

Florida Shorebird Alliance Monitoring Data at Work



July 2019

Florida Fish & Wildlife Conservation Commission

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Photo: Britt Brown



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SHOREBIRD CONSERVATION & THE FLORIDA SHOREBIRD ALLIANCE

Coastal habitat is critical to the survival of Florida's coastal-dependent shorebirds and seabirds. Florida has over 1,300 miles of coastal habitat. Shorebirds and seabirds share this extensive habitat with 14 million residents and millions of visitors each year. Impacts from development, recreation, tourism, and predation threaten the viability of Florida's shorebird and seabird populations, creating conditions where potential habitat is limited and birds are dependent on management for survival. Without active management and protection, their populations may not thrive into the future.

With so many miles of coastline, the conservation and management of shorebirds and seabirds is beyond the scope of any one agency or organization. Fortunately, many dedicated people and organizations are working diligently to protect Florida's amazing diversity of shorebirds and seabirds. Collectively, this network of partners is the [Florida Shorebird Alliance \(FSA\)](#).

Established in 2009, the FSA consists of 12 regional partnerships comprised of individuals and groups from the public, the private sector, and a wide range of government agencies. By working together, the FSA facilitates increased communication, improved

coordination, and consistent monitoring and management at a statewide scale.

Since 2011, FSA partners have monitored 20 species of shorebirds and seabirds using the [Breeding Bird Protocol for Florida's Shorebirds and Seabirds \(BBP\)](#) to guide and standardize survey efforts. The BBP ensures consistency and allows the FSA to adjust and respond as new data needs are identified. Five years into this effort, partners reached near-complete coverage of suitable nesting habitat for priority species statewide. Since then, there has been a steady increase in survey frequency, leading to a substantial amount of data that can be analyzed to provide insight into the status, trends, and challenges faced by Florida's shorebirds and seabirds.

This report summarizes how FSA monitoring data is used to measure progress toward conservation goals, identify information gaps, and adaptively manage for the long-term recovery of shorebird and seabird populations.

SHOREBIRD CONSERVATION SUPPORT

Thank you to the Florida Shorebird Alliance partners for the incredible work you do for the birds! Thanks to the National Fish & Wildlife Foundation and multiple funders of shorebird projects in Florida. Your support allows us to build capacity and facilitate significant gains for conservation of shorebirds and seabirds in Florida.



CONTENTS

2	SHOREBIRD CONSERVATION & THE FLORIDA SHOREBIRD ALLIANCE
3	CONTENTS
4	SHOREBIRD & SEABIRD CONSERVATION GOALS & STRATEGIES
5	MONITORING
6	Monitoring Effort
7	Monitoring Data at Work
8	Posting & Conservation Effort
9	Minimum Counts & Population Estimates
11	Rooftop Nesting Trends
14	Productivity & the Role of Predation Management
17	Timing of Ground Nesting & Flightless Chicks
18	MONITORING IN AN EVER-CHANGING LANDSCAPE
	SPECIES FACT SHEETS
19	American Oystercatcher
20	Black Skimmer
21	Least Tern
22	Snowy Plover
23	Wilson's Plover



Shorebird & Seabird Conservation Goals & Strategies

The long-term vision of the [Florida Shorebird Alliance \(FSA\)](#) is to support viable shorebird and seabird populations living in healthy coastal habitats throughout Florida. This vision includes a future where more Floridians and visitors value coastal habitats and are engaged in successful shorebird and seabird conservation efforts. To fulfill the vision, the Florida Fish and Wildlife Conservation Commission (FWC) and FSA partners developed complementary recovery plans that guide conservation actions.

In 2013, a comprehensive Species Action Plan for Imperiled Beach-nesting Birds (IBNB): American oystercatcher, black skimmer, least tern, and snowy plover was developed.¹ The goal of the IBNB plan is to improve the conservation status of the four state-listed species to a point where they can be removed from the Florida Threatened Species List. The IBNB plan sets long-term statewide population goals for the four state-

listed species and outlines conservation actions designed to address threats to shorebirds and seabirds.

To build upon the IBNB plan, the Florida Beach-nesting Bird Plan (BNB) was developed to establish a specific short-term population goal and strategies.² The BNB plan offers a 10-year vision for shorebird conservation in Florida and includes a fifth species, Wilson's plover, which is not State-Threatened but is a Species of Greatest Conservation Need. ***The goal of the BNB plan is to increase the population of five species, American oystercatcher, black skimmer, least tern, snowy plover, and Wilson's plover, by 10% by 2029.***

Implementing conservation and management strategies statewide is essential to achieve species recovery goals. With partners conducting outreach and monitoring statewide, the FSA provides a structure for carrying out conservation actions in Florida. This robust, partner-led monitoring program is crucial for gauging progress toward population goals and adaptively managing important sites.

5 STRATEGIES FOR GROWING THE POPULATIONS OF THE PRIORITY SPECIES

-  Reduce human disturbance
-  Manage habitat
-  Manage predation
-  Address management information needs
-  Improve regulatory coordination

Look for these dots in each section of the report to see the five strategies in action!



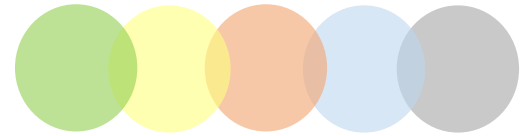
Photo: Britt Brown



¹ Florida Fish & Wildlife Conservation Commission (FWC). 2013. A Species Action Plan for Four Imperiled Species of Beach-Nesting Birds. Tallahassee, Florida, USA.

² Schulte, S.A. et al. 2016. Florida Beach-nesting Bird Plan. Manomet, Massachusetts, USA.

Monitoring



The FSA monitoring program combines a standardized data collection protocol, the [Breeding Bird Protocol for Florida's Shorebirds and Seabirds \(BBP\)](#), and an online database, the [Florida Shorebird Database \(FSD\)](#). To standardize the timing of data collection, the BBP directs partners to focus their monitoring efforts during specific dates, or count windows, each nesting season. Data collected during the count windows provides a consistent statewide snapshot of breeding activity. Additionally, we recommend more frequent monitoring whenever possible. Frequent monitoring (i.e., weekly) helps to confirm the causes of nest or chick loss, document disturbance events, verify whether nesting was successful, capture re-nesting attempts, and document peak nesting. More frequent surveys also reduce the number of unknowns in the data.

The data collected by FSA partners informs the development of population metrics, species distribution maps, and reproductive outcome assessments (i.e., nest/chick success) that are used to adaptively manage Florida's breeding shorebirds and seabirds (Table 1).



Photo: Eric Fortman

Table 1.

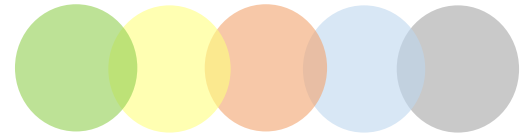
Twenty species of shorebirds and seabirds breed in Florida. Priority species for the current population assessment are in bold. State- or federally-listed species are indicated with an asterisk (*).

Shorebirds	Species	Scientific Name
	American Oystercatcher*	<i>Haematopus palliatus</i>
	Black-necked Stilt	<i>Himantopus mexicanus</i>
	Killdeer	<i>Charadrius vociferous</i>
	Snowy Plover*	<i>Charadrius nivosus</i>
	Eastern Willet	<i>Tringa semipalmata</i>
	Wilson's Plover	<i>Charadrius wilsonia</i>

Seabirds	Species	Scientific Name
	Black Skimmer*	<i>Rhynchops niger</i>
	Bridled Tern	<i>Onychoprion anaethetus</i>
	Brown Noddy	<i>Anous stolidus</i>
	Brown Pelican	<i>Pelecanus occidentalis</i>
	Caspian Tern	<i>Hydroprogne caspia</i>
	Gull-billed Tern	<i>Gelochelidon nilotica</i>
	Laughing Gull	<i>Leucophaeus atricilla</i>
	Least Tern*	<i>Sternula antillarum</i>
	Magnificent Frigatebird	<i>Fregata magnificens</i>
	Masked Booby	<i>Sula dactylatra</i>
	Roseate Tern*	<i>Sterna dougallii</i>
	Royal Tern	<i>Thalasseus maxima</i>
	Sandwich Tern	<i>Thalasseus sandvicensis</i>
	Sooty Tern	<i>Onychoprion fuscatus</i>



Monitoring Effort



*In 2018, **273** partners entered more than **10,000** records into the Florida Shorebird Database and covered **894** miles of Florida's shorebird and seabird nesting habitats (Figure 1). That's approximately the distance from Tallahassee to Washington, D.C.!*

When you count the number of times each route was surveyed, our partners monitored over 10,400 miles in 2018. **That's roughly the distance from Tallahassee to Australia!** Mapping route survey locations allows us to identify areas where monitoring can be expanded.

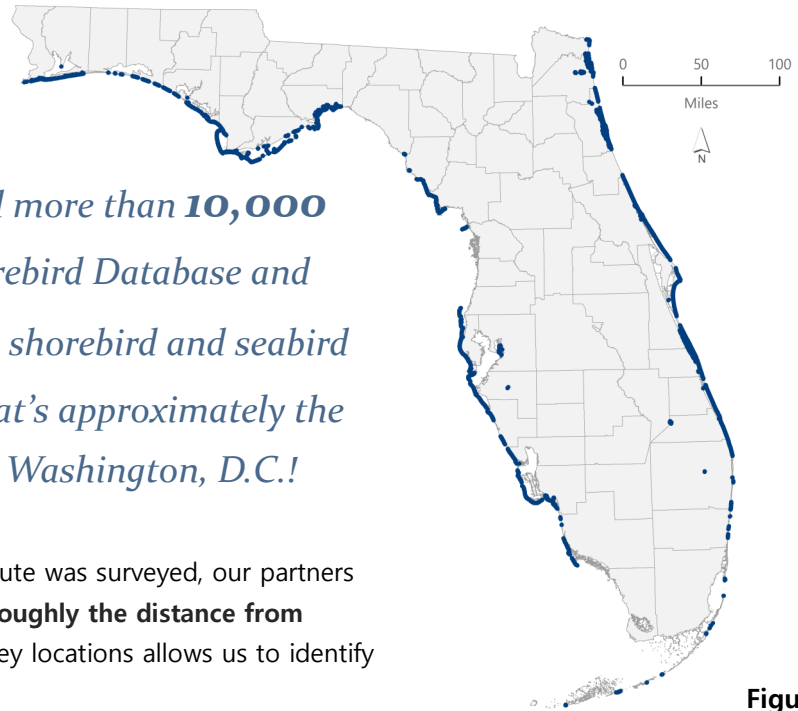


Figure 1.

Map of routes surveyed in 2018.

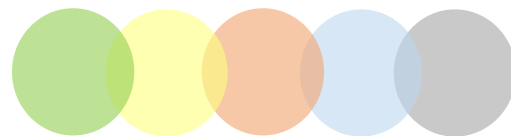
Table 2. Statistics from the FSD and monitoring data from 2011-2018

		2011	2012	2013	2014	2015	2016	2017	2018
Users	FSD Accounts	164	323	464	586	739	863	1005	1167
	FSA Monitors	112	161	183	191	255	279	274	273
Routes	Number of Routes	184	228	203	268	299	331	304	336
	Total Route Surveys	1107	1824	1967	3158	3370	3920	4128	4189
Ground	Solitary	sites	888	1105	1265	1331	1578	1063	1161
		visits	2524	3123	3859	4430	5387	4322	4647
	Colonial	sites	123	170	170	194	196	208	196
		visits	656	1028	1164	1531	1427	1804	1826
Rooftop	sites	169	221	260	313	387	407	387	402
	visits	320	661	1000	1473	2419	2886	2889	4176
Chick/young sightings		617	1027	1172	1339	2262	2404	2153	2287

Note: FSD Accounts includes all accounts ever created; FSA Monitors is the number of people submitting data in a given year. Number of routes includes all unique routes that were completely surveyed at least once during the season. Number of solitary sites is the total number of nest attempts reported for a given year (one pair may re-nest multiple times) for all shorebird species. Colonial sites contain multiple nests and re-nests. Rooftop sites include all previously documented rooftops that were checked, whether they were active or inactive. Chick sightings can include repeat observations of chicks over time.



Monitoring Data at Work



FSA partners spent over 14,500 hours monitoring nesting sites in 2018. That's equivalent to 1.7 years of monitoring in an 8-month period, and that estimate doesn't even include the time our partners spent traveling to and from nesting locations, entering data into the FSD, or participating in stewarding and outreach efforts. Because of the FSA partners, the feat of monitoring Florida's shorebird and seabird populations statewide is possible!

Monitoring data submitted by partners via the [Florida Shorebird Database \(FSD\)](#) provides a wealth of information that is leveraged by FWC and FSA partners to support a multitude of conservation, management and protection actions.

FSD monitoring data are used to:

- ◆ Guide management decisions at local, regional, and state levels
- ◆ Establish population recovery goals and measure progress toward those goals
- ◆ Evaluate the success of management and conservation efforts (e.g., bird stewarding, vegetation management, posting)
- ◆ Pinpoint areas in need of special protection, such as seasonal closures (e.g., Critical Wildlife Areas) or increased law enforcement
- ◆ Identify threats to nest success (e.g., predators, overwash, disturbance)
- ◆ Inform the need for specific permit conditions or mitigation to protect shorebird and seabird habitats
- ◆ Inform damage assessment and restoration plans following natural or man-made disasters
- ◆ Communicate current and previous nesting locations so sensitive areas can be avoided (e.g., oil spills, disaster preparedness, etc.)
- ◆ Uncover countless research priorities to improve management and conservation



Photo: Britt Brown

Monitoring data informs...

LAW ENFORCEMENT PATROLS

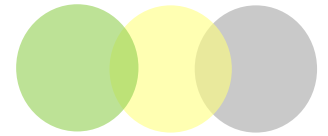
FWC law enforcement is expanding patrols of shorebird and seabird nesting areas. Monitoring data collected by FSA partners tells us which sites are the highest priority and need enforcement action. Providing detailed information (priority + need) has allowed Law Enforcement to allocate their time most effectively. In 2018, FWC law enforcement conducted 629 shorebird patrols totaling over 1,000 patrol hours.

DISASTER PREPAREDNESS EFFORTS

Shorebird and seabird nesting and brood rearing locations (identified from the FSD) were included in NOAA's recent revision to the [Environmental Sensitivity Index \(ESI\) Maps](#) available to first responders to prepare and respond strategically should disaster strike.



Posting & Conservation Effort



Posting of nesting, brood-rearing, and sensitive feeding habitats is one of the primary means of reducing disturbance in busy recreational areas statewide. Nesting sites are often posted with signs and twine to alert beachgoers that nests are present. The [Florida Shorebird Alliance \(FSA\)](#) strives to identify and post nesting areas that are most vulnerable to human disturbance.

Posting is particularly crucial in FWC's designated Critical Wildlife Areas (CWAs) because they support some of the most vulnerable beach-nesting habitat in the state. Establishing a buffer zone with signs and/or symbolic fencing in nesting, brood-rearing, and sensitive feeding

habitats has been shown to reduce disturbance and increase nest and chick success for shorebirds and seabirds.

For example, research in Florida demonstrated that snowy plovers were **four times more likely to nest within a posted area**, and **nests within posted areas were 1.5 times more likely to hatch**.³ At state parks in the Panhandle where brood-rearing areas were posted in addition to posting nesting areas, broods were twice as likely to fledge compared to broods raised in areas without posting.⁴

The best protections are achieved when posting is combined with outreach, stewarding, and coordination with law enforcement.

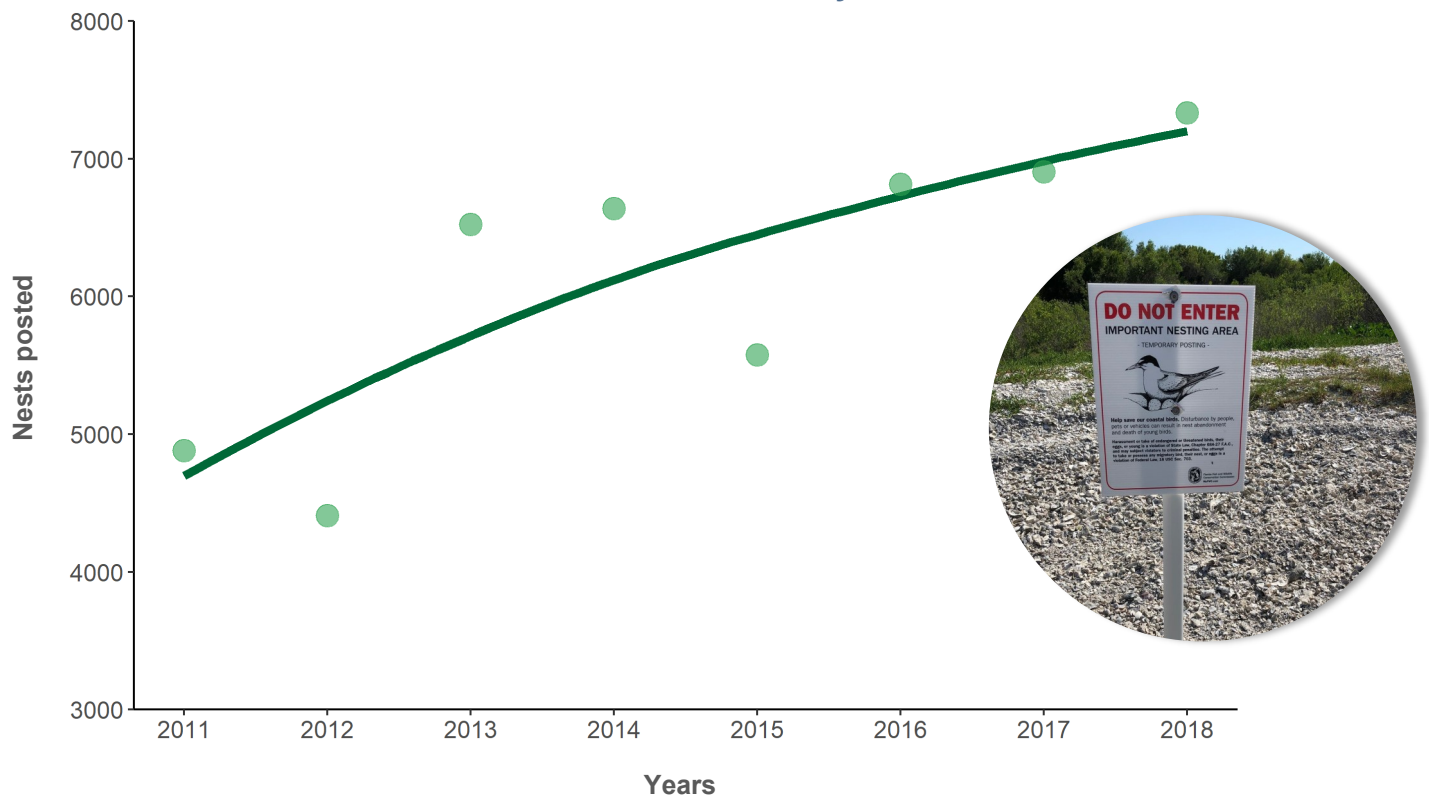


Figure 2. Trend showing number of nests for American oystercatcher, black skimmer, least tern, snowy plover, and Wilson's plover protected with signs/fencing since 2011. If we include all species, the number of nests protected with posting is over 50,000!

³ Pruner, R.A. 2010. Conservation and management of the Snowy Plover along the Florida Gulf Coast: habitat selection and the consequent reproductive performance. Thesis. University of Florida, Gainesville, Florida, USA.

⁴ Pruner, R.A. et al. 2011. Interpreting the influence of habitat management actions on shorebird nesting activity at coastal state parks in the Florida panhandle. 2010-11 study final report. Department of Environment Protection, Florida Park Service, Panama City, Florida, USA.



Minimum Counts & Population Estimates



FWC is currently developing a statistically rigorous approach to assess population trends of the American oystercatcher, black skimmer, least tern, snowy plover, and Wilson's plover. These population estimates will be finalized by December 2020. Until that work is complete, statewide minimum counts for breeding shorebirds and seabirds will serve as useful proxies for statewide population sizes (Table 3).

Although **minimum counts are not population estimates**, they are defensible, reproduceable, and flexible to interannual changes in survey effort. They are also designed to eliminate double counting of birds that relocate and re-nest through the season.

Minimum counts for the five priority species will be replaced by population estimates as they are finalized.

Table 3. The minimum counts of breeding pairs and the baseline population estimates are both applied at the statewide scale, use FSD data, and include rooftop counts for most rooftop-nesting species. The minimum counts of breeding pairs use a 10-day window and only include sites that were surveyed within that timeframe. The population estimates will incorporate all the data in the FSD and additional variables to account for detection, and will use counts from all sites to extrapolate statewide abundance of breeding birds. Both can be used to detect trends, but the minimum counts of breeding pairs can only serve as an indicator of population status.

	Minimum Count of Breeding Pairs	Population Estimates
Represents	Statewide minimums	Statewide population estimates
Data Source	FSD data snapshots	FSD data + detection + variables
Rooftops	Included for some species	Included for all species
Trends	Indicator of possible trends	Population trend
Species	Most species	Focal species
Precision	Range of minimum values	Confidence limits
Updated	Annually – Replaced with population estimates when available	Annually

Table 4. Minimum number of breeding pairs in Florida. Minimum pairs were derived from the highest number of pairs observed statewide by species during a selected 10-day survey period annually. The range of minimum pairs for the last five years shows the variation over time. The time-period used for the range of minimum pairs coincides with peak nesting statewide for each year. These are true counts that are not corrected for imperfect detection or asynchronous nesting. Minimum pairs for priority species (in bold) will be replaced by statewide population estimates once completed.

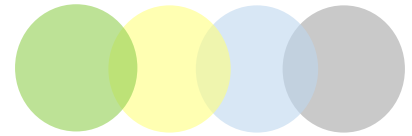
		2018 Minimum Pairs	Range of Minimum Pairs (2014-2018)	Time period used for range
Seabirds	Black Skimmer*	2,834	2,110 - 2,834	Mid May to early July
	Caspian Tern	156	144 - 302	Early May to mid June
	Gull-billed Tern	255	56 - 255	Mid May to mid June
	Laughing Gull	36,554	32,013 - 51,040	Early May to mid June
	Least Tern	4,718	3,511 - 4,718	Mid May to mid June
	Roseate Tern	40	19 - 177	Mid May to late June
	Royal Tern	4,724	4,523 - 17,000	Late April to early June
	Sandwich Tern	640	426 - 1,613	Late April to late May
Shorebirds	American Oystercatcher	118	88 - 128	Mid April to mid May
	Snowy Plover	142	142 - 155	Early April to early June
	Wilson's Plover	146	96 - 146	Early May to mid June

*Rooftops were not included.



Photo: Pat Leary

Rooftop Nesting Trends



A rooftop with nesting activity is known as an “active rooftop.”

With increasing development and human use of beaches, some shorebirds and seabirds have shifted to nesting on gravel rooftops where they are less subject to disturbance and predation. In Florida, flat gravel rooftops provide nesting habitat for two shorebird species (American oystercatcher and killdeer) and four seabird species (least tern, roseate tern, gull-billed tern, and black skimmer).

The number of rooftops with nesting activity reported to the [Florida Shorebird Database](#) has steadily increased since 2011 (Fig. 3). This increasing trend is the result of an increase in rooftop monitoring efforts from FSA partners, rather than an increase in gravel rooftop availability. By 2015, stable and consistent monitoring efforts were achieved and have continued through 2018. The number of active rooftops reported since 2015 were similar or greater than those found in 2010, when a comprehensive

survey was conducted by FWC staff. This indicates that FSA partner rooftop monitoring efforts have contributed to a robust monitoring program. Despite achieving near-comprehensive rooftop monitoring coverage, the number of active rooftops in Florida continues to be lower than that reported two decades ago.

Understanding the spatial and temporal variation in the distribution of active rooftops can help improve the efficiency and effectiveness of the shorebird monitoring program. Rooftop colonies currently occur statewide, except for the Big Bend region, but they are more

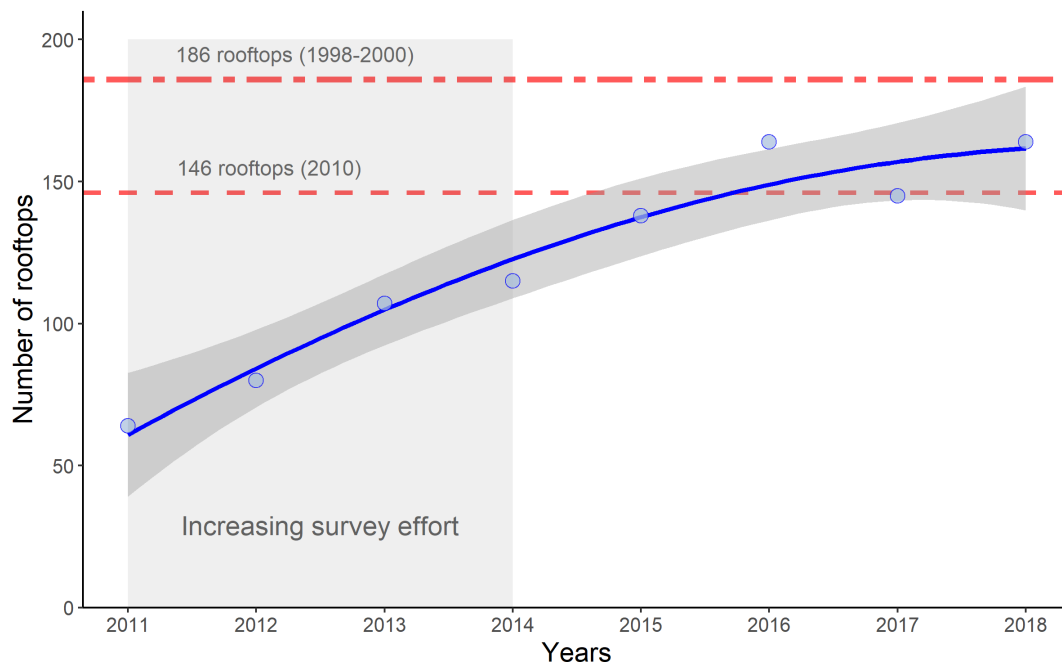


Figure 3. Number of rooftops with nesting shorebirds and seabirds reported by Florida Shorebird Alliance partners since 2011 (blue circles with blue trend line). Results from the FSA monitoring efforts are contrasted against two comprehensive statewide surveys conducted in 2000 (Gore et al. 2007; two-dashed red line) and 2010 (Zambrano and Warraich 2012; dashed red line).^{5,6}

⁵ Gore, J.A. et al. 2007. Distribution and Abundance of Breeding Seabirds Along the Coast of Florida, 1998-2000. Final Performance Report. Florida Fish & Wildlife Conservation Commission, Tallahassee, Florida, USA.

⁶ Zambrano, R. & Warraich, T.N. 2012. 2010 Statewide Seabird and Shorebird Rooftop Nesting Survey in Florida. Final Report. Florida Fish & Wildlife Conservation Commission, Tallahassee, Florida, USA.



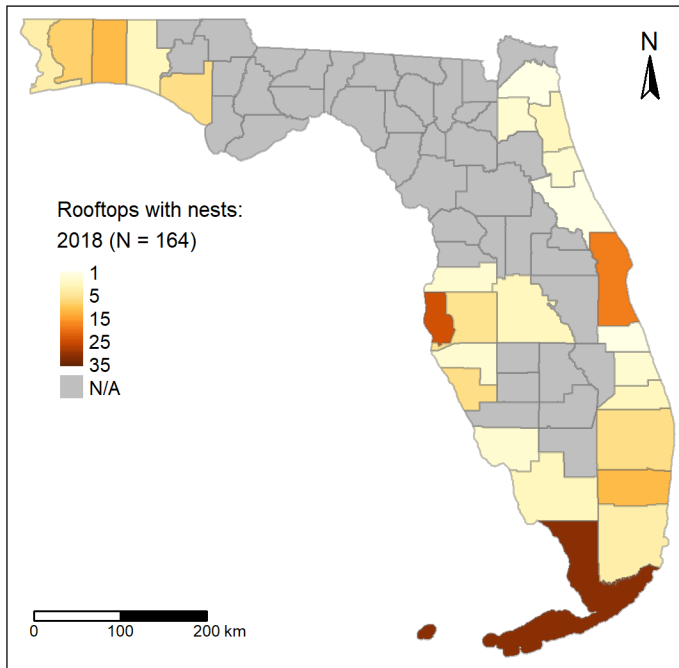


Figure 4. FSD reported active shorebird and seabird nesting rooftops by county in 2018. Darker colors indicate higher number of rooftops occupied by nesting birds.



Photo: Jeff Liechty

common along the Atlantic coast than the Gulf coast (Fig. 4). While the total number of reported rooftops with nesting birds and their overall distribution has been stable for the last four years, the number of active rooftops per county has shifted in recent years (Fig. 5). Local variations in monitoring efforts, differences in the regional rate of decline of gravel rooftop availability, and annual movements of nesting birds from rooftops to ground nesting sites are among the possible causes of the observed distribution shifts.

We are using FSD data to explore possible reasons for the shifts in rooftop nesting and to inform future management and conservation actions.

Coordination, communication, and survey consistency are crucial for maintaining a successful rooftop monitoring program. In 2018, an intensive rooftop

monitoring study showed that **weekly surveys from May 10 to June 20 largely increased the chance of capturing peak nesting events at any given rooftop.** These peaks in nesting are used to estimate our statewide breeding populations. In addition, weekly surveys increase the chance of detecting birds nesting on rooftops and provide the needed metrics (total number of active rooftops and number of adults counted by flush counts) to assess annual rooftop nesting populations for statewide population estimates. Data collected outside the peak nesting period are also valuable to guide conservation management actions geared towards protecting and preserving rooftop nesting birds.



Photo: Ashlee Minor

*Can you spot
the chicks?*

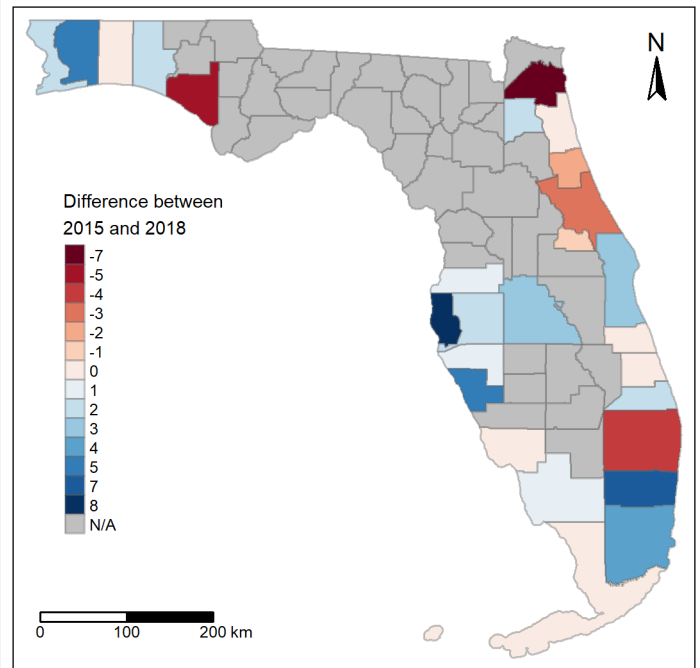


Figure 5. Difference in the number of FSD-reported active rooftops used by nesting shorebirds and seabirds between the 2015 and 2018 breeding seasons. Counties shaded in red indicate a decline in the number of reported active rooftops, while counties shaded in blue represent an increase. The map legend indicates the actual difference in the number of reported rooftops over time.

ROOFTOP PROTECTION & MANAGEMENT

Rooftops are important human-made nesting habitat for shorebirds and seabirds, especially least terns. In 2018, more than half of the state's breeding population of least terns nested on rooftops. Because of this, FSA partners put significant resources into managing rooftops for breeding birds. From chick-proofing rooftops, to coordinating rooftop repairs with building owners, FSA partners orchestrate a labor of love each year in order for the birds to continue to successfully use rooftops as breeding sites.



Photo: Carly Fankhauser

Productivity & the Role of Predation Management

PRODUCTIVITY

The number of flight-capable young produced per breeding pair

Productivity goals are often established to inform the management of rare or declining species. For example, according to the US Shorebird Conservation Plan, snowy plovers should produce an average of 1.5 fledged young per nesting pair over a 5-year period to maintain population stability.⁷ Estimating productivity at the state level helps to inform population goals, while monitoring productivity at the local level guides management and conservation actions and informs the adaptive management process (i.e., learn by doing).

When productivity is low (i.e., nests fail, or chicks disappear before they are flight capable), it is important to identify site-specific threats (e.g., disturbance, overwash, predation) and consider management options.

Frequent monitoring is key to identifying causes for nest failure and chick loss. From 2011–2018, [Florida Shorebird Alliance](#) monitoring partners reported that predators were a source of loss for more than half of all nest sites and colonies they monitored. From this information, we can infer that predation is a critical threat to the reproductive success of shorebirds and seabirds in Florida and warrants investigation at a local scale.

To highlight how adaptive predation management can benefit productivity, we present an example from St. George Island State Park, where monitoring data revealed that snowy

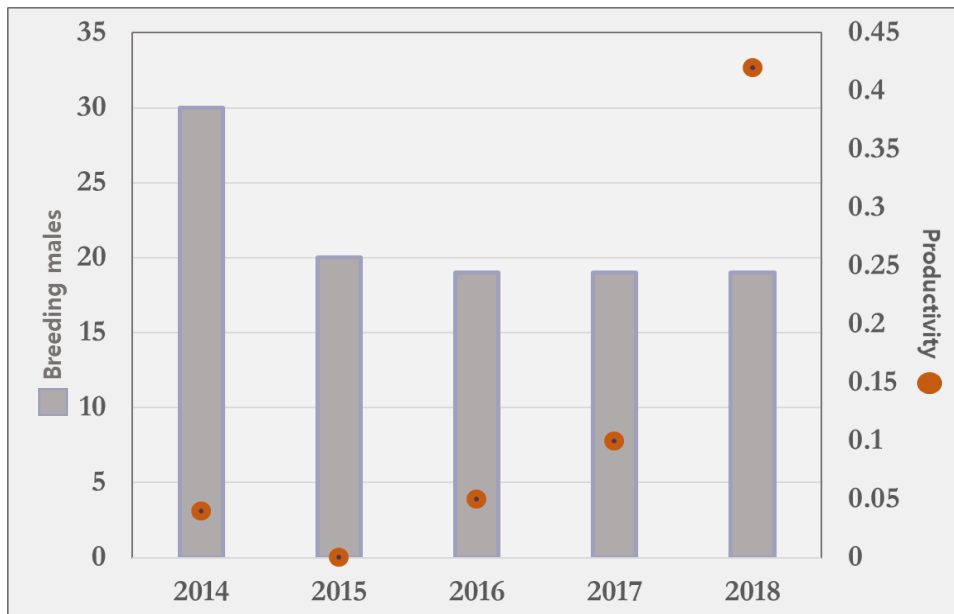


Figure 6. Snowy plover productivity trends at St. George Island State Park, Franklin County, FL, 2014–2018. From 2014–2015, predation management actions were ongoing. However, management actions targeting avian predators didn't begin until 2016. Here, we use breeding males instead of breeding pairs due to a skewed sex ratio.

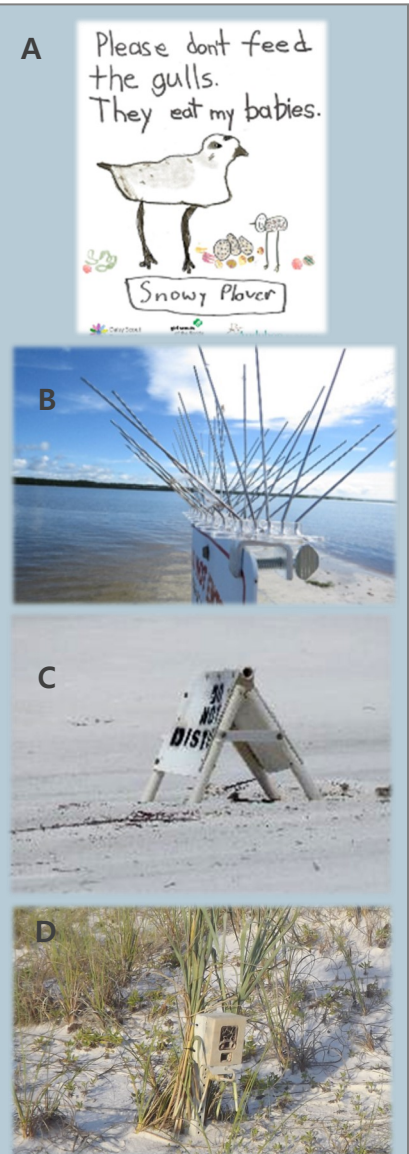


Figure 7. Examples of targeted predation management actions or tools implemented at St. George Island State Park to reduce loss due to avian predators. A) targeted outreach, B) perch deterrents, C) chick shelters, and D) game cameras



⁷ Hunter, W.C. et al. 2002. Southeastern Coastal Plains-Caribbean Report: U.S. Shorebird Conservation Plan. U.S. Fish and Wildlife Service. Atlanta, Georgia, USA.

Although predation management actions can improve shorebird productivity, as they did at St. George Island State Park, it is critical to understand the predator community and assess the full range of management options when developing a strategy. Moreover, management actions should be targeted and evidence-based with a goal of *reducing predator impacts* and not necessarily predator numbers. Currently, 'predation' (i.e., loss due to predator, but species is unknown) is the most frequent source of predator-related impacts reported by partners, indicating that it's often unclear which predator is responsible for the loss (Fig. 8). Often there are multiple potential predators in an area and it can be challenging to determine which predator



was responsible for the loss. Here, we provide guidance to help partners assess local threats, identify predator pressures, and develop a management strategy in situations where predators are limiting local breeding populations (Fig. 9). FWC is currently drafting additional guidance documents addressing adaptive management strategies. Stay tuned for more information.



Before implementing predation management, it is important to ask:

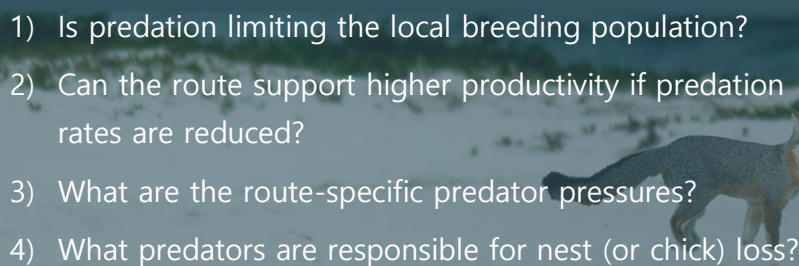
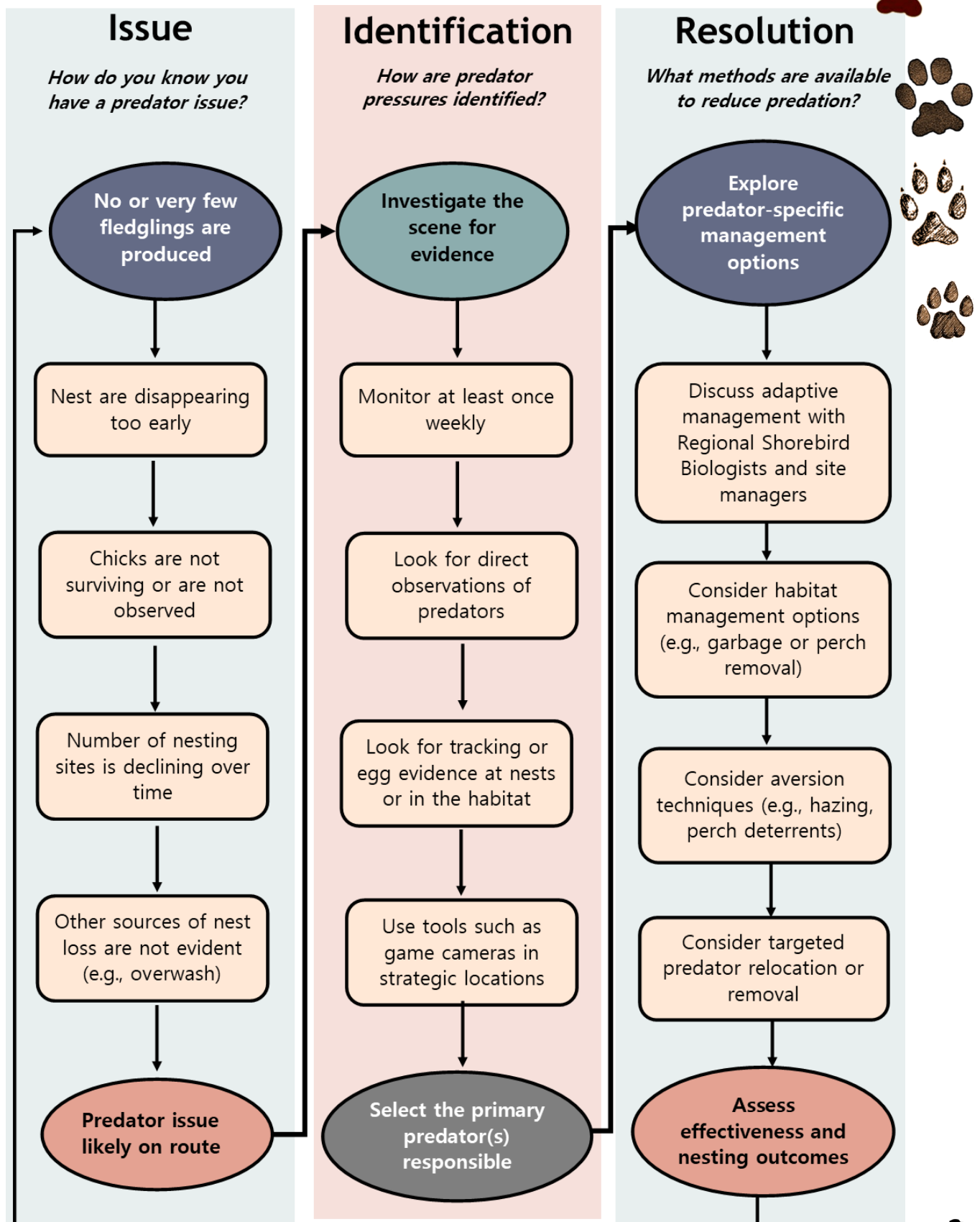
- 
- A blurred background image of a coastal landscape with a dog in the foreground. The dog is a medium-sized breed with grey and tan fur, standing on a sandy beach. The background shows a body of water and a distant shoreline with some vegetation. The overall image is out of focus, emphasizing the text overlay.
- 1) Is predation limiting the local breeding population?
 - 2) Can the route support higher productivity if predation rates are reduced?
 - 3) What are the route-specific predator pressures?
 - 4) What predators are responsible for nest (or chick) loss?

Photo: Kevin Christman

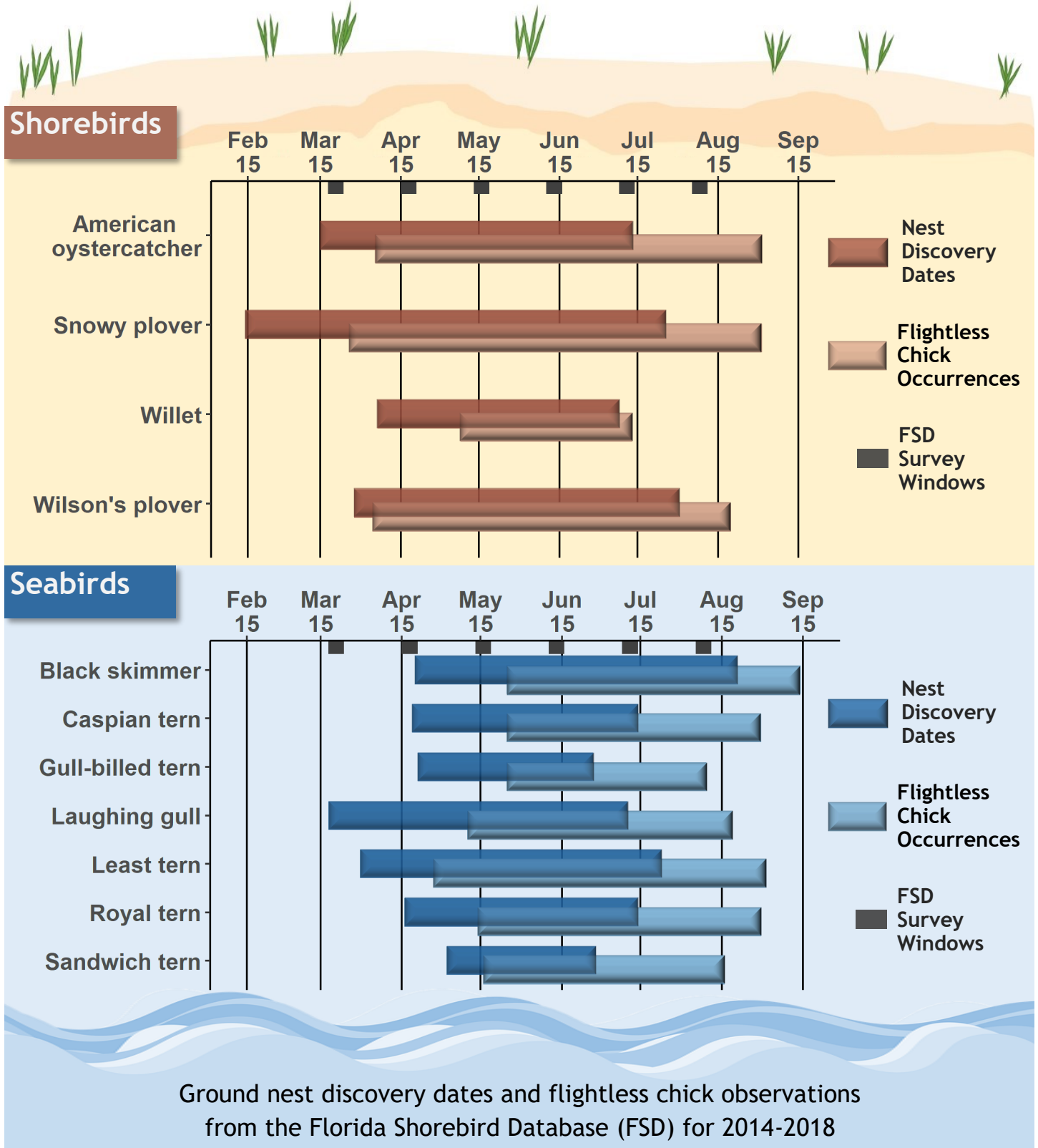
Figure 9. A guide to predation management that optimizes the path for a data-driven and adaptive predation management approach. This process emphasizes the reduction of uncertainties and implementation of targeted predator- and site-specific predation management actions.



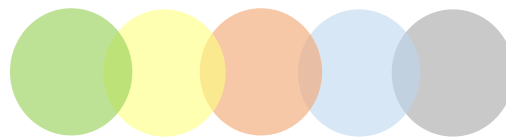
Timing of Ground Nesting & Flightless Chicks

Sensitive time periods for nests and chicks on beaches throughout Florida

Discovery dates may be influenced by FSD survey windows; nests and chicks can occur outside these ranges.



Monitoring in an Ever-changing Landscape



As Florida's coastal landscape changes, so do nesting opportunities for shorebirds and seabirds. Anchored by a standardized data collection [protocol](#), the [Florida Shorebird Alliance \(FSA\)](#) monitoring program is designed to collect reliable information while facing multiple challenges.

SHIFTING SANDS: Shorebird and seabird breeding habitat in Florida is highly dynamic. Islands shift over time, beaches erode and accrete, oyster bars vanish, and restoration projects create new habitat. Although these inter-annual variations present challenges and opportunities for monitoring, FSA partners strive for complete statewide survey coverage every year.

EXTREME WEATHER EVENTS: In 2018, Hurricane Michael transformed the landscape of the eastern Panhandle. In some areas, rooftop nesting habitat was lost when buildings were destroyed, and existing habitat was altered when passes were created. In other areas, reduced vegetation created new potential habitat for nesting shorebirds and seabirds. With every storm, FSA partners report these changes and intensify their survey efforts to find new nesting areas.

DEVELOPMENT: Every year, rooftop nesting habitat is lost when buildings are re-roofed or demolished. Conversely, new construction sites can be a transient source of potential nesting habitat for birds that seek cleared areas. In every situation, FSA partners work with developers,

building owners and managers to find creative solutions that balance human activities with shorebird and seabird nesting.

FSA PARTNERSHIPS: The FSA is a statewide network of partners dedicated to advancing shorebird and seabird conservation in Florida. As FSA partnerships experience turnover, experienced partners welcome new partners and pass along their hard-earned monitoring knowledge and wisdom. Partnership continuity is a foundational element for successful monitoring programs.

WHAT'S NEXT: As FSA partners continue to rise to the challenges of monitoring shorebirds and seabirds, FWC is applying monitoring information to improve management, conservation, and monitoring guidance. We will develop population estimates, and a strategy to track trends for the priority species, by December 2020. We will continue to adapt our management strategies to ensure conservation progress in Florida's ever-changing coastal landscape.

The FSA leads one of the most extensive research- and adaptive management-based, partner-driven monitoring programs in the world. With this dedicated group of partners, shorebird and seabird conservation in Florida has a bright future.



Photo: Britt Brown



American Oystercatcher

Haematopus palliatus



CONSERVATION STATUS

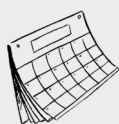
Florida: Threatened



2018 MINIMUM PAIRS

118 pairs observed April 27 - May 6

WHEN DO THEY BREED?



March – September

Days to hatch: 27-29

Flight capable: 35-45 days

CHICKS



When chicks are young, they will lie flat and remain still if they become frightened. As they get older, they will jump in the water to flee danger.

LONGER NESTING SEASON ~150 days

Oystercatchers arrive at nesting territory and defend ~60 days before laying eggs.

Chicks remain dependent on adults ~25 days after becoming flight capable.

WHERE DO AMERICAN OYSTERCATCHERS BREED?



They nest on sand/shell rakes or islands as well as spoil islands, beach habitats, and occasionally rooftops.



CLUTCH SIZE

Average: 3 eggs

Re-nests: 1-3 eggs

LIVING WITH SHOREBIRDS

If you are boating or kayaking near shell rakes, stay back **300 ft**, especially if you see one or two adults.



MANAGEMENT CHALLENGES

Determining cause of nest failure is challenging because tracks are rarely visible in their nesting habitat.

Overwash and unknown predation are leading causes of nest failure.

KEY NONBREEDING AREA - FLORIDA'S BIG BEND REGION

2nd largest concentration of wintering oystercatchers, with flocks of up to 500 birds



Photos by Janell Brush, Joe Marchionno, Amy Schwarzer

Black Skimmer

Rynchops niger



CONSERVATION STATUS

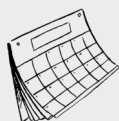
Florida: Threatened



2018 MINIMUM PAIRS

2,834 pairs observed June 9-18

WHEN DO THEY BREED?

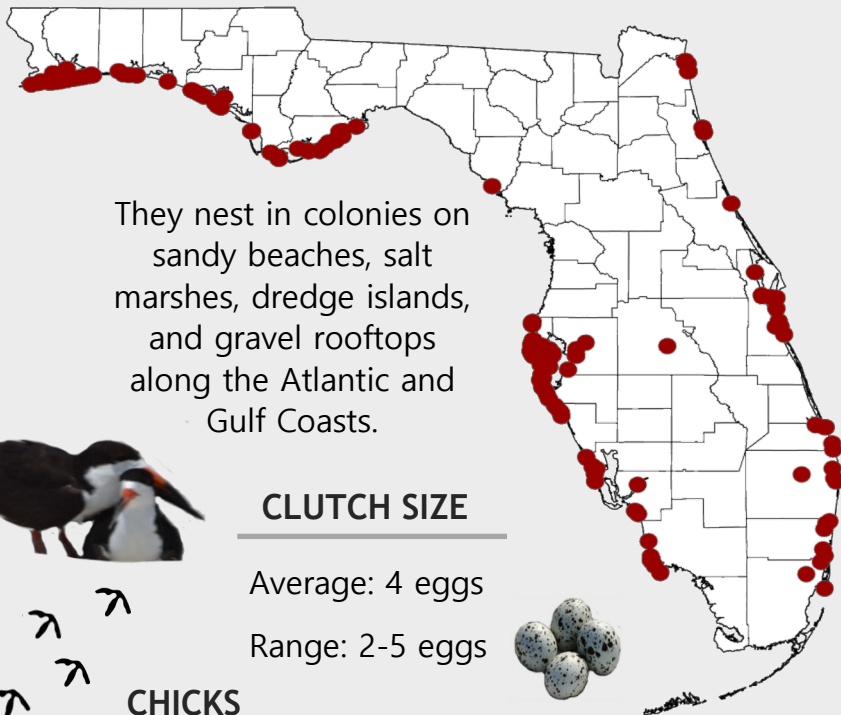


May - September

Days to hatch: 21-25

Flight capable: 23-26 days

WHERE DO BLACK SKIMMERS BREED?



They nest in colonies on sandy beaches, salt marshes, dredge islands, and gravel rooftops along the Atlantic and Gulf Coasts.

CLUTCH SIZE

Average: 4 eggs

Range: 2-5 eggs



CHICKS

Small chicks will hide in the sand; as they get older, they will wander out of the posted area toward the water or shade.



LIVING WITH SEABIRDS – PHOTOGRAPHY

Predators of seabird eggs and young are opportunistic. When photographing a colony, remain **behind** posting, don't exceed **10** minutes, and stay **at least 300 ft** away from birds—farther if they are disturbed. These birds are easily disturbed and flush frequently, please give them **space to rest!**



MANAGEMENT CHALLENGES

Predation (unknown predator) and overwash are the leading causes of nest failure.

CREPUSCULAR FEEDERS

Adults predominantly feed at dawn and dusk; sometimes even at night.



BANDING

In 2015, researchers from Pinellas County, FL started putting green bands with an alpha-numeric code on chicks. Multiple Atlantic coast states are banding chicks to learn more about movement, habitat use, and longevity.



Least Tern

Sterna antillarum



CONSERVATION STATUS

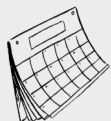
Florida: Threatened



MINIMUM PAIRS 2018

4,718 pairs observed May 13-22

WHEN DO THEY BREED?

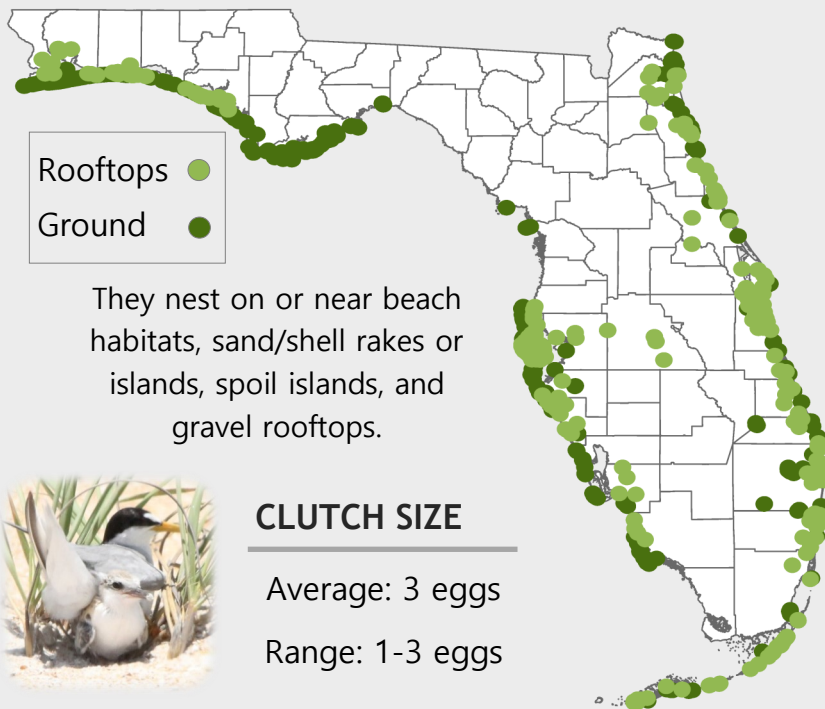


April - September

Days to hatch: 19-25

Flight capable: 19-20 days

WHERE DO LEAST TERNS BREED?



They nest on or near beach habitats, sand/shell rakes or islands, spoil islands, and gravel rooftops.



CLUTCH SIZE

Average: 3 eggs

Range: 1-3 eggs

MANAGEMENT CHALLENGES

Almost half of colony loss in 2018 was from unknown causes, followed by predation and overwash.

FALLEN CHICKS

Occasionally, chicks fall off rooftops, are blown off, or get washed down gutters. If you find a chick, please notify the managers/staff of the building immediately.



OPPORTUNISTIC NESTERS

Can be found nesting at newly available habitats like construction sites
May utilize derelict bridges, elevated or floating platforms

LIVING WITH SEABIRDS

Gravel rooftops are an essential nesting habitat for least terns. To support ongoing nesting, FSA Rooftop Stewards put significant resources into managing rooftops, like '**chick-proofing**' rooftops and '**chick checking**'. Learn more about ways to support rooftop nesting at www.flshorebirdalliance.org!



DECLINING NEST DENSITY ON ROOFTOPS

Average of 29 nesting pairs per rooftop in 2018, which is **half** the number reported in 1993.



Snowy Plover

Charadrius nivosus

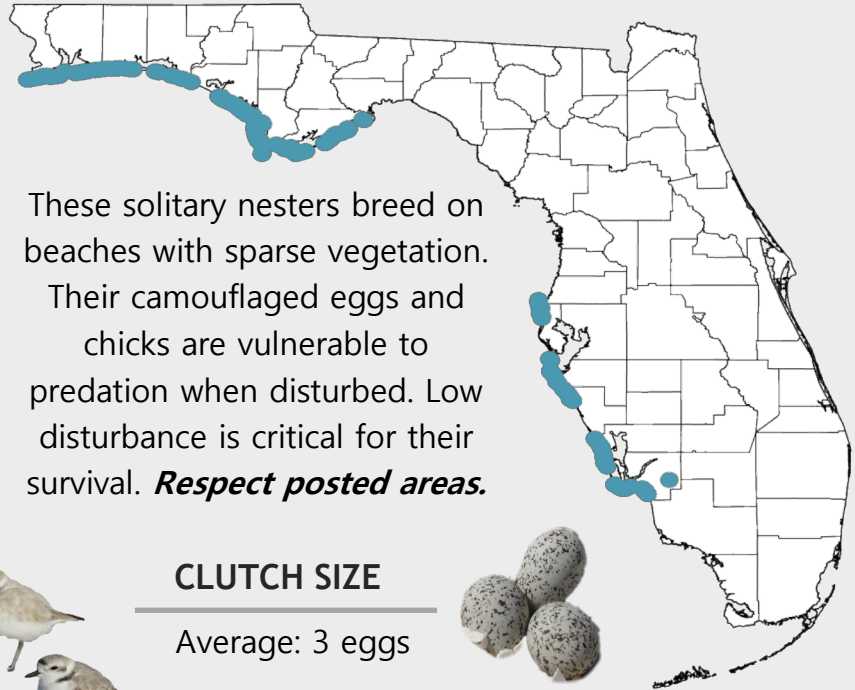


CONSERVATION STATUS

Florida: Threatened



LIVING WITH SHOREBIRDS



These solitary nesters breed on beaches with sparse vegetation. Their camouflaged eggs and chicks are vulnerable to predation when disturbed. Low disturbance is critical for their survival. ***Respect posted areas.***

MINIMUM PAIRS 2018

142 pairs observed May 7-16



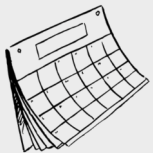
CLUTCH SIZE

Average: 3 eggs

Range: 1-3 eggs



WHEN DO THEY BREED?



February - August

Days to hatch: 24-32

Flight capable: 28-42 days



KEY BREEDING AREAS

>50% of the Snowy Plover fledglings produced in Florida over the last 5 years fledged from only **7** locations.

St. Joseph State Park | Fort Pickens-GUIS |
Santa Rosa-GUIS | Eglin Restricted | Perdido
Key-GUIS | Windmark Beach | Crooked Island
East-Tyndall AFB

MANAGEMENT CHALLENGES

Predation is the leading cause of nest failure for Snowy Plovers in Florida.



Ghost crabs and coyote are the most frequently documented predators on Gulf coast beaches.



LONG DISTANCE RUNNERS

At just days old, chicks may travel over 9 miles in search of food.



LONGEVITY



Based on band re-sights, the oldest known Snowy Plover in Florida lived to be **17 years old**. He hatched at Grayton Beach State Park and bred on Tyndall Air Force Base, 1998-2015!

Photos by Britt Brown, Kevin Christman, Raya Pruner

Wilson's Plover

Charadrius wilsonia



CONSERVATION STATUS

Florida: Species of Greatest Conservation Need



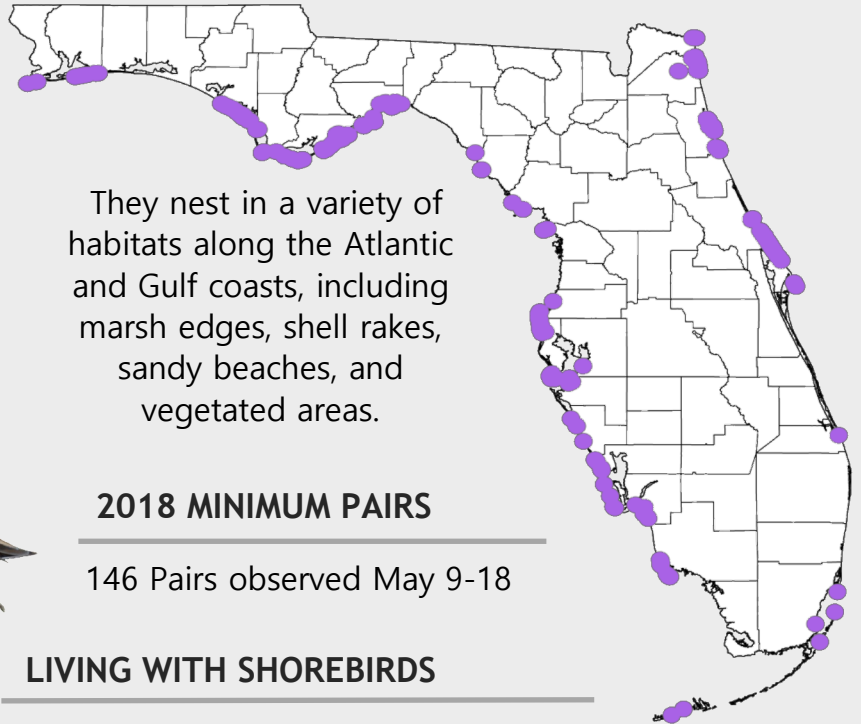
CLUTCH SIZE

Average: 3 eggs

Range: 2-4 eggs



WHERE DO WILSON'S PLOVERS BREED?

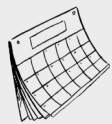


They nest in a variety of habitats along the Atlantic and Gulf coasts, including marsh edges, shell rakes, sandy beaches, and vegetated areas.

2018 MINIMUM PAIRS

146 Pairs observed May 9-18

WHEN DO THEY BREED?



March - August

Days to hatch: 24-25

Flight capable: 31-35 days

LIVING WITH SHOREBIRDS

Trash and food scraps attract predators to nesting areas. Please keep beaches **clean**.



MANAGEMENT CHALLENGES

About $\frac{1}{4}$ of nest failures had cause unknown.

Predation and overwash were the next most common causes of failure.



UNIQUE NESTING HABITATS

New nest sites are discovered every season as we expand the search into new habitats.

Keep your eyes open, you never know where they may nest.

FOOD SELECTION

Their larger bill allows for a highly varied diet including crustaceans like fiddler crabs.



MONITORING CHALLENGES

Locating nests can be challenging. Wilson's plover nests are cryptic and can be found in a variety of habitats, including within seabird colonies.