

# Protocol for Responding to Cold-Stunning Events

## Overarching Goals:

- Ensure safety of people and sea turtles.
- Ensure humane treatment of sea turtles.
- Strive for highest sea turtle survivorship possible.
- Strive for fastest possible release of sea turtles in best possible place given all considerations at hand. Balance the necessity for short captivity periods with requirements for minimal re-stranding risk and return to original habitat.
- Collect high-priority biological information.
- Facilitate the timely and accurate release of information.

## Pre-Event Preparation (General)

- Identify places other than sea turtle rehabilitation facilities where large numbers of sea turtles can be temporarily held in heated saltwater. Reduce transportation needs by selecting facilities as close to sites of previous cold-stunning events as possible. Work to create a situation where sea turtle rehabilitation facilities will only need to hold cold-stunned sea turtles in need of regular medical attention.
- Create a list of equipment and supplies needed during cold-stunning events and stockpile items that are not readily available.
- Identify agencies/groups/individuals that may be able to help search for and retrieve cold-stunned sea turtles from the water. Identify those that would help during minor, moderate, and severe cold-stunning events (need progressively larger groups).
- Identify potential for strategic, aerial support for searches.
- Identify agencies/groups/individuals that may be able to help transport cold-stunned sea turtles from water drop-off sites to staging sites, from staging sites to holding or rehabilitation facilities, and from holding or rehabilitation facilities to release sites. Identify those that would help during minor, moderate, and severe cold-stunning events (need progressively larger groups).
- Identify a core group of personnel (known as the Core Sea Turtle Cold-Stunning Team or CST) who might play key roles in coordinating response to sea turtle cold-stunning events.
- Identify companies that may be able to provide transport trucks or freezer trucks. Resolve any potential renting or use problems.
- Determine areas to be searched for cold-stunned sea turtles during various alerts. Minor alert areas will be core cold-stunning areas where the largest numbers of turtles are found and where initial searches will begin. These will be areas where cold-stunned sea turtles might be found even during minor events. Moderate alert areas will be more widespread than minor alert areas and will be where cold-stunned sea turtles have been found during moderate events. Severe alert areas will be more widespread than moderate alert areas and will be areas where cold-stunned sea turtles have been found during severe events.
- Create maps of minor, moderate, and severe alert search areas and make an adequate number of copies to provide a copy for each search team each day. The searchers will mark their daily search areas and make notes regarding where sea turtles were recovered.

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- Identify the most appropriate sites for each search area where sea turtles recovered from the water can be dropped-off for transport to staging areas or holding facilities.
- Identify staging areas as needed where sea turtles from many drop-off sites can be taken for processing or temporary holding until transported to a holding or rehabilitation facility.
- Establish the ability to remotely monitor water temperatures in southern Mosquito Lagoon and in southwestern St. Joseph Bay (hourly ideal but at least daily).
- Develop an easy and appropriate way to immediately mark cold-stunned sea turtles with a unique identifier (possibly using a flipper band). Determine a standardized way to create identifiers.
- Develop an easy and appropriate way to mark dead turtles that are not collected by searchers.
- Develop standardized methodologies for flipper tagging and PIT tagging cold-stunned sea turtles before release.
- Develop standardized cold-stunning data collection strategies. Create a cold-stunning event data form. Put the FP documentation form on the back of this data form. Use lightly-colored waterproof paper to help identify originals from copies. Create enough copies of these to use during events.
- Develop release strategies. Should loggerheads and larger green turtles be released first? Identify easy ways to determine water temperatures at potential release sites. Check with FWC, NMFS, and local authorities for ongoing activities at release sites that may impact releases (such as dredging or other construction or other activities). No releases conducted after dark. Need sufficient personnel at release sites, including LE when a large number of the public may be present. Threshold water temperature for release ( $> 12^{\circ}\text{C}$  with forecast stable or warming for release of green turtles and  $> 10^{\circ}\text{C}$  with forecast stable or warming for release of loggerheads). Decide on potential release sites and preferences beforehand. Notify public information staff for media coverage of releases.
- Investigate the availability of satellite phones to use as aids to communication in remote areas during cold-stunning events. Determine how these would be obtained during an event and where and when they would be used.
- Investigate the possibility of using stackable containers to hold and transport sea turtles. Purchase and stockpile containers if suitable.
- Investigate the possibility of using a rolling winch to move heavy turtles and other carts to move turtles.
- Recruit veterinarians with the necessary expertise that would be willing to help during sea turtle cold-stunning events.
- Develop plans for holding up to 1,000 Dead Sea turtles for necropsy or sample processing.
- Prepare pre-made kits for processing turtles – calipers, tagging supplies, data form, clipboard, pens.
- Identify cameras so that each staging area has a single camera dedicated for photographs of cold-stunned sea turtles. Prepare for adequate storage space for photographs.
- Develop standardized logs that will be used to record turtles being delivered, transported, received, and released.

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- Develop a list of daily jobs that volunteers may perform. Expect last-minute volunteers to show-up during event. Identify volunteer leaders or organizers at each site who will be able to review available volunteer resources, define the skills of volunteers, and track the efforts of specific volunteers (to later recognize efforts).
- Investigate the possibility of renting large tents for use at staging area and some holding or rehabilitation facilities. Need to be able to heat the tent.
- Address data issues. Need high-speed copier at staging areas and holding facilities with large numbers of sea turtles. Need bins to hold data sheets. Need people dedicated at each site to oversee data collection and management. Investigate the possibility of entry of data into a computer database in real-time. Develop spreadsheet that would be updated at the end of each day to summarize how many turtles are at each facility and at staging areas and whether they are in water or dry. Develop a simple reporting sheet for each facility to submit to event coordinators at the end of each day (via fax or phone). This report would also include how much additional space is available at each facility.
- Address transport issues. Identify vehicles needed for minor, moderate, and severe events. Consider transport from boat drop-off locations to staging areas, from boat drop-off locations to holding or rehabilitation facilities, from staging areas to holding or rehabilitation facilities, and from holding or rehabilitation facilities to release sites. Vehicles must be covered and heated vehicles are preferable. Consider using stackable containers to keep sea turtles separate and to maximize use of space. Padding will be need in containers and on the floor for large turtles. Create maps beforehand that show directions to holding or rehabilitation facilities and release sites.
- Consider permit issues beforehand for those who will receive samples from cold-stunned sea turtles or whole turtles.

## **Pre-Event Preparation (Specific)**

- Communicate with sea turtle rehabilitation facilities every November to evaluate their likely ability to hold cold-stunned sea turtles during the following December and January. Update contact information as needed.
- Communicate with primary searchers and transporters every November to confirm availability during the following December and January. Update contact information and recruit replacements as needed.
- Communicate with CST and veterinarians every November to confirm availability the following December and January. Update contact information and recruit replacements as needed. Discuss the possibility of needing additional staffing in the event of a severe cold-stunning event. Possible needs are veterinarians and veterinarian assistants with sea turtle expertise, sea turtle biologists, good sea turtle data organizers, and marine mammal stranding response personnel. Identify potential staffing and decide how they would be mobilized, and how their travel and time would be covered.
- Coordinate with NMFS and FWC Imperiled Species Management every November to update list of samples wanted from cold-stunned sea turtles and protocols for collection. Have qualified veterinarian review and approve protocols for collection of samples from live turtles. Determine if and when independent teams are needed to collect samples. Need plan for holding and transporting whole carcasses.

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- Check holding capability at Gulf World in Panama City. This is the primary holding facility for cold-stunned sea turtles from the Panhandle (primarily St. Joseph Bay). Move one trailer with two MASH units to Gulf World if additional holding capabilities are needed.
- Moved one trailer with two MASH units to the Brevard Zoo (to serve as the primary holding facilities for sea turtles from Brevard County (primarily Mosquito Lagoon). Have four other MASH units in ready reserve.

## Pre-Event Monitoring

- Monitor water temperatures on a daily basis (ideally on an hourly basis) in southern Mosquito Lagoon and southwestern St. Joseph Bay during December–March.
- Use 10-day extended weather forecast to estimate the 10-day future trend of water temperatures in southern Mosquito Lagoon and southwestern St. Joseph Bay.
- Begin alert status when water temperatures drop to 12°C and are forecast to drop below 10°C.

**Minor Alert** – Water temperatures expected to drop below 10°C within 48 hours and stay below 10°C for up to 3 days. Cold-stunning of about 100 sea turtles possible.

**Moderate Alert** – Water temperatures expected to drop below 10°C within 48 hours and stay below 10°C for 3-6 days. Cold-stunning of hundreds of sea turtles possible.

**Severe Alert** - Water temperatures expected to drop below 10°C within 48 hours and stay below 10°C for 6-10 days. Cold-stunning of thousands of sea turtles possible.

## Alert Status Actions (All alerts)

- Communicate with the FWC dispatch supervisor to ensure that all dispatchers in all districts know how to handle reports of cold-stunned sea turtles. Notify FWC LE commanders in each district regarding alert status and expectation of activity.
- Communicate with FWC Public Information Coordinators regarding alert status and expectation of activity.
- Communicate with sea turtle rehabilitation facilities regarding alert status and expectation of activity.
- Be prepared to use specially designated holding facilities for cold-stunned sea turtles.

## Minor Alert Status Actions

- Contact minor event searchers to begin looking for cold-stunned sea turtles in minor alert search areas within 48 hours.
- Contact minor event transporters to coordinate with searchers. Prepare to transport up to 50 turtles per day over a 2-3 day period.

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- Confirm availability of space for up to 100 cold-stunned sea turtles at Gulf World if Panhandle cold-stunning event is expected. Set-up two MASH units at the Brevard Zoo and have two in ready reserve if east coast cold-stunning event is expected. Determine which rehabilitation facilities can take turtles in need of medical care.
- Contact the veterinarians that may be needed to help with a minor cold-stunning event.
- Prepare to hold or process up to 50 Dead Sea turtles.

## **Moderate Alert Status Actions**

- Contact moderate event searchers to begin looking for cold-stunned sea turtles in minor alert search areas within 48 hours and to begin looking for cold-stunned sea turtles in moderate alert search areas within 72 hours.
- Contact moderate event transporters to coordinate with searchers. Prepare to transport several hundred sea turtles over a 3-6 day period.
- Confirm availability of space for up to 500 cold-stunned sea turtles at Gulf World if Panhandle cold-stunning event is expected. Set-up four MASH units at the Brevard Zoo and have two in ready reserve if east coast cold-stunning event is expected. Determine which rehabilitation facilities can take turtles in need of medical care.
- Contact the veterinarians that may be needed to help with a moderate cold-stunning event.
- Prepare to hold or process up to 100 Dead Sea turtles.

## **Severe Alert Status Actions**

- Contact severe event searchers to begin looking for cold-stunned sea turtles in minor alert search areas within 48 hours, to begin looking for cold-stunned sea turtles in moderate alert search areas within 72 hours, and to begin looking for cold-stunned sea turtles in severe alert search areas within 96 hours.
- Contact severe event transporters to coordinate with searchers. Prepare to transport several thousand sea turtles over a 6-10 day period.
- Confirm availability of space for up to 1500 cold-stunned sea turtles at Gulf World if Panhandle cold-stunning event is expected. Use MASH units if needed. Set-up eight MASH units at the Brevard Zoo and have two in ready reserve if east coast cold-stunning event is expected. Determine which rehabilitation facilities can take turtles in need of medical care and which can hold extra turtles not in need of medical care.
- Contact the veterinarians that may be needed to help with a severe cold-stunning event.
- Prepare to hold or process up to 1,000 Dead Sea turtles.

## **Search and Collection of Turtles on Water**

- Search in pre-defined areas and use provided maps to mark search areas and areas where turtles were found (and numbers if possible).
- Collect all sea turtles that are immobilized, cannot dive, or that can be easily captured by hand.

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- Bring in all immobilized sea turtles (dead or alive) if possible. If space on the search vessel is limited, the order of priority (from highest to lowest) for the collection of sea turtles is as follows: those that are definitely alive (responsive), those that are unresponsive but are not in rigor mortis (perhaps alive, perhaps dead), and those that are definitely dead (in rigor mortis or decomposing).
- Mark collected sea turtles using the three-digit location code and the day of the month (three letters and one number). Green turtles, Kemp's ridleys, and hawksbills will be marked (in duplicate) on the carapace with a water-proof marker (after cleaning and drying an area on the carapace as much as possible). Use a capital "P" after the day of the month to designate a turtle with fibropapillomatosis. Loggerheads will be marked (in duplicate) using flipper bands. The three-digit location and day of the month will be written on the band. Use a different color band for each day. Use one red band to identify loggerheads with fibropapillomatosis (FP).
- Mark dead turtles using the same system but with a capital "D" after the day of the month.
- Transport live sea turtles right-side-up and on a padded surface if possible. Sea turtles may be held upside down for short periods (< 30 minutes) if necessary. Be sure to right turtles in the same direction they were turned upside-down (do not rotate a turtle in this manner 360 degrees – only 180 degrees). Do not place sea turtles on abrasive surfaces. Protect sea turtles from wind as much as possible.
- Maintain regular communications with associated drop-off location and staging location to advise of search status, number of sea turtles being brought in, and estimated time of arrival.
- Conduct briefings with search teams every morning to review search areas and specific strategies and to provide search maps and sea turtle marking supplies.
- Conduct debriefings with search teams every afternoon to collect data on work conducted that day, to evaluate search effort methodology, and to discuss search strategy for the following day.

### **Transport of Turtles from Boat Drop-off Location to Staging Location or Holding or Rehabilitation Facility**

- Transport live sea turtles right-side-up and on a padded surface if possible. Sea turtles may be held upside down for short periods (< 30 minutes) if necessary. Be sure to right turtles in the same direction they were turned upside-down (do not rotate a turtle in this manner 360 degrees – only 180 degrees). Do not place sea turtles on abrasive surfaces. Protect sea turtles from wind as much as possible. Covered vehicles preferable and necessary for long (> 30 minute) transports.
- If taking sea turtles from boat drop-off locations, the transport vehicle operator needs to know the general location where each load of sea turtles was collected. If taking turtles from a staging location to a holding facility, the transport vehicle operator needs to have any original data sheets on any of the turtles that are being transported to give to the holding facility.

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- Maintain regular communications with associated search boat to coordinate pick-up of sea turtles and to minimize wait for search boat and for sea turtles at boat drop-off location.
- Maintain regular communications with associated staging location or holding facility to advice of number of sea turtles being brought and estimated time of arrival.

## Handling of Sea Turtles at Staging Location

- Evaluate each sea turtle as it is removed from the transport vehicle. This evaluation is to be conducted by a sea turtle biologist.
- Check to make sure each sea turtle is appropriately marked or banded. Apply marks or bands as needed (consult with the vehicle driver to get the location where the turtles were found).
- Segregate sea turtles by those that have FP and those that don't have FP. Make sure each turtle with FP has the appropriate mark or flipper band color. Set-up separate area for turtles with FP and make area clearly defined with signage and dividers such as sand fencing.
- Segregate sea turtles that are non-responsive from those that are responsive. Set-up a separate area for non-responsive turtles and make area clearly defined with signage and dividers such as sand fencing. Place non-responsive turtles on pads that elevate the posterior end (so that the head is lower) to allow any fluids to flow out of the lungs.
- Segregate sea turtles with injuries that may require medical treatment from those without such injuries. Set-up separate area for injured turtles and make area clearly defined with signage and dividers such as sand fencing. Make injured turtles a priority for transport to a rehabilitation facility.
- Maintain a daily log of all sea turtles that arrive at the staging area. Count the number by search area and note how many were dead and how many had FP.
- Hold sea turtles on padded, non-abrasive surfaces in a building with an air temperature between 60 and 70°F. Apply triple antibiotic ointment to the eyes of every turtle each day the turtle is held out of the water. Do not cover the turtles and do not place turtles directly in front of heaters. Clean all holding areas at least once a day (preferably twice a day). Clean turtles that are held overnight. Wet turtles held overnight with clean freshwater.
- Provide inspection of staging area at least once a day by a veterinarian. Maintain a veterinarian on-site as much as possible.
- If time allows, if appropriate personnel are available, and if turtles can be maintained separately in clean conditions during transport, apply external flipper tags and an internal PIT tag. Do not tag turtles with FP or that are injured. Ideally, a team of three people is needed to tag. There should be a data recorder who stays clean, an assistant who prepares tags and cleans tagging site, and a tagger/measurer. These teams should try to stay together as much as possible to promote continuity.
- If time allows, begin a data form for each turtle. This data form will be sent with the turtle wherever it goes. Use the cold-stun event data form.
- If time allows, complete an FP documentation form for each turtle that has FP. This form is on the back of the cold-stunning event data form and will be sent with the turtle wherever it goes.

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- If time allows, take a dorsal and ventral photograph of each turtle with the camera that is dedicated for this purpose. Make an ID card to be placed in each picture that has the unique identifier code and location code or the external flipper tag numbers (if present).
- Maintain a daily log of all sea turtles that leave the staging area for holding or rehabilitation facilities. Note destination of each turtle.
- Any sea turtle that remains non-responsive after being held overnight can be declared dead (barring any other indication of life).
- Clearly mark all dead turtles and place in a separate area. As time allows, complete data forms for and take photographs of each dead turtle. Ideally, one processing team will be dedicated to working with dead turtles. Freeze dead turtles as necessary.

### **Handling of Sea Turtles at Holding or Rehabilitation Facility**

- Check to make sure each sea turtle is appropriately marked or banded. Apply marks or bands as needed (the vehicle driver should have the data on where and when the turtles were found).
- Maintain a daily log of all sea turtles that arrive at the holding facility. Note the number of dead turtles and the number with FP.
- As time and circumstance allow, make sure that all turtles eventually get an external flipper tag and an internal PIT tag. Begin a data form for each turtle that does not already have one. Use the cold-stunning event data form. If not already done, complete an FP documentation form for each turtle that has FP. This form is on the back of the cold-stunning event data form and will be sent with the turtle wherever it goes. Take a dorsal and ventral photograph of each turtle that has not already been photographed with the camera that is dedicated for this purpose. Make an ID card to be placed in each picture that has the flipper tag numbers.
- Maintain a daily log of all sea turtles that leave the holding facility for the release site using tag numbers. Note the release site for of each turtle.

### **Transport of Turtles from Holding or Rehabilitation Facility to Release Site**

- Transport live sea turtles right-side-up and on a padded surface if possible. Sea turtles may be held upside down for short periods (< 30 minutes) if necessary. Be sure to right turtles in the same direction they were turned upside-down (do not rotate a turtle in this manner 360 degrees – only 180 degrees). Do not place sea turtles on abrasive surfaces. Protect sea turtles from wind as much as possible. Covered vehicles preferable and necessary for long (> 30 minute) transports.
- The transport vehicle operator needs to have a list of the turtles (with tag numbers) being taken for release.
- The transport vehicle operator needs to be able to communicate with the holding facility to advice on arrival time at the holding facility and to communicate with personnel at the release site to advice on arrival time at the release site.
- Transport needs to be coordinated so turtles arrive at the release site at least one hour before sunset.