

Best Management Practices for Protection of Florida's Coastal Wildlife

Florida is home to a number of threatened and endangered species and other protected wildlife. Oil spill response activities can inadvertently result in destruction of wildlife and wildlife habitat. The following guidelines should be followed for all activities related to the spill response.

Sea turtles, seabirds and shorebirds, manatees, beach mice, and other wildlife are protected by law. Report anyone harming or harassing these animals to the FWC at 1-888-404-3922.

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1. Best Management Practices for Protection of Florida's Coastal Wildlife

Working on the beach:

- Do not work on the beach after dark. If work must be conducted on the beach at night, see Appendix 11 for guidance on how to avoid impacts to wildlife.
- Do not begin work on the beach until the daily sea turtle nesting surveys have been completed. If you need to be on the beach before 9:00 am contact FWC's sea turtle permitting administrator at least one day before to coordinate.
- Avoid the upper beach as much as possible. Remain at or below the high tide line, while attempting to avoid disturbance to the dead vegetation that has washed ashore (wrack).
- Do not enter posted sea turtle or shorebird/seabird nest sites and minimize time spent around these sites, except under the special activities or circumstances listed on the next pages. Most of these sites will be marked with posts and signs, but not all. If you note birds in the area that are acting agitated there is a good possibility it is an active nesting area. Please retreat the way you approached and leave the area.

Driving on the beach:

- Utilize a light weight vehicle such as an ATV or Mule whenever possible.
- Contact the County, municipality, or land manager to ensure you have approval to drive on the beach. **SOME BEACHES ARE RESTRICTED** for military or other purposes.
- Enter the beach only at designated access points and proceed directly to the hard-packed sand near or below the high tide line. Stay below the high tide line when driving.
- Avoid driving on the upper beach whenever possible, and never drive over any dunes or over beach vegetation.
- If you must investigate the dunes – park the vehicle as low on the beach as possible; walk the edges and look into the dunes (NOTE: If your approach causes shorebirds/seabirds to become agitated or noisy, you are probably near a nest and should retreat as noted below).
- Avoid driving over the wrack line or areas of dense seaweed, which may contain sea turtle hatchlings or baby birds.

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- Minimize ruts on the dry sandy beach by lowering tire pressure and using 4WD, particularly near sea turtle or bird nests.
- Drive slowly. Movement should be slow enough to observe any bird eggs, chicks, or sea turtle hatchlings in the vehicle's line of travel. Be aware that bird chicks often feed along the water's edge. They may freeze in place rather than run away when ATVs or other vehicles approach.
- Obey speed limits while transporting ATVs and other beach use vehicles via roadways. If seabirds and shorebirds (especially their chicks) are observed nearby, slow down. The birds and their chicks may cross coastal roads and are difficult to see.

Nesting Coastal Waterbird and White-Crowned Pigeon Sites:

Florida's nesting coastal waterbirds, including seabirds (gulls and terns), shorebirds (sandpipers), and wading birds (herons and egrets), are particularly vulnerable to disturbance and nest destruction because of their breeding biology. Some seabird and shorebird nesting areas on beaches and dredge spoil islands are posted using symbolic fencing composed of stakes, signs, and twine. Wading bird and white-crowned pigeon colonies (aggregations of birds with nests, eggs, or young) are generally not posted. The FWC has maps of all current documented nesting sites, which will be made available to all oil spill responders. Coastal waterbirds and white-crowned pigeons are protected by both state and federal law.

To view the latest FWC (and partners) Beach Nesting Birds Survey Database, visit the Florida Shorebird Database Internet Portal at: <https://public.myfwc.com/crossdoi/shorebirds/index.html>

Shorebirds and seabirds nest on beaches from mid-February through the middle of September. They are particularly vulnerable to disturbance during this period, and their eggs and flightless young can be virtually invisible, especially from a vehicle. To learn more about why disturbance can affect their survival, read the FWC's "Matter of survival" brochure (<http://myfwc.com/docs/Conservation/BNBBrochure.pdf>).

Do not enter waterbird or white-crowned pigeon nesting sites for the following:

- a. Rescue of oiled, but flight-capable birds. These birds will simply fly away if attempts are made to rescue them. Tremendous harm to the colony can be inflicted by rescue attempts.
- b. Collection of evidence. While collection of evidence will be critical to obtaining restitution for damages done to natural resources, evidence is likely to be abundant and pervasive and the limited amount likely to be present within an active nesting area will not warrant the potential risks to otherwise healthy wildlife. Evidence may be documented remotely (video) or collected after nesting is completed.
- c. Impact documentation. Similarly, documentation of impacts should not be done at the risk of inflicting additional impacts. Where possible, remote documentation should be employed (i.e., through video documentation).

Some activities or circumstances may warrant entry into an active nesting area:

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These scenarios are presumed to be extremely limited but may involve the need to rescue oiled/injured birds or clean-up activities critical to the recovery of the habitat or survival of the birds themselves. These eventualities are too variable to predict. Therefore, a site-specific decision will be required. At a minimum, the following needs to be taken into consideration:

- a. Flushing of adults will leave eggs and young of beach-nesting birds vulnerable to the elements. Entry into the site should be conducted early in the morning or late in the afternoon when temperatures are less extreme. Entry should not be made when it is raining as dampening of exposed eggs and young can reduce survival.
- b. Flushing of adults will attract predators and leave eggs and young unprotected. Do not enter a beach-nesting bird site if crows, herons, or gulls are visible in the area.
- c. Flushing of adults from the colony may cause them to land in oiled waters, leading to additional losses of or injury to adults.
- d. Survival of adult birds is more critical to the stability of the population than is that of the eggs or young. Entry may be acceptable if it will only result in loss of eggs and young. If entry is likely to result in additional harm to breeding adults by forcing them into oiled waters, then entry is not advisable.

Under very limited circumstances entering bird areas to remove oil from the habitat may be prioritized over survival of eggs or young, but should not be prioritized over survival of breeding adults. For example, entry into a nesting area may be warranted for protection of limited habitats; such as isolated nesting islands; that, if not cleaned, will likely result in loss or long term damage to that nesting habitat.

Diamond-backed Terrapins:

Diamond-backed terrapins are adapted to living in salt marsh and brackish water areas that may be oiled. These turtles can be distinguished from sea turtles by their feet. Sea turtles have flipper-like front feet, whereas terrapins have front feet typical of freshwater turtles. When exposed to oil, terrapins get chemical burns, become unable to swim normally, and may die. When working in areas where diamond-backed terrapins occur, use the following guidelines.

- Be careful when moving tidal wrack (seaweed) and other vegetation as terrapins may be hiding under it. Terrapins may also burrow into the mud on mangrove islands, estuarine marshes, and tidal river mouths, so use caution when accessing these sites. Although terrapins can bite, they are not dangerous. If found, they should be allowed to escape on their own.
- When operating boats in tidal marshes and coastal waterways, boaters should be cautious because terrapins, like other wildlife, will often not move quickly if they are suffering the effects of oil exposure.

Small Mammals:

Small mammals, such as rice rats, marsh rabbits, and cotton rats may be encountered throughout the coastal marsh ecosystems of Florida. Additional rare and listed species may be found at certain localities. Environmental Sensitivity Index maps [<http://ocean.floridamarine.org/esimaps>] should be

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consulted prior to and during cleanup activities. These species include round tailed muskrats (Choctawhatchee Bay), Florida salt marsh vole (Cedar Key area and Lower Suwannee NWR), Sanibel Island rice rat and Pine Island rice rat (Sanibel and Pine Islands), silver rice rat (lower Keys), and lower keys marsh rabbit (lower Keys).

- Avoid impacts to marsh vegetation.
- Avoid staging equipment on small vegetated islands throughout southwest Florida and the Florida Keys.
- If oiled or injured rare or listed small mammals are encountered, report to FWC's mammal point of contact.

Cedar Key Mole Skinks:

Cedar Key Mole Skinks are small, slender lizards. They only live on the islands near Cedar Key, Levy County, FL; specifically Cedar Key, Scale Key, Atsena Otie Key, Snake Key, Seahorse Key, and North Key. These lizards are often found under driftwood or tidal wrack (seaweed) on the shore where they feed. When working on islands that may have Cedar Key Mole Skinks, the following guidelines apply:

- Only remove oiled driftwood or oiled tidal wrack, otherwise leave in place for the skinks.
- If removal of driftwood or tidal wrack is necessary, do not use heavy machinery because of the potential to harm Cedar Key Mole Skinks.
- Do not step on non-oiled driftwood or tidal wrack to avoid accidental trampling of skinks.
- If dead or dying skinks are encountered as a result of oiling call Florida's Wildlife Alert Hotline at 888/404-3922.

Snakes:

Florida has venomous and non-venomous snakes that may be impacted by oil. The frequently encountered snakes in coastal wetlands in Florida include the salt marsh snake (non-venomous) and cottonmouth (venomous). Because of the potential of being bitten by a venomous snake, the following guidelines should be followed when a snake is encountered:

- Do not attempt to capture or harm the snake. Healthy snakes will usually flee when encountered. The majority of snake bites come from attempts to capture or handle snakes.
- If the snake does not flee, appears to be sick or dying, and has been exposed to oil, call the Wildlife Alert Hotline (**888-404-3722**).
- If bitten by a snake, seek immediate medical attention unless you are certain the snake is non-venomous.

Fish Kills:

All reports of dead or dying fish and invertebrates (e.g., crabs, shrimp, clams, oysters, scallops) shall be forwarded to the FWC Fish Kill Hotline at **800-636-0511** or submitted to <http://research.myfwc.com/fishkill/submit.asp>

Sea Turtles:

May through October is sea turtle nesting season. However, some species of sea turtles have been known to nest as early as February, and hatchlings can emerge from their nests as late as the mid-winter months. Ruts made by vehicles can trap and disorient turtle hatchlings. For more information:

http://research.myfwc.com/features/category_main.asp?id=1289 or at
http://myfwc.com/WILDLIFEHABITATS/SeaTurtle_index.htm

Beach Mice:

Beach mice inhabit coastal dunes in the panhandle and along portions of the east coast of Florida. These rodents are active at night. They live their entire lives in the coastal dunes, digging burrows in the sand where they spend the daytime and raise their young. Actions that damage the dunes, such as trampling or driving on vegetation or loosening the sand will destroy their habitat. Walking over or on the dunes can be as destructive as driving on them. For more information see:

<http://www.myfwc.com/conservation/you-serve/wildlife/beach-mice/>.

For more information about these and other wildlife visit:

<http://www.myfwc.com/>

<http://www.fws.gov/endangered/>

2. Descriptions of the Impacts and Effects of Oil on Wildlife and Habitats*

Very few long term studies have been conducted or published, so little is known, but the following outline some of the currently known impacts to wildlife and habitats. References are listed at the bottom of this section.

Birds

- Severe dehydration and emaciation²
- Loss of ability to self regulate body temperature – hypothermia/hyperthermia²
- Ingestion of oil during cleaning causes irritation to the lining of the mouth, esophagus and stomach²
- Irritants in oil interrupt the intestines ability to absorb nutrients, proteins and water²
- Dehydration can cause urate accumulation (in kidneys, liver and spleen) which will block the organ's normal flow²
- Once the kidneys, liver and spleen stop properly filtering – the body accumulates toxic levels of uric acid (the nitrogen waste product in birds – equivalent to urea in humans but much more potent)²
- If kidney, liver and spleen failure doesn't kill the birds on its own – the bird's ability to fight disease will – they become more susceptible to diseases such as aspergillosis (disease caused by a fungus which affects the lungs) and e. coli²

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Sea Turtles

- Oil clings to the nares (nostrils), eyes, and upper esophagus and can be found in the feces⁶
- Damage to airways and lungs⁶
- Four-fold increase in white blood cell counts and 50% reduction in red blood cell counts has been observed⁶
- Red blood cell polychromasia (often a symptom of anemia)⁶
- Acute inflammatory cell infiltrates (acute swelling)⁶
- Cellular changes in the epidermis (skin) – can increase susceptibility to infection⁶
- 21-day recovery period observed in laboratory experiments – long-term effects are unknown⁶
- Highly sensitive to chemical insults such as oil – vulnerable at all life stages⁹
- Oil contamination of nesting sites is most harmful if fresh oil is spilled during the nesting season⁹
- Oil can interfere with gas exchange within the nest, alter the hydric (water) environment, alter nest temperature⁹
- Turtles will eat anything appropriately sized – including tar balls, which can cause large esophageal swelling, displaced liver and intestines and severe tissue swelling⁹
- Oil ingested is retained in the body for several days – increasing internal contact and the likelihood that toxic compounds will be absorbed⁹
- Oiled sandy beaches: contaminated eggs, egg mortality, developmental defects, direct mortality in hatchlings, juveniles and adults has been observed⁹
- Negative impacts to skin, blood, digestive system, immune system and salt glands⁹
- Irritation of mucous membranes (nose, throat and eyes) leading to inflammation and infection⁴

Sirenians (manatees)

- Less likely to suffer from skin adherence⁴
- Could damage sensory hairs around their mouths which serve as sensors as they search for edible sea grasses – causing inflammation and infections⁴
- Inhalation could cause lipid pneumonia⁴
- Consumption could cause long term chronic effects such as liver problems⁴

Cetaceans

- Killer whales found dead after *Exxon Valdez* oil spill⁴
- Dolphins have been found to detect oil and avoid it, but not always⁴
- Inhalation: causes damages to the airways, lungs, mucous membranes, possible death⁴

Fish

- Depends widely on their habitat (pelagic vs. reefs)⁴
- Eggs, larvae and young fish are sensitive to oil – toxic levels could accumulate in the organism⁴
- Fish may take avoiding action of oil. However, not enough conclusive evidence⁴

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- Oil-induced deaths of young fish and larvae are often of little significance compared with huge losses each year through natural predation and fishing⁴
- Stocks that are most at risk are ones when the spill coincides with the spawning periods³
- Fish kills have been documented in shallow coral reef habitats influenced by oil spills³
- Effects of reproduction and feeding in fish and shellfish at low concentrations of oil – reduced egg hatching, reduced larval survival, larval abnormalities and shell closure in shellfish³
- Can disrupt searching, feeding and grooming behavior in lobsters and mating behavior in crabs³

Corals

- Oil exposure can kill coral⁷
- Tissue death⁷
- Impaired feeding response⁷
- Impaired polyp retraction⁷
- Impaired sediment clearance ability (inability to remove sediment such as sand from the coral which could ultimately cause mortality)⁷
- Increased mucus production⁷
- Change in calcification rate (reduced growth of hard structure of the coral)⁷
- Gonad damage⁷
- Premature extrusion of planulae (larvae)⁷
- Larval death⁷
- Impaired larval settlement⁷
- Expulsion of zooxanthellae (the photosynthesizing symbiont which provides the coral with a majority of its energy)⁷
- Change in zooxanthellae primary production⁷
- Muscle atrophy (decrease in muscle mass)⁷
- Low-level exposures has been found to almost completely disintegrate coral tissues after 48 hours in a few species⁷
- Longer exposure (4-48 hrs) to low concentrations of oil may be more toxic than shorter exposures at higher concentrations⁷
- Previous study: nearly all branching corals killed in oiled reef areas⁷
- Chronic exposure can kill an entire colony⁷
- Branching corals most susceptible, massive corals more tolerant⁷
- Reproductive impacts depending on spawning time⁷

Mangroves

- Highly susceptible to oil exposure – can kill trees within a few weeks to several months⁸
- Lighter oils are more acutely toxic to mangroves than heavier oils⁸
- Yellowing of leaves, defoliation (loss of leaves), tree death, germination failure (inability to grow from a seed to a plant), increased mutation⁸

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- Mangrove associated invertebrates and plants recover more quickly from oiling than do the mangroves themselves.⁸
- One study found that more than 96% of seedlings exposed to crude oil died⁸
- Most deaths occur in the first 6 months of exposure⁸
- Chlorosis – condition where leaves do not produce enough chlorophyll, results in severely decreased energy production⁸

Seagrasses

- Following heavy oiling – loss of upper green leafy portion of the plant observed, with re-growth evident¹
- Studies have found that the invertebrates living within the seagrass beds are affected by dispersed oil¹
- Quick recovery is often found after an oil spill – within 2 – 3 weeks⁵
- Plants have been observed to have black “burnt” leaves – but production of new leaf tissue continued normally⁵
- There are strong effects on benthic organisms living in the seagrass beds – with strong decreases in both the number of individuals and the number of species present after an oil spill⁵
- Organisms living on the seagrass blades and the juveniles using the beds as nurseries are highly sensitive to oil on the seagrass and sediments⁵

***(compilation source: Katie Wirt, Center for Spatial Analysis, FWC – Fish and Wildlife Research Institute, May 2010)**

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