**Forage Analysis for Compartment 57 Timber Sale Project**

*Purpose:* The purpose of this analysis is to ensure this project is in compliance with the RCW Recovery Plan (USDI 2003) and *the Plan and Amendment #7* (USDA 1996 and 2006), which requires that areas with high site productivity provide each group of red-cockaded woodpeckers 120 acres of good quality foraging habitat within ½ mile of an active cluster. Because of timber harvest activities occurring within ½ mile of an active cluster, this analysis is intended to assess potential changes in foraging habitat. The analysis was conducted for only cluster 67-61, because it is the only cluster within ½ mile of the project area.

*Method:* This forage analysis considers multiple stand data, along with fire history. The MATRIX analysis was not used because it requires data that is not collected with the Forest Service stand exams (i.e. hardwood midstory, hardwood canopy and ground cover). However, the variables used for this analysis are similar to those used in the MATRIX. The variables include: forest types, pine basal area ($ft^2$/ac), hardwood basal area ($ft^2$/ac), stand age, number of burns, years since last burn, and season of burn. The basal area of hardwood 6 to 11.9 inch dbh replaced hardwood midstory, the number of burns since 2000 replaced percent ground cover, and basal area of hardwood ≥12 inch dbh replaced percent canopy hardwoods. Each variable was scored according habitat quality and higher scores correspond to better foraging habitat. Below is a breakdown of the scoring. Stands dominated by hardwood or less than 30 years old were classified "Poor" by default.

**Table 1. U.S. Forest Service stand CISC data scored for RCW foraging habitat.**

| | SCORE | | | | | |
|---|---|---|---|---|---|---|
| ***Stand characteristics*** | **3** | **2** | **1** | **0** | **Rank [c]** | **Weight** |
| Forest Types [1] | Pine | Pine-Hrdwd | | Hrdwd [a] | 9 | 0.02 |
| BA Pine (≥11") [2a, 2d] | ≥40 | 20 to 39 | '10 to 19 | <10 | 1 | 0.20 |
| BA Pine (5-10.9") [2c] | <10 | 11 to 22 | 23 to 29 | ≥30 | 6 | 0.09 |
| BA Hardwood (≥12") (% canopy hrdwd.) [2g] | <10 | 10 to 22 | 23 to 29 | >30 | 5 | 0.11 |
| BA Hardwood (6-11.9") (hrdwd. midstory) [2f] | 0 to 1 | 1 to 10 | 10 to 30 | >30 | 3 | 0.16 |
| Age (years) [2a] | ≥60 | 30 to 59 | | <30 [b] | 2 | 0.18 |
| # of RxBurns since 2000 (% veg. groundcover) [2e] | ≥ 4 | 2 to 3 | 1 | 0 | 4 | 0.13 |
| Last RxBurn (yrs since) [2e] | <4 | 4-6 | ≥7 | NoBurn | 7 | 0.07 |
| Season RxBurn [2e] | GS | NGS | | NoBurn | 8 | 0.04 |

a. any stand dominated by hardwood is consider poor.

b. any stand less than 30 years old is considered poor.

c. rankings are the same as the rankings used for the MATRIX, which are based on expert rankings.

Note: Stand characteristics' superscripts "1" through "2e" refer to the criteria from 8I Part A, pgs. 188-189 of the recovery plan (2003).

Weighted scores for each stand are added to get a final stand score between 0 and 3. "Good" quality foraging habitat must have a perfect score of 3. "Fair" habitat is between 1 and 2.99 and "Poor" is anything less than 1. To get the foraging acres, overlapping foraging areas are divided by the number of groups sharing foraging areas (See Figure 1 map showing overlapping foraging areas).

*Results:* There are approximately 200 acres of good foraging habitat within a ½ mile of cluster 67-61 (Table 2, Figure 1) and there would be no change in good foraging habitat due to this project. A large block of good foraging habitat is in compartment 67, which is directly adjacent to cluster 67-61. Compartment 57 has only fair habitat due to the lack of fire and hardwoods. Stand 57-7 would change from fair to poor habitat, because it would be converted to '0 to 10 age class'.

**Table 2. Forage analysis results for cluster 67-61.**

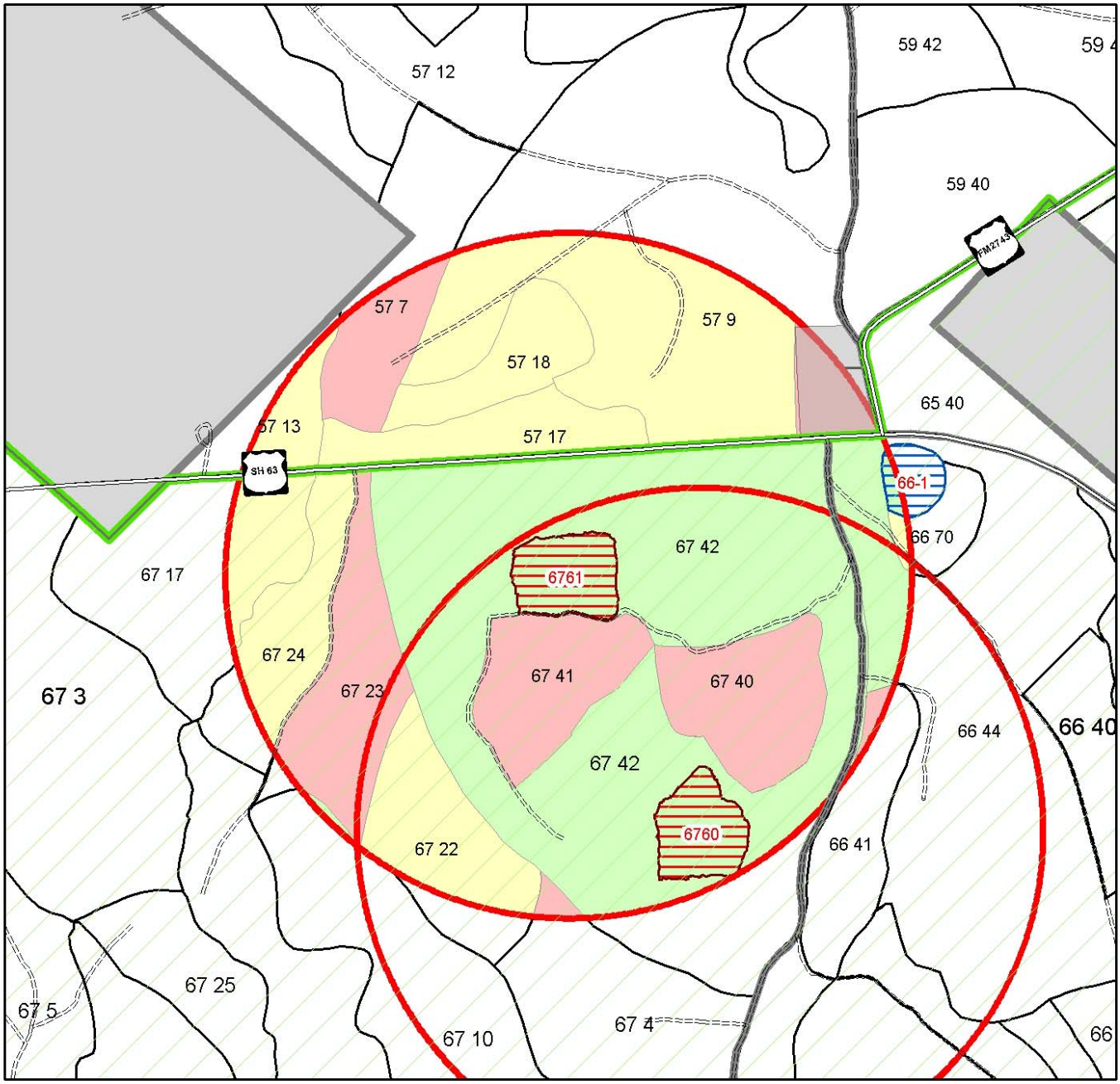
| Condition | Pre-Treatment (acres) | Post-Treatment (acres) | Change (acres) |
|---|---|---|---|
| **Fair** | 188 | 172 | -16 |
| **Good** | 136 | 136 | 0.0 |
| **Poor** | 57 | 73 | 16 |
| **Total*** | 381 | 381 | 0.0 |

* Total foraging habitat is less than 502 acres, which the total area inside the 1/2 mile radius, because of overlapping foraging areas from other active clusters. The overlapping acres are divided by the number of clusters sharing foraging areas (See Figure 1 map showing overlapping foraging areas).

*Discussion:* Compartment 57 has not had a prescribed fire treatment since 2003, which has allowed increased hardwood midstory and some overstory; thus, this area provides only fair foraging habitat. The loss of 16 acres of fair foraging habitat in stand 57-7 would have very little effect on the red-cockaded woodpecker available foraging. Stand 57-13 is proposed for pine thinning, but this would not improve foraging habitat because of the abundance of hardwood midstory and overstory. The good foraging habitat in compartment 67 would remain unchanged. Compartment 67 provides over 120 acres of good quality foraging habitat, even after dividing in half the overlapping foraging acres from the group using cluster 67-60. Compartment 57 is across state highway 63, which further separates this group from the project area. Compartment 57 is also in MA1, which has not been actively managed for RCW. Thus, no additional effects on RCW populations as a result of this project are expected.

The sale administrator and timber contractors will be instructed to look for potential RCW activity in the project area. If RCW are found in the project area, timber operations will cease, and U.S. Fish and Wildlife Service will be contacted.

**Figure 1. Cluster 67-61 post-treatment foraging habitat in compartments 67 and 57 on the Angelina National Forest. The analysis shows no change in available good foraging habitat as a result of the project.**




Disclaimer:
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0 0.25 0.5 Miles

N W E S

**Legend** JAE 10/2007

- Compart boundary
- Private lands
- HMA (MA6) boundary
- 1/2-mile buffer of active clusters

**RCW Clusters**
- Active
- Inactive
- Recruitement

**Forage Analysis**
- Poor Habitat (73 ac.)
- Fair Habitat (115 ac.)
- Good Habitat (193 ac.)

**The variables used for this analysis include: forest types, pine basal area (ft2/ac), hardwood basal area, stand age, number of burns since 2000, and most recent fire. The foraging areas acres are divided by the number of groups sharing foraging areas.**

| Federally Listed Threatened or Endangered | Scientific Name | Status | OAR Code | Habitat Requirements For High Potential Habitat | Forest-wide Distribution | Determination of Effect |
|---|---|---|---|---|---|---|
| **Birds** | | | | | | |
| Piping plover * | *Charadrius melodus* | T | 1 | | No Habitat, No Occurrences | No Effect |
| Whooping crane * | *Grus americana* | E | 1 | | No Habitat, No Occurrences | No Effect |
| Red-cockaded woodpecker | *Picoides borealis* | E | 3 | Open, fire-maintained, mature pine stands with forb and/or grass dominated ground cover and a midstory relatively devoid of hardwoods (Jackson 1994; Conner et al. 2001; USFWS 2003). | All National Forest | Not likely to adversely affect |
| Least tern * | *Sterna antillarum* | E | 1 | | No Habitat, No Occurrences | No Effect |
| Blacked-capped vireo | *Vireo atricapilla* | E | 1 | | LBJ | No Effect |
| **Mammals** | | | | | | |
| Louisiana black bear | *Ursus americanus luteolus* | T | 3 | Extensive forests (at least 2500 ac.) dominated by mature hardwoods; river basin bottomland hardwood forests. Needs areas with minimal human disturbance and low open road density (TPWD 2005) | Sabine & Angelina - | Not likely to adversely affect |
| **Amphibians** | | | | | | |
| Houston toad | *Bufo houstonensis* | E | 1 | | No Habitat, No Occurrences | No Effect |
| **Insects** | | | | | | |
| American burying beetle | *Nicrophorus americanus* | E | 1 | The American burying beetle occurs in a variety of habitats, including sandy grassland and oak-pine woodlands. | Caddo - | No Effect |
| **Mollusks** | | | | | | |
| Ouachita rock pocketbook | *Arkensia wheeleri* | E | 1 | | Caddo - Bois D' Ark Creek Watershed | No Effect |
| **Plants** | | | | | | |

| Federally Listed Threatened or Endangered | Scientific Name | Status | OAR Code | Habitat Requirements For High Potential Habitat | Forest-wide Distribution | Determination of Effect |
|---|---|---|---|---|---|---|
| Texas prairie dawn * | *Hymenoxys texana* | E | 1 | It is most often found in poorly drained depressions or at the base of mima mounds (small (usually 10-50 ft. in diameter) low (usually less than 12 inches high) mounds of sandier soil than the surrounding flat area) in open grassland in almost barren areas with Limnosciadium pumilum, peppergrass, little barley, and nostoc. | Adjacent to the Davy Crockett - Comp 116, 118, 120, and 121 (Habitat ONLY, No Occurrences) | No Effect |
| White bladderpod | *Lesqurella pallida* | E | 1 | Open areas associated with exposed calcareous Weches Formation outcrops that are seepy and wet most of the year. Soils are thin, poorly drained, and alkaline. In contrast, most of the surrounding soils are acidic and sandy. The surrounding vegetation type is pine-oak-hickory woodland. Associated species include the rare Texas golden glade cress (Leavenworthia texana), as well as Drummond's onion (Allium drummondii), and little bluestem (Schizachyrium scoparium) (NatureServe 2007). | Sabine - | No Effect |
| Texas trailing phlox * | *Phlox nivalis ssp. Texensis* | E | 1 | | No Habitat, No Occurrences | No Effect |
| American chaffseed * | *Schwalbea americana* | E | 1 | | No Habitat, No Occurrences | No Effect |
| Navasota ladies'-tresses | *Spiranthes parksii* | E | 2 | Grows on forb-dominated barrens, on shallow, nutrient-poor soils from the Catahoula Formation. Found under a 50% canopy of post oak and black hickory in small openings (Orzell 1990). | Angelina - Post oak woodlands and barrens over Catahoula Formation, nearest pop. in Angelina Co. | No Effect |

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7 = Aquatic species or habitat known or suspected downstream of the treatment area(s), but outside identified geographic bounds of water resource cumulative effects analysis area (defined as point below which sediment amounts are immeasurable and insignificant).
8 = Aquatic species or habitat known or suspected downstream of treatment area(s), but inside identified geographic bounds of water resource cumulative effects analysis area.

* - Listed species that have no known occurrences on National Forest and Grasslands in Texas.

| Regional Forester's Sensitive Species | Scientific Name | Status | OAR Code | Habitat Requirements For High Potential Habitat | Forest-wide Distribution | Determination |
|---|---|---|---|---|---|---|
| **Birds** | | | | | | |
| Bachman's Sparrow | *Aimophila aestivalis* | S | 3 | Open, frequently burned pine forests with a dense bunchgrass ground cover and minimal woody understory (Oberholser 1974; Hardin and Probasco 1983; Hamel 1992). | All National Forest | May Impact, not cause trend toward federal listing. |
| Bald eagle | *Haliaeetus leucocephalus* | S | 2 | Coastal areas, and around large bodies of water such as reservoirs, lakes, and rivers (USFWS 1995). Nests and associated pilot trees are typically located in large trees within two miles of open water. | All Forest and Grasslands. Nest commonly found along San Rayburn and Toledo Bend reservoirs. Other sites include … | May Impact, not cause trend toward federal listing. |
| Migrant loggerhead shrike | *Lanius ludovicianus migrans* | S | 2 | Breeding habitat is varied, but must include open grassland areas with scattered trees or shrubs. Shrikes are generally absent from closed canopy forests and grasslands without trees or shrubs. Historic habitat included open pine-grasslands; however, pastures and hayfields are considered suitable (USFWS 2000). | All Forest and Grasslands. | No Impact |
| **Mammals** | | | | | | |
| Rafinesque's big-eared bat | *Corynorhinus rafinesquii* | S | 2 | Roosts within mature bottomland hardwood communities within 1 km of water, showing a preference for large, hollow black gum trees with large triangular basal openings. Commonly use abandoned buildings in the southern parts of their range. Maternity colonies consist of a few dozen individuals and males are usually solitary (Davis and Schmidly 1994; Harvey et al. 1999). | All National Forest | No Impact |
| **Reptiles** | | | | | | |
| Louisiana pine snake | *Pituophis ruthveni* | S, C | 3 | Open, frequently burned pine forests with little midstory vegetation, a well-developed understory of grasses and forbs, sandy, well-drained soils, and the presence of pocket gophers (Rudolph and Burgdorf 1997). | Sabine & Angelina - | May Impact, not cause trend toward federal listing. |
| **Crustaceans** | | | | | | |
| Sabine fencing crayfish | *Faxonella beyeri* | S | 3 | Roadside ditches that are intermittently filled (NatureServe 2005). | Sabine, Angelina, & Davy Crockett | May Impact, not cause trend toward federal listing. |
| Neches crayfish | *Procambarus nechesae* | S | 3 | Simple burrows in temporary or semi-permanent pools in roadside ditches (Hobbs 1990; NatureServe 2005). | Angelina - Comp 2, SFA Exp. Forest; & Davy Crockett | May Impact, not cause trend toward federal listing. |
| Blackbelted crayfish | *Procambarus nigrocinctus* | S | 3 | Occurs among debris in streams with sandy or rocky bottoms (Hobbs 1990). | Sabine, Angelina, & Davy Crockett | No Impact |

| Regional Forester's Sensitive Species | Scientific Name | Status | OAR Code | Habitat Requirements For High Potential Habitat | Forest-wide Distribution | Determination |
|---|---|---|---|---|---|---|
| **Insects** | | | | | | |
| Texas emerald dragonfly | *Somatochlora margarita* | S | 3 | Larvae associated with small, clear, sandy-bottomed streams and boggy seeps within loblolly and longleaf pine stands (NatureServe 2005). Adults are generalist, and they forage for insects at canopy level over mature forest and over gravel roads and small openings (Price et al. 1989). | All National Forest | May Impact, not cause trend toward federal listing. |
| **Mollusks** | | | | | | |
| Texas pigtoe | *Fusconaia askewi* | S | 7 | Streams with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures (Howells et al. 1996). | All National Forest | No Impact |
| Triangle Pigtoe | *Fusconaia lananensis* | S | 7 | Mixed mud, sand, and fine gravel in streams (Howells et al. 1996). | Sabine & Angelina - | No Impact |
| Sandbank pocketbook | *Lampsilis satura* | S | 7 | Small to large rivers with moderate flows on gravel, gravel-sand, and sand bottoms (Howells et al. 1996). | All National Forest | No Impact |
| Southern hickorynut | *Obovaria jacksoniana* | S | 7 | Creeks and rivers with moderate current, often in gravel (Howells et al. 1996). | Sabine & Angelina - | No Impact |
| Louisiana pigtoe | *Plerobema riddellii* | S | 7 | Found in streams (Howells et al. 1996). | All National Forest | No Impact |
| Texas heelsplitter | *Potamilus amphiachaenus* | S | 7 | Found in quiet waters in sand and mud (Howells et al. 1996). | All National Forest | No Impact |
| **Fish** | | | | | | |
| Sabine shiner | *Notropis sabinae* | S | 7 | Closely restricted to a substrate of fine, silt-free sand in smaller streams and rivers having slight to moderate current (Lee et al. 1980). | All National Forest | No Impact |
| **Plants** | | | | | | |
| Incised groovebur | *Agrimonia incisa* | S | 3 | Fire-maintained longleaf pine savanna on well-drained but not xeric sandy soils (Orzell 1990). | Sabine & Angelina - | May Impact, not cause trend toward federal listing. |
| Panicled indigobush * | *Amorpha paniculata* | S | 2 | It occurs in deep acid woodlands and bogs over Letney (Arenic Paleudults) soils within the Catahoula Formation. Amorpha paniculata is a stout shrub that grows in deep acid woodlands and bogs in East Texas (Philipps 2007). | Sabine & Angelina - comp 90 & 92 | No Impact |
| Texas bartonia | *Bartonia texana* | S | 2 | Along wooded streams, bogs, and creek bottoms in swamp tupelo (Nyssa aquatica) forests and bay-gall (*Ilex coriacea*) thickets. Often on elevated clumps of sphagnum moss or other organic matter (NatureServe 2007). | Sabine, Angelina, & Sam Houston | No Impact |

| Regional Forester's Sensitive Species | Scientific Name | Status | OAR Code | Habitat Requirements For High Potential Habitat | Forest-wide Distribution | Determination |
|---|---|---|---|---|---|---|
| Warner's hawthorn | *Crataegus warneri* | S | 1 | Open, deep sandy soils, where it is restricted to areas with periodic disturbance by fire, wind, and/or erosion (NatureServe 2005). | Davy Crockett - | May Impact, not cause trend toward federal listing. |
| Mohlenbrock's umbrellas-sedge | *Cyperus grayioides* | S | 3 | Fairly abundant where it occurs, in open areas of deep, disturbed sands. It is restricted to areas with periodic disturbance by fire, wind, and/or erosion, however, and is vulnerable to encroachment by woody or weedy plant species. Sand prairie habitats have declined severely as a result of agricultural and residential development, fire suppression, and grazing (NatureServe 2007). | Sabine & Angelina - | May Impact, not cause trend toward federal listing. |
| Southern lady's-slipper | *Cypripedium kentuckiense* | S | 3 | Near wooded seepage areas, on stream floodplains, and in mesic hardwood ravines on lower mesic slopes or on stream terraces (Orzell 1990). | Sabine & Angelina - | May Impact, not cause trend toward federal listing. |
| Commanche Peak Prairie Clover | *Dalea reverchonii* | S | 1 | Grasslands (e.g., Little bluestem-side oats grama prairie) or openings in post oak (*Quercus stellata*) woodlands on shallow calcareous clay to sandy clay soils over limestone. Often among sparse vegetation in barren, exposed sites (NatureServe 2007). | LBJ | No Impact |
| Neches river rose mallow | *Hibiscus dasycalyx* | S, C | 1 | Open marsh, nearest population from Harrison Co. | Davy Crockett - | No Impact |
| Pineland bogbutton | *Lachnocaulon digynum* | S | 3 | Hillside seepage bogs, wet pine savannas, wet sphagnum bogs in pine savannas (NatureServe 2005). Pitcher plant bogs and wetland pine savanna with herbaceous groundcover | Sabine & Angelina - | May Impact, not cause trend toward federal listing. |
| Texas golden gladecress | *Leavenworthia aurea* var. *texana* | S, C | 2 | Restricted to small, treeless glades found on rocky outcrops of the Weches Geologic Formation. Weches Formation outcrops, known only from San Augustine and Sabine Cos. | Sabine | No Impact |
| Branched gayfeather | *Liatris cymosa* | S | 1 | Open herbaceous savanna over Catahoula Formation, closest population in San Jacinto Co. It occurs on somewhat barren, grassy openings in post oak (Quercus stellata) woodlands or post oak savanna-blackland prairie ecotones on tight clay-loam, chalky, or gravelly soils (NatureServe 2007). | Sam Houston - Comp. 58-62 | No Impact |
| Slender gayfeather | *Liatris tenuis* | S | 6 | Open pine forests on sandy soil in eastern Texas (Orzell 1990). Habitat requirements include fire maintained dry, upland longleaf pine savanna. | Sabine & Angelina - | May Impact, not cause trend toward federal listing. |
| Yellow fringeless orchid | *Platanthera integra* | S | 2 | Frequently burned hillside seepage bogs (Orzell 1990). Pitcher plant bogs and wet savannas w/ herbaceous understory | Sabine & Angelina - | No Impact |
| Barbed rattlesnake-root | *Prenanthes barbata* | S | 3 | Rich, mesic hardwood forests, and near rivers and streams. Mesic hardwood or riparian forests with unique associates, nearest populations in Nacogdoches and Jasper Cos. | Sabine & Angelina - | May Impact, not cause trend toward federal listing. |
| Dwarf post oak | *Quercus boyntonii* | S | 3 | The shrub layer of loblolly pine (*Pinus taeda*)-oak forests on deep sandy soils in creek bottoms. Possibly also in shallower soils of upland prairies (NatureServe 2007). | Angelina (historical record from Angelina Co.) | May Impact, not cause trend toward federal listing. |
| Large beakrush | *Rhynchospora macra* | S | 2 | Bogs, wet pine savannas, and wet flatwoods. Pitcher plant bogs or open herbaceous seeps | Sabine & Angelina - | No Impact |

| Regional Forester's Sensitive Species | Scientific Name | Status | OAR Code | Habitat Requirements For High Potential Habitat | Forest-wide Distribution | Determination |
|---|---|---|---|---|---|---|
| Sabine coneflower | *Rudbeckia scabrifolia* | S | 2 | Hillside seepage bogs and associated broadleaf semi-evergreen acid seep forests (Orzell 1990). Pitcher plant bogs or open herbaceous seeps, nearest known pop. In Sabine Co. | Sabine & Angelina - | No Impact |
| Texas sunnybell | *Schoenolirion wrightii* | S | 3 | Grows on forb-dominated barrens, on shallow, nutrient-poor soils from the Catahoula Formation (Orzell 1990). In east Texas and southern Arkansas this taxon generally inhabits open savannas canopied by a mixture of pine and hardwoods (NatureServe 2007). | Angelina | May Impact, not cause trend toward federal listing. |
| Scarlet catchfly | *Silene subciliata* | S | 3 | Deep, usually well drained sands or sandy loams in partially shaded longleaf forests with an open, herbaceous understory. Grows in the ecotone between upland longleaf pine savannah and forested ravines that were historically maintained by natural low-intensity ground fires (Orzell 1990). Deep, sandy soils usually on transition zone from upland to streamside over Catahoula Formation | Sabine & Angelina - | May Impact, not cause trend toward federal listing. |
| Clasping (Oklahoma) twistflower | *Streptanthus maculatus* | S | 2 | Moist, open woodlands and glauconitic outcrops (the latter are not known to occur on the ANF). Open calcareous glades usually on Weches Formation in Texas, nearest pop. in Sabine Co. | Sabine | No Impact |
| Arkansas meadow-rue | *Thalictrum arkansanum* | S | 1 | Bottomland hardwood forests in counties along Red River | | No Impact |
| Texas trillium | *Trillium texanum* | S | 2 | Low, boggy hardwood bottoms; seep borders of ravine streams. Often in sphagnum mats (NatureServe 2005).. Baygalls and forested seeps | Sabine & Angelina - | No Impact |
| Drummond's yellow-eyed grass | *Xyris drummondii* | S | 2 | Hillside seepage bogs, in areas of exposed fine wet sand or peaty sand (Orzell 1990).. Pitcher plant bogs and open herbaceous seeps | Sabine & Angelina - | No Impact |
| Louisiana yellow-eyed grass * | *Xyris louisianica* | S | 3 | It occurs on the lower edges of hillside seepage slopes and wet claypan pine savannas (Philipps 2007). | Sabine & Angelina - comp 79 (Dan Lay Bog) & comp 95 (Upland Island Wilderness) | May Impact, not cause trend toward federal listing. |
| Harper's yellow-eyed grass | *Xyris scabrifolia* | S | 2 | Hillside seepage bogs, in open boggy areas and in partial shade of boggy evergreen shrub thickets. Often on hummocks of sphagnum moss in bogs (Orzell 1990). Pitcher plant bogs and open herbaceous seeps | Sabine & Angelina - | No Impact |

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* Species that are not Region Forester's sensitive species, but are globally and/or state imperiled and have known occurrences on the Forest.