

# Alabama Audubon Coastal Conservation Programs

2020 Report

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*Founded in 1946 as the Birmingham Audubon Society, Alabama Audubon has since grown to become the state's leading nonprofit promoting conservation and a greater knowledge of birds, their habitats, and the natural world. While we work closely with our partners at the National Audubon Society, we are an independent 501(c)(3) organization with staffed offices in Birmingham and on the Gulf Coast.*

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# Table of Contents

<b>ACKNOWLEDGEMENTS.....</b>	<b>4</b>
<b>BACKGROUND .....</b>	<b>5</b>
<b>BEACH-NESTING BIRD STEWARDSHIP.....</b>	<b>5</b>
<b>BEACH-NESTING BIRD MONITORING .....</b>	<b>5</b>
SNOWY PLOVER.....	7
BLACK SKIMMER.....	8
LEAST TERN.....	10
<i>Predation and disturbance.....</i>	<i>11</i>
<i>Heat exposure study.....</i>	<i>13</i>
<b>AUDUBON COASTAL BIRD SURVEYS.....</b>	<b>17</b>
<b>PRIORITY SPECIES .....</b>	<b>19</b>
<b>BANDED BIRD RESIGHTS .....</b>	<b>26</b>
<b>LITERATURE CITED.....</b>	<b>27</b>
<b>APPENDIX I. COMMON AND SCIENTIFIC NAMES OF SPECIES INCLUDED IN THIS DOCUMENT. ....</b>	<b>27</b>

## **Acknowledgements**

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## **Background**

Over the last 50 years, shorebird populations in North America have been on a gradual decline, with an estimated loss of 37% between 1970 and 2017 (Rosenberg et al. 2019). Collectively, shorebird species face many challenges throughout the annual cycle, including habitat loss through coastal development, predation from native and non-native species, and the increasingly deleterious effects of climate change. Understanding habitat use in climate-sensitive areas and the reproductive success of shorebirds will allow for the development of conservation strategies and the protection of coastal habitat.

Alabama has approximately 660 miles of coastal habitat of which 60 are coastline bordering the Gulf of Mexico. Barrier and nearshore islands provide additional access to the required resources migrating and breeding birds need to thrive. Established in 2017, the Alabama Coastal Bird Stewardship Program (ALCBSP) has allowed Alabama Audubon to monitor and collect data on coastal bird species that are sensitive to their changing environment.

ALCBSP has two main components: (1) beach-nesting bird monitoring and stewardship, and (2) Audubon Coastal Bird Surveys (ACBS). Both components of the program allow us to collect valuable population data year-round. There are 11 coastal species that the program views as priority species: American oystercatcher, black skimmer, brown pelican, least tern, reddish egret, red knot, sanderling, short-billed dowitcher, piping plover, snowy plover, and Wilson's plover.

## **Beach-Nesting Bird Stewardship**

During the 2020 breeding season, we used symbolic fencing to protect approximately 69 acres of beach and island habitat. As a result of the ongoing COVID-19 pandemic, we were unable to conduct in-person outreach events; however, coastal staff and volunteers devised new methods of outreach for the 2020 season through webinars, Facebook live sessions, and the addition of a new blog, "Scope on the Coast" (<https://alaudubon.org/scope-on-the-coast/>).

## **Beach-Nesting Bird Monitoring**

During the 2020 breeding season, Alabama Audubon coastal staff included one full-time Coastal Coordinator and two full-time Coastal Biologists, as well as a Coastal Stewardship Coordinator subcontracted through the City of Orange Beach. In addition, a volunteer consistently monitored several sites on Dauphin Island. We focused our monitoring efforts on sites that supported the majority of the breeding activity during 2018 and 2019 (Table 1) in Baldwin (Figure 1) and Mobile (Figure 2) Counties. We conducted surveys a minimum of once per week (for locations with no breeding activity), and up to three times per week where nests were present. Due to the pandemic, access to nearshore islands via boat was restricted, therefore we did not collect nesting data for those sites. At all mainland sites, we collected data on adult behavior, nest and chick numbers, and evidence of predators and disturbance within 15m of the nest site or colony. In the event of nest or chick failure, we determined the cause through evidence found near the nest such as predator tracks, eggshell fragments, or wrack lines from tides. In some instances, we recorded nest and chick losses as unknown due to a lack of evidence. We deployed two game cameras this season to obtain evidence of predation and document nest failures. We completed a total of 124 solitary-nesting bird surveys and 282 colonial-nesting bird surveys during April-August.

**Table 1. Priority sites and species monitored during the 2020 breeding season.**

<b>Baldwin County</b>	
Gulf State Park	least tern, snowy plover
Beach Club Resort & Spa, Fort Morgan*	least tern
Alabama Point, Orange Beach	least tern, black skimmer
No Fly Zone, Orange Beach	least tern
Shallow Lot, Orange Beach	least tern
Laguna Key	least tern
Rooftops, Orange Beach	least tern
Piggly Wiggly, Fairhope*	least tern
<b>Mobile County</b>	
Pelican Island	least tern, snowy plover, American oystercatcher
Public Beach East	snowy plover
Public Beach West	snowy plover
Little Dauphin Island	least tern, black skimmer
Dauphin Island West End	snowy plover
Katrina Cut	snowy plover
Far West End	snowy plover

\*Sites where game cameras were deployed.



**Figure 1. Beach-nesting bird survey sites in Baldwin County, Alabama, in 2020.**



**Figure 2. Beach-nesting bird survey areas in Mobile County, Alabama, in 2020.**

## Snowy Plover

Snowy plovers are small shorebirds that are year-round residents in coastal Alabama. Snowy plovers nest solitarily, and pairs will defend territories from other nearby plovers. Nesting snowy plovers face numerous threats, including severe weather events, predation, human disturbance, and habitat loss due to coastal development (Page et al. 2009). Predators of snowy plover nests and chicks include coyotes, foxes, ghost crabs, laughing gulls, and crows. Human disturbance can indirectly lead to the loss of eggs and chicks when the adult birds flush from the nest, leaving eggs or young vulnerable to heat exposure and predation.

We monitored three snowy plover nests during the 2020 breeding season (Table 2), two on Dauphin Island (Figure 3) and one at Gulf State Park (Figure 4). We also found a pair with a chick on the far west end of Dauphin Island, suggesting that a nest was present, although we did not find it during the incubation period. We considered nests successful if at least one egg hatched, and chicks successfully fledged at 30 days after hatching or when we observed them making sustained flights. Two nests successfully hatched, and one nest failed due to overwash during tropical storm Cristobal in early-June. Overall productivity across all sites monitored was 0.25 fledglings/pair.

**Table 2. Snowy plover breeding season metrics in 2020.**

Site	Pairs	Successful Nests	Failed Nests	Chicks	Fledglings
Gulf State Park	1	1	0	2	1
Public Beach East	1	1	0	3	0
Katrina Cut	1	0	1	0	0
Far West End*	1	1	0	1	0

\* Nest was never found; territorial behavior was displayed by a snowy plover pair and a chick was observed in the area on 16 July.



**Figure 3. Locations of snowy plover nests on Dauphin Island, Alabama, in 2020.**



**Figure 4. Location of snowy plover nest at Gulf State Park, Alabama, in 2020.**

### *Black Skimmer*

Black skimmers are large, colonial-nesting birds. During the breeding season, colonies can consist of tens to hundreds of nesting skimmers, and will often be mixed in with other large colonial-nesting species such as royal terns. While most reside year-round on the Gulf of Mexico coast, some individuals will migrate to Central America during the winter, and can range north as far as New Jersey during the summer months. Black skimmers are sensitive to disturbance, and generally nest on offshore islands away from humans and predators. While constant or extreme disturbance can cause complete colony abandonment, occasional disturbance by humans can flush adults from nests and chicks, leaving them open to heat exposure and predation. Colonies on islands have added protection from those disturbances; however, they are more at risk of over washing from extreme weather conditions such as tropical storms and hurricanes. Flooding, storms, and predation are known causes of colony failure (Gochfeld and Burger 1994). Coastal development, especially on barrier islands, is reducing suitable nesting habitat for skimmers and other beach-nesting birds.

In previous years, we documented black skimmers nesting in two locations in Alabama, Marsh Island and Tern Island. Due to COVID-19 restrictions, we were unable to survey those sites this year; however, we observed skimmers attempting to nest in two new locations. A small colony had made an attempt to nest among least terns on Little Dauphin Island (Figure 5), and a single pair had nested at Alabama Point in Orange Beach (Figure 6). The colony on Little Dauphin Island had four nests, all of which failed. We found coyote tracks on the island leading to the nesting area, and documented carcasses of adult terns and gulls that we believed were depredated. We also documented human prints, dog tracks, and trash nearby on the island, indicating that people were landing on the beach and spending time by the colony. We believe that the combination of coyote predation and human disturbance led to colony failure. The



skimmer pair that nested at Alabama Point successfully hatched and fledged two chicks. This pair was very unusual as they were not part of a colony, and the location had almost constant human presence and disturbance.

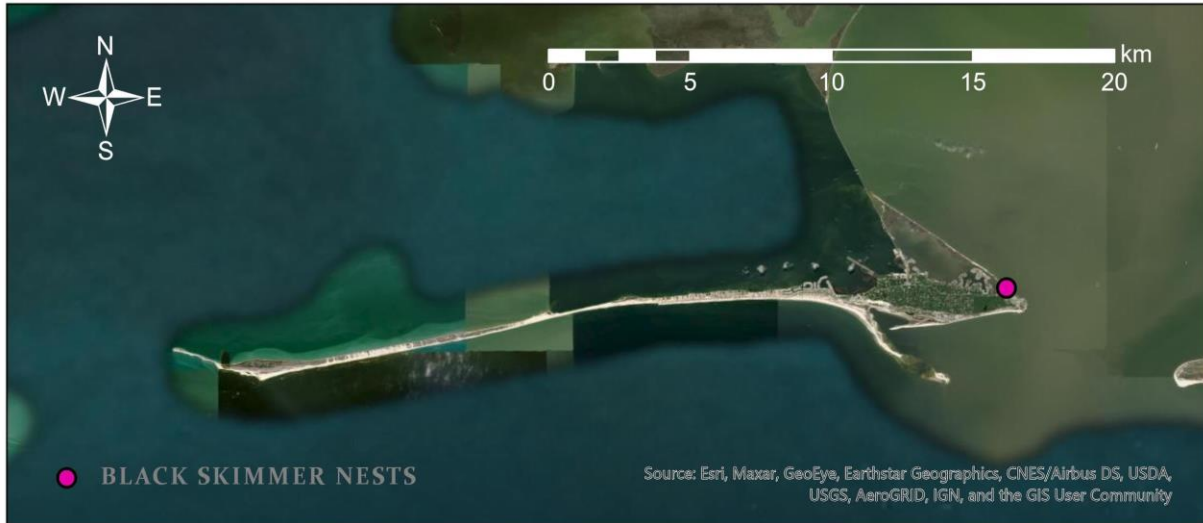


Figure 5. Location of black skimmer nest attempts on Little Dauphin Island.

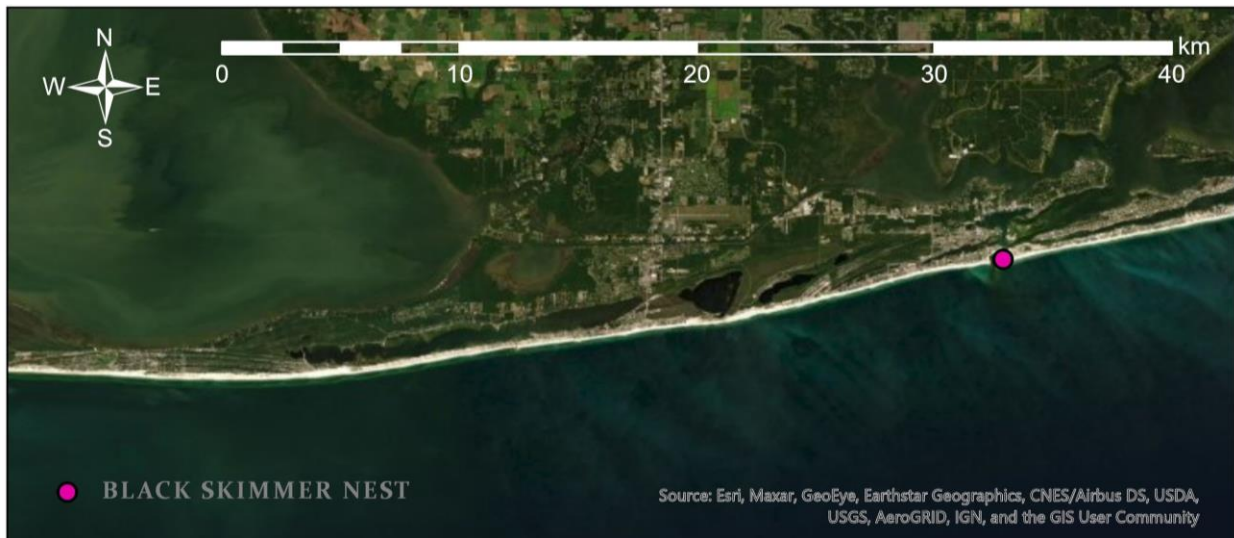


Figure 6. Location of black skimmer nest at Alabama Point.

## *Least Tern*

Seasonal visitors to the Alabama coast, least terns are the smallest terns found in North America. Their geographic range includes the coasts of Mexico, Central America, and South America during the non-breeding season, as well as coastal and interior parts of the United States during the breeding season. Breeding for these birds begins in Alabama in late-April, and ends in early-August. Like other tern species, least terns nest in colonies on mainland and island beaches with a sandy substrate and little vegetation. Nests are unprotected, shallow depressions made in the sand. As a coastal nesting species, these birds face many natural and anthropogenic challenges throughout the breeding season (Thompson et al. 1997). Predators are the most common threat to breeding colonies in Alabama. Common predators observed depredating nests in Alabama include red fox, coyote, crows, and ghost crabs. Due to these birds' nesting behavior, they can also be significantly impacted by severe storms. Over the last decade, coastal development has also driven the species to look for alternative nesting habitat. As a result, least terns have been increasingly seen nesting on gravel rooftops and in vacant lots.

During the 2020 breeding season we documented least tern nests at 12 sites throughout Mobile and Baldwin Counties (Figure 7). These included five rooftop colonies in Baldwin County (we did not monitor nearshore islands or Lighting Point due to COVID-19 restrictions and construction activity, respectively). This season we documented a minimum of 136 least tern pairs and 28 fledglings (Table 3). Overall productivity across the monitored sites was 0.21 fledglings/pair.



Figure 7. Locations of monitored least tern colonies during 2020 breeding season.

**Table 3. Least tern breeding season metrics in Alabama during 2020.**

Site	Pairs	Nests	Failed Nests	Chicks	Fledglings
Beach Club	40	44	25	30	11
Gulf State Park	4	4	3	1	1
Alabama Point	8	8	8	0	0
No Fly Zone	25	25	10	15	15
Shallow Lot	11	11	7	5	1
Perdido Grande East	1	1	1	0	0
Perdido Grande West	5	5	5	0	0
Phoenix on the Bay I	4	4	2	2	0
Phoenix on the Bay II	2	2	1	2	0
Piggly Wiggly	25	25	25	0	0
Laguna Key	1	1	1	0	0
Pelican Island	0	0	0	0	0
Little Dauphin Island	10	10	10	0	0
Total	136	140	98	55	28

### Predation and disturbance

Predation continued to be the predominant cause of nest failure. We deployed one of the game cameras at the Beach Club least tern colony from 30 April through 05 August. The first coyote disturbance to the colony was on 27 May (Figure 8), and an estimated four to 10 nests were destroyed. Two additional coyote visits were recorded throughout the remainder of the season. The second was recorded on 09 June, with a documented loss of approximately nine chicks and four nests, and the last on 30 July, with no loss of nests or chicks seen (Figure 9). A red-shouldered hawk was in the colony on 26 July, but we did not see evidence of depredation (Figure 9).

We also deployed a game camera at a rooftop colony in Fairhope, Alabama. The camera was set up on 28 May but was unable to capture any direct evidence of predation before the colony failed. Images taken after colony failure displayed laughing gull and fish crow disturbance (Figure 10). We also documented displaced and damaged eggs, found on 11 June (Figure 11).

At sites without game cameras, we most frequently observed coyote and fox tracks, and we also documented one set of tracks from an owl species (Figure 12).



Figure 8. Game camera images of a coyote at the Beach Club least tern colony in 2020.



Figure 9. Game camera images of a coyote and red-shouldered hawk at the Beach Club least tern colony in 2020.



Figure 10. Fish crow and laughing gull disturbance captured by a game camera at Piggly Wiggly after least tern colony failure in 2020.



**Figure 11. Damaged least tern eggs found on Piggly Wiggly rooftop after impact of tropical storm Cristobal in June 2020.**



**Figure 12. Tracks found during 2020 beach-nesting bird surveys: owl (left) and coyote (right).**

### Heat exposure study

Alabama Audubon continued to collect temperature data at least tern colonies in 2020. We deployed ThermoChron iButtons (DS1921G, Embedded Data Systems) at the Piggly Wiggly, Beach Club Resort and Spa, Alabama Point, and No Fly Zone. Each site had one sensor exposed to direct sun and another located in shade. We programmed the sensors to record temperature every 30 minutes, and reset them after one month of logging to prevent rollover. Once least tern colonies became inactive, we removed the iButtons and compiled data.

The Piggly Wiggly had the greatest difference between sun and shade, with a 17-degree difference in average daytime (08:00-19:00) temperatures (Table 4). The Piggly Wiggly also had the greatest difference between maximum temperatures recorded, with full sun at 31-degrees higher than shade. Average daytime temperatures at the Beach Club had a six-degree difference between sun and shade and an 18-degree difference between maximum temperatures. Alabama Point had a difference of four-degrees between sun and shade, and a higher maximum temperature recorded in shade. This could have been

due to positioning of the shade sensor when first deployed and accumulation of sand over the sun sensor. Two sun sensors were lost over the course of the breeding season at No Fly Zone, resulting in a loss of data; therefore, average daytime temperatures are representative of data collected from 03 June through 01 July.

To mitigate potential negative effects of heat exposure to young birds, we put shade structures (“chick shelters”) out at least tern and black skimmer colonies prior to any eggs hatching. These structures were consistently used at all sites where chicks were present (Figures 13 and 14).

**Table 4. Average daytime and maximum temperatures (°F) at four least tern colony locations in full sun and shade during the 2020 breeding season.**

Site	Average Sun	Average Shade	Max. Sun	Max. Shade
Alabama Point*	92.1	88.0	117.5	118.4
Beach Club	95.1	89.0	122.9	104.9
No Fly Zone**	96.7	91.8	120.2	110.3
Piggly Wiggly	102.2	84.6	129.2	97.7

\*Alabama Point iButtons were removed on 05 June in preparation for impact of tropical storm Cristobal and redeployed on 10 June.

\*\* No Fly Zone data in table represents temperatures recorded from 03 June to 01 July. Two sun Thermochron iButtons were not retrieved from the site resulting in a loss of data.



**Figure 13. Chick shelters were placed at three least tern colony sites, Beach Club, Piggly Wiggly, and No Fly Zone. Adult least terns and chicks used the structures for shelter and shade during inclement weather and high temperatures.**



Figure 14. Two chick shelters were placed at Alabama Point near the black skimmer nest. Chicks were observed using the shelters while adults stood nearby.

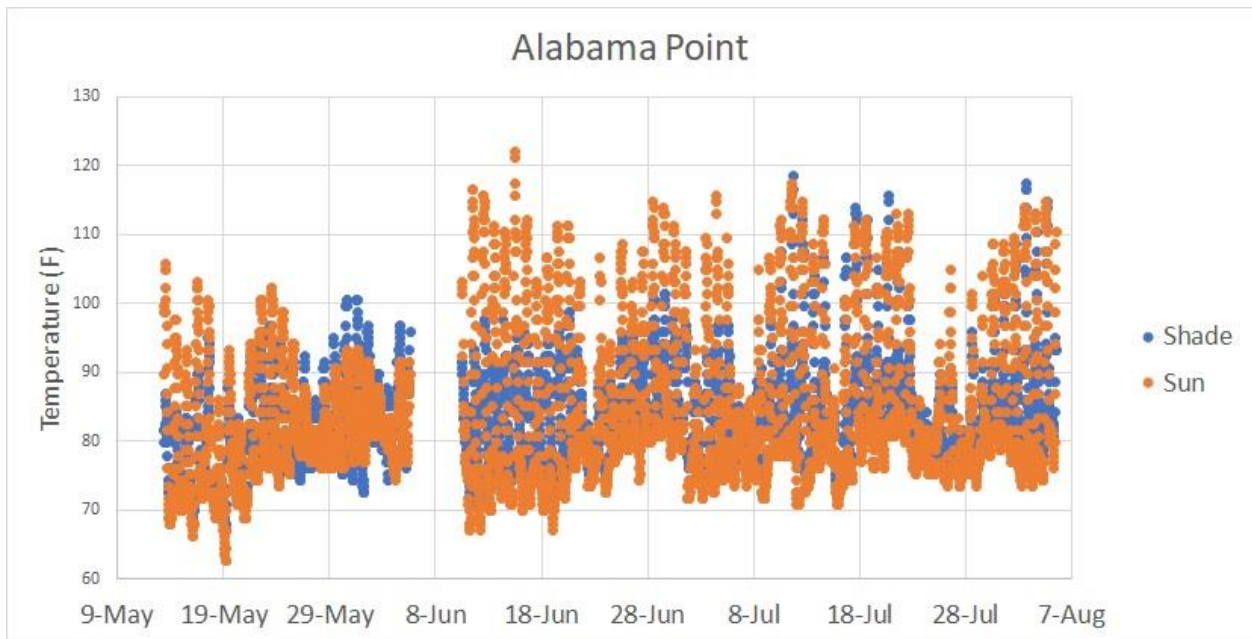


Figure 15. Temperature data collected at the Alabama Point least tern colony during the 2020 breeding season.

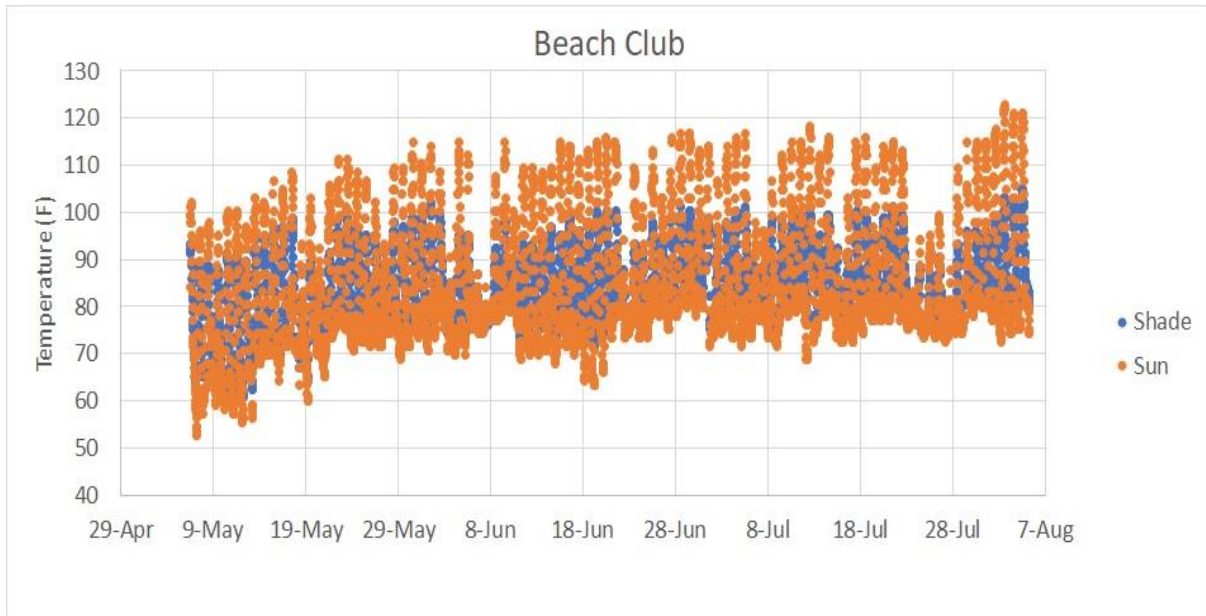


Figure 16. Temperature data collected at the Beach Club least tern colony during the 2020 breeding season.

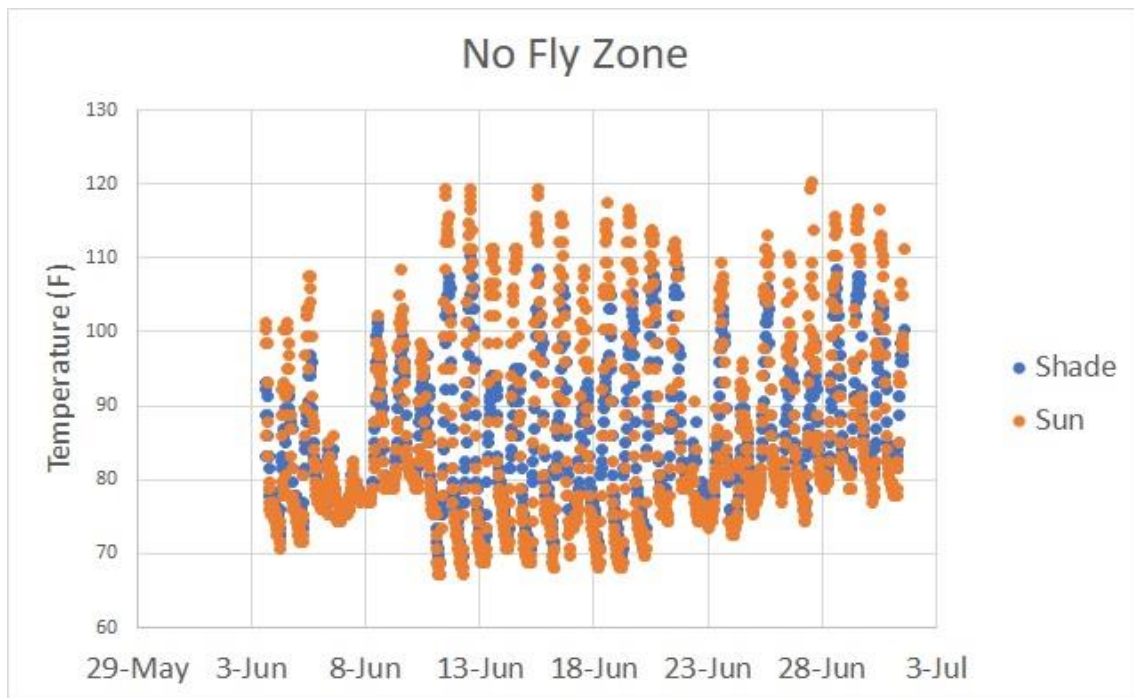
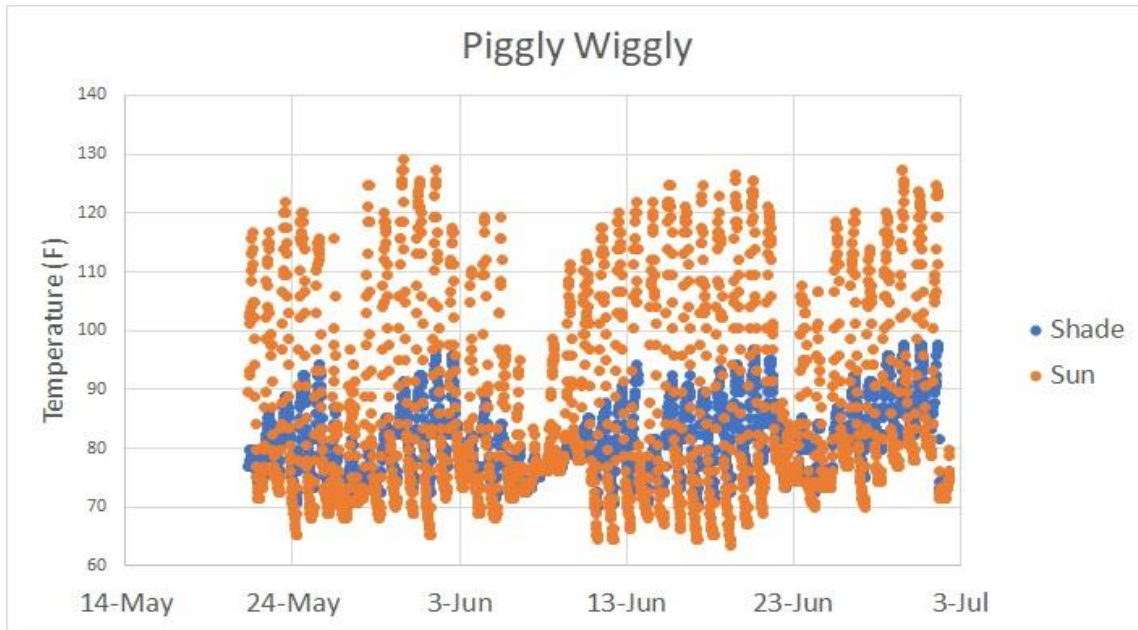


Figure 17. Temperature data collected at the No Fly Zone least tern colony during the 2020 breeding season.





**Figure 18. Temperature data collected at the Piggly Wiggly least tern colony during the 2020 breeding season.**

## **Audubon Coastal Bird Surveys**

Alabama Audubon staff and volunteers conduct surveys every fall, winter, and spring. The fall and spring surveys consist of six pulses each, taking place August-October and March-May, respectively. Winter surveys include three pulses from January to February. Surveys are conducted in 10 to 14-day intervals. The winter 2020 ACBS season included four new survey routes, while the spring 2020 season added one, resulting in 18 total sites: eight in Baldwin County and 10 in Mobile County (Figure 19).

The four ACBS routes added in winter 2020 were Marsh Island, Cat Island, Coffee Island (Figure 20), and Little Dauphin Island (Figure 21). Marsh, Cat, and Coffee Islands are located in Portersville Bay, and are accessed via boat from Bayou La Batre. Little Dauphin Island is a three-mile stretch of land located just northwest of Dauphin Island. The southernmost mile of the island is owned by the U.S. Army Corps of Engineers, and the approximately two-mile northern section is owned by Bon Secour National Wildlife Refuge. This site is accessed via a boat launched from Little Billy Goat Hole. The Dauphin Island far west end route (Figure 22) added in spring 2020 is four miles long, located at the very west end of Dauphin Island, and is accessed via a UTV.

Due to pandemic related beach closures, the spring survey season consisted of only two pulses in May. Boat access was also restricted, and as a result we did not survey Cat, Coffee, and Marsh Islands during the spring and fall seasons, or Little Dauphin Island in the spring.



Figure 19. Locations of all 18 ACBS routes in Baldwin and Mobile Counties.

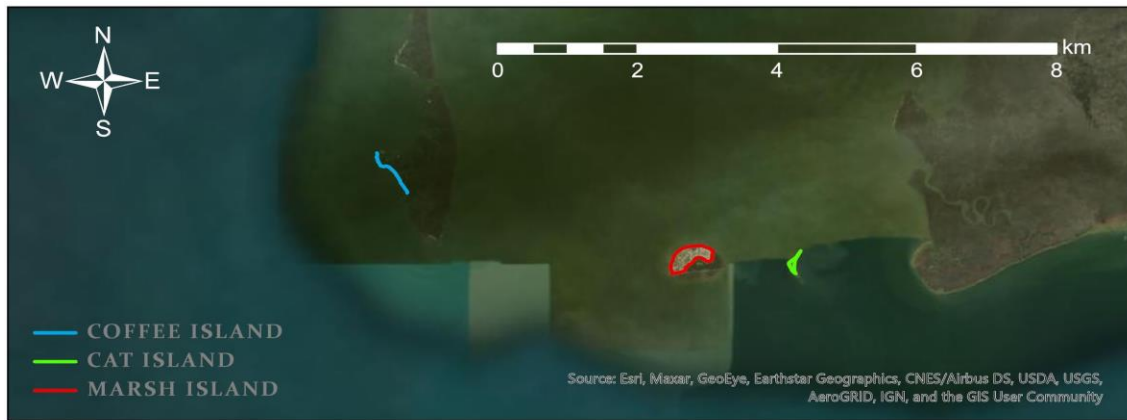


Figure 20. ACBS routes on Coffee Island, Cat Island, and Marsh Island.



Figure 21. Little Dauphin Island ACBS route.

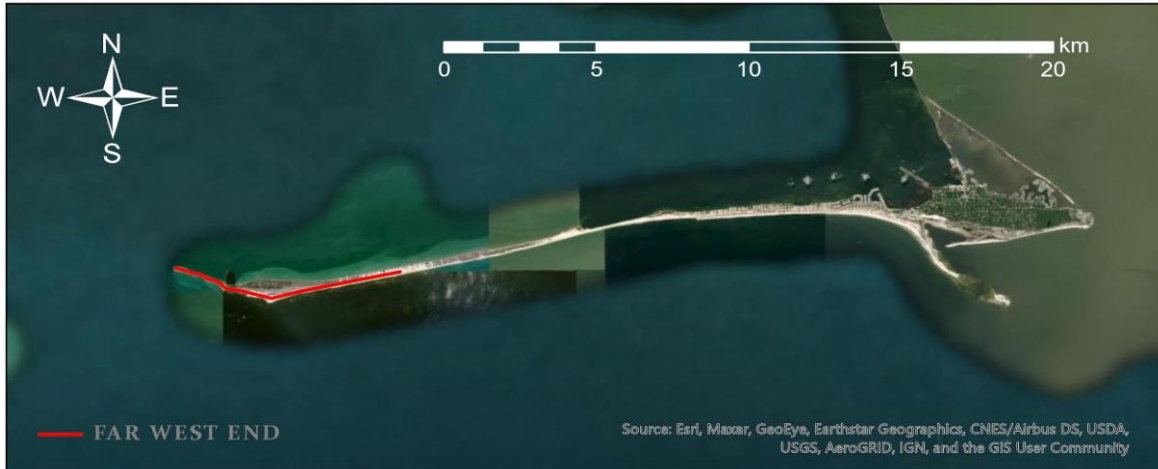


Figure 22. Far West End of Dauphin Island ACBS route.

## Priority Species

Through Audubon Coastal Bird Surveys and beach-nesting bird monitoring, Alabama Audubon staff and volunteers are present on the coast year-round. This allows for valuable priority bird data to be collected throughout the year. During ACBS, we record GPS locations for (Figures 23-34) and behavior of the 11 priority species as they are observed. Those data can be used to examine how birds are using coastal habitat throughout the year.

From January to August 2020, we recorded 264 observations of priority bird species. Sites recorded with the highest percentage of priority species included Pelican Island (42.8%) and Far West End (29.5%), both of which are located on Dauphin Island (Figures 23 and 25).

Table 5. Data collected on priority species, January–August 2020.

Species	Records	Max. Individuals/Record
American oystercatcher	38	8
Black skimmer	60	196
Piping plover	32	8
Reddish egret	63	4
Red knot	5	3
Snowy plover	63	8
Wilson’s plover	3	1



Figure 23. Priority bird locations at the Far West End of Dauphin Island, January–August 2020.

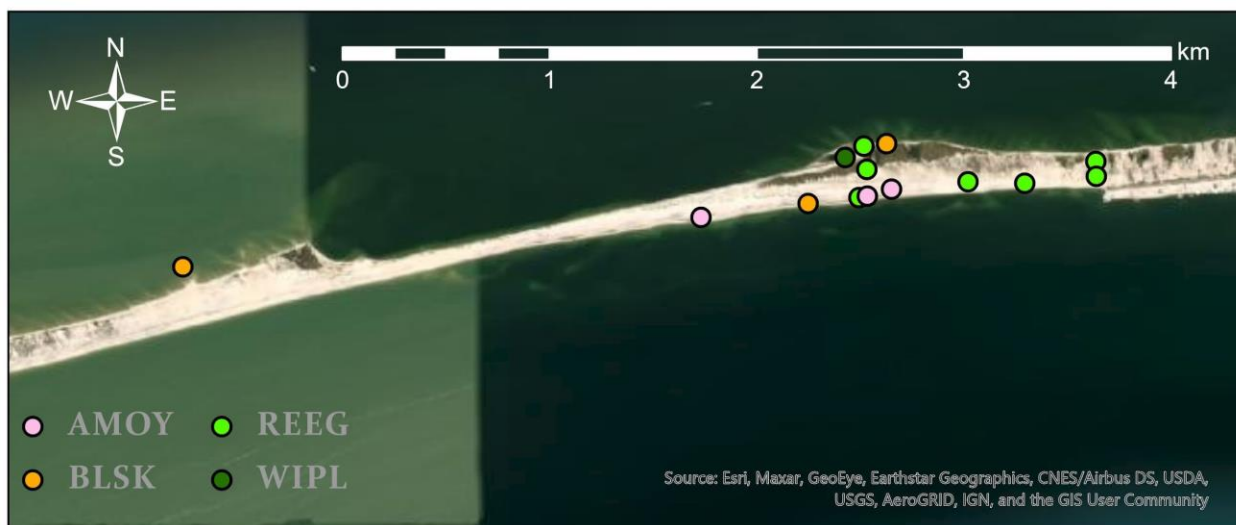


Figure 24. Priority bird locations at Katrina Cut and Dauphin Island West End, January–August 2020.



Figure 25. Priority bird locations at Dauphin Island Public Beach West and Pelican Island, January–August 2020.

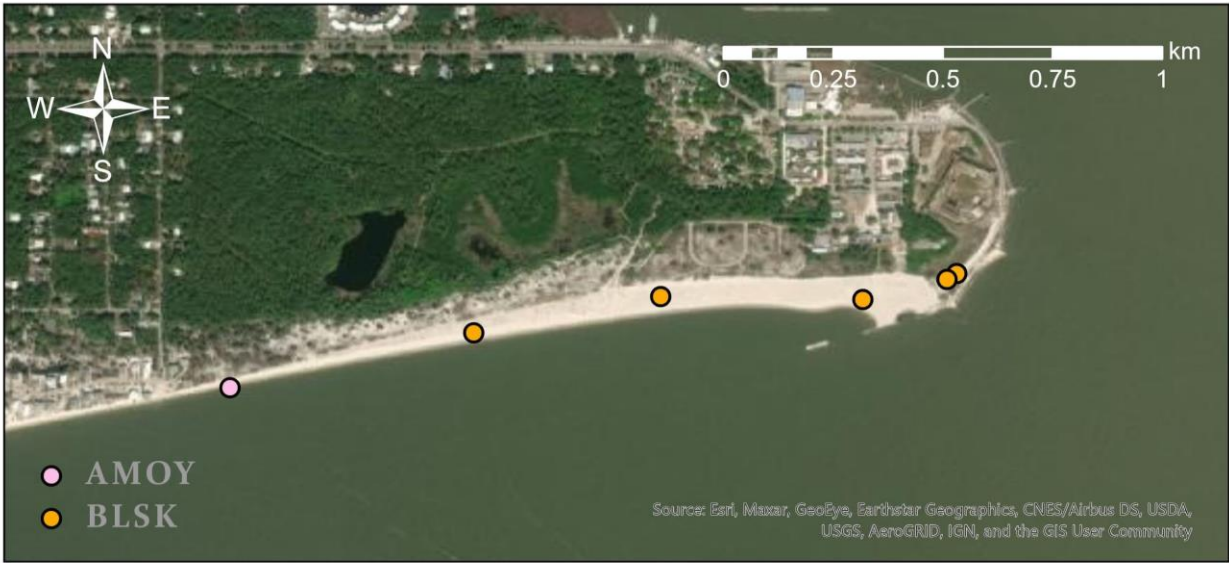


Figure 26. Priority bird locations at the Dauphin Island Public Beach East, January–August 2020.



Figure 27. Priority bird locations on Little Dauphin Island, January–August 2020.



Figure 28. Priority bird locations at the Fort Morgan Unit of Bon Secour National Wildlife Refuge, January–August 2020.

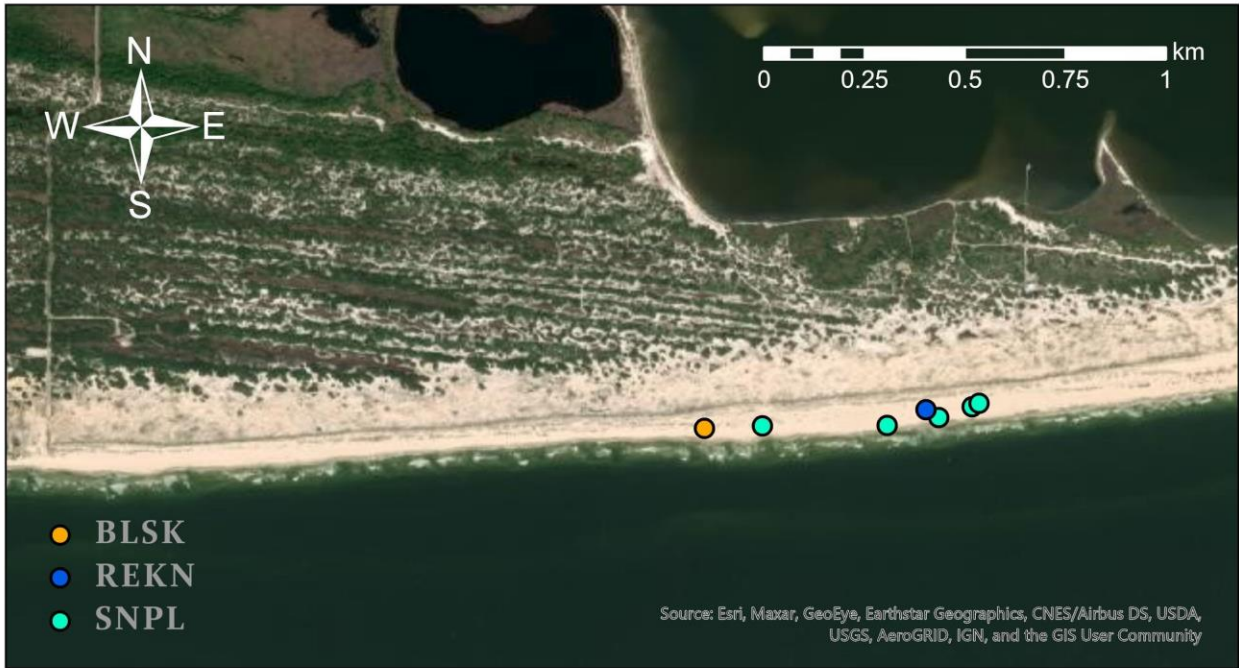


Figure 29. Priority bird locations along the Perdue Unit of Bon Secour National Wildlife Refuge, January–August 2020.



Figure 30. Priority bird locations at Gulf State Park, January–August 2020.

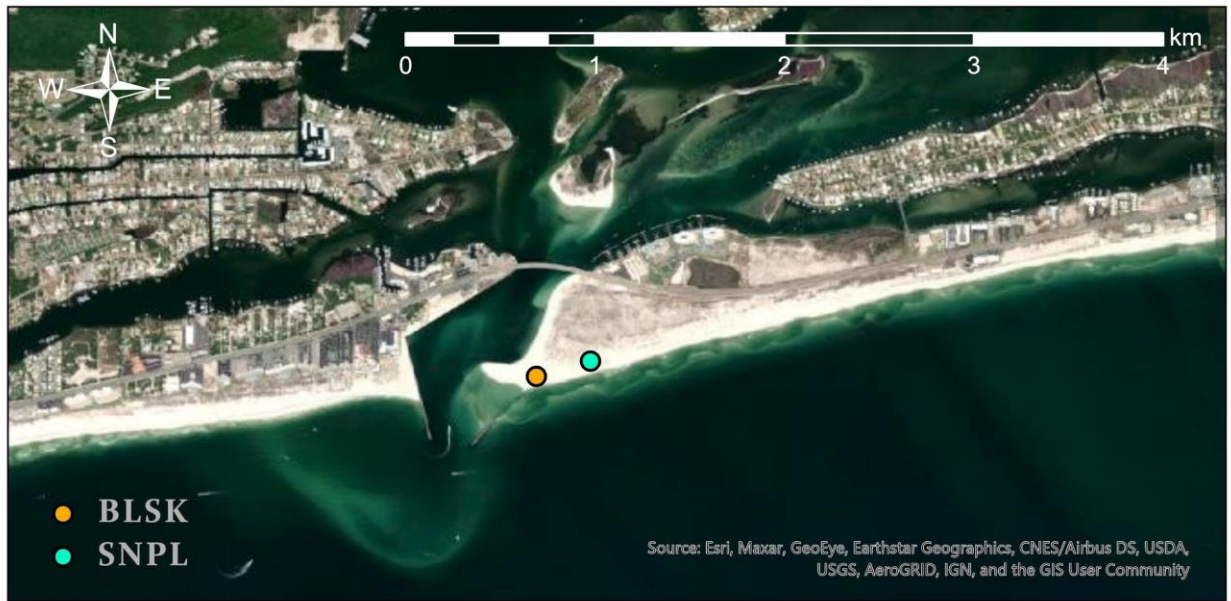


Figure 31. Priority bird locations at Alabama Point, January–August 2020.



Figure 32. Priority bird locations at Beach Club Resort and Spa, January–August 2020.





Figure 33. Priority bird locations on Coffee Island, January–August 2020.



Figure 34. Priority bird locations at Lighting Point, January–August 2020.

## Banded Bird Resights

From January to August 2020, we recorded a total of 32 individual banded birds. Nineteen of the individuals were snowy plovers and 10 were piping plovers. We also resighted two banded least terns and one American oystercatcher.

**Table 6. Data collected on banded bird resights, January–August 2020.**

Species	Resights	Individuals
Piping Plover	25	10
Snowy Plover	69	19



**Figure 35. Snowy plover (X/W:--/B,B) observed on 20 July 2020 during beach-nesting bird monitoring on Pelican Island.**



**Figure 36. Piping plover (F19) seen on 27 July 2020 during beach-nesting bird monitoring on Pelican Island.**

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## Appendix I. Common and scientific names of species included in this document.

### Birds

American crow	<i>Corvus brachyrhynchos</i>	
American oystercatcher	<i>Haematopus palliatus</i>	AMOY
Black skimmer	<i>Rynchops niger</i>	BLSK
Brown pelican	<i>Pelecanus occidentalis</i>	BRPE
Fish crow	<i>Corvus ossifragus</i>	
Laughing gull	<i>Leucophaeus atricilla</i>	
Least tern	<i>Sternula antillarum</i>	LETE
Owl sp.	<i>Strigiformes sp.</i>	
Piping plover	<i>Charadrius melodus</i>	PIPL
Reddish egret	<i>Egretta rufescens</i>	REEG
Red knot	<i>Calidris canutus</i>	REKN
Red-shouldered hawk	<i>Buteo lineatus</i>	
Royal tern	<i>Thalasseus maximus</i>	
Sanderling	<i>Calidris alba</i>	SAND
Short-billed dowitcher	<i>Limnodromus griseus</i>	SBDO
Snowy plover	<i>Charadrius nivosus</i>	SNPL
Wilson's plover	<i>Charadrius wilsonia</i>	WIPL

### Mammals

Coyote	<i>Canis latrans</i>
Red fox	<i>Vulpes vulpes</i>

### Other

Atlantic ghost crab	<i>Ocyrode quadrata</i>
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