Sam D Hamilton Noxubee National Wildlife Refuge

Silvicultural Prescription for Compartment 27

2012

GENERAL DESCRIPTION

Compartment 27 is located in the northern most portion of the Refuge, in Oktibbeha County (Figure 1). The compartment is comprised of 1,311 acres. Longview County road represents the northern most boundary of the compartment. The refuge property boundary serves as the eastern, western and the lower northern boundary. The south boundary and the southern most western boundaries are created by an interior refuge fire break. Talking Warrior creek divides the compartment, flowing in a southeasterly direction. The compartment is 100 percent forested.

Soils

Soils directly influence the types of vegetation present on a site and the amount of water available for plants and wildlife. Soil type may dictate the type of equipment that can be used in management activities, or the seasonality of its use. Soil type also indicates the erosion potential. Below are definitions of key terms and concepts:

1) *Erosion hazard* is the probability that damage will occur as a result of mechanized forest management activities. A *slight* rating indicates that no particular prevention measures are needed. A *moderate* rating indicates that measures are needed for certain silvicultural activities. A *severe* rating indicates that special precautions are required for most silvicultural activities.
2) *Equipment limitation* reflects the characteristics and conditions of the soil that restrict use of forestry equipment.
3) *Site index* is a measure of site quality. It is the average height, in feet, that dominant and co-dominant trees of a specific species attain in a given number of years, known as base age. The site index reported here is base age 50 for hardwoods and pines.
4) Soils can be rated for their suitability for different elements of wildlife habitat. A *good* rating means that habitats are easily created and maintained, and few limitations affect management. A *fair* rating means habitats can be generally created or maintained, but a moderate level of management intensity is required. A *poor* rating means habitats can be created, but limitations are severe and intensive effort is required for satisfactory results.
   These rating are for soil properties and features that affect the growth/productivity of the items below:
   - *Grain and seed crops*
   - *Grasses and legumes*
   - *Wild herbaceous plants*
   - *Hardwood trees* and woody understory
   - *Coniferous plants*
   - *Wetland plants*
   - *Habitat for openland*
   - *Habitat for forestland wildlife*
   - *Habitat for wetland wildlife*

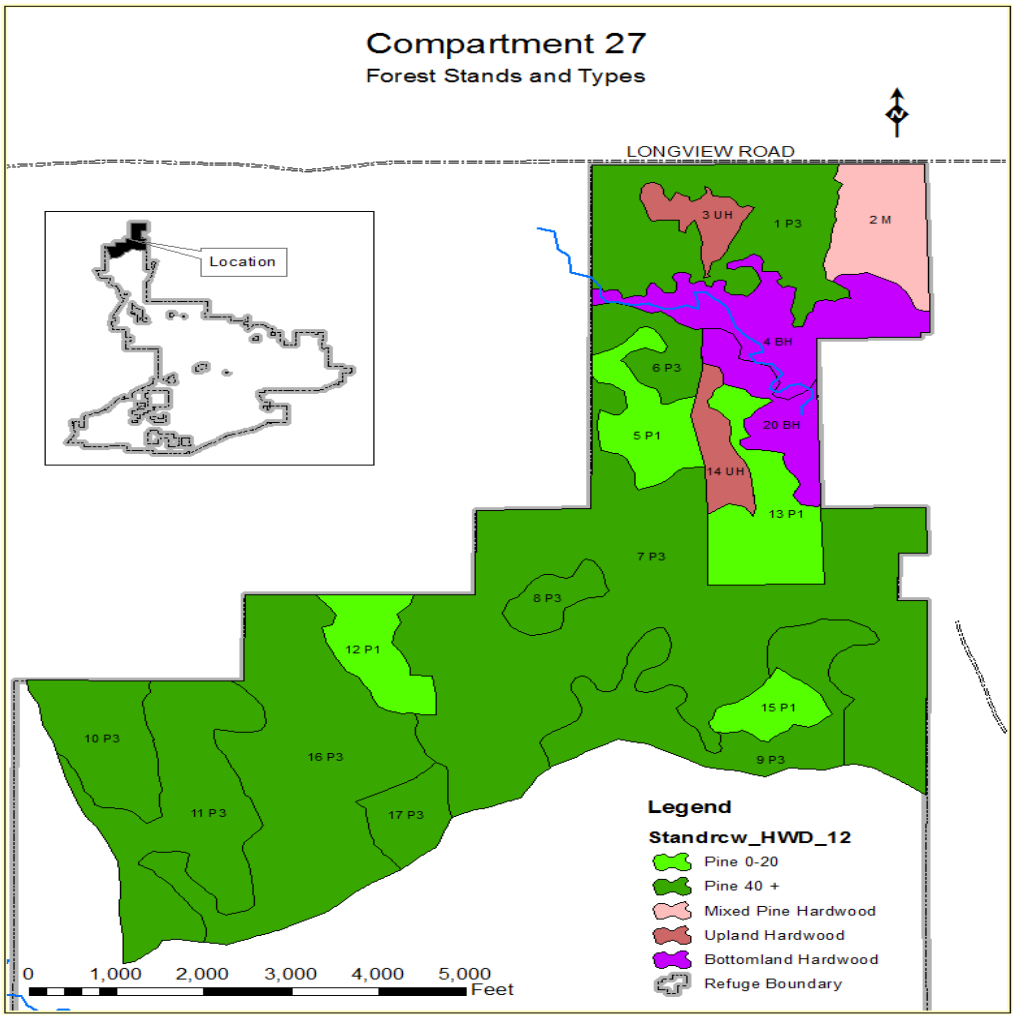

Figure 1: Compartment 27 Forest Stands and Types (Forest type is indicated by color and individual stands are indicated by numbers).

There are six soils associated with the compartment. These soils are as follows; Longview (1021 acres), Mathiston (110 acres), Wilcox (112 acres), Adaton (28 acres), Providence (26 acres), and Prentiss (14 acres). Longview, Adaton, Providence, Wilcox, and Prentiss are associated with the flatwoods. These five soils are generally good for all woodland wildlife except waterfowl. Mathiston, which is associated with drainages within the flatwoods, provides a suitable environment for all species of wildlife that inhabit the area.

Longview soils makes up almost 80 percent of the compartment and are somewhat poorly drained to moderately well drained. Permeability is moderately slow to slow. Available water capacity is medium to high. Erosion hazard is slight. Equipment restriction is moderate, since the soil does not drain well equipment will bog down and/or cause rutting when wet. Site index for loblolly pine is 87 and sweetgum is 90.

Mathiston soils makes up slightly less than 10 percent of the compartment and are somewhat poorly drained located in floodplains. Permeability is moderate with available water capacity medium to very high. Erosion hazard is slight. Equipment restriction is severe. Site index for loblolly pine is 98 and cherrybark oak is 101.

Wilcox soils makes up slightly less than 10 percent of the compartment and are well drained moderately well drained, and somewhat poorly drained located on uplands. Permeability is moderate to very slow with available water capacity medium to very high. Erosion hazard is slight. Equipment restriction is moderate. Site index for loblolly pine is 81.

Adaton soils makes up slightly more than 2 percent of the compartment and are poorly drained on upland flats. Permeability is moderately slow to very slow with available water capacity very high. Erosion hazard is slight. Equipment restriction is severe. Site index for loblolly pine is 84 and sweetgum 98.

Providence soils makes up slightly more than 2 percent of the compartment and are moderately well drained soils with a fragipan. Permeability is moderately slow to very slow with available water capacity medium. Erosion hazard is slight. Equipment restriction is slight. Site index for loblolly pine is 84 and cherrybark oak 95.

Prentiss soils makes up slightly more than 1 percent of the compartment and are well drained and moderately well drained soils. Permeability is moderate to moderately slow with available water capacity medium. Erosion hazard is slight. Equipment restriction is slight. Site index for loblolly pine is 88 and sweetgum 98.

WILDLIFE and HABITAT INTERRELATIONSHIPS

Presently there are four inactive red-cockaded woodpecker (RCW) cluster sites located in Compartment 27, Clusters 54, 90, 91, and 101. All four sites are spaced in a linear fashion, parallel to the compartment's southern boundary (Figure 2). Cluster activity records have been recorded since 1989 for this Compartment (Table 1).

The clusters have been partitioned using the Service's Geographical Information System (GIS) RCW Matrix program (Figure 2). RCW habitat conditions were assessed by a foraging habitat analysis using the RCW Matrix program for cluster partitions 90, 91, and 101 because portions of the proposed timber thinning occur within these partitions. Cluster 54 lies outside the stands to be treated. The analyses determined that potentially suitable foraging habitat is present, but management is required to restore and improve habitat conditions. A key factor for the poor to unsuitable condition of foraging habitat is the large amount of small hardwoods in the midstory and larger hardwoods in the canopy.

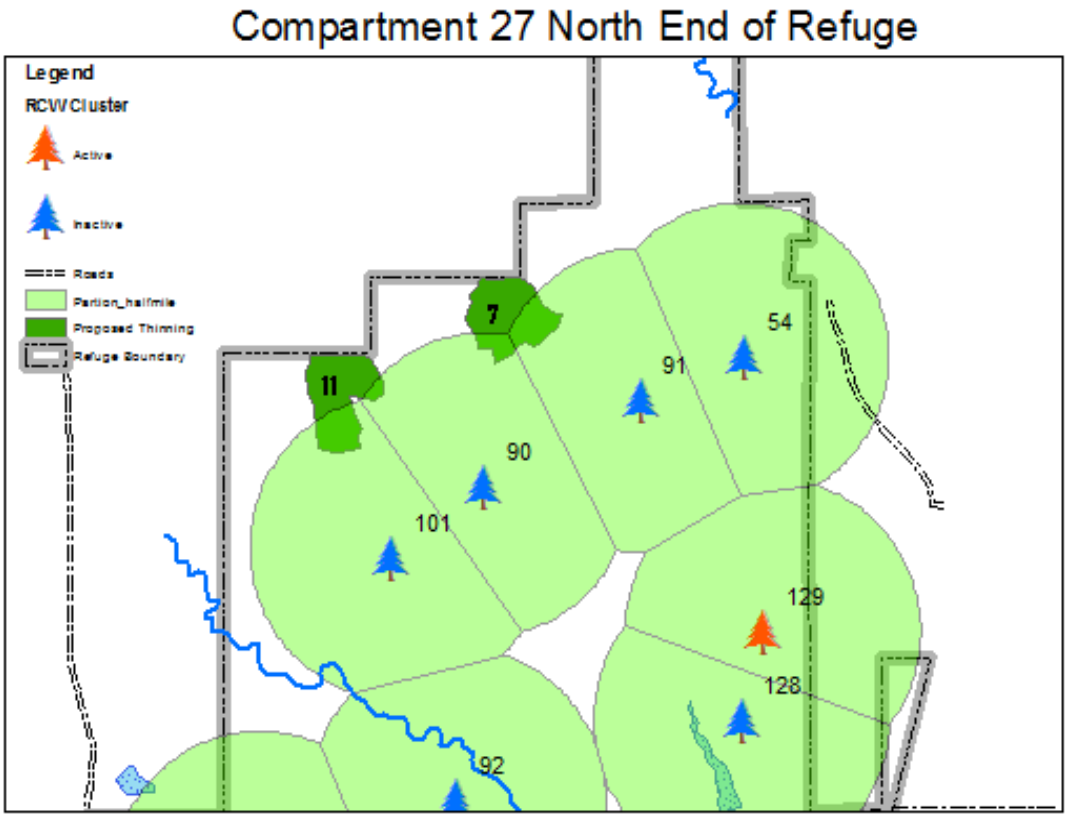

Figure 2: Map of RCW active/recruitment clusters and proposed thinning.

Table 1. Summary of cluster activity by year.

Cluster#	Active Years	Inactive Years
54	1992 -2009	1991 2010-2012
90	1992 -2007	1991 2008-2012
91	2001	1995-2000 2002-2012
101	1996 -2000 2007 -2009	1989-1995 2001-2006 2010-2012

Compartment 27, Stands 5, 12, 15 and 20 have received past silvicultural treatments (Table 2) and prescribed fire. The compartment south of Talking Warrior Creek has had prescribed fire applied at 3-5 year intervals until 2005. The forest north of Talking Warrior has not had a silvicultural treatment of any sort for the past 20 years except for salvaging downed trees or insect invested pines of less than four total acres.

***Table 2. Recent Past Silvicultural Treatments in* Compartment 27 (1,311 acres).**

YEAR	DESCRIPTION
1994	19.4 acre seed tree harvest Stand 15
1997	32.7 acre seed tree harvest Stand 12
1996	Acquired 120 acres with 85.5 acre harvested Stand 13 and Stand 20
	52.7 acres and 32.8 acres of natural regeneration into pine and young hardwood respectively
1997-2001	3 Southern pine beetle spots totaling 4.3 acres
1999	windstorm damage 1 acre
2011	36.7 acres seedtree harvest Stand 5

SILVICULTURAL RECOMMENDATIOS

The compartment's older (>20 years) trees were inventoried by sampling in 2004 and 2005. The sampling was conducted on a grid spacing using sampling points with a ten basal area prism (point sampling). Data recorded included tree species, diameter at breast height (dbh), and tree classification data. Tree classification data grouped trees into sawlogs, pulpwood, snags, culls and wildlife trees. Wildlife trees are those trees having identifiable unique functional value for wildlife (e.g., cavity trees, den trees). This areas is comprised of 1,311 forested acres: 101 acres (8%) in bottomland hardwood (**BH**), 36 acres (3%) in upland hardwood (**UH**), 46 acres (3.5%) in mixed pine/hardwood (**M**), and 1,128 acres (86%) in pine (**P**). Pine stands are subdivided into **P1**, **P2**, and **P3**, 20 years for a P1 stand to grow to a P2 stand, and another 20 years for a P2 stand to grow to a P3 stand. The ideal pine age class distribution for sustaining the pine forest into the future is 20% P1, 20% P2, and 60% P3. The current age class distribution does not reflect that distribution (Table 3).

Table 3: Pine Age Class Distribution (acres)

size class	Ideal (%)	Actual (%)	Difference (%)
P1	20	13	-7
P2	20	0	-20
P3	60	87	+17

The Foraging habitat analyses determined that the habitat within the RCW partitions with Stands 7 and 11 are poor to unsuitable good quality foraging habitat for RCW's. Within these parts of Stands 7 and 11, and the remaining parts of these stands, the midstory in the RCW partitions is greater than or equal to seven feet tall and of moderate to high density. Heavy midstory is likely the primary cause of RCW cluster abandonment within Compartment 27. Controlling the midstory is one of the most important tasks in improving RCW habitat.

There are two proposed thinning areas: a 37 acre area in stand 7, and a 37 acre area in stand 11 (Figure 2). Thinning within those two stands will enhance the RCW foraging habitat by reducing hardwoods in both the midstory and canopy in accordance with the RCW Recovery Plan. Throughout these stands no more than 50% of 24" dbh trees will be harvested. Spacing of the retention trees will be 30 to 40 feet apart, which will leave approximately 60 square feet per acre of residual basal area (BA). Some hardwoods greater than 13.0" in dbh are planned to be retained for their wildlife value. The hardwood component for Loblolly according to the RCW guidelines is a maximum of 30%. Table 4 summarizes the trees by class that will be left within the stands following the thinning procedure.

Table 4: Total number of trees to be left after thinning

Pine					Hardwood				Total
Stand	TPA*<10**	TPA 10-14	TPA≥14	Pine TPA	TPA<10	TPA≥10	HWD TPA	ACRES	TPA*
7	8	7	30	45	3	14	17	37	62
11	2	2	32	36	3	8	11	37	47

* TPA= trees per acre

** Diameter in inches at breast height

PROJECTED OUTCOMES

Compartment 27 is comprised of high basal area timber stands. Thinning stands 7 and 11 will add potential good quality foraging habitat for red-cockaded woodpeckers and be a good starting point toward restoring activity to the four inactive clusters, two of which were active in 2010. The primary factor limiting habitat quality, based on the foraging habitat analysis, under current conditions is excessive hardwoods within the midstory and canopy.

Stand 11, predominantly made up of loblolly pine, was surveyed in August, 2012, by refuge staff for cavities and no use by the red-cockaded woodpeckers or other species of special interest were observed.

Basal areas in most areas exceed 100 and the canopy has greater than 75 percent closure in the majority of the stand. The stands have a heavy hardwood component that make up the midstory and understory layer, with very little (less than 10 percent) desirable herbaceous ground cover. Thinning to 60 square feet per acre basal area will address the need to reduce the amount of hardwoods within both the midstory and canopy and promote the growth of pine trees into the next higher size classes. Following the proposed thinning, the stand's canopy will allow for light to penetrate to the forest's floor for the establishment of a more desirable herbaceous understory component. Prescribed fire use in this stand on a two to three year rotation will also promote desirable herbaceous plant growth and further aid in controlling the undesirable hardwood component. Use of thinning along with frequent prescribed fire will allow the refuge to accomplish its habitat goals related to the red-cockaded woodpecker and other species of special interest within this stand.

In Stand 7, which has a mix of hardwood and pine, cavity surveys again noted no use by red-cockaded woodpeckers or other species of special concern. Basal areas in most areas exceeded 100 and the canopy has greater than 75 percent closure in the majority of the stand. Thinning within this stand will address the moderate hardwood component interspersed throughout the stand's midstory and canopy. At present, the understory has very little (less than 15 percent) desirable herbaceous ground cover. Thinning to decrease basal area will allow light to penetrate to the forest's floor for the establishment of a more desirable herbaceous understory component. Prescribed fire use in this stand on a two to three year rotation will also promote desirable herbaceous plant growth and further aid in controlling the undesirable hardwood component. Use of thinning along with frequent prescribed fire will allow the refuge to accomplish its habitat goals related to the red-cockaded woodpecker and other species of special interest within this stand.

Other species of special interest that would benefit from a thinning to 60 basal area include Bachman's sparrow, brown-headed nuthatch, Northern bobwhite and Eastern wild turkey. These species need open pine habitat with frequent fire to optimize population growth. The majority of the previously mentioned species are species of interest in the forest of the southeast. By thinning the canopy, sunlight will penetrate through to the forest floor promoting new vegetation growth and increasing diversity of the understory community; in turn providing increased habitat for an array of terrestrial species.