

## **SACRED HEART MITIGATION**

### **Fall 2021 Monitoring Report**

USACE Permit No.: SAJ-1998-4720 IP-RVH

Permittee: Sacred Heart Hospital of Pensacola  
C/o Mr. Patrick J. Madden – President  
5151 north 9<sup>th</sup> Avenue  
Pensacola, FL 32504

Responsible Party for Monitoring: Northwest Florida Water Management District  
81 Water Management Drive  
Havana, FL 32333

Entity Conducting Vegetation Monitoring: Florida Natural Areas Inventory  
Institute of Science and Public Affairs  
Florida State University  
1018 Thomasville Road, Suite 200-C  
Tallahassee, FL 32303

Monitoring Dates: 11/16/2021 (Vegetation)  
4/21/2021 & 9/23/2021 (Panoramic Photography)

### **Summary**

This project (Sacred Heart Mitigation) compensates for impacts to jurisdictional wetlands associated with construction of the Sacred Heart Hospital near the intersection of US 98 and Mack Bayou Road in Walton County. It consists of restoring 82 acres of hydric pine flatwoods within the Devils Swamp area of the Northwest Florida Water Management District (NFWWMD) Choctawhatchee River Water Management Area. The offsite mitigation area is located approximately 15 miles east of the impact along an unnamed dirt road east of the unincorporated community of Bunker (Figure 1). Prior to NFWWMD acquisition in 1992, the site had been converted to slash pine plantation.

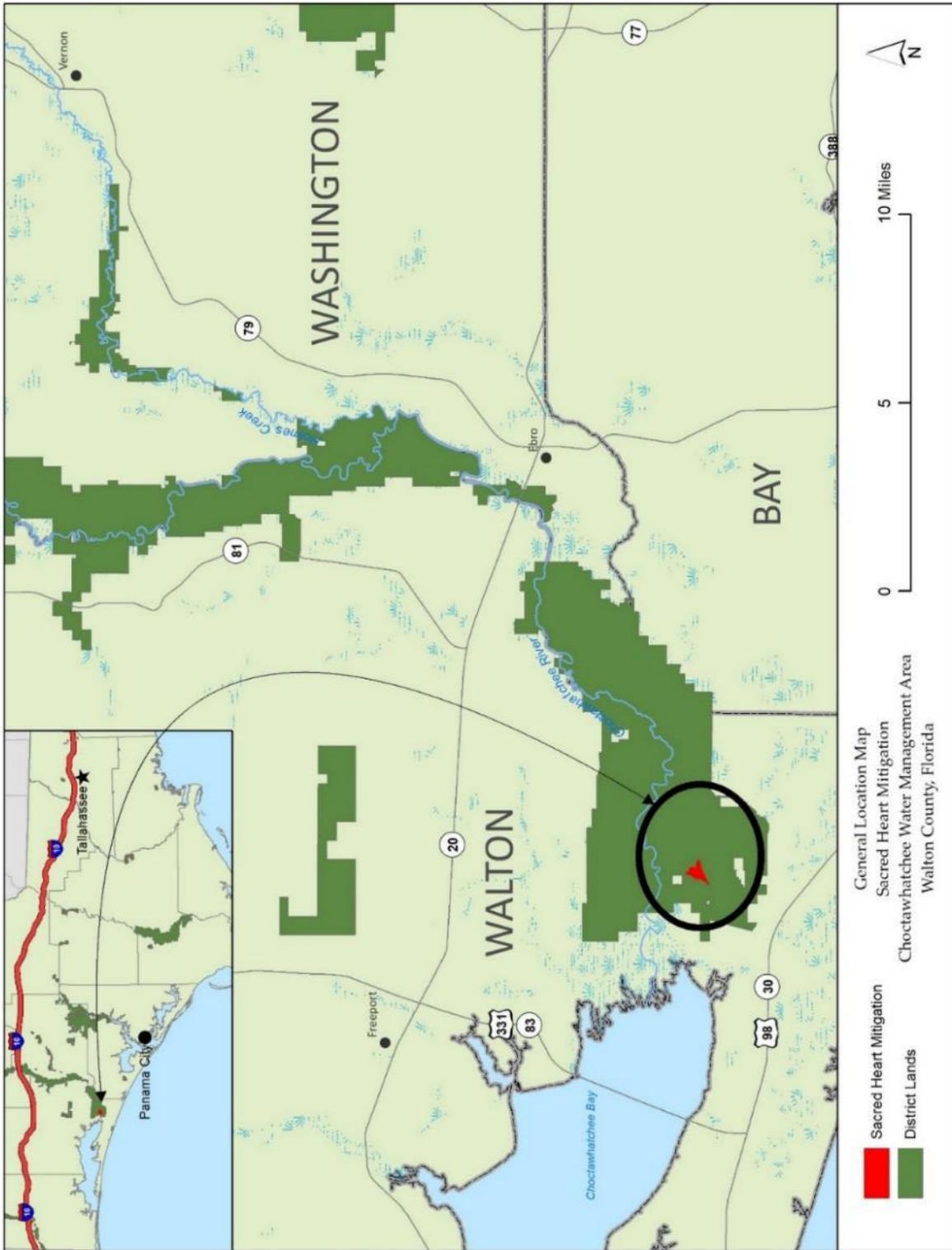


Figure 1. Location Map

The mitigation area is divided into two management polygons. Mitigation activities implemented-to-date include 1) baseline monitoring (November 2017), 2) prescribed fire (February 2018 and April 2021), 3) repeat panoramic photography (March 2018, September 2018, September 2019, October 2020, April 2021, September 2021), and 4) post-baseline quantitative vegetation monitoring (April 2018, March 2019, October 2019, November 2020, and November 2021).

Exotic and invasive plant species are not present. Thinning of tree density to less than 200 trees per acre, delayed because of widespread damage associated with Hurricane Michael (October 2018) and the unavailability at that time of logging contractors, was completed January 2021. Shrub cover was treated with herbicide in September 2019 with mixed results. Monitoring in 2021 determined that achievement of the shrub cover target of <5% will require additional herbicide treatments and prescribed fire. Percent shrub cover ranged from 5.86% to 23.79% across vegetation transects, with an average shrub cover of 16.14%.

**Performance Standards**

<b>Standard</b>	<b>Status</b>
Reduce tree density to less than 200 trees per acre.	Met.
Reduce shrub cover to less than 5%.	Not Met—Shrub cover averages 16.14%. Additional herbicide treatments and prescribed fire will be required to control shrub cover.
Implement prescribed fire on a 2 to 3-year cycle.	Met—Prescribed fire implemented in February 2018 and April 2021.
Conduct annual monitoring for a minimum of five years.	Met—Annual monitoring is being conducted.
Cover of Category I and II invasive exotic plant species, pursuant to the most current list established by the Florida Exotic Pest Plant Council at <a href="http://www.fleppc.org">http://www.fleppc.org</a> , less than 1%.	Met—Cover of Category I & II invasive exotic plant species less than 1%.

## Quantitative Monitoring Methodology and Results

Percent vegetation cover was measured November 16, 2021 in 1 m<sup>2</sup> quadrats (10-foot intervals) along four randomly placed 150-foot transects (Figure 2). The percent cover for each species and bare ground was determined by adding all quadrat observations 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 percent cover of bare ground and plant species. Rooted shrub stem density was estimated by counting rooted stems within five 1 m<sup>2</sup> quadrats established at random. Shrub stem density averaged 38.2 stems per m<sup>2</sup> (Table 1).

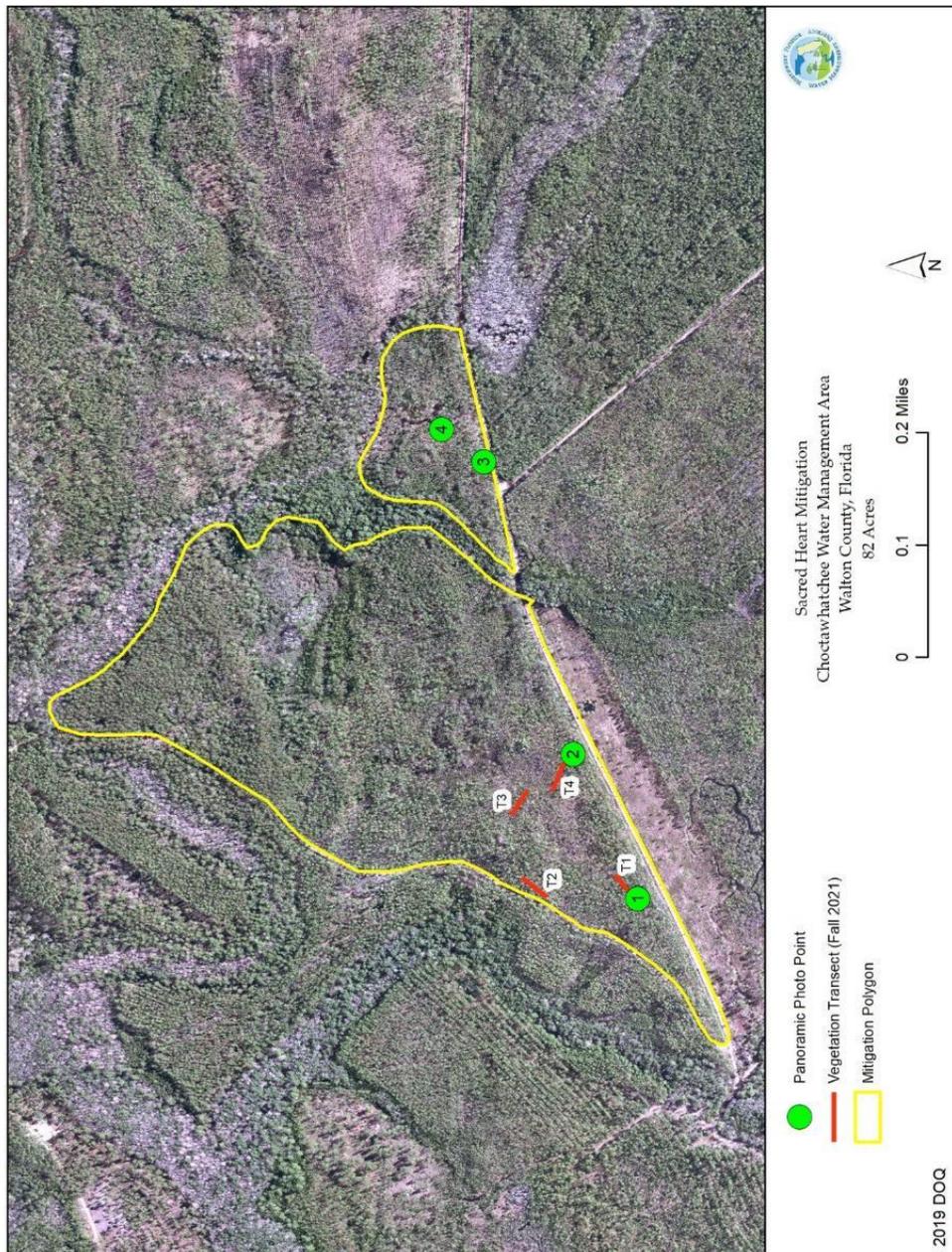


Figure 2. Fall 2021 Vegetation Transects

Table 1. Sacred Heart Mitigation - Rooted Shrub Stem Density Quadrats (November 2021)

<b>Shrub Quadrat</b>	<b>Shrub Stems per m<sup>2</sup></b>
1	10
2	49
3	49
4	42
5	41
AVG Stem per m <sup>2</sup>	38.2

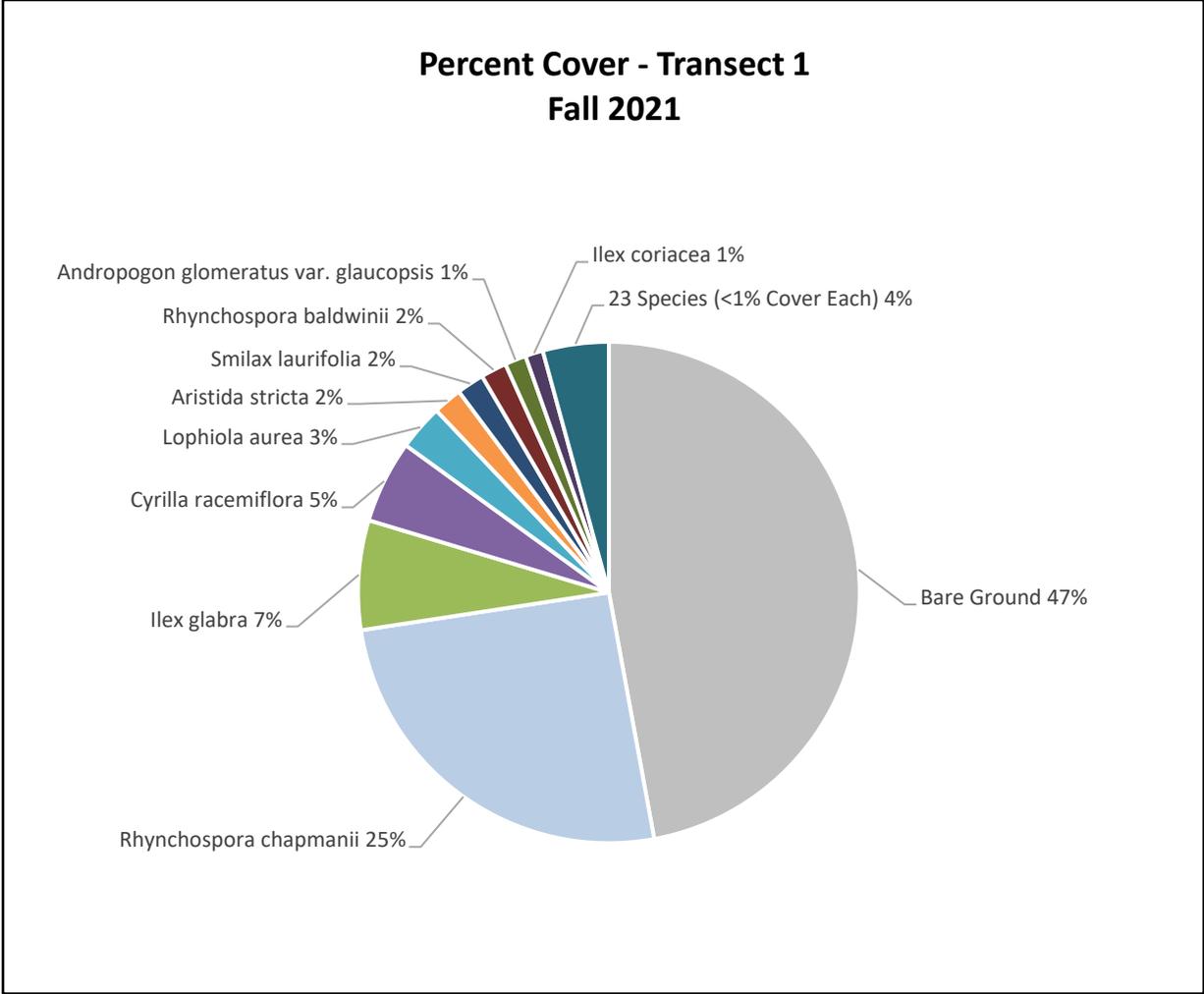


Figure 3. Sacred Heart Mitigation - Transect 1 (November 2021)

Table 2. Sacred Heart Mitigation - Transect 1 (November 2021)

Scientific Name	Common Name	Percent Cover
<i>Andropogon arctatus</i>	Pinewoods bluestem	0.49
<i>Andropogon glomeratus</i> var. <i>glaucopsis</i>	Purple bluestem	1.37
<i>Andropogon glomeratus</i> var. <i>glomeratus</i>	Bushy bluestem	0.33
<i>Andropogon</i> sp.	Bluestem	0.03
<i>Aristida stricta</i>	Wiregrass	1.86
<i>Aronia arbutifolia</i>	Red chokeberry	0.03
Bare Ground	Bare Ground	47.11
<i>Coleataenia longifolia</i>	Ciliate redtop panicum	0.23
<i>Cyrilla racemiflora</i>	Titi	5.33
<i>Dichanthelium ensifolium</i> var. <i>ensifolium</i>	Cypress witchgrass	0.20
<i>Dichanthelium leucothrix</i>	Rough witchgrass	0.59
<i>Dichanthelium</i> sp.	Witchgrass	0.10
<i>Drosera capillaris</i>	Pink sundew	0.07
<i>Gaylussacia dumosa</i>	Dwarf huckleberry	0.26
<i>Gaylussacia mosieri</i>	Woolly huckleberry	0.07
<i>Hypericum brachyphyllum</i>	Coastalplain St. John's wort	0.03
<i>Ilex coriacea</i>	Large gallberry	1.14
<i>Ilex glabra</i>	Gallberry	7.07
<i>Kelochloa verrucosa</i>	Warty panicgrass	0.20
<i>Lachnanthes caroliana</i>	Carolina redroot	0.29
<i>Lachnocaulon anceps</i>	Whitehead bogbutton	0.03
<i>Lophiola aurea</i>	Golden crest	2.94
<i>Lycopodiella appressa</i>	Southern club-moss	0.46

Scientific Name	Common Name	Percent Cover
<i>Polygala lutea</i>	Orange milkwort	0.03
<i>Rhexia alifanus</i>	Savannah meadowbeauty	0.07
<i>Rhexia petiolata</i>	Fringed meadowbeauty	0.03
<i>Rhynchospora baldwinii</i>	Baldwin's beaksedge	1.67
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	25.48
<i>Rhynchospora fascicularis</i>	Fascicled beaksedge	0.36
<i>Rhynchospora plumosa</i>	Plumed beaksedge	0.10
<i>Smilax laurifolia</i>	Laurel greenbrier	1.77
<i>Xyris brevifolia</i>	Shortleaf yellow-eyed grass	0.13
<i>Xyris sp.</i>	Yellow-eyed grass	0.13
		100.00

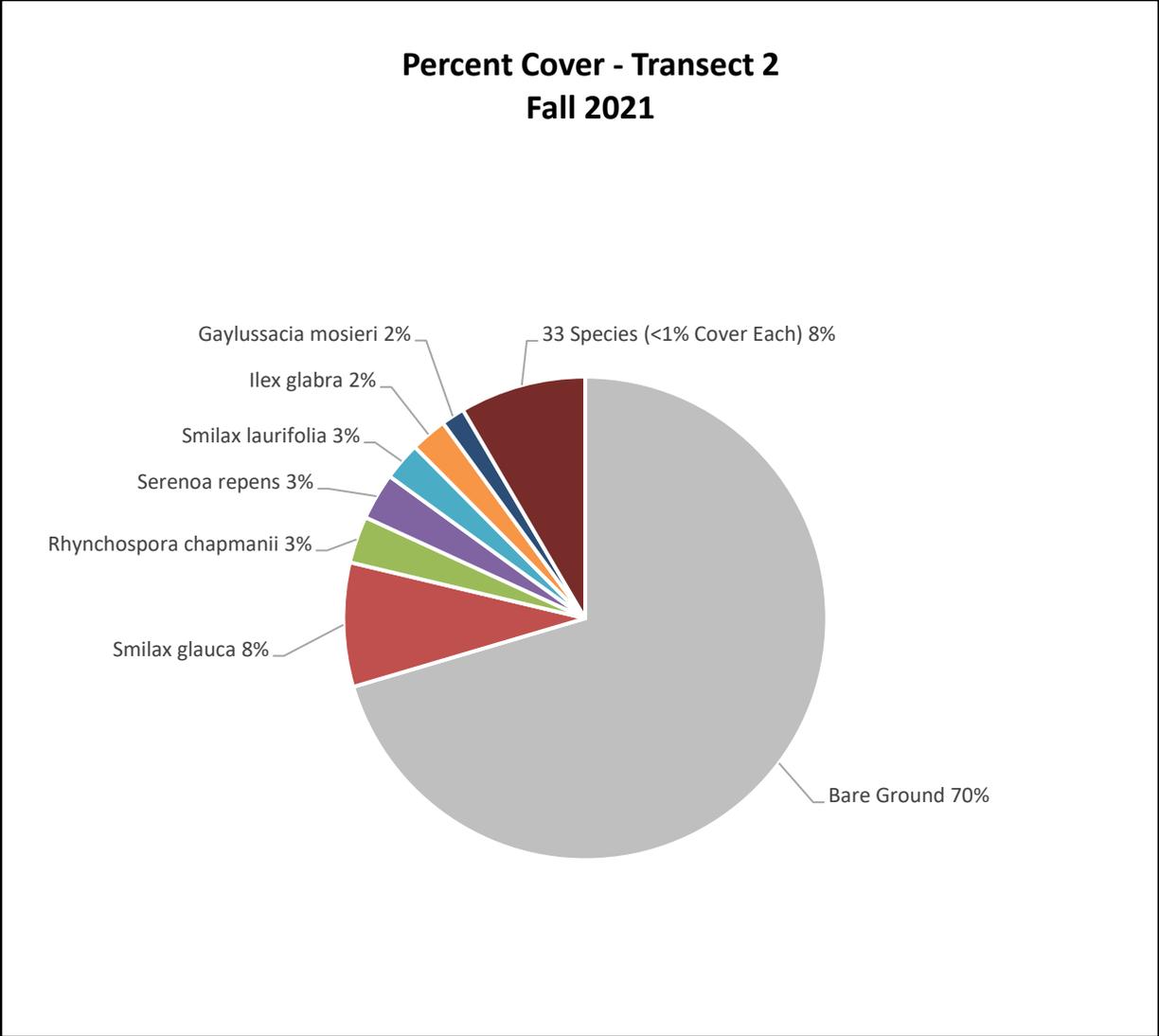


Figure 4. Sacred Heart Mitigation - Transect 2 (November 2021)

Table 3. Sacred Heart Mitigation - Transect 2 (November 2021)

Scientific Name	Common Name	Percent Cover
<i>Andropogon arctatus</i>	Pinewoods bluestem	0.24
<i>Aristida stricta</i>	Wiregrass	0.52
Bare Ground	Bare Ground	70.43
<i>Cliftonia monophylla</i>	Black titi	0.52
<i>Coleataenia longifolia</i>	Ciliate redtop panicum	0.10
<i>Ctenium aromaticum</i>	Toothache grass	0.52
<i>Dichanthelium ensifolium</i> var. <i>ensifolium</i>	Cypress witchgrass	0.10
<i>Dichanthelium leucothrix</i>	Rough witchgrass	0.07
<i>Dichanthelium</i> sp.	Witchgrass	0.03
<i>Dichanthelium strigosum</i>	Roughhair witchgrass	0.03
<i>Drosera capillaris</i>	Pink sundew	0.03
<i>Fuirena breviseta</i>	Saltmarsh umbrellasedge	0.10
<i>Gaylussacia mosieri</i>	Woolly huckleberry	1.57
<i>Ilex coriacea</i>	Large gallberry	0.52
<i>Ilex glabra</i>	Gallberry	2.44
<i>Ilex vomitoria</i>	Yaupon	0.52
<i>Kelochloa verrucosa</i>	Warty panicgrass	0.91
<i>Lachnanthes caroliana</i>	Carolina redroot	0.38
<i>Lachnocaulon anceps</i>	Whitehead bogbutton	0.03
<i>Lachnocaulon</i> sp.	Bogbutton	0.03
<i>Ludwigia linifolia</i>	Southeastern primrosewillow	0.03
<i>Oldenlandia uniflora</i>	Clustered mille grains	0.07
<i>Osmunda cinnamomea</i>	Cinnamon fern	0.24
<i>Osmunda regalis</i> var. <i>spectabilis</i>	Royal fern	0.24

Scientific Name	Common Name	Percent Cover
<i>Pinus elliottii</i>	Slash pine	0.24
<i>Quercus minima</i>	Dwarf live oak	0.70
<i>Rhexia petiolata</i>	Fringed meadowbeauty	0.03
<i>Rhynchospora baldwinii</i>	Baldwin's beaksedge	0.45
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	3.14
<i>Rhynchospora debilis</i>	Savannah beaksedge	0.24
<i>Rhynchospora fascicularis</i>	Fascicled beaksedge	0.10
<i>Rhynchospora pusilla</i>	Fairy beaksedge	0.21
<i>Rhynchospora sp.</i>	beaksedge	0.03
<i>Scleria reticularis</i>	Netted nutrush	0.52
<i>Serenoa repens</i>	Saw palmetto	3.14
<i>Smilax glauca</i>	Cat greenbrier	8.30
<i>Smilax laurifolia</i>	Laurel greenbrier	2.55
<i>Vaccinium corymbosum</i>	Highbush blueberry	0.24
<i>Vaccinium myrsinites</i>	Shiny blueberry	0.03
<i>Xyris sp.</i>	Yellow-eyed grass	0.31
		100.00

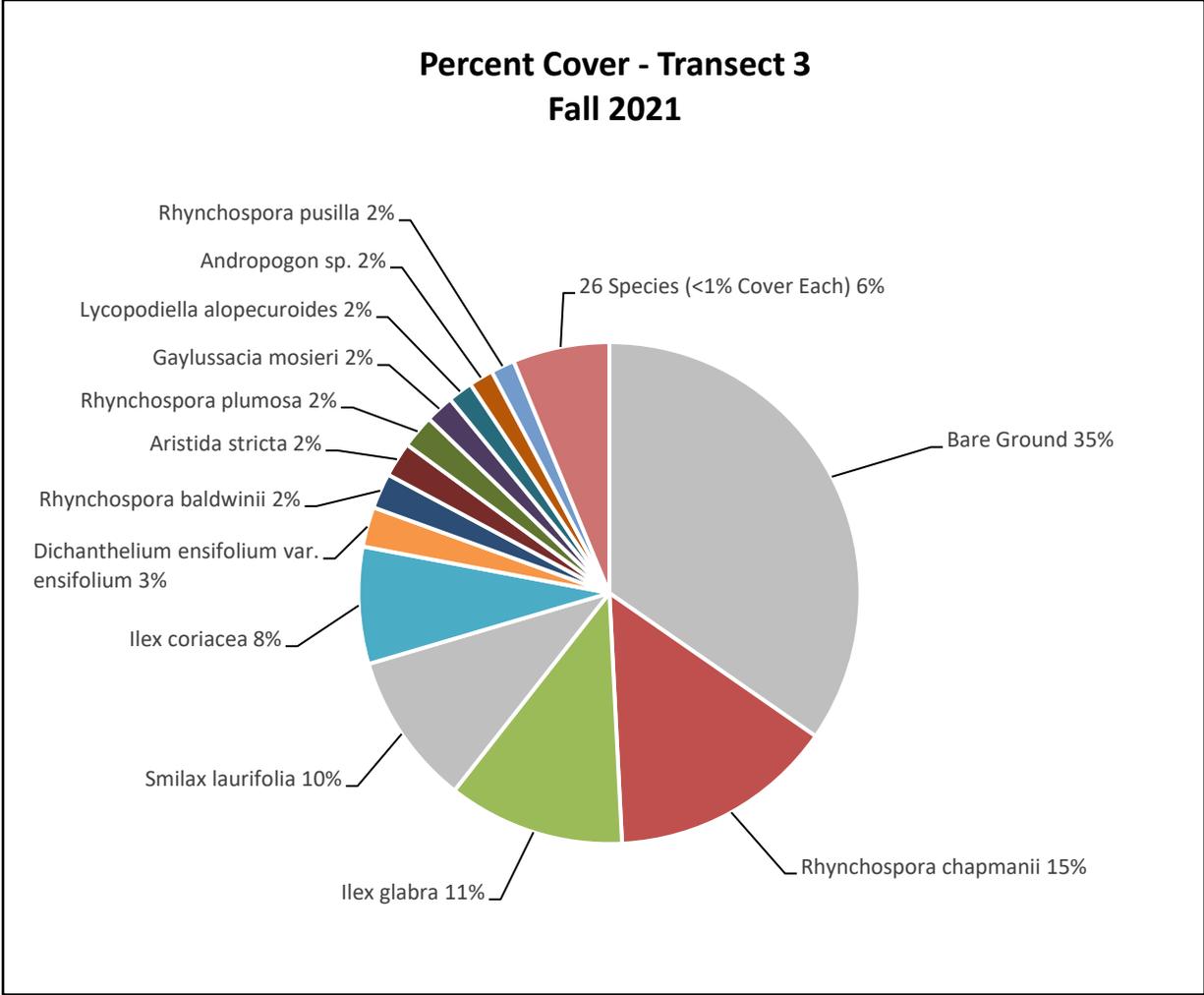


Figure 5. Sacred Heart Mitigation - Transect 3 (November 2021)

Table 4. Sacred Heart Mitigation - Transect 3 (November 2021)

Scientific Name	Common Name	Percent Cover
<i>Andropogon glomeratus</i> var. <i>glaucopsis</i>	Purple bluestem	0.03
<i>Andropogon glomeratus</i> var. <i>glomeratus</i>	Bushy bluestem	0.22
<i>Andropogon</i> sp.	Bluestem	1.57
<i>Andropogon virginicus</i> var. <i>glaucus</i>	Chalky bluestem	0.42
<i>Aristida palustris</i>	Longleaf threeawn	0.03
<i>Aristida stricta</i>	Wiregrass	2.25
Bare Ground	Bare Ground	34.66
<i>Coleataenia longifolia</i>	Ciliate redtop panicum	0.42
<i>Dichanthelium dichotomum</i>	Cypress witchgrass	0.03
<i>Dichanthelium ensifolium</i> var. <i>ensifolium</i>	Cypress witchgrass	2.57
<i>Dichanthelium leucothrix</i>	Rough witchgrass	0.10
<i>Dichanthelium scabriusculum</i>	Woolly witchgrass	0.22
<i>Dichanthelium strigosum</i>	Roughhair witchgrass	0.03
<i>Drosera capillaris</i>	Pink sundew	0.13
<i>Eriocaulon decangulare</i>	Tenangle pipewort	0.10
<i>Gaylussacia mosieri</i>	Woolly huckleberry	1.83
<i>Hypericum brachyphyllum</i>	Coastalplain St. John's wort	0.03
<i>Ilex coriacea</i>	Large gallberry	7.54
<i>Ilex glabra</i>	Gallberry	11.39
<i>Kelochloa verrucosa</i>	Warty panicgrass	0.13
<i>Lachnanthes caroliana</i>	Carolina redroot	0.26
<i>Lachnocaulon anceps</i>	Whitehead bogbutton	0.48
<i>Lachnocaulon</i> sp.	Bogbutton	0.13

Scientific Name	Common Name	Percent Cover
<i>Lophiola aurea</i>	Golden crest	0.58
<i>Lycopodiella alopecuroides</i>	Foxtail club-moss	1.60
<i>Oldenlandia uniflora</i>	Clustered mille graines	0.03
<i>Pinus elliottii</i>	Slash pine	0.71
<i>Rhexia alifanus</i>	Savannah meadowbeauty	0.06
<i>Rhynchospora baldwinii</i>	Baldwin's beaksedge	2.28
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	14.54
<i>Rhynchospora fascicularis</i>	Fascicled beaksedge	0.45
<i>Rhynchospora plumosa</i>	Plumed beaksedge	2.15
<i>Rhynchospora pusilla</i>	Fairy beaksedge	1.54
<i>Smilax glauca</i>	Cat greenbrier	0.32
<i>Smilax laurifolia</i>	Laurel greenbrier	9.85
<i>Vaccinium myrsinites</i>	Shiny blueberry	0.22
<i>Xyris ambigua</i>	Coastalplain yellow-eyed grass	0.80
<i>Xyris brevifolia</i>	Shortleaf yellow-eyed grass	0.10
<i>Xyris sp.</i>	Yellow-eyed grass	0.19
		100.00

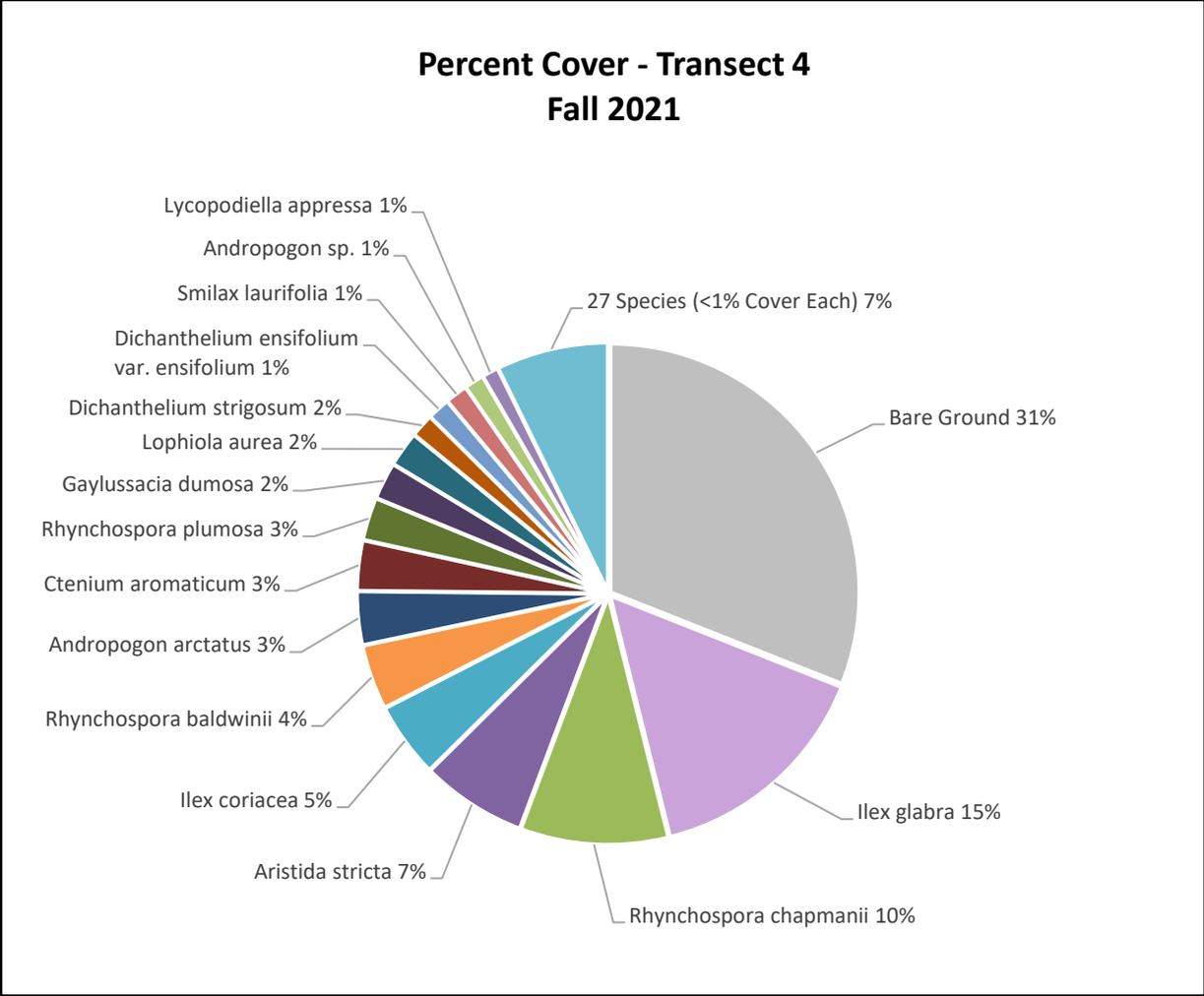


Figure 6. Sacred Heart Mitigation - Transect 4 (November 2021)

Table 5. Sacred Heart Mitigation - Transect 4 (November 2021)

Scientific Name	Common Name	Percent Cover
<i>Andropogon arctatus</i>	Pinewoods bluestem	3.48
<i>Andropogon glomeratus</i>	Bushy bluestem	0.46
<i>Andropogon sp.</i>	Bluestem	1.28
<i>Andropogon virginicus</i>	Broomsedge bluestem	0.09
<i>Andropogon virginicus var. glaucus</i>	Chalky bluestem	0.70
<i>Aristida stricta</i>	Wiregrass	6.87
<i>Aronia arbutifolia</i>	Red chokeberry	0.67
Bare Ground	Bare Ground	31.00
<i>Coleataenia longifolia</i>	Ciliate redtop panicum	0.46
<i>Ctenium aromaticum</i>	Toothache grass	3.27
<i>Dichanthelium ensifolium</i>	Cypress witchgrass	0.21
<i>Dichanthelium ensifolium var. ensifolium</i>	Cypress witchgrass	1.47
<i>Dichanthelium ensifolium var. unciphyllum</i>	Cypress witchgrass	0.43
<i>Dichanthelium leucothrix</i>	Rough witchgrass	0.31
<i>Dichanthelium ovale</i>	Eggleaf witchgrass	0.43
<i>Dichanthelium strigosum</i>	Roughhair witchgrass	1.53
<i>Gaylussacia dumosa</i>	Dwarf huckleberry	2.41
<i>Gaylussacia frondosa var. tomentosa</i>	Blue huckleberry	0.46
<i>Gaylussacia mosieri</i>	Woolly huckleberry	0.24
<i>Hypericum microsepalum</i>	Flatwoods St. John's wort	0.06
<i>Ilex coriacea</i>	Llarge gallberry	4.89
<i>Ilex glabra</i>	Gallberry	15.12
<i>Kellochloa verrucosa</i>	Warty panicgrass	0.46
<i>Lachnanthes caroliana</i>	Carolina redroot	0.58

Scientific Name	Common Name	Percent Cover
<i>Lachnocaulon anceps</i>	Whitehead bogbutton	0.12
<i>Lachnocaulon sp.</i>	Bogbutton	0.03
<i>Lechea pulchella var. ramosissima</i>	Leggett's pinweed	0.03
<i>Lophiola aurea</i>	Golden crest	2.29
<i>Lycopodiella appressa</i>	Southern club-moss	1.07
<i>Oldenlandia uniflora</i>	Clustered mille grains	0.03
<i>Polygala lutea</i>	Orange milkwort	0.06
<i>Rhexia alifanus</i>	Savannah meadowbeauty	0.03
<i>Rhynchospora baldwinii</i>	Baldwin's beaksedge	4.22
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge	9.59
<i>Rhynchospora fascicularis</i>	Fascicled beaksedge	0.67
<i>Rhynchospora plumosa</i>	Plumed beaksedge	2.78
<i>Rhynchospora pusilla</i>	Fairy beaksedge	0.03
<i>Seymeria cassioides</i>	Yaupon blacksenna	0.06
<i>Smilax glauca</i>	Cat greenbrier	0.09
<i>Smilax laurifolia</i>	Laurel greenbrier	1.47
<i>Xyris brevifolia</i>	Shortleaf yellow-eyed grass	0.43
<i>Xyris caroliniana</i>	Carolina yellow-eyed grass	0.09
<i>Xyris flabelliformis</i>	Savannah yellow-eyed grass	0.03
		100.00

## Panoramic Monitoring Photos

### Photo Point 1 (Hydric Pine Flatwoods Restoration)



Sacred Heart Mitigation Photo Point 1: 3/8/2018



Sacred Heart Mitigation Photo Point 1: 9/18/2018



Sacred Heart Mitigation Photo Point 1: 9/26/2019



Sacred Heart Mitigation Photo Point 1: 10/30/2020



Sacred Heart Mitigation Photo Point 1: 4/21/2021



Sacred Heart Mitigation Photo Point 1: 9/23/2021

**Photo Point 2  
(Hydric Pine Flatwoods Restoration)**



Sacred Heart Mitigation Photo Point 2: 3/8/2018



Sacred Heart Mitigation Photo Point 2: 9/18/2018



Sacred Heart Mitigation Photo Point 2: 9/26/2019



Sacred Heart Mitigation Photo Point 2: 10/30/2020



Sacred Heart Mitigation Photo Point 2: 4/21/2021



Sacred Heart Mitigation Photo Point 2: 9/23/2021

**Photo Point 3  
(Hydric Pine Flatwoods Restoration)**



Sacred Heart Mitigation Photo Point 3: 3/8/2018



Sacred Heart Mitigation Photo Point 3: 9/18/2018



Sacred Heart Mitigation Photo Point 3: 9/26/2019



Sacred Heart Mitigation Photo Point 3: 10/30/2020



Sacred Heart Mitigation Photo Point 3: 4/21/2021



Sacred Heart Mitigation Photo Point 3: 9/23/2021

**Photo Point 4  
(Hydric Pine Flatwoods Restoration)**



Sacred Heart Mitigation Photo Point 4: 3/8/2018



Sacred Heart Mitigation Photo Point 4: 9/18/2018



Sacred Heart Mitigation Photo Point 4: 9/26/2019



Sacred Heart Mitigation Photo Point 4: 10/30/2020



Sacred Heart Mitigation Photo Point 4: 4/21/2021



Sacred Heart Mitigation Photo Point 4: 9/23/2021

## **Conclusions**

Mitigation and monitoring are being implemented in accordance with the USACE-approved mitigation plan associated with SAJ-1998-4720 IP-RVH. Performance standards for implementation of prescribed fire, monitoring, and invasive exotic plant species cover are being met. Shrub cover, although reduced by herbicide treatment in September 2019, averages 16.14% and is above the performance standard of <5% cover. Additional herbicide treatments and prescribed fire will be necessary to bring shrub cover into compliance with permit conditions.