

Inland Bays Volunteer Horseshoe Crab Tagging Protocol



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Safety First!

Horseshoe crab tagging takes place on beaches, where volunteers may encounter a variety of hard-to-see hazards that could lead to falls, cuts, or other injuries. In addition, occasionally, tagging may take place at night after the horseshoe crab spawning survey, which significantly reduces visibility (low light) and increases tripping hazards.

To keep everyone as safe as possible, it is essential that all volunteers be familiar with and observe the following practices during the surveys. Team leaders will be responsible for enforcing safety rules, but all volunteers who see a safety issue should feel free to speak up. Volunteers who do not, or cannot, follow these rules will not be permitted to participate.

- All volunteers, including parents or guardians who accompany minors, must sign a liability waiver form. Minors must be supervised by their adult at all times. Team leaders are not appropriate supervisors for minor volunteers.
- If thunderstorms are in progress, do NOT go onto the beach.
- During night tagging, bring a headlamp or flashlight. Headlamps are preferred because they free up both hands. [High-lumen headlamps are best!] If you can set the headlamp to the red light setting, even better, as it causes less disturbance to nighttime wildlife.
- Wear appropriate clothing for the weather and wet conditions at the water's edge. Closed-toe shoes with soles are REQUIRED. No bare feet, flip-flops, or neoprene booties will be allowed. We recommend rubber boots, waterproof shoes (with soles), or old sneakers.
- Work gloves are useful when there are high densities of horseshoe crabs on the beach and for protecting your hands when handling them for tagging.
- Keep an eye out for tripping hazards or debris that may cause injuries to you or your teammates.
- Bay water contains bacteria that may, in rare cases, lead to serious infections of cuts or puncture wounds. If you have any open cuts or wounds, we recommend that you not participate until they are healed.
- Inform your team leader immediately if you sustain any type of injury, even if it seems minor. All teams will have a first aid kit. Consult a medical provider if you have any concerns, particularly if you sustain a cut or puncture wound that could become infected. Team leaders should complete an incident report form.
- Use sunscreen during the day and insect repellent when needed.
- Do not take risks or do anything that makes you uncomfortable. Safety is always the most important consideration.

Tagging Protocol

Horseshoe Crab (HSC) Tagging Teams & Members Rotation

The tagging team requires at least four individuals, each performing one or two tagging roles (*see below*), depending on the team members' experience and comfort. Team leaders or co-team leaders should be present during tagging events and are responsible for safekeeping all tagging materials. Please contact team leaders to secure and confirm tagging date(s) at your preferred site.

1. Grabber(s): the person who hand-captures HSCs to be tagged and holds them in place for the measurer.
2. Measurer- the person measures the prosomal width in millimeters.
3. Driller- the person who will drill the prosomal hole.
4. Tagger- the person who will insert the tag.
5. Recorder- the person who provides the tagger with the sequential tag and records prosomal width, estimated age of the HSC, and unusual characteristics of the tagged crab.

Tagging Procedure

Tags will be attached to the left wing, the left posterior (rear) point of the prosoma, (*see Figure 1*). There is a high concentration of fibrous material within the body in this area, which minimizes bleeding. Before drilling the attachment hole, clean off any epibionts (barnacles, slipper shells, algae, etc.) near the attachment site.

The tag is attached by drilling a 5/32" hole through the left side of the prosoma near the dorsal edge and then pushing the plastic pin (with tag) into the hole as far as it will go. It should NOT go all the way through the prosoma and come out the other side. The cork "stop" will allow the drill to only penetrate the first layer of the wing. A small amount of bleeding may be noticed, and occasionally eggs will exude from the drilled hole. Attach only one tag per horseshoe crab. If the HSC is damaged or has heavy epibionts attached near the tagging site, attach the tag to the opposite side (*remember to record this change in the data sheet*), OR do not tag the animal.

On the data sheet, record the tagger's name and the organization affiliation. Other data that need to be collected for each HSC include the tag number, sex, age, prosomal width (PW) in millimeters (measured at the widest point of the HSC), the date tagged, beach name, waterbody name, and state. Preprinted Tagging Record Sheets with tag numbers are included in your tagging materials. Record descriptive information on a crab, such as damage to prosoma, lost appendages, or excessive epibiont growths on the carapace of the HSC.

Age Determination for HSCs

Horseshoe crabs live approximately 21 years and molt yearly until reaching sexual maturity at approximately age 9-10. It then undergoes its final molt, and sexual dimorphism is marked, allowing gender determination. Age classification for our study will be Young Adult (Y), Mature Adult (M), and Old Adult (O) (*see Figure 2*). A young adult will have recently undergone its final molt, developed its sexual dimorphism, and have a smooth "waxy" appearance with little or no epibionts attached. As the HSC ages, it will lose its waxy texture and darken from deep olive green/brown to almost black in color as the upper layer is worn away. Mature adults will start to have areas eroding where bacteria and fungi have softened the chitinous material of the prosoma. There may be significant epibionts attached. The Old adult will be very dark in color, have soft areas on the prosoma, and may actually have holes in the prosoma.

Tag Returns and Rewards

Tag return information will be taken by the USFW-Maryland Fishery Resources Office via the website printed on the tag. For anyone who returns tagged crab information, a certificate of release, a letter about the program, a pewter horseshoe crab pin (one per household), and fact sheets of shorebirds and horseshoe crabs will be sent out from the USFW. If you encounter previously tagged HSCs in your tagging study (not from the current year), record the tag number and sex of the HSC in the margin of your tagging record sheet so that the tag may be included in the team leader's Resight Report that the Center submits to USFW each year at the end of the season.

Submission of Data Sheets

Completed tagging data sheets should be returned to Nivette Pérez-Pérez at the Delaware Center for the Inland Bays (39375 Inlet Road, Rehoboth Beach, DE 19971). Please make a copy of your data sheets for your records as a backup. The information from your data sheets will be transferred to the USFW reporting form and electronically sent to the Regional Office in Annapolis, MD.

HORSESHOE CRAB TAG PLACEMENT

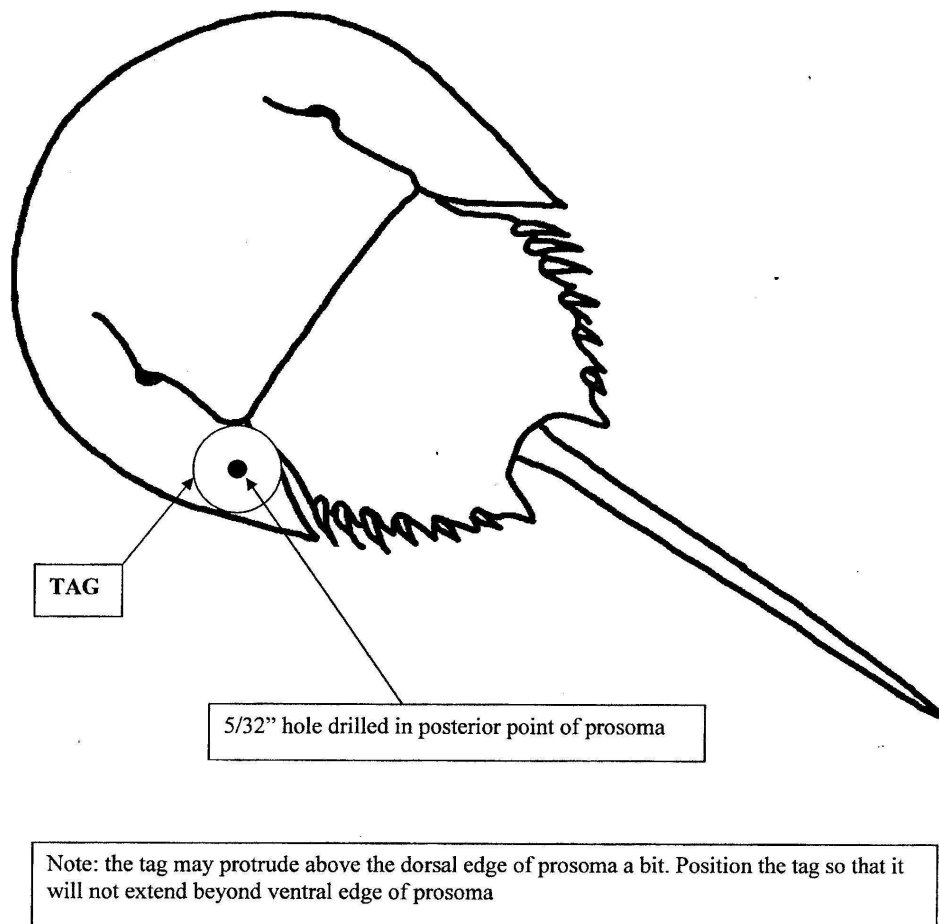


Figure 1. Horseshoe crab tag placement. Attached to the left wing, the left posterior (rear) point of the prosoma.

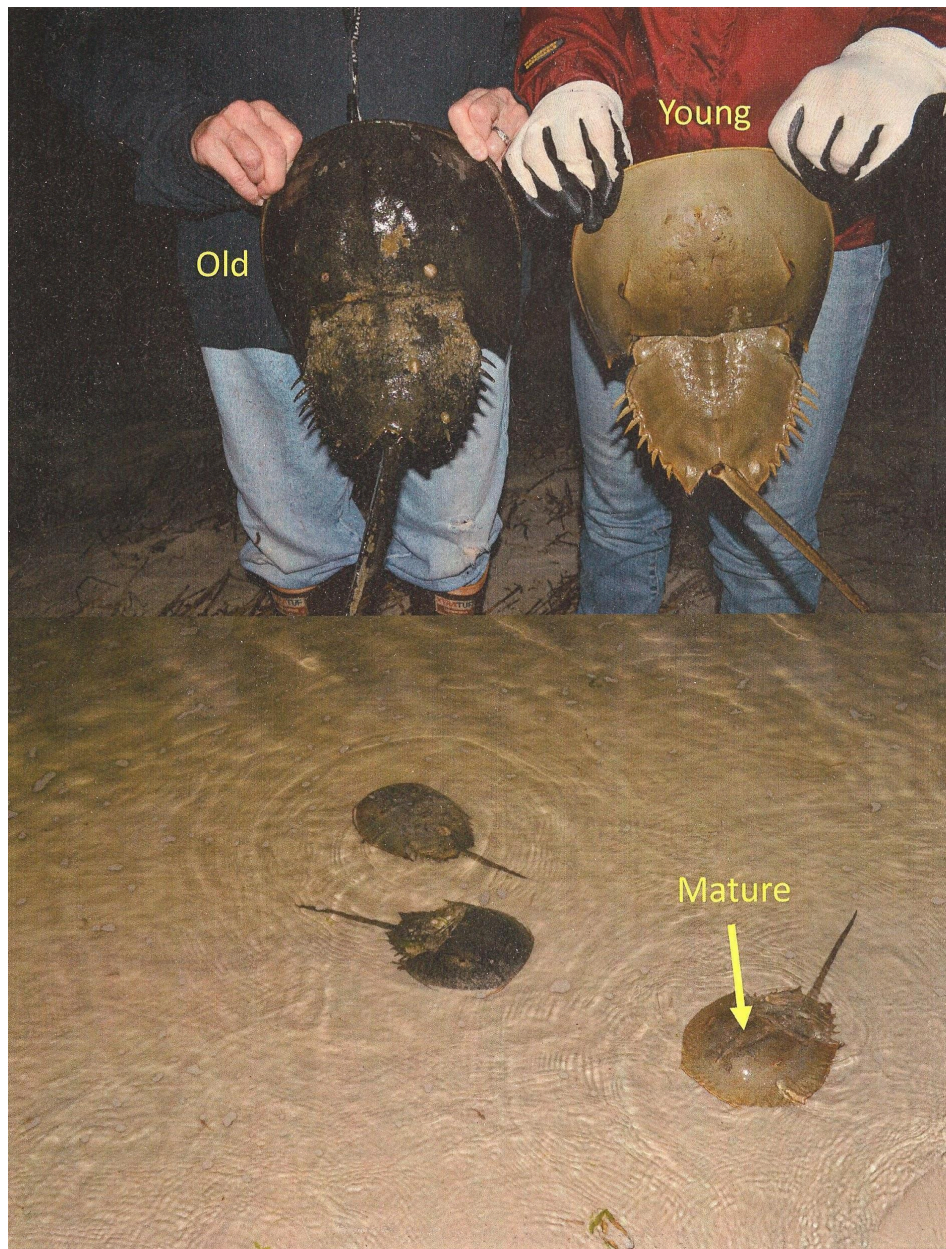


Figure 2. Age classes of horseshoe crabs. The mature HSC will show areas of darkening on the prosoma due to wear during spawning and through epibiont activity. Photo by Delaware Center for the Inland Bays- Eric Buehl

Horseshoe Crab Survey Contacts

Coordinators

- Nivette Pérez-Pérez (Center), Manager of Community Science
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- Mary Kunst (Center), Participatory Science Technician
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Site Team Leaders

Site	Team Leader (s)	Phone Number	Email
Tower Road	Isabel Benson	302-228-2383	issy1to4@comcast.net
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Bay Colony	Bridget OShaughnessey	301-467-0237	bridgetoshaughnesseyusa@gmail.com
The Peninsula	Rosemary and Ed Hoffmann	973-300-5325	hoffmannrosemary@yahoo.com; edhoffmann713@yahoo.com
Ellis Point	Terry Shuchart	717-586-4043	tshuchart713@gmail.com
Camp Arrowhead	Gary Nennstiehl Kristin Peters	410-251-0477	garynenn@gmail.com; adultsknowbetter@gmail.com

Equipment & Supplies

- Five-gallon buckets
- Cordless drill
- 5/32" drill bits
- Tags with attachment pins
- Data Sheets for assigned tags
- Metric rule for measuring prosoma width
- Clipboard & pencils
- Work gloves for those handling the HSCs
- First Aid Kit
- Camera

Personal Things to Bring

- Headlamps/ flashlights (for occasional night tagging)
- Insect repellent
- Closed-toe shoes w/ soles (no bare feet or flip flops)!
- Mobile phone with Team members and emergency numbers
- Camera in a Ziploc bag for water-resistant storage
- Gloves