, mowing, blazing and signage.

Connected actions necessary to facilitate the proposed action include maintenance of 4.67 miles of landlines, reconstruction of approximately 13.99 miles of system roads, temporary improvement and use of approximately 1.0 miles of non-system which provide access to pine plantations, and the maintenance of approximately 8.11 miles of system roads used to haul timber products from the analysis area. For duration of the operations, the FNST trail would be temporarily detoured to follow existing corridors (i.e. forest roads, landlines, utility lines, etc.) for public health and safety.

If approved, these actions would take place in Compartments 312, 326, and 328 of the Wakulla Ranger District, Apalachicola National Forest in Liberty, Florida within the next 5-10 years.

**Table 1: Proposed Action, Alternative B – Estimated Treatment Acres by Stand**

Comp	Stand	Treat. Acres	Treatment	Hexazinone	Triclopyr	Glyphosate	Plant Longleaf	Release
312	1	38	Thin	X				
312	5	17	Thin					
312	6	29	Thin					
312	7	55	Thin					
312	9	30	Thin		X	X		
312	10	15	Thin		X	X		
312	11	18	Hardwood Removal		X	X		
312	15	24	Thin		X	X		
312	18	41	Clearcut		X	X	X	X
312	18	59	Underplant		X	X	X	X
312	21	12	Clearcut		X		X	X
312	22	46	Thin		X	X		
312	23	57	Thin		X	X		
312	24	18	Thin		X	X		
312	27	62	Thin					
326	1	24	Clearcut	X			X	X
326	2	12	Thin					
326	7	45	Thin		X	X		
326	8	5	Thin / Hardwood Control	X				
326	9	25	Thin					
326	12	74	Thin/ Hardwood Control	X				
326	14	44	Thin/ Hardwood Control	X				
326	15	9	Thin		X	X		
326	17	22	Thin		X	X		
326	18	47	Thin		X	X		
326	19	88	Thin		X	X		
326	20	14	Thin					
326	23	19	Thin		X	X		
326	28	20	Thin					
326	30	48	Thin		X	X		
328	1	30	Thin/ Hardwood Control	X				
328	3	54	Hardwood Control	X				
328	4	69	Thin					

Comp	Stand	Treat. Acres	Treatment	Hexazinone	Triclopyr	Glyphosate	Plant Longleaf	Release
328	6	6	Thin		X	X		
328	9	150	Thin		X	X		
328	10	125	Thin					
328	12	63	Thin/ Hardwood Control	X				
328	13	44	Thin		X	X		
328	14	8	Thin		X	X		
328	15	17	Thin		X	X		
328	16	62	Thin					
328	18	6	Thin					
328	23	44	Thin		X	X		
328	27	13	Thin		X	X		
328	26	70	Thin					
328	28	20	Thin					
328	34	10	Thin					
328	42	15	Clearcut		X	X	X	X
328	43	29	Thin		X	X		
328	45	28	Thin		X	X		
328	46	24	Thin					
328	49	28	Thin		X	X		
328	50	16	Thin					
328	53	80	Thin		X	X		
328	65	10	Hardwood Control	X				
328	66	35	Hardwood Control	X				
328	67	43	Thin		X	X		
328	81	13	Thin		X	X		
328	86	33	Thin		X	X		
328	87	22	Thin					
328	88	23	Thin					
328	97	43	Thin					
328	99	80	Thin					
<b>Totals</b>		<b>2330</b>		<b>377</b>	<b>1149</b>	<b>1137</b>	<b>151</b>	<b>151</b>

\*Timber Stand Improvement

Figure 6. Compartment 312 treatment map

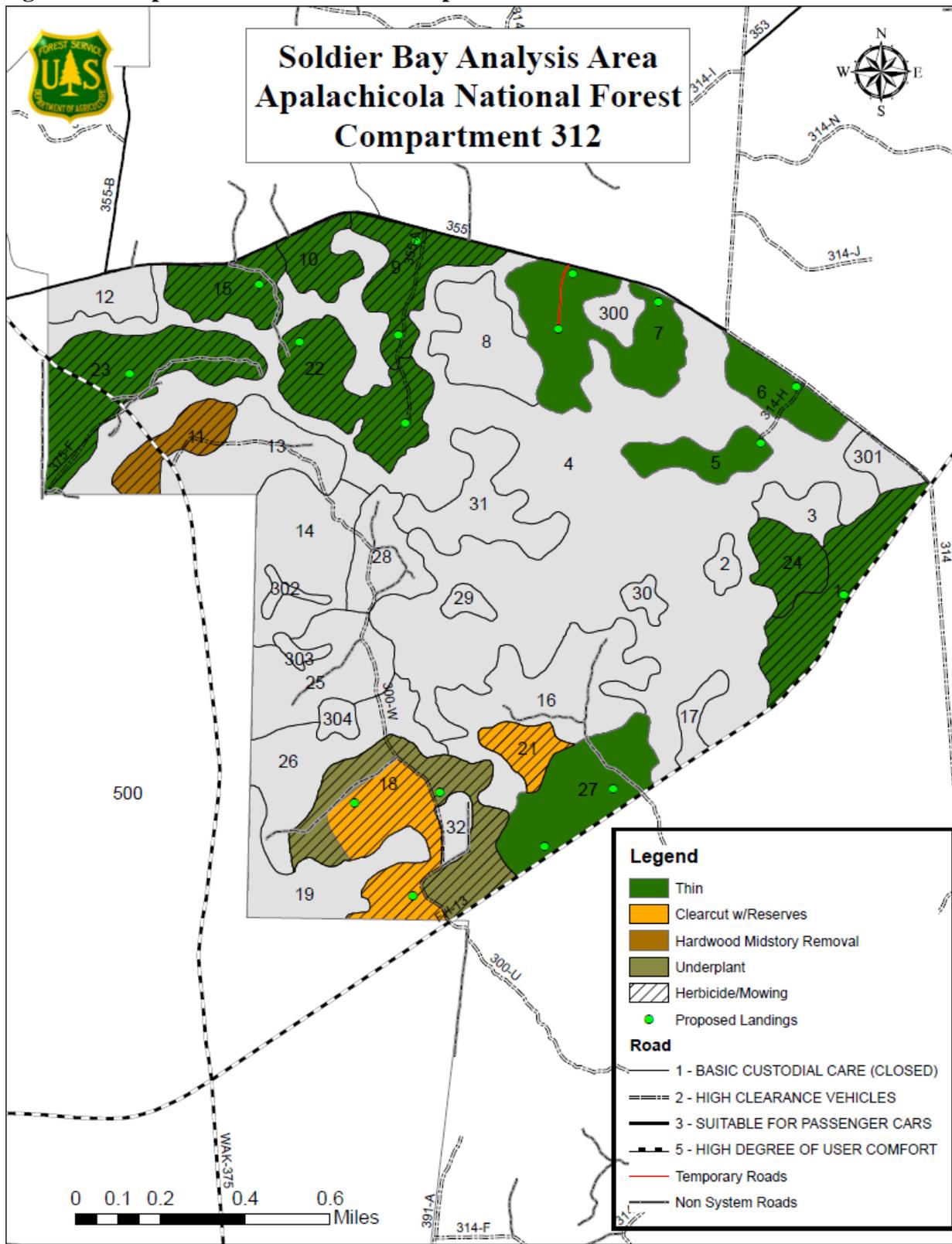


Figure 7. Compartment 326 treatment map

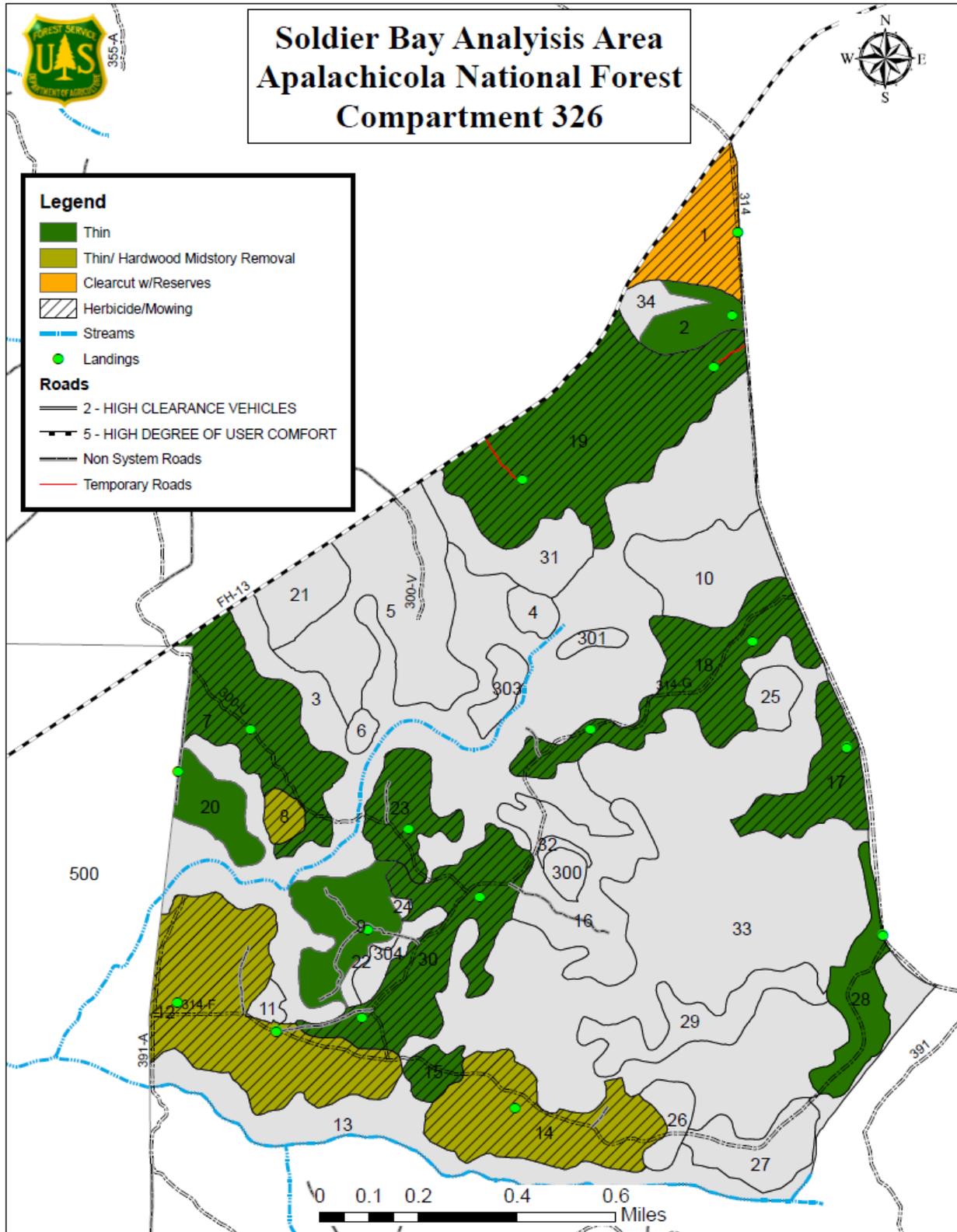
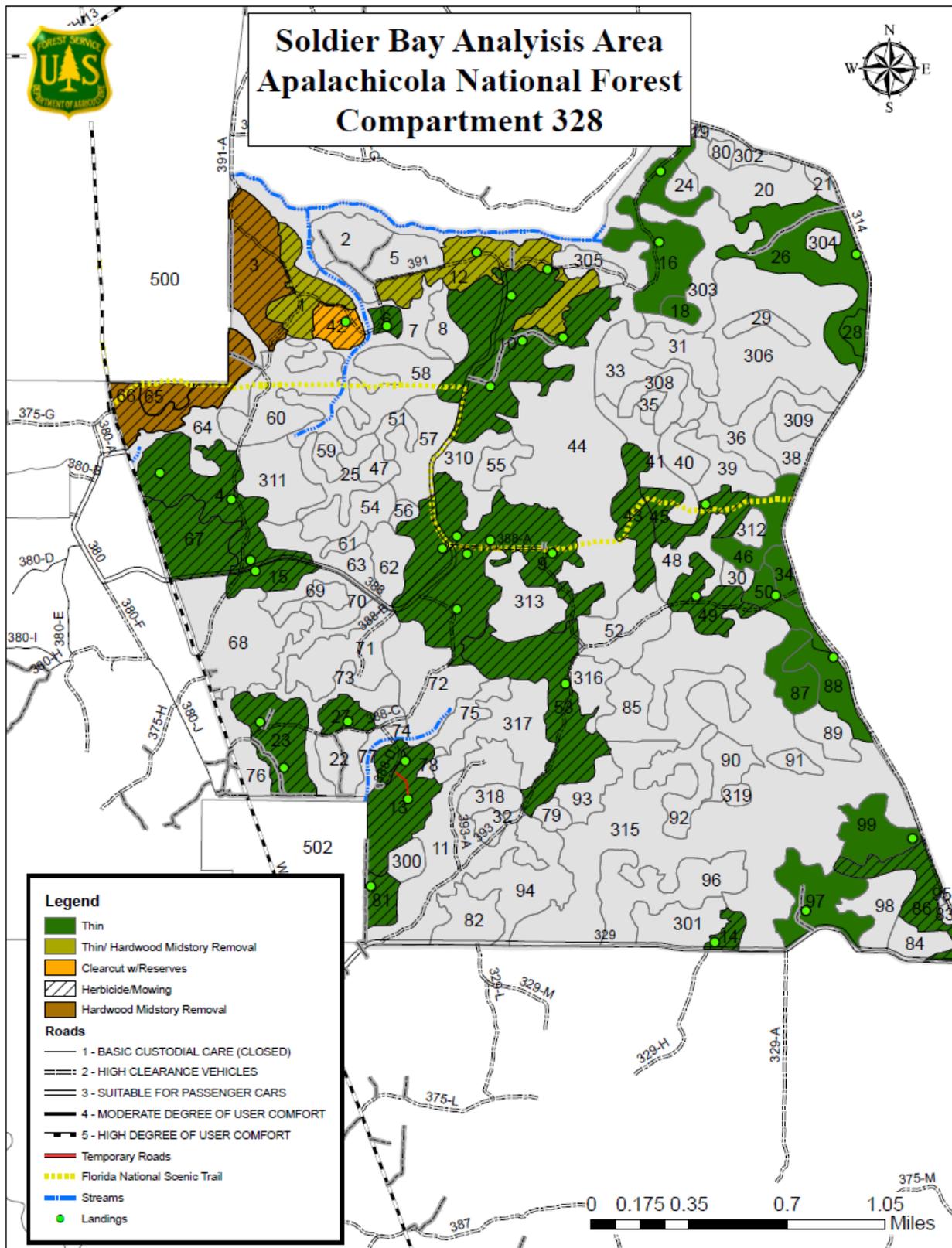


Figure 8. Compartment 328 treatment map



### **Alternative C – No Herbicide**

This alternative would include all actions described in the Proposed Action, however, hand tools and mechanical equipment would be used instead of the herbicides, hexazinone and/or triclopyr for site preparation, groundcover restoration, and pine release.

## **Coordination Measures**

Coordination measures were incorporated into the design of the alternatives to reduce the risk of potential impacts to the physical, biological, and social-economic environments. These measures include all applicable Forest Plan Standards and Guidelines described below.

### **Proposed, Endangered, Threatened and Sensitive (PETS) Species**

- If modifications are made in the project, or if additional information regarding the effects of the project on listed species becomes available, the U.S. Fish and Wildlife Service (USFWS) would be notified and informal consultation would be reinitiated if the USFWS or the FS determines it is needed.
- Contracts would contain penalty clauses to protect white-banded RCW trees.
- If possible, temporary roads, log decks, and skid trails would be located outside of active or inactive RCW clusters (except for skidding timber out of clusters).
- Log decks should be located no closer than 200 ft. from RCW cavity trees.
- Timber and road contracts will prohibit harvest, hauling, and/or roadwork within active Red-cockaded Woodpecker (RCW) clusters during the nesting season, April 1 through July 31. Exceptions will be made for hauling and/or roadwork on major numbered roads and highways (FS Level 5, 4, 3 Roads). Exceptions will also be made during nesting season if a biologist determines through direct observation that the cluster is no longer active, there is not a pair, or the young have fledged before July 31.
- **WL-11**—Educate field personnel and contractors in burrow identification. In potential gopher tortoise habitat, prohibit locating log landings, designating skid trails, and parking equipment within 25 feet of known gopher tortoise burrows. Equipment operators will be instructed to maintain a 25 foot distance during operations when previously unknown burrows are encountered (USDA 1999b).
- Purchasers and contractors will be advised of the possible presence of threatened, endangered, and sensitive species and will be instructed to avoid harming any wildlife they encounter, including snakes.
- Equipment cleaning measures would be required by contracts to prevent the introduction of non-native invasive plants.
- To protect aquatic species; pesticide application, timber harvesting activities, and road maintenance will adhere to the standards of Florida's Silvicultural Best Management Practices (BMPs). For a detailed discussion of these practices, see the Silviculture BMP Manual: [http://freshfromflorida.s3.amazonaws.com/silvicultural\\_bmp\\_manual.pdf](http://freshfromflorida.s3.amazonaws.com/silvicultural_bmp_manual.pdf)

### **Heritage Resources**

- **HE-1** If any cultural resources are discovered during operations all ground-disturbing activity will cease. The Forest Archeologist will determine changes to be made to the project before work resumes (USDA 1999b).

- **HE-9** Known cultural resource sites will be protected by timber sale contract and no ground-disturbing activities will occur in these areas, which may include segments of roads (USDA 1999b).

### **Public Health and Safety**

- Use herbicides in accordance with registration label. Place herbicide notice signs at treatment sites. Herbicide notice signs (FSH 7109.11) would be clearly posted, and would include the application date, the herbicide used, and safe reentry date. Private lands would not be treated. No herbicide would be applied within 100 feet of private land. No herbicide would be applied within 100 feet of any public or domestic water source.
- The Pesticide Use Handbook (FSH 2109.14) and the Health and Safety Code Handbook (FSH 6709.11) would be used as guidance for workers. Workers who apply herbicides would be trained to ensure minimum impacts and maximum effectiveness. Only those methods that assure proper application of herbicides would be used. Herbicide application by contract and/or in-house personnel would be performed by or directly supervised by the holder of a current Federal Pesticide Applicator's license following all current legal application procedures administered by the USDA Forest Service and the label on the herbicide container.

### **Soil & Water**

- **WA-1** Adhere to standards of Florida's Silvicultural Best Management Practices (BMPs). For a detailed discussion of these practices, see the Silviculture BMP Manual: [http://freshfromflorida.s3.amazonaws.com/silvicultural\\_bmp\\_manual.pdf](http://freshfromflorida.s3.amazonaws.com/silvicultural_bmp_manual.pdf)
- **WA-2** Three perennial streams are located within the analysis area (Smith Creek, North Branch, and Arbor Bush Branch) and drain into the Ochlockonee River. A 35-foot Special/Streamside Management Zone (SMZ) will be required in the following areas (LRMP, 3-24): Compartment 312 Stands 11, 15, and 23; Compartment 326 stands 7, 9, 12, 14, 23 and 28; and Compartment 328 Stands 1, 6, 42, and 77. No operation of heavy equipment will occur during periods when weather and soil conditions will promote excessive rutting or compaction.
- Forest Plan standard WA-6: Restrict soil compacting activities, including logging traffic when the water table is within 12 inches of the surface, or when soil moisture exceeds the plastic limits (USDA 1999b).

### **Vegetation**

- **VG-37** - Control invasive terrestrial and aquatic weeds. Do not apply herbicides within 60 feet of any PETS plant species unless analysis indicate herbicide use is the best way to protect PETS plants from invasive weeds (USDA 1999b). Contract specifications for equipment cleaning will be placed in contracts to prevent the introduction of exotic plants.
- **VG-18** – Minimize soil-disturbing site preparation in longleaf and slash pine sites. When disturbance is necessary to achieve the desired future conditions, use methods that displace no more than 10 percent of the soil surface in the treated area. The objective

should be to maintain the integrity of the native herbaceous vegetation (especially wiregrass) overtime (USDA 1999b).

- Follow guidelines for planning and applying herbicides (USDA 1999a).

### **Visual Quality**

- **VG-15** - To enhance visual quality, require that slash, tops, and logging debris be piled no more than 2 feet high within 100 feet of levels A and B roads and the congressionally designated trail. Stands 1, 6, 7, 9, 10, 15, 18, 23, and 27 in compartment 312; stands 1, 2, 7, 17, 18, 19, and 28 in compartment 326; and stands 4, 14, 26, 28, 34, 46, 50, 66, 67, 86, 88, 97, and 302 of compartment 328 meet this criteria.

## **Comparison of Alternatives**

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

**Table 2. Comparison of Alternatives**

Proposed Actions	Units	Alternatives		
		A	B	C
<b>Improve Forest Health:</b>		No Action	Proposed	Without Herbicide
Thin pine slash and longleaf pine stands to maintain radial growth and tree vigor	Acres	0	2062	2062
Replace off-site species with native species (Restore Longleaf Pine)	Acres	0	151	151
<b>Improve Ecosystem Functioning:</b>				
Prepare areas for tree planting by applying herbicides (Hexazinone, Glyphosate, and Triclopyr)	Acres	0	151	0
Prepare areas for tree planting mechanically (chopping, mowing, or disking)	Acres	0	0	151
Restore groundcover by supplementing native grasses.	Acres	0	92	92
Apply herbicides for pine release (Triclopyr)	Acres	0	151	0
Release pine seedlings using mechanical brush saws		0	0	151
<b>Reduce Hazardous Fuel:</b>				
Reduce woody wildfire fuels (using herbicide and/or mechanical)		0	1434	0
Reduce woody wildfire fuels (using only mechanical equipment)	Acres	0	0	1434
<b>Recreational Opportunities:</b>				
FNST hazard tree removal and mowing	Mile	0	4	4
Install parallel parking spots near FNST trailhead	Spaces	0	3	3
<b>Transportation:</b>				
Road maintenance for timber sale	Miles	0	12.46	12.46
Road reconstruction to haul timber removed	Miles	0	5.255	5.255
Temporary road	Miles	0	3.29	3.29
<b>Forest Product Outputs:</b>				

Merchantable Sawtimber	CCF	0	738	738
Merchantable Pulpwood	CCF	0	8,841	8,841
Product Value	Dollars	\$0	431,768	\$431,768

**Table 3. Comparison of Environmental Consequences by Alternative**

Resource Area	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (No Herbicide)
Soils	Some soil displacement will occur as a result of ongoing management activities such as prescribed burning.	Soil displacement would occur as a result of timber sale operations. Effects are not expected to be significant.	Soil displacement would occur as a result of timber sale operations. Soil compaction and soil displacement may occur from mechanical site preparation. Effects are not expected to be significant.
Water	No change from current conditions.	Improved road drainage and stream crossings would reduce current sedimentation. Herbicide application will be monitored and mitigated to as to not pollute rivers, streams, and aquifers.	Improved road drainage and stream crossings would reduce current sedimentation.
Air quality	Recurrent road maintenance may temporarily reduce air quality but to a less effect than Alt. B and C. Prescribe burning may have a cumulative effect on all alternatives, particularly when adjoining landowners are administering control burns. Florida's permitting process for prescribed burns would minimize the effects.	Logging equipment will produce exhaust and dust in the analysis area but will have no significant impact on short term or long term air quality. Prescribe burning may have a cumulative effect on all alternatives, particularly when adjoining landowners are administering control burns. Florida's permitting process for prescribed burns would minimize the effects.	Smoke from prescribed fire for site preparation would be in addition to annual burning. Duration of smoke would be short-term. Logging and mechanical site prep equipment will produce exhaust and dust in the analysis area but will have no significant impact on short term or long term air quality.
PETS (Animals)	Habitat conditions for species preferring open longleaf/wiregrass habitats would continue to decline gradually as groundcover conditions continue to deteriorate.	Habitat conditions for species preferring open herbaceous longleaf/slash habitats would improve on the treated acres as increased light penetration to forest floor promotes grassy establishment.	Habitat conditions for species preferring open herbaceous longleaf/slash habitats would improve on the treated acres. Groundcover establishment would occur over a longer period of time as fire would serve as the sole means of woody shrub reduction.
PETS (Plants)	Habitat conditions for species preferring open sunlit conditions would continue to decline gradually as canopy closure and woody encroachment continue to occur.	Habitat conditions for species preferring open sunlit conditions would improve on treated acres. Individual plants may be impacted by herbicide application and heavy equipment operations but the population as a whole would improve.	Habitat conditions for species preferring open sunlit conditions would improve on treated acres.
MIS (Animals)	Habitat conditions for species preferring open herbaceous longleaf/slash	Habitat conditions for species preferring open herbaceous longleaf/slash habitats would	Habitat conditions for species preferring open herbaceous longleaf/slash habitats would improve on the treated acres.

Resource Area	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (No Herbicide)
	habitats would continue to decline gradually.	improve on the treated acres.	
MIS (Plants)	Habitat conditions for species preferring open sunlit conditions would continue to decline gradually as canopy closure and woody encroachment continue to occur.	Habitat conditions for species preferring open sunlit conditions would improve on treated acres. Individual plants may be impacted by herbicide application and heavy equipment operations but the population as a whole would improve.	Habitat conditions for species preferring open sunlit conditions would improve on treated acres.
Vegetation	Without thinning, overstocked stands would begin to exhibit slower growth and continue to shade out herbaceous vegetation.  Without replacing off-site species growth of trees would continue to decline and mortality would increase.	Growth rates would increase and conditions for herbaceous ground cover would be improved. Effects would last longer for those areas treated with herbicide and increase chance of survival of Longleaf. The use of heavy equipment would damage some grasses, forbs, and flowers. Damage to overall vegetation is not expected to be long term and/or significant.	Growth rates would increase but conditions for herbaceous ground cover would occur over a longer period of time without the use of herbicide. Groundcover restoration efforts would most likely be delayed until prescribed fire could reduce the hardwood trees and brush through sequential growing season prescribed burns. Non-target vegetation kills would be minimal due to the absence of herbicide.
Cultural Resources	No impact to cultural resources.	No impact to cultural resources.	No impact to cultural resources.
Visual Quality	Lack of treatment would result in thick forests outside desired conditions which would gradually reduce visual quality.	Treatment would result in short-term (1-5 years) reduction in visual quality from vegetation treatments. Long-term conditions (5-10 years) would improve as desired conditions are achieved.	Treatment would result in short-term (1-5 years) reduction in visual quality from vegetation treatments. Long-term conditions (20-30 years) would improve as desired conditions are achieved.
Economics	No change from current conditions	This alternative would remove approximately 9,575 CCF of pine products with a slightly positive net worth.	This alternative would remove approximately 9,575 CCF of pine products with a slightly positive net worth.
Transportation System	Existing interior roads are in moderate to poor condition.  No Change in miles available for public access.	Existing interior road conditions would be improved through road reconstruction and maintenance.  Public access on the road system would remain the same.	Existing interior road conditions would be improved through road reconstruction and maintenance.  Public access on the road system would remain the same.
Recreation	FNST trailhead parking would remain limited. Hunting is the primary recreation use in the area. Opportunities would remain about the same over the short term. As groundcover quality and quantity gradually decreases wildlife presence may decrease.	Some disruption would occur during the course of the proposed actions. Increased activity in the area may reduce hunting success.  Road conditions would be improved and could result in increased use.  Temporary detour of FNST may	Some disruption would occur during the course of the proposed actions. Motorcycle trails would be re-routed or closed during harvest operations. Increased activity in the area may reduce hunting success.  Road conditions would be improved and could result in increased use.  Temporary detour of FNST may add approximately 5 miles to the hike. Overall,

Resource Area	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (No Herbicide)
	This could lead to a decline in hunting success and wildlife viewing.	add approximately 5 miles the hike. Overall, trail conditions would improve for forest visitors.	trail conditions would improve for forest visitors.

## ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above. The analysis below assumes that the coordination measures to avoid harm to sensitive or protected resources would be fully incorporated into project implementation.

Effects of herbicides on resources are based on previous experience on the Apalachicola National Forest, the Forest Plan FEIS and technical reports prepared by the Syracuse Environmental Research Associates (SERA).

## PHYSICAL ENVIRONMENT

### Soil

#### Affected Environment:

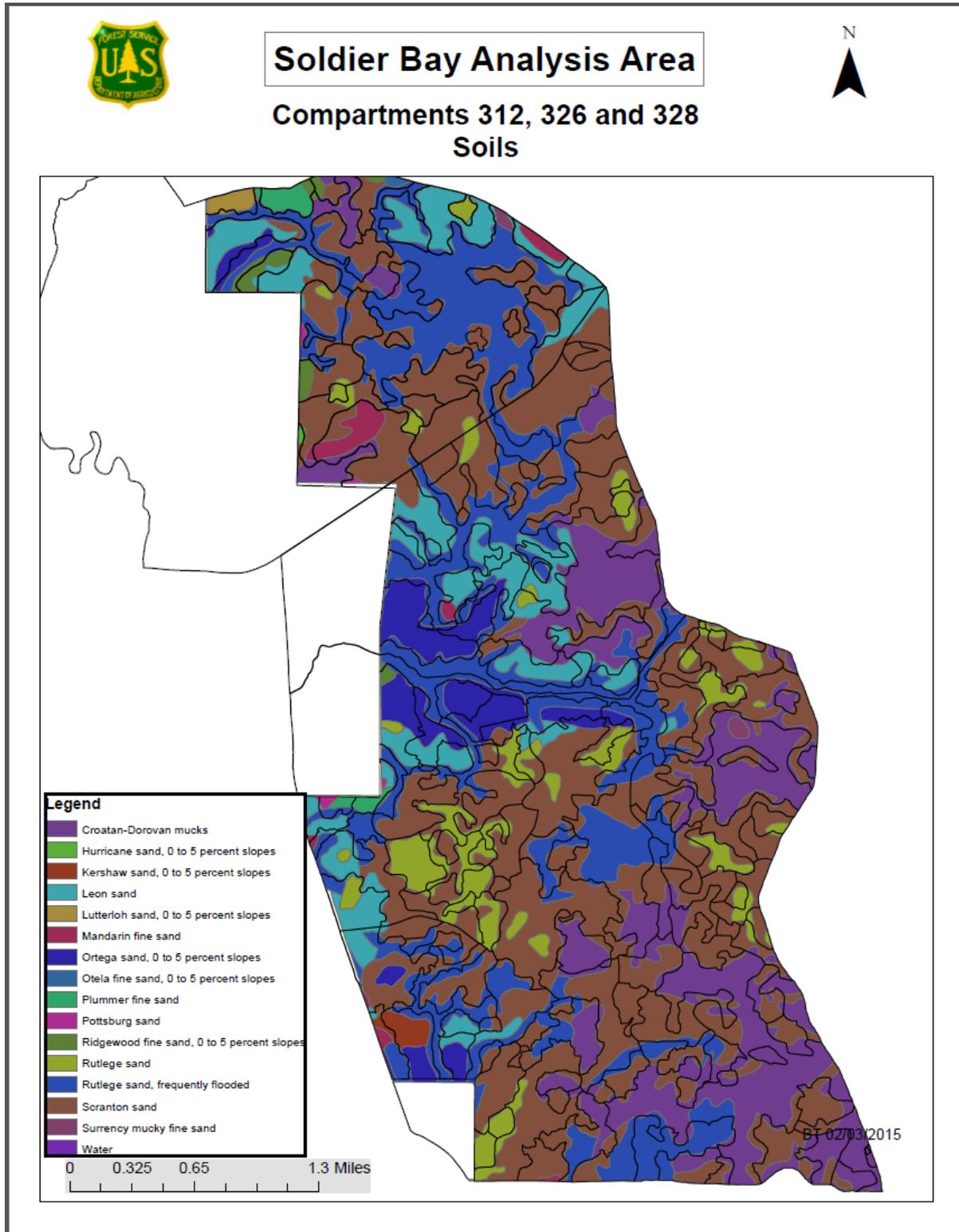
The affected area analyzed for soils includes all 6,589 acres within the analysis area. Short term impacts are considered those happening while management activities are ongoing (up to 2 years) to 1-5 years after activities have concluded. Long term impacts are expressed as those occurring five years or more following the proposed actions. The area includes 14 general soil series as described in the morphology section of the Soils and Vegetation of the Apalachicola National Forest publication. The Scranton and Rutledge soil series account for the majority of soils found within the analysis area. The Scranton series is broad on flatwoods and has a high seasonal water table within 10 inches of the surface for 1 to 3 months of the year. Rutledge soils also have a high water table above or the near the surface for about 4 to 6 months of the year and is subject to flooding after periods of high rainfall. Available soil capacities of both series are low and permeability is rapid. All other soil series that are within the analysis area are shown in table 4. Full descriptions of these soils can be found in *Soils and Vegetation of the Apalachicola National Forest* (United States Forest Service 1984). As noted in the following table, erosion hazard for these soils are slight, but due to their somewhat poorly drained conditions rutting by heavy equipment can occur.

**Table 4. Soil Series**

Soil Series	Acres of Soil in the Analysis Area*	Acres Treated in Proposed Action*	Drainage Description	Erosion Hazard	Equipment Limitation
Croatan-Dorovan	1061	80	Very Poorly Drained	Slight	Moderate
Hurricane	618	2	Somewhat Poorly Drained	Slight	Moderate
Kershaw	25	25	Excessively Drained	Slight	Moderate
Leon	556	250	Poorly Drained	Slight	Moderate
Lutterloh	16	0	Somewhat Poorly Drained	Slight	Moderate
Mandarin	57	40	Somewhat Poorly Drained	Slight	Moderate
Ortega	294	75	Moderately Well Drained	Slight	Moderate
Otela	3	3	Moderately Well Drained	Slight	Moderate
Plummer	35	35	Poorly Drained	Slight	Moderate
Pottsburg	7	7	Poorly Drained	Slight	Moderate
Ridgewood	41	10	Somewhat Poorly Drained	Slight	Moderate
Rutledge	1851	375	Very Poorly Drained	Slight	Moderate
Scranton	2582	1200	Poorly Drained	Slight	Severe
Surrency	10	5	Very Poorly Drained	Slight	Severe

\*Acres are an approximation

Figure 9. Soils Map



**Alternative A – No Action**

Some soil displacement would occur as a result of ongoing forest management, but it would generally be minimal and not result in any adverse effects. The effect of prescribed burning on soils would have a short-term reduction in litter and duff, but would increase the amount of organic matter in the uppermost layer of mineral soil. Refer to the Apalachicola Prescribed Burning FY 2012-2017 Environmental Assessment for more information on the affects prescribed burning on soil [http://www.fs.fed.us/nepa/nepa\\_project\\_exp.php?project=35380](http://www.fs.fed.us/nepa/nepa_project_exp.php?project=35380).

**Cumulative Effects**

The forest wide prescribed burn program would continue to occur under Alternative A. Prescribed fire provides benefits such as renovation of dominant species, where conditions allow, and increase available nutrients (Certini 2005). Soil erosion may occur with severity being determined by vegetation composition and hydrology of the area. Refer to the Apalachicola Prescribed Burning FY 2012-2017 Environmental Assessment for more information on the effects of prescribed burning on soil. Invasive species treatments will continue to occur throughout various areas of the National Forest, including Soldier Bay. These treatments when combined with the no action alternative are not expected to result in cumulative effects. No other past, present or future management activities were identified.

**Alternative B – Proposed Action**

Soil compaction and displacement would occur as a result of heavy machinery during harvesting and mechanical fuel reduction. Soil factors such as dryness, organic matter present, and soil depth influence the degree of compaction. The greatest impact on soils from logging usually occur under wet soil conditions (Williamson and Neilsen 2000). The inherently moist conditions of the flatwoods in the analysis area could lead to an excessive amount of rutting if proper mitigation measures are not taken. Under the proposed action harvesting activities would be restricted during times of excessive moisture. Under drier soil conditions compaction would not occur at levels that would restrict root growth. Soil surface mineral loss has also been found to occur following harvest operations (Nave and others 2010). The effects however were found not to be permanent.

Road reconstruction and road maintenance would increase the potential for soil erosion. Loose and exposed soil would occur on the road surface and within the immediate road prism and would be susceptible to runoff until fully stabilized. Road design features would generally control the amount of erosion and control it's occurrence through appropriate drainage features. Surface erosion associated with roads usually decreases rapidly once road construction is complete with little signs being found 3-5 years following road construction/reconstruction (Grigal 2000). Temporary roads would be closed to the public and allowed to naturally re-vegetate thereby reducing erosion risk. In these areas enhanced growth would occur due to lack of competition along the road prism. More information regarding the impacts of road reconstruction and maintenance on soils can be found in the Final Environmental Impact Statement for the Revised Land Management Plan for the National Forests in Florida.

Re-establishing native vegetation would generally improve overall soil stability and productivity.

The number of passes by heavy machinery has been shown to affect the degree of compaction with more compaction occurring during the first few initial passes (Grigal 2000). If compaction occurs, a return to the initial un-compacted state can be very slow.

The use of herbicides may have an effect on soils. The herbicide hexazinone is proposed for site preparation on 24 acres and fuel reduction on approximately 353 acres. Hexazinone is labeled for site preparation in forestry. The proposed application method would be on a 6 foot by 6 foot grid, in which 5 ml of 50% solution would be applied to each spot. This application method yields approximately  $\frac{3}{4}$  of a gallon of herbicide per acre.

Hexazinone is soil active and tends to be highly mobile in soil, especially porous soils with percolating water. Mobility is strongly influenced by soil texture; high clay or organic matter content retards movement and reduces efficacy. Application rates must be adjusted to suit soil texture. Do not apply to saturated or poorly drained soils (SERA 2005).

Breakdown of hexazinone in soil is by soil microbes and its persistence is moderate with a half-life of 1-6 months; 90 days being typical (SERA 2005).

The herbicide triclopyr is prescribed for hardwood reduction and pine release. This herbicide is not soil active. It is generally non-mobile in soils, though gross applications (spills) or misapplications may show some mobility. It has a moderately short half-life of 10-46 days with an average of 30 days. It is degraded both by soil microbes and by photolysis (SERA 2011).

The herbicide glyphosate biodegrades into naturally occurring elements with no residual soil activity. It binds tightly to soil so it will not leach or wash to contaminate adjacent areas. Upon absorption glyphosate is no longer available for uptake by plant and loses its functional abilities. The main glyphosate degradation is accomplished by various microorganisms. Soils can exhibit great variability in their ability to degrade glyphosate with some studies pointing to the microbial activity as being an indicator of degradation time. The herbicide has a reported half-life ranging anywhere from 1.2-197 days, with an average of 32 days (Tatum 2004).

The environmental consequences of each herbicide are also discussed in Chapter IV of the Final Environmental Impact Statement for Vegetation Management in the Coastal/Piedmont, Volume I.

Soil displacement could occur during the logging operations when skidders and other heavy equipment traverse across the land especially when dragging trees or lowering a blade, but would not result in any long-term adverse effects. Some soil compaction would occur in the top 3 inches of the soil. Implementation of Best Management Practices and coordination measures would generally ensure that no long-term adverse effects to soil resources occur.

### **Cumulative Effects**

The forest-wide prescribed fire program will be executed in conjunction with Alternative B. Prescribed burning shortly after harvesting operations have been completed could increase soil erosion and leaching of soil nutrients. Refer to the Apalachicola Prescribed Burning FY 2012-2017 Environmental Assessment for more information on the effects prescribed burning on soil [http://www.fs.fed.us/nepa/nepa\\_project\\_exp.php?project=35380](http://www.fs.fed.us/nepa/nepa_project_exp.php?project=35380).

The ongoing non-native invasive species project will treat infested areas along roadsides around and within the project area. The use of herbicides to control non-native invasive plant species in conjunction with herbicide use in the Soldier Bay project is not expected to have a significant cumulative impact on soils in the analysis area. The Soldier Bay fuel reduction project was approved September 29, 2015 and included the mechanical fuel reduction treatment of 200 acres, the removal of timber on approximately 40 acres, and the maintenance of 5.4 miles of forest service road 314. Road maintenance could cumulatively impact soil conditions in the analysis area over both the short and long term. Short term erosion problems could increase during the actual road work but long term impacts would prove to be cumulatively beneficial as new culverts and ditches would allow for proper water-flow throughout the area. These would lead to fewer instances of erosion. The Betsey Branch project, located in compartment 310 directly north of compartment 312, was approved in June 2009 and implemented shortly thereafter. Activities included 91 acres of clearcuts, 790 acres of thinnings, and uneven-aged management cuts. The Soldier Bay and Betsey Branch project areas are separated by forest service road 355, which is a graded road suitable for passenger car traffic. To the immediate south of the analysis area is the Alligator pond project, approved in May 2008. It is located in compartments 342, 342, 344, and 347 and included 1,676 acres of thinning and 140 acres of clearcuts to restore longleaf pine. The cumulative impact of these activities is not anticipated to create significant soil issues throughout the area. Aust and Blinn (2004) concluded that forest harvesting in conjunction with other management activities in steeper regions resulted in erosion and leaching that fell below acceptable values for land use. Given the flat topography of the project areas the proposed actions the forest service does not expect significant soil impacts.

### **Alternative C – No Herbicide**

Some soil compaction and displacement would occur during mechanical site preparation. Tree harvesting followed by chopping will result in compaction that is slightly greater than what would occur under Alternative B due to repeated passes of heavy machinery (Williamson and Neilsen 2000). Severity will depend on compaction of the area prior to harvest and soil moisture. Chopping would affect the first 6 inches of the soil profile, but since the area being treated includes heavy concentrations of titi and other non-herbaceous vegetation, there would be little actual soil disturbance. It is expected that Forest Plan Standard VG-18 as described below would be exceeded by these activities.

- Forest Plan Standard VG-18: Minimize soil-disturbing site preparation in longleaf and slash pine sites. When disturbance is necessary to achieve the desired future conditions, use methods that displace no more than 10 percent of the soil surface in the treated area.

All other environmental effects of Alternative C are the same as Alternative B.

### **Cumulative Effects**

Cumulative effects would be similar to those in Alternative B with slightly more compaction occurring due to mechanical site prep.

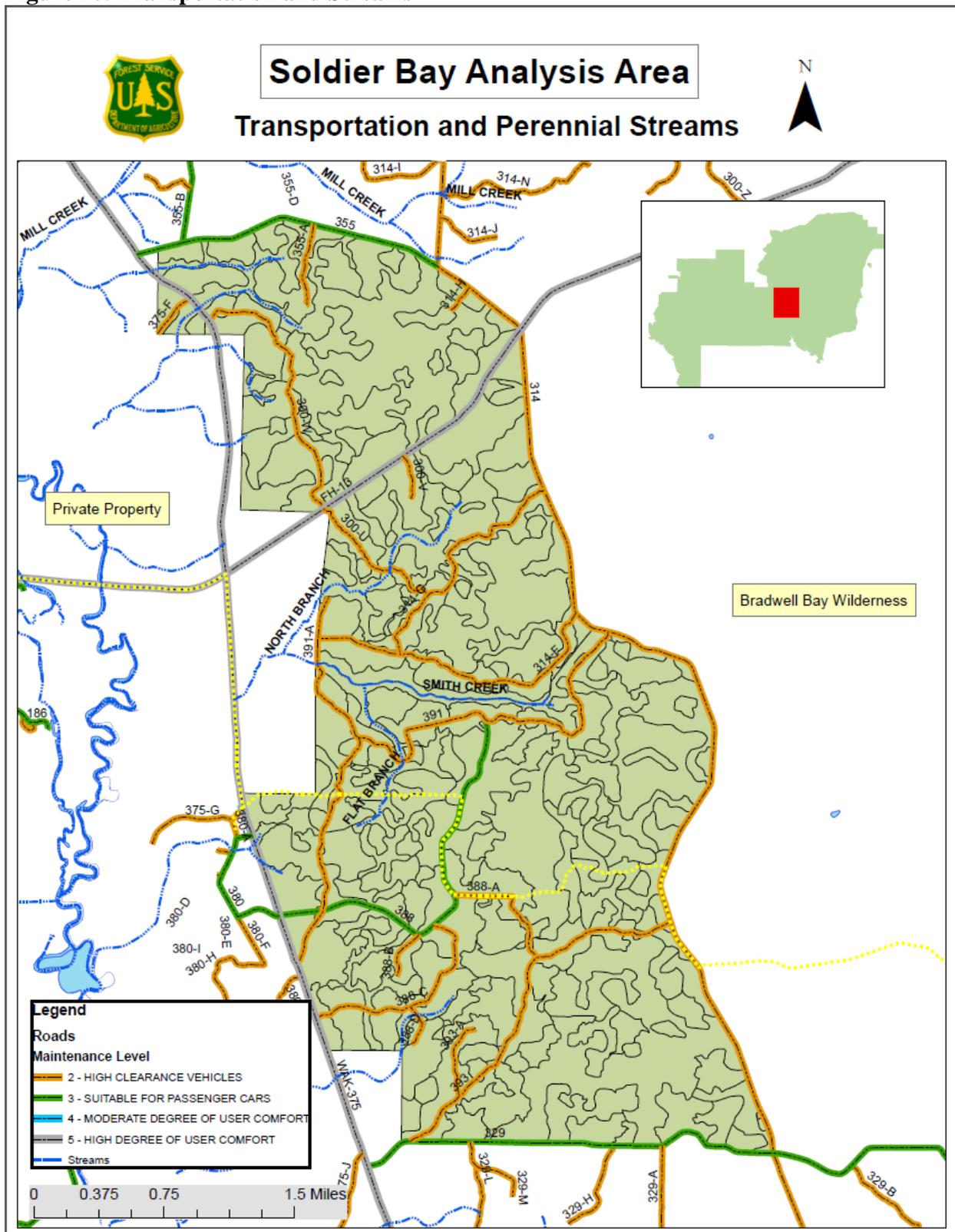
## Water Quality

### **Affected Environment:**

The project area falls within the boundary of one watershed, Hitchcock Lake- Ochlockonee River. The project area within the watershed boundary represents approximately 11% of the total Hitchcock Lake-Ochlockonee watershed.

The analysis area is drained by two streams to the north (Mill Creek and Big North Branch) which eventually flow into the Ochlockonee River. Smith Creek and Flat Branch also drain the south end of the analysis area into the Ochlockonee River. Several stretches of the Ochlockonee River are classified as impaired waterways, including those that intersect the above mentioned creeks. Parameters of concern include fecal coliform, iron, and dissolved oxygen. It drains 3,600 square miles of north Florida and south Georgia. Florida Department of Environmental Quality (FDEP) determined median daily discharge in 2013 to be 64 cubic feet per second (FDEP 2013). There are also wet season ponds and swamps (wetlands) in the area that do not drain into these streams.

Figure 10. Transportation and Streams



### **Alternative A – No Action**

The primary impacts to water quality in the area would occur from the existing transportation system, which is in poor to moderate condition, and also from routine prescribed fire. Poorly designed water crossings can increase sedimentation and damage caused by vehicles when crossing streams could lead to increased levels of erosion.

### **Cumulative Effects**

The forest-wide prescribed burn program would continue to move forward on the Apalachicola National Forest. Refer to the Apalachicola Prescribed Burning FY 2012-2017 Environmental Assessment for more information on the effects prescribed burning on soil

[http://www.fs.fed.us/nepa/nepa\\_project\\_exp.php?project=35380](http://www.fs.fed.us/nepa/nepa_project_exp.php?project=35380).

The ongoing non-native invasive species project will treat infested areas along roadsides around and within the project area. The Betsey Branch project, located in compartment 310 directly north of compartment 312, was approved in June 2009 and implemented shortly thereafter. Activities included 91 acres of clearcuts, 790 acres of thinnings, and uneven-aged management cuts. The Soldier Bay and Betsey Branch project areas are separated by forest service road 355, which is a graded road suitable for passenger car traffic. To the immediate south of the analysis area is the Alligator pond project, approved in May 2008. It is located in compartments 342, 344, and 347. It included 1,676 acres of thinning and 140 acres of clearcuts to restore longleaf pine. Water quality throughout the analysis area is not expected to receive significant cumulative impacts due to the implementation of these projects.

### **Alternative B – Proposed Action**

Generally, water from forests is of good quality with relatively low concentrations of nitrates and other dissolved minerals (Gundersen and others 2006). Because the proposed activities represent a relatively small portion of the overall watershed areas, it is expected that no measurable changes in water quality, availability, or flow would occur as a result of this action.

There are 19 stands adjacent to perennial streams. Most of these stands are separated from the streams by existing hardwood or other vegetative stringers. All stands would maintain buffers described in Forest Plan standard WA-2 and would comply with the most recent *Silviculture Best Management Practices Manual* published by the state of Florida.

The proposed road system includes several perennial or intermittent stream crossings by low standard roads. Current crossings would be improved as needed to reduce potential impacts to streams such as siltation.

Reduction of trees and brush through the thinning, mowing, and clearcut treatments will reduce evapotranspiration in the treatment stands and cause a temporary increase in the groundwater level of the stand. As vegetation recovers the levels of transpiration will increase and water quality and quantity will recover, usually in 2-5 years (Aust and Blinn 2004).

In this alternative, hexazinone is proposed for site preparation on 24 acres and fuel reduction on 353 acres. The herbicide would be put out at a rate of approximately three quarts per acre. The use of herbicides would introduce man-made chemicals into the ecosystem.

Hexazinone is generally selective, controlling most hardwoods while not affecting most grasses. Its mode of action is a photosynthetic inhibitor. The herbicide is readily absorbed through the roots and, to a lesser degree through foliage. It is translocated upward via the xylem. Because of its high solubility, it has the potential to move offsite through leaching and runoff (Neary and others 1983). Soil type and rainfall affect the amount and duration of offsite movement (Tatum 2004). A description of hexazinone and its environmental effects on vegetation is described in detail in the Syracuse Environmental Research Associates Risk Assessment (SERA).

The herbicide triclopyr is prescribed on approximately 127 acres for site preparation and pine release. It will also be used for fuel reduction on 1,149 acres. This herbicide has a moderate to low solubility in water. Under normal conditions, its potential for leaching is low since it binds to clay and organic matter in soil. Sunlight rapidly breaks down triclopyr in water, with a half-life of less than 24 hours.

- Solubility: Triclopyr has moderate to low solubility.
- Potential for Leaching into Ground-Water: The potential for leaching depends on the soil type, acidity, and rainfall conditions. Triclopyr should not be a leaching problem under normal conditions since it binds to clay and organic matter in soil. Triclopyr may leach from light soils if rainfall is very heavy. Triclopyr is not soil active. Generally non-mobile in soils; but misapplications (spills) of Garlon 3A may show some mobility and non-target root uptake and may contaminate ground water (Tatum 2004).
- Surface Waters: Sunlight rapidly breaks down triclopyr in water. The half-life in water is less than 24 hours (10 hr. half-life at 25 ° C). It has a moderately short half-life of 10-46 days with an average of 30 days, and is degraded both by soil microbes and by photolysis (SERA 2011).

Glyphosate will also be used for 127 acres for site preparation and pine release. Approximately 1,137 acres will be treated for fuel reduction. Glyphosate is a non-selective herbicide that is strongly absorbed into the soil (Tatum 2004). Because of its strong absorption into the soil it is unlikely to enter aquatic environments in more than trace amounts. Sediment is the primary sink for glyphosate. After spraying, glyphosate levels in sediment rise and then decline to low levels in a few months. The reported half-life of glyphosate in water ranges from a few days to 2 weeks.

To reduce potential effects, this alternative is designed such that no herbicide equipment would be cleaned within 100 feet of open water or wells and no herbicide would be applied within 100 feet of perennial or intermittent springs or streams. Also, herbicide application would be suspended by the Contracting Officer's Representative or inspector if rainfall is heavy enough to cause movement of herbicide from target species. No herbicide would be applied within 100 feet of any public or domestic water source.

The application rate for the herbicides would be applied at or below the product label recommendations, and would meet the requirements of the 1989 FEIS Vegetation Management in the Coastal Plain/Piedmont. The environmental consequences of these herbicides are discussed at length in Chapter IV of the Final Environmental Impact Statement for Vegetation Management in the Coastal Piedmont, Volume I.

Road construction, reconstruction, or maintenance may affect the water quality of the area directly through surface run-off or raindrop splash on soils disturbed or exposed during these operations. State of Florida Best Management Practices will be adopted during the road reconstruction or maintenance work. These practices will reduce potential effects of road work. All of the work would be conducted in or along existing road corridors so it is not anticipated that these activities would affect subsurface or groundwater flow.

### **Cumulative Effects**

The forest-wide prescribed burn program would continue to move forward on the Apalachicola National Forest. Prescribed burning when implemented shortly after the proposed action is implemented has the potential to increase runoff and siltation of streams due to a short-term loss of vegetation to slow or absorb rainfall. Also when excess amounts of burned foliage enters streams nitrogen, phosphorus, and cation levels can become altered but only for short periods of time (Battle and Golladay 2003). This effect would be lessened due to the removal of trees associated with the proposed action and thus lower amounts of available leaf litter to burn. The relative flatness of the area together with standard Best Management Practices ensures that any movement of soil is generally localized within the project area. Existing sedimentation is expected to be reduced by improving stream crossings of roads used for transporting logs. The Betsey Branch and Alligator Pond projects include thinnings, clearcuts, and herbicide use. Cumulative impacts of thinning, and fuel reduction could lead to an increase in above ground water flow during periods of rain. Cumulative increases in groundwater are expected throughout the area as a result of past operations and the actions proposed under alternative B. These increases are expected to be short term (3 months – 1 year).

### **Alternative C – No Herbicide**

The environmental effects of alternative C are the same as alternative B except that there would be no potential impacts to water quality due to the use of herbicides.

### **Cumulative Effects**

Cumulative effects would be similar to those in alternative B without the potential impacts to water quality from the use of herbicides.

## **Air Quality**

The Soldier Bay Analysis Area is located within Air Quality Class II. National Ambient Air Quality Standards (NAAQS) were set by the Environmental Protection Agency to promote a level of air quality sufficient to protect public health and welfare issues. The Florida Department of Environmental Protection (DEP) is responsible for inventory, monitoring, and regulation of air quality. Areas are divided into air quality classes. In Class I areas, fresh air (lack of odor) is a recognized value of the area and very little air pollution is allowed. Bradwell Bay Wilderness is rated as a Class I Area and is approximately 15 miles southeast of the analysis area. Class II areas allow a moderate level of air pollution to accommodate industrial/urban development. Prescribed fire has been a part of management of this analysis area for many years. These compartments have been prescribed burned several times in the past. The table below shows the

history of prescribed burning in these compartments in the last ten years. The analysis area currently meets National Ambient Air Quality Standards.

**Table 5. Ten-Year Prescribed Burn History (Burnable Acres)**

COMP	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
312		0	0	832	0	0	0	832	0	0	0
326		774	0	774	0	0	0	753	0	0	0
328	2881	0	0	0	0	0	0	2881	0	0	0

### Alternative A – No Action

Under the No Action alternative impacts to air quality would be limited to ongoing projects that occur throughout the forest.

### Cumulative Effects

The ANF conducts a Forest-wide prescribed burning program that attempts to treat all upland pine areas every three years. Smoke created as a result of prescribed burning is managed and analyzed as part of each burn plan. The Apalachicola National Forest follows the National Forest Smoke Management Guidelines to minimize the effects. Refer to the Apalachicola FY 2012-2017 Prescribed Burning environmental assessment for more details on the environmental effects. Smoke from routine burning would result in short-term impacts to air quality, but would occur to a lesser degree than alternatives B and C. A non-native invasive species treatment project is ongoing throughout the forest. Treatment areas are limited to roadsides and recreation areas.

The Betsey Branch and Alligator Pond project areas are not expected to negatively impact air quality in the area. Thinning, clearcut, and herbicide activities have been nearly completed in each of those areas.

### Alternative B – Proposed Action

The use of herbicides is not expected to affect air quality since application would only occur when wind speeds are less than 8 miles per hour to reduce chance of wind drift. Heavy equipment use would release emissions and create dust while in operation. Timber harvesting would occur during dry periods or when stand conditions permit operability. These effects would be minimal during operations. Local weather patterns would aid in dissipating dust after each day of operation. Effects from dust for example would in most cases occur for less than a few hours, while smoke from prescribed fires could be present for several days.

### Cumulative Effects

The only potential cumulative effect would be if prescribed fire in adjacent compartments occurs at the same time as the road reconstruction, maintenance, timber harvesting, or site preparation work. Primary concerns from smoke and or dust from harvesting would be to adjacent landowners and traffic on nearby roadways. Coordination measures would include caution signage and/or flashing warning lights on major highways and roads. In the event of severe smoke in heavily congested areas, Forest Service personnel are strategically stationed in areas of

concern. The duration of these overlapping effects would be short-term, lasting from a few hours to a few days.

### **Alternative C – No Herbicide**

Alternative C would utilize prescribed fire and mechanical methods such as handtools and other mechanical equipment for site preparation, pine seedling release, and fuel reduction in the stands identified under the Proposed Action. The smoke from prescribed burning and dust from mechanical equipment may adversely affect visibility on roads and air quality depending on environmental conditions such as wind speed and direction, temperature, humidity and other factors. These impact short term air quality but would not have any long term effects and would not exceed impacts discussed in the Final Environmental Impact Statement (FEIS) for the Forest Plan.

### **Cumulative Effects**

Cumulative effects would be similar to those for alternative B without the risk of drift associated with herbicide application. Refer to the Apalachicola Prescribed Burning FY 2012-2017 Environmental Assessment for more information on the affects prescribed burning on air quality [http://www.fs.fed.us/nepa/nepa\\_project\\_exp.php?project=35380](http://www.fs.fed.us/nepa/nepa_project_exp.php?project=35380).

### **Climate Change**

Although some activities proposed in this project will produce greenhouse gases (e.g., timber harvesting and prescribed fire), the primary objective of these activities is to convert offsite slash pine and over stocked longleaf pine stands to resilient and diverse long-rotation longleaf pine stands. This shift in management will sequester more carbon in standing trees that will accumulate carbon for at least 120 years and live for up to 450 years (Kush and others 2004). When some of these longleaf pines are eventually harvested, they will primarily produce sawtimber products rather than pulp, which will sequester carbon beyond the life of the tree (Avalapati and others 2002). Additionally, recent studies suggest that litter and understory C and N pools in longleaf/slash pine stands recover rapidly from fire so the effects of prescribed burning on the overall carbon budget in this system are expected to be negligible. In conclusion, the short-term production of greenhouse gases by the proposed action in this project will likely be offset by increased carbon sequestration as desired vegetation responds to improved conditions (National Wild Turkey Federation 2009). Although the no-action alternative would not directly result in increased emissions of greenhouse gasses, it would result in a higher risk of catastrophic fire due to high fuel loads, which in turn would release a large pulse of CO<sub>2</sub> and particulates.

## **BIOLOGICAL ENVIRONMENT**

### **Wildlife**

Species addressed in this section include the Management Indicator Species as defined by Forest Plan, Proposed, Endangered, Threatened species as defined by the USFWS and species included on the RFSS (Regional Forester's Sensitive Species) list for Apalachicola National Forest.

There are perennial streams within the analysis area; however they are too small to sustain a game fish population suitable for recreational fishing. These streams would likely contain small bluegill and minnows. With the precautions mentioned in the Physical Environment section there are no expected effects to fisheries or aquatic life.

### ***Management Indicator Species - Animals***

#### **Affected Environment**

Under the 1976 National Forest Management Act (NFMA), the Forest Service is charged with managing National Forests to provide for a diversity of plant and animal communities consistent with multiple-use of forest resources. Management Indicator Species (MIS) are one tool used to accomplish this objective. MIS and their habitat needs are used to set management objectives and minimum management requirements to focus on effects analysis, and to monitor effects of plan implementation. The general wildlife community that occurs in the Soldier Bay Analysis Area is typical of the southern Coastal Plain. Because it is not feasible to monitor the effects of management actions on all wildlife species, certain species were chosen to be “management indicators”. MIS are selected to monitor the effectiveness of Forest Plan implementation in meeting the desired future conditions. Species or suites of species were identified for each of the major managed habitat types; unmanaged habitats do not require MIS because they are not directly affected by most activities authorized in the Forest Plan.

In 2011 the National Forests in Florida amended the Forest Plan (amendment 10) which changed the MIS species. Animal species chosen as MIS for the Apalachicola National Forest are the red-cockaded woodpecker and Bachman’s sparrow. The Forest Plan identifies Bachman’s sparrow and RCW as indicators for sandhill, scrubby flatwoods, mesic flatwoods, and wet flatwoods community types. The predominant community in the project area is mesic flatwoods.

#### Red Cockaded Woodpecker

The red-cockaded woodpecker (RCW) was identified as an MIS for sandhill and flatwoods habitats and is also listed as endangered under the Endangered Species Act of 1973. Detailed analysis of the effects of the proposed action on RCWs is presented in the Biological Assessment and a summary of those effects can be found in the endangered and threatened species section of this document.

#### Bachman’s Sparrow

Bachman's sparrows are found in the southeastern United States. Most of the populations live in Florida and along the Gulf Coast. They are also found as far north as the Indiana-Michigan border and as far west as the Arkansas-Oklahoma border. In the winter, Bachman's sparrows are especially secretive and little is known of their winter habits. Their winter range seems to be limited to the coastal southeastern U.S. This species is mostly found in open oak and pine forests with abundant grasses. They are most often found in forests with wiregrass (*Aristida*) or broomsedge (*Andropogon*). Populations are highest in areas where forest fires are regular, eliminating hardwood understory shrubs. Bachman's sparrow populations disappear 4 to 5 years after a burn. Much of their original habitat, open pine forests, has been logged throughout their

range, forcing the species into marginal habitats such as forest edges and utility rights-of-way. In the marginal habitats, hardwood understory shrubs are discouraged by poor soils, fires, or human management (Dewey and Darin 2007).

Bachman's sparrow was selected as an MIS because they prefer habitat similar to that described in the desired conditions for flatwoods on the Apalachicola National Forest, and their presence and abundance indicates the effects of management in these habitats. In general, management actions that reduce hardwood midstory, promote open stand structure and encourage growth of grassy and herbaceous vegetation benefit this species. Bachman's sparrows are included in annual bird point counts and the number of individuals counted on the Apalachicola National Forest has been variable but shows little evidence of multi-year trends (see FY 2011 Forest Plan monitoring report).

### **Alternative A – No Action**

Under the no action alternative, Bachman's sparrow trends in this area would be expected to show no change or a decline in the project area. Much of the potential Bachman's sparrow habitat in the project area suffers from a dense, closed pine overstory. A dense, closed pine canopy causes a decrease in herbaceous groundcover due to competition for sunlight and nutrients. Although many of these stands currently have herbaceous groundcover, as trees continue to mature and the canopy continues to close further, groundcover conditions are expected to decline. Under this alternative, habitat conditions would remain poor or decline in dense pine stands.

### **Cumulative Effects**

The continuation of prescribed burning alone would likely not improve habitat enough in the project area to result in any noticeable increase of sparrow numbers. When herbaceous groundcover is lost, potential nesting habitat is reduced and prescribed fire cannot maintain quality habitat due to the lack of fine fuels needed to carry fire across the landscape. Although prescribed burning is a necessary component of Bachman's sparrow management, with the existing state of the pine stands in the project area, application of routine prescribed burning alone may not provide long-term suitable habitat.

### **Alternative B – Proposed Action**

This action alternative would contribute to improving habitat for the Bachman's sparrow. Thinning pine stands, mechanical vegetation removal, and herbicide applications would control woody vegetation, thin the pine overstory, and increase herbaceous vegetation needed for quality Bachman's sparrow habitat. Herbicide application is not likely to directly affect this species because herbicide would be applied directly to target vegetation, reducing the possibility of forage contamination (grass seeds and insects). This species is a ground nester, and it is not likely to be present in herbicide application areas because these areas would not provide suitable nesting habitat. Bachman's sparrows prefer open, well-burned pine stands. It is unlikely a substantial overall population difference would be realized due to this one project but numbers may increase in the project area in response to improved habitat conditions.

### **Cumulative Effects**

The effects of this project, other ongoing projects, and future projects that restore the open pine system would positively influence Bachman's sparrow numbers over time. Project activities would decrease canopy cover and stimulate groundcover. Prescribed burning would then maintain openness and herbaceous groundcover favored by Bachman's sparrow. An increase in Bachman's sparrow population size would be expected as the desired future condition for the entire Forest is attained.

### **Alternative C – No Herbicide**

This action alternative could have a positive effect on Bachman's sparrow habitat by ensuring an open pine canopy in a shorter time period than burning alone. However mechanical treatment frequently only top kills vegetation and repeated treatments may be needed to kill the undesirable vegetation.

### **Cumulative Effects**

This alternative when combined with prescribed burning would have beneficial cumulative effects for Bachman's sparrow. This alternative would open up the canopy with mechanical vegetation removal and tree thinning, and prescribed burning would stimulate the herbaceous groundcover needed for nesting and foraging. However, mechanical vegetation treatments are not likely to be as effective as herbicide treatments because mechanical treatment primarily only top kills vegetation. Also these treatments would need to be coordinated with prescribed fire to be effective which may not be feasible due to weather patterns.

### ***Management Indicator Species – Plants***

In 2011, the National Forest in Florida amended the forest plan (amendment 10) which changed the MIS species list. Many individual plant species were taken out of this list in favor of plant composition groups and new MIS species which can more easily be monitored. Plant composition groups and new individual species include:

**Perennial Fire-Dependent Graminoids** (*such as: wiregrass, pineywoods dropseed, chapman's beaksedge, toothache grass, hairy muhly, Florida toothache grass*) – an abundance of this plant composition group indicates healthy flatwood, sandhill, and savanna habitat.

**Saw Palmetto** – On the Apalachicola National Forest, saw palmetto is primarily found in flatwoods habitats and is often associated with longleaf pine. Saw palmetto is a native species and provides many benefits to wildlife, but dense palmetto understories can indicate that prescribed fire is not effective at managing for wiregrass and other grassy and herbaceous species in these habitats.

**Titi** – Titi (both *Cyrilla racemiflora* and *Cliftonia monophylla*) are woody shrubs native to the Apalachicola National Forest. When fire is suppressed or occurs at low frequency or intensity, titi expands from shrubby or forested wetlands into flatwoods and wet savannas. This species is found in wetland edges and flatwoods and provides a good indicator of the effectiveness of prescribed burning. Encroachment by this species indicates degrading habitat conditions.

**Woody Shrubs/Trees** (such as: gallberry, large gallberry, fetterbush, sweet pepper bush, sweetgum, loblolly bay, water oak)-These species are primarily found in flatwoods, and the overall density of these species is a good indicator of management effectiveness. An overabundance of these species indicates degrading habitat conditions.

**Sandhill Offsite Trees-** Laurel oak and sand pines were identified as offsite species for sandhill habitats. In general, these species do not persist with regular fire and high abundance indicates need for management. After longer periods of fire suppression, mechanical removal or herbicide may be the most effective way to reduce offsite trees, and after initial removal the sites can then be managed with more regular prescribed fire. An overabundance of these species indicates degrading habitat conditions.

Since the analysis area occurs in flatwoods habitats all MIS plant groups will be addressed.

### Perennial Fire-dependent Graminoids

#### **Alternative A – No Action**

Under alternative A, this plant group would only be affected by natural processes and previously approved management actions such as prescribed fire and treatment of non-native invasive plant species. While prescribed burning does benefit these species, it is not likely that prescribed burning alone can significantly increase graminoid density. These species are light dependent. The primary risk factor repeatedly noted for many of these plants species is habitat conversion to pine plantations and subsequent shading/competition for resources. Individuals would likely continue to be suppressed or otherwise impacted by the lack of sunlight. Vegetative changes would be limited to those resulting from natural phenomena and prescribed burning. Perennial fire-dependent graminoids would continue to lose vigor in the analysis area.

#### **Alternative B – Proposed Action**

Long-term positive benefits would be expected from implementation of this alternative. These species evolved in the longleaf pine-wiregrass community and require an open, fire-maintained landscape. The species under consideration are shade intolerant and would benefit from the proposed action. Herbicide application and timber harvest would open up the canopy allowing more light to reach the forest floor. This would make habitat conditions more favorable for fire dependent graminoids. This alternative when combined with past, present, and future activities is expected to improve habitat conditions for these species.

Individuals may be crushed, broken, uprooted, buried or otherwise impacted during the proposed management actions due to the use of heavy equipment for logging, mechanical vegetation and herbicide treatments. Impacts to individuals from herbicide application could include direct or indirect deposition from unintentional spraying, spray drift, or contaminated water/soil movement. If sprayed accidentally, even at the low application rates used by the Forest Service, non-target vegetation could be damaged. Selective application methods would be employed and would minimize potential adverse effects.

It is anticipated that the woody vegetation treatments (herbicide application) would improve conditions for these plant species by reducing the shrubs and, when combined with prescribed

burning, would result in increased graminoid abundance.

### **Alternative C – No Herbicide**

As in alternative B, individuals may be crushed, broken, uprooted, buried, or otherwise impacted during the proposed management actions. Use of prescribed fire alone, with the existing vegetative conditions, may not be as effective at reducing the woody vegetation competition as in Alternative B. The risk of damage to non-target plant species with this alternative may be slightly smaller because herbicide application is not included. However, mechanical treatments primarily top kill target vegetation and multiple mechanical treatments may be needed to reduce titi and other woody vegetation abundance in the analysis area. When combined with past, present, and future management activities, there would likely be cumulatively long-term habitat improvement for these herbaceous plants, but activities may be less effective without the use of herbicides.

### Saw Palmetto

#### **Alternative A – No Action**

Under this alternative palmetto abundance is expected to stay the same. Prescribed fire would maintain palmetto abundance keeping this species from becoming over abundant in the analysis area. No cumulative effects are expected because no actions would take place.

#### **Alternative B – Proposed Action**

While saw palmetto is native to sandhills and flatwoods habitats, an overabundance of this species can decrease diversity and shade out herbaceous groundcover. Individuals may be crushed, broken, uprooted, buried or otherwise impacted during the proposed management actions due to the use of heavy equipment for logging, mechanical vegetation and herbicide treatments. Palmetto would be reduced in high traffic areas and herbicide treatment sites, but palmetto in lower trafficked areas is not expected to perish. This alternative when combined with past, present, and future activities is expected to slightly reduce palmetto in the analysis area. Palmetto damaged by timber operations and herbicide when combined with prescribed burning would decrease, stimulating herbaceous groundcover and increasing diversity.

#### **Alternative C – No Herbicide**

As in alternative B, individuals may be crushed, broken, uprooted, buried, or otherwise impacted during the proposed management actions. These activities when combined with past, present and future management activities such as prescribed fire would help achieve desired management goals for the project area. However there is expected to be less palmetto reduction without the use of herbicides.

### Titi

#### **Alternative A – No Action**

Titi abundance in the analysis area is expected to show no change or slightly increase under this alternative. No new actions would take place under this alternative leaving prescribed burning as the only current action to control titi. Prescribed burning would maintain current conditions in some areas while decreasing titi abundance in others depending on fire intensity. No past,

present, or future activities are expected to be cumulative with this alternative.

### **Alternative B – Proposed Action**

Under this alternative, titi abundance is expected to slightly decrease. Individuals may be crushed, broken, uprooted, buried or otherwise impacted during the proposed management actions due to the use of heavy equipment for logging, mechanical vegetation, and herbicide treatments. Past, present and future forest service activities when combine with this alternative are expected reduce titi in the analysis area. Proposed activities combined with prescribed burning would increase fine fuels allowing fire to carry farther pushing the titi back towards the wetland edges. A reduction in titi would lead to increased herbaceous groundcover and plant diversity.

### **Alternative C – No Herbicide**

As in Alternative B, individuals may be crushed, broken, uprooted, buried, or otherwise impacted during the proposed management actions. These activities when combined with past, present and future management activities such as prescribed fire would help achieve desired management goals for the project area.

### Woody Shrubs/ Trees

#### **Alternative A – No Action**

Under this alternative, woody shrubs and trees are expected to slightly increase or maintain current levels of abundance. While these are native to the ecosystem and do provide forage for some wildlife species, an overly stocked stand can reduce herbaceous ground cover needed to support the crucial fire regime that maintains quality flatwoods habitat. Prescribed fire does reduce the abundance of these species, but once these species become over abundant prescribed fire does not burn effectively due to the lack of fine fuels. The no action alternative when combined with past, present, and future management activities would cause onsite tree growth to slow or go unchanged.

#### **Alternative B – Proposed Action**

Alternative B is expected to reduce woody trees and shrubs in the project area. Individuals may be crushed, broken, uprooted, buried or otherwise impacted during the proposed management actions due to the use of heavy equipment for logging, mechanical vegetation and herbicide treatments. These actions would reduce overabundance of these species allowing more herbaceous groundcover to establish and carry fire more effectively through the project area. These activities when combined with past, present and future management activities such as prescribed fire would help achieve desired management goals for the project area.

#### **Alternative C – No Herbicide**

As in alternative B, individuals may be crushed, broken, uprooted, buried, or otherwise impacted during the proposed management actions. Use of mechanical and prescribed fire alone, with the existing vegetative conditions, may not be as effective at reducing the woody vegetation competition because herbicide would not be used. These activities when combined with past, present and future management activities such as prescribed fire would help achieve desired management goals for the project area, but would not be as effective with the absence of

herbicide application.

### Sandhill Offsite Trees

#### **Alternative A – No Action**

Under this alternative, the condition of offsite trees is expected to deteriorate over time. An overabundance of these tree species can reduce herbaceous ground cover needed to support the crucial fire regime that maintains quality sandhill habitat. Prescribed fire does reduce offsite tree abundance, however once the trees reach mid-story size prescribe burning becomes less effective. The no action alternative when combined with past, present, and future management activities would cause offsite trees to slightly increase or not change.

#### **Alternative B – Proposed Action**

Alternative B is expected to reduce the abundance of sandhill onsite and offsite trees in the project area. Individuals may be crushed, broken, uprooted, buried or otherwise impacted during the proposed management actions due to the use of heavy equipment for logging, mechanical vegetation and herbicide treatments. These actions would reduce overabundance of these species allowing more herbaceous groundcover to establish and carry fire more effectively through the project area. These activities when combined with past, present and future management activities such as prescribed fire would help achieve desired management goals for the project area.

#### **Alternative C – No Herbicide**

As in Alternative B, individuals may be crushed, broken, uprooted, buried, or otherwise impacted during the proposed management actions. Use of mechanical and prescribed fire alone, with the existing vegetative conditions, may not be as effective at reducing the woody vegetation competition (offsite trees) because herbicide would not be used. Without herbicide application, hardwood removal is expected to be less effective because mechanical removal and prescribed burning frequently only top kill the targeted vegetation. These activities when combined with past, present and future management activities such as prescribed fire would help achieve desired management goals for the project area, but would not be as effective with the absence of herbicide application.

## **Endangered and Threatened Species**

A biological assessment (BA) was prepared to determine the likely effects of the alternatives on endangered, threatened, and sensitive species and/or their habitat. The tables below summarize the determinations. See the BA for more detail.

The standards of protection for USFWS listed species are different from those for FS listed sensitive species because of the differences in the degree of endangerment. Endangered and threatened species are protected both as individuals and at the population level, while sensitive species are generally protected at the population level only. Because of this, determining and stating the potential effects on endangered and threatened species is not the same as deciding the possible effects for Sensitive species.

**Table 6. The conceptual relationship between analysis and findings for endangered and threatened species is as follows:**

	Type of Effects Identified	Corresponding Determination of Effect
1.	No effects (not ever, any)	“No effect”
2.	Discountable, insignificant or completely beneficial effects	“May affect, Not likely to adversely affect”*
3.	Adverse effects	“May affect, Likely to adversely affect”*

\*Both 2 & 3 determinations may be referred to as “may affect” determinations under the 1986 ESA regulations, but without further elaboration, the term “may affect” could be misunderstood.

### Red-cockaded woodpecker

The Apalachicola National Forest contains the largest extant population of RCW and has continued to grow despite regular removal of fledglings for the species’ translocation program. The Apalachicola Ranger District population has met its recovery goal of 500 active clusters and currently contains 562 active clusters. In 2003, when the revised RCW Recovery Plan (USFWS 2003) was finalized, the Wakulla District was estimated to contain 138 active clusters. The current estimate is 188 active clusters and annual surveys have shown recent growth of the district population. The Soldier Bay analysis area contains 4 active clusters as of 2015. The project area also contains 8 historical clusters that have each been inactive for more than 5 years.

### **Alternative B – Proposed Action**

Analysis for this alternative can be found in the Biological Assessment (BA). Implementing the proposed timber thinning will improve RCW foraging habitat according to the Recovery Plan. None of the proposed actions would result in stands that currently meet foraging habitat criteria not meeting those criteria post-treatment. Currently, 10 stands in the project area meet the MSS. Timber thinning is proposed for 3 of those stands, but implementation of the action would not modify stand structure in such a way that it would no longer meet the MSS. Four stands currently meet the recovery standard, and 1 of those is proposed for thinning that would also not modify stand structure in such a way that they would no longer meet the recovery standard.

Implementation of the proposed action would produce more area of RCW habitat. Thinning will result in 1 additional stand meeting MSS bringing the total to 11 stands meeting the MSS. Additionally, thinning younger stands (less than 30 years) will encourage growth of remaining trees, allow more light to the understory and facilitate use of prescribed fire, all of which will benefit RCW habitat in the future.

The cluster-level effects analysis, maps and stand data tables, found in the BA, provides detailed information regarding the current conditions and effects of the proposed activities.

### **Alternative C – No Herbicide**

Direct and indirect effects under this alternative are expected to be similar to the proposed action except there would be no effects from herbicide. Risks to RCW from herbicide exposure are minimal (as described in the Biological Assessment), but this alternative may not have as great an impact on reducing the woody vegetation without the use of herbicide. Mechanical midstory removal would reduce woody vegetation initially, but woody vegetation is likely to re-sprout

from the roots. Without a rigorous prescribed fire regime directly following mechanical treatment it is not likely that mechanical treatments would be as effective as herbicide at improving midstory and groundcover conditions. The overall effects of this alternative would still be positive and similar to those for alternative B, but there is some risk that woody shrubs would not be well controlled without herbicide or that control would require multiple expensive mechanical treatments.

This alternative when combined with prescribed burning is likely to have beneficial cumulative effects to RCW Habitat. The proposed thinning treatments and woody vegetation removal would open up the canopy stimulating groundcover. Prescribed burning would initially improve and then maintain these more open conditions favored by the RCW. However due to the absence of herbicide use, these treatments are not expected to be as effective. Additional mechanical treatments and prescribed burns may be needed to kill undesired woody vegetation because mechanical treatments and prescribed burning mainly top kill vegetation. Overall, habitat would be improved as a result of implementing this alternative.

### Eastern Indigo Snake

Historical range extended throughout the lower Coastal Plain of the southeastern United States, from southern South Carolina through Georgia to the Florida Keys, and west to southern Alabama and perhaps southeastern Mississippi. Current range includes southern Georgia and Florida (widely distributed throughout the state, south to the Keys, though perhaps very localized in the panhandle). The species is apparently very rare or extirpated in Alabama, Mississippi, and South Carolina. Recent reintroductions have been made in Florida, Alabama, Georgia, South Carolina, and Mississippi. Habitat includes sandhill regions dominated by mature longleaf pines, turkey oaks, and wiregrass; flatwoods; most types of hammocks; coastal scrub; dry glades; palmetto flats; prairie; brushy riparian and canal corridors; and wet field. Occupied sites are often near wetlands and frequently are in association with gopher tortoise burrows (NatureServe2013). In the northern part of its range, including the Florida panhandle where this project is located, the indigo snake is highly dependent on gopher tortoise burrows as a refuge from cold winter temperatures (Moler 1992). Although suitable habitat exists in the Beasley Pond Analysis Area, the eastern indigo snake is rare or absent on the ANF with the last confirmed sighting in the sandhill areas southwest of Tallahassee, FL in 1996 (Enge et al. 2013).

If any actions are approved in the Soldier Bay Analysis Area, coordination measures for implementation would include following the US Fish and Wildlife Service's eastern indigo snake protection measures as well as state guidelines for avoiding harm to gopher tortoises or their burrows.

### **Alternative A – No Action**

This alternative would have no direct effects on eastern indigo snakes because no actions would take place. There is some potential gopher tortoise habitat within the analysis area but recent habitat mapping and surveys (unpublished, work conducted by FNAI in 2014) suggest that the project area does not include large areas of high-quality habitat. Taking no action would keep the analysis area in its current state and would not improve habitat conditions for indigo snakes. Because taking no action would have negligible effects on indigo snakes or their habitat, there

are no cumulative effects of this alternative in the context of ongoing processes and previously approved activities. Prescribed fire would continue to maintain stands that currently have herbaceous groundcover but it is unlikely that stands a high abundance of canopy cover would be improved with prescribed fire alone.

### **Alternative B – Proposed Action**

Analysis for this alternative can be found in the Biological Assessment available on the project website. In summary, because indigo snakes are not known from the area and because high-quality habitat is limited, it is unlikely that implementing the proposed action would directly affect this species. Timber harvest activities could disturb or harm indigo snakes, as described in the Forest Plan Biological Assessment and US Fish and Wildlife Service Biological Opinion (USDA 1999b). However, given the lack of known occurrences, the scarcity of high-quality habitat and the relatively low density of gopher tortoises, the proposed action is not likely to adversely affect the eastern indigo snake. When combined with ongoing prescribed burning, this alternative would improve habitat for both gopher tortoises and indigo snakes, which could increase the likelihood that indigo snakes could persist in the area in the future.

### **Alternative C - No Herbicide**

Direct, indirect, and cumulative effects to eastern indigo snakes would be similar to alternative B except implementing alternative C may not have as great an impact on reducing the woody vegetation without the use of herbicide. This alternative, when combined with prescribed burning, is likely to have few cumulative effects on eastern indigo snake because it is unlikely that the species occurs in the project area, however, alternative C would result in improved habitat conditions in the future as beneficial cumulative effects and improve eastern indigo snake habitat in the project area.

### Frosted Flatwoods Salamander

This species' range includes the lower southeastern Coastal Plain of the United States from southern South Carolina southward to Marion County (north-central Florida) and disjunct sites westward through southern Georgia and northern Florida to the Apalachicola and Flint rivers (mid-Panhandle of Florida and northward) (NatureServe 2013). Habitat consists of pine flatwoods communities with wiregrass groundcover and scattered wetlands often dominated by cypress and gum. Frosted flatwoods salamanders usually breed in ponds that lack predatory fish and have emergent vegetation (Hipes et al 2001). Potential threats include conversion of pine flatwoods habitat for agriculture, silviculture, or commercial/residential development; drainage or enlargement (with subsequent introduction of predatory fishes) of breeding ponds; habitat alteration resulting from suppression of fire; mortality and collecting losses associated with crayfish harvest; and highway mortality during migration (NatureServe 2013).

There have been no frosted flatwoods salamanders documented within the project area or on the Wakulla Ranger District. Potential frosted flatwoods salamander habitat was assessed in the Soldier Bay project area using GIS databases, including the USFWS designated critical habitat boundary and the potential flatwoods salamander ponds database. The closest designated critical habitat is approximately 10.75 miles from Soldier Bay project and the closest documented pond is approximately 11 miles away. During stand visits, isolated wetlands were found, but none

appeared suitable (they are heavily encroached with woody vegetation and contain little to no grassy or herbaceous vegetation that is preferred by this species). Based on the critical habitat analysis, evaluation of known and potential breeding ponds on the forest and inspection of isolated wetlands in the Soldier Bay project area, it is unlikely that this species is present in the project area.

### **Alternative A – No Action**

There would be no direct effects under this alternative because no new actions would be authorized that would affect flatwoods salamanders or their critical habitat. It is likely that under the no action alternative isolated wetlands and surrounding uplands would remain in their current condition or slightly decline over time due to continued shading and altered hydroperiod as a result of high evapotranspiration from dense trees and shrubs. However, because the alternative would have no direct and uncertain indirect effects, there would be no cumulative effects under this alternative.

### **Alternative B – Proposed Action**

Analysis for this alternative can be found in the BA. This project when combined with past, present, and future projects would be beneficial to flatwoods salamanders. Timber thinning and herbicide treatment when combined with prescribed fire would improve habitat in the project area by opening up the canopy and encouraging herbaceous understory vegetation to emerge. Improved herbaceous vegetation surrounding isolated wetlands would allow more fire to reach the wetlands improving habitat conditions for breeding habitat as well. Overall, the proposed activities in conjunction with previously approved and expected future activities would improve both upland and wetland habitat quality in the analysis area.

### **Alternative C – No Herbicide**

This alternative would have effects similar to alternative B except there would be no potential effects from herbicide. Woody vegetation reduction would be accomplished mechanically, initially reducing the hardwood vegetation in the treated stands. This, however, is expected to only have short term beneficial effects as mechanical removal only top kills most woody vegetation and they would likely resprout soon after cutting. Thinning and mechanical woody vegetation removal when combined with prescribed burning would have beneficial cumulative effects for frosted flatwoods salamanders. Aggressive prescribed burning would need to be coordinated with the mechanical treatments in order to be affective. This may not be feasible due to strict prescribed burning parameters and repeated mechanical treatments and prescribed burning may be needed.

**Table 7. Summary of the TES species effects determinations for the Soldier Bay Project August 2015**

<b>SPECIES</b>	<b>ALT A</b>	<b>ALT B</b>	<b>ALT C</b>
*Gray bat	No Effect	No Effect	No Effect
*Wood stork	No Effect	No Effect	No Effect
*RCW	No Effect	May affect, not likely to adversely affect	May affect, not likely to adversely affect
*Harperocallis flava	No Effect	No Effect	No Effect

*Macbridea alba	No Effect	No Effect	No Effect
*Scutellaria floridana	No Effect	No Effect	No Effect
*Pinguicula ionantha	No Effect	No Effect	No Effect
*Indigo snake	No Effect	May affect, not likely to adversely affect	May affect, not likely to adversely affect
*Flatwoods salamander	No Effect	May affect, not likely to adversely affect	May affect, not likely to adversely affect
*Gulf sturgeon	No Effect	No Effect	No Effect
*Mollusks	No Effect	No Effect	No Effect

\* US Fish and Wildlife Service Endangered or Threatened

## Sensitive Animal Species

**Table 8. The conceptual relationship between analysis and findings for sensitive species is as follows:**

	Type of Effects Identified	Corresponding Determination of Effect
1.	No effects	“No impacts”
2.	Beneficial effects	“Beneficial impacts”
3.	Adverse effects (one of these two determinations, depending on extent of adverse effects)	“May impact individuals but not likely to cause a trend to federal listing or a loss of viability” or “Likely to result in a trend to listing or a loss of viability”

### Gopher Tortoise

This species ranges in the Southeastern United States from southern South Carolina through southern Georgia to southern Florida (excluding most of inland southern Florida), west through southern Alabama and southeastern Mississippi to eastern Louisiana. It occurs on islands off the Gulf coast of Florida as far south as Cape Sable. This species commonly occupies habitats with a well-drained sandy substrate, ample herbaceous vegetation for food, and sunlit areas for nesting. These habitat types include sandhill (pine-turkey oak), sand pine scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, and mixed hardwood-pine communities. It prefers open habitats that support a wide variety of herbaceous ground cover vegetation for forage; usually abandons densely canopied areas and frequently can be found in disturbed habitats such as roadsides, fence-rows, old fields, and the edges of overgrown uplands (NatureServe 2013). Gopher tortoises excavate deep burrows for refuge from predators, weather, and fire. More than 300 species of animals have been recorded sharing these borrows. Much of its native habitat has been lost to agriculture, citriculture, forestry, mining, urban development, and residential development. Although protected populations occur on public land, the recent development of severe respiratory disease threatens those populations (Hipes and others 2001).

### **Alternative A – No Action**

No direct or indirect effects are expected under this alternative. Habitat conditions would not

change in the analysis area. Alternative A would have no impacts on gopher tortoises because there would be no new management actions implemented in the analysis area.

### **Cumulative Effects**

There are no cumulative effects expected under this alternative. Prescribed burning would continue and gradually improve habitat in some areas and maintain the existing conditions in others. However, substantial habitat improvement is not expected. Without the removal of midstory and over abundant overstory vegetation in dense stands, herbaceous vegetation is not likely to receive enough sunlight to become abundant.

### **Alternative B – Proposed Action**

Gopher tortoises and burrows may be encountered in compartments 326 and 328 where xeric habitat is present. Skid trails and log landings would be placed at least 25 feet away from gopher tortoise burrows, and equipment operators would be instructed to maintain a 25-foot distance from them as well. Even with these measures in place to avoid burrows some could be crushed. However, a study conducted by the Army Corps of Engineers showed that tortoises usually excavate collapsed burrows and are not injured by the burrow collapse (Medonca and others 2007).

Thinning and longleaf conversion would have beneficial indirect effects for gopher tortoises. Timber removal would allow more sunlight to reach the ground in turn causing the herbaceous ground cover to increase. Converting some stands to longleaf pine would also be beneficial to gopher tortoises. Longleaf needles provide fine fuel which carries fire across the landscape. Fire stimulates herbaceous vegetation which in turn provides more forage for gopher tortoises.

The direct effects of herbicide on gopher tortoises are unknown. These animals could be subject to exposure. They may move into the areas on drier sites to take advantage of any flush of herbaceous vegetation that might occur and may still be present when herbicides are applied. Reminding contractors to never spray or harass wildlife of any kind and to move away when wildlife is encountered would reduce chances of exposure. It is unlikely that tortoises would ingest enough treated vegetation to be affected because the proposed herbicide triclopyr would not be intentionally sprayed directly on forage vegetation. These herbicides would be used to remove hardwood vegetation which out competes herbaceous vegetation, gopher tortoises primary food source, for nutrients and sunlight. The use of herbicides when combined with other activities, is likely to improve habitat conditions in the project area. In summary, the proposed action may impact individuals, but is not likely to cause a trend to federal listing or a loss of viability of gopher tortoises.

### **Cumulative Effects**

Cumulative Effects of the proposed action are expected to be beneficial. Implementation of the proposed action combined with frequent application of prescribed burning would improve gopher tortoise habitat.

### **Alternative C – No Herbicide**

This alternative is similar to alternative B but no herbicides would be used. This alternative may not have as great an impact on reducing the woody vegetation without the use of herbicide.

While mechanical midstory removal would reduce midstory vegetation initially, woody vegetation is likely to re-sprout from the roots. Implementing alternative C may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of gopher tortoises because effects would be minimal.

### **Cumulative Effects**

Cumulative effects of the this alternative are expected to be beneficial. This alternative combined with prescribed burning is likely to improve gopher tortoise habitat. Opening up the pine canopy and improving herbaceous groundcover would improve conditions for gopher tortoises. However mechanical treatments are not expected to be as effective as herbicide treatments. Additional mechanical treatments and prescribed burns may be needed to kill undesired wood vegetation because mechanical treatments and prescribed burning mainly top kill vegetation.

### **Bachman's Sparrow**

Bachman's sparrows are found in the southeastern United States. Most of the populations live in Florida and along the Gulf Coast. They are also found as far north as the Indiana-Michigan border and as far west as the Arkansas-Oklahoma border. In the winter, Bachman's sparrows are especially secretive and little is known of their winter habits. Their winter range seems to be compressed into the coastal southeastern U.S., Florida, the Gulf states, and eastern Texas. This species is mostly found in open oak and pine forests with abundant grasses. They are most often found in forests with wiregrass (*Aristida*) or broomsedge (*Andropogon*). Populations are highest in areas where forest fires are regular, eliminating hardwood understory shrubs. Bachman's sparrow populations disappear 4 to 5 years after a burn. Much of their original habitat, open pine forests, has been logged throughout their range, forcing them into marginal habitats, such as forest edges and utility rights-of-way, where hardwood understory shrubs are discouraged by poor soils, fires, or human management (Dewey and Darin 2007).

### **Alternative A – No Action**

This no action alternative would likely not have an effect on Bachman's sparrow continued viability on the Forest but would not result in any considerable improvement of this area. Prescribed burning would continue but may only maintain the existing conditions and not improve them enough for this bird. Alternative A would have no impacts on Bachman's sparrows because there would be no effects.

### **Cumulative Effects**

There are no cumulative effects expected under this alternative. Prescribed burning would continue and gradually improve habitat in some areas and maintain the existing conditions in others. However, substantial habitat improvement is not expected. Without the removal of midstory and over abundant overstory vegetation in dense stands, herbaceous vegetation is not likely to receive enough sunlight to become abundant.

### **Alternative B – Proposed Action**

Implementing the proposed action would improve habitat for the Bachman's sparrow. Thinning pine stands, mechanical vegetation removal, and herbicide applications would control woody

vegetation, reduce pine overstory, and increase herbaceous vegetation needed for quality Bachman's sparrow habitat. Herbicide application is not likely to directly affect this species because it would be applied directly to target vegetation. This species is a ground nester, and it is not likely to be present in areas proposed for herbicide application because these areas would not provide suitable nesting habitat. In summary the proposed action may impact individuals but is not likely to cause a trend to federal listing or a loss of viability for Bachman's sparrows.

### **Cumulative Effects**

The effects of implementing the proposed action, other ongoing projects, and future projects that restore the open pine system would positively influence Bachman's sparrow numbers over time. Project activities would decrease canopy cover and stimulate groundcover. Prescribed burning would maintain herbaceous groundcover favored by Bachman's sparrow.

### **Alternative C – No Herbicide**

This action alternative could have a positive effect on Bachman's sparrow habitat by ensuring an open pine canopy in a shorter time period than burning alone, although the use of herbicides in alternative B may achieve better results than not using herbicides as in alternative C.

Implementing alternative C may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of Bachman's sparrows because effects would be minimal.

### **Cumulative Effects**

This alternative when combined with prescribed burning would have beneficial cumulative effects for Bachman's sparrow. This alternative would open up the canopy with mechanical vegetation removal and tree thinning, and prescribed burning would stimulate the herbaceous groundcover needed for nesting and foraging. However, mechanical vegetation treatments are not likely to be as effective as herbicide treatments because mechanical treatment primarily only top kills vegetation.

### Rafinesque's Big-eared Bat

Rafinesque's big-eared bat's range extends from southern Virginia, West Virginia, Ohio, Indiana, and Illinois south to Florida (primarily the panhandle and northern and central portions of the peninsula) and the Gulf of Mexico; west to Louisiana, Arkansas, eastern Oklahoma, and the eastern edge of Texas (NatureServe 2013). Habitat consists mainly of forested communities, particularly those associated with floodplains, supporting large, hollow trees used for roosting. This species also utilizes flatwoods and mixed oak-pine forests, and can be found roosting in old buildings and culverts. Threats to this species include removal of large, hollow trees, and clear-cutting (Hipes and others 2001).

### **Alternative A – No Action**

No direct or indirect effects are expected under this alternative. Habitat conditions would not change in the analysis area.

### **Cumulative Effects**

There are no cumulative effects expected under this alternative because no actions would take place.

**Alternative B – Proposed Action**

The primary direct threat to this species would be loss of roosting habitat. This species primarily roosts in hollow trees in floodplains, but will also utilize flatwoods and mixed forests. Potential roost trees in the uplands may be lost as a result of implementing the proposed action. However, there would still be roost trees available in the floodplain and swamps so viability of this species would not be threatened. Thinning and using herbicide to reduce shrubby vegetation would have beneficial indirect effects by opening up the canopy and increasing herbaceous groundcover. Increasing herbaceous groundcover would also increase insect populations resulting in improved foraging conditions. Implementing the proposed action may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

**Cumulative Effects**

This alternative when combined with prescribed burning would have beneficial effects on foraging habitat. Thinning and herbicide application would open up the canopy allowing more sunlight to reach the understory stimulating herbaceous groundcover. Prescribed burning would then maintain herbaceous groundcover.

**Alternative C – No Herbicide**

This alternative is similar to alternative B but no herbicides would be used. This alternative may not have as great an impact on reducing the woody vegetation without the use of herbicide. While mechanical midstory removal would reduce midstory vegetation initially, hardwood vegetation is likely to re-sprout from the roots. Implementing alternative C may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

**Cumulative Effects**

Cumulative Effects of this alternative are expected to be beneficial. This alternative combined with prescribed burning is likely to improve foraging habitat for this species. Opening up the pine canopy and improving herbaceous groundcover would improve conditions for insects that are big-eared by prey. However, mechanical treatments are not expected to be as effective as herbicide treatments. Additional mechanical treatments and prescribed burns may be needed to kill undesired woody vegetation because mechanical treatments and prescribed burning mainly top kill vegetation.

**Florida Black Bear**

Historically, black bears ranged throughout the southeastern United States with the Florida subspecies inhabiting all of Florida (except the lower Keys) and southern portions of Georgia and Alabama. The distribution of the subspecies, however, has been significantly reduced and fragmented to one subpopulation each in Alabama and Georgia, and in Florida to seven subpopulations. Habitat selection by bears is a function of nutritional needs and spatially fluctuating food sources. The Florida black bear thrives in habitats that provide an annual supply of seasonally available foods, secluded areas for denning, and some degree of protection from humans. Bears are opportunistic foragers, taking advantage of seasonally available fruits, nuts, insects, and human supplied foods such as garbage and domestic animal feed. Known mortality

of adult bears is caused largely by humans (i.e., vehicle collisions, illegal kill, and euthanasia). In highly fragmented habitat, bears have more frequent interactions with humans and human-related sources of mortality can be significant. Bears establish home ranges based of food availability, subpopulation density, reproductive status, as well as human influences such as habitat fragmentation. Ranges for females are approximately 1,000 to 4,000 acres. Male black bears establish home ranges in relation to presence of females and are usually 3 to 8 times larger than females' home ranges (FWC2012).

#### **Alternative A – No Action**

No direct or indirect effects are expected under this alternative. Habitat conditions would not change in the analysis area. Alternative A would have no impacts on Florida black bears because there would be no effects from management activities.

#### **Cumulative Effects**

There are no cumulative effects expected under this alternative. Prescribed burning would continue and gradually improve habitat in some areas and maintain the existing conditions in others. However, substantial habitat improvement is not expected. Without the removal of over abundant overstory vegetation in dense stands, herbaceous vegetation is not likely to receive enough sunlight to become abundant.

#### **Alternative B – Proposed Action**

This project is likely not large enough to have much of an impact on the black bear population or its habitat. It is unlikely that black bears would be directly affected by the proposed action because they are likely to move from the project area while work is taking place. A shift in home range use may occur while treatments are ongoing, but individuals would likely return once treatments are completed. At the proposed rate of application of herbicides it is unlikely that a black bear would ingest enough treated vegetation to be harmed. In summary, the proposed action may impact individuals, but is not likely to cause a trend to federal listing or a loss of viability for Florida black bears.

#### **Cumulative Effects**

Viability of this species in the project area would not be threatened because effects would be minimal when combined with past and future management activities. Prescribed burning when combined with the proposed action would increase herbaceous groundcover. However, black bears are generalists and use a variety of habitats so improved herbaceous understory is not likely to have a measurable effect on black bear populations in the analysis area. Implementing alternative B may impact individuals but is not likely to cause a trend to federal listing or a loss of viability of this species because effects would be minimal.

#### **Alternative C – No Herbicide**

Alternative C would have similar effects to alternative B but without the herbicide effects. Implementing alternative C may impact individuals but is not likely to cause a trend to federal listing or a loss of viability for Florida black bears because effects would be minimal.

#### **Cumulative Effects**

Viability of this species in the project area would not be threatened because effects would be

minimal when combined with past and future management activities.

### Florida Pine Snake

The Florida pine snake occurs throughout the state, excluding the Florida Keys, The Everglades, extreme southwestern Florida, and immediately north of Lake Okeechobee. Outside of Florida, it occurs in southwestern and eastern Georgia to southern South Carolina. The Florida Pine Snake requires dry sandy soils for burrowing. It is found most often in open pine-turkey oak woodlands and abandoned fields, and also in scrub, sandhills, and longleaf pine forest. The Florida Pine Snake feeds primarily on pocket gophers, which it pursues by forcing its way into their underground burrows. Other small mammals, lizards, and reptile eggs are also eaten. It may occasionally climb trees in search of birds and their nests. Florida Pine Snakes spend most of their time underground in pocket gopher or gopher tortoise burrows. (NatureServe 2013) Threats to this species include collection for pets, highway mortality, habitat loss and fragmentation caused by development, intensive agriculture, and mining (Hipes and others 2001).

### **Alternative A – No Action**

This alternative would have no impacts on pine snakes because no action would take place. Alternative A would have no impacts on Florida pine snakes because there would be no effects.

### **Cumulative Effects**

Under the no action alternative cumulative effects are expected to be non-existent. Current and future forest service activities are not expected to make noticeable habitat changes.

### **Alternative B – Proposed Action**

Heavy equipment used for timber harvest and mechanical woody vegetation treatment along with the human interaction would be the potential threats from this proposal. Contractors would be advised of their responsibility to avoid harming any animals, including snakes. It is highly unlikely that these snakes would be exposed to herbicide use, and even if they were present the likelihood of toxicity to them is low. In summary the proposed action may impact individuals but is not likely to cause a trend to federal listing or a loss of viability for Florida pine snake because effects would be minimal.

### **Cumulative Effects**

Cumulative effects from this alternative are expected to be beneficial. The proposed action combined with prescribed burning is likely to improve habitat for pine snake prey in turn providing better habitat for pine snakes. Woody vegetation reduction and pine thinning would allow sunlight to increase stimulating herbaceous groundcover. Prescribed burning would further stimulate groundcover by putting nutrients back into the soil through ash. More abundant herbaceous layers supply more roots and bulbs from pocket gophers, pine snakes primary food source. Improving habitat for pine snake prey would improve habitat conditions for pine snakes as well.

### **Alternative C – No Herbicide**

Alternative C would have similar effects to Alternative B but without the herbicide effects. Multiple mechanical treatments may be needed to kill undesirable vegetation because mechanical treatments only top kill vegetation. Implementing alternative C may impact

individuals but is not likely to cause a trend to federal listing or a loss of viability for Florida pine snake because effects would be minimal.

### **Cumulative Effects**

Cumulative effects are expected to be similar to alternative B except mechanical vegetation treatments are not likely to be as effective as herbicide treatments because mechanical treatment primarily only top kills vegetation.

## **Sensitive Plant Species**

The ANF's sensitive species list was revised as of January 1, 2002 and 35 plants were added. Still, little is known about the distribution of many of these species other than general county and state occurrence information gained from NatureServe. FNAI does not track the majority of these species and there are no elements of occurrence records for the ANF. In order to better understand and evaluate potential impacts to sensitive plants we determined through literature searches, the primary community type each plant would occur in. Rather than address each plant individually, the potential impacts on the community in which they occur is discussed.

Sandhills, flatwoods, and wetland (stringer, cypress ponds, and swamps) were determined to be the "affected community types". Fifty-one (51) sensitive plant species occupy these habitats. A list of individual species by community type can be found in Appendix A. The remaining plant species, those that occur in the other community types, were eliminated from further analysis.

### **Alternative A – No Action**

Alternative A would see no pine thinning in the analysis area. The opportunity would be lost at this time to open the canopy and begin to restore the native wiregrass community. Vegetative changes would be limited to those resulting from natural phenomena and prescribed burning. Reduction of intact, contiguous ground fuels coupled with the invasion of hardwood shrubs has lessened the impact of fire as a force on this landscape. Overly dense plantations would be left to thin under natural processes. Those portions of stands experiencing initial crown closure would likely grow darker and denser, effectively shading out the herbaceous groundcover component and moving further away from suitable sensitive plant habitat. Native groundcover species would continue to lose vigor and may over time vanish. This alternative would eventually lead the affected area away from the desired native fire climax community. In summary alternative A may affect sensitive plants but is not likely to cause a trend toward federal listing.

### **Cumulative Effects**

Under this alternative no cumulative effects are expected because no actions would take place. Prescribed burning and natural phenomena would continue to be the only mechanisms for vegetative change within the project area.

### **Alternative B – Proposed Action**

Moving heavy equipment (feller/bunchers) and skidding trees across the ground would directly affect vegetation, including any sensitive plant species that may be present. These impacts tend to be concentrated on skid trails, log landings, and in isolated shallow wet areas. Individual

sensitive plants located in these sites or in the paths of equipment may be crushed, broken, uprooted, or buried. Most perennial species can be expected to survive top kill but are likely to die if uprooted. Loss of individual sensitive plants may occur.

Thinning would lessen the effects and appearance of intensive forestry practices by reducing the number of trees per acre and minimizing the row effect. To some extent it can mimic the natural stand conditions by opening the canopy and increasing the amount of light that reaches the forest floor. This is especially important in the densely planted, overstocked stands present in the analysis area. All sensitive plants under consideration are dependent upon high light conditions and would immediately benefit from the increased sunlight. It is anticipated that thinning would open stands up enough to encourage dormant rhizome and seed banks to respond. The remaining trees would continue to provide needle cast, providing fine fuels to carry fire.

Experience has shown that thinning, in concert with frequent prescribed burning, leads to open pine stands that can provide good habitat for sensitive plants. Prescribed burning helps restore fire dependent plant species in stands that have lacked frequent fire. Together, the reduction in tree density and prescribed fire can be expected to help restore and improve the understory plant community. Areas with intact, contiguous groundcover would have the greatest responses. Although individuals may be lost, the overall habitat would be improved and populations could increase as a result.

#### Herbicide Application

**Triclopyr:** This herbicide is semi-selective and especially useful for broad-leaf herbs and woody species. Grasses are generally tolerant and pines are tolerant of the amine formulation after resting buds are formed in late summer. The active ingredient is readily absorbed by foliage, with some stem uptake. It translocates up and down in plants, accumulating in growing tissues and the root collar. Triclopyr is not soil active and is generally non-mobile in soils. This herbicide has a moderately low half-life in soil of 10-46 days (average 30 days) and is degraded by both soil microbes and photolysis. Triclopyr amine is used as an injection or cut-surface treatment in site preparation and release, and as a foliar spray in rights-of-way or for hardwood control in conifer plantations (SERA 2011).

Impacts to sensitive plants from herbicides include direct or indirect deposition from unintentional spraying, spray drift, or contaminated water/soil movement. If sprayed accidentally at the low application rates used by the Forest Service, non-target vegetation could be damaged. Selective application methods (soil spot treatments and direct application to target vegetation) would be employed to minimize potential adverse effects. Overall impacts of treatment with selective herbicides would vary depending on how closely the target and non-target plant species are related, as well as the rate of application.

#### Planting pine seedlings

Planting pine seedlings would likely have no impact on sensitive plant species.

#### Nutrient removal and redistribution

Harvest and removal of trees would extract nutrients from the affected area. Standard measures reduce this effect by requiring branches and tops of harvested trees, which contain the majority

of nutrients found in the tree, be left on-site and scattered. In thinned stands, most of these nutrients would be quickly taken up and immobilized by residual trees and understory vegetation. Harvest and removal of the tree boles would have a minor impact on nutrient reserves temporarily reducing soil productivity. A short-term increase in nutrient leaching would also occur following harvesting, however many of the nutrients released from the branches and tops of harvested trees would quickly be taken up and immobilized by residual vegetation. Natural inputs of nutrients from soil weathering, precipitation and dust fall would eventually replace lost nutrients and no long-term decrease in productivity should occur.

Harvest activities would not only remove limited nutrients, they would also cause some redistribution of nutrients within the cutting units. The scattering of branches and treetops would not be uniform and would create an increase in nutrients in some areas and a corresponding decrease in others. Redistribution of nutrients would have micro-site impacts to soil productivity, both positive and negative, but would not affect the over-all productivity of the project area.

#### Transportation

Old aerial photographs of the forest indicate that most of the roadbeds visible today were already in place some time ago. These roadbeds have stabilized and the ditches have re-vegetated. Culverts and swales will be maintained. No new road beds would be created as a result of this project. There is no unacceptable erosion or sedimentation occurring from the existing roadbeds within the project area that might impact sensitive plants.

Transportation of logs along temporary roads may impact sensitive plants. Individual sensitive plants located in the temporary road or in the paths of equipment may be crushed, broken, uprooted, or buried. Most perennial species can be expected to survive top kill but are likely to die if uprooted. Loss of individual sensitive plants may occur. These temporary haul routes would not cross sensitive or erosion-prone areas and will be closed following the harvest. The local climate and seed bank would promote rapid regeneration of pioneer species into these temporary roadways stabilizing the soil.

Maintenance and re-construction of existing roadways would have minimal impacts on sensitive plant species. These activities would take place in existing roads used by the public so there would be no increased threat of invasive species introduction. Some individual plants may be crushed, broken, uprooted, or buried due to these activities. However, most of the species present along these existing roads would be resilient to disturbance because of current habitat conditions and would be expected to recover.

In summary the proposed action may affect sensitive plants but is not likely to cause a trend towards federal listing.

#### **Cumulative Effects**

Experience has shown that thinning and herbicide application, in concert with frequent prescribed burning, leads to open pine stands that can provide good habitat for sensitive plants. Prescribed burning helps restore fire dependent plant species in stands that have lacked frequent fire. Together, the reduction in pine and hardwood density and prescribed fire can be expected to

help restore the understory plant community. Areas with intact, contiguous groundcover would have the greatest responses. Although individuals may be lost, the overall habitat would be improved and populations could increase as a result.

### Alternative C – No Herbicide

The primary difference between this alternative and alternative B would be that herbicide would not be used. The immediate impacts would be the same as alternative B with no potential effects from herbicide application. However, long-term shrub reduction and habitat improvement would likely be more effective with the use of herbicides. Implementing alternative C may affect sensitive plants but is not likely to cause a trend towards federal listing.

### Cumulative Effects

Cumulative Effects of this alternative are expected to be beneficial. This alternative combined with prescribed burning is likely to improve sensitive plant habitat. Opening up the pine canopy and improving herbaceous groundcover would improve conditions for these species. However mechanical treatments are not expected to be as effective as herbicide treatments. Additional mechanical treatments and prescribed burns may be needed to kill undesired woody vegetation because mechanical treatments and prescribed burning mainly top kill vegetation.

**Table 9. Summary of sensitive and proposed species effects determinations for the Soldier Bay Project August 2015.**

Sensitive aquatic animals and animals that use aquatic habitats	No Impact	No Impact	No Impact
Florida Pine Snake	No Impact	May Impact Indv.	May Impact Indv.
Florida Black Bear	No Impact	May Impact Indv.	May Impact Indv.
Rafinesque's Big-eared Bat	No Impact	May Impact Indv.	May Impact Indv.
Bachman's Sparrow	No Impact	May Impact Indv.	May Impact Indv.
Gopher tortoise	No Impact	May Impact Indv.	May Impact Indv.
Striped newt	No Impact	No Impact	No Impact
Sensitive aquatic animals and animals that use aquatic habitats	No Impact	No Impact	No Impact
Sensitive Plants	No Impact	May Impact Indv.	May Impact Indv.
Sandhills	No Impact	May Impact Indv.	May Impact Indv.
Mesic-Wet Flatwoods	No Impact	May Impact Indv.	May Impact Indv.
Strands, Cypress Ponds, Swamps	No Impact	No Impact	No Impact
Savannas, Bogs, Seepage Slopes	No Impact	No Impact	No Impact
Pond, Lake Margins	No Impact	No Impact	No Impact
Aquatic	No Impact	No Impact	No Impact
Slope, Hardwood Forest	No Impact	No Impact	No Impact
Bluffs	No Impact	No Impact	No Impact
River/Streambanks	No Impact	No Impact	No Impact
Floodplains	No Impact	No Impact	No Impact

## Vegetation

### Timber

#### Affected Environment

The analysis area has young slash pine plantations between 25-50 years old and mature stands that range from 65-106 years old. These stands are interspersed with hardwood and mixed pine/hardwood swamps and stream buffers.

Mature longleaf pine stands are represented within the analysis area having site indexes ranging from 60-70. Their ages are from approximately 60-100+ years old and consist of trees with favorable crown ratios (40-60%) and growing space. The basal areas have a range of 30-108 sq. ft. There are some occasional slash pines growing with the longleaf pine. These stands are not proposed to be treated at this time.

Slash pine plantations are generally classified as immature and mature poletimber. Their site indexes range from 60-70. The average basal areas range from approximately 70-130 sq. ft. /ac. Within most stands the diameter at breast height (DBH) ranges from 3-11 inches. Growing space is limited which has resulted in decreasing levels of radial growth. The understory consists mainly of woody brush species such as gallberry which makes burning increasingly difficult.

These stands are proposed to be thinned to 40 sq. ft./ac. of basal area with a goal of reducing fuels in an analysis area that borders a local community. The Bradwell Bay Wilderness is located directly to the east of Soldier Bay. Wildfires originating in the Wilderness have in the past jumped over into the analysis area and posed a direct threat to private property. Reducing fuels in the analysis area will result in a decreased level of fire activity in the event of a wildfire event. Thinning to 40 BA will promote herbaceous groundcover and allow for more frequent prescribed burning.

The stunted slash stands are far away from the desired condition of the forest described in the forest plan. The preferred tree species for this site would be longleaf pine. Clearcut with reserves would be the best cutting method for converting these off-site slash pine sites to longleaf. Seed tree or shelterwood regeneration cuts would fail to fully restock the stand due to the lack of longleaf trees required to serve as a seed source for regeneration. For this reason clearcutting was chosen as the optimal cutting method. The longleaf pine volunteers are generally clumped or sporadic and would not provide a seed source to fully restock the stand. The eastern half of stand 18 is proposed for underplanting of longleaf pine under stunted slash pine. This stand treatment is proposed due to maximum clearcut limitations, the more herbaceous nature of the groundcover, and the smaller crowns of the slash pines in eastern half of the stand compared to

the western half. This practice of underplanting longleaf pine under stunted is not common practice on the forest but there are several stands where such conversion techniques have been implemented.

The National Forest Management Act of 1976 (NFMA) states that the Forest Service “shall insure that, prior to harvest, stands of trees throughout the National Forest System shall generally have reached the culmination of mean annual increment of growth (CMAI) (calculated on the basis of cubic measurement or other methods of calculation at the discretion of the Secretary)” (NFMA 1976). The clearcuts proposed under the Soldier Bay Analysis Area are exempt from conforming to CMAI standards based on the forestwide goals outlined in the Forest Plan to “Maintain or, where necessary restore ecosystem composition, structure, and function within the natural range of variability in all ecosystems, with emphasis on longleaf pine-wiregrass....”(USDA 1999b pg. 2-3). To accomplish the goals outlined, the Forest Plan has set a long term objective to “restore all off-site slash pine to appropriate native vegetation” (USDA 1999b pg. 2-5). In addition, the four proposed clearcut areas range between 25-40 years of age and are exhibiting signs of stunted growth as evidenced by their smaller than normal crowns.

**Table 10. Age-class distribution by forest type**

Forest Type	Acres by Age class													MISS	Total	Percent
	1-	11-	21-	31-	41-	51-	61-	71-	81-	91-	101-	111+				
	10	20	30	40	50	60	70	80	90	100	110					
Slash pine/Hardwood								49		22					71	2
Longleaf Pine			111	74			4	237	139	192	118		14	890	16	
Slash Pine			594	291	88	26	290	1318	501	113	30			3250	57	
Longleaf Pine/Slash Pine								24			55			78	2	
Bottomland Hardwood/Yellow Pine									43					43	1	
Baldcypress/Water Tupelo								7						7	1	
Undrained Flatwoods									18			5	58	81	2	
Brush species			8					106	455				764	1332	24	
<b>AC</b>			713	365	88	26	294	1742	1156	327	203		836	5752	<b>Total</b>	

Figure 11. Vegetation Map

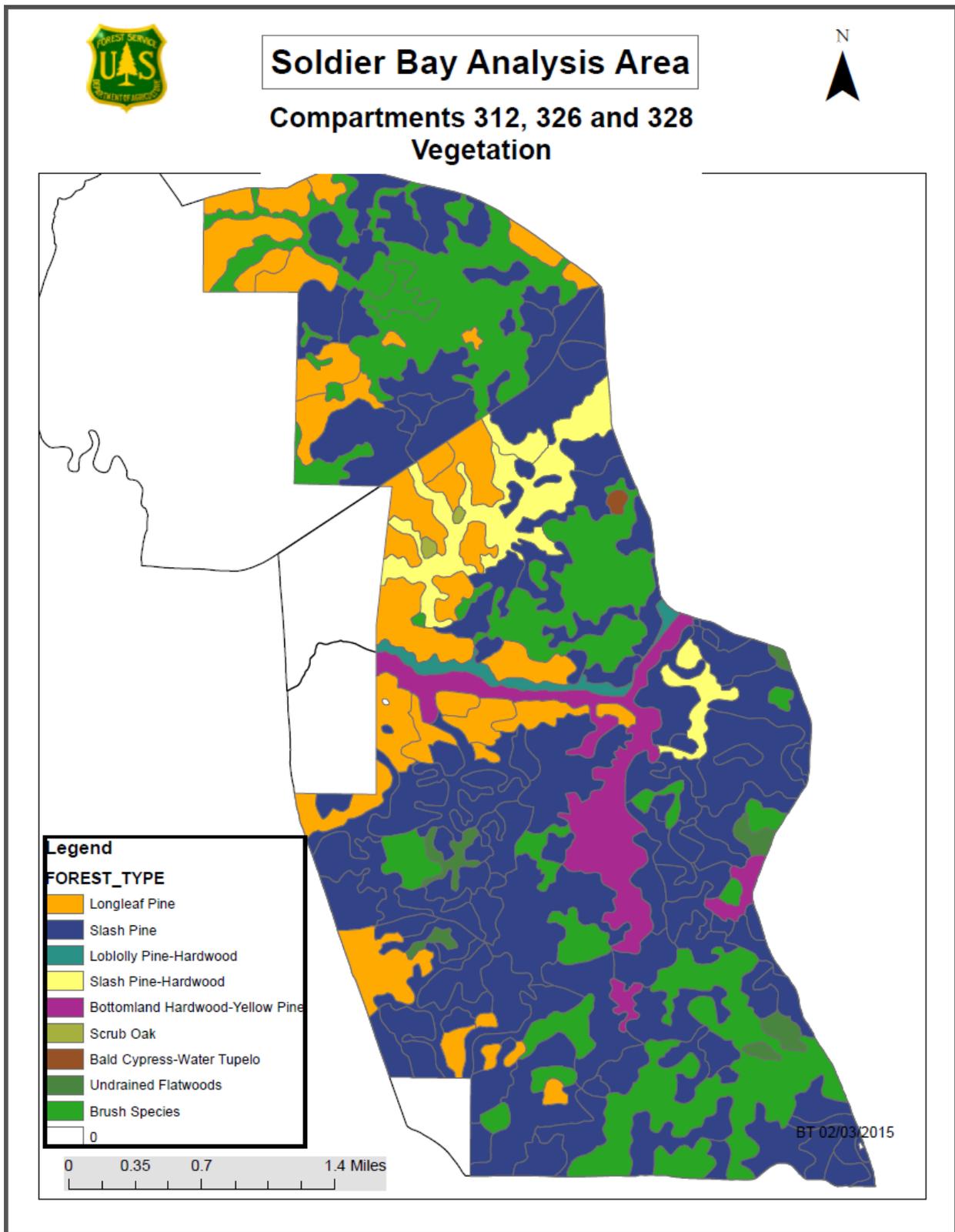


Table 11. Treatment and Volume Summary

Compartment	Stand	Treatment Acres	Treatment	Approximate Volume Removed - CCF		
				Pulpwood	Sawtimber	Total
312	1	38	Thin	228	0	228
312	5	17	Thin	46	0	46
312	6	29	Thin	61	0	61
312	7	55	Thin	330	0	330
312	9	30	Thin	84	0	84
312	10	15	Thin	9	0	9
312	11	18	Hardwood Midstory Removal	0	0	0
312	15	24	Thin	50	26	76
312	18	41	Clearcut	422	0	422
312	18	59	Underplant	0	0	0
312	21	12	Clearcut	17	0	17
312	22	46	Thin	59	0	59
312	23	57	Thin	130	52	182
312	24	18	Thin	41	25	66
312	27	62	Thin	82	0	82
326	1	24	Clearcut	113	28	141
326	2	12	Thin	51	0	51
326	7	45	Thin	105	25	130
326	8	5	Thin / Hardwood Control	4	26	30
326	9	25	Thin	50	84	134
326	12	74	Thin/ Hardwood Control	81	0	81
326	14	44	Thin/ Hardwood Control	47	62	109
326	15	9	Thin	42	0	42
326	17	22	Thin	131	8	139
326	18	47	Thin	167	0	167
326	19	88	Thin	268	0	268
326	20	14	Thin	27	3	30
326	23	19	Thin	29	38	67
326	28	20	Thin	180	0	180
326	30	48	Thin	300	0	300
328	1	30	Thin/ Hardwood Control	19	0	19
328	3	54	Hardwood Midstory Removal	0	0	0
328	4	69	Thin	470	0	470
328	6	6	Thin	16	47	63
328	9	150	Thin	918	0	918
328	10	125	Thin	827	0	827
328	12	63	Thin/ Hardwood Control	100	180	280
328	13	44	Thin	140	0	140
328	14	8	Thin	29	0	29
328	15	17	Thin	103	0	103

Compartment	Stand	Treatment Acres	Treatment	Approximate Volume Removed - CCF		
				Pulpwood	Sawtimber	Total
328	16	62	Thin	119	67	186
328	18	6	Thin	17	3	20
328	23	44	Thin	176	0	176
328	26	70	Thin	420	0	420
328	27	13	Thin	78	0	78
328	28	20	Thin	180	0	180
328	34	10	Thin	13	0	13
328	42	15	Clearcut	46	0	46
328	43	29	Thin	77	0	77
328	45	28	Thin	56	0	56
328	46	24	Thin	144	0	144
328	49	28	Thin	180	0	180
328	50	16	Thin	96	0	96
328	53	80	Thin	289	0	289
328	65	10	Hardwood Midstory Removal	0	0	0
328	66	35	Hardwood Midstory Removal	0	0	0
328	67	43	Thin	157	0	157
328	81	13	Thin	25	0	25
328	86	33	Thin	386	0	386
328	87	22	Thin	44	0	44
328	97	43	Thin	79	0	79
328	99	80	Thin	428	64	492
<b>Total</b>				8841	<b>738</b>	9579

## Groundcover

The groundcover is mainly composed of saw palmetto, and gallberry, in combination with fetterbush, titi, wax myrtle, blueberry, sweetbay, huckleberry, or holly. Wiregrass, runner oak, broomsedge and various other grasses and forbs can also be found in the upland areas.

Surrounding the pine flatwoods are swamps, low areas and natural drainages that contain bottomland hardwoods. Between the pine ridges and bottomlands are usually a gently sloping, wet flatwoods ecotone. These areas are characterized by a sparse overstory of pine with either thick, shrubby understory and very sparse groundcover, or a sparse understory and dense groundcover of hydrophytic herbs and shrubs.

The mostly woody understory condition of many of the stands in combination with mesic character of the analysis area make burning the area increasingly difficult. This results in heavier than desired fuel loadings that could threaten the Smith Creek community located on the western edge of the analysis area. The proposed action and alternative B are designed to reduce the woody understory and promote herbaceous groundcover that is more conducive to prescribed burning application.

## Old Growth

There is one old growth stands, as designated by the forest plan, is within the analysis area. Old-growth stands were designated within the forest according to the guidance provided in Forestry Report R8-FR 62 at the projected acreages for individual management area (described in the Forest Plan on page 2-6). Many of the designated stands do not meet the old growth

parameters in the report, but these stands were designated because these were the oldest stands and most likely to achieve the old-growth parameters first.

**Table 12. Designated Old Growth Stands within Soldier Bay Analysis Area**

Old Growth Type	Comp	Stand	Acres	Year of Origin	Forest Type	DFC MA	Treatment
Southern wet pine forest, woodland, and savanna	312	8	40	1910	21	7.1	None

### Non-Native Invasive Species

A wide variety of non-native invasive species occur on the ANF. A complete inventory of the forest has not been conducted but many species are known to occur throughout the forest, mostly concentrated along roads and disturbed areas. As a coordination measure, contracts for timber sales, road reconstruction or maintenance, and site preparation that involve equipment would contain equipment cleaning clauses to reduce the risk of spread or introduction of exotic plants.

If a population of non-native invasive species is discovered in the analysis area it could be treated under the authority established in the Environmental Assessment for Non-Native Invasive Plant Control on the Apalachicola National Forest. The decision notice for this analysis was approved on 7/15/2004.

### Alternative A - No Action

Under alternative A, slash pine plantations would continue to lose vigor, exhibit slower growth and continue through the stem exclusion stage of development. As canopy closure continues (next 5-10 years) herbaceous understory vegetation would continue to decline. In studies such as Means (1997) light was determined to be the limiting factor in the reestablishment of wiregrass in slash pine plantations. Stagnation would also continue to occur throughout slash pine plantations. Once a stand stagnates it may not be able to respond to thinning in the future. Longleaf stands would continue to be overstocked with limited radial growth. As canopy closure continues shade tolerant woody species will begin to dominant the understory and midstory. A functional longleaf/wiregrass characteristic would become non-existent and more difficult to restore. Under the No Action alternative old growth stands would continue to provide a variety of values such as biological diversity and recreation. Encroachment of undesired plant and tree species would occur in small pockets and could potentially alter the growth type of the stand.

### Cumulative Effects

Prescribed burning would continue every 3 to 4 years which would aid in limiting complete woody dominance of the understory. Prescribed burning alone would not restore herbaceous understory species due the continued overstory shading that would occur under Alternative A. The ongoing non-native invasive species treatment would only affect vegetation in roadsides around and within the analysis area. The Betsey Branch and Alligator Pond projects located to the north and south of the analysis area are not expected to cumulatively impact vegetation in the proposed treatment areas. No other past, present or future management activities were identified for analysis.

**Alternative B – Proposed Action**

Thinning would reduce the basal area of selected stands to the target amount, which in this case would be 40ft<sup>2</sup>/ac of basal area by removing selected rows or individual trees within stands. The removal of pine trees would reduce the amount of pine needle litter that falls to the forest floor. Pine straw is one of the fuel types that provide continuity across a forest stand allowing fire to spread evenly. In the Soldier Bay Analysis Area many of the plantations depend solely on pine needle cast to carry fire across the stands. The forest service expects that using herbicide and mechanical mowing in conjunction with thinning will facilitate in establishment and growth of herbaceous groundcover. Establishment of herbaceous groundcover would make burning these stands, which are naturally wetter, easier. It has been determined by our fuels specialist and a biologist that this pine straw reduction would not cause a reduction in our ability to prescribe burn these stands effectively. Harvesting operations, such as thinning pose a risk of direct mortality to sensitive plant species, but the benefit to the population as a whole would be positive. Thinning would open the overstory of these stands and reduce the competition between residual trees for sunlight, moisture, and nutrients, causing an increase in radial growth. Herbaceous vegetation would also respond to the increase of sunlight, moisture, and nutrients (Means 1997). Thinning of pines stimulates herbaceous growth and abundance in longleaf stands (Harrington and Edwards 1999). Under alternative B, fuel reduction/hardwood midstory removal treatments are proposed for the majority of stands proposed for treatment. This would be accomplished using one or a combination of the herbicides hexazinone, triclopyr, and glyphosate. The combination of three herbicides was proposed to give the Forest Service more flexibility in the choice of herbicides/herbicide combinations. Herbicide combination may vary depending on the woody response following timber removal.

Clear-cutting and chemical site prep could have a short term negative effect on existing herbaceous groundcover in the stands. Herbaceous groundcover in these stands is currently limited with future conditions projected to worsen with no action. Removing off-site or poorly growing species and replanting the sites to longleaf pine should increase the site productivity of the stands involved. Currently these stands are not growing well and have stagnated. Site preparation whether herbicide or mechanical would increase the survival of the longleaf seedlings to be planted. Site preparation is designed to kill or “knock back” woody vegetation that would compete with the longleaf seedlings for sunlight, nutrients, and water.

Herbicide use to reduce wildfire fuels and control midstory would have the same effect on pine trees and herbaceous groundcover as thinning. The reduction in competition and opening of the forest floor to more sunlight will improve and promote graminoid dispersal. Non-target species kill can occur when applying herbicides. Mitigation measures outlined in the service contract such as not applying under certain wind or moisture conditions will reduce the risk of this occurrence.

Hexazinone is a photosynthetic inhibitor in broadleaf trees. It is readily absorbed through the roots and, to a lesser degree, through foliage (liquid formulations). Foliar absorption can be greatly enhanced by the addition of a nonionic surfactant. Hexazinone translocates upward via the xylem and is generally selective, controlling most hardwoods (Tatum 2004). Loblolly pine is somewhat more susceptible than the other, generally resistant, southern yellow pines

Triclopyr is a growth regulator. It is readily absorbed by foliage with some stem uptake. It translocates up and down in plants, and accumulates in growing tissues and the root collar. Glyphosate is a non-selective herbicide, meaning an application will kill most plants. It prevents plants from producing proteins and vitamins required for growth.

Herbicide application would kill approximately 60% of the understory hardwoods. Application of herbicide in combination with mowing and prescribed fire would result in a reduction of hardwoods and an increase in the cover of wiregrass and other native groundcover (Brockway, 2000). It will also aid in the survival of pine seedlings.

Planting wiregrass and longleaf would have the short-term effect of providing fine fuels to carry fire and structure for insects and birds. The long-term effect would result in fully stocked pine stands of desirable species and herbaceous vegetation.

Timber harvesting, road reconstruction, road maintenance, and mechanical/herbicide site preparation contracts would increase the risk of introducing non-native invasive plants into the project area. Contracts contain a clause that would require that mechanical equipment be cleaned before entering the project area and when moving from one unit to another within the project area.

### **Cumulative Effects**

The Soldier Bay fuel reduction project was approved September 29, 2015 and included the mechanical fuel reduction treatment of 200 acres, the removal of timber on approximately 40 acres, and the maintenance of 5.4 miles of forest service road 314. Timber removal occurred along-side forest service road 314 and included only trees that were in the road right-of-way. The removal of these trees when considered with the proposed action is expected to further benefit groundcover by allowing sunlight to penetrate to the forest floor. Mechanical fuel treatment will have similar cumulative impacts. Future impacts from prescribed burns in and around the analysis area in conjunction with the proposed action would positively affect vegetation such as wiregrass, which historically are maintained through natural fire process (Brockway and Outcalt 2000). In addition, a general reduction in risk of attack from forest pathogens and wildfire is expected to occur as timber thinning is implemented along with the normal prescribed fire program. Impacts are generally limited to within the project area. The proposed treatment in alternatives C would help move some treatment stands toward the desired future condition as described in the Forest Plan, however this will be a gradual change over time.

Climate Change scenarios for the southeastern United States frequently include a moderate increase in average air temperature and a higher incidence and increased severity of droughts, fires, and hurricanes. These changes may have a variety of effects on ecosystems and processes, but planting longleaf pines and frequent prescribed fires should increase forest resistance to disease and catastrophic wildfire and increase resilience to extreme weather events (National Wild Turkey Federation 2009). In the context of climate change, the proposed activities will increase forest health and resilience to climate-related perturbation, whereas the no action alternative will produce forests that are less resistant and resilient to drought, disease, hurricanes, and insect damage.

**Alternative C - No Herbicide**

Effects of alternative C would be the same as alternative B, except for in stands which are to be treated for site prep and fuel reduction would be done mechanically. Relying primarily on mechanical treatments and/or prescribed fire in site prep stands would lead to aggressive re-sprouting of woody vegetation and a potential reduction in longleaf seedling survival.

Mechanical site preparation is a common method used throughout the southern United States. The effects of it have been well studied and disclosed. For example, past use of roller chopping on the Apalachicola National Forest has shown to be effective without producing unacceptable soil displacement. The potential effects of chopping on the vegetation would be crushed vegetation and the creation of 6-8 inch slits in the soil that may cut plant roots. The crushed vegetation forms a uniform continuous layer across the stand that aids prescribed burning about six weeks later. A single chop would kill only a small portion of the vegetation on these sites.

**Cumulative Effects**

Cumulative effects are similar to those found in alternative B minus the effects associated with herbicide use.

## **SOCIAL ECONOMIC ENVIRONMENT**

**Public Health and Safety**

The use of herbicide is often a concern to forest users, workers, and the general public regarding human health and safety.

**Alternative A – No Action**

No herbicide use is proposed with this alternative. There would be no potential for effects to human health from herbicide use under this alternative.

**Cumulative Effects**

The forest-wide prescribed burn program will continue to take place in the proposed project area. Short term exposure to smoke and fine particulates will occur locally in burn units. Exposure would last anywhere from a few hours to a day. If herbaceous diversity diminishes in these areas due to over-shading prescribed burning could become more difficult in some areas of the project area. The ongoing non-native invasive species treatment project would occur along roadsides near or within the analysis area. See the public health and safety coordination measures on page 18 for mitigation measures to be taken during herbicide application.

**Alternative B – Proposed Action**

This alternative proposes the use of herbicides for wildfire fuel reduction and hardwood midstory removal. Due to the short half-lives and fast biodegradability of the proposed products, there is a very low probability of prolonged exposure and risk. The herbicides considered for this project were selected largely for their low toxicity to humans and the environment. There is little risk that the public may unknowingly come into direct contact with treated vegetation as areas will be posted with signs or access otherwise prevented. With the mitigation measures described previously in this document, there is low probability of drift or off-site movement. The label directions place restrictions on wind speed at the time of spraying. Applications will be made close to the ground surface with equipment that produces large size droplets that do not carry far.

Herbicide labeling, which governs the types of uses, disposal, precautions for use, etc., is regulated by the EPA in accordance with FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act of 1947, with numerous additions). Based on tolerances, residue data, and environmental fate, label-use restrictions may be placed on an herbicide label.

Herbicides approved by the EPA would be used. All label requirements would be followed, as required by the EPA. Following the label ensures that the public will not come in contact with herbicide concentrations that may cause harmful effects.

Herbicide applications would be supervised by a Forest Service Certified Pesticide Applicator. This employee would ensure compliance with labeling instructions and safety methods to reduce the risk of accidents.

Risk to public health from herbicide applications has been addressed in a Risk Assessment as part of the VMEIS CP/P (Vol II, Appendix A) and supplemented by the analyses done by Syracuse Environmental Research Associates (SERA 2002, 2003a, 2003b, 2004, 2005, 2011). They document the probable effects on human health (and wildlife) resulting from typical and maximum applications, and accidental spills of herbicide. They analyze the potential for these herbicides to cause toxic effects, cancer, mutations, and birth defects. Based on the Risk Assessment in the VMEIS CP/P, the Regional Forester concluded in the Record of Decision (ROD) for the VMEIS CP/P (p. 12) that application of these herbicides, when applied under the guidelines described, provided greater health protection to workers, the public, and wildlife, than is required by published health and safety standards. Applied under the guidelines, these herbicides do not pose a significant risk to human health. These guidelines are found in Appendix A of the ROD for the VMEIS CP/P.

If label directions are not followed properly, these herbicides could cause eye and skin irritations to workers. The Apalachicola NF uses the lowest rate possible to meet its goals. For a typical application, the use of these chemicals poses a low risk to safety. Under the conditions of typical public exposure to Triclopyr or Hexazinone, no member of the public would be affected (VMEIS CP/P, Vol I, p. IV-14). Hexazinone and triclopyr herbicides are soluble and do not accumulate in human or animal tissue. Human and animal exposure and risk studies conducted for, or cited in, the VMEIS CP/P indicate that cumulative build up effects on human health do not occur when used at prescribed rate with appropriate application methods.

### **Cumulative Effects**

The forest-wide prescribed burn program will continue to take place in the proposed project area. In the southeastern United States, prescribed burning serves as an important source of primary air pollution (Lee and others 2005). Short term exposure to smoke and fine particulates will occur locally in burn units. Refer to the Apalachicola Prescribed Burning FY 2012-2017 Environmental Assessment for more information on coordination measures to be taken to ensure minimal human health issues. [http://www.fs.fed.us/nepa/nepa\\_project\\_exp.php?project=35380](http://www.fs.fed.us/nepa/nepa_project_exp.php?project=35380). The cumulative effect of prescribed burning and herbicide would not be significant with herbicide use occurring at least one year prior to the area being burned.

**Alternative C – No Herbicide Alternative**

No herbicide use is proposed with this alternative. There would be no potential for effects to human health from herbicide use under this alternative.

**Cumulative Effects**

The forest-wide prescribed burn program will continue to take place in the proposed project area. No other past, present or future projects were identified as adding cumulative impacts under alternative C.

**Cultural Resources****Affected Environment:**

All stands and roads in the proposal were inventoried for cultural and heritage resources in 2015. To avoid impacting potential sites, the proposed action has been developed to exclude known sites.

**Alternative A – No Action**

In this alternative, ongoing forest management activities would have no effect on cultural and heritage resources. There would be no opportunity to locate presently unknown sites within the project area.

**Cumulative Effects**

No past, present or future projects were identified as potentially impacting cultural resources.

**Alternative B – Proposed Action**

Activities involving the operation of heavy equipment, such as timber harvesting, mechanical site preparation, road maintenance, and road reconstruction have the greatest potential of all the proposed actions to damage or destroy heritage sites.

Alternative B is not likely to have an effect on cultural or heritage resources because stands to be treated have been surveyed by our forest archeologist. There is still potential to affect undiscovered sites, but this potential is low because stands that had a high probability for cultural resources were intensely surveyed. The following coordination criteria would be set in place to minimize the effect:

- *If any heritage resources were discovered during operations all ground-disturbing activity would cease. The Forest Archeologist would determine changes to be made to the project before work would resume (Forestwide Standard & Guide HE-1).*
- *Known cultural resource sites would be protected by timber sale contract and no ground-disturbing activities would occur in these areas, which may include segments of roads (Forestwide Standard & Guide HE-2).*

**Cumulative Effects**

No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect for cultural resources.

**Alternative C – No Herbicides**

Under this alternative herbicide for site preparation would be replaced by mechanical methods such as chopping or prescribed burning. As with alternative B the mechanical site prep is not likely to have an effect on cultural resources but does increase likelihood of damage if an undiscovered site is encountered. In addition the effects on cultural resources for alternative C would be the slightly less than alternative B if prescribed fire is used for site preparation.

**Cumulative Effects**

No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect for cultural resources.

**Economics****Alternative A – No Action**

The “No Action” alternative would not bring in any revenue to the United States Treasury, but it would also not cost any more than current management activities. Alternative A would not contribute to the economy of Wakulla or surrounding counties in the form of revenues and the cost of the normal prescribed burning and road maintenance would cause this alternative to have a negative net value.

**Cumulative Effects**

No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect for cultural resources.

**Alternative B – Proposed Action**

This alternative would remove approximately 9,579 CCF of pine products through timber harvest. Studies on private property values near public lands indicate that management activities can have a positive effect on property values with distance to public lands and management strategies serving as the key drivers (Kim and Johnson 2002). Clearcuts near private property can have negative impacts on property values. Three of the four clearcuts proposed in the Soldier Bay Analysis Area are not directly adjacent to private property and are not expected to impact property values in the nearby Smith Creek Community. Compartment 312 stand 18 is proposed for clearcut and is directly adjacent to private property, however the private property is also wooded and not expected to drop significantly in value due to the proposed action.

The following table shows the financial analysis of the alternatives. The actual revenue generated by a timber sale would be computed using final cruise data, bid prices, and costs current at the time of the sale. The cost analysis indicates a sale net worth of this alternative would be slightly positive.

**Cumulative Effects**

No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative economic effects.

**Alternative C – No Herbicide**

Effects of alternative C would be the less expensive than Alternative B because there are no

herbicides proposed for the stands to be clearcut, which would be included in the sale economics as required reforestation. This would result in a positive net gain for the sale. All other impacts are similar to those in alternative B.

**Cumulative Effects**

No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative economic impacts.

**Table 13. Financial Analysis**

Base Year 2016  
 Inflation Rate 0.019

				Alternative A		Alternative B		Alternative C	
<b>Revenues:</b>			Year	Units	Inflated	Units	Inflated	Units	Inflated
Product	Units	Value/Unit	Planned	Planned	Benefits	Planned	Benefits	Planned	Benefits
Sawtimber	CCF	\$78.26	2017	0	0	738	58,853	738	58,853
Pulpwood	CCF	\$40.50	2017	0	0	8,841	364,864	8,841	364,864
Total				0	0	9,579	423,717	9,579	423,717

				Alternative A		Alternative B		Alternative C	
<b>Costs:</b>			Year	Units	Inflated	Units	Inflated	Units	Inflated
Action	Units	Cost/Unit	Planned	Planned	Costs	Planned	Costs	Planned	Costs
Sale Preparation	CCF	\$2.00	2016	0	0	9,575	19,150	9,575	19,150
Site Preparation - Herbicide	Acre	\$276.53	2017	0	0	151	42,549	0	0
Site Prep Mechanical	Acre	\$191.82	2017	0	0	151	29,515	151	29,515
Chemical Release	Acre	\$276.53	2019	0	0	151	44,182	0	0
Mechanical Release	Acre	\$191.82	2019	0	0	0	0	151	30,647
Plant Longleaf	Acre	\$492.78	2018	0	0	151	77,264	151	77,264
1st Year Survival Check (NS)	Acre	\$74.43	2018	0	0	151	11,670	151	11,670
3rd Year Survival Check (NS)	Acre	\$74.43	2020	0	0	151	12,118	151	12,118
Road Reconstruction	Miles	\$11,793.62	2017	0	0	5	63,153	5	63,153
Road Maintenance	Miles	\$12,743.75	2017	0	0	12	155,831	12	155,831
Temporary Roads	Miles	\$11,616.13	2017	0	0	3.3	38,943	3.3	38,943
<b>Sale Summary:</b>			Total		0		494,375		438,291

Action	Units	Calculation	Alternative A		Alternative B		Alternative C	
Benefits	Dollars	Total Revenues less Roads		0		321,621		321,621
Roads and Trails	Dollars	10% Roads and Trails		0		32,162		32,162
NFF- Return to Counties	Dollars	17% Revenues		0		54,676		54,676
Action Costs	Dollars	Total Costs		0		212,660		156,577
Sale Net Worth	Dollars			0		22,123		78,206

<b>Non Sale Related Items:</b>									
Fuel Reduction (Chemical)	Acre	\$276.07	2017	0		1,434	403,406	0	0
Fuel Reduction (Mechanical)	Acre	\$43.06	2017	0		1,434	62,921	1,434	62,921
Plant Native Grass Plugs	Acre	\$1,010.00	2018	0		91	95,436	91	95,436
				Non-Sale Related Costs		0	2,132,055		1,659,031
(NS) Non-stocked				Grand Total Cost of Alternative		0	2,626,430		2,097,322

## Infrastructure

### Affected Environment

The Transportation Plan for the Soldier Bay Analysis Area includes roads in compartments 312, 326, and 328. There are approximately 30 miles of system and non-system roads in these compartments. The roads are maintained at several different maintenance levels described in the table below. The main travel arteries are graded forest roads. Most of the maintenance level 1 and 2 roads that provide back-country access to the public are of a native surface material and require high clearance vehicles. These “woods roads” are only maintained if a problem such as erosion occurs.

**Table 14. Miles of Roads by Operation Maintenance Level**

Description	Road Maintenance Level	Miles	Used During Sale
High Degree of User Comfort	5	7.85	7.85
Suitable for Passenger Cars	3	6.65	6.65
High Clearance Vehicles	2	16.3	13.5
Basic Custodial Care (Closed)	1	0	0
Non-system – Administrative Use Only	NA	0	0
Total	NA	30.8	28

In 2007 District Ranger Marcus Beard issued a Decision Notice and FONSI on Motorized Route Designation for roads and trails on the Apalachicola National Forest. This decision changed the basic way we managed the road system on the forest. It no longer allowed cross-county travel and required users to stay on numbered roads. It reduced the number of roads open to the public on the Apalachicola Ranger District by 968 miles and 249 miles on the Wakulla Ranger District thus reducing the road density accordingly.

All roads within the analysis area were analyzed to determine if current maintenance levels were appropriate. Non-system roads were assessed in order to decide if decommissioning and/or decommissioning would benefit habitat and management needs. Upon analysis it was determined that current road density and use were appropriate for the area and thus not included in the proposed action.

### Alternative A – No Action

There would be no change to the current transportation system described in Table 12 and shown in the preceding map on Page 24.

**Cumulative Effects**

No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect for cultural resources.

**Alternative B – Proposed Action**

The proposed action would also include road reconstruction of approximately 16 miles and maintenance of 6.65 miles.

Timber harvesting would cause a temporary increase in traffic as a result of hauling timber products. The proposed roadwork would provide better access for public and/or administrative use, while protecting the environment. Temporary log landings would be placed in stands that are to be thinned.

**Cumulative Effects**

The Route Designation process completed in 2007 eliminated OHV use in the area. The Forest will complete a Forest-wide analysis of the transportation system in FY14 as described in 36 CFR§ 212.5. Any changes to the transportation system would be addressed in a separate site-specific analysis.

The upcoming Soldier Bay fuel reduction project will positively affect the transportation system within the analysis area before the implementation of the proposed action takes place. The fuel reduction project will focus on the maintenance of FSR 314 which includes removing trees from the existing right of way and installing culverts. Both of which will provide enhanced user comfort for visitors to the area.

**Alternative C – No Herbicide**

Effects from Alternative C on the transportation system would be the same as Alternative B.

**Cumulative Effects**

Cumulative effects would be the same as under Alternative B.

**Table 15. Road Maintenance, Construction and Reconstruction Cost Summary.**

Road Number	Compartment	Stand	Reconstruction (Miles)	Maintenance (Miles)	Temporary (Miles)	Cost
FH-13	312, 326	312- 1, 18, 27; 326 -1, 7, 19		2.23	0.19	\$28,111
314	326, 328	326-1, 2, 16, 17, 19, 28; 328-19, 26, 28, 34, 46, 50, 87, 88, 99, 302			0.22	\$2,556
300-U	326	7, 8, 23	0.015		0.20	\$2,497
300-W	312	11, 18	0.47		0.21	\$11,448
314-F	326	12, 14, 15, 28	0.83			\$9,641
314-G	326	18	1.52		0.36	\$21,838
314-H	312	5, 6	0.19			\$2,207
355	312	6, 7, 9, 10, 15		1.79	0.46	\$26,136
355-A	312	9, 22	0.51			\$5,924
375	312, 328	312-23, 328- 4, 66, 67			0.27	\$3,136
388	328	15, 23, 27, 67		2.26	0.65	\$33,802
388-A	328	9, 49, 50	0.70		0.08	\$9,060
388-C	328	9, 23, 27	0.73		0.49	\$14,172
388-D	328	73, 77	0.29			\$3,369
391	328	1, 6, 12		1.9		\$22,070
393	328	34, 49, 50, 53		1.84		\$21,373
329	328	14, 86, 97		2.44	0.16	\$28,343
<b>Total</b>			5.225	12.46	3.29	\$245,683.00

## Visual Quality

The visual quality objective of the analysis area is classified as Partial Retention. These designations are based in part on distances from points of interest, such as developed recreation areas, heavily traveled recreation roads, or wilderness areas. All of the Soldier Bay Sale area falls into the Partial Retention classification. In this designation, all deviations caused by human alterations and management activities remain subordinate (from an aerial perspective) (USDA 1999a: 3-155).

**Table 16. Visual Quality Assessment**

Visual Quality Objective	Acres in Analysis Area	Percent Of Analysis Area
Retention	0	0%
Partial Retention	6584	100%
Modification	0	0%

Maximum Modification	0	0%
Total	6584	100%

### Alternative A – No Action

In the short-term, the primary visual impact is from the current prescribed fire program which would leave large areas of blackened vegetation. Much of the blackened ground vegetation regrows within the first month following fire. Blackened tree boles and woody shrubs killed by fire would remain for up to a year or more. Repeated burning would promote an open understory dominated by herbaceous ground cover in a more open park like condition which would improve visual quality.

### Cumulative Effects

The forest-wide prescribed burn program would continue to occur and cumulatively affect the visual quality in both the short and long term. Short term impacts include temporary loss of vegetation on the forest floor and charred and burned vegetation. Long term affects are generally positive and include an increase in herbaceous groundcover and a relatively open understory and midstory. Non-native invasive species treatment would affect the appearance of small patches along the roadside throughout the analysis area.

### Alternative B – Proposed Action

The treatment clearcut and associated site preparation would have the largest impact on the visual quality of the area. Once timber removal operations begin the decline in visual quality will become immediately evident. Many other stems or brush species in these stands would be jagged, splintered, or crushed by the mechanical equipment which will leave the area with an uneven quality. This effect is expected to last two or three years or until the tree seedlings begin to fill out the area.

Other short-term effects to visual quality would include residual slash from thinning, skid trails and log landings. These conditions would likely remain evident on the ground for up to 2- years, but would gradually become less evident on the ground. The long-term effect would be a more open forest with herbaceous ground cover which would improve the visual quality by meeting the areas desired conditions. Under this Alternative, Forest-wide standard *VG-15 would apply to several stands along Forest Highway 13 and State Highway 375. VG-15 would require slash, tops, and logging debris be piled no more than 2 feet high within 100 feet of these roads.*

The visual effects of mechanical or herbicide site preparation, fuel reduction, and hardwood midstory removal will be limited to the immediate area of the stand itself. Some of the treatment areas are right along forest roads and will be visible to people passing by.

### Cumulative Effects

Prescribed burning in conjunction with alternative B would result in charred and burned downed debris associated with harvesting operations. These impacts would be short term as logging debris would become consumed with each additional burn. Long term cumulative effects would be beneficial as the project area will begin to resemble historic open park-like forests of northwest Florida.

**Alternative C – No Herbicide**

The effects from alternative C would be the same as alternative B except the browning of vegetation from the use of herbicides would not occur. In clearcut areas that would receive mechanical site preparation the more jagged appearance created by logging equipment would appear more uniform in appearance due to further breaking and spreading of debris.

**Cumulative Effects**

Cumulative effects would be similar to those in Alternative B.

**Recreation****Affected Environment:**

The recreation opportunities that are available to the public in this analysis area include, but are not limited to, camping, hunting, picnicking, and wildlife viewing. Of these recreation uses, hunting is the most common activity in this area. This spectrum is a USDA Forest Service management approach for recognizing possible combinations of recreation activities, settings and probable experience opportunities.

**Alternative A – No Action**

Without reforestation, the area would lose composition and character, and would decline into a thick brushy understory. Hunting, wildlife viewing, and pleasure driving experiences would decline as the stands become dense with vegetation.

**Cumulative Effects**

No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect for cultural resources.

**Alternative B – Proposed Action**

The proposed action includes the partial reconstruction of the FNST to allow for the construction of three parallel parking spaces on FSR 314. In addition the trail goes through seven proposed treatment stands. These actions will result in a short (5-7 months) decrease in user traffic on the trail. This alternative would create short term impacts on hunting due the loss of vegetation and cover following thinning operations. These losses will be short lived and in the long term result in an increase in forage diversity for game species such as white-tailed deer (Masters and others 1996) Stands within compartments 312, 326, and 328 have clear-cut activities. These stands will receive groundcover restoration treatments, such as herbicide and mechanical chopping, which would create short terms impacts on hunting from the loss of aesthetic quality, wildlife browsing and cover, and brooding habitat. In the long term the conversion of groundcover to a more herbaceous component will encourage browsing for game species and attract bird species for wildlife viewing. Once longleaf pine saplings are planted and established the general appearance of the forest will improve.

**Cumulative Effects**

The forest-wide prescribed burn program will, in conjunction with Alternative B, positively impact recreation in the long term (>1 year) in the project area. Prescribed burning in thinned pine stands will promote herbaceous establishment and growth indicative of historic longleaf

wire ecosystems. These systems are diverse in game species and nesting birds species valued by hunters and bird watchers. In the short term logging debris and prescribed burning would reduce aesthetic quality and wildlife viewing opportunities.

### **Alternative C – No Herbicides**

Under this alternative, the effects would be the same as Alternative B except some of the short-term effects from the use of herbicides would not be evident and the long term openness of the forest may not be visualized.

### **Cumulative Effects**

No effects from past, present and future activities were identified that would combine with the effects of the proposed action and result in a measurable cumulative effect.

## **Environmental Justice and Civil Rights Impact Analysis**

None of the actions proposed by any of the alternatives should have a negative effect on the Civil Rights of the citizens of Liberty County or the surrounding area. No minorities would be discriminated against because of the proposed actions in these alternatives. No groups of people would be disproportionately affected as a consequence of the proposed action. All labor contracts generated from the proposed action would have clauses, which prohibit discrimination for any reason. There are no foreseeable changes in the management of the forest or surrounding private lands that would adversely affect the Civil Rights of people in the future. There would be no significant effects on public health and safety. These activities are commonplace forestry activities, which have been utilized many times in the past.

## CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

### Interdisciplinary Team Members

Sonja Durrwachter, Timber Manager  
John Dunlap, Wildlife Biologist  
Brenton Holt, Wildlife Biologist  
Branden Tolver, IDT Leader  
Gary Hegg, Silviculturist  
Andrea Repp, Archeologist  
Todd Waller, Engineer  
Frank Fulford, Sale Administrator  
Marcus Beard, District Ranger

### ***FEDERAL, STATE, OR LOCAL AGENCIES, FEDERAL TRIBES and Individual Consulted:***

USDI Fish and Wildlife Service  
Florida State Historic Preservation Officer  
Northwest Florida Water Management District  
Brittany Phillips, Wildlife Biologist, Apalachicola National Forest  
Matthew Trager, Forest Planner, National Forests in Florida

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## Comments

Commenter	Issue	FS Response
Dick Artley-received 11/17/14	You propose to apply herbicides containing glyphosate. This chemical is a carcinogen.	The use of glyphosate is discussed on pages 18-74 of the EA. Herbicide application will be done in accordance with the pesticide label and Forest Service policy.
Fran James (On behalf of the Friends of the Apalachicola National Forest)-received 11/25/14	Comp 326-7. This 91-year-old longleaf stand is open and the ground cover is in good shape, so there is no need for intermediate thinning or herbicides, at least east of the trail that runs through the stand. Thinning is likely to cause greater growth of shrubs—a trend that the FS should try to avoid. We prefer discouragement of the shrubs with burning.	Compartment 326-7 does have open areas east of the Forest Service Road 300-U. However west of the road and the southern portion of the stand exhibits higher stocking levels. See figure 4. In addition the purpose of this project is to reduce fuels in order to further protect the adjacent Smith Creek Community. Stand 7 borders private property.
	Comp 328-86. This shrubby wet flatwoods behind the borrow pit has high shrubs and the dense trees definitely need thinning. It should be thinned and burned in winter, then herbicided if necessary. Here is a case where we agree that herbiciding may be necessary.	Compartment 328-86 is proposed for thinning and herbicide application. It is also scheduled for dormant season burning.
	Comp 312-1. This slash pine stand is thick with shrubby plants (e.g., palmetto, gallberry, and <i>Baccharis</i> ) and the shrubs need to be reduced in stature. It does need intermediate thinning but the shrubs could best be controlled with frequent burning. We don't see the need for application of hexazinone. The ground cover contains a diverse herbaceous component with Florida	Proposed herbicide use for the analysis area will be reevaluated on a stand by stand after logging operations are complete. If stand conditions are not conducive to herbicide application the Forest

	<p>dropseed (<i>Sporobolus floridana</i>), a TES species.</p>	<p>Service would not treat the stand. Herbicide application is proposed to give the Forest Service a full range of management options post logging operations.</p>
	<p>Comp 326-1. The planted slash pine seems stunted but the ground cover appears to be in good shape. It will be important to maintain a pine overstory to provide needle cast for future burning. If it is clearcut, it won't burn. Natural gaps are forming that could be used for planting longleaf. There is no need to clearcut it. You could take out two rows and leave two rows, then plant longleaf. Florida dropseed is here too.</p>	<p>The proposed action prescribes native groundcover restoration. This would include planting or seeding the area with wiregrass to facilitate burning.</p>
	<p>Comp 312-18. This stand has been proposed to be split into two treatments: (a) underplant with longleaf and (b) clearcut and apply Triclopyr and Glyphosate. We assume that the reason for taking this approach is to make a side-by-side comparison of two restoration options. We appreciate and applaud this objective. Having more sites in which both treatments were applied would have strengthened the comparison, but we don't see any other possibilities in Soldier Bay. We are worried about whether the FS will be able to burn frequently enough to make the desired comparison. If you do it, it will be important to have clear objectives and to collect pre- and post-treatment data. Establish criteria for making the comparison: cost, growth of longleaf, composition of the ground cover.</p>	<p>The split treatment in 312-18 is proposed due to the groundcover conditions of the eastern and western halves of the stand. Underplanting was proposed in the eastern half due to the higher quality of the herbaceous groundcover and the lower overstory density. The western half is more woody and thus proposed for clearcut. Compartment 312 has been burned three times within the past 10 years. See table 5. The Forest Service expects that burning on a 2-3 year rotation will aid in moving the stand to the desired condition outlined on page 9 of the EA.</p>
	<p>If one objective is ecological restoration, we</p>	<p>The herbicides will be</p>

	<p>are not satisfied that these herbicides are appropriate. Triclopyr controls broadleaved weeds and is commonly used for brush control, but this is not just unwanted brush. It is a complex forest that is being restored. Glyphosate (the active ingredient in Roundup), for example, is usually mixed with a detergent which is known to harm amphibians. It kills weeds and grasses, but it is the grasses that you are trying to encourage. What dosages do you use? Hexazinone is broad spectrum.</p>	<p>used in accordance with the label and Forest Service Policy. Private property and aquatic areas will be avoided during proposed treatment. Please see the coordination measures on pages 18-20 of the EA.</p>
	<p>Why not just increase the burn frequency? Are there any before-and-after data, so we can find out more about just what these herbicides are doing to the ground cover besides just reducing the shrubs?</p>	<p>The analysis area has been burned on a 3 year rotation over the past 10+ years. The inherent wetness and woody composition of the area makes increasing the burn regime difficult. The proposed would reduce the woody fuel load and also promote herbaceous groundcover establishment and growth needed for prescribed burning.</p>
	<p>Second, some of these stands need thinning badly, but others slated for thinning could just be burned. In general, we don't think that clearcutting is justified unless the overstory trees are dead. Admittedly, with our proposed alternative for longleaf restoration (burning, thinning and underplanting with longleaf), the longleaf grow more slowly, but the herbaceous component of the ground cover can be protected from mechanical and chemical disturbance.</p>	<p>Thank you for your opinion about clearcutting. We have considered under planting in this proposal where conditions are more likely to succeed. In general the under planting examples that have been tried on the Forest are not considered successful because the majority of the seedlings planted have not gone into the bolt phase yet.</p>
	<p>Third, if fuels will be reduced in a 200 ft</p>	<p>Forest Service Road</p>

	<p>corridor, why is the widening of FR 314 needed?</p>	<p>314 has been removed from the proposed action for this project. It was also added as a cumulative action.</p>
<p>Todd Engstrom (on behalf of the Friends of the Apalachicola National Forest)</p>	<p>We do not see that the heterogeneity of the stands in this category has been taken into the EA. Also 1434 acres will be treated using herbicide and/or mechanical equipment to promote herbaceous groundcover and reduce heavy fuels. Our concern is that burning is taking a back seat here when it should be in the front seat. Thinning will open the canopy for more understory growth, which will be shrubby without burning, even with the herbicides. We understand that the FS wants to reduce the fuel load in this zone near Smith Creek, but we think more of the budget for Soldier Bay should be spent on burning and less on herbicides. An effective strategy to minimize the fuel load in this area would be to maintain a shorter fire interval than has been the case in the past. The perennial grasses require frequent burning. Cutting to 40 square feet per acre should not be used as a blanket prescription for improving Red-cockaded Woodpecker habitat.</p>	<p>Pages 3-8 of the EA address the current condition of the analysis area. The Apalachicola National Forest has and will continue to emphasize the importance of prescribed fire across the landscape. It is primary management tool used on the forest. Page 34 of the EA outlines the prescribed burning history of the analysis area. Proposed herbicide use for the analysis area will be reevaluated on a stand by stand after logging operations are complete. If stand conditions are not conducive to herbicide application the Forest Service would not treat the stand. Herbicide application is proposed to give the Forest Service a full range of management options post logging operations.</p>
	<p>Convert 151 acres of stagnant offsite slash pine plantations to longleaf pine. Convert 92 acres with clearcuts. Underplant 59 acres with longleaf. Again, we do not see that the EA has responded to our recommendations that (1) the comparison in Stand 312.18 will be followed carefully with pre- and post-treatment data or (2) that underplanting</p>	<p>Any tree planting done on the forest is followed up with a first and third year survival examination. We disagree that underplanting is a viable alternative to</p>

	<p>longleaf seedlings is a viable alternative to clearcutting slash pine and that it has numerous ecological advantages.</p>	<p>clearcutting slash pine. We consider underplanting an experimental treatment which has yet to prove where, when, and under what stand conditions a good chance for survival and growth of the longleaf seedlings could be achieved. The split treatment in 312-18 is proposed due to the groundcover conditions of the eastern and western halves of the stand. Underplanting was proposed in the eastern half due to the higher quality of the herbaceous groundcover, lower density overstory, and maximum allowable clearcut size limitations.</p>
	<p>We are also concerned about the broad use of 40 to 50 sq ft/acre basal area as a target for optimal RCW habitat in recent projects. This criterion in the RCW Recovery Plan was not intended to be used as a target for good quality foraging habitat (pers. comm. W. McDearman).</p>	<p>The primary purpose of this proposal is to the reduce fuel loading near and around the Smith Creek Community. Thinning to 40 square feet/acre basal area is proposed primarily to meet this purpose. Please refer to the Biological Assessment for information on the proposed thinning's impact on RCW habitat.</p>
	<p>And finally, the estimates of basal area in some Forest Service projects are not consistent with the estimates used as a basis</p>	<p>The wedge-prism is the method the Forest Service uses to</p>

	<p>for the 2003 RCW recovery plan. We would like to make some direct comparisons between estimates made with the prism method used in FS stand cruises and the 0.1-acre circle method used in research that provided the basis for the recovery plan.</p>	<p>determine basal area. Both methods are should yield approximate results but will be different because individual plot locations and the natural variation in trees size and density across the stand.</p>
<p>R.L. Caleen Jr. – received 12/20/15</p>	<p>I am a long-time resident of Tallahassee concerned with the pollutant impacts of prescribed burning, including substantial emissions of greenhouse gases. I have been disappointed with the lack of any real consideration of such impacts and ways to reduce them.</p> <p>In my review of the Soldier Bay Analysis EA, I have so far seen no mention of planned prescribed burning in the designated tracts. Could you please indicate if the Forest Service plans to conduct any prescribed burning in implementing its Soldier Bay Plan? If so, please point out where I can review that part of the EA that addresses the impact of the release of such pollutants into our ambient air, including the aggravation of respiratory diseases inflicting many residents of Tallahassee and increases of greenhouse gas emissions.</p>	<p>The proposed project area is included in the forest-wide prescribed burning regime. It was analyzed and approved as part of our forest-wide prescribed burning environmental analysis (signed November 2011). Page 34 of the Soldier Bay environmental assessment outlines the 10 year burn history of the three compartments included in the proposal. Two of the three compartments have been burned three times within the last 10 years.</p> <p>Pages 33-35 discuss the environmental effects of the proposed action on the air quality within the general vicinity of the project area. For a more detailed discussion on air quality effects from prescribed burning please review the forest-wide prescribed burning environmental analysis at</p>

		<a href="http://goo.gl/C7GL4d">http://goo.gl/C7GL4d</a> .
<p>W.V. McConnell</p>	<p>The EA proposes a number of unusual management actions that require considerably more detailed explanation and discussion than has been provided. These include:</p> <p>"Thinning" down to 40 sq.ft. basal area (is this a regeneration cut?), excessive use of herbicides, operability, (many of the units have cut volumes far below the minimum needed to sustain an operable cut). failure to state regeneration objectives, underplanting longleaf (what is the research supporting this action), planting longleaf on inappropriate soils, how does the F.S. plan to handle this treatment (collaborative, stewardship? - will have an impact on returns to the counties).</p> <p>Without more information on these issues, intelligent comment is not possible. I request that the closure date for comments be extended and that the district host a "show me" trip for concerned parties where district personnel can lead an on-the-ground discussion of the issues. I suggest that sample marking on selected areas in question be available for inspection so that the interested public can see exactly what is being proposed.</p>	<p>The primary purpose and need for this project is fuel reduction. Many of the considerations for normal timber sales are not being considered, this project was proposed with fuel reduction in mind. Reducing the overstory density and the midstory shrubs and brush will lower the flame length and fuel loading in these stands.</p> <p>As mentioned above, We consider underplanting an experimental treatment which has yet to prove where, when, and under what stand conditions a good chance for survival and growth of the longleaf seedlings could be achieved. The split treatment in 312-18 is proposed due to the groundcover conditions of the eastern and western halves of the stand. Underplanting was proposed in the eastern half due to the higher quality of the herbaceous groundcover and lower density overstory.</p>