Mass Audubon
Felix Neck Wildlife Sanctuary

2021 Training Handout for Horseshoe Crab Spawning Surveys

EQUIPMENT

Tashmoo gear is at the Loberg's house (see directions at bottom of this document)

Gear Provided at the Location: *Clipboard, pencils, coin, thermometer, Data Sheets, compass, wind gauge, quadrat stakes/rope.* There are also laminated sheets with info for how to record data plus a Map of the survey area.

Please check the MAP for survey areas and ***which end is North v. South.***

WHAT TO WEAR & BRING

Someone in the group needs waders/hip boots or water shoes. Waterproof shoes or boots are a good idea for everyone. Polarizing sunglasses are an asset, even during the early evening. Bring a Flashlight or Headlamp for night surveying. It can also be quite cool, esp. in the evening/night.

There are 2 pairs of waders at FN – Men's 9 and 6 (=women's 8 – bring heavy socks if your feet are small)

[Donations of waders in good condition are always needed]

SURVEY PROTOCOL

Mass Division of Marine Fisheries Protocol

1) **ARRIVE at beach ½ hr before** the High Tide to gather gear, set tide stake, and record info on first page (note – times on Sign-up sheet are the High Tide times). ***Record time you arrived*** *at the survey site.* [Note: tide times are approximate and can vary by many minutes depending on the weather and shore currents. We have found the tide to have turned 15-30 minutes *before* stated time on occasion; hence the need to arrive well ahead of posted time of high tide.]

2) WHICH END: Toss the coin to determine whether you will start at the North or South end of the beach. ***Record which end you start*** *on the Data sheet.*

3) **Plant TIDE STAKE** at swash line as soon as you get to your starting end.

4) **Fill in rest of DATA COVER SHEET**: surveyors' names, phone #, and e-mail; weather and water info.

   WEATHER: Crabs tend to prefer quieter water for spawning. If there are wind-driven low waves on the beach and no crabs, do stretch/swing the quadrat ropes out to quickly do the beach (details below).

If it is rough water or stormy, do not survey, but ***please fill out the info on the first page*** *(surveyors, time of arrival and tide and weather info).*

5) Determine START SPOT by using **Random Number Sheet** (good science requires avoiding procedures that might lead to bias when recording data. It is therefore important to vary the exact starting location of each survey.)

   "Blindly" put a finger on the Random Number sheet. The number the finger is on or closest to is the RADOM NUMBER for this survey. ***Record this number on the data sheet.***

   The *last digit* will be the *number of meters* from the official start location at the north or south end (see map) where you put the first quad stake. Plant one end stake at the official starting spot (see map) and stretch the rope along the edge of the water. The red marks are *1-meter marks* – use these to mark off the number of meters the random number indicates and begin the survey at that spot.

   - Ex: If the random # ends in "2", you begin 2 meters from the official start spot; if it ends in "8" you begin 8 meters from the official start spot; if "0", you begin right at the official start spot.

   We survey **Contiguous Quadrats**. Always keep the forward stake firmly in the beach before moving the other stakes beyond it. Two stakes will always be along the swash line. The 3rd stake will be stretched out into the water. The 3 stakes with two 5M lengths of rope between create 2 sides of the quadrat. The other 2 sides are estimated.

6) DATA SHEETS: ***Record the Beach*** *and* ***Date,*** *and circle* ***Day*** *or* ***Night*** *at top of each sheet.* ***Fill out data sheets*** *completely, legibly, and accurately.*

   Number each Quad as you survey. **RECORD Quads from Left to Right across the page**.

   "Cluster" = 1 pair (1 male attached to 1 female) OR 1 pair plus 1 or more "satellites" (1 or more unattached males close by the pair and trying to get into the action).

   Record clusters in a quadrat on the #*Clusters*_____line for that quadrat:

   - Ex: a quadrat has one pair of crabs (female w/attached male) – record: "1 pr" on Cluster line
   - Another quadrat has 2 pair, and one pair has 1 satellite male - record: "1 pr, 1pr +1 M" Another quadrat has 2 pairs – record: 2 pr on Cluster line
   - A quadrat has 1 pair and also a single male in another part of the quadrat - record: 1 Pr on Cluster line and 1 M on Singles line for that quadrat.

If a crab's body is ½ in a quadrat, it counts for that quadrat only. If it straddles 2 quadrats, count the crab only once and record in quadrat where the majority of its body is located.

Most quadrats will have no crabs. Record: "0". Zero crabs is important data!

Determining gender of single crabs: Estimate males as being about the width of a man's hand spread. FEMALES are much larger than males. Males have thumb-like claspers instead of regular claws on front pair of legs, plus the front of the shell is somewhat curved to straddle the female's shell (which is straight across the front). Feel free to turn a SINGLE crab over to check legs.

Record **# of Females, # of Males** and **# of Outside Crabs** in a quadrat on the lines for that quad.

- "*Outside Crabs"* are those crabs you can see in deeper water beyond your quadrat. There also may be Outside Crabs before or beyond the end points of the survey beach, (esp. at the north end at Tashmoo because of configuration of the sandbar and flats).

Skipping Quadrats: If a section of the beach is under water, you will not able to survey it. Survey up to or away from the inundated stretch of beach and make a note on the front of your data sheet. (For ex, "North end inundated and not surveyed")

- At Tashmoo, if the "point" (where the beach turns a bit near the north end) is under water but beach beyond the point is out of water, skip the inundated section and **put *"X" in each quad box that you must skip***. Estimate number of quadrats skipped as best as you can.
- **DO NOT PUT "0" IN SKIPPED QUADS**. Only put "0" in quads where you COUNT no crabs. If the water is unusually high and choppy, do not survey.

Record **Total # of Crabs** in quad (record 0 if no crabs), then move rope(s) to form next quadrat.

Day Surveys: If there are no crabs seen, you can survey quickly down the beach by stretching the ropes and stakes fully parallel to the water. Use 2 stakes + 1 section of rope for measuring 1 quadrat. Use 3 stakes + all rope for measuring 2 quadrats at a time. *Be sure to mark a "0" in each quadrat marked this way on your data sheet.* Survey by "swinging ropes" end to end. This way until you see crabs, then stop and create a quadrat with ropes as usual.

PLEASE BE SURE TO COUNT QUADRATS ACCURATELY and record a "0" on the data sheet for each empty quadrat. **At night, *always have someone walking in the water* w/a light** looking for crabs if you swing ropes down the beach.

7) COMMENTS SECTION on bottom of first page: note any comments you might have here.

- Ex: tire marks on beach; # crabs seen on beach between parking lot and survey beach; bait harvesting (see below), nest depressions or anything else of interest.

Return completed Tashmoo sheets to FN at your earliest convenience.

BAIT FISHERMEN

The beach is closed to bait fishermen during the 5 days around each full and new moon of May and June. Thus, you should not see bait fishermen collecting during the surveys. If you do see bait fishermen picking up crabs, document on the data sheets where they are working and whether they are taking crabs that you just surveyed. Do not engage them or try to stop them; *we cannot enforce the regulations*. If possible, record the fisherman's boat registration and/or truck license plate number on your sheet and let someone at Felix Neck know. We will contact the Environmental Police who is the responsible authority.

TRUCKS ON THE BEACH AT TASHMOO

Driving on the beach at Tashmoo is not permitted (as well as damaging to sensitive beach and wetlands). Please record license plate numbers or, if comfortable, call the police if a vehicle is on the beach. If you see fresh tire marks but no vehicle, mark it in the comments section.

DIRECTIONS TO THE LOBERG'S/TASHMOO SURVEY EQUIPMENT

The Tashmoo survey equipment is now being stored at Melinda Loberg's cottage by the survey beach so you don't have to pick it up and return it to Felix Neck.

The Loberg cottage is **#637**, the fourth to last house on Herring Creek Road, the road to Tashmoo beach and cut.

Herring Creek Road is the last right at the west end of Daggett Rd (off Franklin) – a long dirt road. This road is very bumpy. Drive slowly and allow extra time to get to site.

As you come around the curve and begin to drive along the lake shore, the shrubbery gives way to very low growth along the left side of the road. About ½ way to the end, just after the sand bar end of the beach, there will be a sign (*not* the first sign, if I recall) on the right saying "No parking on the street" and there will some pitch pines on left side starting to block the view of the lake.

The Loberg's house is the next driveway - a wide, short driveway with a large rock on one side (maybe both). The house is close to the road and is **a simple one-story "camp" with 4 windows and one door facing you**.

There is a narrow deck on the side of the house facing you, with the stairs on the right end leading up to the door. Under the deck, there are 2 sets of doors enclosing the storage areas under the deck. **The Survey Gear is inside the right storage area, directly below the cottage door:**

- Quadrat ropes/poles (there is a spare set), stake with orange survey tape for marking tide line and a small plastic box containing the survey sheets and small gear. Be sure the top is properly secured to protect contents.

Please secure lid - or it can blow off *and things will get rain wet.*