

Stranding and Salvage Networks

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Overview: The Importance of a Network

Stranded sea turtles are defined as those that wash ashore dead or alive or are found floating dead or alive (generally in a weakened condition). Sea turtles strand in the vicinity of migratory routes, foraging habitats, developmental habitats, and nesting beaches. The numbers that strand are typically influenced by a variety of factors and vary at different geographical locations and during different years and seasons.

Systematic data gathering for stranded sea turtles can provide resource managers and scientists with biological information useful in improving the conservation and management of these species. Data gathering is best accomplished through a formal stranding and salvage network that can document stranded sea turtles, salvage dead individuals for necropsy, and transport live individuals to rehabilitation facilities. Data collected through the network can be used to identify sources of mortality, document locations of negative human/sea turtle interactions, evaluate the effectiveness of various regulations, and serve as a basis for management decisions. Documenting stranded sea turtles and associated tag returns can enhance an understanding of species composition, distribution, seasonality, sizes, migratory patterns, and habitat use. Through salvage, necropsy, and specimen collection from dead stranded turtles, information is obtained on sex ratios, diseases, foraging ecology, and other topics. Live stranded sea turtles that are located and taken to appropriate rehabilitation facilities can

often be successfully rehabilitated and released back into the wild.

A national Sea Turtle Stranding and Salvage Network (STSSN) has operated in the USA since 1980. It serves as a basis for many of the protocols and recommendations offered in this chapter.

Network Components

Network Participants and Coordinators

Funding is typically limited; thus, it is recommended that most participants and coordinators volunteer to provide data without compensation. Whenever possible, these volunteers should be trained biologists who understand the importance of accurate data collection, and who will be able to participate in the network for several years. Among those that should be considered to participate are employees of natural resource agencies, zoos and aquaria, as well as park managers, educators and dedicated local residents. Once informed about the importance of the stranding network, employers may allow participation in network activities during normal work hours. In order to facilitate timely data collection, participants should be distributed throughout the geographical area where the network will operate, and they should receive training in standardized data collection protocols.

A Network Coordinator, as well as several Regional Coordinators, should be designated. Each Regional Coordinator should be located within a specific geographical area and oversee network activi-

ties conducted there. The Network Coordinator should be an employee of the agency willing to commit to the long-term maintenance of a central computerized database that will contain all stranding records.

Detection of Stranded Turtles

Network participants document turtles stranded within their geographical area. Stranded turtles are detected either by network participants or by other individuals who report the turtles. Participants should immediately attempt to find turtles reported alive, so that they do not succumb prior to transfer to rehabilitation facilities, and promptly attempt to locate those reported dead, so that they do not deteriorate appreciably before data collection.

Turtles may be detected opportunistically, or during surveys designed specifically to identify stranded turtles. Depending on funding and time availability, surveys can be undertaken intermittently or systematically. If systematic monitoring is undertaken, surveys should be made from 1-3 times per week so that turtles can be located before they deteriorate or are taken by people or predators. "Index areas" for systematic monitoring can be established if those areas are surveyed consistently and effort expended is recorded. Regardless of the method used to detect stranded turtles, the numbers documented should be considered minimum stranding figures since they represent only reported strandings and not all stranding events.

Documentation of Stranded Turtles

Each stranded turtle located should be documented by a network participant on a standardized form. The form used by the STSSN is included as an example (Figure 1). Managers and researchers establishing networks in other areas will likely need to modify the STSSN form to meet their specific needs. Only one standardized form should be developed and used for a particular network. The form should include the data parameters and notation codes listed below, but contain only those species occurring within the geographical area covered by the network. It should be as short, concise, self-contained, and easy to complete as possible. The data to be collected for each stranded turtle should be printed on the front; a species guide and the Regional Coordinator's address should be printed on the back.

All data parameters listed on the standardized form should be recorded for each turtle. Straight and

curved carapace length and width should be measured using standard methodology (see Bolten, this volume). Straight line measurements made with calipers are more accurate than curved measurements made with a flexible tape. Attempts to determine sex using blood serum testosterone assays, laparoscopy, and examination of gonads during necropsy should be noted. It is not recommended to use tail length to identify sex since this method is unreliable for decomposed carcasses and immature turtles.

If possible, each stranded turtle should be photographed at the stranding site, necropsy location, or rehabilitation facility. Photographs provide additional documentation of the stranding authenticity and characteristics. Network participants should immediately submit each completed original stranding form to the appropriate Regional Coordinator, who should immediately review it for accuracy and submit it to the Network Coordinator. Both the network participant and Regional Coordinator should retain a copy of each form for archival and reference purposes.

Other Associated Activities for Stranded Turtles

Once an animal has been documented, it should be marked or removed from the stranding site (to prevent it being counted again). Live stranded turtles should be transported to rehabilitation facilities (the facility should be noted on the data form). Dead stranded turtles (fresh or moderately decomposed) and live stranded turtles that succumb during rehabilitation efforts can be salvaged for necropsy and specimen removal and are an important resource for obtaining additional information. Necropsies should be conducted using standardized protocol (see Jacobson, this volume). Dead turtles not salvaged for necropsy should be buried high on the beach or pulled behind the dunes. It is not recommended to mark them with paint or other materials since these markings usually disappear over time.

Acknowledgments

We would like to thank participants of the USA's Sea Turtle Stranding and Salvage Network, including those early participants who developed the standardized stranding form and protocols used by the network today, and those participants who have continued the network's activities.

Appendix I

Record Keeping: Standard Information for a Data Form

1. Observer's name, address, telephone number
2. Turtle number by day (enter a consecutive number for the individual observer for that day)
3. Stranding date (enter yr / month / day)
4. Stranding location in reference to the closest town or landmark. Include county, state, or other relevant geographical breakdown, as well as latitude and longitude. Note whether stranding was located inshore (bays, estuaries, or passes and their beaches) or offshore (oceans and their beaches).
5. Species code: CC = Loggerhead; CM = Green/Black; DC = Leatherback; EI = Hawksbill; LK = Kemp's ridley; LO = Olive ridley; ND = Flatback; UN = Unknown
6. Reliability of species identification (indicate "unsure," "probable," or "positive").
7. Species verified by Regional Coordinator ("yes" or "no")
8. Sex of turtle ("female," "male," or "undetermined")
9. How sex was determined (enter the method used)
10. Condition of turtle, coded as follows: 0 = Alive; 1 = Fresh dead; 2 = Moderately decomposed; 3 = Severely decomposed; 4 = Dried carcass; 5 = Skeleton, bones only.
11. Final disposition of turtle, coded as follows: 1 = Painted, left on beach; 2 = Buried, on beach/off beach; 3 = Salvaged specimen, all or part; 4 = Pulled up on beach or dune; 5 = Unpainted, left on beach; 6 = Alive, released; 7 = Alive, taken to holding facility.
12. Tag number(s). Enter type of tag (metal, plastic, PIT, living, etc.), tag numbers, tag position, tag return address, and disposition of tag. Draw located tags on the diagram.
13. Remarks. Enter information on tar or oiling, gear or debris entanglement, wounds or mutilation, propeller damage, papillomas, epizoa, etc. Draw noted items on the diagram.
14. Measurements (straight length / width; curved length / width). Circle measurement units.

SEA TURTLE STRANDING AND SALVAGE NETWORK – STRANDING REPORT

PLEASE PRINT CLEARLY AND FILL IN ALL APPLICABLE BLANKS. Use codes below. Measurements may be straight line (caliper) and/or over the curve (tape measure). Measure length from the center of the nuchol notch to the tip of the most posterior marginol. Measure width at the widest point of carapace. **CIRCLE THE UNITS USED.** See diagram below. Please give a specific location description. **INCLUDE LATITUDE AND LONGITUDE.**

Observer's Full Name _____ Stranding Date _____
year month day

Address / Affiliation _____

Area Code / Phone Number _____

Species _____ Turtle Number By Day _____

Reliability of I.D.: (CIRCLE) Unsure Probably Positive Species Verified by State Coordinator? Yes No

Sex: (CIRCLE) Female Male Undetermined How was sex determined? _____

State _____ County _____

Location (be specific and include closest town) _____

Latitude _____ Longitude _____

Condition of the Turtle (use codes) _____ Final Disposition of Turtle (use codes) _____

Tag Number(s) (include tag return address and disposition of tag) _____

Remarks (note if turtle was involved with tar or oil, gear of debris entanglement, wounds or mutilations, propeller damage, papillomas, epizoa, etc.) continue on back if necessary.

MEASUREMENTS: CIRCLE UNITS

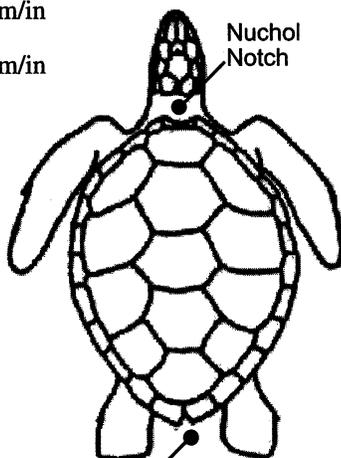
Straight Length _____ cm/in

Straight Width _____ cm/in

Curved Length _____ cm/in

Curved Width _____ cm/in

Mark wounds, abnormalities and tag locations



Posterior Marginal Tip

CODES

SPECIES:

- CC = Loggerhead
- CM = Green
- DC = Leatherback
- EI = Hawksbill
- LK = Kemp's Ridley
- UN = Unidentified

CONDITION OF TURTLE:

- 0 = Alive
- 1 = Fresh dead
- 2 = Moderately decomposed
- 3 = Severely decomposed
- 4 = Dried carcass
- 5 = Skeleton, bones only

FINAL DISPOSITION OF TURTLE:

- 1 = Painted, left on beach
- 2 = Buried: on beach / off beach
- 3 = Salvaged specimen: all / part
- 4 = Pulled up on beach or dune
- 5 = Unpainted, left on beach
- 6 = Alive, released
- 7 = Alive, taken to a holding facility

Figure 1. STSSN standardized stranding form