

Hawaiian Green Sea Turtle

COMMON NAME: Green Turtle, Green Sea Turtle

HAWAIIAN NAME: *Honu*

SCIENTIFIC NAME: *Chelonia mydas*

LEGAL STATUS: Threatened (Federal/State). Endangered (IUCN Red List). Protected under CITES. Hawai'i is part of the Central North Pacific DPS for green sea turtles.

APPEARANCE: Green sea turtles are the largest hard-shell sea turtle, averaging three feet in length and weighing 300 to 350 pounds. They have a heart-shaped shell that is smooth with shades of black, gray, green, brown and yellow on top and yellow-white on the bottom. All hatchlings have a black dorsal surface and a white ventral surface. Flippers of green sea turtles are single-clawed.



HABITAT: Honu are most often found in shallow, protected or semi-protected, water around coral reefs and coastal areas. These habitats contain sea grasses and algae for foraging and shelter from predators such as tiger sharks. Key foraging habitat can be found around most of the Hawaiian Islands, but they often return to the same foraging areas after the breeding season. Female green sea turtles migrate between foraging areas and nesting beaches. Basking can occur on both nesting beaches and non-nesting areas.

DIET: Adult green sea turtles are almost exclusively herbivorous. Their diet mainly consists of algae (*limu*) and seagrasses, though they may also forage on sponges, invertebrates, and discarded fish.

REPRODUCTION: Green sea turtles nest primarily in the NWHI but frequent the MHI for much of the year feeding on *limu*. Females nest every 2 to 4 years after approximately 22 years of age. Female green turtles reach maturity at 25 to 35 years. They return to the same beaches where they hatched. Nesting occurs April 1 - October 30. Females lay an average of five nests (or clutches) 60-100 eggs each at approximately two-week intervals. Eggs incubate for approximately 50 days before hatching. Hatchlings emerge almost exclusively at night and move immediately towards the brightest horizon.



THREATS:

- **Disease.** Fibropapillomatosis, a tumor-forming disease associated with herpesvirus, occurs on honu in Hawai'i. Fibropapillomatosis tumors are external and can impede critical functions such as swimming, eating, breathing, vision, and reproduction.
- **Habitat degradation.** Alien seaweeds are displacing important foraging, resting, and cleaning habitats. Other threats include loss or degradation of foraging habitats along coastal areas due to development, sedimentation, soil erosion, or sewage.

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- **Fisheries bycatch.** Mortality of adult and juvenile turtles results from fisheries bycatch. Due to federally mandated take reduction measures implemented by Hawaiian longline fisheries, bycatch rates have been reduced.
- **Predation.** Eggs and hatchlings are preyed on by introduced species (e.g., mongoose, rats, dogs, feral pigs, and cats) on the MHI. Predation on hatchlings by seabirds, fish, and sharks in the open ocean are a threat, although the extent of predation is unknown.
- **Human disturbance and activities.** Snorkeling and other recreational activities may cause disturbance or stress to honu. Injury or mortality from collisions with boats is also a threat.
- **Marine debris.** Entanglement by, or ingestion of, marine debris is a source of mortality.
- **Climate change.** Effects of climate change, such as increased temperatures, sea level rise, ocean acidification, and increased storm frequency leading to erosion, could have a variety of effects on honu, such as decreased reproductive success, loss or degradation of nesting habitat, and changes in juvenile and adult distribution.

NOAA FISHERIES and U.S. Fish and Wildlife Service (USFWS) CONSERVATION STRATEGIES: Protect species through use of international agreements, protect primary nesting areas of the green sea turtle in the NWHI, enforce regulations prohibiting take of the species, mediate the adverse effects on nesting and foraging habitats, stop direct harvest of turtles and eggs through education and enforcement actions, reduce incidental harvest by deep water fisheries, and prevent capture in nearshore gillnets and hookings by nearshore fishers.

MCBH CONSERVATION MEASURES

Green sea turtles are frequently seen in MCBH Kaneohe Bay's security buffer zone and near shore areas, and on a periodic occurring basis are seen basking on the Pu'uloa RTF beach. The first known nesting by a green sea turtle at MCBH occurred in June 2015 at MCBH Kaneohe Bay. Although the turtle was not sighted, crawl marks were detected as well as hatchling tracks and some dead hatchlings were observed.

MCBH engages in a variety of conservation measures to support the continued health and viability of green sea turtles. Specific management actions detailed are identified below and revised when necessary due to new information. The following management activities have been implemented and procedures established to protect green sea turtles to the greatest extent possible. They also apply to the less common hawksbill and olive ridley sea turtles. Management activities aimed at maintaining ecosystem health benefits these species indirectly, such as implementing measures to minimize erosion and polluted run-off and removing invasive species.

Predator control. Predator control, principally for mongoose and at-large cats, is conducted year-round for the protection of MCBH's endangered waterbirds and MBTA-protected ground nesting seabirds (wedge-tailed shearwaters) that nest on the vegetated shoreline adjoining the beach, also benefits green turtles nesting activities. However, native predators like the pallid ghost crab or Ōhiki (*Ocypode pallidula*) and Hawaiian seabirds and shorebirds are not controlled.

Sea turtle monitoring. Since 2020, MCBH Natural Resources staff has partnered with the non-profit organization Mālama i nā Honu, funded in part from a NOAA grant to monitor Hawaiian green turtle nesting activity on MCBH and other O'ahu beaches. Without the support of this organization, MCBH's ability to monitor the increasing of yearly turtle nesting would be severely limited. MCBH is constrained by personnel availability, vehicle availability, and the fact that there roughly 3-4 miles

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of shoreline to monitor, much of which is currently accessible only by foot. MCBH consults with NOAA Fisheries and USFWS as necessary and coordinates turtle nest excavations with them. Information collected during monitoring includes survey date, turtle activity (e.g., nests, false crawl, non-nesting excavation, observation of adults), general location of nests, approximate size and age (adult/juvenile), and other noteworthy observations (e.g., tumors, tag).

- ❖ MCBH Kaneohe Bay Shorelines: Pyramid Rock, 2,000 feet; North Beach, 5,300 feet; Fort Hase, 6,300 feet with (3,100 feet within WMA)
 - Efforts are made to enlist support from volunteers, water safety personnel, and HMAR to gain more visual coverage of Mōkapu Peninsula beaches.
 - Monitor all beaches at least 1x/week year-round for green sea turtles coming ashore to bask. Opportunistic monitoring supplements routine monitoring.
 - During nesting season (April 1 - October 30), monitor Pyramid Rock, North Beach, and Fort Hase beaches 3x/week. Frequency increases once signs of turtle nesting activity is observed.
 - Monitor presumed nests 5x/week if additional volunteer support is available. Within 5 days of predicted eggs hatching, (around the 50-day mark) monitor daily if personnel availability and time permits.
 - All presumed nests are cordoned off by a posts and rope/chain barrier and signed. Signs warning of nesting activity affixed to an A-frame are placed 50 feet away from protected nest sites.
- ❖ MCTAB Shoreline [5,000 feet]
 - Will seek to enlist the support of Bellows Air Force Station to help monitor MCTAB's shoreline.
 - Opportunistic monitoring will be conducted for green sea turtles coming ashore to bask.
 - Monitor 2-3x a week when a nest is discovered. Monitoring will occur more frequently if volunteer assistance is available.
- ❖ Pu'uloa RTF Shoreline [2,950 feet]
 - The Range's beach guards monitor Pu'uloa's restricted beach almost daily to prevent unauthorized access. They report any marine life resting on the beach below the ranges impact berms. Periodically, we are able to get a volunteer out there to check the beach.
 - The beach is highly eroded, very narrow, and inland movement is restricted by impact berms.
 - On the rare occasions a green sea turtle comes ashore on the beach at Pu'uloa, it would be reported. They are known to come ashore during late evening, early morning hours.

Wildlife friendly lighting. During the 2020 turtle nesting season, two undiscovered nests on the Fort Hase public beach found a large number of hatchlings upon emerging crawl several hundred feet towards the Pa Honua housing and had to be rescued; still many died. USFWS notified MCBH that TAKE of green turtles or other listed species resulting from failure to address lighting issues is not currently authorized under the ESA of 1973 (16 U.S.C. 1531 et seq.), as amended. Take of sea turtles due to light attraction is easily avoidable and failure to prevent such take is a violation of ESA section 9 take prohibitions. Natural Resources staff are working with the Facilities Department, Marine Corps Community Services (MCCS), and Ohana Military Community housing to minimize lighting issues throughout MCBH, especially near the shorelines. The Kailua Bay recreation trail near the shoreline (Pa Honua housing) has had its bollard lighting modified and streetlights have been de-energized to reduce light emissions seen from the shoreline. Projects are being planned to modify lighting throughout the MCBH Bay. Light pollution can disorient turtles, leading them to wander inland, into vegetation or roads, and away from the ocean. When outdoor lighting is required in areas that effect sea turtles, as well as all exterior lights for new, and existing

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construction and renovations, MCBH shall install coastal lighting compliant fixtures that meet the criteria to "Keep it Low, Keep it Long, Keep it Shielded and turn it off unless needed," unless otherwise required by the military mission.

Keep it low: Mount fixtures as low as possible. Low mounted fixtures provide more light directly on the ground where it is needed for human safety. Only the MCTAB campground bathrooms have lighting close to the beach; MCBH has requested that CCH keep these bathroom lights off during turtle nesting season. This also reduces the potential of the light source or lamp from being directly visible. Use the lowest wattage or lumen output necessary for the needed purpose.

Keep it long: Use long wavelength (greater than 560 nanometers AND absent wavelengths below 560 nanometers) light sources such as amber, orange, or red light emitting diodes (LEDs) without the use of filters, gels, or lenses. Using long wavelength light sources is less disruptive to marine turtles than white or multi-colored lights. Short wavelength light sources, PC Ambers, RGBs, dual lighting boards, and color change options are not acceptable.

Keep it shielded: The fixture must meet or exceed full cutoff. This is defined as no light emitting above a 90-degree plane. The fixture must be shielded so that the lamp or glowing lens is not directly visible.

Window tinting: In areas where any buildings have windows that can be seen from beaches, tinted glass or film is required. The best option for minimizing lighting impacts to sea turtles is 15% visible light transmittance (inside to outside), which eliminates the need for additional window coverings like black out curtains on all glass windows, doors, and walls within line of sight of the beach. Appendix E identifies the wildlife friendly and coastal lighting standards.

- Avoid shining bright lights near sea turtles or on nesting beaches after dusk (such as flash photography, cell phone screen lights, vehicle lights, exterior building lights, beach fires, etc.).

Beach management/shoreline protection. Nesting occurs on minimally disturbed sandy beaches, which is critical to the survival of the honu. MCBH makes great efforts to protect shoreline vegetation, especially native beach strand vegetation on beach areas to reduce erosion and stabilize the shoreline. Efforts are made to control invasive coastal and dryland plant species and promote the native species. Vehicles are prohibited from driving on the beaches and adjoining vegetation.

Digging and removing sand is prohibited to prevent the loss of beach sand, exposing human remains, and exacerbating erosion. **Sea turtle protection measures.** All incidences of basking or nesting sea turtles are reported to the HMAR dispatch at (888) 256-9840; When the HMAR dispatch is closed, the military police is notified at (808) 257-2123. Both organizations are instructed to report sightings immediately to the Natural Resources staff and CLEOs.

Sea turtle basking:

- ❖ If a sea turtle comes ashore for basking, A-frames with signs warning people and pets to stay 50 feet from the turtle. The basking turtle is periodically



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monitored to ensure it is not disturbed and people maintain the stand-off distance.

- ❖ Pets must be leashed at all times and are not allowed on base beaches 1000-1500 or as otherwise signed.

Sea turtle nesting:

❖ All presumed nests are cordoned off as soon as possible after discovery. Posts and a rope/chain barrier are installed, and signs attached. The signs state that these are protected species and people and their pets are required to maintain a stand-off distance of 50 feet. The signs also contain contact information

- ❖ Limit the training to within 150 feet of the nesting site; however, upon coordination with the Natural Resources staff, military personnel may move around the clearly marked turtle nest.
- ❖ When and where possible make beach off-limits to dogs until the hatchlings depart.
- ❖ Restrict nighttime beach activities.
- ❖ Minimize artificial lighting that can be seen from on beach.
- ❖ Prevent foot traffic and driving of all vehicles on the seaward side of active nests as the emergence date approaches; footprints and tire ruts will impede the movement of hatchlings. Rake ruts to ensure that emerging hatchlings have a clear path between the nest and water.
- ❖ Notify USFWS when nests are discovered and document the nest in accordance with MCBH's turtle protocol.
- ❖ Notify USFWS at the first signs of emergence; document all emergence.
- ❖ Nest excavations: Excavations are coordinated with USFWS in accordance with the Turtle protocol. NOAA may assist at USFWS's discretion.



Marine debris removal. MCBH conducts efforts to remove derelict fishing gear and other marine debris from MCBH jurisdictional waters. Monitor for and remove marine debris, including derelict fishing gear, nets, plastics, glass, or other entanglement hazards, from the beach.

Access restrictions. MCBH has several regulations in place that provide protection for sea turtles. MCBH Kaneohe Bay has a 500-yd seaward security buffer zone within which MCBH exerts control to all access and resources. Regulations restrict fishing, surfing, and other near shore activities. Enforcement is supported by two full-time federally commissioned CLEOs on the Environmental Division staff.

Protocols for military maneuvers (Rim of the Pacific Exercise, Marine Expeditionary Unit visits, Motor Vehicle training, Amphibious landings) and large-scale recreational events. Beaches and nearshore waters in the vicinity of the event are surveyed at least one hour prior to the event and observed during the event. If sea turtles are present, the event may be postponed, cancelled, or moved at least 150 feet away from the marine animal. In the unlikely event a sea turtle comes ashore during an event, people and equipment will be required to move at least 150 feet away from the area and regular protection zone protocols are followed.

Injured/dead response. If a sick, injured, stranded, entangled, or dead sea turtle appears in MCBH waters or on beaches it is immediately reported to the Military Police or Natural Resources staff, protected, and subsequently reported to NOAA's Sea Turtle Statewide Stranding Hotline (888)

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256-9840 for rehabilitation and/or necropsy. If the turtle is in the water, it is brought ashore, if safe to do so, and the entanglement removed. We do not remove barbed hooks but cut the fishing line as close as possible to the hook.

Educational outreach. Conduct education and outreach efforts, particularly to address threats such as fishing interactions, marine recreation interactions, and marine debris. Briefings are given to military personnel on base, which include information on sea turtle reporting procedures and appropriate actions to follow. Informational material on sea turtles is provided to visitors staying at the Temporary Lodging Facility, beach cottages, cabanas and made available at all public events held on base. Fishermen are required to use barbless fishing hooks; barbed hooks that have been crimped down are acceptable. Information on sea turtle reporting procedures is posted on the MCBH Environmental Divisions' Natural Resources website or you may contact the Environmental Division at (808) 496-7000 / 7131 or (808) 285-6464.

Additional Measures. MCBH will also implement the following measures in support of sea turtle conservation.

1. Map and Protect seagrass beds foraged by turtles - USFWS is mapping the seagrass beds within the MCBH's 500 yard Defensive Sea Area as part of the Marine surveys.
2. Motorboats must drive slowly (5-10 knots) near the marina, boat launch areas, within 200 feet of nearshore areas, and coral reefs or where water is 15 feet or shallower.
3. No motor boats will be allowed in Pali Kilo Cove.
4. Provide NOAA "Fishing around Sea Turtles" and "Boating Around Sea Turtles" decals to the MCBH marina and Waterfront Operations to be placed in their boats. These decals will also be provided to the dive shop on base. Examples of these decal stickers are provided below.

Sea Turtles

Nesting Beach Surveys Topic: Crawl Identification

Adapted from Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Guidelines for Marine Turtle Permit Holders
PIFWO Version: June 2016

GLOSSARY OF TERMS

Crawl – Tracks and other sign left on a beach by a sea turtle.

False crawl – A crawl resulting from an abandoned nesting attempt (a non-nesting crawl).

Nest – A crawl resulting from a nesting attempt in which eggs were deposited.

Egg chamber – The cavity excavated by the rear flippers of a nesting turtle into which the turtle deposits a clutch of eggs.

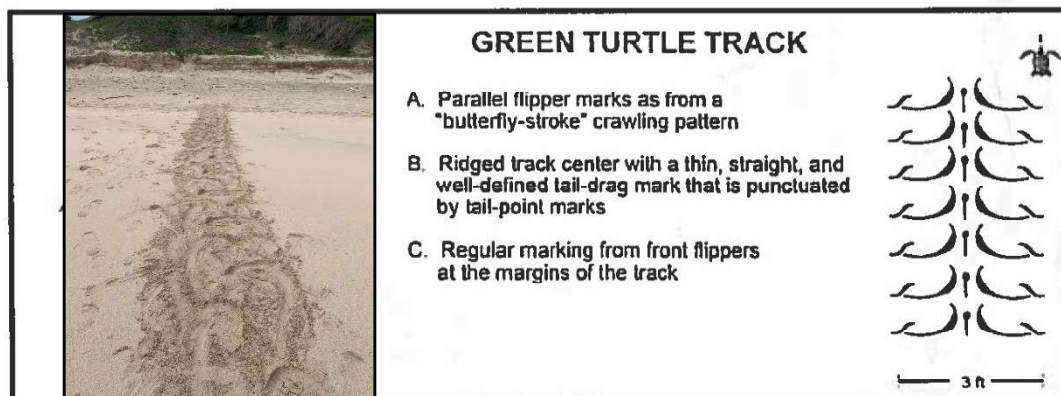
Primary body pit – The excavation made by a turtle on the beach just prior to digging the egg chamber.

Backstop – An approximately 45° incline made in the sand as sand is pushed back with the rear flippers during the excavation of the primary body pit. Such a steeply inclined backstop is not present in the secondary body pit.

Escarpment – The perimeter of the secondary body pit where the front flippers have cut away a small cliff into the surrounding sand.

CRAWL IDENTIFICATION

Green turtle (*Chelonia mydas*) tracks from a sea turtle with simultaneous limb movement, a center drag mark from the tail, and track width approximately 35 inches:



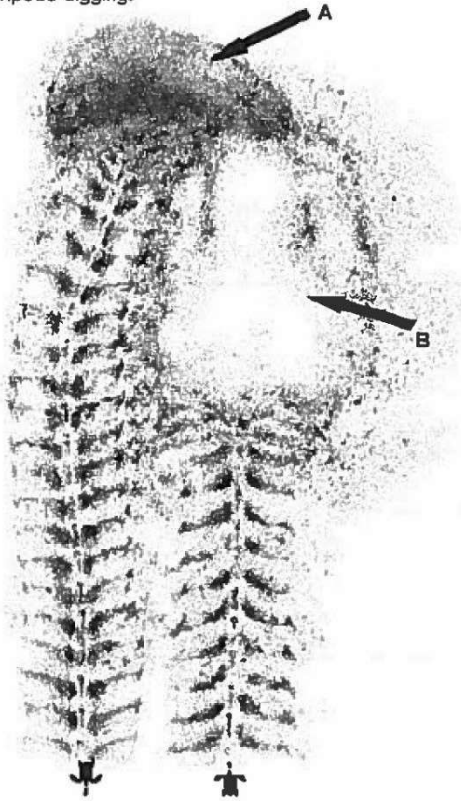
If the crawl is from a green turtle, is it a nest or a false crawl?

- A. Identify emerging and returning tracks by their direction (Figure 1). As a green turtle crawls, it will push sand backward with each flipper stroke.
- B. Follow the path taken by the turtle and look for the following attributes.
 1. Evidence of front flipper covering (Figure 3). If present, the crawl is a **NEST**.
 - a. Sand thrown into a mound that is more than twice as long as the visible body pit or a deep (1-2 foot) secondary body pit with an escarpment (Figure 3).
 2. Evidence of an abandoned nesting attempt. If present, the crawl is a **FALSE CRAWL**.
 - a. Very little or no sand disturbed other than tracks.
 - b. Less sand thrown over the emerging track and a shallower body pit than in 1a above (Figure 3).

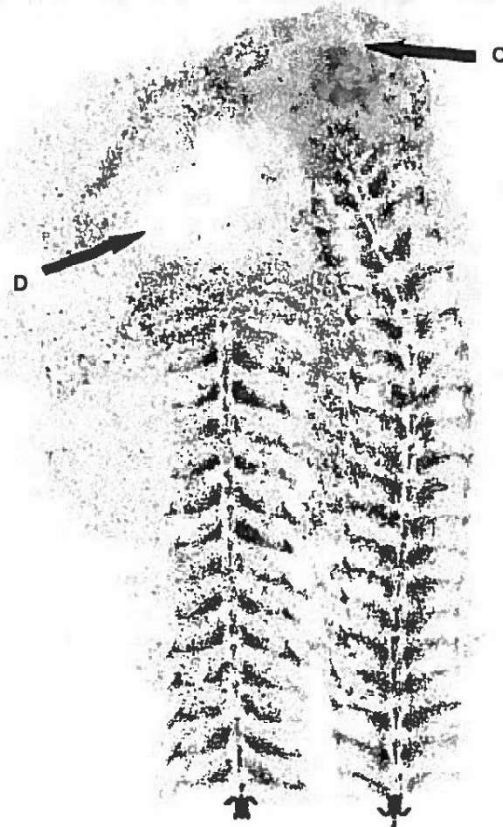
Sea Turtles

Figure 3. Characteristics of **green turtle crawls** indicating either that the turtle had previously nested (left a nest) or had abandoned its nesting attempt (left a "false crawl").

A **green turtle nest site** on an open beach showing a secondary body pit (A) and a mound of thrown sand (B) that is greater than twice as long as the visible secondary body pit. Note that smaller nest mounds are expected when obstacles or vegetation impede digging.



A **green turtle false crawl** on an open beach showing an abandoned primary body pit (C) and a mound of thrown sand (D) that is smaller than twice as long as the visible primary body pit. Note that many green turtle nests may have body pits and nest mounds that look similar to this.



Sea Turtles

Below is an example of signs put out by MCBH Natural Resources staff around turtle nests warning people to avoid the nesting area.



Sea Turtles

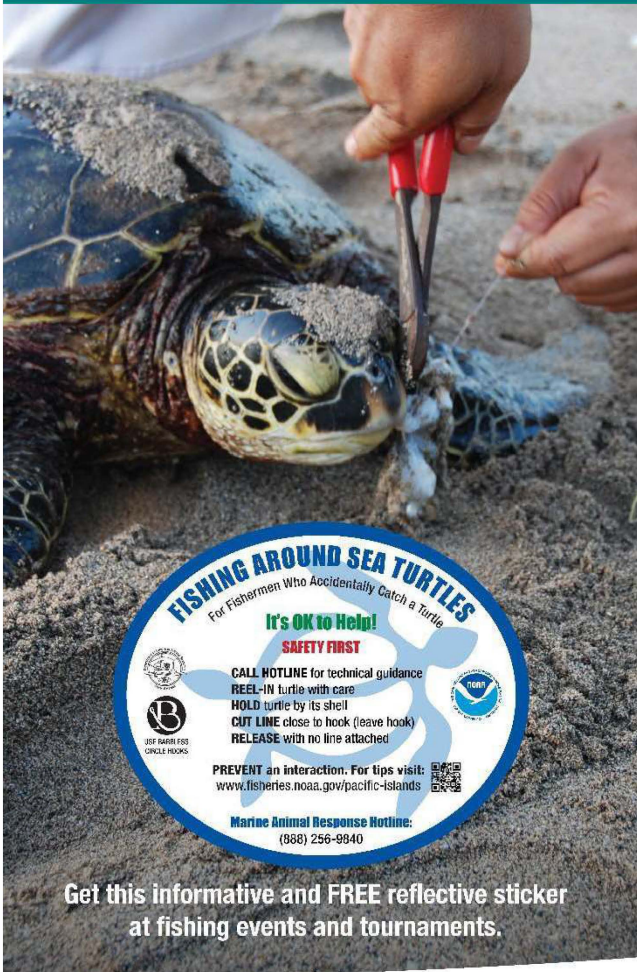
Below is an example of sticker and poster provided by MCBH Natural Resources to fishermen that fish on base to provide guidance in the case that they accidentally catch a turtle. An example of a sticker and poster providing information for boaters to avoid sea turtle strikes is also provided below. These materials are given out where vessels are rented and sold, and are placed on the gates to rental boats. Boat renters are also briefed in an orientation/education.



Sea Turtles



It's OK to Help!



Get this informative and FREE reflective sticker at fishing events and tournaments.

Know what to do if you accidentally catch a sea turtle while fishing in Hawaii

SAFETY FIRST If safe to help

CALL HOTLINE for technical guidance
REEL-IN turtle with care
HOLD turtle by its shell
CUT LINE close to hook (leave hook)
RELEASE with no line attached

For more information and tips on how to prevent or reduce the potential for interactions, visit the **FISHING AROUND SEALS AND TURTLES** program.



Tip: Use barbless circle hooks to help reduce sea turtle and monk seal injuries.



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Questions?

Contact: RespectWildlife@noaa.gov

For marine animals in distress, call the Marine Animal Response Hotline: (888) 256-9840

Take a photo to link to the webpage.

Sea Turtles



Prevent a Boat Strike

- **Post-a-lookout!**
- **Drive slowly** (5-10 knots)
 - Over shallow reef areas
 - Near harbors and boat launches
- **Adhere to no wake zones.**
- **Wear polarized sunglasses** to help see and avoid turtles.
- **Never feed** turtles so they do not associate boats with food.

REMEMBER: Sea turtles surface to breathe often, and turtles living near harbors are most at risk of a boat strike.



Report injured or dead marine animals to **(888) 256-9840**



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