

**SACRED HEART MITIGATION
QUALITATIVE AND QUANTITATIVE MONITORING
FIRST MONITORING REPORT 2017**



The annual monitoring was conducted in accordance with the approved monitoring plan on November 21st by David Clayton, Environmental Scientist IV for the Northwest Florida Water Management District.

Introduction

The Sacred Heart Devils Swamp Mitigation Project compensates for wetland impacts associated with the Sacred Heart project in Walton County, Florida. The mitigation area of 82 acres is located within the Devils Swamp area of the Northwest Florida Water Management District's (NFWFMD) Choctawhatchee River Water Management Area, adjacent to unnamed road near the community of Bunker (Figure 1, 2). The wetland restoration will restore hydric pine flatwoods from a degraded condition. The hydric pine flatwood communities described had been converted to slash pine plantation in the distant past.

The baseline monitoring occurred on November 21, 2017. As the first step in the restoration process, a site burn was conducted on February 22, 2018. Shrub reduction and a timber harvest are scheduled for later in 2018. Quantitative and qualitative monitoring were used to document the current plant species composition and vegetation structure of these targeted communities. This is the first annual monitoring report.

Representative panoramic site photography can be found at:

<https://www.nfwmdwetlands.com/Umbrella-Plan/NFWFMD-Mitigation-Sites/Choctawhatchee-Watershed-Mitigation-Sites/Devils-Swamp/Sacred-Heart-Mitigation>

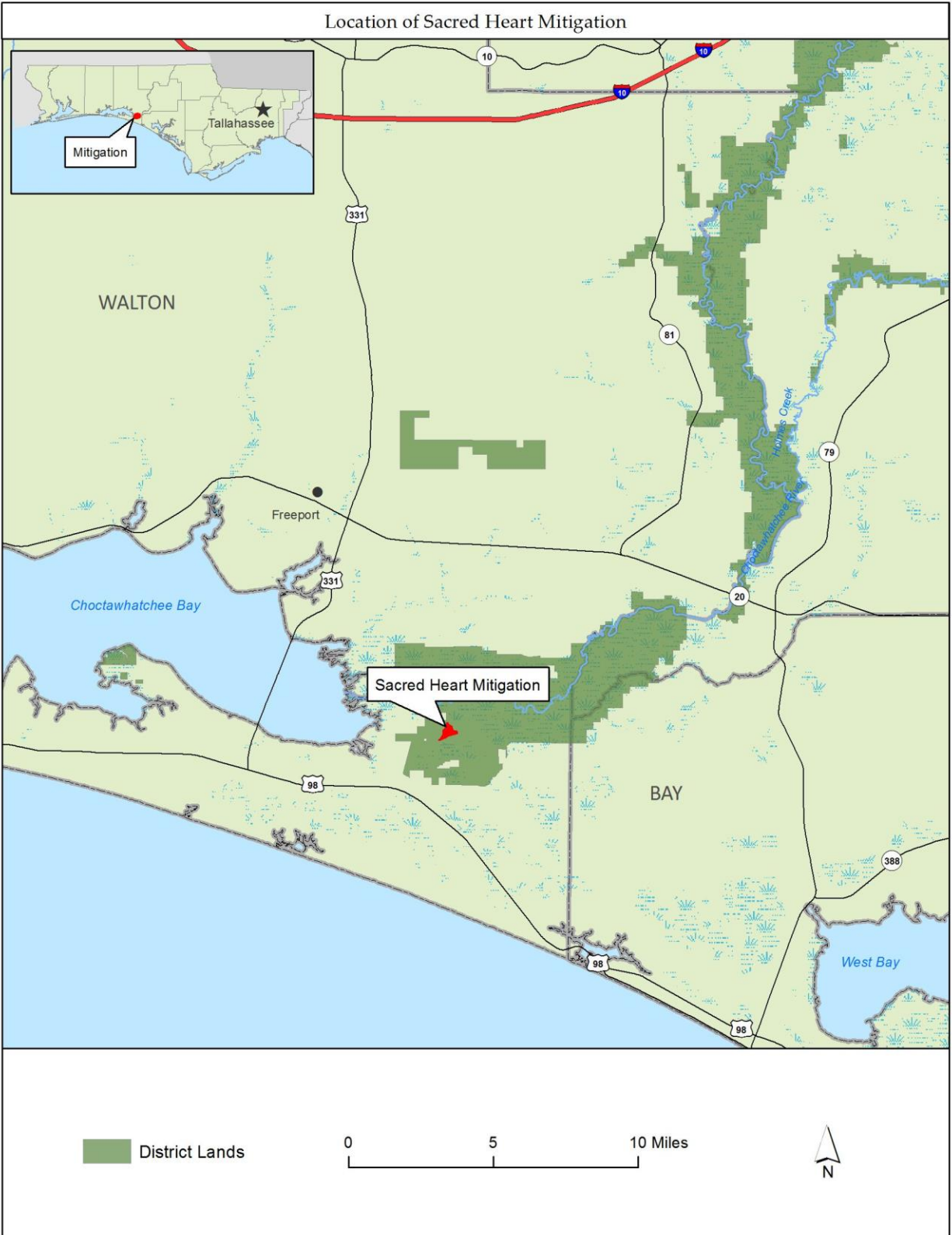


Figure 1. Devils Swamp Mitigation for the Sacred Heart Wetland Restoration Location Map

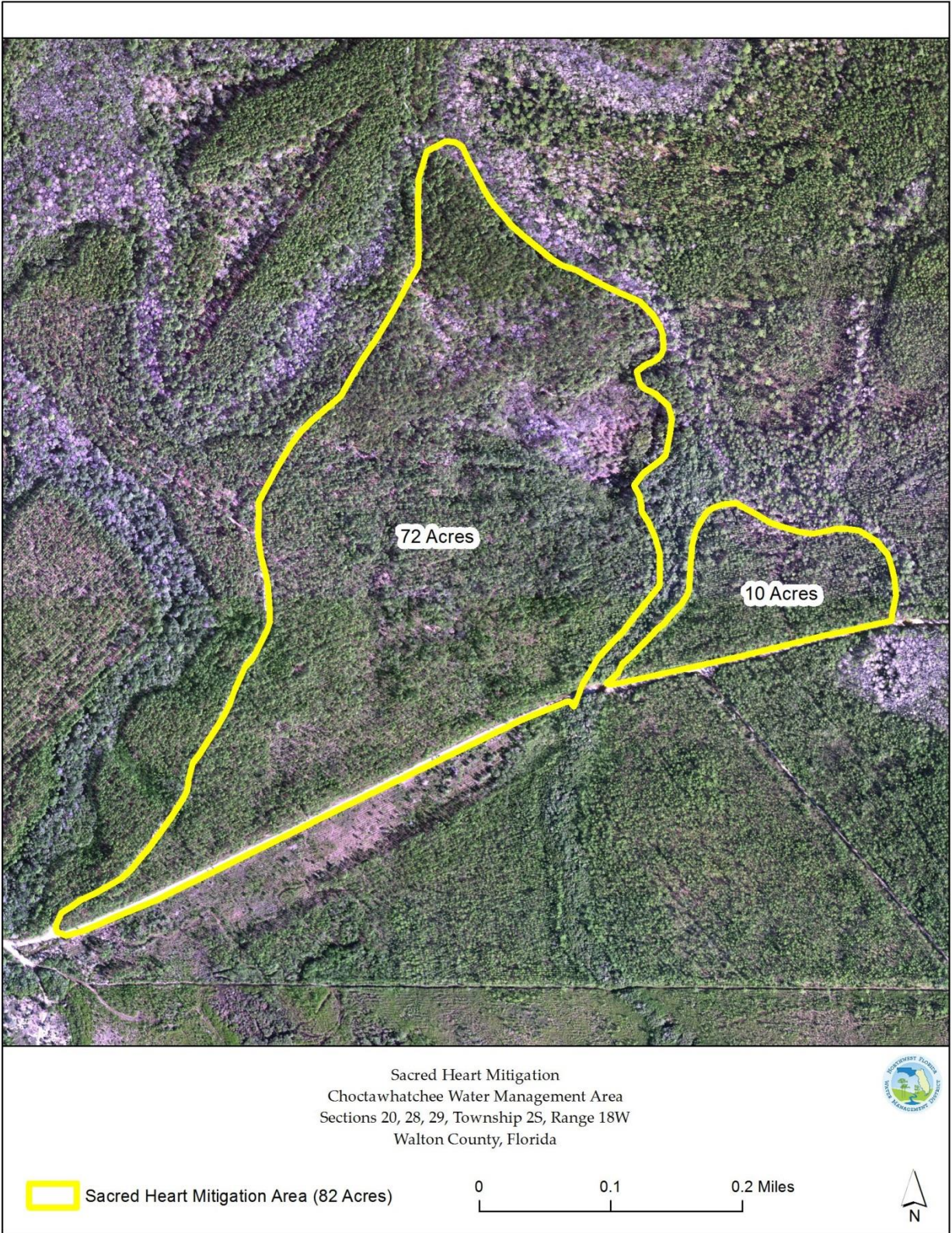


Figure 2. Devils Swamp Mitigation for the Sacred Heart Project

Methods

Qualitative Monitoring

Qualitative vegetation monitoring includes species identification, and general habitat health. Pedestrian surveys increase site coverage and include a 20+ minute meandering walk-path. The pedestrian walk-path continued as long as species were being added; however, once additional species were not recorded for five minutes the survey was complete. Plants are listed in the data sheets in the following categories (tree, shrub, vine or herbaceous) to give a better understanding of community composition.

During the vegetation monitoring described above, wildlife observations are recorded in each community. These observations will consist of direct sightings, scat, tracks, or vocalizations.

Quantitative Monitoring

The percent vegetation cover was monitored at four 150-foot transects. Along each transect, one-meter square quadrats were established at 20-foot intervals. Vegetation species coverage statistics was recorded at each site. The percent coverage for each species (and bare ground or open water) was determined by adding all quadrat observations together and dividing the total coverage by the cover of each species within each transect. This represents a modified Daubenmire cover scale where vegetation species statistics are used to determine the percent cover by bare ground, water and species. These include wetland species, invasive exotic, and nuisance species present.

Shrub density was monitored using five, one-meter square quadrats, established at random within each transect. Within each quadrat the shrubs were identified by species and counted. The number of stems per square meter were determined. Representative site photos will be taken and included in the report.

Results and Discussion

Qualitative Monitoring

Hydric Pine Flatwoods (82 Acres)

Fifty-three species were observed along the pedestrian transect (Table 1). Species were representative of hydric flatwoods. Shrub species were dominant within the community and shaded out the understory. Dominant shrubs included black titi, gallberry, tall gallberry, high bush and Elliot's blueberry.

Table 1. Sacred Heart Mitigation Hydric Pine Flatwoods

Date: 11/21/2017 Data Collector: David Clayton					
82 Acres Hydric Pine Flatwoods					
Wildlife Observations: Towhee					
<u>Scientific Name</u>	<u>Common Name</u>	<u>Tree</u>	<u>Shrub</u>	<u>Vine</u>	<u>Herb</u>
<i>Andropogon glomeratus</i>	Busy blue stem				X
<i>Andropogon sp.</i>	Bluestem				X
<i>Aristida stricta</i>	Wiregrass				X
<i>Balduina uniflora</i>	Coastalplain honeycombhead				X
<i>Bigelovia nudata</i>	Rayless goldenrod				X
<i>Carex sp.</i>	Nutsedge				X
<i>Carphephorus odoratissimus</i>	Vanilla leaf				X
<i>Clethra alnifolia</i>	Sweet pepper bush		X		
<i>Cliftonia monophylla</i>	Black titi		X		
<i>Cyrilla racemiflora</i>	Red titi		X		
<i>Dicanthelium spp.</i>	Witch grass				X
<i>Drosera capillaris</i>	Pink sundew				X
<i>Erigeron vernus</i>	Early white fleabane				X
<i>Eriocaulon decangulare</i>	Tenangle pipewort				X
<i>Euphorbia inundata</i>	Florida pineland spurge				X
<i>Eubotrys racemosus</i>	Swamp dog hobble		X		
<i>Eurybia eryngiifolia</i>	Coyote-thistle aster				X
<i>Gaylussacia dumosa</i>	Dwarf huckleberry		X		
<i>Gaylussacia frondosa</i>	Blue huckleberry		X		
<i>Gaylussacia mosieri</i>	Woolly huckleberry		X		
<i>Geobalanus oblongifolius</i>	Gopher apple			X	
<i>Hypericum crux-andreae</i>	St. Peter's wort				X
<i>Hypericum fasciculatum</i>	St. John's wort				X
<i>Ilex coriacea</i>	Tall gallberry		X		
<i>Ilex glabra</i>	Gallberry		X		
<i>Ilex vomitoria</i>	Yaupon		X		
<i>Ilex myrtifolia</i>	Myrtle-leaved holly	X			
<i>Kellochloa verrucosa</i>	Warty panic grass				X
<i>Lachnanthes caroliana</i>	Red root				X
<i>Lachnocaulon anceps</i>	Whitehead bogbutton				X
<i>Liquidambar styraciflua</i>	Sweet gum	X			
<i>Lycopodiella alopecuroides</i>	Foxtail club-moss				X
<i>Lycopodiella appressa</i>	Southern club-moss				X
<i>Lophiola aurea</i>	Golden crest				X
<i>Morella inodora</i>	Odorless bayberry		X		
<i>Persea palustris</i>	Swamp bay	X			
<i>Persea rubra</i>	Red bay	X			
<i>Pinus elliotii</i>	Slash pine	X			
<i>Polygala lutea</i>	Orange milkwort				X
<i>Quercus elliotii</i>	Runner oak		X		

Table 1. Continued.					
<u>Scientific Name</u>	<u>Common Name</u>	<u>Tree</u>	<u>Shrub</u>	<u>Vine</u>	<u>Herb</u>
<i>Rhexia alifanus</i>	Meadow beauty				X
<i>Rhexia nuttallii</i>	Nuttall's meadow beauty				X
<i>Rhynchospora sp.</i>	Rhynchospora				X
<i>Scleria sp.</i>	Scleria				X
<i>Serenoa repens</i>	Saw palmetto		X		
<i>Seymeria cassioides</i>	Senna seymaria				X
<i>Smilax glauca</i>	Catbriar			X	
<i>Smilax laurifolia</i>	Greenbriar			X	
<i>Vaccinium darrowii</i>	Darrow's blueberry		X		
<i>Vaccinium elliotii</i>	Elliot's blueberry		X		
<i>Viola lanceolata</i>	Bog white violet				X
<i>Xyris caroliniana</i>	Yellow-eyed grass				X
<i>Xyris sp.</i>	Yellow-eyed grass				X

Quantitative Sampling

Shrub Density

Baseline shrub density within the hydric pine flatwoods averaged 27 stems per meter squared within transect 1, 50, stems per meter square within transect 2, 44 within Transect 3 and 51 along transect 4. The dominant shrub species were Elliot's blueberry, yaupon, gallberry, tall gallberry, and black titi (Figure 3).

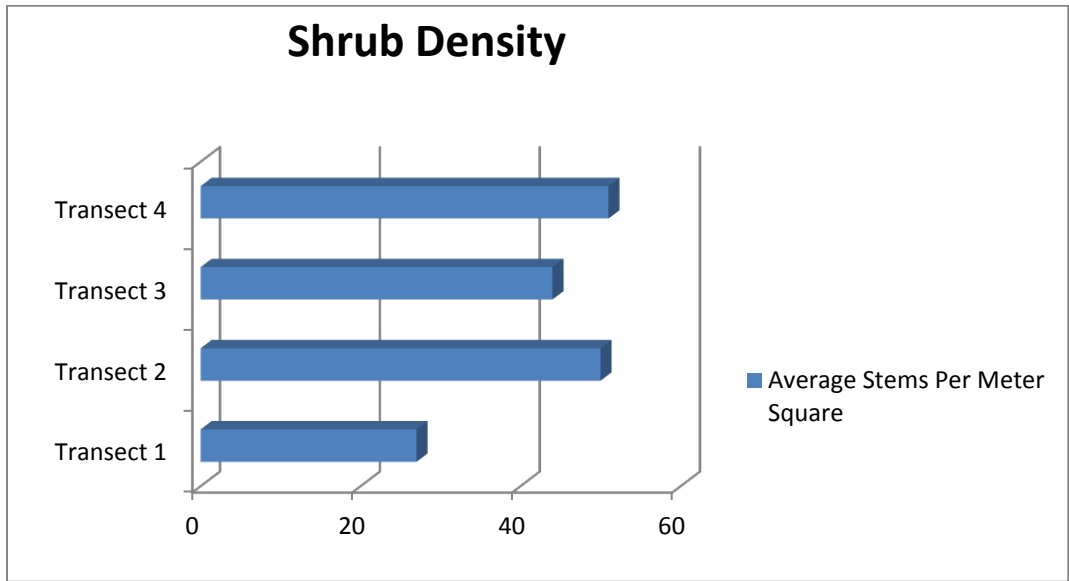


Figure 3. Baseline Stems per Meter Square at Sacred Heart Restoration Site

Transect Sampling

Transect 1. Hydric Pine Flatwoods

Fifteen species were observed along Transect one (Table 2, Figure 4). A total of 32 percent of the transect cover consisted of bare ground. Shrub coverage was 39% and consisted primarily of gallberry, and black titi. Wiregrass coverage was 3.7% (Figure 4). Species were typical of those found within a fire suppressed, shrub dominated hydric flatwood. Shrub removal and a fire interval of two years should greatly increase the dominance of grasses and forbs.

Table 2. Transect 1 Hydric Pine Flatwoods

<u>Scientific Name</u>	<u>Species</u>	<u>Percent Cover</u>
<i>Andropogon glomeratus</i>	Bushy bluestem	2.3
<i>Andropogon sp.</i>	Bluestem	0.33
<i>Aristida stricta</i>	Wiregrass	3.7
<i>Carex sp.</i>	Sedge	1.6
<i>Cliftonia monophylla</i>	Black titi	3.3
<i>Dichanthelium aciculare</i>	Needleleaf witch grass	0.33
<i>Gaylussacia dumosa</i>	Dwarf huckleberry	9
<i>Gaylussacia mosieri</i>	Wooly huckleberry	2.7
<i>Ilex coriaceae</i>	Tall gallberry	0.7
<i>Ilex glabra</i>	Gallberry	35
<i>Lachnocaulon anceps</i>	Whiteheaded bog button	0.7
<i>Scleria sp.</i>	Nutrush	0.7
<i>Serenoa repens</i>	Saw palmetto	6.3
<i>Smilax laurifolia</i>	Catbriar	0.33
<i>Xyris sp.</i>	Carolina yelloweyed grass	1
	Bare ground	32

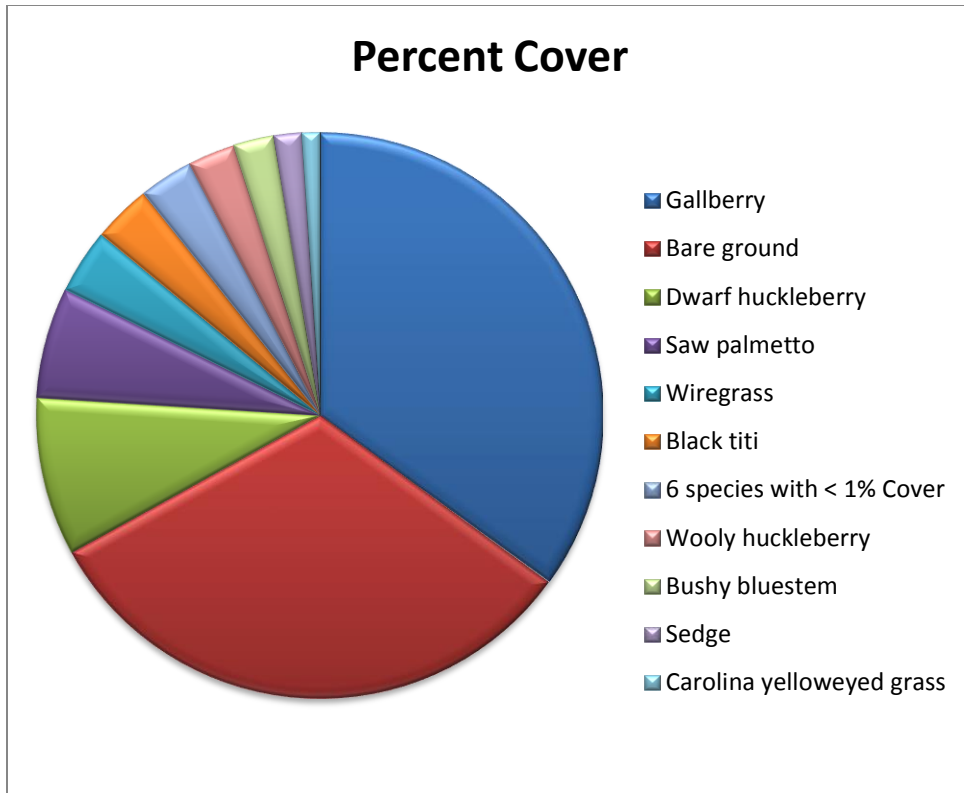


Figure 4. Transect 1, Hydric Pine Flatwoods

Transect 2. Hydric Pine Flatwoods

Seventeen species were observed within transect two (Figure 3). A total of 32 percent of the transect cover consisted of bare ground. Shrub coverage was 43% and consisted primarily of gallberry, black titi and tall gallberry (Figure 5). Wiregrass coverage was 6.3%.

Table 3. Transect 2, Hydric Pine Flatwoods

<u>Scientific Name</u>	<u>Species</u>	<u>Percent Cover</u>
<i>Andropogon glomeratus</i>	Bushy bluestem	0.33
<i>Aristida stricta</i>	Wiregrass	6.3
<i>Cliftonia monophylla</i>	Black titi	7.6
<i>Dichantheium aciculare</i>	Needleleaf witch grass	0.33
<i>Gaylussacia dumosa</i>	Dwarf huckleberry	2
<i>Hypericum sp.</i>	St. John's wort	0.33
<i>Ilex coriaceae</i>	Tall gallberry	3.3
<i>Ilex glabra</i>	Gallberry	32
<i>Lachnanthes caroliana</i>	Redroot	0.33
<i>Magnolia virginiana</i>	Sweet bay	6
<i>Persea borbonia</i>	Redbay	0.66
<i>Serenoa repens</i>	Saw palmetto	0.33

Table 3. Continued.		
<u>Scientific Name</u>	<u>Species</u>	<u>Percent Cover</u>
<i>Smilax laurifolia</i>	Catbriar	0.66
<i>Vaccinium elliotii</i>	Elliot's blueberry	4
<i>Vaccinium darrowii</i>	Darrow's blueberry	0.66
<i>Vaccinium myrsinites</i>	Sniny blueberry	0.33
<i>Xyris sp.</i>	Carolina yelloweyed grass	2
	Bare ground	32

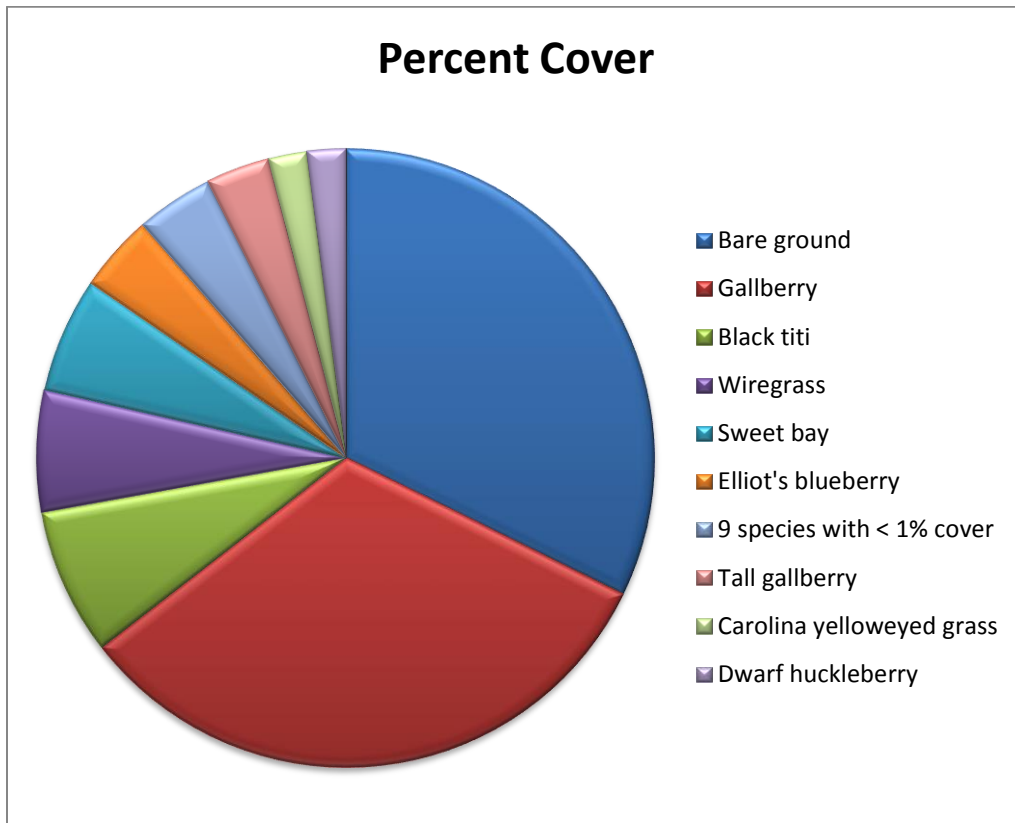


Figure 5. Transect 2. Hydric Pine Flatwoods

Transect 3 Hydric Pine Flatwoods

Nineteen species were observed along Transect three (Table 4, Figure 6). A total of 23.7 percent of the transect cover consisted of bare ground. Shrub coverage was 40.9% and consisted primarily of black titi, tall gallberry and gall berry (Figure 6). Wiregrass coverage was 10%.

Table 4. Hydric Pine Flatwoods, Transect 3.

<u>Scientific Name</u>	<u>Species</u>	<u>Percent Cover</u>
<i>Andropogon glomeratus</i>	Bushy bluestem	0.33
<i>Andropogon sp.</i>	Bluestem	0.7
<i>Aristida stricta</i>	Wiregrass	10
<i>Carex sp.</i>	Sedge	0.33
<i>Cliftonia monophylla</i>	Black titi	5
<i>Eriocaulon decangulare</i>	Tenagle pipewort	0.7
<i>Eubotrys racemosus</i>	Swamp dog hobble	1.33
<i>Gaylussacia dumosa</i>	Dwarf huckleberry	3.7
<i>Hypericum sp.</i>	St. John's wort	0.7
<i>Ilex coriacea</i>	Tall gallberry	11.3
<i>Ilex glabra</i>	Gallberry	23.3
<i>Lachnanthes caroliana</i>	Redroot	0.33
<i>Lachnocaulon anceps</i>	Whiteheaded bogbutton	0.33
<i>Scleria sp.</i>	Nutrush	0.33
<i>Serenoa repens</i>	Saw palmetto	10.7
<i>Smilax laurifolia</i>	Catbriar	0.33
<i>Vaccinium elliotii</i>	Elliot's blueberry	4.7
<i>Vaccinium myrsinites</i>	Sniny blueberry	0.33
<i>Xyris sp.</i>	Carolina yelloweyed grass	1.3
	Bare ground	23.7

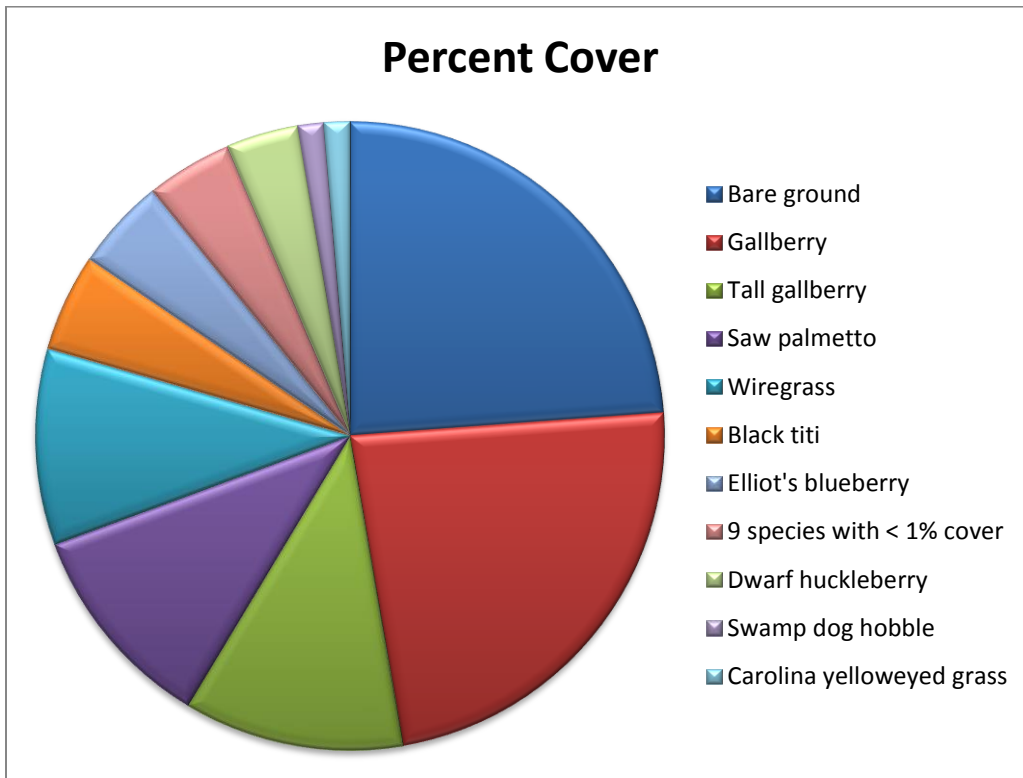


Figure 6. Transect 3, Hydric Pine Flatwoods

Transect 4. Hydric Pine Flatwoods

Fourteen species were observed along Transect one (Table 5, Figure 7). A total of 35.3 percent of the transect cover consisted of bare ground. Shrub coverage was 47% and consisted primarily of gallberry, tall gallberry, black titi and Elliot’s blueberry (Figure 7). Wiregrass coverage was 5.3%.

Table 5. Hydric Pine Flatwoods, Transect 4

<u>Scientific Name</u>	<u>Species</u>	<u>Percent Cover</u>
<i>Andropogon glomeratus</i>	Bushy bluestem	0.7
<i>Aristida stricta</i>	Wiregrass	5.3
<i>Carex sp.</i>	Sedge	1
<i>Cliftonia monophylla</i>	Black titi	11.7
<i>Dichantherium aciculare</i>	Needleleaf witch grass	0.33
<i>Gaylussacia dumosa</i>	Dwarf huckleberry	7.3
<i>Ilex coriacea</i>	Tall gallberry	7
<i>Ilex glabra</i>	Gallberry	25
<i>Ilex vomitoria</i>	Yaupon	0.7
<i>Lachnocaulon anceps</i>	Whiteheaded bogbutton	0.7
<i>Lycopodiella appressa</i>	Southern clubmoss	0.33
<i>Rhexia alifanus</i>	Savannah meadowbeauty	0.33
<i>Scleria sp.</i>	Nutrush	1
<i>Vaccinium elliottii</i>	Elliot's blueberry	3.3
	Bare ground	35.3

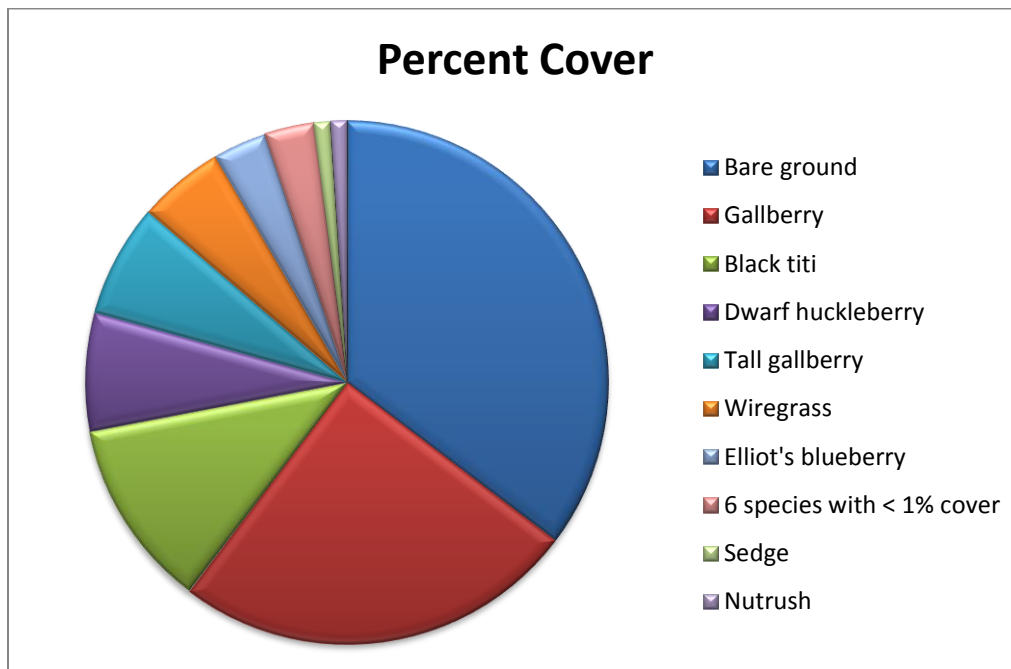


Figure 7. Hydric Pine Flatwoods, Transect 4

Conclusion

The Sacred Heart mitigation site is typical of natural lands that had been converted to a bedded commercial pine plantation. Most wiregrass and native vegetation were removed during bedding. Commercial tree densities shade out the understory vegetation. Currently only minor components of the natural community remain. In the absence of frequent burns, shrubs have invaded and become the dominant cover. Reduction of tree density to more natural conditions and the re-introduction of frequent burns and shrub reduction are the first steps in restoring this area to a more natural condition.