# American oystercatcher, snowy plover, black skimmer, least tern

## *Haematopus palliatus, Charadrius nivosus, Rynchops niger, Sternula antillarum*

*Photographs (clockwise from top left): American oystercatcher, snowy plover, least tern, and black skimmer by FWC*

## Executive Summary

The American oystercatcher, snowy plover, black skimmer, and least tern are listed as state Threatened on Florida's Endangered and Threatened Species List. This document describes protections for these four imperiled beach-nesting birds (IBNBs) and the biological background necessary to understand when a permit may be necessary for these species. The document also provides voluntary conservation measures for which no permit is necessary, measures to avoid take, and permitting options as well as minimization and mitigation measures when take is unavoidable.

These guidelines apply statewide, with special focus on three types of sites that support essential behaviors of these species: Breeding Sites, Critical Brood-rearing Sites (snowy plovers only), and Critical Roosting Sites (American oystercatchers only). Breeding IBNBs need undisturbed, open or sparsely vegetated habitat with sand, shell, gravel, cobble, dredge spoil, or some combination of these materials in which to dig shallow nests called "scrapes." The coastal areas used by IBNBs to nest and rear young also are popular for many human activities. Human-related disturbance, habitat loss, and habitat alteration are among the primary threats to IBNBs.

Rule 68A-27.003, Florida Administrative Code (F.A.C.), prohibits take of these species, which includes harm and harassment. Take can be either intentional or incidental to an otherwise lawful activity. Harm includes significant habitat modification as well as injury or mortality. Harassment includes flushing these species within Active Breeding Sites or Critical Brood-rearing Sites, keeping these species from breeding or rearing broods, and intentionally or negligently forcing American oystercatchers to fly from Critical Roosting Sites. Capturing, handling, marking, taking biological samples from, or collecting these species or their eggs are other forms of take.

*Will my activity cause take?*
- Definitions and take
- Figure 6
- Appendix A

*Can I avoid take?*
- Measures to Avoid Take
- Examples of Activities Not Expected to Cause Take
- Other Authorizations for Take

*How do I apply for a permit?*
- Box 2
- Incidental take
- Research, education, salvage

*Are there standard mitigation or minimization measures for my activity?*
- Standard mitigation options
- Appendix B

*If not, how do I determine mitigation?*
- Box 2
- Mitigation options

These guidelines include measures to avoid take, as well as circumstances under which take is authorized without a permit. If take is unavoidable during otherwise lawful activities, the Florida Fish and Wildlife Conservation Commission (FWC) may issue incidental take permits, which must provide a scientific or conservation benefit to the species (Box 2). Conservation benefit typically is achieved through a combination of minimization measures, which reduce the take that occurs, and mitigation measures, which counterbalance the take and provide an additional benefit. Standard minimization and mitigation options are available for many common activities on Florida's coasts. The FWC also issues Scientific Collecting Permits for some forms of intentional take, including research and collection or possession for educational use.

- The Distribution and Survey Methodology section and ShoreMapper can help determine if an activity will occur within 300 feet of an Active or Recent Breeding Site, Critical Brood-rearing Site, or Critical Roosting Site.
- Review the Examples of Activities Not Expected to Cause Take and Other Authorizations for Take.
- Expounding on the Definition of Take, Measures to Avoid Take, Figure 6, and Appendix A can help potential applicants determine whether a project or activity is expected to cause incidental take.

- Refer to the Potential to Significantly Disrupt or Impair Essential Behavioral Patterns section for definitions of terms and common types of take.
- Common types of incidental take include harm via **death or injury** of adults, eggs, or chicks; harm via **significant habitat modification**; or **harassment of breeding pairs or chicks**. Activities can result in one, two, or all three of these. Please note that FWC typically does not issue permits for direct killing or injuring of adults, eggs, or young except in cases of human health and safety.

- Refer to the FWC Permitting: Incidental Take section for information on how to estimate the extent of take.
- Determine the extent of take (e.g., how many breeding pairs of birds would be taken or how many acres would be modified) using the ShoreMapper application at https://gis.myfwc.com/shoremapper/.

- Minimization measures reduce the amount of take that will occur (refer to Minimization Options).

- Mitigation measures counterbalance the take identified in Steps 2 and 3 and provide a scientific or conservation benefit (refer to Mitigation Options).

- Incidental take permit applications are available on FWC's online permitting site, currently under the name "migratory bird nest removal."
- The applicant must be the landowner or an individual designated in writing by the landowner.

# Glossary

**Active Breeding Site:** For solitary-nesting shorebirds, breeding sites where one or more Active Nests are present. For colonial-nesting seabirds, breeding sites where one or more Active Nests are present or where flightless young are present. See the Potential to Significantly Disrupt or Impair Essential Behavioral Patterns section for more details.

**Active Nest:** Nests are typically shallow depressions (scrapes) in sand, shell, gravel, or sparsely vegetated substrate. A nest is considered active when it is supporting essential behavioral patterns, including breeding behavior that occurs from the point of nest building (i.e., digging a scrape) until young of the season permanently leave the nest. Essential behavioral patterns at Active Nests include incubating or shading eggs and brooding or feeding young. Breeding behavior, including courtship and territorial defense, that occurs in areas with nests (scrapes) signifies active nesting for IBNBs, even when eggs are not yet present in the scrapes. Scrapes are considered active nests until there is sufficient documentation demonstrating they no longer support essential behavioral patterns. See the Potential to Significantly Disrupt or Impair Essential Behavioral Patterns section for more details.

**Activity footprint:** The boundary of a project which includes the entire area to be modified and where project activities will occur (e.g., staging areas). See the Determining the Extent of Take section for more details.

**Breeding Site:** An area used by shorebirds and seabirds for breeding (courtship, nest scraping, territorial defense, egg-laying, incubating or shading eggs, and/or caring for dependent young).

**Colonial-nesting seabirds:** In this document, refers to black skimmers and least terns.

**Colony:** A congregation of one or more pairs of breeding IBNBs that nest and roost in proximity at a particular location. Colonies can contain multiple species.

**Critical Brood-rearing Site:** Habitat that has been used frequently by snowy plover chicks and juveniles for resting, foraging and other essential behaviors over the preceding five years for which data are available in the Florida Shorebird Database. A Critical Brood-rearing Site is considered Active from March 15-September 1, which is when it is likely to contain snowy plover chicks and juveniles. See the Potential to Significantly Disrupt or Impair Essential Behavioral Patterns section for more details.

**Critical Roosting Site:** Habitat critical for the essential behaviors of roosting (i.e., sheltering) for American oystercatchers. See the Potential to Significantly Disrupt or Impair Essential Behavioral Patterns section for more details.

**Direct impact:** In the context of significant habitat modification, direct impacts occur within the activity footprint and result from activities that remove habitat. See calculating financial contributions for significant habitat modification for more details.

**Essential behavioral patterns:** Behaviors associated with breeding, feeding, or sheltering.

**Florida Shorebird Alliance (FSA):** A statewide partnership of government and non-government organizations committed to advancing shorebird and seabird conservation in Florida (flshorebirdalliance.org).

**Florida Shorebird Database (FSD):** The statewide monitoring database for shorebirds and seabirds. A standard protocol is followed to collect and enter data online at FLShorebirdDatabase.org.

**FWC Regional Shorebird Contact:** Agency staff in the FWC's five regional offices that provide technical assistance regarding shorebirds and seabirds. Contact information can be found at myfwc.com/conservation/you-conserve/wildlife/shorebirds/contacts

**IBNB:** State Threatened imperiled beach-nesting birds: American oystercatcher, snowy plover, black skimmer, and least tern.

**IBNB Permitted Monitor:** A trained, dedicated individual who meets the minimum qualifications outlined in Appendix C and has been issued a FWC IBNB Permitted Monitor permit.

**Inactive Nest:** A scrape becomes inactive when it no longer contains viable eggs and does not contain young that are incapable of permanently leaving the nest. See the Potential to Significantly Disrupt or Impair Essential Behavioral Patterns section for more details.

**Indirect impact:** In the context of significant habitat modification, indirect impacts occur within 300 feet of the activity footprint and result from activities that render habitat unsuitable or reduce its suitability for IBNBs. See calculating financial contributions for significant habitat modification for more details.

**Incidental take:** Take that results from, but is not a purpose of, carrying out an otherwise lawful activity.

**Intentional take:** Take that is not incidental to an otherwise lawful activity and is prohibited without a scientific collecting permit or unless the take is authorized under certain circumstances involving risks to property or human safety.

**Posted area:** See Regulatory Boundary Sign.

**Project activities:** Actions necessary to complete a project, including operation of vehicles, movement or storage of supplies or equipment, site preparation (e.g., clearing, grading), construction, sand placement or sand removal, and other activities that may harm or harass shorebirds or seabirds.

**Project area:** The activity footprint plus a 300 ft buffer.

**Project buffer:** A posted area established to avoid or minimize take as a provision of a FWC incidental take permit. The Project Buffer creates a boundary between an activity and Active Nests or important habitat features within an Active Critical Brood-rearing Site.

**Qualified Rooftop Monitor:** Individuals who have completed the FWC online training (see FWC's IBNB webpage at https://myfwc.com/license/wildlife/ibnb/) and obtained a Rooftop Monitor Certificate (see Appendix E).

**Recent Breeding Site:** Breeding sites where one or more Active Nests with eggs or flightless young have been recorded in any of the preceding five consecutive breeding seasons for which data are available in the Florida Shorebird Database (FSD). See the Potential to Significantly Disrupt or Impair Essential Behavioral Patterns section for more details.

**Regulatory Boundary Sign:** FWC signage specifically used to protect sensitive IBNB nesting, feeding, or roosting areas from human disturbance. Areas posted with Regulatory Boundary Signs, often accompanied by rope (i.e., "symbolic fencing"), are typically referred to as posted areas. See the Potential to Significantly Disrupt or Impair Essential Behavioral Patterns section for more details.

**Scrape:** A shallow, inconspicuous depression created by a breeding pair of IBNBs in the sand, shell, gravel, cobble, dredge spoil, or some combination of these materials during courtship and in preparation of egg-laying.

**ShoreMapper:** Online mapping application for IBNB Recent Breeding Sites, Critical Brood-rearing sites, and critical Roosting Sites (updated annually by April 1). Layers within the app are derived from data from the FSD. Application is hosted on FWC's website at: https://gis.myfwc.com/shoremapper/.

**Significant habitat modification:** Actions that result in loss or modification of greater than 500 square feet of habitat within Active or Recent Breeding Sites, Critical Brood-rearing Sites, or Critical Roosting Sites, or that render these sites unsuitable (i.e., reduce occupancy, survival, or productivity of IBNBs). Also, actions that result in any loss or modification of habitat within an Active or Recent Breeding Site or Critical Roosting Site that already contains less than 500 square feet of suitable habitat, or that render these sites unsuitable. See Expounding on what constitutes take for more details.

**Solitary-nesting shorebirds:** In this document, refers to American oystercatchers and snowy plovers.

**Suitable Habitat**: See Box 4

**Wrack (wrack line, beach wrack):** Lines or clumps of organic material deposited on the beach along the edge of the tide line, generally consisting of sea grass, shells, macroalgae, and other marine debris.

## Species Overview

The American oystercatcher, snowy plover, black skimmer, and least tern are listed as state Threatened on Florida's Endangered and Threatened Species List.

- 68A-27.003(2)(a), F.A.C. No person shall take, possess, or sell any of the threatened species included in this subsection, or parts thereof or their nests or eggs except as authorized by Florida Fish and Wildlife Commission (Commission) rule or by permit from the Commission or when such conduct is authorized in a management plan as defined in this chapter and approved by the Commission, or as authorized in Commission-approved guidelines.
- 379.411, Florida Statutes, prohibits the intentional killing or wounding of any species designated as endangered, threatened, or of special concern; penalties. A person may not intentionally kill or wound any fish or wildlife species designated by the Commission as endangered, threatened, or of special concern, or intentionally destroy the eggs or nest of any such fish or wildlife, unless authorized by rules of the Commission. A person who violates this section commits a Level Four violation under s. 379.401.
- 68A-27.001(4), F.A.C., defines take – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The term "harm" in the definition of take means an act which actually kills or injures fish or wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The term "harass" in the definition of take means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.
- 68A-16.001, F.A.C., 68A-4.001, F.A.C., and the Federal Migratory Bird Treaty Act protect native birds, active nests, eggs, and young.
- 68A-16.006, F.A.C., prohibits the use, placement, and possession of bird traps without the appropriate authorization.
- 68A-19.005, F.A.C., designates Critical Wildlife Areas that may have year-round or seasonal closures to prevent disturbance during critical life stages for imperiled wildlife, including these species.

## Biological Background

This set of Guidelines addresses four species: American oystercatcher (*Haematopus palliatus*), snowy plover (*Charadrius nivosus*), black skimmer (*Rynchops niger*) and least tern (*Sternula antillarum*). These state Threatened species are collectively referred to as imperiled beach-nesting birds (IBNB).

This section describes the biological background for IBNBs and provides context for the following sections. This section focuses on habitats that support essential behaviors, threats, and what constitutes take for these species. For more information about life history and conservation actions for IBNBs, please refer to A Species Action Plan for Four Imperiled Beach-nesting Birds (FWC 2013).

American oystercatchers, black skimmers, and least terns are found throughout most coastal areas of the state, but snowy plovers are found only along the coasts of the Panhandle and Southwest Florida. Black skimmers and especially least terns are also observed at inland water bodies. Least terns only occur in Florida during their breeding season and spend the non-breeding season in Central and South America (Thompson et al. 2020). American oystercatchers and black skimmers are year-round residents, with resident populations

augmented by migrants in the non-breeding season. Most snowy plovers are year-round residents, but some migrate to other Gulf of America states during the non-breeding season (Himes et al. 2006).

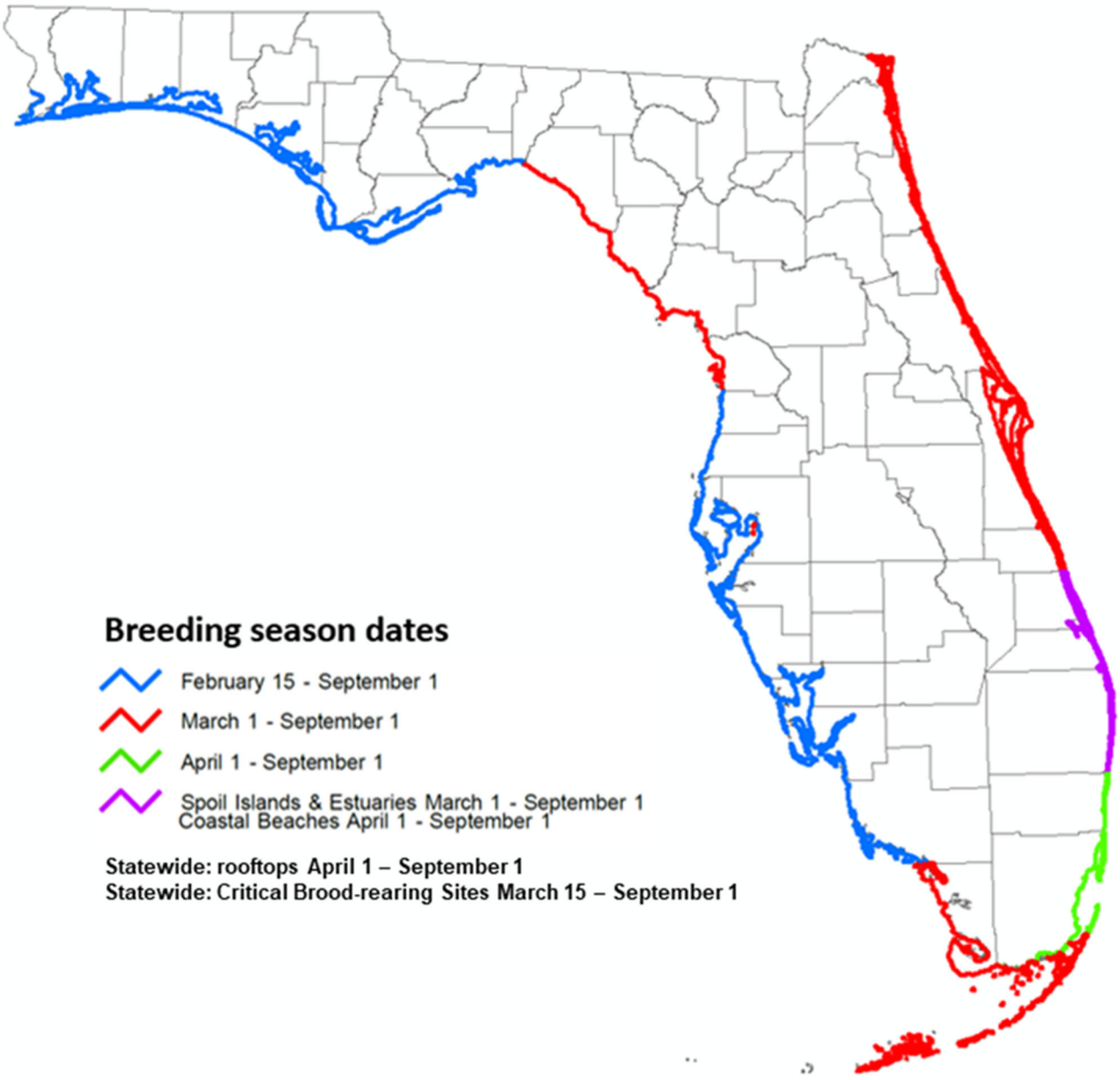



*Figure 1. Start and end dates for the breeding season of state Threatened beach-nesting birds vary throughout Florida.*

Breeding seasons vary by species and location within Florida (Figure 1). IBNBs may re-nest multiple times in a season if nests fail (Gochfeld et al. 2020, Page et al. 2020, Thompson et al. 2020, Working Group et al. 2020), but only snowy plovers rear multiple broods in a season (Pruner 2010, Pruner et al. 2011, Page et al. 2020).

IBNBs often return to the same site where they nested during previous breeding seasons (Gochfeld 1978; Atwood and Massey 1988, FWC 2013; FWC unpublished data). However, IBNBs sometimes temporarily or permanently abandon breeding sites due to changes in environmental conditions, poor reproductive success, or excessive disturbance (Burger 1982, Burger 1984). At sites re-used by IBNBs between 2011-2018, some

sites were abandoned temporarily, but these absences were typically only 1 to 2 years and rarely exceeded 4 years (FWC, unpublished data). This underscores the importance of conserving recent breeding sites, even if birds are absent for 1 or more years.

American oystercatchers and snowy plovers are solitary rather than colonial-nesters, with territories spaced closer together in higher quality habitat (Figure 2). Least terns and black skimmers typically nest in colonies ranging from a few pairs to hundreds (Gore 1996; Figure 3). Multi-species colonies are common and may include other seabirds (Gore et al. 2007, Zambrano and Warraich 2012). All 4 species nest in scrapes: shallow, inconspicuous depressions in sand, shell, gravel, cobble, dredge spoil, or some combination of these materials (Figure 4). American oystercatchers also nest in wrack or low vegetated substrate. Wrack is organic material deposited on the beach along the edge of the tide line, generally consisting of algae, sea grasses, and other marine debris.

*Figure 2. American oystercatchers and snowy plovers are solitary-nesting shorebirds. FWC Photos.*

*Figure 3. Black skimmers and least terns are colonial-nesting seabirds. FWC photos.*

*Figure 4. Least tern eggs in a scrape. FWC photo.*

IBNB chicks are dependent on their parents to protect them from heat and cold. Newly-hatched chicks typically cannot regulate their own body temperature until they are 10 days old (Nichelmann and Tzchentke 2002), so parents brood (i.e., cover with their bodies) newly-hatched chicks to protect them from the elements. American oystercatcher and snowy plover adults spend considerable time brooding chicks during this time period (Colwell et al. 2007, Working Group et al. 2020). Least terns brood young continuously for the first 24-48 hours after hatching. Black skimmers brood young continuously for the first week.

American oystercatcher chicks are dependent on their parents for invertebrate food up to 60 days after hatching, though they may do some foraging on their own in as early as 2 to 3 weeks (Working Group 2020). Snowy plover young, which leave the nest within hours of hatching, forage for insects and other invertebrates (Page et al. 2020). Black skimmer and least tern chicks are solely dependent upon their parents for provision of food (fish) until they are capable of sustained flight and can forage on their own. American oystercatchers, black skimmers, and least terns typically raise broods at the breeding site, but snowy plover parents guide young chicks to high-quality brood-rearing sites, sometimes up to several miles away from breeding sites (Pruner and Johnson 2010).

When not foraging, IBNBs need safe places for the essential behavior of roosting (i.e., resting or sleeping). All 4 species roost in flocks during the non-breeding season. The availability of safe roosting sites that are exposed at high tide is considered a limiting factor for American oystercatchers in Florida (Brush et al. 2017).

In Florida, IBNBs are primarily found along sandy beaches, inlets, spoil and barrier islands, and estuaries. Least terns and black skimmers are also found in interior portions of Florida, particularly foraging around freshwater lakes and human-made bodies of water and resting in adjacent sandy or gravel areas.

Breeding IBNBs need undisturbed, open or sparsely-vegetated habitat with sand, shell, gravel, cobble, dredge spoil, or some combination of these materials in which to dig scrapes (e.g., Figure 4). American oystercatchers breed on beaches, natural and spoil islands, shell rakes, riprap, wrack, and low vegetated substrate. Snowy plovers breed on open or sparsely-vegetated barrier islands and coastal beaches. Black skimmers and least terns nest on beaches, emergent sandbars, washouts in dunes and coastal berms, shell rakes, and dredge spoil islands. American oystercatchers, black skimmers, and least terns also nest on flat, gravel rooftops (Zambrano and Smith 2003, Gore et al. 2007). More than half of Florida's least tern population nests on rooftops (FWC 2020), presumably due to habitat loss, human-related disturbance, and avoidance of mammalian predators (Fisk 1978). Least terns in Florida have also been documented nesting on 2 non-gravel rooftops (Warraich et al. 2012), as well as sand mines, temporary mining sand tailings, construction sites, causeways, agricultural fields, parking lots, and other bare lands (Gore et al. 2007, Zambrano and Warraich 2012 Thompson et al. 2020). Development; groins, jetties, and shoreline hardening structures; mechanical beach cleaning; and human recreational activities in coastal areas are likely reasons why least terns are increasingly nesting in alternative locations.

The availability of high-quality brood-rearing habitat is important for chick survival (Pruner 2010, DeRose-Wilson et al. 2018). For American oystercatchers, black skimmers, and least terns, brood-rearing habitat typically overlaps with breeding habitat. Brood-rearing habitat may overlap with nesting habitat for snowy plovers, though in some areas snowy plovers guide chicks along the shoreline, sometimes for great distances, to high-quality brood-rearing habitat (Pruner and Johnson 2010). These *Critical Brood-rearing Sites* (see definition below) may be similar to breeding habitat but often contain significant features such as ephemeral pools, lagoons, salt flats, and other low energy, poorly-drained coastal areas recharged by tidal activity and rainwater. These features have greater amounts of prey, which results in greater productivity for snowy plovers (Pruner 2010).

Imperiled beach-nesting birds roost in habitats similar to those used for breeding. IBNBs need open roost sites that are relatively safe from predators and close to foraging areas (Rogers et al. 2006). American oystercatchers require quality roost sites available during high tides (Brush et al. 2016). These *Critical Roosting Sites* (see definition below) for American oystercatchers tend to be farther away from shore and away from woody vegetation that can harbor potential predators (Brush et al. 2017).

American oystercatchers forage on sandy beach shorelines, oyster beds, and shell rakes, and in estuaries, lagoons, impoundments, and other tidal areas. Snowy plovers forage in a variety of coastal habitats, such as washovers; ephemeral tidal pools; mudflats; sandflats; wrack lines; sparsely vegetated dunes; and shorelines of coastal ponds, lagoons, and salt marshes. The wrack line is an important source of invertebrate prey for shorebirds (Colombini and Chelazzi 2003, Dugan et al. 2003). Snowy plover chicks sometimes shelter and forage for insects among sparse coastal vegetation such as sea oats (*Uniola paniculata*), railroad vine (*Ipomoea pescaprae*), and other native beach vegetation (e.g., *Panicum amarum*). Least terns and black skimmers forage for fish and occasionally for crustaceans in shallow waters immediately offshore and within estuaries, lagoons, and impoundments; they also forage in bodies of fresh water. Black skimmers require shallow, calm waters for foraging.

Human-related disturbance, habitat loss, habitat alteration, and predation are the primary threats faced by IBNBs (Schulte et al. 2016, Burger 2018). Human-related disturbance results from a wide variety of activities,

including but not limited to, beach recreation (Sabine et al. 2008, DeRose-Wilson et al. 2018); dogs (Weston and Elgar 2007, Faillace 2010, Weston and Stankowich 2014); construction projects in breeding sites; operation of unmanned or manned vehicles on land, in the water, or in the air (Burger 1998, Borneman et al. 2016, Durkin and Cohen 2019, Valle and Scarton 2019); special events such as fireworks, concerts, and sporting events (U.S. Fish and Wildlife Service 1997; FWC unpublished data); mechanical beach-cleaning (E. Forys, Eckerd College, personal communication); construction of groins and jetties; clean-up activities following disasters such as oil spills (Henkel et al. 2014); and rooftop maintenance and repairs (FWC unpublished data). Human-related disturbance reduces survival and reproductive success for shorebird and seabird populations (Anderson and Keith 1980, Safina and Burger 1983, Pruner et al. 2011, Borneman et al. 2016, DeRose-Wilson et al. 2018). Impacts of human-related disturbance on reproductive success include reduced nesting, hatching, and fledging success rates (Safina and Burger 1983, Stillman et al. 2007, Pruner et al. 2015).

Human-related activities can impact IBNBs directly or indirectly. Direct mortality of eggs and chicks occurs from trampling by pedestrians, destruction or predation by dogs, or crushing by vehicles (Chase III and Gore 1989, Melvin et al. 1994, Toland 1999, Durkin and Cohen 2019). IBNB eggs and chicks are well-camouflaged and difficult to see, and chicks stand still or lie down in low areas when approached (Colwell et al. 2007, Page et al. 2020). Chicks can have trouble climbing out of tire ruts and may not move fast enough to avoid vehicles (see Melvin et al. 1994 for citations).

In addition to direct injury or mortality, human activities can indirectly affect survival and reproductive success through disrupting breeding, feeding, or sheltering. Activities that flush adult birds from nests exposes eggs and chicks to predators and the elements, creating the likelihood of nest failure and chick mortality. During incubation, nest failure can occur if eggs are exposed to extreme temperatures, particularly heat (Webb 1987). Egg temperatures greater than 105◦ F can lead to malformation or death of bird embryos (Lundy 1969). Surface temperatures frequently exceed these levels at shorebird and seabird nesting sites in the southern United States (Mallarch and Leberg 1999), with surface temperatures in excess of 140◦ F recorded at least tern nesting sites on beaches and dredge spoil islands and in excess of 150◦ F on rooftop nesting sites in Georgia (Krogh and Schweitzer 1999). In response to high temperatures, shorebirds and seabirds spend more time incubating and shading eggs during the hottest part of the day (Purdue 1976, Grant 1982, Gochfeld et al. 2020). Egg temperatures can increase to lethal levels after just a few minutes of exposure to direct sunlight (Grant 1982, Yasue and Dearden 2006, Amat et al. 2017, Stenzel et al. 2019), and embryo failure in shorebirds has been observed in as little as 2 minutes of exposure to high temperatures (Grant 1982). Similarly, exposure to extreme temperatures can negatively impact chick survival. Signs of physical distress (e.g., calling, panting, and elevated rates of movement) in least terns have been observed after as little as 5 minutes of exposure to ambient temperatures above 113◦ F (Howell 1959). Although less of a threat in Florida than exposure to extreme heat, prolonged exposure to lower temperatures may also result in nest failure or have sublethal effects on embryo development (Grant 1982). Activities that flush adults away from nests may also make eggs and chicks more vulnerable to predators (Quinn 1984, Stenzel et al. 2019). When human activity disturbs adult birds sheltering eggs or chicks and causes them to flush, this creates the likelihood of reproductive failure.

Breeding adults respond to disturbance by moving away from nests or chicks or by employing defensive behaviors, both of which divert their time from incubating eggs and feeding chicks (Sabine et al. 2008). When approached by people or dogs, snowy plovers and American oystercatchers may simply run from nests, but they also give alarm calls, and/or perform distraction displays, including feigning injury, crouching, or adopting a mock sleeping or brooding posture (Figure 5; Page et al. 2020, Working Group et al. 2020). Least terns and black skimmers may take flight, produce alarm calls, and dive at perceived intruders (Gochfeld et al. 2020, Thompson et al. 2020). Black skimmers also engage in distraction displays, including flying low,

sometimes paddling the ground briefly with their feet, or feigning injury (Gochfeld et al. 2020). Engaging in these behaviors is potentially costly for eggs and chicks. For example, IBNB chicks require frequent brooding by their parents until they are able to regulate and maintain their own body temperature (Nichelmann and Tzchentke 2002), so situations that cause parents to separate from chicks can cause harm. Beach-nesting birds can abandon nests or entire breeding sites as a result of being disturbed repeatedly (Burger 1984, Lafferty et al. 2006, Sabine et al. 2008, Martín et al 2015).

*Figure 5. Shorebirds engage in distraction displays to lure predators away from nests. Such displays are costly for eggs and chicks left unattended. FWC photos.*

Chick survival decreases when human activity increases (Ruhlen et al. 2003, DeRose-Wilson et all. 2018). Human-related disturbance reduces the time that parents spend brooding and guarding their chicks and can cause chicks to feed less and to move to lesser quality habitat where they may have lower feeding rates, slower growth, and decreased survival (Yalden and Yalden 1990, DeRose-Wilson et al. 2018). Regular and repetitive disturbance can contribute to protracted snowy plover brood-rearing periods (up to 7 weeks instead of the typical 4 weeks), thereby reducing fledge rates (Pruner et al. 2015).

Repeated disturbance of foraging and roosting adult birds also threatens IBNBs. Recurring disturbance can force beach-nesting birds to abandon high-quality foraging or roosting habitat in search of undisturbed sites (Burger 1986, Burger 1994). Repeated disturbances are stressful and energetically costly for adult birds, with potential impacts on survival (Hill et al. 1997, Rogers et al. 2006, Gibson et al. 2018).

In addition to causing disturbance, human activities have greatly limited the amount of habitat available for IBNBs (Schulte et al. 2016). Coastal development has resulted in the loss of habitat, and losses are expected to continue as the state's human population continues to grow (Carr and Zwick 2016). Dredging, coastal armoring, and groins and jetties can result in loss of IBNB habitat by direct removal of habitat and by altering natural coastal processes. Reduction in habitat can lead to abandonment of a breeding site (Burger 1984). Beach management practices such as mechanical beach cleaning and beach driving, create disturbances that can render otherwise suitable habitat unusable for IBNBs. Development, vegetation succession, and human recreational activities in coastal areas are all likely reasons why least terns and black skimmers are increasingly nesting in alternative locations (Gore et al. 2007, Zambrano and Warraich 2012, Thompson et al. 2020). Over 50% of Florida's least tern population currently nest on rooftops (FWC 2020), where they face unique challenges such as chicks trapped in gutters, falling off edges, or falling down downspouts where they become trapped or killed. Gravel rooftops suitable for nesting are decreasing in quantity and quality in Florida (DeVries and Forys 2004, Zambrano and Warraich 2012), with an average of three suitable rooftops lost per year from 2000-2019 (FWC, unpublished data). As the amount of suitable habitat on beaches and rooftops declines, the importance of limited remaining habitat increases.

Increased levels of native and non-native predators also threaten IBNBs. Trash left behind on the beach by people attracts predators, such as laughing gulls (*Leucophaeus atricilla*), crows (*Corvus* sp.), rats (*Rattus* sp.), coyotes (*Canis latrans*) and raccoons (*Procyon lotor*), that scavenge for food scraps. Direct feeding of birds,

especially gulls, also commonly occurs on recreational beaches. Both food sources increase predator presence and redirects their foraging attention onto the sandy beach areas where IBNBs are nesting or rearing chicks.

Additional threats for IBNBs include climate change and associated severe weather events, harmful algal blooms (FWC, unpublished data; Landsberg et al. 2009, Newstead 2014), and environmental contaminants (Shender et al. 2018). Climate change is expected to result in stronger weather events and disruption of weather and ocean patterns, as well as range expansion and increased frequency of harmful algal blooms, such as *Karenia brevis* (Errera et al. 2014, Gobler 2020). Sea level rise, and the consequential coastal squeeze, will further limit the amount of available habitat. A Species Action Plan for Four Imperiled Beach-nesting Birds (FWC 2013) and the Florida Beach-nesting Bird Plan (Schulte et al. 2016) outline actions to address many of the threats described above.

This section describes what constitutes take of IBNBs under Chapter 68A-27, F.A.C. For ways to avoid take (and thus preclude the need for an FWC permit) please see Measures to Avoid Take. Take of IBNBs can be either incidental or intentional. **Incidental take** refers to take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. This type of take is prohibited without an incidental take permit or other authorization (see Box 2). Harassment of IBNBs during coastal engineering projects is an example of incidental take. **Intentional take** is not incidental to an otherwise lawful activity and is prohibited without a scientific collecting permit or unless the take is authorized under certain circumstances involving risks to property or human safety. Capturing and handling IBNBs for research is an example of intentional take. The following terms, as defined below, are used throughout these guidelines:

- **Active Nest**: Nests are typically shallow depressions (scrapes) in sand, shell, gravel, or sparsely vegetated substrate. For the purposes of this document, a nest is considered active when it is supporting essential behavioral patterns, including breeding behavior that occurs from the point of nest building (i.e., digging a scrape) until young of the season permanently leave the nest. Essential behavioral patterns at Active Nests include incubating or shading eggs and brooding or feeding young. Breeding behavior, including courtship and territorial defense, that occurs in areas with nests (scrapes) signifies active nesting for IBNBs, even when eggs are not yet present in the scrapes. Scrapes are considered active nests until there is sufficient documentation demonstrating they no longer support essential behavioral patterns. Please note that this definition conforms with the definition of "active nest" in the FWC's Imperiled Species Management Plan (ISMP) but differs from the definition in the Breeding Bird Protocol for Florida's Shorebirds and Seabirds and Species Action Plan (FWC 2013) by including courtship and territorial defense in areas with scrapes.
- **Inactive Nest:** A scrape becomes inactive when it no longer contains viable eggs and does not contain young that are incapable of permanently leaving the nest. An Inactive Nest may contain egg-shell fragments or dead chicks, but only if adult birds have stopped attending to the nest, eggs, or young is the nest considered inactive.
- **Breeding Site**: An area used by shorebirds and seabirds for breeding.
    - **Active Breeding Site**: For solitary-nesting shorebirds, breeding sites where one or more Active Nests are present. For colonial-nesting seabirds, breeding sites where one or more Active Nests are present or where flightless young are present. Active Breeding Sites include sites for colonial nesting seabirds and solitary nesting shorebirds. The boundary of the Active Breeding Site is determined by creating a 300-foot buffer around Active Nests. A smaller, site-specific buffer with Regulatory Boundary Signs can be delineated by the FWC, Florida Shorebird Alliance Partners, or qualified IBNB Permitted Monitors in some circumstances in accordance with the Guidelines for Posting Shorebird and Seabird Sites in Florida. For colonies, the buffer is from the outermost

nests. Boundaries may shift if the colony grows in size. At ground sites, buffers are sometimes, but not always, delineated using symbolic fencing and Regulatory Boundary Signs (i.e., posted areas). On rooftops and some small islands and shell rakes, buffers often encompass the entire nesting substrate.

- **Recent Breeding Site**: Breeding sites where one or more Active Nests with eggs or flightless young have been recorded in any of the preceding five consecutive breeding seasons for which data are available in the Florida Shorebird Database (FSD) (i.e., for which data have undergone review and quality control by FWC staff). As noted in the Biological Background section, some breeding sites are not used every year, but IBNBs often return to the sites in subsequent breeding seasons. At sites re-used by IBNBs between 2011-2018, some sites were abandoned temporarily, but these absences rarely exceeded 4 years (FWC, unpublished data).
    - Recent Breeding Sites include sites for colonial nesting seabirds and solitary nesting shorebirds.
    - For solitary-nesting shorebirds, Recent Breeding Sites are determined by buffering all nest locations over the last five consecutive breeding seasons for which data are available in the FSD by 300 ft and dissolving overlapping buffers. Areas with non-overlapping buffers are considered separate breeding sites.
    - For colonial-nesting seabirds, Recent Breeding Sites are determined by buffering colony boundaries entered into the FSD by 300 ft and dissolving overlapping buffers. Areas with non-overlapping buffers are considered separate breeding sites.
    - A map of Recent Breeding Sites can be found in the ShoreMapper application on the FWC's website at: https://gis.myfwc.com/shoremapper/. Recent Breeding Site maps will be updated by April 1 of each year.
    - Please note that rooftops and other artificial structures (e.g., abandoned bridges) are not considered Recent Breeding Sites due to the ISMP policy on state-listed species and man-made structures (see Other Authorizations for Take). However, man-made structures that were required as part of a mitigation plan for permits and that need to be removed must be replaced elsewhere.
    - As discussed in the Other Authorizations for Take section below, the following are not treated as Recent Breeding Sites:
        - An area of non-habitat that was newly cleared for construction (i.e., cleared within the past 5 months) and that IBNBs subsequently used for nesting,
        - An area of non-habitat that was newly cleared (i.e., cleared within the past 5 months) for water storage, flood control, or water management upon which IBNBs subsequently nested,
        - Gravel roads or gravel parking lots upon which IBNBs have nested (please note, however, that converting suitable habitat (Box 4) within a Recent Breeding Site or Critical Brood-rearing Site into a gravel substrate intended for driving or parking vehicles constitutes take via significant habitat modification),
        - Temporary habitat created in active mine operation areas (e.g., sand tailings, clay settling ponds, mine waste disposal areas, excavation areas).

- **Colony:** A congregation of one or more pairs of breeding IBNBs that nest and roost in close proximity at a particular location. Least terns and black skimmers typically nest in colonies. Colonies can contain multiple species and may also contain one or more nests of solitary-nesting shorebirds such as snowy plovers and American oystercatchers.
- **Critical Brood-rearing Site**: Habitat that has been used frequently by snowy plover chicks and juveniles for resting, foraging and other essential behaviors over the preceding five years for which

data are available in the FSD (i.e., for which data have undergone review and quality control by FWC staff).
  - A map of Critical Brood-rearing Sites can be found in ShoreMapper (https://gis.myfwc.com/shoremapper/) and is updated annually by April 1.
  - Critical Brood-rearing Sites may or may not overlap with Recent Breeding Sites.
  - Critical Brood-rearing Sites typically contain ephemeral pools, lagoons, salt flats, and other low energy, poorly drained coastal areas recharged by tidal activity and rainwater that are crucial for snowy plover chicks.
  - Guidelines only delineate Critical Brood-rearing Sites for snowy plovers, because brood-rearing habitat typically overlaps with breeding habitat for American oystercatchers, black skimmers, and least terns.
- **Active Critical Brood-rearing Site:** A Critical Brood-rearing Site is considered active from March 15-September 1, which is when it is likely to contain snowy plover chicks and juveniles.
- **Critical Roosting Site:** Habitat critical for the essential behaviors of roosting (i.e., sheltering) for American oystercatchers. A map of Critical Roosting Sites can be found through ShoreMapper at https://gis.myfwc.com/ShoreMapper/. Critical Roosting Sites may or may not overlap with Recent Breeding Sites. Critical Roosting Sites support essential behaviors at any time of year. Critical Roosting Sites were identified where data indicate that high tide roosts are a limiting factor for this species (e.g., Brush et al. 2017).
- **Regulatory Boundary Sign:** FWC signage specifically used to protect sensitive IBNB nesting, feeding, or roosting areas from human disturbance. These signs reference state or federal rules or statutes and are designed to prevent people from inadvertently violating laws protecting IBNB. Areas posted with Regulatory Boundary Signs, often accompanied by rope (i.e., "symbolic fencing"), are typically referred to as "posted areas." The Guidelines for Posting Shorebird and Seabird Sites in Florida describe the difference between Regulatory Boundary Signs and educational signs.

Broadly speaking, the most frequently encountered types of take include harm via death or injury of adults, eggs, or young; harm via significant habitat modification; or harassment of adults or chicks. A single activity can result in one, two, or all three of these types of take. Please note that FWC typically does not issue permits authorizing direct killing or injuring of adults, eggs, or young except in cases of human health and safety. FWC and partners often use Regulatory Boundary Signs and symbolic fencing to help beachgoers, boaters, and others avoid these types of take. Common examples of take are outlined below, with examples related to specific coastal activities summarized in Appendix A.

1. Actions result in take if they cause direct death or injury of IBNB adults, eggs, or young. Examples of this type of take include *but are not limited to*:
    a. A person steps on or moves eggs.
    b. A vehicle operator runs over or strikes IBNB adults, eggs, or young.
    c. A dog owner allows a dog to enter an Active Breeding Site where the dog subsequently kills or injures IBNB adults, eggs or young.

Some examples of activities that may result in this type (and other types) of take are listed in Appendix A. The FWC and partners use symbolic fencing and Regulatory Boundary Signs, as well as coordination with rooftop owners/managers, wherever possible to help people avoid this type of take.

2. Significant habitat modification results in take under the circumstances below, although this is not an exhaustive list. Significant habitat modification typically does not take place during minor activities that are exempt from Coastal Construction Control Line (CCCL) permitting under Rule 62B-33.004, F.A.C., and 161.053(11), F.S. (*although please note that take via harassment may still occur during the minor activities listed in the rule and statute above*).
    a. Actions cause take if they result in loss or modification of greater than 500 square feet (0.01 acres) of habitat within Active or Recent Breeding Sites, Critical Brood-rearing Sites, or Critical Roosting Sites; or if they render Active or Recent Breeding Sites, Critical Brood-rearing Sites, or Critical Roosting Sites unsuitable. Modifications render habitat unsuitable if they reduce occupancy, survival, or productivity of IBNBs.
    b. Actions cause take if they result in any loss or modification of habitat within an Active or Recent Breeding Site or Critical Roosting Site that already contains less than 500 square feet of suitable habitat (e.g., removal of a 450 square ft shell rake where American oystercatchers breed).
    c. Examples of actions that significantly impair or disrupt breeding in this manner include, but are not limited to, those described as potentially resulting in significant habitat modification in Appendix A. Those conducting actions listed as potentially resulting in significant habitat modification in Appendix A – or other actions not listed but that may cause take – within an Active or Recent Breeding Site, Critical Brood-rearing Site, or Critical Roosting Site should apply for a FWC permit.

3. Actions that result in IBNBs flushing within or from Active Breeding Sites (i.e., adults or juveniles flying into the air or flightless young moving away from the source of disturbance, or adults displaying defensive behaviors cause take by significantly disrupting or impairing normal breeding behaviors. Guidance on appropriate buffer distances to avoid harassment can be found below in Measures to Avoid Take. Examples of this type of take include, *but are not limited to*:
    a. A person enters an Active Breeding Site and subsequently flushes IBNBs.
    b. A vehicle operator flushes IBNBs that are in an Active Breeding Site.
    c. A dog owner fails to keep their dog from flushing IBNBs that are in an Active Breeding Site.
    d. A person or organization uses fireworks that cause IBNBs to flush within or from Active Breeding Sites.
    e. Construction or development activities, or preparation for such activities, cause IBNBs to flush within or from Active Breeding sites.
    f. A person flushes IBNBs on a rooftop that is an Active Breeding Site. Please note that the FWC has a process in place to authorize take on rooftops for urgent repairs (see Appendix E).
    g. An unmanned aircraft system (UAS) flushes birds from an Active Breeding Site (see Appendix F).

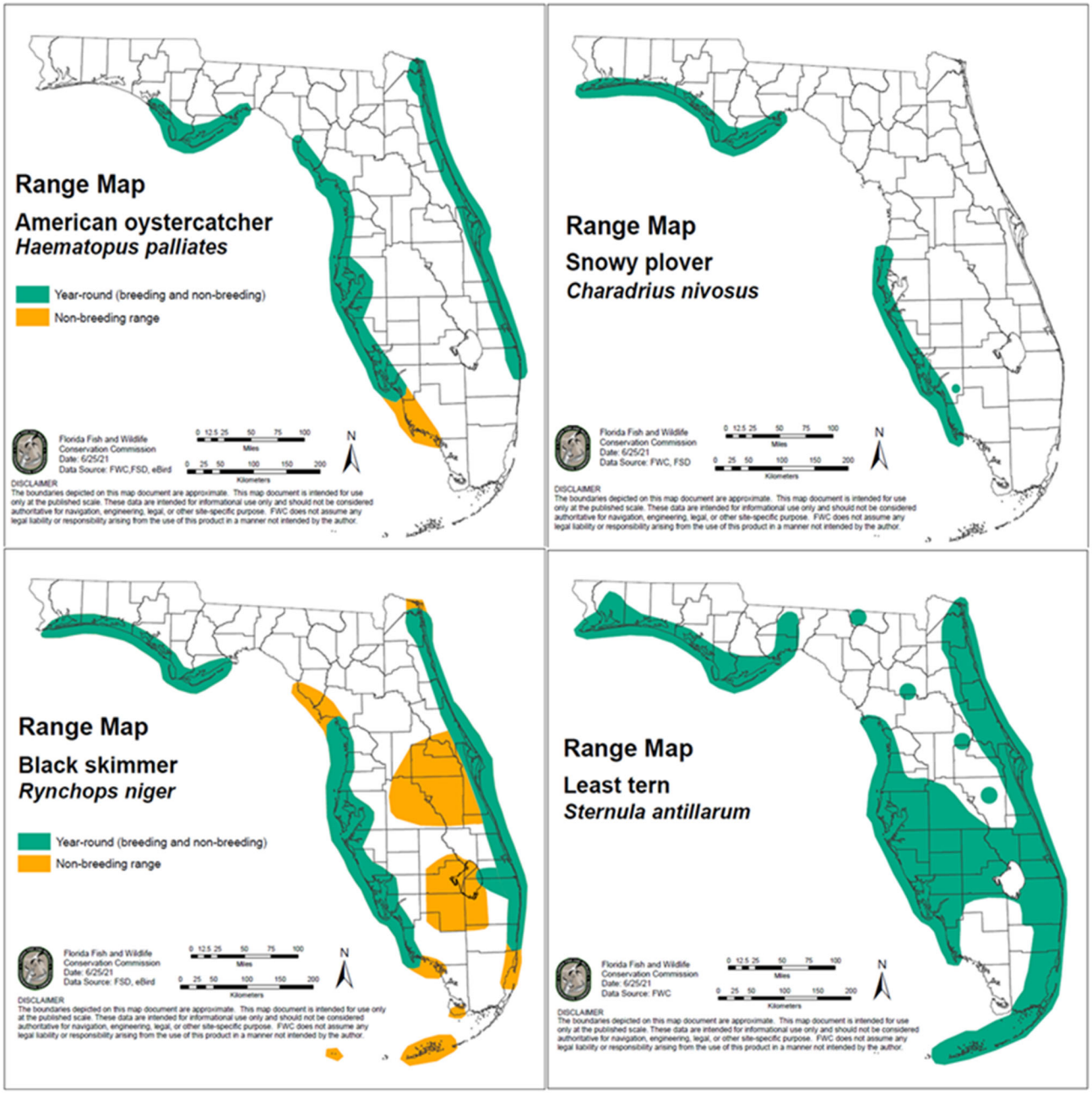
Some examples of activities that may result in this type of take are listed in Appendix A. The FWC and partners use symbolic fencing and Regulatory Boundary Signs, as well as coordination with rooftop owners/managers, wherever possible to help people avoid this type of take.

4. Intentionally or negligently keeping birds from breeding or rearing broods (but see Other Authorizations for Take). Examples of this type of take include, *but are not limited to*:
    a. A person places objects within an Active or Recent Breeding Site or Critical Brood-rearing Site with the intent of deterring IBNBs from breeding or brood-rearing.
    b. A person uses measures designed to deter birds (e.g., plastic owls or other raptor-shaped deterrents, moving objects, predator calls, propane cannons, furrowing of the substrate, etc.) within an Active Breeding Site or within a Recent Breeding Site or Critical Brood-rearing Site during the breeding season (see Figure 1 for dates).
    c. A person prevents snowy plover chicks from accessing areas posted with Regulatory Boundary Signs within an Active Critical Brood-rearing Site. These posted areas typically contain ephemeral pools, lagoons, salt flats, and other low energy, poorly drained coastal areas recharged by tidal activity and rainwater that are crucial for snowy plover chicks.
    d. New shoreline stabilization structures (e.g., groins, jetties) block snowy plover chicks from traveling from Active or Recent Breeding Sites to Critical Brood-rearing Sites.
5. Intentionally or negligently forcing flightless snowy plover young to flush (move away from the source of the disturbance) or adults with flightless young to display defensive behaviors within an Active Critical Brood-rearing Site. Examples of this type of take include, *but are not limited to*:
    a. A person pursues snowy plover adults or young within an area posted with Regulatory Boundary Signs in an Active Critical Brood-rearing Site.
    b. A dog owner allows their dog to pursue snowy plover adults or chicks within an Active Critical Brood-rearing Site posted with Regulatory Boundary Signs.
    c. A vehicle or equipment operator enters an area posted with Regulatory Boundary Signs and subsequently flushes snowy plover adults or chicks.
6. Intentionally or negligently forcing American oystercatchers to fly from a Critical Roosting Site at any time during the year.

7. Capturing, handling, or collecting IBNBs or eggs constitutes take, as does banding, collecting, attaching auxiliary markers to, and drawing blood or other biological samples from IBNBs. Those seeking to conduct these activities should apply for a scientific collecting permit.

## Distribution and Survey Methodology

The maps in this section depict the principle geographic range of the species addressed in these Guidelines, including intervening areas of unoccupied habitat. These maps are for informational purposes only and not for regulatory use. Maps and counties below do not represent an exhaustive list of all areas where Breeding Sites, Critical Brood-rearing Sites, and Critical Roosting Sites may occur. Refer to Recommended Survey Methodology below for information on FWC's ShoreMapper application, which can be used in combination with species and habitat surveys to determine if IBNBs and IBNB habitat occur near your project or activity.




Alachua, Bay, Brevard, Broward, Charlotte, Citrus, Collier, De Soto, Dixie, Duval, Escambia, Flagler, Franklin, Glades, Gulf, Hamilton, Hardee, Hendry, Hernando, Highlands, Hillsborough, Indian River, Lake, Lee, Leon, Levy, Manatee, Martin, Miami-Dade, Monroe, Nassau, Okaloosa, Okeechobee, Osceola, Palm Beach, Pasco, Pinellas, Polk, Saint Johns, Saint Lucie, Santa Rosa, Sarasota, Volusia, Wakulla, Walton.

The survey methods below are meant to help potential permit applicants determine if an activity may result in incidental take of IBNBs. All projects should conduct a project planning survey. Even if an activity is not within a Recent Breeding Site according to the project planning survey, projects scheduled to occur during the IBNB breeding season (Figure 1) should conduct an additional pre-activity survey prior to project initiation to identify any Active Breeding Sites not previously documented in ShoreMapper near or within project boundaries. Breeding Activity Checks are a typical minimization measure for permitted activities that occur during the breeding season. These three types of surveys are described in more detail below.

Project planning surveys occur during the initial stages of project design. Those planning coastal projects can conduct these desktop surveys via ShoreMapper, an online mapping application (app) for IBNB Breeding Sites, Critical Brood-rearing Sites, and Critical Roosting Sites (but see Box 3). ShoreMapper is available at https://gis.myfwc.com/shoremapper/. Layers within the app are derived from data from the FSD.

Data within ShoreMapper are updated by April 1 of each year *and the desktop analysis for significant habitat modification will be valid until March 31 of the following calendar year*. Permit applicants must use the most up-to-date data available on ShoreMapper at the time their online application is submitted. Permits are generally valid for one year, and mitigation measures outlined in the permit will remain the same regardless of updates/changes to Recent Breeding Site, Critical Brood-rearing Site, or Critical Roosting Site boundaries on ShoreMapper while the permit is valid. However, minimization measures in the permit will apply to any previously undetected Active Nests or Active Breeding Sites found during project activities. The time necessary for staff to complete annual updates in ShoreMapper means that there is a delay before some new breeding sites are captured as Recent Breeding Sites in ShoreMapper. Staff will monitor the results of this delay and will revise Guidelines as necessary.

> Please note that ShoreMapper focuses on coastal sites and does not include inland sites, such as mines. For inland sites that do not have data in the Florida Shorebird Database, surveys using the Breeding Bird Protocol for Florida's Shorebirds and Seabirds are recommended to identify Active Breeding Sites during the project planning stage to avoid potentially costly project delays.

Permit amendments are required for projects that take longer than anticipated to complete and that will extend beyond the expiration date of the original permit. If the amendment is seeking authorization for take via harassment for breeding seasons not covered in the original permit, the applicant must use the most recent version of ShoreMapper to estimate take.

ShoreMapper also has tools to inform calculation of the extent of take and mitigation that may be needed for take that is unavoidable (see FWC Permitting: Incidental Take for more details).

Even if an activity is not within a Recent Breeding Site according to the desktop survey, we recommend a pre-activity survey by a qualified IBNB Permitted Monitor for activities that occur during the breeding season in suitable habitat, as a precaution. The pre-activity survey consists of an inspection for Active Nests within the activity footprint and within a 300-foot buffer around the activity footprint in suitable IBNB habitat. *Please note that, if previously undetected Active Nests or Active Breeding Sites are found during the pre-activity survey or just prior to or during project activities, take is unavoidable, and take is not already authorized by an incidental take permit, the applicant should contact the FWC to discuss permitting options.*

Breeding Activity Checks conducted by a qualified IBNB Permitted Monitor are standard minimization measures for some activities (see Appendix B) and often are appropriate for other activities for which permitting is evaluated on a case-by-case basis. Breeding Activity Checks, as well as minimum qualifications and roles for IBNB Permitted Monitors, are described in Appendix C.

## Recommended Conservation Practices

Recommended conservation practices are general measures that could benefit the species but are not required. No FWC permit is required to conduct these activities (unless specified below). For additional actions that benefit IBNB conservation, please see the Species Action Plan (FWC 2013).

- Monitor ground and rooftop nesting sites using the Breeding Bird Protocol for Florida's Shorebirds and Seabirds. Enter monitoring data in the state's central data repository for shorebirds and seabirds, the FSD. Please note that a permit or other authorization may be necessary in some circumstances:
  - Monitoring within a designated FWC Critical Wildlife Area during a closed period requires a FWC permit.
  - Entering an area posted with Regulatory Boundary Signs is likely to cause take and would require a FWC permit.
  - Accessing rooftops to survey rooftop-nesting nesting birds may cause take, which would require a permit or other authorization.
  - Monitoring both ground and rooftop nesting sites may require permission from property owners and managers.
- Manage breeding sites to maintain and restore conditions necessary for successful nesting and brood rearing:
  - Reduce disturbance to Active Breeding Sites by following the Guidelines for Posting Shorebird and Seabird Sites in Florida. Please note that posting nesting areas incorrectly can result in take of IBNBs and possibly marine turtles. Coordinate with the regional Florida Shorebird Alliance partnership or FWC regional shorebird contacts, as well as local land managers, and obtain permission from landowners prior to posting.
  - Protect IBNB breeding areas by organizing a Bird Stewardship Program at Active Breeding Sites.
  - Install educational signage according to the Guidelines for Posting Shorebird and Seabird Sites in Florida, and distribute outreach materials at Active or Recent Breeding Sites.
  - Improve nesting habitat for shorebirds and seabirds by managing vegetation or substrate outside of the breeding season (Figure 1) and when no Active Nests are present. Examples include removing invasive, non-native vegetation, creating open sandy areas, and increasing the longevity of open areas through placement of shells. Contact the FWC regional shorebird contact for technical assistance on project siting and design. Careful consideration is required when siting and implementing projects to avoid take of federally listed beach mice and marine turtles. In beach mouse habitat, please consult with the U.S. Fish and Wildlife Service (USFWS) prior to project activities. Coastal resilience provided by the vegetation and habitat should also be considered prior to removal. The appropriate method(s) of vegetation removal will vary depending on the situation. Please note that vegetation removal and substrate management require permission from the landowner and may also need an authorization from the Florida Department of Environmental Protection (DEP). Check all applicable local government regulations during project planning.
- Follow the Best Management Practices for Operating Vehicles on the Beach, even when driving on beaches in areas not known to support IBNB.
- Avoid placement of trash, open trash receptacles, and other food sources that may attract predators near Active or Recent Breeding Sites or Critical Brood-rearing Sites.
- Discourage the public from feeding wildlife on the beach, as such feeding can attract predators.
- Coordinate with the Florida Shorebird Alliance to manage rooftops outside of the breeding season and when no Active Nests are present to maintain and restore conditions necessary for successful

nesting. Contact your local FWC regional shorebird contact for technical assistance. Please note that some activities on rooftops during active nesting can result in take of IBNBs or other protected migratory birds.
  - Conduct routine rooftop maintenance and necessary repairs between September 1 – April 1.
  - Organize a Rooftop Steward program or join an established program to monitor, chick-proof, and chick-check rooftops.
  - Decrease mortality by installing "chick fencing" around the perimeter of rooftops prior to each breeding season to prevent chicks from falling.
  - Cover exposed tar with sand or gravel prior to the breeding season, if allowable under local regulations, to keep eggs or chicks from becoming stuck.
  - Cover drains and gutters with galvanized mesh to prevent chicks from falling through.
  - Monitor for fallen chicks following the Rooftop/Chick Checking Manual.
  - Remove potential perches for avian predators by adding perch deterrents to signage or structures and removing perch sites when possible.
- Develop a site-specific predation management plan in coordination with your local FWC regional shorebird contact to conduct predation management activities within an adaptive management framework. Obtain any necessary local, state, or federal authorizations and landowner permissions prior to conducting predation management. *Please note that conducting activities within an Active Breeding Site posted with Regulatory Boundary Signs — or within 300 feet of Active Nests or Active Breeding Sites without Regulatory Boundary Signs — (e.g., removing a ghost crab burrow near a nest) is expected to cause take, which is prohibited without a permit or other FWC authorization*.
- Create or improve suitable nesting, brood-rearing, or foraging habitat on beaches, oyster bars and rakes, and spoil islands outside of the breeding season and when no Active Nests are present. FWC regional shorebird contacts can provide assistance during project planning and design.
- Consider IBNB habitat needs when planting native vegetation or installing sand fencing for dune ecosystem restoration.
  - Contact the FWC regional shorebird contact for guidance on how to balance the needs of different wildlife species in project design.
  - Leave Recent Breeding Sites undisturbed when possible, or minimize loss of IBNB habitat within Recent Breeding Sites to the extent practicable.
  - Erect sand fencing in a manner that does not create a barrier to snowy plover chicks traveling within Recent Breeding Sites or between breeding sites and Critical Brood-rearing Sites.
  - Consider removing sand fencing if monitoring data indicate that (1) avian predators are using the fencing as perches and (2) predation of IBNBs by avian predators is occurring at the site.
  - Consider waiting 1-2 years after a storm to assess whether native plants will recover without planting and focus native plantings in areas that are not recovering naturally.
  - Consider reducing vegetation density, in accordance with all applicable state or local protections, if planted restoration areas become too dense for wildlife.
  - When planting native vegetation or placing sand fencing, maintain periodic openings to allow IBNBs to access back-dune habitat features.
  - Develop and implement monitoring to determine the long- and short-term project outcomes for coastal dependent species. This information can be used to refine management and conservation strategies to minimize future project impacts to IBNBs.
- Design docks, piers, and similar recreational facilities with conservation measures to minimize threats from entanglement in fishing line. Examples include marked repositories or lidded trash cans for discarding fish carcasses, educational signage, and participation in the Monofilament Recovery and Recycling Program. Promote fishing line cleanup activities.

- Remove fishing line, tackle, and other debris from breeding and brood-rearing sites to reduce the probability of entanglement, provided the removal occurs outside of the breeding season and when no Active Nests are present.
- Remove sand fencing from Recent Breeding Sites and Critical Brood-rearing Sites outside of the breeding and brood-rearing season once the fencing is no longer functional.
- Join your local Florida Shorebird Alliance partnership to further identify regional opportunities and needs.

## Measures to Avoid Take

The following measures will eliminate the need for an FWC incidental take permit. Figure 6 and Appendix A provide additional tools for determining whether an activity is likely to result in incidental take. For more information on activities that may cause intentional take (e.g., capturing and handling for research, intentional take to ensure human safety), please visit the intentional take section of this document. Activities may avoid incidental take by:

1. Avoiding acts that can kill or injure IBNB adults, eggs, or young; and
2. Avoiding acts that result in loss or modification of greater than 500 square feet of habitat within Active or Recent Breeding Sites, Critical Brood-rearing Sites, and Critical Roosting Sites (see definitions); and
3. Avoiding acts that result in any loss or modification of habitat within Active or Recent Breeding Sites that are already smaller than 500 square ft; and
4. Avoiding actions that render greater than 500 square ft of habitat within an Active or Recent Breeding Site, a Critical Brood-rearing Site, or Critical Roosting Site unsuitable for essential behaviors (see the take section for examples; for reference, a shuffleboard court is 300 square ft and a typical beach volleyball court is 1,800 square ft); and
5. Avoiding flushing IBNB adults or young (i.e., cause adults or juveniles to fly or flightless young to move away from the source of disturbance, or adults to display ) within or from Active Breeding Sites, Active Critical Brood-rearing Sites, or Critical Roosting Sites. This can be achieved by:
    a. Conducting activities that may result in human disturbance outside of Active Critical Brood-rearing Sites and outside of a buffer of 300 ft (91 m) from Active Nests, Recent Breeding Sites during the breeding season (Figure 1), and Critical Roosting Sites at any time of year;
        - Examples of activities that can result in human disturbance include, but are not limited to: pedestrian traffic, operation of vehicles or vessels (including trucks, boats, bicycles, Segways, etc.), operation of UAS (see Appendix F), terrestrial remote-controlled vehicles, recreational equipment (e.g., paragliders, paramotors, windsurfing, etc.), and construction/development activities (including associated site preparation activities such as clearing, grading, bulldozing, paving, or building construction).
        - Recreational pedestrian traffic on beaches is not expected to result in take within Active Breeding Sites and Active Critical Brood-rearing Sites if people remain outside of areas posted with Regulatory Boundary Signs.
    b. Conducting activities that may result in human disturbance within 300 feet (91 m) from Active Nests, Recent Breeding Sites during the breeding season (Figure 1), and Critical Roosting Sites at any time of year only if there is a sufficient visual and auditory buffer between the activity and the IBNB habitat. A sufficient visual and auditory buffer includes the following criteria. Please note that these criteria do not apply to special events with loud noises (e.g., fireworks displays, concerts, sporting events, air shows, boat races, and similar events):

- Project activities are not visible from any point within the Active or Recent Breeding Site, Critical Brood-rearing Site, or Critical Roosting Site due to an existing permanent structure or intervening landcover type (e.g., primary and secondary dunes, coastal grassland, coastal strand, coastal scrub, maritime hammock, exotic plants such as Australian pine), or
- Project activities are occurring in an existing urban area (urban landcover as defined in Kawula and Redner 2018) separated from the habitat by at least a paved, 2-lane road, or
- Project activities are occurring at ground level adjacent to a rooftop with Active Nests, provided the building is at least two stories high, equipment and project personnel operate below the roofline, and activities are not on the structure supporting nesting, or
- If project activities will occur above the permanent structure or intervening landcover height, or for other potential visual and auditory buffers between the activity and the habitat, contact the FWC regional shorebird contact to see if avoidance of take is possible. Proposed visual and auditory buffers must be at least as protective as those in the bullets above.

c. Avoiding flying UAS over Active Breeding Sites, Recent Breeding Sites during the breeding season, Active Critical Brood-rearing Sites, and Critical Roosting Sites at any time of year; and
d. Operating either manned or unmanned aircraft in a manner that does not result in birds flushing (i.e., adults or juveniles flying into the air or flightless young moving away from the source of disturbance, or adults displaying defensive behaviors) within or from Active Breeding Sites, Active Critical Brood-rearing Sites, or Critical Roosting-Sites; and
e. Maintaining a distance of at least 0.75 miles (1.21 km) between loud noises from special events (e.g., fireworks displays, concerts, sporting events, air shows, boat races, and similar events), and Active Breeding Sites, Active Critical Brood-rearing Sites, or Critical Roosting Sites unless the potential permit applicant can provide sound models (e.g., Keyel et al. 2018) that indicate sound levels will be less than 85 decibels at the Active Breeding Site, Active Critical Brood-rearing Sites, or Critical Roosting Sites; and

6. Adhering to shorebird and seabird permit conditions in Joint Coastal Permits (JCPs) during beach nourishment.

This section provides examples of specific activities that, when conducted in the manner described below, are not expected to result in take and do not require a permit from the FWC. Please note that this section is meant to provide assurances to stakeholders conducting these activities but is not meant to be a comprehensive list.

- Except when resulting in significant habitat modification, conducting construction or development activities, or preparing for such activities, outside of the breeding season or outside of a buffer of 300 feet (91 m) from Active Nests or from Recent Breeding Sites during the breeding season, is not expected to cause take and does not require a permit.
- Recreational pedestrian traffic on beaches that remains outside of areas posted with Regulatory Boundary Signs within Active Breeding Sites and Active Critical Brood-rearing Sites.
- Conducting activities authorized under an FWC Marine Turtle Permit issued pursuant to Florida Statute 379.2431(1) and 68E-1, F.A.C., provided all activities are conducted outside of areas posted with Regulatory Boundary Signs and in accordance with the beach driving minimization measures in Appendix D. Maintaining communication between Marine Turtle Permit Holders and FWC regional shorebird contacts is important for avoiding take of both marine turtles and IBNBs.

- Viewing or photographing IBNBs from outside areas posted with FWC Regulatory Boundary Signs, or from greater than 300 ft (91) from an Active Nest if the site is not posted with signage. However, in areas with smaller, site-specific buffers, move farther back if the activity alters normal behavior. Indications of altered behavior include changing from feeding/roosting/breeding activities to an alert posture, flushing, calling, or exhibiting defensive behaviors such as dive-bombing or distraction displays.
- Activities on rooftops that occur September 1 to April 1 and when no Active Nests are present and that occur in accordance with FWC's policy on state-listed species and man-made structures, found in Florida's ISMP (FWC 2016).
- Repair or maintenance of existing roadways and utility infrastructure within a Recent Breeding Site or a Critical Brood-rearing Site, provided repairs occur outside of the breeding season, when no Active Nests are present, and when there is no degradation to the habitat (e.g., through changes in breeding or brood-rearing substrate).
- Non-injurious deterrents installed on rooftops outside of the breeding season and when no Active Nests are present. FWC regional shorebird contacts can provide technical assistance on effective deterrents.
- It is not considered take to use non-injurious deterrents (e.g., maintaining constant activity on-site or placement of alternative substrate like straw or jute mats) in non-habitat that is newly cleared (i.e., areas cleared within the past 5 months) for construction to keep birds from being attracted to the site, provided birds have not already started creating scrapes and exhibiting courtship behavior. Note that such clearing may attract IBNBs by creating the open, sandy conditions conducive for IBNB nesting. IBNB habitat is described in the Biological Background and Box 4. Note that in coastal habitat, cleared areas are accessible to marine turtles and should not use jute mats, and straw should be free of weeds and fire ants. Please note that this only applies to newly cleared sites b*efore* they become Active Breeding Sites; an incidental take permit may be necessary once Active Nests are present. FWC regional shorebird contacts can provide technical assistance on effective deterrents.

This list is not an exhaustive list of actions that are not expected to cause take. Please refer to Appendix A or contact the FWC regional shorebird contact at the appropriate regional office if you have questions about whether your activity is likely to cause take of IBNBs. For private landowners, developers, consultants, and government agencies proposing land use plans or development and construction projects with the potential to convert wildlife habitat to other land uses, technical assistance is available from the FWC Office of Conservation Planning Services. General information on fish and wildlife species and habitat conservation measures can be accessed through the Florida Wildlife Guide, which includes planning tools for ecologically based, landscape-level conservation. Project-specific requests for fish and wildlife coordination can be emailed to ConservationPlanningServices@MyFWC.com. Regionally assigned staff can assist with listed species coordination, pre-application project review, wildlife surveys and other conservation recommendations.

Rule 68A-27.003(2)(a), F.A.C., notes that some forms of take can be authorized via Commission-approved guidelines. This section outlines forms of take that are authorized without a FWC permit. Please note that the authorizations below do not authorize take of other state or federally listed species, such as marine turtles, red knots, piping plovers, or beach mice.

- As described in Rule 68A-27.007(2)(c), F.A.C., land management activities that benefit wildlife and are not inconsistent with FWC Management Plans are authorized and do not require a permit authorizing incidental take.

- Qualified IBNB Permitted Monitors and FSA partners are authorized to adjust the boundaries of areas posted with Regulatory Boundary Signs and symbolic fencing to accommodate new shorebird nests or the expansion of seabird colonies, provided such adjustment is completed in accordance with the FSA Guidelines for Posting Shorebird and Seabird Sites in Florida.
- Activities within an airport security area in accordance with Rule 68A-9.012, F.A.C.
- Rooftop-related authorizations
  - Qualified Rooftop Monitors (Appendix E) are authorized for harassment of IBNBs that may occur when monitors access rooftops to determine if avoidance is possible or to determine where birds are located on the rooftop; estimate number of adult IBNBs; and determine if nests, eggs, or young are present as part of preparing an incidental take permit or providing technical assistance to applicants.
  - The State-listed species and man-made structures policy in the FWC's ISMP (FWC 2016) authorizes the removal or modification of structures recently or previously occupied by state Threatened species, provided no eggs or dependent young are present, or the nesting cycle (or rearing of young) has been completed; the activity is conducted in such a way so as to avoid direct physical injury of individual animals; and at least 14 days prior notification is provided to the FWC in the region where the activity will occur.
    - In accordance with this policy, building owners with rooftop-nesting IBNBs may erect FWC-approved passive deterrents from September 1 to April 1—and when no Active Nests are present—to deter future nesting on their rooftop. The FWC regional shorebird contact can provide technical assistance on non-injurious, effective deterrents.
    - No permit is needed for removal or modification of rooftops that occurs outside of the breeding season and when no Active Nests are present.
  - Placing fallen chicks back on a roof using a safe, non-injurious method, such as a "chick-a-boom" and in accordance with the Florida Shorebird Alliance's Rooftop/Chick Checking Manual.
- Placement of chick shelters within Active Breeding Sites under the following circumstances:
  - With approval by the FWC regional shorebird contact.
  - With permission from the landowner or building manager.
  - When impacts to unmarked marine turtle nests, hatchlings, and nesting females are avoided.
- Beach cleaning necessary to address significant, unusual deposition of macroalgae (e.g., Sargassum) and fish kills caused by harmful algal blooms, provided personnel follow measures in Appendix D and remain outside of areas posted with Regulatory Boundary Signs.
- In accordance with the FWC's Policy on Nest Removal for Inactive Single-use Nests of State-Threatened Birds, no permit is required to destroy an *Inactive* Nest as long as the proposed level of habitat modification or degradation is not significant enough to result in take (see significant habitat modification under Expounding on what constitutes take for IBNBs). *Please note that this policy does not authorize take via harm or harassment of nearby adults, eggs, or chick*s. It is best not to destroy an Inactive Nest until after the breeding season. For technical assistance on whether nests are inactive, contact the FWC regional shorebird contact.
- Planting of native species and installation of sand fencing are authorized outside of Active Breeding Sites and Active Critical Brood-rearing Sites. Additionally, project managers are encouraged to contact the FWC regional shorebird contact for technical assistance when planning these activities in Critical Brood-rearing Sites. Efforts should be made to implement site-specific restoration strategies in consultation with FWC subject matter experts that maximize benefits for a healthy, resilient dune ecosystem while minimizing harm to IBNBs (see Recommended Conservation Practices).

- Take is authorized for time-sensitive operations that occur after the Governor or a local government issues a declaration in response to local emergencies or other situations that place public health, safety, or welfare at risk, though Emergency Orders issued in response to declarations of emergency by the Governor may include required minimization measures, such as those in Appendices C and D.
- Emergency water management actions necessary for human health and safety, such as flood control.
- Beach driving to address an imminent human health or safety emergency.
- Beach driving associated with official government activities that remains outside of areas posted with Regulatory Boundary Signs and that adheres to beach driving minimization measures in Appendix D.
- Activities within active mine operation areas, provided such activities occur outside of Active Breeding Sites and without flooding the Active Breeding Site or occur during the non-breeding season or when no Active Nests are present.
- Use non-injurious deterrents in active mine operation areas to prevent IBNBs from initiating nesting in temporarily created habitat (e.g., sand tailings, clay settling ponds, mine waste disposal areas, excavation areas) in order to avoid conflicts with planned deposition activities or other mining operations.
- For breeding sites that meet the conditions in the following sub-bullets, take via significant habitat modification is authorized outside of the breeding season and when no Active Nests are present. Additionally, the landowner is authorized to use passive, non-injurious deterrents or altered substrate (e.g., straw, jute mats) prior to subsequent breeding seasons to keep IBNBs from returning to areas described in the sub-bullets below (contact the FWC regional shorebird contact for technical assistance on deterrents):
  - An area of non-habitat that was newly cleared for construction (i.e., cleared within the past 5 months) and that IBNBs subsequently used for nesting,
  - An area of non-habitat that was newly cleared (i.e., cleared within the past 5 months) for water storage, flood control, or water management upon which IBNBs subsequently nested,
  - Gravel roads or gravel parking lots upon which IBNBs have nested. Please note, however, that converting suitable habitat (Box 4) within a Recent Breeding Site or Critical Brood-rearing Site into a gravel substrate intended for driving or parking vehicles constitutes take via significant habitat modification.
- Dredge deposition areas on dredge spoil islands and Dredged Material Management Areas may use non-injurious deterrents to prevent IBNBs from initiating nesting within the portion of the site scheduled for deposition of dredged material within that breeding season.
- If IBNBs nest on the footprint of a man-made structure (e.g., house) that was destroyed by a natural disaster (e.g., tropical storm, hurricane), take via significant habitat modification is authorized for reconstruction work (including site preparation) initiated within five years after the disaster. Take via harassment, however, is not authorized without a permit if reconstruction work occurs during the breeding season when Active Nests are present.
- Flooding of reservoirs designed for water storage and Stormwater Treatment Areas (STAs) when no Active Nests or flightless chicks are present.
- Routine vegetation maintenance activities and maintenance/repair of utility infrastructure (excluding installation and removal of utility poles) within existing power line rights of way within 300 feet of Recent Breeding Sites or Critical Brood-rearing Sites during the breeding season, provided:
  - The activity meets one of the criteria in 5b under Avoidance Measures that Eliminate the Need for FWC Incidental Take Permitting, or
  - The activity occurs in an urban area (as defined in Kawula and Redner 2018); is comparable in nature, size, duration, and intensity to activities already occurring at the site; and does not

require personnel, vehicles, or equipment within suitable habitat (Box 4) within the Recent Breeding Site or Critical Brood-rearing Site, or

- For work requiring personnel, vehicles, or equipment within suitable habitat (Box 4) within a Recent Breeding Site or Critical Brood-rearing Site, an IBNB Permitted Monitor has conducted a pre-activity survey immediately prior to maintenance activities and has determined that no Active Nests or flightless chicks are present.

Routine vegetation maintenance activities are those conducted in accordance with local, state, and federal regulations (including, but not limited to, Federal Energy Regulatory Commission [FERC] Electric Reliability Standard FAC-003-4, National Electrical Safety Code [NESC] section 218, and Florida Public Service Commission [FPSC] mandates).

- In cases where there is an immediate danger to the public's health and/or safety, including imminent or existing power outages that threaten public safety, or in direct response to an official declaration of a state of emergency by the Governor of Florida or a local governmental entity, power restoration activities and non-routine removal or trimming of vegetation within linear right of way in accordance with vegetation management plan that meets applicable federal and state standards does not require a permit.

## Coordination with Other State and Federal Agencies

The FWC participates in other state and federal regulatory programs as a review agency. During review, FWC staff identifies and recommends measures to address fish and wildlife resource impacts and may provide recommendations for addressing potential impacts to state-listed species in permits issued by other agencies. If permits issued by other agencies adequately address all requirements for issuing a state Threatened species take permit, the FWC will consider these regulatory processes to fulfill the requirements of Chapter 68A-27, F.A.C., with a minimal application process. This may be accomplished by issuing a concurrent take permit by the FWC, by a memorandum of understanding with the cooperating agency, or by a programmatic permit issued to another agency. These permits would be issued by the FWC based on the understanding that implementation of project commitments will satisfy the requirements of Rule 68A-27.007, F.A.C. This situation is expected to be rare for IBNBs.

- FWC staff, in coordination with other state agencies, provides comments to federal agencies (e.g., the Army Corps of Engineers) on federal actions, such as projects initiated by a federal agency or permits being approved by a federal agency.
- FWC staff works with landowners, local jurisdictions, and state agencies such as the Department of Economic Opportunity and the Florida Department of Transportation on land use decisions, including long-term planning projects like sector plans and transportation projects, projects in Areas of Critical State Concern, and large-scale comprehensive plan amendments.
- FWC staff coordinates with state agencies such as DEP and the five Water Management Districts that issue Environmental Resource Permits (ERP), such as JCPs. JCPs cover activities such as beach nourishment, groins and jetties, port facility expansion projects, some navigational dredging projects, and some docking facilities.
  - During the JCP process, FWC staff may provide guidance on avoidance, minimization, and mitigation measures for IBNBs. DEP may include avoidance measures as conditions in the JCP.
  - FWC staff will also work with DEP and applicants during the pre-application period to determine if mitigation required as part of the JCP will also satisfy the applicants' responsibilities under

Chapter 68A-27, F.A.C., and associated policies (see FWC's Incidental Take Permitting process below).
  - Conservation benefit, as evaluated by considering factors listed in Rule 68A-27.007(2)(b), F.A.C., may be accomplished through minimization and mitigation measures included in a JCP permit.
  - For activities governed by both Chapter 373.603, F.S., (ERP) and Chapter 378.205, F.S., (Conceptual Reclamation Plan [CRP]), the applicant may request FWC review of the DEP application, if it includes a Wildlife/Habitat Management Plan (WHMP), and it is submitted concurrently to DEP and FWC. A WHMP shall address all State-listed species observed or reasonably likely to occur on a project site. The application and WHMP will be reviewed by FWC staff to determine whether or not it complies with the requirements under Chapter 68A-27, F.A.C., and the standards in the FWC's ISMP (FWC 2016), which provides further details about WHMPs.
- FWC staff coordinate with DEP and applicants for some CCCL permits (e.g., attending pre-construction meetings or phone conferences; annually providing maps of Recent Breeding Sites, Critical Brood-Rearing Sites, and Critical Roosting Sites to CCCL program staff).

## FWC Permitting: Incidental Take

According to Rule 68A-27.001, F.A.C., incidental take is take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Activities that result in incidental take of IBNBs are prohibited without a permit from the FWC unless included in Other Authorizations for Take. Incidental take permit applications are available on the online permitting site, as "migratory bird nest removal" permits. With few exceptions, the applicant should be the landowner or an individual designated in writing by the landowner. Please note the following:

- ***Applicants should be aware that the FWC typically does not issue permits for take of Active Nests*** (as defined above in this document) or for direct killing or injuring of adults or young, except in situations involving health and human safety.
- ***For urgent rooftop repairs on buildings with Active Nests,*** Appendix E is designed to support rooftop owners in completing the permitting process and includes information on standard minimization measures.
- Permits will not be issued solely for ***proposed infrastructure*** (e.g., roads and utilities) that are part of a larger common development plan, project, plat, or subdivision. Issued permits must address all impacts to IBNBs on the entire project, development, plat, or subdivision site plan (the development footprint), including phased activities planned within five years. Utility infrastructure may be permitted independently for system expansion or improvements needed to support new customers or increased demand.
- Permittees and their agents/sub-permittees must ***have a copy of the permit available*** when conducting permitted activities. Construction projects must have a copy of the permit posted on site.
- In addition to state permits, the applicant is responsible for acquiring any necessary ***local or federal authorizations***. Federal permits may be needed from the U.S. Fish and Wildlife Service to comply with the Migratory Bird Treaty Act (16 USC 703-712). For example, a federal permit may be needed in addition to the state permit to remove an Active Nest under certain circumstances. Issuance of a FWC incidental take permit does not constitute federal authorization, nor does issuance of a federal authorization substitute for a state incidental take permit for state Threatened species. Permits may also be needed for take of federally listed marine turtles, piping plovers, red knots, or beach mice that share habitat with IBNBs.

The FWC may issue permits *when there is a scientific or conservation benefit to the species* and only upon showing by the applicant that the permitted activity will not have a negative impact on the survival potential of the species. Scientific benefit, conservation benefit, and negative impacts are evaluated by considering the factors listed in Rule 68A-27.007(2)(b), F.A.C. These conditions are usually accomplished through a combination of avoiding take when practicable, minimizing take that is unavoidable, and mitigating for the permitted take. The sections below describe the minimization measures and mitigation options available as part of the incidental take permit process for take of IBNBs. *Applicants must include minimization and mitigation measures in the permit application.*

Please refer to the Distribution and Survey Methodology section for how to determine whether an activity is likely to impact an Active or Recent Breeding Site, Critical Brood-rearing Site, or Critical Roosting Site. Expounding on what constitutes take for IBNBs and Measures to Avoid Take can help potential applicants determine the circumstances under which take is likely to occur. Examples of Activities Not Expected to Cause Take and Other Authorizations for Take can help potential applicants determine when a permit may not be necessary. Additionally, the flow charts below (Figure 6) and Appendix A provide additional guidance about circumstances under which many coastal activities are expected to cause incidental take If it is possible that activities intended to be completed outside of the breeding season and that did not need a permit may extend into the breeding season and cause harassment, we recommend that individuals contact the FWC to discuss permitting options. If it is possible that permitted work intended to be completed during the non-breeding season may extend unexpectedly into the breeding season, the applicant may wish to include authorization for harassment in the permit application to avoid the need for a permit amendment. Applicants and permittees should be aware that new permit applications and an amendment to an existing permit may take up to 90 days for processing, which could lead to project delays.

If take is unavoidable, determining appropriate minimization and mitigation measures requires determining the *type(s)* and *extent* of take that will occur from an activity.

> As discussed in Potential to Significantly Disrupt or Impair Essential Behavioral Patterns, incidental take can occur in a variety of forms, including harm, whether via direct injury or mortality or via significant habitat modification, or harassment. Replacement of an existing structure within the same footprint is not considered significant habitat modification, though this activity could cause take via harassment if it occurs during the breeding season. Determining the type of take is important for determining appropriate mitigation, as described in the sections below.

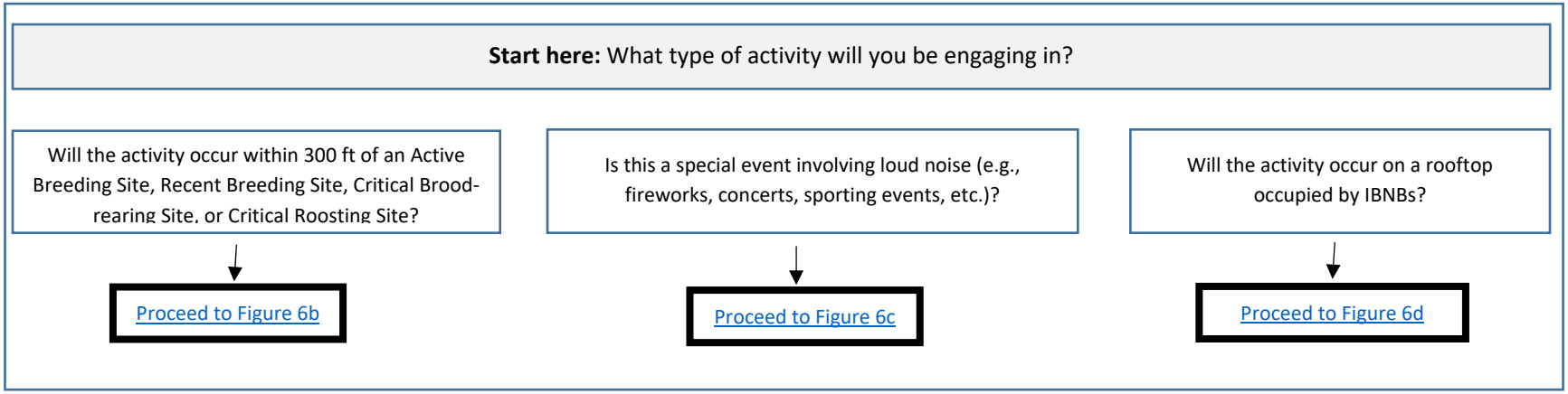



*Figure 6a. Determining whether an activity is likely to result in take of imperiled beach-nesting birds. Individuals can use ShoreMapper to determine the distance to Recent Breeding Sites, Critical Brood-rearing Sites, and Critical Roosting Sites.*

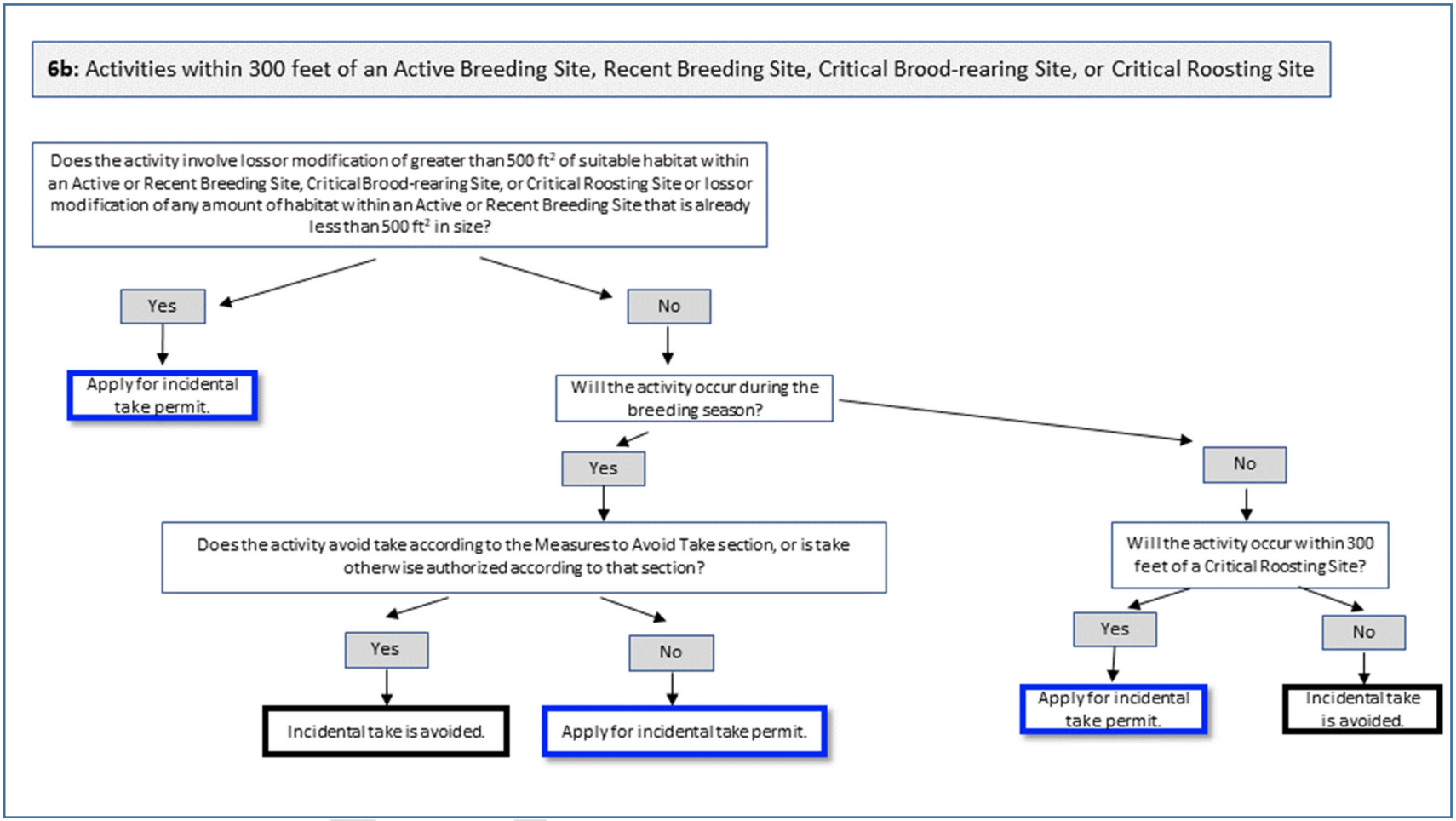



*Figure 6b. Determining whether an activity within 300 ft of an Active Breeding Site, Recent Breeding Site, Critical Brood-rearing Site, or Critical Roosting Site is likely to result in take. Refer to Figure 1 for breeding season dates.*

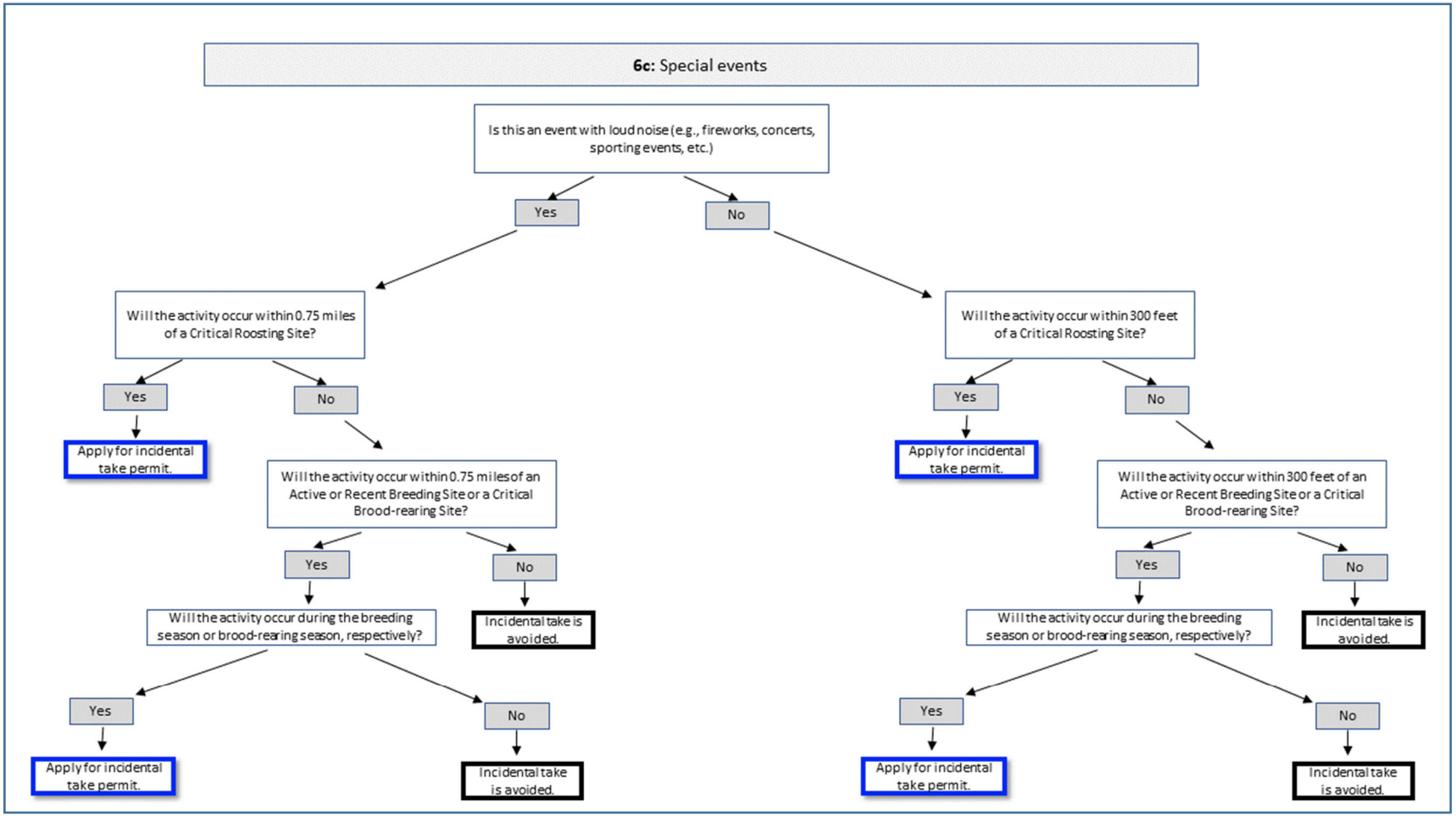



*Figure 6c. Determining whether a special event is likely to result in take. Refer to Figure 1 for breeding season dates.*

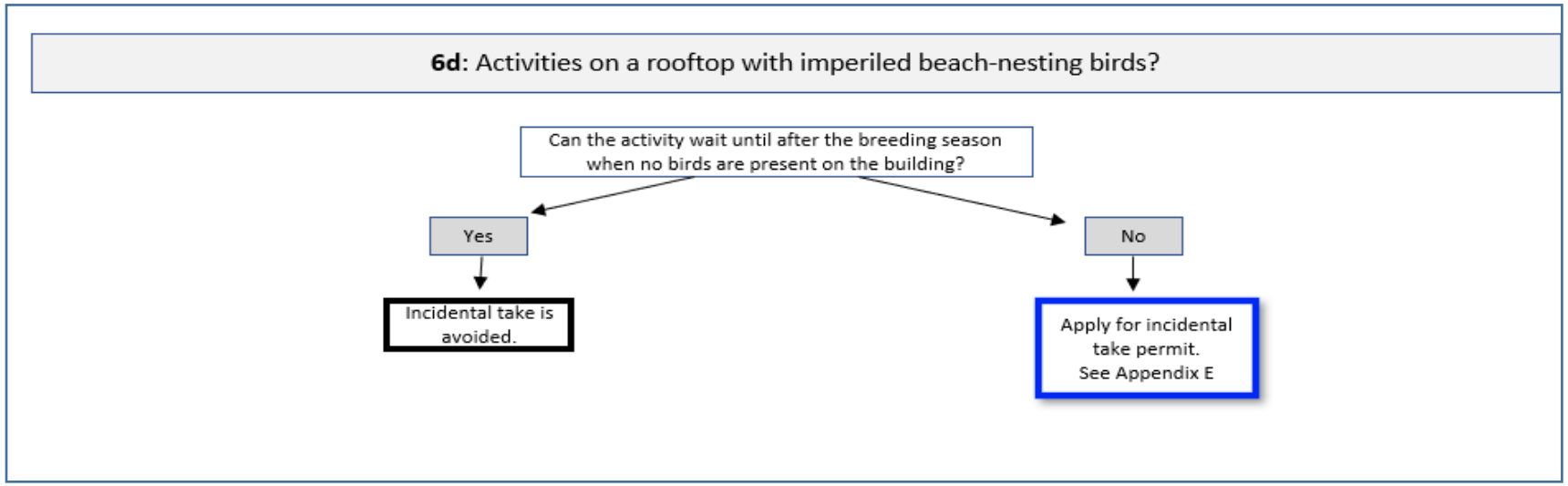



*Figure 6d. Determining whether an activity on a rooftop used by imperiled beach-nesting birds is likely to result in take.*

**Recent Breeding Sites**

For Recent Breeding Sites, applicants can estimate the extent of take (e.g., how many breeding pairs of IBNBs would be harassed and/or the extent of habitat to be modified) during project planning surveys using the ShoreMapper app and the sections below. The steps below use suitable habitat (Box 4) and site-specific IBNB data to estimate the number of breeding pairs harmed or harassed by activities at the site. Given the dynamic nature of the coast, *a site visit by applicants or their designated individual is strongly recommended to verify site conditions and ensure the accuracy of the suitable habitat determined in ShoreMapper*. The following steps apply to using ShoreMapper to determine the extent of take:

- For special events involving loud noises, measure whether activities are less than 0.75 miles (1.2 km) from a Recent Breeding Site, Critical Brood-rearing Site, or Critical Roosting Site.
- Users of ShoreMapper will draw a polygon representing the **activity footprint**. The activity footprint is the area in which all activities will take place. Below are just a few examples of activity footprints:
  - For construction of a home or similar structure, the activity footprint would include the entire area directly modified for development (e.g., areas cleared, graded, or paved; the structure itself; driveways; parking areas; lawns and landscaping; etc.).
  - For a new groin, jetty, or dune crossover, the activity footprint would include the area to be occupied by the new structure.
  - For a project involving removal of a spit via dredging, the activity footprint would include the total area from which sand is being removed.
  - Note that if a project includes temporary equipment/vehicle staging areas or other activities that do not modify the habitat, the activity footprint should include these areas when evaluating take via harassment.
- The app will then buffer the activity footprint by 300 ft (91 m).
- Users then draw a polygon around suitable habitat (see Box 4) in both the buffered activity footprint and Recent Breeding Sites that intersect with the buffered activity footprint. ShoreMapper calculates the proportion of overlap between the buffered activity footprint and the Recent Breeding Site, including only areas of suitable IBNB habitat. In Recent Breeding Sites, users should not include areas seaward of the line separating the dry sand beach from the wet sand (i.e., the area affected by typical tides). This line is sometimes visible on aerial imagery. However, a site visit is recommended to assess whether the extent of habitat has changed, particularly if the aerial imagery available in ShoreMapper for the project area is more than 1 year old. Areas of non-habitat newly cleared as part of project activities should not be included in the estimate of suitable habitat.
- For the purposes of determining appropriate mitigation, the extent of harm via significant habitat modification is measured in square feet, and the extent of harassment is measured in number of breeding pairs.
  - ShoreMapper's output includes an estimate of the number of breeding pairs, the proportion of pairs likely to be harassed, and square feet expected to be impacted.
  - For shorebirds, the number of breeding pairs is derived by estimating the maximum number of breeding pairs observed in any year over the last five years for which data are available in the FSD. For seabirds, the number of breeding pairs is derived by averaging the estimated maximum number of breeding pairs observed in each occupied year over the last five years for which data are available in the FSD. We used the average for seabirds because colony size tends to vary from year to year.

- *ShoreMapper will be updated annually by April 1st to include the previous year's data and the reports generated by ShoreMapper will be valid until March 31st of the following calendar year*.

The FWC strongly encourages individuals to conduct Project Planning Surveys as described in the Distribution and Survey Methodology section in advance to avoid project delays and to achieve regulatory certainty regarding the extent of take via harassment. If the applicant has not conducted Project Planning Surveys and encounters Active Nests within a Recent Breeding Site, the applicant must employ a IBNB Permitted Monitor to estimate the number of breeding pairs present within 300 feet of the activity footprint. The IBNB Permitted Monitor must use the Breeding Bird Protocol for Florida's Shorebirds and Seabirds to estimate the number of breeding pairs. The extent of take via harassment must be estimated using the number of breeding pairs estimated by the IBNB Permitted Monitor or the estimate derived from ShoreMapper, *whichever is greater*.

If individuals unexpectedly encounter Active Nests in an area that was not a Recent Breeding Site in ShoreMapper, no mitigation is necessary for habitat modification. However, if harassment is unavoidable, individuals should seek an incidental take permit. The applicant must employ an IBNB Permitted Monitor to estimate the number of breeding pairs present within 300 feet of the activity footprint using the Breeding Bird Protocol for Florida's Shorebirds and Seabirds.

In Recent Breeding Sites, "suitable habitat" for the least tern, black skimmer, and snowy plover occurs in landcover types of sand beach (dry), beach dune, coastal berm, coastal grassland (as described in Kawula and Redner 2018), as well as dredge-spoil areas, and includes the following characteristics:

a. substrate of sand, shell, gravel, cobble, dredge spoil, or some combination of these materials, *and*
b. vegetation is either absent or dominated by herbaceous plants, *and*
c. vegetation, when present, covers less than 90% as estimated by visual examination of aerial imagery (or ground-truthing surveys).

In Recent Breeding Sites, "suitable habitat" for the American oystercatcher occurs in landcover types of sand beach (dry), beach dune, coastal berm, coastal grassland, oyster bar, or salt marsh (as described in Kawula and Redner 2018), as well as dredge-spoil areas, and includes areas with substrate of sand, shell, gravel, cobble, dredge spoil, wrack, or some combination of these materials. Vegetation may be absent or cover up to 100% of suitable habitat. "Suitable habitat" in Critical Roosting Sites includes oyster rakes and oyster bars.

In Critical Brood-rearing Sites, "suitable habitat" for snowy plovers occurs in landcover types of sand beach (dry), beach dune, coastal berm, coastal grassland, tidal flat, or intertidal (as described in Kawula and Redner 2018), as well as ephemeral pools, lagoons, and other low energy, poorly drained coastal areas recharged by tidal activity and rainwater. Brood-rearing habitat for snowy plovers includes the following characteristics:

a. substrate of sand, silt, shell, gravel, cobble, mud, dredge spoil, wrack, or some combination of these materials, *and*
b. vegetation is either absent or dominated by herbaceous plants, *and*
c. vegetation, when present, covers less than 90% as estimated by visual examination of aerial imagery (or ground-truthing surveys).

ShoreMapper is not able to estimate the extent of take for Critical Brood-rearing sites or Critical Roosting Sites. FWC regional shorebird contact for technical assistance on the extent of take for activities in these areas.

Minimization options can help to reduce take of the species and lessen the mitigation necessary to counterbalance take (Box 5). All minimization options below assume that adhering to avoidance measures that eliminate the need for FWC permitting is not possible, and that some level of take may occur. *Please note that Appendix B provides standard, activity-specific minimization options for some actions*.

Standard minimization measures often include an IBNB Permitted Monitor, who protects IBNBs, nests, and eggs from injury and mortality. For activities involving continued work within 300 feet of Active Breeding Sites, the IBNB Permitted Monitor remains on site during work or revisits the site periodically throughout the day to minimize harassment of breeding birds (see Appendix C for more information on IBNB Permitted Monitors).

Below are general options that apply to most activities, but this is not an exhaustive list of options.

- Conduct activities outside of the breeding season whenever possible (Box 5).
- For activities that may result in birds flushing from Active Nests, schedule activities for early morning (i.e., within 2 hours of sunrise) or evening (i.e., within 1 hour of sunset) to minimize the exposure of eggs and chicks to heat and sun. Alternatively, measure surface temperatures, and cease work when surface temperatures reach 105◦ F. Be sure to measure temperature at the surface (e.g., via infrared thermometer) rather than atmospheric temperature.
- For activities that must take place within Active Breeding Sites or within 300 feet of Active Critical Brood-rearing Sites during the breeding season (i.e., harassment is unavoidable), reduce the extent of harassment by maintaining the largest Project Buffer feasible from Active Nests or Active Critical Brood-rearing Sites.
  - A **Project Buffer** is a posted area established to avoid or minimize take as a provision of a FWC incidental take permit. The Project Buffer creates a boundary between an activity and Active Nests or important habitat features within an Active Critical Brood-rearing Site.
  - The Project Buffer must be established by the project's IBNB Permitted Monitor and must be posted with Regulatory Boundary Signs and symbolic fencing.
  - The Project Buffer must be established in accordance with the Methods and Materials sections of the Guidelines for Posting Shorebird and Seabird Sites in Florida.
  - A Project Buffer of 300 ft (91 m) from Active Nests is recommended to avoid take via harassment during most activities. The IBNB Permitted Monitor may establish a smaller, site-specific buffer with Regulatory Boundary Signs when necessary and consistent with

Adopting minimization measures can reduce the amount of mitigation needed to counterbalance take. For example, a construction project that occurs during the breeding season may cause take via both significant habitat modification *and* harassment of breeding pairs. A Permittee seeking to make a financial contribution as mitigation would have to counterbalance both forms of take. Conducting the activity outside of the breeding season would reduce the financial contribution (i.e., the contribution would only include the amount necessary to counterbalance take via significant habitat modification because working outside of the breeding season eliminates take via harassment).

permit conditions, provided the IBNB Permitted Monitor establishes the buffer in accordance with the Guidelines for Posting Shorebird and Seabird Sites in Florida and notifies the FWC regional shorebird contact via e-mail prior to establishing the buffer. FWC staff retain discretion to alter site-specific buffers established by the IBNB Permitted Monitor.
  - The project's IBNB Permitted Monitor is responsible for establishing the Project Buffer only within the area impacted by project activities.
  - Increasing the size of the buffer if birds appear agitated or disturbed by project activities will minimize take.
- If activities must occur within 300 ft of a Critical Roosting Site, attempt to avoid conducting activities within two hours of high tide.

- Design projects so all or most activities that must occur near or within Recent Breeding Sites or Critical Brood-rearing Sites occur outside of the breeding season (Box 5).
- Structure the order of tasks to minimize the number and/or duration of project activities during the breeding season within Active or Recent Breeding Sites or Critical Brood-rearing Sites.
- Limit the work area to the smallest extent practical.
- Leave at least one-third of any continuous wrack line (natural material that washes onto the beach) in place whenever possible. Wrack provides important foraging habitat for shorebirds (see Biological Background, Dugan et al. 2003, Schlacher et al. 2017).
- Employ methods to reduce vehicles speeds for road projects in Recent Breeding Sites and Critical Brood-rearing Sites.
- Design projects so that onsite conservation is a feasible form of mitigation (see Mitigation Options below).
- Limit the number of dune walkovers, crossovers, vehicular ramps, and similar access points, and site them as far as possible from Active or Recent Breeding Sites and Critical Brood-rearing Sites.

- Maintain buffers using symbolic fencing and Regulatory Bounday Signs in accordance with FWC's Guidelines for Posting Shorebird and Seabird Sites in Florida.
- Use a qualified IBNB Permitted Monitor (see Appendix C for qualifications) to:
  - Identify the location of Active Breeding Sites and flightless chicks.
  - Establish, adjust, and maintain buffers around Active Nests and Active Critical Brood-rearing Sites using Regulatory Boundary Signs on each day prior to initiation of project activities until Active Nests and flightless young are no longer present. A buffer of 300 ft (91 m) is recommended to avoid take via harassment during project activities. However, the IBNB Permitted Monitor may establish a smaller, site-specific buffer with Regulatory Boundary Signs when necessary, provided the IBNB Permitted Monitor establishes the buffer in accordance with the Guidelines for Posting Shorebird and Seabird Sites in Florida and notifies the FWC regional shorebird contact via e-mail within 24 hours. FWC staff retain discretion to alter site-specific buffers established by the IBNB Permitted Monitor.
  - Alert project personnel to the presence of flightless chicks outside of areas posted with Regulatory Boundary Signs so personnel can avoid death or injury to chicks.
  - Establish access and travel corridors for vehicles, pedestrians, and heavy equipment as far away from Regulatory Boundary Signs as possible to avoid death or injury to flightless chicks or impacts to nests established outside Regulatory Boundary Signs.
  - Monitor movement of vehicles to ensure no chicks are in the path of the moving vehicle and

chicks are not separated from adult birds, when flightless chicks are present within or adjacent to travel corridors.

- Reposition Regulatory Boundary Signs as necessary. Signs and symbolic fencing shall not be removed, repositioned, or otherwise modified by anyone other than the IBNB Permitted Monitor or FWC. FWC staff may adjust Regulatory Boundary Signs to ensure adequate protection for IBNBs at Active Breeding Sites or Active Critical Brood-rearing Sites.
- Adhere to minimization measures for operation of vehicles on the beach in Active or Recent Breeding Sites or Critical-brood-rearing Sites (see Appendix D).
- Level or smooth tracks, ruts, or holes capable of trapping flightless chicks at the conclusion of each day's work.
- For activities that must occur within 300 feet of Active Nests on beaches, dredge material islands, oyster rakes, or similar substrates (note: please see Appendix E for minimization measures specific to rooftops):
    - Post nesting areas using signage and symbolic fencing in accordance with FWC's Guidelines for Posting Shorebird and Seabird Sites in Florida to assist project personnel with identifying and staying as far away as possible from nests.
    - Cease activities within the Active Breeding Site if chicks are observed displaying signs of physical distress (calling, panting, high rates of movement, etc.).

*Please note that sufficient mitigation provides scientific or conservation benefit to the specific species impacted by project activities (e.g., actions that result in take of American oystercatchers must provide mitigation that benefits American oystercatchers).* Mitigation is scalable depending on the impact (e.g., Box 5), with mitigation options available for take that significantly impairs or disrupts essential behavioral patterns.

The list of mitigation options in Table 1 and in the section below is not exhaustive. Programmatic permits (e.g., multi-party, multi-action, or longer-term permits for repeat activities) are possible and will be evaluated on a case-by-case basis. In rare cases, mitigation provided through the ERP process may satisfy the requirements of Chapter 68A-27, F.A.C., as described in Coordination with Other State and Federal Agencies. All mitigation contributions will support IBNB conservation actions consistent with the Species Action Plan (FWC 2013) or those identified by FWC subject matter experts as emerging needs for the species, and use of mitigation contributions will be guided by the extensive monitoring network of the Florida Shorebird Alliance (FSA) and data in the FSD.

*Table 1. Typical mitigation options for incidental take permits for IBNBs.*

| Type of Mitigation | Options |
|---|---|
| **Scientific Benefit** | Studies that provide *significant advancement* in knowledge or management of the species (see list in this document) |
| **Conservation Benefit** | Onsite conservation<br>Offsite conservation<br>Financial contribution<br>Information* |

*The information option includes support for research, monitoring, or education. This option can be part of a mitigation package but not the sole source of mitigation.

As described in the ISMP (FWC 2016), a study must be designed to provide *significant advancement* in knowledge or management of the species in order to meet the standard of scientific benefit. The following research and monitoring projects can provide scientific benefit, provided FWC staff approve the objectives and methods submitted as part of the permit application.

- Establish or expand on existing studies designed to increase the knowledge of the effects of predation, predator presence, and effectiveness of targeted predation management in an adaptive management framework on the demographics of breeding IBNBs. Study shall include the assessment of predator presence and predation frequency in relation to vegetation structure.
- Evaluate and assess the impacts of beach management strategies for purposes other than benefiting IBNBs (e.g., beach nourishment, revegetation, etc.) on breeding and nonbreeding IBNB movement patterns, reproductive success, and survival.
- Evaluate the importance of site fidelity in breeding and nonbreeding IBNBs and incorporate site specific variables to determine rates of mortality and emigration.
- Develop and implement a statewide, long-term (≥7 years) demographic study using either color-banding or transmitter technology for least terns or black skimmers to examine survival and dispersal of adults and fledged chicks.
- Model the impact of climate change (sea-level rise, temperature, and rainfall) on nesting and foraging habitat of state Threatened IBNBs. This could include a spatiotemporal assessment of foraging habitat near priority seabird colonies, as determined through coordination with FWC.

*To achieve conservation benefit, standard mitigation options are available for some activities in Active or Recent Breeding Sites, whereas mitigation will be evaluated on a case-by-case basis for other activities* (Table 2, Appendix B). Mitigation will be evaluated on a case-by-case basis for all activities resulting in take in Critical Brood-rearing Sites and Critical Roosting Sites.

ShoreMapper is available on FWC's website at https://gis.myfwc.com/ShoreMapper/ to guide people in determining the extent of take for activities with standard mitigation options, as described above. *A site visit is strongly recommended to ensure the accuracy of the extent of take estimated by the app.* Standard options (Appendix B) often include selection of onsite, offsite, or financial contribution options, as described below.

**Onsite conservation**

Onsite conservation is the preferred option for shorebird conservation, when feasible.

*Table 2. Activities within Active or Recent Breeding Sites for which standard mitigation options are available (see Appendix B). Other activities will be evaluated on a case-by-case basis.*

| Mitigation type | Activity | |
|---|---|---|
| **Standard mitigation** | Beach vehicular ramps<br>Major structures*<br>Minor structures*<br>Groins and jetties<br>Coastal dune lake outlets<br>Debris removal, oil-spill cleanup, derelict vessel removal, removal of sand from roads<br>Dune crossovers/walkovers | Emergency response activities<br>Non-habitable structures*<br>Rooftop maintenance / repairs<br>Special events<br>Stormwater outfalls |
| **Case-by-case evaluation** | Beach cleaning<br>Beach nourishment**<br>Coastal armoring***<br>Deposition of dredged material<br>Dredging<br>Mining | Scientific research<br>All activities impacting Critical Brood-rearing Sites and Critical Roosting Sites<br>Others |

*As defined in Florida Statute 161.54. Note that dune walkovers and crossovers have a separate mitigation framework compared to other minor structures, and sand fencing is discussed in Other Authorizations for Take.

**Adhering to the shorebird conditions in a Department of Environmental Protection JCP almost always constitutes avoidance of take for beach nourishment activities. In rare cases where avoidance is not possible, mitigation will be evaluated on a case-by-case basis.

*** As defined in Rule 62B-41.002 , F.A.C.

**Seasonal Refuges:** One option for onsite conservation entails establishing a "Seasonal Refuge" for IBNBs. Seasonal Refuges are on-site areas where Regulatory Boundary Signs and symbolic fencing are posted early, just prior to breeding season and are not taken down until breeding season ends or breeding activity is completed, whichever is later. Such areas provide undisturbed open space for IBNBs to breed with minimal human disturbance. These refuges may also provide brood-rearing habitat for IBNBs. To serve as sufficient mitigation, a Seasonal Refuge must be of adequate size and have habitat of sufficient quality to sustain a number of IBNB pairs greater than the number of pairs for which the applicant is seeking authorization for take. For projects resulting in significant habitat modification, Seasonal Refuges must be maintained for 25 years, or until a Seasonal Refuge is no longer feasible, as determined by FWC. The landowner or their designated representative are responsible for maintaining the Seasonal Refuge to provide habitat suitable for IBNB breeding. A management plan for the site shall be outlined in an agreement or permit with the FWC. If the management plan is in an agreement separate from the incidental take permit, the permittee must follow the terms of the agreement. An agreement or permit including multiple landowners can help make onsite conservation feasible in highly developed coastal areas. Under a multi-party agreement or permit, the location of the Seasonal Refuge can vary from year to year, provided each location has sufficient quantity and quality of habitat. Once an Active Nest is established in a Seasonal Refuge, the site becomes a Recent Breeding site and is subject to the protections provided in these Guidelines.

FWC staff will use the best available species-specific information when evaluating sufficiency of

proposed Seasonal Refuges. The FWC may determine that onsite mitigation in the form of a seasonal refuge cannot achieve conservation benefit for one or more of the following reasons:

- The site does not contain enough habitat to support a number of IBNB pairs greater than the number of pairs for which the applicant is seeking authorization for take.
- The site does not contain sufficient quality of habitat (e.g., Seasonal Refuges must be at an elevation that protects nests from being washed over during most high tides; nesting habitat should not be directly adjacent to tall buildings; nesting habitat must have less than 10% vegetation cover; the configuration of the habitat must be wide enough to prevent disturbance and provide suitable nesting habitat; etc.).
- Habitat modifications due to the project or activity will increase threats (e.g., human disturbance, predators) onsite in a manner that significantly reduces probability of successful nesting.
- Future activities on or adjacent to the site are likely to increase threats or reduce habitat quality over time in a manner that significantly reduces probability of successful nesting.

Applicants should include the following details in their permit application:

- A map with aerial imagery showing the location, dimensions, and acreage of the proposed Seasonal Refuge.
- The distance of the proposed Seasonal Refuge to nearest existing and proposed major and minor structures (as defined in Florida Statute 161.54).
- A description of any management actions needed to make the proposed refuge suitable for IBNBs.
- A description of annual management actions that will be conducted for IBNBs, including details on when and how the area will be posted with Regulatory Boundary Signs and habitat management actions that will be conducted to maintain suitable habitat conditions (if necessary).
- Describe activities likely to take place within 300 ft of the proposed refuge and detail any actions that will take place to manage potential sources of human disturbance (if necessary).

FWC regional shorebird contacts can provide technical assistance to applicants considering Seasonal Refuges prior to submittal of a permit application.

**Other Onsite Options:** FWC staff also consider onsite habitat restoration or enhanced management as part of the mitigation package. Examples include, but are not limited to, removal of invasive exotic vegetation, removal of paved surfaces, speed attenuation measures (e.g., speed humps) at roads with documented IBNB mortality, adding shell to prolong availability of open areas, and predation management.

**Offsite conservation**

Offsite conservation may be proposed when onsite conservation is not feasible. For example, offsite conservation may be more appropriate for a landowner in a highly developed area whose property has insufficient space for onsite conservation. Offsite conservation can include population management (e.g., predation management), improved protections (e.g., Regulatory Boundary Signs, bird stewards, law enforcement patrols) from human-related disturbance, rooftop management, seasonal closures, habitat restoration (e.g., vegetation management), habitat creation (e.g., nesting platforms for least terns, spoil island management), 1:1 land acquisition with management, or a combination of these actions. It is preferable for offsite conservation to be located within the same region of the state where IBNBs are impacted by

project activities (see map of IBNB regions in the Species Action Plan [FWC 2013]). The Species Action Plan outlines identified conservation actions and can serve as a resource when determining feasible options. Close coordination with the appropriate FWC regional shorebird contact is encouraged prior to proposing offsite mitigation as part of a permit application. Offsite mitigation used as a standard mitigation option must provide an overall conservation benefit to the species to be taken. Requirements associated with offsite mitigation (e.g., actions, timelines, habitat criteria) will be included in permit conditions.

**Financial contribution**

Applicants also can propose a financial contribution to the Fish and Wildlife Foundation of Florida's Imperiled Species Permitting Conservation Fund. Mitigation contributions will be used to fund priority actions included in, or consistent with the objectives of, the Species Action Plan (FWC 2013).

The framework presented below for calculating financial contribution applies to all activities with standard mitigation options (Table 2), with the exception of constructing new dune walkovers and crossovers, which are addressed in Table 6 . For repair or replacement of existing dune walkovers and crossovers, take via harassment may apply depending on location.

Financial contributions may include mitigation for harassment, significant habitat modification (harm), or both in cases where both types of take will occur (Table 3). After determining the extent of take in ShoreMapper, permit applicants follow the steps below to calculate the appropriate financial contribution.

*Table 3. Types of take and anticipated form(s) of financial contribution.*

| Type of take | Form(s) of financial contribution |
|---|---|
| Harassment | Per breeding pair (per year, if applicable) |
| Harm other than significant habitat modification | FWC typically does not issue permits for this type of take, except in emergency situations for human health and safety |
| Harm via significant habitat modification | Per square foot (one-time contribution) |
| Significant habitat modification *and* harassment* | Per breeding pair *plus* per square foot |

*e.g., Construction projects that occur during the breeding season may involve both significant habitat modification and harassment of breeding pairs.

**Calculating financial contributions for harassment:**

1. The permit applicant uses ShoreMapper to produce a report that includes the number of pairs of birds associated with a Recent Breeding Site and the proportion of the Recent Breeding Site impacted by a project or activity.
2. The applicant multiplies the number of pairs by the proportion of the Recent Breeding Site impacted, rounding up to the nearest whole number. The result an estimate of the amount of harassment (expressed in number of IBNB pairs).
3. Multiplying the number of pairs in step 2 by the appropriate dollar amount per pair in Table

4 produces the financial contribution to achieve conservation benefit. Table 4 provides the mitigation amount per pair for each species, taking into account the relative abundance of each species in Florida. Please note that mitigation contributions in Table 4 are annual (per breeding season). For example, a project anticipating 2 breeding seasons of harassment would double the mitigation contribution derived from Table 4.

*Table 4. Financial contribution for harassment is measured **per breeding pair** of birds and per breeding season, and the contribution varies by species. Contributions were based on the cost of strategies designed to increase population size, divided among the abundance of state Threatened imperiled beach nesting birds (weighted according to abundance of each species, so less abundant species have higher mitigation costs per pair). Mitigation contribution amounts will be adjusted over time to keep pace with inflation, and updated amounts will be published at FWC's IBNB webpage.*

| Species | Per pair (Per breeding season) |
|---|---|
| American oystercatcher | $1,900 |
| Black skimmer | $270 |
| Least tern | $200 |
| Snowy plover | $2,250 |

A special event is scheduled to occur during the breeding season. The applicant checks ShoreMapper, which indicates that the event will occur within a Recent Breeding Site. No habitat modification will occur, but harassment of breeding pairs is likely to occur.

The applicant produces a report in ShoreMapper, which estimates that take will include harassment of 1 pair of snowy plovers.

The applicant wishes to mitigate using a financial contribution. Using Table 4, the applicant calculates the mitigation for harassment as:

1 snowy plover pair x $2,250 = $2,250

**Calculating financial contributions for significant habitat modification:**

1. The permit applicant uses ShoreMapper to produce a report that includes the square footage of direct and indirect impacts that will occur from the project or activity.
    a. Direct impacts result from activities that remove habitat.
    b. Indirect impacts result from activities that render habitat unusable or reduce its suitability. For example, IBNBs avoid nesting close to structures, and productivity decreases as human disturbance increases.
    c. Direct impacts occur within the activity footprint, and indirect impacts occur within 300 feet of the activity footprint.
    d. See Biological Background for more information on direct and indirect impacts.
2. The ShoreMapper report also indicates the relative priority of the site, ranked from Tier 1 (highest value) to Tier 3.
3. Multiplying the square footage of direct and indirect impacts by the values in Table 5 provides the financial contribution sufficient to achieve conservation benefit.
    a. Note that dune walkovers and crossovers have a separate mitigation structure

(Table 6).

b. Please note that mitigation contributions for significant habitat modification are one-time contributions.
c. Dollar amounts are based on the average cost per square foot of known and planned habitat restoration or creation projects for IBNBs and similar species.

*Table 5. Financial contribution for significant habitat modification is measured **per square foot** and varies based on the size (Tier) of the breeding site. This is a one-time contribution. Tiers were established based on an analysis of the number of breeding pairs over the past 5 years for which data are available in the FSD. Breeding sites that, on average, have the most breeding pairs were assigned to Tier 1. Single-family homes are expected to have reduced indirect impacts compared to other activities, such as construction of a hotel, and therefore have less mitigation per square foot. Similarly, minor and non-habitable structures (as defined in Florida Statute 161.54) that are less than 1,500 square feet have less mitigation per square foot, compared to large parking lots, tennis courts, or parking garages. Mitigation contribution amounts will be adjusted over time to keep pace with inflation, and updated amounts will be published at FWC's IBNB webpage (https://myfwc.com/license/wildlife/ibnb).*

| **Tier** | **Direct impact** (removal of habitat) | **Indirect impact** (reduces habitat suitability)<br>• For single-family homes<br>• For minor structures and non-habitable structures under 1,500 sq ft | **Indirect impact** (reduces habitat suitability)<br>• For all activities not listed in the previous column |
|---|---|---|---|
| Tier 3 | $1.75 | $0.05 | $0.50 |
| Tier 2 | $6.50 | $0.15 | $1.50 |
| Tier 1 | $8.00 | $0.20 | $2.00 |

**Dune walkovers and crossovers**

The following framework applies to dune walkovers and crossovers that will remove habitat from or terminate within a Recent Breeding Site. A flat mitigation contribution for dune walkovers and crossovers applies to these projects and is based on the amount of expected impact and the priority of the Recent Breeding Site. The expected impact is determined by the type of structure associated with the walkover or crossover, and the relative priority of the Recent Breeding Site is indicated by Tiers (Table 6). Mitigation for take via harassment resulting from construction of dune walkovers and crossovers is calculated as described in calculating financial contributions for harassment for other activities.

A construction project for a single-family home must be accomplished over the course of one breeding season. The applicant checks ShoreMapper, which indicates that the project will occur within a Recent Breeding Site. The buffered project footprint within the Recent Breeding Site exceeds 500 square feet and will therefore result in significant habitat modification, as well as harassment of breeding pairs.

The applicant produces a report in ShoreMapper, which estimates that take will include harassment of 5 breeding pairs of least terns, as well as indirect impacts to 45,000 square feet of Tier 2 least tern habitat. Direct impact will not occur in this scenario because the house project footprint will not remove existing suitable habitat.

The applicant wishes to mitigate using a financial contribution. Using Table 4, the applicant calculates the mitigation for harassment as:

5 least tern pairs x $200 = $1,000

Using Table 5, the applicant calculates mitigation for significant habitat modification as:

*Direct impact + indirect impact = contribution for significant habitat modification*

(0 x $6.50) + (45,000 x $0.15) = $6,750

The total financial contribution would be $1,000 + $6,750 = $7,750

*Table 6. Financial contribution for significant habitat modification resulting from new dune walkovers and crossovers that remove habitat from or terminate within a Recent Breeding Site. Note that construction of new dune walkovers and crossovers also may result in take via harassment if conducted during the breeding season. Mitigation contribution amounts will be adjusted over time to keep pace with inflation, and updated amounts will be published at FWC's IBNB webpage.*

**Type of structure associated with the walkover or crossover**

| Tier | Single Family | Multi-family (< 10 units) or parking area (< 10 spaces) | Multi-family (> 10 units) or parking area (> 10 spaces) |
|---|---|---|---|
| Tier 3 | $500 | $950 | $9,500 |
| Tier 2 | $500 | $9,500 | $19,000 |
| Tier 1 | $500 | $19,000 | $33,000 |

The mitigation contribution amounts in Tables 4-6 will be adjusted over time to keep pace with inflation. Tying these changes to the Consumer Price Index ensures mitigation contributions are adjusted relative to actual price increases or decreases. The FWC uses the "All Urban Consumers Price Index" (CPI-U), which reflects the highest percentage of the population, and the CPI-U for the Southeast region. Information on the Consumer Price Index is available online at www.bls.gov/cpi. Adjustments to the contribution amount will take effect on March 1 of each year because the CPI for the previous year is usually not available until mid-February. The contribution will be calculated based on the date that a completed application is received by FWC. Updated mitigation contribution amounts will be published at FWC's IBNB webpage.

If standard mitigation options are not available for a particular activity, or if an applicant wishes to propose alternative mitigation to achieve conservation benefit, the following list provides mitigation categories for applicants to consider. Applicants can combine multiple categories of mitigation in a mitigation package.

**Habitat**

- On-site Seasonal Refuge to protect IBNBs during the breeding season.
- Off-site habitat creation and maintenance (e.g., least tern nest platforms, spoil island management).
  - Please note: man-made structures that were established as part of a mitigation plan for previously-issued permits and that need to be removed must be replaced elsewhere.
- Habitat restoration and management (e.g., vegetation management, debris removal, beach nourishment with Seasonal Refuge [note: nourishment may not be appropriate in some sites with snowy plovers or American oystercatchers]).
- Enhanced management of existing habitat (e.g., predation management, improved protections from human disturbance, rooftop management, seasonal closures).

**Funding**

- Mitigation may take the form of a financial contribution to the Fish and Wildlife Foundation of Florida's Imperiled Species Permitting Conservation Fund. Mitigation contributions will be used to fund priority actions included in or consistent with the objectives of the Species Action Plan.

**Information**

- Mitigation can be used to support research, monitoring, or educational projects included in or consistent with the objectives of the Species Action Plan. This form of mitigation can be part of a mitigation package but shall not be the sole form of mitigation unless included above under Scientific Benefit.

- Programmatic permits will be considered on a case-by-case basis and can be used to address situations under which:
  - A long-term permit may be advantageous to the applicant and the FWC.
  - An applicant wishes to cover multiple coastal activities under a single permit.
  - Multiple applicants wish to be covered under a single permit.
- Examples of activities that may benefit from a programmatic permit include, but are not limited to, repeated or ongoing activities like dredging or dredge spoil management and large-scale public works projects.
- Programmatic permits similar to Safe Harbor agreements are possible for landowners concerned that a temporary activity may attract nesting IBNBs.

- Different species of IBNBs often nest in the same location, and multispecies permits are recommended for both standard and case-by-case permitting options above.
- It is also possible to include state Threatened IBNBs in Federal Habitat Conservation Plans developed in coordination with the U.S. Fish and Wildlife Service for federally listed species that occur within the same habitat types.

Standard mitigation options are available for many activities (Table 2). For activities that are evaluated on a case-by-case basis, applicants can create a mitigation package by selecting a single mitigation option or through a combination of the mitigation options outlined in the pages above. When assembling a mitigation package for activities evaluated case-by-case, applicants should consider: (1) what is the extent of take that will occur, and (2) how much mitigation is necessary to counterbalance the take expected to occur and provide an additional benefit to the species? For instance, mitigation for actions that harass breeding pairs must replace the productivity lost due to the action and provide an additional benefit. The appropriate amount and duration of mitigation will depend on the impact.

For example, if an action harasses a colony of 10 least tern pairs in a single breeding season, mitigation needs to be sufficient to replace the lost breeding opportunity for those 10 pairs and provide an additional benefit. However, if an action results in permanent loss of a breeding site used by 10 least tern pairs, mitigation would have to counterbalance more than just a one-time loss of productivity (e.g., replacing the lost habitat through habitat protection, creation, or restoration).

The mitigation package must include:

- A description of activities expected to result in take, including a map that shows the location of activity footprint, buffered by 300 feet (and 0.75 miles for special events that include loud noises), and the location of Active or Recent Breeding Sites, Critical Brood-rearing Sites, or Critical Roosting Sites.
- The type(s) (i.e., harm and/or harassment) and extent of take that will occur. Applicants are encouraged to use ShoreMapper to assist with estimating the extent of take.
- The report generated in ShoreMapper, if applicable.
- A description of minimization measures that will reduce the amount of take that will occur. The applicant must include a list of any IBNB Permitted Monitors employed for the project.
- A list of mitigation options that the applicant will commit to employing to provide a scientific or conservation benefit, including specific descriptions for each (e.g., the total amount of financial contribution for each type of take, maps and description of management for any proposed onsite conservation).

The permit application must contain sufficient information for FWC staff to evaluate whether the mitigation counterbalances take and provides an additional benefit to the species. Note that mitigation contributed for past projects cannot be included as mitigation for a new incidental take permit. Projects initiated prior to permit issuance typically cannot be used as mitigation. Mitigation must benefit the species impacted.

Additional mitigation options may be considered by the FWC's Protected Species Permitting Office, provided the applicant provides adequate justification of scientific or conservation benefit.

## FWC Permitting: Intentional Take

Intentional take is not incidental to otherwise lawful activities. Per Chapter 68A-27, F.A.C., intentional take is prohibited without a permit or other authorization. For state Threatened species, intentional take permit applications may be considered *for scientific or conservation purposes* (defined in FWC's ISMP as activities that further the conservation or survival of the species taken). Permits are issued for state Threatened species following guidance in Rule 68A-27.007(2)(a), F.A.C. Intentional take without a permit is authorized under certain circumstances that involve risks to property or human safety, such as on airport property (see Other Authorizations for Take).

- Permits will be issued only under limited and specific circumstances, in cases where there is an immediate danger to the public's health and/or safety, such as imminent or existing power outages that threaten public safety, or in direct response to an official declaration of a state of emergency by the Governor of Florida or a local governmental entity. Applicants must submit a complete permit application, along with a copy of the official declaration of a state of emergency, if applicable. If chicks are removed and taken to a licensed rehabilitation center under these circumstances, the permittee must compensate the rehabilitation center for food and supplies for subsequent care of the birds.
- Rule 68A-9.012, F.A.C., describes circumstances under which IBNBs may be taken on airport property without further state authorization for an imminent threat to aircraft or human safety.

- Not applicable for IBNBs.

Scientific collecting permits may be issued for IBNBs using guidance found in Rule 68A-27.007(2)(a), F.A.C. Forms of research that cause take, captive possession, educational use, and salvage of parts or eggs are prohibited without a permit. Applicants can apply for scientific collecting permits on the FWC's online permitting site.

**Research activities** that cause take include any projects that involve capturing, handling, or marking IBNBs; entering Active Breeding Sites, Active Critical Brood-rearing Sites, or Critical Roosting Sites for scientific purposes; conducting biological sampling; or other activities that may cause harm or harassment. *To ensure applications are complete when submitted, please carefully review the Considerations for Issuing a Scientific Collecting Permit and Relevant to all Scientific Collecting for IBNBs sections below*.

Please note that some Recent Breeding Sites are located in designated Critical Wildlife Areas, which may be closed to public access without a permit at certain times of year (Rules 68A-14.001 and 68A-19.005, F.A.C.).

Scientific collecting permit applications involving **captive possession** for any period of time must include a full explanation of whether the facility has the appropriate resources for accomplishing the objectives and for maintaining the animals in a safe and humane manner. Applications for **educational use** of live IBNBs must include an evaluation by an independent rehabilitator and a licensed veterinarian demonstrating that the individual cannot be released into the wild; must demonstrate appropriate educational use; and must include information about the ability of the applicant(s) to conduct the educational activities, their history of performing such activities, and resources for maintaining IBNBs. Appropriate educational use means that the IBNBs must be housed at a non-profit scientific or educational facility, must be on public display with the intent of conservation education whenever the facility is open to the public (provided the bird is in good health), and must not be displayed for commercial purposes (i.e., any manner that implies personal use or that promotes or endorses any product, merchandise, good, service, business or organization). Additionally, applicants seeking to possess live IBNBs for educational purposes must abide by caging requirements (Chapter 68A-6, F.A.C.) and obtain a license for exhibition/public sale (379.3761 Florida Statutes).

For **possession of dead IBNBs, or their parts or infertile eggs**, an applicant must meet the definition of appropriate educational use provided above, except that specimens may be housed in a manner appropriate for their preservation, provided they are still accessible for public use. Permits may be issued to display a specimen if the specimen was obtained via a rehabilitation facility or was encountered dead.

Although issuance of an FWC scientific collecting permit does not depend on the possession of **local or federal authorizations**, permittees must obtain all necessary local and federal authorizations before executing the state permit. Please note federal permits may be required from the U.S. Fish and Wildlife Service to comply with the Migratory Bird Treaty Act and may be required from the United States Geological Survey (USGS) Bird Banding Lab for banding, color-marking, specific capture methods, sampling of blood/tissues, collection of feathers, and attachment of transmitters or other data gathering mechanisms.

FWC staff considers the following questions when evaluating scientific collecting permit applications, based on the factors outlined in Rule 68A-27.007(2)(a), F.A.C. The bullets under each question provide guidance to applicants for assembling a complete application:

1. Is the purpose adequate to justify removing the species (if the project requires this)?
    - Permits may be issued if the identified project is consistent with the goal of the Species Action Plan (improvement in status that leads to removal from Florida's Endangered and Threatened Species List), or addresses a data gap important for the conservation of the species.
2. Is there a direct or indirect effect of issuing the permit on the wild population?
    - Applicants must include detailed methods, including measures taken to minimize take. Applications also must include proposed study duration, sample size, and disposition of individuals, as appropriate.
    - Trapping, capturing and handling IBNBs may impact ability to forage, breed, or rear young. Applications proposing these activities must include trapping and handling protocols. Trapping and handling protocols must identify measures to lessen stress for captured individuals and to lessen impacts to IBNB populations.
    - Methodologies for any collection of tissues such as blood must be clearly spelled out, including measures taken to reduce stress/injury to the birds.
    - If proper precautions are not in place, entering Active Breeding Sites or Active Critical Brood-rearing Sites could result in death or injury of eggs or chicks, harassment of adults or chicks, or even abandonment of the site. Applicants that propose to work near or within Active Breeding Sites or Active Critical Brood-rearing Sites must include measures for minimizing disturbance.
    - American oystercatchers rely on Critical Roosting Sites at high tide. Applicants that propose to work near or within Critical Roosting Sites must include measures for minimizing disturbance.
3. Will the permit conflict with a program intended to enhance survival of species?
    - Applications must include clear objectives to ensure that the project does not conflict with other conservation efforts for the species.
    - Coordination with land managers, partners (county, city, state or national), and FWC must be addressed in the application to demonstrate that the project will not conflict with other efforts for the species.
    - Applications must identify the project location, such as where trapping or handling will occur (privately owned or public lands).
    - Applicants proposing to enter Active Breeding Sites, Active Critical Brood-rearing Sites, or Critical Roosting Sites must justify that the impacts to birds will not conflict with objectives of the Species Action Plan and other relevant conservation efforts for the species.

4. Will purpose of the permit reduce likelihood of extinction?
   - Projects consistent with the goal of the Species Action Plan or that fill identified data gaps in species life history or management may reduce the likelihood of extinction.
   - Applications must include clear project objectives and justification of why the proposed project has a scientific or conservation purpose, including how the project advances conservation of the species.
5. Have the opinions or views of other scientists or other persons or organizations having expertise concerning the species been sought?
6. Is applicant expertise sufficient?
   - Applicants must have prior documented experience or training with these or similar species, and applicants must have met all conditions of any previously issued FWC permits.
   - The application must describe the qualifications (e.g., experience or training) of staff overseeing the work and the resources and facilities available to conduct the proposed work.

- Permit amendment and renewal applications must be "stand alone" (i.e., include all relevant information on objectives and methods, even if previously submitted for a predecessor permit).
- Applications must include a proposal that contains the elements in the Considerations for Issuing a Scientific Collecting Permit and Relevant to all Scientific Collecting for IBNBs sections above.
- Applications should include detailed qualifications or training for all individuals who will be capturing or handling IBNBs. For those likely to submit multiple applications over time, applicants are encouraged to upload minimum qualifications as part of an application for a Registered Agent permit in the online permitting site. The FWC also encourages applicants to include qualifications of sub-permittees in the Registered Agent permit. This will allow applicants to upload minimum qualifications only once rather than repeatedly uploading them in each scientific collecting permit application.
- Surveys following methods described in the Breeding Bird Protocol for Florida's Shorebirds and Seabirds or the FWC Monitoring Protocol for Non-breeding Shorebirds and Seabirds do not need a scientific collecting permit. Please note that some Recent Breeding Sites are located in designated Critical Wildlife Areas, which may be closed to public access without a permit at certain times of year (Rules 68A-14.001 and 68A-19.005, F.A.C.).
- Passive observations (such as those involved in behavioral studies) of foraging, roosting, and nesting birds do not need a permit provided observers remain outside 300 feet (or smaller buffer identified by Regulatory Boundary Signs) and the birds do not flush from Active Nests or Active Breeding Sites, Active Critical Brood-rearing Sites, or Critical Roosting Sites. Installation of, maintenance for, and access to game camera(s) placed within Active Breeding Sites requires a scientific collecting permit.
- For guidance on permitting for surveys of IBNBs using UAS, please see Appendix F for more information.
- Aerial surveys in manned vehicles do not need a permit, provided flight altitude is above 500 feet from Active Breeding Sites, Active Critical Brood-rearing Sites, or Critical Roosting Sites.
- Habitat sampling that does not involve modification of habitat near foraging, roosting, and nesting birds does not need a permit, provided observers remain outside Active Breeding Sites, Active Critical Brood-rearing Sites, or Critical Roosting Sites with American oystercatchers present.

- Any mortality associated with permitted activities must be reported to the FWC, and permittees must follow permit provisions regarding proper disposal of specimens.
- A final report must be provided to the FWC in the format specified in the permit conditions.

## Additional information

ShoreMapper displaying Recent Breeding Sites, Critical Brood-rearing Sites, and Critical Roosting Sites is available at https://gis.myfwc.com/ShoreMapper/

FWC's IBNB webpage can be found at https://myfwc.com/license/wildlife/ibnb/

Information on economic assessment of these Guidelines can be found at: http://myfwc.com/wildlifehabitats/imperiled/management-plans/

## Contact

For permitting questions or to report mortalities that occur during permitted activities, contact the FWC at (850) 921-5990 or WildlifePermits@MyFWC.com. To contact a FWC regional shorebird contact, please visit https://myfwc.com/conservation/you-conserve/wildlife/shorebirds/contacts/. To report a wildlife violation please visit https://myfwc.com/contact/wildlife-alert/ or call 1-888-404-FWCC (3922).

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# Appendices

The table below provides examples of actions that create the likelihood of significantly impairing (harm) or disrupting (harass) essential behavioral patterns. If conducting one of these activities in one of the times and places where take is possible, we recommend contacting the FWC regional shorebird contact to avoid a wildlife violation. This list is not meant to be comprehensive and does not include activities for which FWC typically does not issue permits. See the Take section for general guidance. H = harassment, I = injury or mortality, S = significant habitat modification.

| Action | Within 300 feet of Recent Breeding Site (during breeding season; Figure 1) | Within 300 feet of Recent Breeding Site (outside of breeding season) | Within 300 feet of Active nests (i.e., within an Active Breeding Site) | Within 300 feet of Active Critical Brood-rearing Site (Mar 15 - Sep 1) | Within 300 feet of Critical Brood-rearing Site (Sep 2 - Mar 14) | Within 300 feet of Critical Roosting Site (year-round) | Notes |
|---|---|---|---|---|---|---|---|
| Beach Nourishment and Associated Tilling (As defined in Rule 62B-41.002, F.A.C.) NOTE: Adherence to shorebird conditions in a Joint Coastal Permit for beach nourishment almost always constitutes avoidance of take. In rare cases where avoidance is not possible, mitigation will be evaluated case-by-case. Projects issued a JCP prior to 2012 should contact FWC to make sure JCP permit conditions still are sufficient. | H, I | | H, I | H, I | | | |
| Beach Vehicular Ramps (construction of) | H, I, S | S | H, I, S | H, I, S | S | | Significant habitat modification if habitat loss > 500 sq ft or if the ramp terminates in one of these sites; note that maintenance/repair of an existing ramp may cause take if conducted during the breeding or brood-rearing season. |
| Beach Cleaning (mechanical) | H, I | | H, I | H, I | | | |
| Coastal Armoring (As defined in Rule 62B-41.002, F.A.C.) | H, I, S | S | H, I, S | H, I, S | S | | |
| Coastal Dune Lake or Stormwater Outlets | H, I, S | S | H, I, S | H, I, S | S | | Significant habitat modification if habitat loss > 500 sq ft; note that maintenance/repair of an existing outlet may cause take if conducted during the breeding or brood-rearing season |

The table below provides examples of actions that create the likelihood of significantly impairing or disrupting essential behavioral patterns. If conducting one of these activities in one of the times and places where take is possible, we recommend contacting the FWC regional shorebird contact to avoid a wildlife violation. This list is not meant to be comprehensive and does not include activities for which FWC typically does not issue permits. See the Take section for general guidance. H = harassment, I = injury or mortality, S = significant habitat modification.

| Action | Within 300 feet of Recent Breeding Site (during breeding season; Figure 1) | Within 300 feet of Recent Breeding Site (outside of breeding season) | Within 300 feet of Active nests (i.e., within an Active Breeding Site) | Within 300 feet of Active Critical Brood-rearing Site (Mar 15 - Sep 1) | Within 300 feet of Critical Brood-rearing Site (Sep 2 - Mar 14) | Within 300 feet of Critical Roosting Site (year-round) | Notes |
|---|---|---|---|---|---|---|---|
| Debris removal, oil spill cleanup, removal of derelict vessels, removal of sand from roads, and Emergency Response Activities (i.e., immediate action to repair, replace, or restore structures, equipment, works, and operations damaged by a storm, during a state of emergency declared by an Executive Order of the Governor) | H, I | | H, I | H, I | | H | |
| Deposition of dredged material (e.g., onto spoil islands or Dredge Material Management Areas) | H, I | | H, I | H, I | | | |
| Dredging (e.g., removal of a spit used by IBNB for nesting, dredging activities that flush IBNB from Active Nests, use of deterrents to deter IBNB from nesting, etc.) | H, I, S | S | H, I, S | H, I, S | S | H, S | Significant habitat modification if habitat loss > 500 sq ft or if indirect habitat loss > 500 sq ft through erosion. Some dredging projects also require authorization for take via harassment to deter birds from nesting on areas scheduled for dredging. |
| Dune Crossovers, Walkovers, Beach Accessibility Mats | H, I, S | S | H, I, S | H, I, S | S | | Significant habitat modification if habitat loss > 500 sq ft or if the walkover/crossover terminates in a Breeding Site or Critical Brood-rearing Site. Note that significant habitat modification applies to new walkover/crossover, and repair or replacement may cause harassment. |

The table below provides examples of actions that create the likelihood of significantly impairing or disrupting essential behavioral patterns. If conducting one of these activities in one of the times and places where take is possible, we recommend contacting the FWC regional shorebird contact to avoid a wildlife violation. This list is not meant to be comprehensive and does not include activities for which FWC typically does not issue permits. See the Take section for general guidance. H = harassment, I = injury or mortality, S = significant habitat modification.

| Action | Within 300 feet of Recent Breeding Site (during breeding season; Figure 1) | Within 300 feet of Recent Breeding Site (outside of breeding season) | Within 300 feet of Active nests (i.e., within an Active Breeding Site) | Within 300 feet of Active Critical Brood-rearing Site (Mar 15 - Sep 1) | Within 300 feet of Critical Brood-rearing Site (Sep 2 - Mar 14) | Within 300 feet of Critical Roosting Site (year-round) | Notes |
|---|---|---|---|---|---|---|---|
| Groins, Jetties, and Other Erosion Control, Mechanical Sand Bypass Systems, or Sand-catching Structures (Construction of new or maintenance of existing structures) | H, I, S | S | H, I, S | H, I, S | S | H, S | Significant habitat modification if habitat loss > 500 sq ft. Also, these structures can cause take if they separate snowy plover breeding sites from Active Critical Brood-rearing Sites. Construction of a new structure or maintenance/repair of an existing structure may cause take via harassment if conducted during the breeding or brood-rearing season. |
| Major and Minor Structures (As defined in Florida Statute 161.54) (Includes site preparation, such as clearing/grading) (e.g., single-family and multi-family dwellings, roads, bridges, boardwalks, etc.) *Please note that dune walkovers and crossovers are handled separately (see above)* | H, I, S | S | H, I, S | H, I, S | S | H, S | Significant habitat modification if habitat loss or modification > 500 sq ft. Check the ShoreMapper app. |
| Mining | | | H, I | | | | |
| Non-habitable Structures on the Beach (As defined in Florida Statute 161.54) (Includes site preparation, such as clearing/grading) (e.g., non-portable Lifeguard Stands) | H, I, S | S | H, I, S | H, I, S | | H, S | Significant habitat modification if habitat loss or modification > 500 sq ft. Check the ShoreMapper app. |

The table below provides examples of actions that create the likelihood of significantly impairing or disrupting essential behavioral patterns. If conducting one of these activities in one of the times and places where take is possible, we recommend contacting the FWC regional shorebird contact to avoid a wildlife violation. This list is not meant to be comprehensive and does not include activities for which FWC typically does not issue permits. See theTake section for general guidance. H = harassment, I = direct injury or mortality, S = significant habitat modification.

| Action | Within 300 feet of Recent Breeding Site (during breeding season; Figure 1) | Within 300 feet of Recent Breeding Site (outside of breeding season) | Within 300 feet of Active nests (i.e., within an Active Breeding Site) | Within 300 feet of Active Critical Brood-rearing Site (Mar 15 - Sep 1) | Within 300 feet of Critical Brood-rearing Site (Sep 2 - Mar 14) | Within 300 feet of Critical Roosting Site (year-round) | Notes |
|---|---|---|---|---|---|---|---|
| Intentionally Deterring IBNBs by Placing Objects or Devices or changing the substrate (e.g., placing straw, furrowing the sand) | H | | H | H | | H | For exceptions, see Examples of Activities Not Expected to Cause Take and Other Authorizations for Take |
| Rooftop Maintenance or Repairs (Note: take can occur even if birds are on a rooftop adjacent to where repairs are taking place) | | | H, I | | | | See Appendix E |
| Scientific Research (not on IBNBs) that requires movement of people, vehicles, or equipment or alteration of habitat | H, I | | H, I | H, I | | H | |
| Special Events (e.g., concerts, fireworks, sporting events, boat races, air shows) | H, I | | H, I | H, I | | H | ***NOTE: Harassment can occur from loud noise within 0.75 mi,** unless: (1) previous observations demonstrate that birds are acclimated at the site, or (2) sound models (e.g., Keyel et al. 2018) indicate sound < 85 decibels at the site.<br><br>Crowds or equipment within 300 ft of the site can cause harm or harassment. |

| | |
|---|---|
| Beach vehicular ramps (maintenance/repair during the breeding or brood-rearing season or new construction) | B.1 |
| Groins and jetties (maintenance/repair during the breeding or brood-rearing season or new construction | B.2 |
| Coastal dune lake outlets and stormwater outfalls (maintenance/repair during the breeding or brood-rearing season or new) | B.3 |
| Debris removal, oil-spill cleanup, derelict vessel removal, removal of sand from roads | B.4 |
| Dune walkovers, crossovers, accessibility mats | B.5 |
| Major structures (As defined in Florida Statute 161.54) | B.6 |
| Minor structures (As defined in Florida Statute 161.54). Dune walkovers and crossovers are handled separately above. | B.7 |
| Non-habitable structures (As defined in Florida Statute 161.54) | B.8 |
| Rooftop maintenance and repairs | B.9 |
| Special Events: For loud noise within 0.75 miles of Critical Roosting Site, Active or Recent Breeding Site or a Critical Brood-rearing Site | B.10 |
| Special Events: For crowds, vehicles, equipment within 300 ft of Critical Roosting Site, Active or Recent Breeding Site or a Critical Brood-rearing Site | B.11 |

**Table B.1. Beach vehicular ramps (maintenance/repair during the breeding or brood-rearing season or new construction)**

| Breeding season | Non-breeding season | Within 300 ft of recent breeding site | Within 300 ft of active breeding site | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|
| | X | X | | | **(1) offsite mitigation** **(2) financial contribution** (significant habitat modification; Table 5) |
| X | | X | X | Appendices C. IBNB Permitted Monitors and Appendix D. Operation of Vehicles | (1) **offsite mitigation.** (2) **financial contribution** (significant habitat modification *plus* harassment; Tables 4 and 5) |

**Table B.2. Groins and jetties (maintenance/repair during the breeding or brood-rearing season or new construction)**

| Breeding season | Non-breeding season | Within 300 ft of recent breeding site | Within 300 ft of active breeding site | Separating a Snowy Plover Critical Brood-rearing Site from a Recent or Active Breeding Site | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|---|
| | X | X | | | Shorebird and seabird conditions within the Department of Environmental Protection's Joint Coastal Permit | **(1) offsite mitigation** **(2) financial contribution** (significant habitat modification; Table 5) |
| X | | X | X | | Appendices C. IBNB Permitted Monitors and Appendix D. Operation of Vehicles | (1) **offsite mitigation.** (2) **financial contribution** (significant habitat modification *plus* harassment; Tables **4** and **5**) |
| X | X | | | X | Shorebird and seabird conditions within the Department of Environmental Protection's Joint Coastal Permit | (1) Maintain connectivity by maintaining sand on the geotextile tubes or rocks in perpetuity, or (2) build and maintain a corridor in the groin |

**Table B.3. Coastal dune lake outlets and stormwater outfalls (maintenance/repair during the breeding or brood-rearing season or new)**

| Breeding season | Non-breeding season | Within 300 feet of recent breeding site | Within 300 feet of active breeding site | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|
| | X | X | | | **(1) offsite mitigation**<br>**(2) financial contribution** (significant habitat modification; Table 5) |
| X | | X | X | Appendices C. IBNB Permitted Monitors and Appendix D. Operation of Vehicles | (1) **offsite mitigation.**<br>(2) **financial contribution** (significant habitat modification *plus* harassment; Tables 4 and 5) |

**Table B.4. Debris removal, oil-spill cleanup, derelict vessel removal, removal of sand from roads**

| Breeding season | Non-breeding season | Within 300 feet of recent breeding site | Within 300 feet of active breeding site | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|
| X | | X | X | Appendices C. IBNB Permitted Monitors and Appendix D. Operation of Vehicles | No mitigation is necessary because removal and cleanup provide conservation benefit. |

**Table B.5. Dune walkovers, crossovers, accessibility mats**

| Breeding season | Non-breeding season | Within 300 feet of recent breeding site | Within 300 feet of active breeding site | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|
| | X | X | | | Table 6 for significant habitat modification (new walkover/crossover) |
| X | | X | X | Appendices C. IBNB Permitted Monitors and Appendix D. Operation of Vehicles | Table 6 for significant habitat modification (new walkover/crossover); Table4 for harassment (new, replacement, or repair during breeding season) |

**Table B.6. Major structures (As defined in Florida Statute 161.54)**

| Breeding season | Non-breeding season | Within 300 feet of recent breeding site | Within 300 feet of active breeding site | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|
| | X | X | | | (1) **on-site, Seasonal Refuge.**<br>(2) **offsite mitigation.**<br>(3) **financial contribution** (significant habitat modification; Table 5) |
| X | | X | X | Appendices C. IBNB Permitted Monitors and Appendix D. Operation of Vehicles | (1) **on-site, Seasonal Refuge**.<br>(2) **offsite mitigation.**<br>(3) **financial contribution** (significant habitat modification *plus* harassment; Table 4 and 5) |

**Table B.7. Minor structures (As defined in Florida Statute 161.54). Dune walkovers and crossovers are handled separately above**

| Breeding season | Non-breeding season | Within 300 feet of recent breeding site | Within 300 feet of active breeding site | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|
| | X | X | | | (1) **on-site, Seasonal Refuge**.<br>(2) **offsite mitigation.**<br>(3) **financial contribution** (significant habitat modification; Table 5) |
| X | | X | X | Appendices C. IBNB Permitted Monitors and Appendix D. Operation of Vehicles | (1) **on-site, Seasonal Refuge**.<br>(2) **offsite mitigation.**<br>(3) **financial contribution** (significant habitat modification *plus* harassment; Tables 4 and 5) |

**Table B.8. Non-habitable structures (As defined in Florida Statute 161.54)**

| Breeding season | Non-breeding season | Within 300 feet of recent breeding site | Within 300 feet of active breeding site | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|
| | X | X | | | (1) **on-site, Seasonal Refuge**.<br>(2) **offsite mitigation.**<br>(3) **financial contribution** (significant habitat modification; Tables 4 and 5) |
| X | | X | X | Appendices C. IBNB Permitted Monitors and Appendix D. Operation of Vehicles | (1) **on-site, Seasonal Refuge**.<br>(2) **offsite mitigation.**<br>(3) **financial contribution** (significant habitat modification *plus* harassment; Tables 4 and 5) |

**Table B.9. Rooftop maintenance and repairs**

| Breeding season | Non-breeding season | Within 300 feet of recent breeding site | Within 300 feet of active breeding site | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|
| X | | X | X | Appendix E. Rooftops | **No mitigation is necessary,** because maintaining gravel rooftops that support rooftop-nesting birds achieves conservation benefit. |

**Table B.10. Special Events: Loud noise within 0.75 miles of Critical Roosting Site,**

| Breeding season | Non-breeding season | Within 0.75 miles | Within 0.75 miles | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|
| X | | X | X | | Presence of a qualified IBNB Permitted Monitor to collect data on the response of nesting birds to the noise, plus an after-action report. |

**Table B.11. Special Events: For crowds, vehicles, equipment within 300 ft of Critical Roosting Site,**

| Breeding season | Non-breeding season | Within 0.75 miles of ? | Within 0.75 miles of ? | **Minimization Measures** | **Mitigation options** ***These are standard mitigation options, and applicants may propose alternative mitigation measures that counterbalance take and provide additional benefit.** |
|---|---|---|---|---|---|
| X | | X | X | Establishing Regulatory Boundary Signs according to the Guidelines for Posting Shorebird and Seabird Sites in Florida. Steward(s) to educate the public and keep the public from entering areas with Regulatory Boundary Signs. Appendix D for vehicles. | (1) **financial contribution** (harassment; Table 4) |

Standard minimization measures for many activities include using a trained, dedicated individual (IBNB Permitted Monitor) with proven shorebird and seabird identification skills and avian survey experience. The primary purpose of the IBNB Permitted Monitor is to help the FWC Incidental Take Permittee (Permittee) avoid direct injury or mortality to birds or eggs. Any parts of the project where "project activities" take place entirely outside the breeding season do not require a IBNB Permitted Monitor. The term "project activities" includes operation of vehicles, movement or storage of supplies or equipment, site preparation (e.g., clearing, grading), construction, sand placement or sand removal, and other activities that may harm or harass shorebirds or seabirds.

The incidental take permit applicant is responsible for identifying and employing an IBNB Permitted Monitor who meets the minimum qualifications below. Incidental take permit applicants can search the list of Permit Holders on FWC's IBNB webpage (https://myfwc.com/license/wildlife/ibnb/) to find an IBNB Permitted Monitor that meets the minimum qualifications. *The applicant must include a list of IBNB Permitted Monitor(s) employed for the project with their incidental take permit application.*

IBNB Permitted Monitors must meet the following minimum qualifications:

1. The IBNB Permitted Monitor must obtain a permit from the FWC. Permits for IBNB Permitted Monitors are valid for 2 years. Please see FWC's IBNB webpage for information on how to apply.
2. The IBNB Permitted Monitor permit application must include the applicant's previous training and experience surveying breeding beach-nesting birds in Florida.
    a. Applicants must demonstrate that they have conducted at least 3 surveys that involved observation of Active Nests of IBNBs.
    b. Applicants also must attest that they are able to 1) identify all species of beach-nesting birds that breed in Florida by sight and sound within the region(s) in which the agent will operate (see Species Action Plan for IBNB regions), 2) identify breeding/territorial behaviors, and find nests of shorebirds and colonies of seabirds, and 3) identify habitats preferred by IBNBs for breeding.
    c. Applicants must attest to being familiar with beach driving best practices outlined in Appendix D.
    d. Applicants must attest that they are willing and able to post Active Breeding Sites with Regulatory Boundary Signs and in a manner consistent with the Methods and Materials sections of the FSA Guidelines for Posting Shorebird and Seabird Sites in Florida.
3. The applicant must agree to follow and must adhere to the IBNB Permitted Monitor Code of Conduct, found at FWC's IBNB webpage. **Failure to adhere to the Code of Conduct is grounds for revocation of the IBNB Permitted Monitor's permit**.
4. The applicant must upload the Certificate of Completion for IBNB Permitted Monitor Training, available on FWC's IBNB webpage.

One of the primary roles of IBNB Permitted Monitors is to conduct a Breeding Activity Check, which consists of an inspection within the activity footprint and within a 300-ft buffer around the activity footprint in suitable IBNB habitat. During this inspection, the IBNB Permitted Monitor must adhere to the protocol for Breeding Activity Checks, found on FWC's IBNB webpage. The objective of the Breeding Activity Check is to locate Active Nests and flightless chicks so that they can be protected during permitted activities.

During a Breeding Activity Check, only the suitable habitat within 300 ft of the project activities (including vehicle travel and staging areas) must be inspected. If nesting is documented beyond that area (e.g., if a colony extends beyond the area required to be inspected or if solitary nests are incidentally discovered beyond the project boundaries) the IBNB Permitted Monitor must notify the FWC regional shorebird contact by e-mail within 24 hours.

*The following are standard minimization measures that will be included in FWC incidental take permits for all activities listed in Appendix B that occur within Active Breeding Sites or within 300 ft of Recent Breeding Sites during the breeding season. Activities within Critical Brood-rearing and Critical Roosting Sites are evaluated on a case-by-case basis but may have similar minimization measures:*

1. The IBNB Permitted Monitor must read, understand, and abide by the applicable conditions in the FWC incidental take permit associated with each project for which the Agent provides services.
2. The Permittee must ensure that the IBNB Permitted Monitor initiates a Breeding Activity Check starting at least 3 days prior to project commencement and continuing daily to allow for the posting of any nests with Regulatory Boundary Signs and symbolic fencing in accordance with the Guidelines for Posting Shorebird and Seabird Sites in Florida. Breeding Activity Checks must occur on each day of project activities, before any activities have begun, and must continue daily for the duration of the permitted activity or the end of the breeding season (Figure 1), whichever is earlier. However, please note that, while most species have completed the breeding cycle by September 1, flightless young may be present through September and must be protected if present. For projects that extend into subsequent breeding seasons, Breeding Activity Checks must begin again at least 3 days prior to the first day of the subsequent breeding season.
    a. The IBNB Permitted Monitor must adhere to the protocol for Breeding Activity Checks, found on FWC's IBNB webpage.
    b. If birds have not initiated any Active Nests by August 1 in a Recent Breeding Site (i.e., no part of the Recent Breeding Site has become Active), the IBNB Permitted Monitor may cease Breeding Activity Checks within the Recent Breeding Site.
    c. ***Varies based on activity. See language below.***
3. The Permittee must ensure that no movement of equipment, operation of vehicles, or other activities that could potentially disrupt breeding behavior or cause harm to the birds, their eggs, or young occur each day until the IBNB Permitted Monitor has completed the Breeding Activity Check and has erected or adjusted Regulatory Boundary Signs and symbolic fencing to protect nests.
4. The IBNB Permitted Monitor shall establish a Project Buffer around any location within the project area (i.e., the activity footprint plus a 300-ft buffer) where the IBNB Permitted Monitor has observed IBNBs engaged in breeding behavior, including courtship and territorial defense, in areas with nests (scrapes), even when eggs are not yet present in the scrapes. The Project Buffer is a protective space established to avoid or minimize take as a provision of a FWC incidental take permit between an activity and Active Nests.
    a. The IBNB Permitted Monitor shall establish a 300-foot Project Buffer with Regulatory Boundary Signs around the outermost Active Nests of least tern and black skimmer colonies. When necessary, the IBNB Permitted Monitor may establish a smaller, site-specific Project Buffer, provided the IBNB Permitted Monitor establishes the buffer in accordance with the Guidelines for Posting Shorebird and Seabird Sites in Florida and notifies the FWC regional shorebird contact by e-mail within 24 hours, or provided the smaller Project Buffer is included as a provision in the incidental take permit. The IBNB Permitted Monitor must shift

the buffer or install additional posted areas as necessary to protect all Active Nests. FWC staff retain discretion to alter site-specific Project Buffers established by the IBNB Permitted Monitor.

b. The IBNB Permitted Monitor shall establish a 300-ft Project Buffer with Regulatory Boundary Signs around the perimeter of areas where solitary nesting shorebirds are seen digging nest scrapes or defending nest territories. When necessary, the IBNB Permitted Monitor may establish a smaller, site-specific buffer, provided the IBNB Permitted Monitor establishes the Project Buffer in accordance with the Guidelines for Posting Shorebird and Seabird Sites in Florida and notifies the FWC regional shorebird contact by e-mail within 24 hours, or provided the smaller Project Buffer is included as a provision in the incidental take permit. FWC staff retain discretion to alter site-specific buffers established by the IBNB Permitted Monitor.

c. The IBNB Permitted Monitor is only responsible for establishing the Project Buffer within the area impacted by project activities. Typically, this area is within 300 ft of project activities, unless otherwise specified in the incidental take permit.

d. If protecting breeding IBNBs and Active Nests requires posting on adjacent properties, the Permittee must ensure that the IBNB Permitted Monitor posts Regulatory Boundary Signs only on property for which the IBNB Permitted Monitor has permission from the landowner. If nesting is documented on property where landowner permission cannot be obtained, the Permittee shall contact the FWC regional shorebird contact within 24 hours of learning that permission could not be obtained.

e. The Permittee must ensure that all construction activities, movement of vehicles, stockpiling of equipment, and pedestrian traffic do not take place within the Project Buffer.

f. The IBNB Permitted Monitor must maintain Regulatory Boundary Signs and symbolic fencing in good repair until no Active Nests, eggs, or flightless young are present. The IBNB Permitted Monitor shall remove posts and materials for Project Buffer once all breeding behavior has ceased, unless otherwise arranged with the FWC regional shorebird contact. Even if snowy plovers and American oystercatchers temporarily leave the posted area with their chicks, the posted area must be maintained to provide a potential refuge for the family until breeding is complete. Breeding is not considered to be completed until all chicks have fledged.

5. The Permittee shall require the IBNB Permitted Monitor to conduct a shorebird/seabird education and identification program (and/or provide educational materials) with the on-site staff to ensure protection of precocial (mobile) chicks. All project personnel are responsible for watching for IBNBs, nests, eggs, and chicks. If the IBNB Permitted Monitor finds that IBNBs are breeding within the project area (i.e., the activity footprint plus 300-ft buffer), the Permittee shall place and maintain a bulletin board in the project staging area with the location map of the construction site showing the bird breeding areas and a warning, clearly visible, stating that "Nesting birds, their eggs, and chicks are protected by State and Federal Law including Chapter 68A-27, F.A.C., and 16 USC Sec. 703."
6. For projects involving continued work within 300 ft of Active Breeding Sites, the IBNB Permitted Monitor shall remain on site during work or revisit the site periodically throughout the day to determine if birds appear agitated or disturbed by project activities in adjacent areas. If birds appear to be agitated or disturbed by these activities, then the IBNB Permitted Monitor shall immediately widen the buffer zone as feasible to minimize harassment of breeding birds.
7. The IBNB Permitted Monitor shall ensure that project activities do not result in direct injury or mortality (e.g., crushing of eggs or chicks by vehicles or pedestrians). If direct injury or mortality

is unavoidable, project activities must not resume until they can be avoided (e.g., the chicks obstructing the activity have fledged or permanently vacated the nest site, or the nests obstructing the activity have been destroyed by predators or other natural causes).

a. If flightless young are present in an Active Breeding Site, the IBNB Permitted Monitor shall remain on site after the day's Breeding Activity Check to ensure that flightless young are not in the path of vehicles or equipment.

8. The IBNB Permitted Monitor shall ensure that reasonable and traditional pedestrian access is available in situations where breeding IBNBs will tolerate recreational pedestrian activities. This is generally the case with lateral movement of beachgoers walking parallel to the beach at or below the highest tide line or when IBNBs choose to initiate breeding within 300 ft of an established beach access pathway. If uncertain whether IBNBs will tolerate pedestrian access, IBNB Permitted Monitor shall work with the FWC regional shorebird contact to determine if pedestrian access can be accommodated without compromising nesting success. When necessary, the IBNB Permitted Monitor may establish a smaller, site-specific buffer with Regulatory Boundary Signs, provided the IBNB Permitted Monitor establishes the buffer in accordance with the Guidelines for Posting Shorebird and Seabird Sites in Florida and notifies the FWC regional shorebird contact by e-mail within 24 hours. FWC staff retain discretion to alter site-specific buffers established by the IBNB Permitted Monitor.
9. If necessary, travel corridors for pedestrian, equipment, or vehicular traffic shall be designated and marked by the IBNB Permitted Monitor outside the areas posted with Regulatory Boundary Signs.
    a. Heavy equipment, other vehicles, or pedestrians may transit past Active Breeding Sites in these corridors. However, the Permittee shall prohibit other activities such as stopping or turning heavy equipment and vehicles within designated travel corridors adjacent to Active Breeding Sites.
    b. When flightless chicks are present within or adjacent to project travel corridors, the Permittee shall ensure that no vehicles are driven through the corridor unless a IBNB Permitted Monitor is present to adequately monitor the travel corridor and redirect vehicles as needed.
    c. Any chicks that may be in the path of moving vehicles must be avoided.
    d. The Permittee shall ensure that any tracks, ruts, or holes that may be capable of trapping flightless chicks are leveled, while avoiding any impacts to the chicks.

The following are standard minimization measures that are required of all permittees for construction of major and minor structures, beach vehicular ramps, dune walkovers and crossovers, major non-habitable structures, debris removal, oil-spill cleanup, derelict vessel removal, removal of sand from roads within Active Breeding Sites or within 300 ft of Recent Breeding Sites during the breeding season.

All conditions above apply, except that condition 2.c. shall read:

c. The Permittee must ensure that the IBNB Permitted Monitor enters data from the first Breeding Activity Check of the project and every fifth Breeding Activity Check thereafter into the Florida Shorebird Database. The IBNB Permitted Monitor must enter data within 7 days of data collection. The IBNB Permitted Monitor must retain data from additional Breeding Activity Checks for a period of one year and must present these data to the FWC upon request.

*The following are standard minimization measures that are required of all permittees for coastal dune lake outlets and stormwater outfalls within Active Breeding Sites or within 300 ft of Recent Breeding Sites during the breeding season.*

All conditions above apply, except that condition 2.c. shall read:

c. The Permittee must ensure that the IBNB Permitted Monitor enters data collected during each Breeding Activity Check into the Florida Shorebird Database within 7 days of data collection, as described in the protocol for Breeding Activity Checks.

Additionally, the IBNB Permitted Monitor must ensure that snowy plover broods are not separated from adults or swept out to sea as a result of project activities.

*The following are standard minimization measures that are required of all permittees for special events that include crowds, vehicles, and equipment within Active Breeding Sites or within 300 ft of Recent Breeding Sites during the breeding season.*

All conditions above apply, except that condition 2.c. shall read:

c. The Permittee must ensure that the IBNB Permitted Monitor enters data collected during each Breeding Activity Check will be entered into the Florida Shorebird Database within 7 days of data collection, as described in the protocol for Breeding Activity Checks.

*The following are standard minimization measures that are required of all permittees for special events that include loud noise within 0.75 miles of Active or Recent Breeding Sites during the breeding season.* ***Please note that these minimization measures are in addition to those in Roles of IBNB Permitted Monitors for Special events with crowds, vehicles, and equipment (above) if the special event also occurs within an Active Breeding Site or within 300 feet of a Recent Breeding Site during the breeding season****. Activities within Critical Brood-rearing and Critical Roosting Sites are evaluated on a case-by-case basis but may have similar minimization measures.*

1. The Permittee is responsible for identifying and employing an IBNB Permitted Monitor to monitor the behavior of IBNBs before, during, and after the event according to the methods below.
   a. The IBNB Permitted Monitor must meet the Minimum Qualifications for IBNB Permitted Monitors in Appendix C of the Species Conservation Measures and Permitting Guidelines. Applicants can search the list of Permit Holders on FWC's IBNB webpage to find an IBNB Permitted Monitor that meets the minimum qualifications.
2. The IBNB Permitted Monitor must read, understand, and abide by the conditions in the FWC incidental take permit associated with project activities.
3. The Permittee must ensure that the IBNB Permitted Monitor initiates daily surveys 3 days prior to project commencement, daily during the event, and for 3 consecutive days after the event has concluded. The IBNB Permitted Monitor must survey using the methods provided at FWC's IBNB webpage which include both bird survey routes and behavioral surveys.
   a. The IBNB Permitted Monitor must establish bird survey routes in any Active or Recent Breeding Site within 0.75 miles of the source of the loud noise.
   d. Additionally, the IBNB Permitted Monitor must conduct a behavioral survey according to the protocol provided at FWC's IBNB webpage.
   e. The IBNB Permitted Monitor must enter route survey data into the Florida Shorebird Database and must submit behavioral survey data sheets to [insert e-mail here] within 7 days of data collection.

*The following minimization measures are examples of potential permit conditions for permitted projects that include operating vehicles on the beach. Please note that these are examples only and may not represent individual permit conditions. These examples are meant to help permit applicants develop minimization measures when applying for an incidental take permit.*

1. Take is authorized without the following minimization measures when permittees or others are driving on the beach to respond to an immediate health and human safety emergency. Otherwise, the minimization measures below must be followed.
2. The permittee shall check ShoreMapper annually on April 1st for the location of Recent Breeding Sites and Critical Brood-rearing Sites, and all personnel associated with the permit shall be instructed about the potential presence of protected species and the location of Recent Breeding Sites and Critical Brood-rearing Sites in the permitted area.
3. All personnel associated with the permit shall take the FWC's "IBNB Minimization Measures" training prior to operating vehicles on the beach. The training will be available FWC's IBNB webpage.
4. Any previously unknown Active Breeding Sites that are encountered opportunistically by the IBNB Permitted Monitor or any project personnel shall be reported immediately by the IBNB Permitted Monitor to the FWC regional shorebird contact.
5. Prior to operating vehicles within an Active or Recent Breeding Site or Critical Brood-rearing Site, the Permittee shall employ the following measures:
    a. The Permittee's designated IBNB Permitted Monitor (Appendix C) shall establish designated access, travel, and work areas. Once established, the same access and travel areas shall be used for the duration of permitted activities, unless areas need to be adjusted to avoid direct injury or mortality to eggs or chicks. No vehicle operations shall occur outside of the permitted activity footprint or the designated access and travel areas.
    b. Designated travel areas must be outside of areas posted with Regulatory Boundary Signs.
    c. Designated travel areas seaward of the crest of the frontal dune or line of permanent vegetation must require operators to drive on the wet, hard-packed sand at low tide and as close to the hard-packed sand as possible at high tide.
    d. For travel that must occur landward of the crest of the frontal dune or line of permanent vegetation, the IBNB Permitted Monitor must establish designated access and travel corridors in developed or disturbed areas, if present, to minimize impacts.
6. All vehicle and equipment operators for permitted activities in Active or Recent Breeding Sites and Critical Brood-rearing Sites must adhere to the conditions listed below:
        a. Vehicles shall be operated at slow speed (<6 mph [10 kph]) and drivers shall use caution and watch for wildlife within the vehicle's line of travel.
        b. When possible, project personnel shall use light-weight vehicles with < 10 psi vehicle-to-ground pressure such as all-terrain (ATV), utility task (UTV), side by side (SXS), multi-purpose utility (MUV), and recreational off highway (ROV) vehicles during the shorebird and seabird nesting seasons. The use of heavy equipment and street vehicles should be avoided when possible.
        c. All vehicles operating seaward of the crest of the frontal dune or line of permanent vegetation must enter the beach through the designated access area(s) and transit directly to the designated travel area(s).
        d. Vehicles must move laterally along the beach in the designated travel area(s). Vehicle access during periods of extreme high tides may not be possible through Active Breeding Sites, and operators should plan accordingly.

e. To avoid impacts to protected species when operating vehicles on the beach, operators must drive directly to and from the activity footprint, avoid stopping or turning around within Active or Recent Breeding Sites or Critical Brood-rearing Sites, avoid creating large ruts in the sand, and not drive over dunes or any beach vegetation outside the approved designated access corridor.
f. Vehicles avoid the wrack line. These areas of biotic material, including marsh grass, seagrass, and seaweed, provide important feeding and roosting habitat and may contain shorebird or seabird chicks or marine turtle hatchlings. Note that this measure does not apply for mechanical beach cleaning necessary to address significant, unusual deposition of macroalgae (e.g., Sargassum).
g. No fluids (e.g., grease, oils, gas, radiator coolant, etc.) shall be discharged onto the beach or dune and all vehicles must be stored and fueled landward of the beach/dune system or outside of 300 feet of Active or Recent Breeding Sites or Critical Brood-rearing Sites.

7. Vehicles must be operated on the beach during daylight hours only and shall not remain on the beach overnight.
8. When driving outside of Active or Recent Breeding Sites or Critical Brood-rearing Sites, follow FWC's guidance for driving on the beach to avoid impacts to marine turtles.

The objective of this appendix is to provide: 1) an overview of rooftop incidental take permitting, 2) roles and responsibilities of Qualified Rooftop Monitors, 3) minimum qualifications for Qualified Rooftop Monitors, and 4) standard minimization measures for rooftop incidental take permits.

Conducting urgent activities such as HVAC repairs — or other activities that cannot be delayed — on rooftops with Active Nests is expected to result in take. When rooftop activities cannot be delayed until after the breeding season, the first step is to determine whether take is avoidable or whether a permit is recommended. Qualified Rooftop Monitors or FWC regional shorebird contacts can provide technical assistance regarding this determination. If take is unavoidable, rooftop owners can seek a permit from the FWC to authorize incidental take.

Qualified Rooftop Monitors are authorized for harassment of IBNBs that may occur when accessing rooftops to determine if avoidance is possible or to gather information necessary for preparation of an incidental take permit. Information needed for the incidental take permit application includes the species and location of birds on the rooftop; an estimate of the number of adult IBNBs; and a determination of whether there are any nests with eggs or young that would be directly impacted by the proposed work. Please note that the FWC typically does not issue intentional take permits for harm (intentional injury or death or collection of eggs or flightless young) during rooftop repairs.

No mitigation is required for rooftop incidental take permits — maintaining gravel rooftops in a manner that supports rooftop-nesting IBNBs achieves conservation benefit, because gravel rooftops could otherwise be modified in accordance with FWC's ISMP policy on State-listed species and man-made structures. This policy states:

> …this policy does not authorize removal or modification of man-made structures when listed species are actively engaged in nesting or breeding. An incidental take permit during this time will be issued without any mitigation when the activity must occur to ensure human health and/or safety. Such incidental take permits will include appropriate conditions for minimizing the take and avoiding direct, physical injury of the animals.

Permit applicants for rooftops must identify a Qualified Rooftop Bird Monitor and upload the monitor's certificate with the incidental take permit application. Applicants are encouraged to contact the FWC regional shorebird contact if they need help locating a Qualified Rooftop Monitor or would like more information on how they or their designee can become one.

The individual must visit FWC's IBNB webpage, navigate to the online training, register under their individual name, take the online training, pass the quiz, and obtain an online Rooftop Monitor Certificate that includes the individual's name.

It is recommended that Qualified Rooftop Monitors have previous field experience in rooftop shorebird or seabird monitoring, but this is not required. Qualified Rooftop Monitors only require the FWC Rooftop Bird Monitor Certificate.

1. The Permittee must designate a Qualified Rooftop Monitor that has obtained the training and certificate described in Appendix E of the FWC's Species Conservation Measures and Permitting Guidelines.
2. Within 2 days prior to the start of work, the Qualified Rooftop Monitor must perform a survey of the rooftop in accordance with FWC's online training for Qualified Rooftop Monitors (available at FWC's IBNB webpage) to determine where Active Nests and flightless chicks are present on the roof.

   a. Please note that the FWC typically does not authorize injury, death, or collection of eggs or flightless young during rooftop activities.
   b. If the bird monitor determines that the work cannot be completed without injury or destruction of eggs or flightless young, the Permittee must contact the FWC regional shorebird contact for guidance.

3. Prior to the start of work, the Qualified Rooftop Monitor must instruct personnel accessing the roof for the authorized activities to avoid direct impacts to nests, eggs, young and adults.
4. The Permittee must either 1) schedule rooftop project activities for early morning (i.e., within 2 hours of sunrise) or evening (i.e., within 1 hour of sunset) to minimize the exposure of eggs or chicks to heat and sun, or 2) measure temperatures at the surface of the roof and cease work when surface temperatures reach 105$^{o}$ F, and resume work when surface temperatures drop below 105 degrees F.
5. The Permittee must ensure that the project manager and other personnel accessing the roof do not conduct the authorized activities in the rain.
6. The Qualified Rooftop Monitor must inform the project manager and other personnel accessing the roof for the authorized activities where it is safe to travel to avoid injury to eggs or young.
7. The Qualified Rooftop Monitor must ensure the project manager and other personnel accessing the roof for the authorized activities minimize disturbance to nesting birds by: 1) limiting the time personnel are on the roof, 2) keeping materials and equipment within reach, 3) minimizing standing and walking around to the extent practicable, 4) minimizing the number of people on the roof at one time to the extent feasible, and 5) limiting sudden movements and remaining as quiet as feasible.
8. The Qualified Rooftop Monitor may authorize use a visual barrier to minimize disturbance.
9. The Qualified Rooftop Monitor must retrieve any chicks that fall from the building due to authorized activities and place the chicks back on the roof.

The following guidance applies to uses of UAS other than for scientific surveys of beach-nesting birds, which are covered in a separate section below. Please note that entering an Active Breeding Site or Critical Roosting Site to retrieve a UAS that has landed or crashed could result in take.

1. Be aware that beach-nesting birds are protected by both State and Federal law.
    - Your use of UAS could lead to impacts that violate these laws (e.g., the federal Migratory Bird Treaty Act; federal Airborne Hunting Act; state Rules 68A-4, 68A-16, and 68A-27, F.A.C.).
    - Shorebirds and seabirds may view UAS as a potential predator.
    - Beach-nesting birds that are disturbed by UAS may flush from their nests.
    - Flushing birds from nests leave the eggs and young vulnerable to predators and the elements.
2. Check current rules and notices on the property.
    - Use of UAS is prohibited on some properties and requires permits on others.
    - Keep the privacy of others in mind during all UAS flights.
3. Be familiar with FAA rules regarding operation of UAS.
    - Always remain within line-of-sight of your UAS while flying.
    - Flying your UAS even at relatively low altitudes can be a violation of federal airspace regulations.
4. To avoid a wildlife violation, check before you fly:
    - Check the FWC's ShoreMapper app online to identify areas where flying a UAS could result in a wildlife violation (i.e., Recent Breeding Sites, Critical Brood-rearing Sites, or Critical Roosting Sites).
    - Check with people that know, such as the property's resource manager (public lands) or FWC regional shorebird contact, to inquire if sensitive or nesting birds may be present along the entirety of your intended UAS flight path from takeoff to landing, including birds nesting on rooftops.
    - Check the area for symbolic fencing and signage that would indicate a breeding site for beach-nesting birds.
        - Perform a pre-flight check for shorebirds and seabirds immediately before takeoff to determine the location of any nearby birds.
5. **Avoid flying over Recent Breeding Sites during the breeding season, areas posted with signage or symbolic fencing, Active Critical Brood-rearing Sites (March 15 to September 1), and Critical Roosting Sites year-round**.
    - If you cannot avoid flying over one of the sites mentioned above, we recommend that you contact the FWC's Protected Species Permitting Office to discuss an incidental take permit.
    - If you need to obtain an incidental take permit, the section Guidance for Using a UAS to Survey or Study Beach-nesting Birds below contains some potential minimization measures that could be included in the permit application.
6. Operators and observers must remain at least 300 ft horizontal distance from Active Breeding Sites, Critical Brood-rearing Sites, or Critical Roosting Sites during the dates specified above.
    - Please note that entering a nesting colony of beach-nesting birds, an area posted with symbolic fencing or signage, a rooftop nesting colony, or a Critical Roosting Site to retrieve a UAS that has landed or crashed is likely to result in take, which is prohibited without a permit.
7. Avoid launching your UAS directly at birds.

- Birds are more likely to be disturbed by UAS as they gain altitude. Launch and land your UAS away from birds, and preferably out of their sight.

8. Avoid changing direction, speed, or altitude in the vicinity of birds.
   - Banking motions and changes in altitude, speed, or direction can make your UAS behavior appear like a predator to birds.
   - Special care should be taken when using a fixed-wing UAS whose profile could be perceived as an aerial predator.
   - Birds are less likely to view your UAS as a threat if you fly a fixed direction, speed, and altitude.
   - Birds are less likely to view your UAS as a threat if given time to observe and habituate to it in the sky before it flies nearby.
9. Launch and land your UAS > 600 ft from IBNBs (and preferably out of sight).
   - Birds are particularly frightened by UAS as they take off or land.
10. Cease UAS activity immediately if you observe birds flushing or becoming agitated.
    - *Signs of disturbance include birds moving away from the UAS, decreasing other natural behaviors to watch the UAS, nodding their heads up and down to continuously size up the distance between themselves and the UAS, wing flapping, standing or walking away from nests, flushing off of nests, or chasing or dive-bombing the UAS.*

Biologists are increasingly turning to UAS as an efficient way to survey birds. Using a UAS to conduct surveys of state Threatened beach-nesting birds (IBNBs) has the potential to result in take, because disturbed birds may flush from nests, leaving eggs and young unattended and exposed to predators, sun, and cold. Some shorebirds and seabirds sometimes pursue and attack UAS. The body of knowledge for UAS and disturbance to shorebirds and seabirds has increased in recent years, but enough uncertainty remains to warrant an FWC scientific collecting permit for researchers that wish to fly UAS over breeding IBNBs. *The following guidance is meant to help biologists develop minimization measures when applying for a scientific collecting permit.*

1. Applications that include surveys using UAS should include information on how the project will contribute to knowledge of appropriate survey methods for IBNBs by measuring and reporting the responses of IBNBs to the UAS. Use one or more observers as spotters to measure behavioral responses from the birds.

2. Reactions to UAS by birds tend to be species-specific (Barr et al. 2020) and vary based on the type of UAS and how it is flown (McEvoy et al. 2016, Borelle and Fletcher 2017, Mapes et al. 2020), making it difficult to provide generalized guidance on the elevation necessary to avoid take. The following studies may help in the design of monitoring or research projects for inclusion in a scientific collecting permit application:

   - **Oystercatchers and plovers**
     - Oystercatchers (*Haematopus* sp.) are known to chase and even strike UAS (Rebolo-Ifran et al. 2019 [supplemental material], Valle and Scarton 2019).
     - The FWC was unable to find data for the reaction of snowy plovers (*Charadrius nivosus*) to UAS at the time of writing.
   - **Terns and skimmers**
     - Use of a fixed-wing UAS on cloudy days resulted in flushing by least terns (*Sternula antillarum*) at both 279 ft (85 m) and 380 ft (116 m), but least terns were not disturbed when the same UAS was flown with sky-blue camouflage on cloudless days (Mapes et al. 2020).
     - Common terns (*Sterna hirundo*) initially flushed when approached by a fixed-wing UAS at 300 ft (91 m) but became habituated over subsequent surveys (Chabot et al. 2015). Common terns quickly habituated to a quadcopter flown at 49 ft (15 m) and 98 ft (30 m) in another study

(Reintsma et al. 2017).
  - Black skimmers (*Rynchops niger*) and royal terns (*Thalasseus maximus*) exhibited limited disturbance from a quadcopter flown between 150 ft (46 m) and 400 ft (122 m; Barr et al. 2020).
  - Aleutian (*Onychoprion aleuticus*) and Arctic terns (*Sterna paradisaea*) did not flush from a quadcopter flown in a "lawn mower" pattern at an altitude of 49 to 66 ft (15 to 20 m; Magness et al. 2019).
  - Bevan and colleagues (2018) recommended altitudes of greater than 197 ft (60 m) for surveys of great crested terns (*Thalasseus bergii*) with a quadcopter.

3. Select UAS designs that are likely to reduce disturbance. Choose smaller, low-visibility vehicles with low audio signatures when possible (Borelle and Fletcher 2017). Take special care when surveying using a fixed-wing UAS whose silhouette could be perceived as an aerial predator (McEvoy et al. 2016). Contrast of UAS color against the sky may also increase disturbance for fixed-wing UAS. Painting a fixed-wing UAS sky blue and flying on cloudless days may decrease disturbance. (Mapes et al. 2020).

4. Begin by flying at the maximum allowable UAS flight ceiling (typically 400 ft above ground level) and allow focal birds to observe flight transects outside of the nesting or colonial boundaries. This allows the birds to habituate and assess the UAS as a non-threat (Chabot et al. 2015, Brisson-Curdadeau et al. 2017). Once an initial pass has been made without noticing bird disturbance, lower the aircraft altitude by approximately 50 ft (15 m) at a location away from the target birds, and then make another straight-line pass over the birds. Continue repeating this process until an ideal altitude for your UAS sensor payload is achieved, or the birds exhibit signs of disturbance, whichever occurs first.

5. How the UAS is flown is important for reducing disturbance:

    - Avoid launching a UAS directly at birds.
      - Birds are more likely to be disturbed by objects coming straight toward them.
    - Avoid changing direction, speed, or altitude above or near birds.
      - Banking motions and changes in altitude or direction can make your UAS appear like a predator to birds. These maneuvers should occur away from birds.
    - Launch and land UAS > 600 ft (183 m) from birds (and preferably out of sight).
      - Birds are particularly frightened by UAS as they take off or land.
    - Surveys in a "lawn mower" pattern are less likely to cause disturbance (Mulero-Pazmany et al. 2016).
    - Conduct a trial flight before a formal survey to assess bird behavior before, during, and after the flight.
    - Conduct the survey under mild weather conditions in case any birds leave the nest and avoid conducting the survey if potential nest predators (e.g., crows) are in the area.

6. Increase your UAS altitude immediately if you observe signs of bird disturbance, such as birds moving away from the UAS, decreasing other normal behaviors to watch the UAS, nodding their heads up and down to continuously size up the distance between themselves and the UAS, wing flapping, standing or walking away from nests, flushing from nests, or pursuing the UAS. If the signs of disturbance continue after a subsequent pass at a higher altitude, immediately abort the survey and return on a different day.

7. Please note that entering an Active Breeding Site or Critical Roosting Site to retrieve a UAS that has landed or crashed could result in take.

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