

**Friends of Hunting Island**  
**Sea Turtle Volunteer**  
**Procedure Manual**

Revised 2015

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**Equipment List**

GPS  
Radio  
notebook and pencil/pen  
permanent marker  
DNR stake  
5 gallon bucket  
cockle shell  
procedure manual/beach notes  
trash bags  
white nest info sheet on clipboard  
latex gloves  
marking tape  
cable ties  
mallet  
towel for covering eggs  
tent pegs (two sets of 10)  
band aids/triple antibiotic cream  
box cutter  
vial for egg study

### **Arrival procedure**

#### **Day leaders**

1. Assemble volunteers and take attendance.
2. Make daily announcements: current activity, weather conditions and tide.
3. **Provide next nest number.**
4. Distribute radios, GPS units, and trash bags.
5. Redistribute zones to fill spots for absences and tide conditions.
6. Perform radio checks and emphasize importance of trash pickup.
7. Answer any questions.

#### **Each team's prober**

1. Confirm zone and beach access points with team.
2. Assign duties - radio operator, data recorder, backpack carrier, and GPS operator/recorder.
3. Confirm each team member has badge and displays turtle volunteer parking permit on the dash of their car. Carpool to assigned zones if possible.

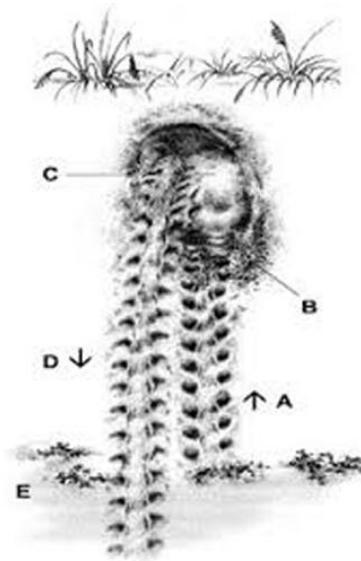
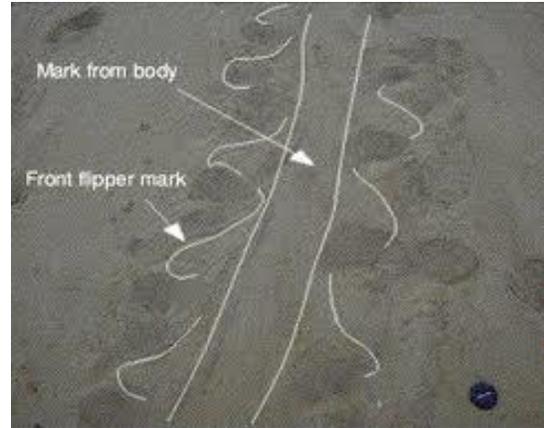
### **Beach patrol**

1. Each team will do a radio check-in with the Day Leader upon entering/leaving zone, i.e., “Zone 4 is on the beach”.
2. Patrol zones by walking the high tide line (where damp and dry sand meet).
3. Pick up trash and fill in holes **on the way back** (record the number of trash bags collected).
4. Check existing nests, look for signs of predation (digging and/or egg shells), ghost crab holes, and nest wash-over (wash-over: damp sand covers entire nest; rain produces a pitted look).
5. If egg shells are found around a nest notify day leader **immediately (see depredated nest, page 5)**. Check for sand accumulation on ocean-facing side of cages and remove if necessary.



### **Non-nesting emergence (false crawl)**

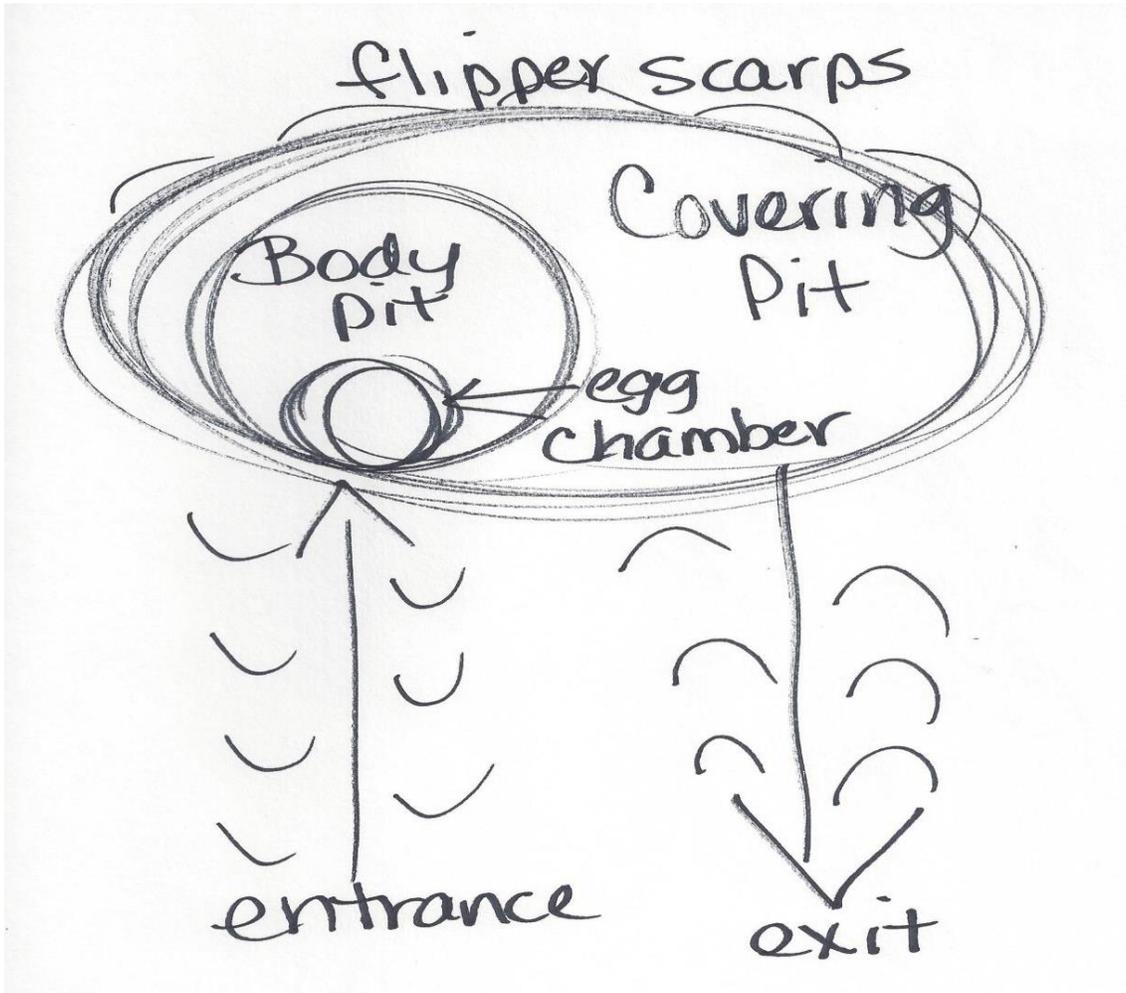
1. Very little or no sand disturbed.
2. A continuous crawl, meaning the turtle did not attempt a body pit (see above).
3. Take and record GPS reading at the point where the turtle turned away from the beach to return to the sea.
4. Draw “Xs” through incoming and outgoing crawls.



### Nesting attempt

1. Identify the incoming (emerging) crawl and the outgoing (returning) crawl.
  - a. As a turtle crawls it pushes sand backward with each flipper stroke.
  - b. If one crawl is shorter, it will be the incoming crawl.
  - c. If crawls overlap, the outgoing crawl will be on top.
  - d. "V" shape impression in the sand always points to direction turtle came from. It is easier to see this in the intertidal zone.
  - e. If there are multiple body pits, find the last one before the outgoing crawl
2. Follow the path taken by the turtle and look for the following nesting attributes:
  - a. Incoming tracks disappearing under covered area.
  - b. Body pit with flipper marks at edges.
  - c. Thrown sand with uprooted and buried vegetation

- d. Outgoing tracks leading back to ocean.
  - e. Different crawl lengths--indicates turtle spent time on the beach.
3. Some nesting attempts will have few if any field signs. **All** crawls with body pits must be thoroughly investigated.



### Locating the Nest

1. Draw a line around the entire body pit.
2. Do a few test probes away from the body pit to get a feel for the hardness of beach sand.
3. Start probing where the incoming crawl enters the body pit. Space probe attempts 3 to 4 inches apart.

4. Work around the body pit towards the outgoing crawl. Probe under wrack and the tops of sand mounds. **Keep probe between your feet, move your body with each probe attempt.** If you hit a soft spot probing too far out from your body, you could lose your balance and break sea turtle eggs.
5. When you feel the sand's resistance give way ("the drop"), immediately stop probing, and draw an arrow to the spot. **Don't place the probe stick into the hole again until you check it by hand.**
6. Gently dig into the hole with your gloved hand until you hit hard-packed sand.
7. When you feel something soft it may be an egg--proceed with caution!
8. No eggs? Keep probing, leave false hole open to mark the attempt.
9. **When eggs are found contact day leader.**
10. Decide if nest will remain *in situ* or will be relocated.

### Depredated Nests

If a nest has signs of **predation** (broken eggs, digging in area of nest):

1. Remove and count the number of eggs destroyed (wear gloves).
2. Select most intact egg shell for genetic sampling.
3. Remove all intact eggs and relocate to new nest.
4. **Do not re-bury egg shells in original nest site.** Place them in a plastic bag and dispose of as directed.
5. If this is a new nest, assign the nest the next available nest number. Record all data; note cause of egg loss.
6. **Radio day leader about loss of nest.**

**Take and record GPS reading on all crawls and nests.**

### Egg removal for genetic study

1. When relocating a nest, move eggs before choosing one for genetic study.
2. If an egg is broken, use this one. Break egg and completely remove and discard contents. Clean shell with seawater.
3. Label side of vial with permanent marker: year-HUN-nest# (example: 15-HUN-28).
4. Write nest number on lid of vial.

## Nest Relocation

Moving sea turtle eggs may create adverse impacts. Movement alone is known to kill developing embryos by rupturing delicate membranes. The incubation environment greatly influences the developing embryo and nest relocation can involve the transfer of eggs from an appropriate environment to an inappropriate one. Normally, the only situation that justifies nest relocation is a nest laid seaward of the debris line marking the current spring high tide line. Nest relocation can also affect the sex ratio of the hatchlings, creating more females than males.

### Things to consider

1. Don't relocate a nest **into** heavy vegetation; don't relocate a nest for this reason.
2. Don't relocate a nest to the top of a high dune or relocate a nest laid on a dune.
3. Don't move a nest too far from the high tide line; hatchlings need the quickest route to the water. Make relocation count, a nest can only be moved once.
4. Don't consider surrounding nests, nests laid in May or June will hatch before nests laid in July or August
5. Consult with day leader and other team members when moving a nest.
6. Nests can survive wash-overs, but not inundation with water.

If a nest requires relocation, it should be moved as early as possible. After laying, the potential for movement-induced mortality in sea turtle eggs increases rapidly. **Eggs must be moved no later than 9 AM.**

1. Disposable gloves must be worn at all times.
2. Carefully remove the sand from around the top eggs.
3. Keep track of egg count, using two people if possible.
4. Individual eggs should be gently lifted from the egg chamber and placed into a 5 gallon bucket with a 2-3 inch layer of moist sand on the bottom. **Be sure to maintain each egg's original orientation; do not rotate eggs or bucket and avoid any abrupt movements.**
6. **As eggs are placed in the container, be sure they do not roll or pile up on one side.**
7. When all eggs are in the container, cover them with a towel.
8. Record total number of eggs laid and number of eggs found broken on nest info sheet.

To expedite relocation, other volunteers can perform the next steps while eggs are being removed from the original nest site:

9. Find suitable beach habitat nearby. Be sure the new nest site is above the spring high tide level and is not in dense vegetation.
- a. **The depth of the nest chamber should be the depth of original nest +2 inches. Use the scale on the probe stick to measure the depth of the original nest.**
  - b. Dry sand should not be allowed to fall into the egg chamber. To prevent this, move the top six inches of sand away from the entrance to the nest chamber. **The shape of the new nest should resemble an inverted light bulb.** Dig straight down to depth of the original nest, then start rounding out the hole. **The new egg chamber should be the size and shape of a volleyball.**
  - c. Relocate the eggs into the new egg chamber by transferring them one at a time while **maintaining each egg's original orientation.**
  - d. After all eggs have been transferred into the new egg chamber, cover them with the moist sand excavated from the hole.
  - e. Mark the center of the egg chamber with a piece of marsh grass. Be sure this temporary marker is not inserted into the egg chamber.
  - f. Firmly pack the sand surface above the eggs with your hand. Replace the dry sand over the egg chamber.
  - g. Step on the new nest to pack the sand.

### **Nest screening/ caging**

#### **Nests in zone 1 and 2: use plastic screen.**

1. Place the screen on the sand and center it exactly over the nest cavity. Remove the temporary marker.
2. Using tent stakes, tightly secure the perimeter of the screen.
3. Cover the edges of the screen with sand if possible.

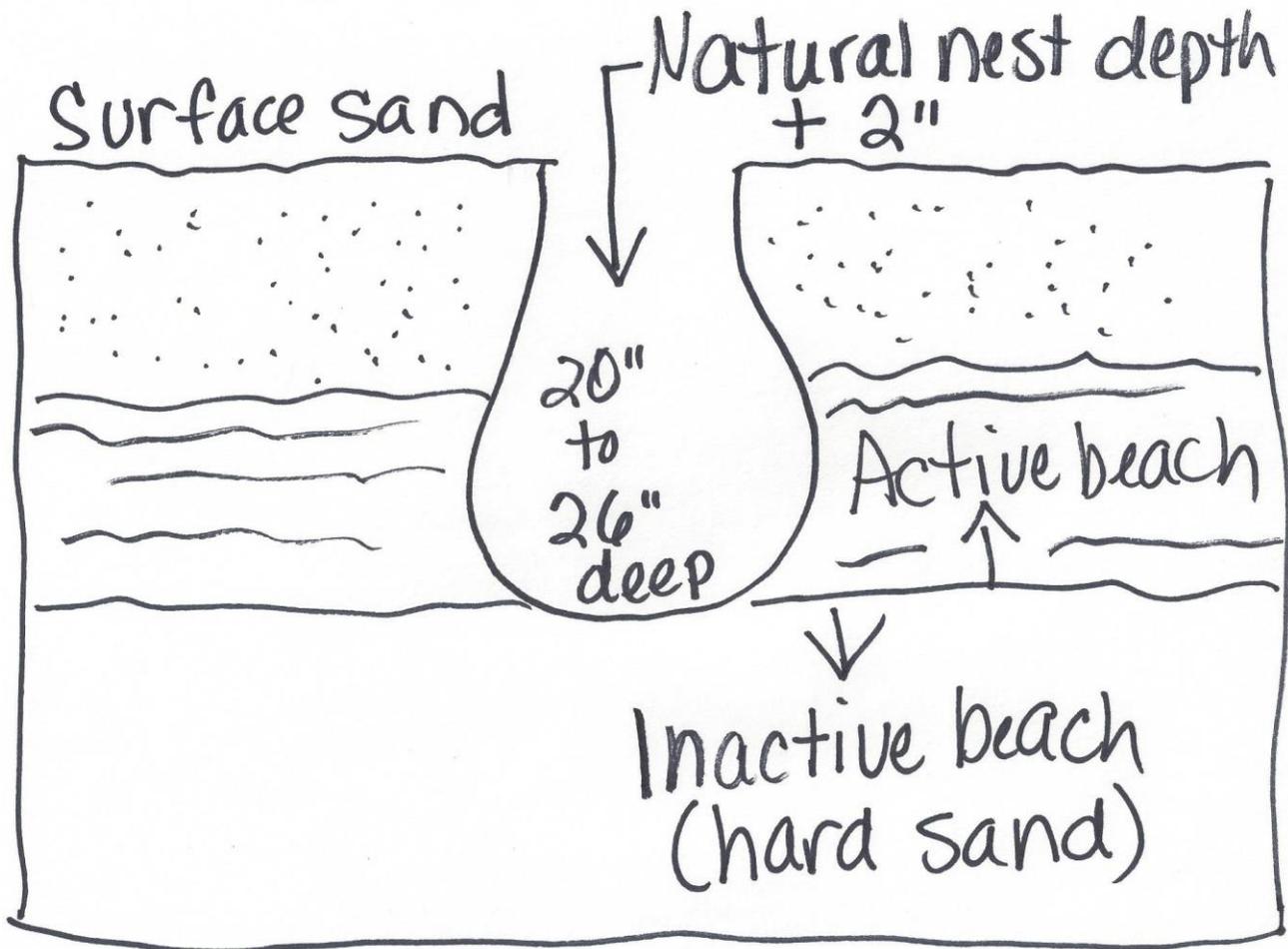
#### **Nests in zone 3 and 4: use metal cage**

1. Center cage exactly over the nest cavity. Remove the temporary marker.
2. Orient the cage so that the **longest side is facing the sea.**
3. Anchor the cage with at least 10 tent stakes.
4. Hammer a stake into the ground at each corner of the cage; make sure the stakes do not enter the egg chamber.
5. Use two plastic cable ties to secure each stake to the cage; one cable tie high and the other as low as you can put it.

Use four wooden stakes to secure the corners of the screen or cage. Place wood stakes outside of cages.

### Marking a nest

1. Record the following data on the **LEFT** front stake with a Sharpie marker:
  - a. Nest number.
  - b. Number of eggs (relocated nests only).
  - c. "*in situ*" if applicable.
  - d. Prober's initials with an asterisk. (\*)
  - e. Initials of team members.
2. Use DNR stake as **RIGHT** front stake.
3. Wrap marking tape or around the nest at each stake.



## After beach patrol

Prior to leaving the beach contact the day leader and inquire if other teams need assistance. If not inform him/her your team is exiting your zone; i.e., “Zone 4 is off the beach”.

### **Team Leader/Team Members**

1. Turn off GPS and radio; place radio in charger, make sure light on charger illuminates.
2. Transfer data from nest info sheet to DNR card and place in proper zone notebook. Leave the nest info sheet in the yellow legal pad.
3. Record number of trash bags collected on yellow legal pad.
4. Record observations (predator tracks, digging around nest, nest wash-over, sand accumulation, visitors, etc.) on yellow legal pad.
5. Place used egg vials in designated container. (check that nest number is recorded on lid).
7. Replace supplies used (cable ties, gloves, tent pegs and egg vials) in backpack.

### **Day Leader**

**DO NOT LEAVE UNTIL ALL TEAM MEMBERS HAVE RETURNED AND ARE ACCOUNTED FOR!**

1. Check the day’s activity on yellow legal pad.
2. Put GPS units in cabinet
3. Make sure all radios are accounted for and charging.
4. Update next nest number on marker board.
5. Fill out or review buff DNR cards. Place in appropriate zone notebook.
6. Record data in the day leader’s notebook.
7. Check that all backpacks have appropriate supplies (cable ties, gloves, tent pegs, and egg vials).
8. Properly wash ATV.
9. Lock door when leaving.

*Acknowledgements:* SCDNR Sea Turtle Permit Guidelines  
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