Wildlife Conservation Values Assessment

Carolina Bays Resort LLC Conservation Easement Property

North Myrtle Beach, Horry County, SC

March 28, 2017

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CONSERVATION ECOLOGY LLC

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This report provides an assessment of the wildlife conservation values of the 116 acre Carolina Bays Resort LLC conservation easement property located near the town of North Myrtle Beach in Horry County, SC. The conservation easement was donated by Carolina Bays Resort LLC to North American Land Trust on December 30, 2014. The easement document is accompanied by a Baseline Document Report prepared by NALT which describes existing conditions and conservation values of the property. The property contains frontage along the Intercoastal Waterway and is mostly forested, contains very low elevations (~25-30'), flat topography, and is currently managed by EcoVest.

I reviewed existing mapping, species, and habitat data to determine conservation context on the landscape and potential for rare species. I also visited the property during the spring and summer of 2016, and the winter of 2017, in order to perform surveys of wildlife species occupying the property. The field surveys targeted detection of birds, large- and medium sized mammals, and bats. Additional fieldwork may take place in 2017 and will be followed by an update to this report

The Carolina Bays Resort LLC property is one of a clustered portfolio of conservation properties held under conservation easement by NALT that are collectively referred to as the "Sandridge" properties. For logistical reasons, wildlife field surveys for the Carolina Bays property were combined with surveys on seven adjacent and nearby properties during 2016 and early-2017 (see "study sites" on map below). Because the conservation values and viability of the Carolina Bays Resort LLC property are enhanced by its adjacency to the neighboring conservation properties, some of the maps and tables below depict findings for multiple properties.

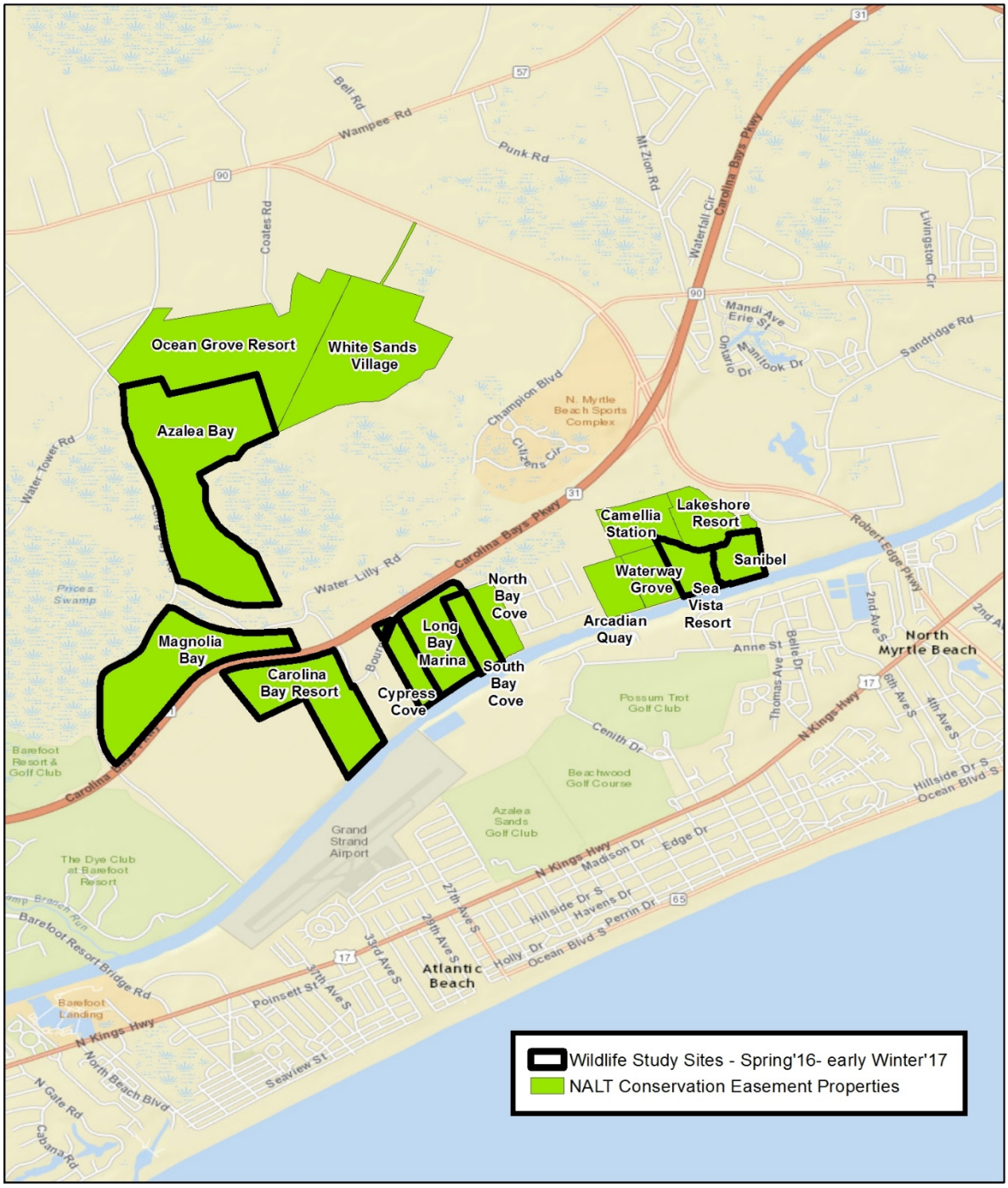
SUMMARY OF FINDINGS

- The 116 acre Carolina Bays Resort LLC property lies within a 1,296 acre cluster of conservation easement properties held by NALT, collectively referred to as the "Sandridge" properties. Protecting a large cluster of natural areas, such as the Sandridge properties, enhances the viability of each individual easement property by minimizing habitat fragmentation, enhancing ecological connectivity, and minimizing easement stewardship and defense issues.
- The dominate vegetation type on the Carolina Bays property is mature Mesic Mixed Hardwood Forest (Coastal Plain Subtype)
- The South Carolina Natural Heritage Trust database has records for 11 rare vertebrate species in the county. Of these, Black Bear has potential to occasional use the property.
- 15 bird species were observed during spring point-count surveys including:
    - 8 SC State Wildlife Action Plan (SC SWAP) priority Species
    - 6 Atlantic Coast Joint Venture (ACJV) priority species
- 3 bat species were detected and all are considered Highest Priority species under the SC Wildlife Action Plan
- In total, 11 species listed as conservation priorities under the SC State Wildlife Action Plan were observed

Review of Existing Mapping, Species, and Habitat Data

Conservation Context – Adjacency and proximity to other conservation properties enhances the viability and conservation value of a site by minimizing fragmentation and negative edge-effect influences, and by increasing the effective size of contiguous protected habitat and promoting ecological connectivity.

- The 116 acre Carolina Bays Resort LLC property lies within a 1,296 acre cluster of conservation easement properties held by NALT, collectively referred to as the Sandridge properties
- The Carolina Bays property lies 400 ft from the 151 acre - Magnolia Bay conservation property, and 1,400 feet from a 145 acre cluster of contiguous conservation lands held under conservation easement by NALT (Cypress Cove, Long Bay Marina, South Bay Cove, North Bay Cove)
- Protecting a large cluster of natural areas, such as the Sandridge properties, enhances the viability of each individual easement property by minimizing habitat fragmentation, enhancing ecological connectivity, and minimizing easement stewardship and defense issues. Additionally, protection of private lands at this scale is very uncommon and difficult for land protection organizations to achieve (particularly in the eastern U.S. and within high growth areas)



Locator Map
Sandridge Conservation Properties
Horry County, SC

Christopher R. Wilson
March 21, 2017
Note: easement and parcel boundaries depicted on this map are for informational purposes and do not represent legal surveys

0 0.5 1 Miles

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USGS Topographic Map
Sandridge Conservation Properties
Horry County, SC

Christopher R. Wilson
March 21, 2017
Note: easement and parcel boundaries depicted on this map are for informational purposes and do not represent legal surveys

0 0.25 0.5 Miles

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Available Habitats – Vegetation types on the property were classified in the field by NALT biologists and reported in the Baseline Documentation Report. Classifications are based on the National Vegetation Classification System.

- The dominate vegetation type on the property is mature Mesic Mixed Hardwood Forest (Coastal Plain Subtype). The property also contains ~ 1,500 feet of frontage along the Intercostal Waterway

South Carolina Natural Heritage Trust GIS Database Review

The South Carolina Natural Heritage Trust is part of the South Carolina Department of Natural Resources and serves as an information clearinghouse in support of the conservation of rare plants, animals, and natural communities. Records of rare species are reported voluntarily to the trust by biologists, and become part of the database. A lack of records for a property or county does not mean that a particular rare species does not occur; only that no records have been reported or, more likely, that surveys have not been conducted.

The SCNHT GIS database was queried for records on or near the property.

- The SCNHT database has no records of rare species occurring on the property
- 11 rare vertebrate species records occur within the county including: Spotted Turtle, Southern Hognose Snake, Black Bear, Red-cockaded Woodpecker, and Pine snake.

Given the habitats on the property, the Black Bear has potential to occasionally use the property and future surveys should target this species. A Black Bear was observed on the nearby Azalea Bay property during the 2016 surveys.

Rare, Threatened, and Endangered Species and Communities Known to Occur in Horry County, SC
June 11, 2014

Scientific Name	Common Name	USESA Designation	State Protection	Global Rank	State Rank
Vertebrate Animals					
Caretta caretta	Loggerhead	LT: Threatened	ST: Threatened	G3	S3
Clemmys guttata	Spotted Turtle		ST: Threatened	G5	S5
Corynorhinus rafinesquii	Rafinesque's Big-eared Bat		SE: Endangered	G3G4	S2?
Fundulus diaphanus	Banded Killifish			G5	S1
Haliaeetus leucocephalus	Bald Eagle		ST: Threatened	G5	S2
Heterodon simus	Southern Hognose Snake			G2	SNR
Mycteria americana	Wood Stork	LE: Endangered	SE: Endangered	G4	S1S2
Picoides borealis	Red-cockaded Woodpecker	LE: Endangered	SE: Endangered	G3	S2
Pituophis melanoleucus	Pine or Gopher Snake			G4	S3S4
Sterna antillarum	Least Tern		ST: Threatened	G4	S3
Ursus americanus	Black Bear			G5	S3?
Invertebrate Animal					
Elliptio congaraea	Carolina Slabshell			G3	S3
Lampsilis splendida	Rayed Pink Fatmucket			G3	S2
Villosa delumbis	Eastern Creekshell			G4	S4
Animal Assemblage					
Waterbird Colony				GNR	SNR
Vascular Plants					
Agalinis aphylla	Coastal Plain False-foxglove			G3G4	S1
Agalinis maritima	Salt-marsh False-foxglove			G5	S1
Amaranthus pumilus	Seabeach Amaranth	LT: Threatened		G2	S1
Andropogon mohrii	Broomsedge			G4?	S2
Anthaenantia rufa	Purple Silkyscale			G5	S2
Asclepias pedicellata	Savannah Milkweed			G4	S2
Balduina uniflora	One-flower Balduina			G4	S2
Calamovilfa brevipilis	Pine-barrens Reed-grass			G4	S1
Calopogon barbatus	Bearded Grass-pink			G4?	S2
Chamaedaphne calyculata	Leatherleaf			G5	SNR
Coreopsis gladiata	Southeastern Tickseed			G4G5	SNR
Coreopsis integrifolia	Ciliate-leaf Tickseed			G1G2	S1
Coreopsis rosea	Rose Coreopsis			G3	S2
Crotonopsis linearis	Narrowleaf Rushfoil			G5	SNR

Scientific Name	Common Name	USESA Designation	State Protection	Global Rank	State Rank
Dionaea muscipula	Venus' Fly-trap			G3	S3
Echinodorus tenellus	Dwarf Burhead			G5?	S2
Eupatorium recurvans	Coastal-plain Thorough-wort			G3G4Q	S1?
Fimbristylis perpusilla	Harper's Fimbry			G2	S2
Helenium brevifolium	Shortleaf Sneezeweed			G4	S1
Helianthemum georgianum	Georgia Frostweed			G4	S2
Ilex amelanchier	Sarvis Holly			G4	S3
Juncus abortivus	Pinebarren Rush			G4G5	S2
Lachnocaulon beyrichianum	Southern Bog-button			G4	S2
Lechea torreyi	Piedmont Pinweed			G4	SNR
Lilaeopsis carolinensis	Carolina Lilaeopsis			G3G5	S2
Lipocarpha micrantha	Dwarf Bulrush			G5	S2
Litsea aestivalis	Pondspice			G3?	S3
Lygodium palmatum	Climbing Fern			G4	S3
Minuartia godfreyi	Godfrey's Stitchwort			G1	SX
Oxypolis ternata	Piedmont Cowbane			G3	S1
Parnassia caroliniana	Carolina Grass-of-parnassus			G3	S2
Peltandra sagittifolia	Spoon-flower			G3G4	S2
Physostegia leptophylla	Slender-leaved Dragon-head			G4?	SNR
Plantago sparsiflora	Pineland Plantain			G3	S2
Pteroglossaspis ecristata	Crestless Plume Orchid			G2G3	S2
Pyxidanthera barbulata	Well's Pyxie Moss			G4	S2
Rhynchospora oligantha	Few-flowered Beaked-rush			G4	S2
Ruellia pedunculata ssp. *pinetorum*	Stalked Wild Petunia			G5T3T4	SH
Sabatia bartramii	Bartram's Rose-gentian			G4G5	S1
Sabatia kennedyana	Plymouth Gentian			G3	S2
Sarracenia rubra	Sweet Pitcher-plant			G4	S3S4
Schwalbea americana	Chaffseed	LE: Endangered		G2G3	S2
Scleria baldwinii	Baldwin Nutrush			G4	S2
Solidago pulchra	Carolina Goldenrod			G3	S1
Sporobolus teretifolius	Wire-leaved Dropseed			G2	S1
Stylisma pickeringii var. *pickeringii*	Pickering's Morning-glory			G4T3	S1
Tofieldia glabra	White False-asphodel			G4	S1S2
Xyris brevifolia	Short-leaved Yellow-eyed Grass			G4G5	S1
Xyris flabelliformis	Savannah Yellow-eyed Grass			G4	S1
Communities					

Scientific Name	Common Name	USESA Designation	State Protection	Global Rank	State Rank
Bald cypress - tupelo gum swamp				G5	S4
Bay forest				G3G4	S3
Bottomland hardwoods				G5	S4
Limestone sink				G3	S1S2
Maritime forest				G2	S2
Maritime grassland				G3G4	S2
Maritime shrub thicket				G4	S2S3
Pine flatwoods				G5	S3S4
Pine savanna				G3	S2
Pocosin				G3G4	S3S4
Pond pine woodland				G4G5	S3
Swale pocosin				G2?	S2?
Xeric sandhill scrub				G5	S3
Geological					
Carolina bay				GNR	SNR

Wildlife Field Surveys 2016

Conservation Significance of Observed Species–

The terms Rare, Endangered, or Threatened species are often used as a catch-all description for species that are in trouble and need conservation attention. Federal and State Endangered Species programs create lists of species that are afforded special legal protections from take, harassment, etc. While important, these lists are not (by themselves) the best references for determining the conservation significance of a species or its habitat, or for prioritizing conservation actions and guiding habitat protection. Whether or not a species is listed as Endangered or Threatened under State and Federal Endangered Species Acts necessarily involves political considerations and much bureaucracy, and many species are considered biologically endangered, but are not on such lists. Also, when a species is listed as Endangered or Threatened, available options to save it may be severely limited and expensive, or it may be too late. Furthermore, a species can be rare but its population quite stable with few threats, whereas a common species can be experiencing major declines with more intense threats anticipated in the future. In response to the need for more robust and proactive methods to determine conservation priorities, a number of different species prioritization schemes (besides State and Federal Endangered Species Lists) have developed in recent decades.

In order to determine the conservation significance of wildlife species found on the property, I referred to the following conservation plans that assign conservation priority status. While these plans offer no legal protections for species, they are government supported and are meant to guide proactive and voluntary conservation actions so that endangered species listings do not become necessary.

The Atlantic Coast Joint Venture - South Atlantic Migratory Bird Initiative (SAMBI) Implementation Plan (2006)

> The ACJV is a partnership of federal, regional and state agencies and organizations focused on the conservation of habitat for native bird species in the Atlantic Flyway region of the United States. The joint venture coordinates planning and delivery of bird habitat conservation, resulting in more effective and efficient conservation and the ability to focus limited resources on continental, national, flyway and regional bird conservation priorities. It is administered through the U.S. Fish and Wildlife Service and coordinates much of the science guiding federal grant making for conservation projects (http://acjv.org/)
>
> The ACJV-SAMBI Implementation Plan (v3.1, 2006) encompasses the eastern portion of BCR 27, the Southeastern Coastal Plain. The objective of the plan is to integrate the objectives of existing and emerging bird conservation plans into a single plan that land managers, biologists, administrators, and private landowners can use to achieve common goals and objectives for bird conservation across a regional landscape. The plan identifies priority species, priority habitats, priority areas, and strategies to achieve the conservation of “all birds across all habitats” in this region. This plan is a result of the

collaboration of federal, state, non-governmental, and private interests to build a cohesive strategy for bird conservation in the southeastern United States.

The Priority Bird Species list for the region is categorized as Highest, High, and Moderate priorities as follows:

- Highest priority species are those of High Continental and/or Regional Concern in need of Immediate Management Attention
- High priority species are species of Continental or Regional Concern in need of Management Attention, and
- Moderate priority species are species where monitoring is needed to ensure population persistence, and which may also include additional Federally endangered species, State listed species, and other species of conservation or management interest.

An important habitat conservation strategy identified in the plan (Strategy B.2.) is the acquisition of conservation easements: "Conservation easements with private landowners and local governments will be used to acquire legal interests to conserve and manage important wetlands and associated upland habitats and limit development while allowing some use by the landowner consistent with the easement conditions." http://www.acjv.org/documents/SAMBI_Plan3.2.pdf

South Carolina's Comprehensive Wildlife Conservation Strategy (aka. – SC State Wildlife Action Plan, or SC SWAP)

The SC SWAP emphasizes a cooperative, proactive approach to conservation. The charge to state wildlife agencies to develop comprehensive strategies had its origins in the Wildlife Conservation and Recreation Program (WCRP) that was created in the federal Appropriations Act of 2001. Appropriations language provided that funds may be used for "...the planning and implementation of [a state's] wildlife conservation and restoration program and wildlife conservation strategy, including wildlife conservation, wildlife conservation education, and wildlife-associated recreation projects" (114 STAT. 2762A -118 PUBLIC LAW 106–553 — APPENDIX B — Title IX). The WCRP appropriations language challenged the states to develop projects in the three major areas anticipated in the Teaming with Wildlife initiative: conservation, education, and recreation. WCRP appropriations language also provided that "Within five years of the date of the initial apportionment, [the states shall] develop and begin implementation of a wildlife conservation strategy based upon the best available and appropriate scientific information and data ….".

In the 2015 revision to the SC SWAP, the SCDNR identified 825 species of flora and fauna to include on the State's List of Species with the Greatest Conservation Need (SGCN, or "priority species"). Expert review helped to identify the current needs of wildlife in the state. These needs translate into conservation actions that can cross multiple scales, with treatments recommended at the species, habitat and regional level. Eight recurring

conservation action areas were identified, including: education and outreach; habitat protection; invasive and nonnative species; private land programs; public land management; regulatory actions; survey and research needs; and urban and developing lands. All of South Carolina's 62 priority actions to address problems and issues fall within these conservation action areas.

The SC SWAP Species of Greatest Conservation Need list was used to assess the conservation priority of wildlife species observed on the property. http://dnr.sc.gov/swap/index.html

Breeding Bird Surveys **-** I estimated the diversity, distribution, and relative abundance of breeding birds across the property using the point-count sampling methodology. Birds were sampled from "point count stations" which were generally located along access roads and trails. During the first week of May 2016, each point count station was sampled once between the hours of local sunrise and 10:00 am, for a period of 5 minutes, and all birds that could be seen or heard within 125 meters from the point count station were identified, counted, and recorded. Flyovers and birds beyond 125 meters were also noted.

Point-count Bird Survey Results - Bird species observed during point-count surveys, their priority status, and distribution are presented in the tables and maps below.

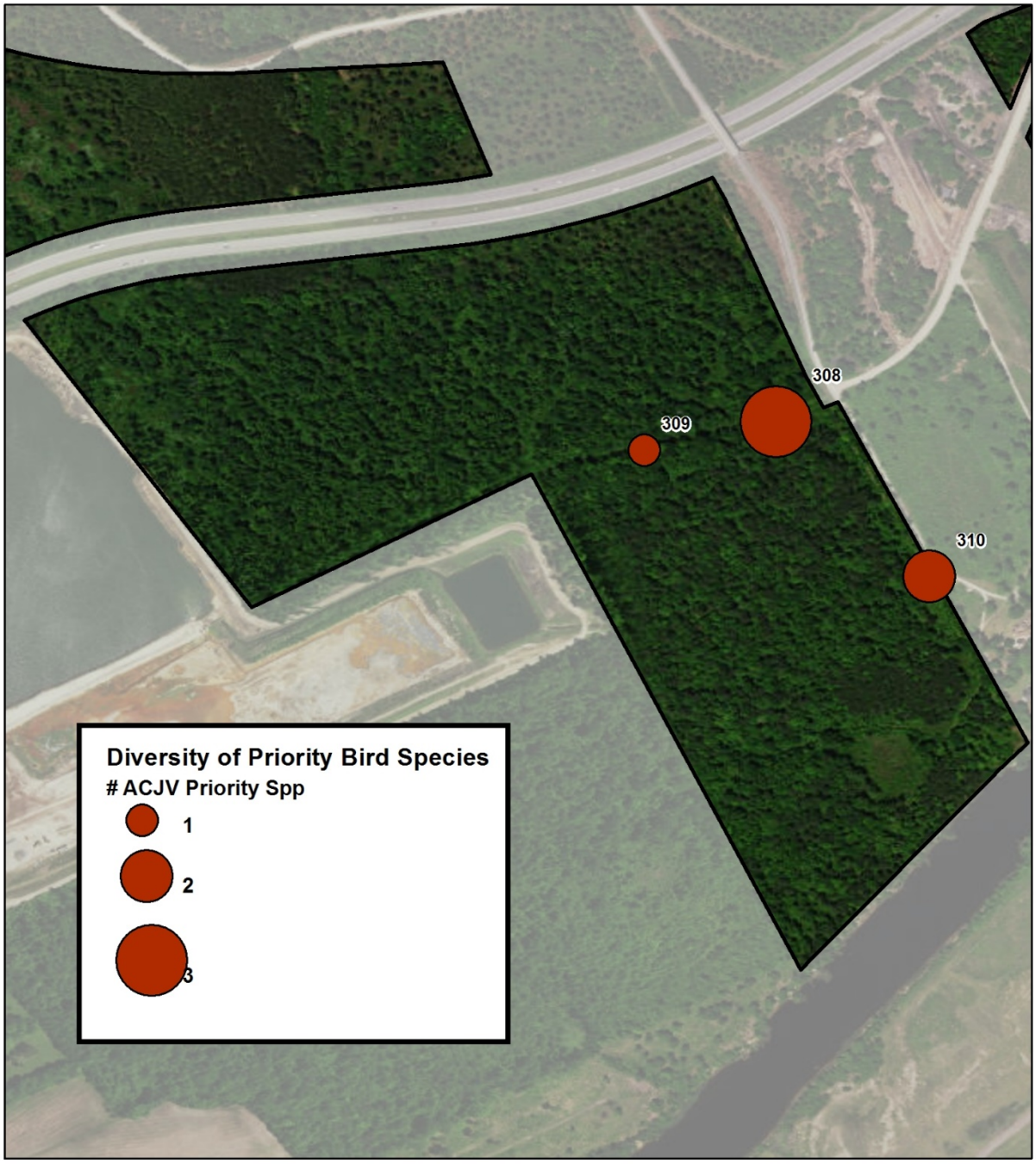
- 3 point-counts were conducted on the Carolina Bays Resort LLC property
- 15 bird species were observed
- Priority species (likely breeding) included:
  - 6 ACJV priority species (1 High, and 5 Moderate)
  - 8 SC SWAP priority Species (2 High, 9 Medium)

Priority Bird Species Detected During Point-Count Surveys – Carolina Bays Property – May 2016

SC SWAP (8 spp)	ACJV (6 spp)
Carolina Bays	Carolina Bays
High	High Priority
Louisiana Waterthrush	Yellow-billed Cuckoo
Yellow-billed Cuckoo	Moderate Priority
Moderate	Indigo Bunting
Carolina Wren	Louisiana Waterthrush
Indigo Bunting	Northern Parula
Northern Parula	Pine Warbler
Pine Warbler	Summer Tanager
Red-bellied Woodpecker	
Summer Tanager	

The most abundant breeding birds on the property were Cedar Waxwing, Great Crested Flycatcher, Carolina Wren, American Redstart, Northern Cardinal, Tufted Titmouse, and Northern Parula. These birds are characteristic of mesic forested areas.

Additional spring-time point-count sampling dispersed across the property is certain to reveal a higher diversity of priority bird species and better document their distribution.



Diversity of ACJV Priority Bird Species Detected at Point-Count Stations (Spring 2016)

Carolina Bays Conservation Property

Horry County, SC

The South Atlantic Migratory Bird Initiative (SAMBI) Implemenation Plan
Atlantic Coast Joint Venture (2006)

Christopher R. Wilson
March 28, 2017
Note: easement and parcel boundaries depicted on this map are for informational purposes and do not represent legal surveys

0 0.05 0.1 Miles

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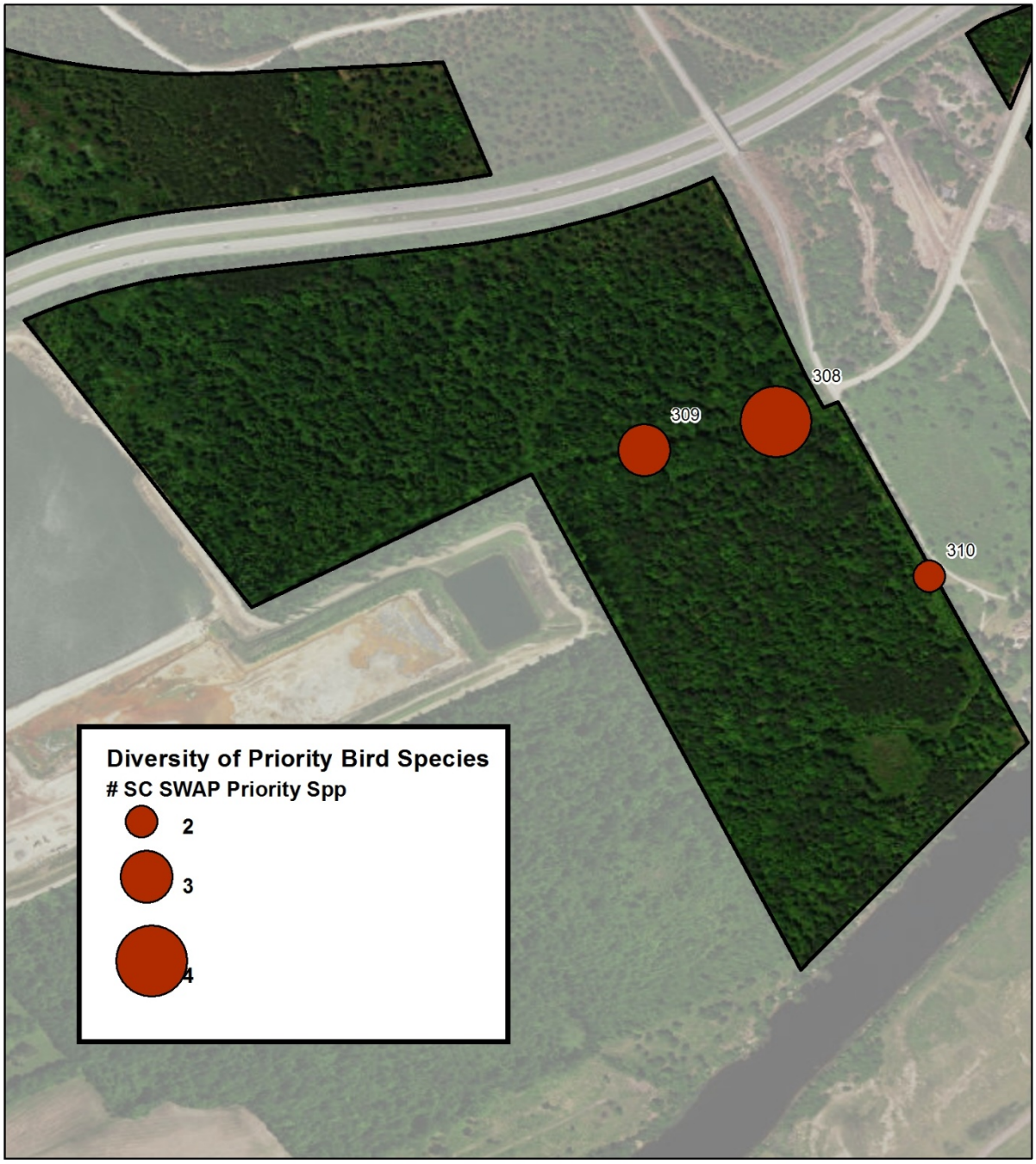
ACJV Priority Species Detected at Point-count Stations
Carolina Bays Conservation Property – May 2016

ACJV Priority Bird Species	Sum
Carolina Bays	34
308	12
Moderate Priority	3
Indigo Bunting	1
Pine Warbler	1
Northern Parula	1
(blank)	9
Great Crested Flycatcher	3
Tufted Titmouse	2
Northern Cardinal	2
Carolina Wren	1
Blue-gray Gnatcatcher	1
309	18
High Priority	1
Yellow-billed Cuckoo	1
(blank)	17
Cedar Waxwing	10
Carolina Wren	3
Great Crested Flycatcher	2
Red-bellied Woodpecker	1
American Redstart	1
310	4
Moderate Priority	2
Summer Tanager	1
Louisiana Waterthrush	1
(blank)	2
Northern Cardinal	1
Great Crested Flycatcher	1
Grand Total	**34**



Diversity of SC SWAP Priority Bird Species Detected at Point-Count Stations (Spring 2016)

Carolina Bays Conservation Property

Horry County, SC

SC State Widlife Action Plan (SWAP 2015)

Christopher R. Wilson
March 28, 2017
Note: easement and parcel boundaries depicted on this map are for informational purposes and do not represent legal surveys

0 0.05 0.1 Miles

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SC SWAP Priority Species Detected at Point-count Stations
Carolina Bays Conservation Property – May 2016

SC SWAP Priority Bird Species	Sum
Carolina Bays	34
308	12
Moderate	4
Pine Warbler	1
Northern Parula	1
Carolina Wren	1
Indigo Bunting	1
(blank)	8
Great Crested Flycatcher	3
Tufted Titmouse	2
Northern Cardinal	2
Blue-gray Gnatcatcher	1
309	18
High	1
Yellow-billed Cuckoo	1
Moderate	4
Carolina Wren	3
Red-bellied Woodpecker	1
(blank)	13
Cedar Waxwing	10
Great Crested Flycatcher	2
American Redstart	1
310	4
High	1
Louisiana Waterthrush	1
Moderate	1
Summer Tanager	1
(blank)	2
Northern Cardinal	1
Great Crested Flycatcher	1
Grand Total	**34**

Bats – Bats were surveyed using Wildlife Acoustics SM2BAT+ and SM4BAT acoustic detectors and SMX-UT and SMM-U1 omnidirectional microphones. The microphones were mounted on 12' high painters-poles and the units were deployed at 7 locations across the 8 Sandridge properties for a total of 14 detector-nights of sampling effort.

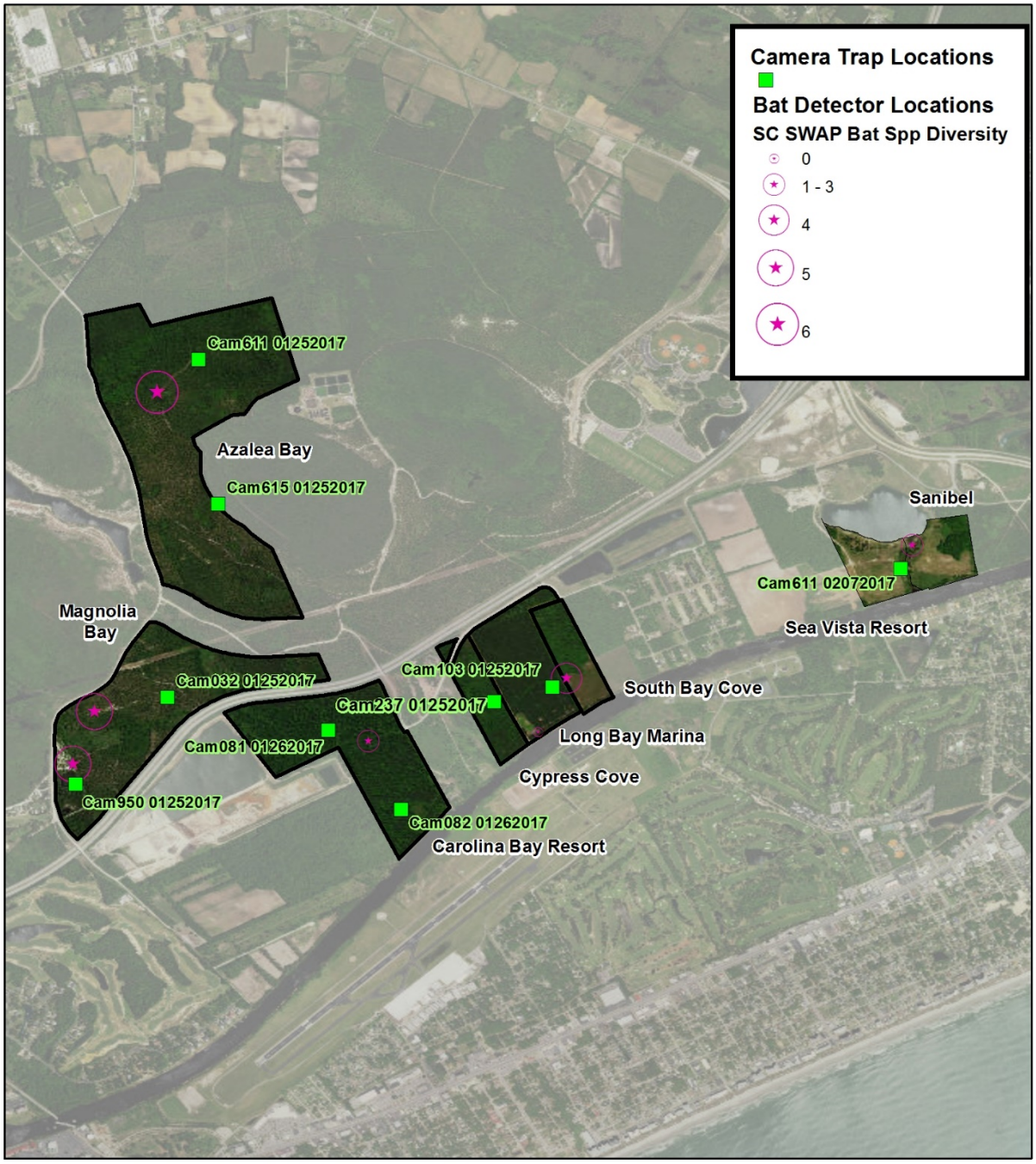
Each recorder unit was placed at the edge of a forest and some kind of opening (meadow, forest road, powerline ROW, etc.) or near pooled water, where feeding bats are likely to concentrate. Acoustic filter settings and programming of the recorders followed the manufacturer's recommendations for USFWS protocol surveys for Indiana Bats (utilizing the 2015 version of the "Indiana.set" file). Wildlife Acoustics Kaleidoscope software (3.1.1) was used to clean the recordings, automatically identify the bat species call, and provide a probabilistic statement about the certainty of the identification. The eastern North America classifiers (3.1.1) were used and were set to +1 More Accurate (the most conservative setting), which minimized false positive identifications.

After scrubbing and converting the native full spectrum files to zero crossing format in Kaleidoscope, the program EchoClass V3.1 (provided by the USFWS) was also used to identify bat species calls and provide a probabilistic measure of certainty of the identification. Because automated bat species identification has high error rates, using two programs can increase confidence in the results. For both programs, a probability of false identification value (or p-value) of <0.05 was chosen as a threshold for accepting the species identification and assuming presence on the property.

Bat species identified in the *SC Bat Conservation Plan* (SCDNR 2016) as occurring in the Coastal Zone & Coastal Palin were included in the analysis. Exceptions are the Northern Yellow Bat and Seminole Bat, which do not have classifiers available within either auto-ID software package. A classifier for the Brazilian Free-tailed Bat was only available in Kaleidoscope.

Bat Summary for the Carolina Bays property:

- 3 Bat species were detected on the Carolina Bays property
- Eastern Red Bat was identified by both auto-ID software packages; while Little Brown Bat and Tricolor Bat were detected by one auto-ID software package
- All 3 species detected are considered Highest Priority species under the SC Wildlife Action Plan



SC-SWAP Priority Bat Species Diversity & Camera Trap Locations

Sandridge Conservation Properties

Horry County, SC

SC State Widlife Action Plan (SWAP 2015)

Christopher R. Wilson
March 26, 2017
Note: easement and parcel boundaries depicted on this map are for informational purposes and do not represent legal surveys

0 0.25 0.5 Miles

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Kaleidioscope 3.1.1 Results – Sandridge Properties

KALEIDOSCOPE 3.1.1										
Bats of North America 3.1.0 S/A:+1				Files Identified						
Property	COTO	EPFU	LABO	LACI	LANO	MYAUS	MYLU	NYHU	PESU	TABR
Long Bay / Cypress Cove			2							
Magnolia Bay		21	131	3	17		9	105	2	28
Azalea Bay		32	686	7	10		42	125	60	15
Magnolia Bay		38	179	23	24		19	68	8	62
Sea Vista / Sanibel		1	10	1			3			
Carolina Bay			7				10	2	4	
Long Bay / South Bay		8	26				12	5	3	1
				Species Identified (Red highlight = p<0.05)						
SC SWAP Priotiy	Highest	Highest	Highest	Highest	Highest	Highest	Highest	-	Highest	-
Property	COTO	EPFU	LABO	LACI	LANO	MYAUS	MYLU	NYHU	PESU	TABR
Long Bay / Cypress Cove	1	1	1	1	1	1	1	1	1	1
Magnolia Bay	0.684773	0.000312	0	0.68113	0	0.6847731	0.684773	0	0.684773	0
Azalea Bay	0.745081	0.03238	0	0.007478	0.040605	1	0.745081	0.745081	0	1
Magnolia Bay	0.682558	0	0	5E-07	8.38E-05	1	0.667336	0.101102	0.51608	0
Sea Vista / Sanibel	1	0.647677	0	0.09208	1	1	0.158947	1	1	1
Carolina Bay	1	1	0.000495	1	1	1	1.5E-06	1	0.000767	1
Long Bay / South Bay	1	3.01E-05	0	1	1	1	0.000162	1	0.166585	1
Values represent the likelihood that files were INCORRECTLY identified; probability <0.5 assumed correct										

EcoClass 3.1 Results - – Sandridge Properties

SC SWAP Priority		Highest	Highest	Highest	Highest	Highest	Highest	-	Highest
Property	Adjusted Date	EPFU	LANO	LABO	LACI	MYAU	MYLU	NYHU	PESU
Azalea Bay	2016-Jul-05	-1	0.0004	0	0	-1	0.0051	0.9996	0
Azalea Bay	2016-Jul-06	0	0.1346	0	0.0003	1	-1	1	0
Carolina Bay	2016-Jul-05	-1	-1	0.0002	-1	-1	-1	-1	1
Carolina Bay	2016-Jul-06	-1	-1	0.0073	-1	-1	-1	-1	-1
Long Bay / Cypress Cove	2016-Jul-05	-1	-1	1	-1	-1	-1	-1	-1
Long Bay / Cypress Cove	2016-Jul-06	-1	-1	-1	-1	-1	-1	-1	-1
Long Bay / South Bay	2016-Jul-05	-1	-1	0	-1	-1	-1	-1	-1
Long Bay / South Bay	2016-Jul-06	0	-1	0	-1	-1	-1	-1	-1
Magnolia Bay	2016-Jul-05	1	0.0011	0	0.0305	-1	-1	0.998	-1
Magnolia Bay	2016-Jul-06	0	0.1982	0	0.1293	-1	-1	0.9987	0.0001
Magnolia Bay	2016-Jul-05	0	0.0008	0	0.0009	-1	-1	0.9988	0
Magnolia Bay	2016-Jul-06	0	0.0055	0	0	-1	-1	1	0
Sea Vista / Sanibel	2016-Jul-05	-1	-1	0.0284	-1	-1	-1	-1	-1
Sea Vista / Sanibel	2016-Jul-06	-1	-1	0	-1	-1	-1	-1	-1

Kaleidioscope & EcoClass Agreements

SC SWAP Priotiy	Highest	Highest	Highest	Highest	Highest	Highest	Highest	-	Highest	-	
Property	COTO	EPFU	LABO	LACI	LANO	MYAUS	MYLU	NYHU	PESU	TABR	**SC SWAP Diversity**
Azalea Bay		K/E	K/E	K/E	K/E		E		K/E	K	6
Carolina Bay			K/E				K		K		3
Long Bay / Cypress Cove											0
Long Bay / South Bay		K/E	K/E				K		K		4
Magnolia Bay		K/E	K/E	K/E	K/E			K	E	K	5
Magnolia Bay		K/E	K/E	K/E	K/E			K	E	K	5
Sea Vista / Sanibel			K/E	K			K				3

K = Kaleidiscope; E = EchoClass; K/E = identified by both programs

Four-letter Code, Status, and Habitat Information

CODE	SCIENTIFIC NAME	COMMON NAME	G-RANK	S-RANK	LEGAL STATUS	SC SWAP PRIORITY	Habitat
CORA	*Corynorhinus rafinesquii*	Rafinesque's Big-eared Bat	G3/G4	S2?	State Endangered	Highest	T-beam and I-beam bridges, abandoned buildings, old bunkers and tunnels, cavity trees, rock outcrops, mines, caves
EPFU	*Eptesicus fuscus*	Big Brown Bat	G5	SNR		Highest	buildings, cavity trees, under bridges and in bat boxes; forage in open fields or forest gaps
LABO	*Lasiurus borealis*	Red Bat	G5	SNR		Highest	thinned stands; roost on smaller branches or twigs, often in the hardwood tree canopy; may roost in leaf litter
LACI	*Lasiurus cinereus*	Hoary Bat	G5	S?		Highest	tree cavities, trunks, tree foliage, squirrel nests, and Spanish moss
LAIN	*Lasiurus intermedius*	Northern Yellow Bat	G4/G5	S?	Of concern, State	Highest	forage over open areas such as fields, pastures, golf courses, marshes, and along lake and forest edges; roost in clumps of Spanish moss or under old palm fronds
LANO	*Lasionycteris noctivagans*	Silver-haired Bat	G5	SNR		Highest	roosts include tree cavities, under loose bark, rock crevices, under tree foliage, and occasionally in buildings, stacks of firewood, and bird boxes; forage over water
LASE	*Lasiurus seminolus*	Seminole Bat	G5	SNR		Highest	roost in large pines located near forested corridors; may roost in leaf litter
MYAU	*Myotis austroriparius*	Southeastern Bat	G3/G4	S1	State Threatened	Highest	caves (including limestone sinks), mines, abandoned buildings, and large hollow trees; prefers to feed and roost over water
MYLE	*Myotis leibii*	Eastern Small-footed Myotis	G3	S1	State Threatened	Highest	caves, mines, abandoned buildings, rock crevices and shelters, and crevices within bridges in wooded areas
MYLU	*Myotis lucifugus*	Little Brown Bat	G5	S3?		Highest	buildings and picnic shelters, cavity trees, caves
MYSE	*Myotis septentrionalis*	Northern Long-eared Bat	G5	S4	Federally Threatened	Highest	crevices and cavities in dead or live-damaged trees, but they sometimes roost between loose bark and the bole of dead trees; forage in mature stands
NYHU	*Nycticeius humeralis*	Evening Bat	G5				bottomland forests, waterways, Roosts in hollow trees, loose bark, Spainish moss, under palm fronds, in buidings/ attics
PESU	*Perimyotis subflavus*	Tri-colored Bat	G5	SNR		Highest	abandoned mines and caves, bridges, buildings
TABR	*Tadarida brasilliensis*	Brazilian Free-tailed Bat	G5				Use wide variety of foraging habitats. Day roosts: buildings, attic, bridges, hollow trees.

Large- and medium Size Mammals – I used baited camera traps to detect the presence of large- and medium size mammals. Seven *Reconyx Hyperfire PC800* cameras were placed within or adjacent to the eight Sandridge study site properties (see map below) during January and February of 2017 for a total of 116 trap nights. Each camera was attached to a tree with a cable lock approximately 2' above the ground. A perforated can of tuna was nailed to a tree approximately 3'-6' in front of the camera as bait to attract carnivore species (bears, weasels, mink, skunk, etc.). Peanut butter and jelly was also used as bait to attract rodents (woodrats, rabbits).

Species detected on the camera traps for Carolina Bays Property were: Common Raccoon, Eastern Gray Squirrel, Gray Fox, Virginia Opossum, and White-tailed Deer

An American Black Bear (*Ursus americanus*) was encountered on the neighboring Azalea Bay property during a site visit on July 7, 2017 and its tracks were photographed. This species is a State Species of Concern and considered a priority species under the SC SWAP. The Black Bear ranges widely within wooded and forested areas and may occasionally occur on the Carolina Bays property.

Black Bear track – from the neighboring Azalea Bay property

Camera Trapping Results – Sandridge Properties - January-February 2017

Common Name / Property	Azalea Bay Cam615	Azalea Bay Cam611	Carolina Bay Cam081	Carolina Bay Cam082	Cypress Cove/ Long Bay Cam237	Long Bay/ South Bay Cam103	Magnolia Bay Cam032	Magnolia Bay Cam950	Sea Vista/ Sanibel Cam611
Bobcat									X
Common Raccoon	X	X	X	X	X	X			X
Coyote									X
Eastern Gray Squirrel			X	X		X			X
Gray Fox	X	X		X					
Marsh Rabbit									X
Virginia Opossum	X		X	X	X	X	X	X	
White-tailed Deer	X		X		X	X	X	X	

Given their range size, abundance, and habitat requirements, all of the above mammal species detected on camera traps are likely to occur across all of the Sandridge properties.

Representative Camera Trap Photographs – Sandridge Properties – Jan/Feb 2017

Azalea Bay_Cam611_Grey Fox

Azalea Bay_Cam611_Grey Fox

Long Bay/ South Bay_Cam103_Raccoon

Carolina Bay_Cam081_White-tailed Deer

Azalea Bay_Cam611_Raccoon

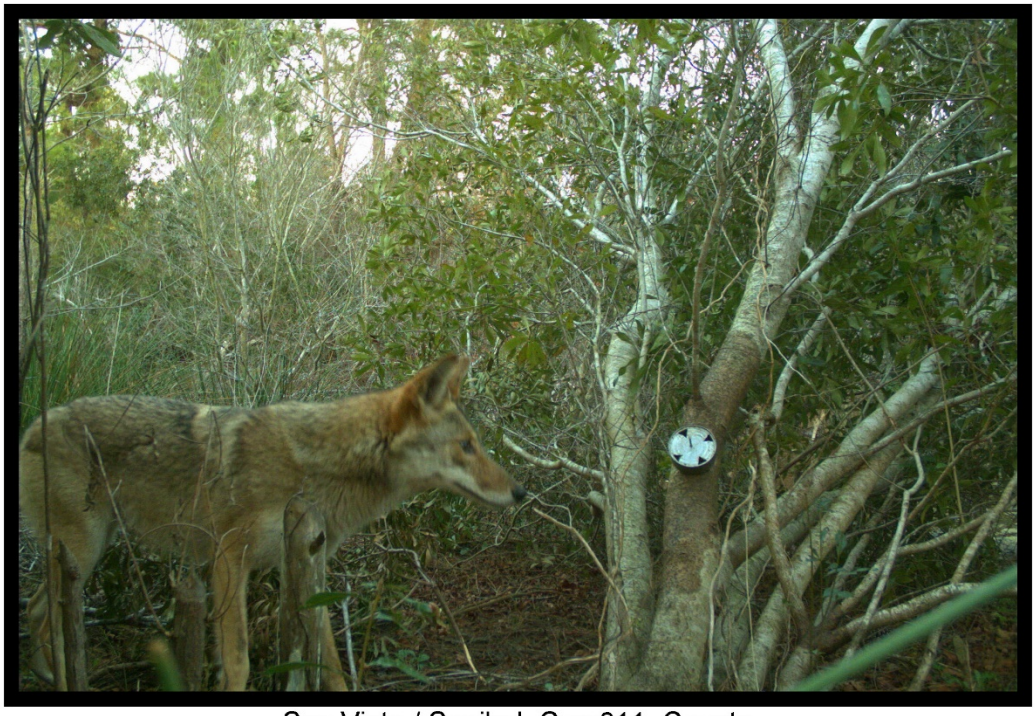
Cypress Cove_Cam237_Raccoons

Long Bay/ South Bay_Cam103_Opposum

Long Bay/ South Bay_Cam103_White-tailed Deer

Sea Vista / Sanibel_Cam611_Bobcat

Sea Vista / Sanibel_Cam611_Raccoon



Sea Vista / Sanibel_Cam611_Coyote

Sea Vista / Sanibel_Cam611_Marsh Rabbit

Wildlife Species Observed – Carolina Bays property - 2016/ 2017

TAXONOMIC GROUP	COMMON NAME	SCIENTIFIC NAME	G RANK	SC SRANK	SC SWAP Priority	Habitat
Bird	American Redstart	*Setophaga ruticilla*	G4			
Bird	Barn Swallow	*Hirundo rustica*	G5			
Bird	Blue-gray Gnatcatcher	*Polioptila caerulea*	GNR			
Bird	Carolina Wren	*Thryothorus ludovicianus*	GNR	SNR	Moderate	woodland thickets; leaf litter; cavities or ledges for nesting; will use bird boxes and many other human material
Bird	Cedar Waxwing	*Bombycilla cedrorum*	G5			
Bird	Great Crested Flycatcher	*Myiarchus crinitus*	G5			
Bird	Indigo Bunting	*Passerina cyanea*	G4	SNRB	Moderate	woodland margins; shrubby thickets in openings
Bird	Louisiana Waterthrush	*Parkesia motacilla*	G5	S4	High	deciduous or mixed forests with rocky streams
Bird	Northern Cardinal	*Cardinalis cardinalis*	G5			
Bird	Northern Parula	*Setophaga americana*	T2	SNRB	Moderate	mature, moist forests; hemlock forests in mountains and swamps or bottomlands with Spanish moss near coast
Bird	Pine Warbler	*Setophaga pinus*	G4	SNR	Moderate	typically middle to mature pine forests
Bird	Red-bellied Woodpecker	*Melanerpes carolinus*	G4	SNR	Moderate	open, mature woods with dead snags for nest cavities; man-made poles with cavities
Bird	Summer Tanager	*Piranga rubra*	G5	S?	Moderate	dry, mixed woodlands
Bird	Tufted Titmouse	*Baeolophus bicolor*	G5			
Bird	Yellow-billed Cuckoo	*Coccyzus americanus*	T4	S4	High	closed canopy deciduous forests with thick tangles
Mammal	Common Raccoon	*Procyon lotor*	G2			
Mammal	Coyote	*Canis latrans*	G5			
Mammal	Eastern Gray Squirrel	*Sciurus carolinensis*	G5			
Mammal	Eastern Red Bat	*Lasiurus borealis*	G5		Highest	thinned stands; roost on smaller branches or twigs, often in the hardwood tree canopy; may roost in leaf litter
Mammal	Gray Fox	*Urocyon cinereoargenteus*	T4			
Mammal	Little Brown Bat	*Myotis lucifugus*	G5	S3?	Highest	buildings and picnic shelters, cavity trees, caves
Mammal	Tricolored Bat	*Perimyotis subflavus*	GNR		Highest	Roosts: abandoned mines and caves, bridges, buildings
Mammal	White-tailed Deer	*Odocoileus virginianus*	T4			

Total SWAP Priority species observed: 11