

Inland Bays Volunteer Diamondback Terrapin Monitoring Program



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INLAND BAYS
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Introduction

Thank you for being a part of the annual CIB Volunteer Diamondback Terrapin Survey! This packet will give you everything you need to know in order to help us complete our survey of the Terrapin population in Rehoboth, Indian River, and Little Assawoman Bays. By participating in this survey together, we will be able to start to paint a picture of this species' population status in Delaware's Inland Bays.

Below are the protocols for both the land-based and water-based surveying techniques.

Access these protocols and additional survey resources from your computer or mobile device at <https://arcg.is/1OXyLn> or in the Center's Better Impact- Files library.

Land-Based Terrapin Surveys

Safety First!

For the land-based survey, you will be visiting one or more of the twelve survey locations. While the primary aspect of this survey is visual observation, and we do not expect any substantial hazards, safety is still our number one priority. It is essential that all volunteers be familiar with and observe the following practices during the surveys. Volunteers who do not, or cannot, follow these rules will not be permitted to participate.

- All volunteers must sign a liability waiver form, including parents or guardians who accompany minors. Minors must be supervised by an adult at all times.
- If thunderstorms are in progress, **do not** attempt the survey. Additionally, surveys should not be completed in any foul weather due to the strict wind & cloud-cover requirements (see page 2).
- 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 are allowed. We recommend rubber boots, waterproof shoes (with soles), or old sneakers.
- Keep an eye out for tripping hazards or debris that may cause injuries to you or other volunteers.
- 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 it is healed.

- Inform the project manager and the volunteer survey coordinators immediately if you sustain any type of injury, even if it seems minor. Consult a medical provider if you have any concerns, particularly if you sustain a cut or puncture wound that could become infected.
- Use sunscreen and insect repellent when needed.
- Do not take risks or do anything that makes you uncomfortable. Safety is always the most important consideration.

Survey Protocol

Arrival & Setup

- All surveys must happen with:
 - Wind speeds less than 8 mph
 - Cloud cover less than 50%
 - Air temperatures over 50° Fahrenheit
 - Within 2 hours of low tide (this makes for a 4-hour potential survey window)
- Before departing for the location, please be sure to consult the tide calendar specific to the location and the closest DEOS Station (<http://www.deos.udel.edu/>) for wind and air temperatures.
- Land-based surveys will take approximately 20 minutes to complete. Please budget enough time to complete the entire survey during the tide window. All surveys must occur during daylight hours.
- The survey is designed to be completed by one person at a time. Larger groups traveling together are perfectly fine, but should each perform the survey separately and fill out separate data sheets, (one person for each data sheet).
- Use the maps provided to be as close to the marked survey point as possible.

Completing the Survey

- Once you arrive at your location, access your land-based data sheet by scanning the QR code (*see to the right*) with your phone or mobile device.
 - *Use hardcopy data sheets ONLY as a last resort in case the ArcGIS Survey123 data sheet or QR code is not working.*
- Fill out the background and weather portions of the data sheet as completely as possible. Use the Beaufort Wind Scale to describe and record wind conditions at the site. If possible, use an anemometer and record wind speed.
- Air and water temperatures can be taken from the nearest DEOS Station. Please be sure to note any changes in the weather throughout the course of the survey.
- Position yourself along the water's edge in a place with a clear view of 180° of water in front of you.



- Fill in the *Start Time* for survey period one.
- Perform a left to right visual sweep of the area, counting all terrapins visible using your eyes and your binoculars or spotting scope. During the left to right sweep of the water, count all terrapins visible, but do not count terrapins if they appear in an area you have already passed over during the sweep. This should only take a minute or so.
- If using binoculars or spotting scopes to increase accuracy for the area sampled, please note in the datasheet.
- Fill out the remainder of survey period one, noting the *End Time*, *total terrapins observed*, and any notes.
- If no terrapins are sighted, enter “none” in the “terrapins observed” column.
- Wait five minutes and repeat the left to right sweep. This process should be repeated again for a total of three left to right sweeps per site.
- *Additional Notes*: Mention any special conditions at your site that might affect the count or would be interesting to report to the survey groups. Use the data sheet note section as necessary.

Some Notes on Counting

- Submerged or floating sticks can look like terrapin heads from a distance but will remain in the same spot. Terrapin heads will move, submerge, and most likely reappear.

Once You Are Done Surveying

- Following the third sweep, fill out the remainder of the data sheet, including *Survey Equipment Used*, add in any additional notes, and submit your data sheet.
- If something went wrong and you used a hardcopy data sheet, immediately scan or take a picture of it and shared it with Terrapin Survey Coordinators, Bill MacLachlan (billmacl221@gmail.com) and Joan Flaherty (flahertyj54@gmail.com).
- Return all of the original hardcopies by **June 30, 2024**, to the Manager of Community Science, Nivette Pérez-Pérez, Office: 302-226-8105, Email: volunteer@inlandbays.org (Note: PLEASE DO NOT FAX! WE NEED ORIGINALS!)
 - Completed Data Sheets
 - Completed Volunteer Timesheet with names and contact information for all volunteers
 - Liability waiver forms for all volunteers and visitors (scans are also acceptable).

Equipment & Supplies:

- Data sheet QR code
 - ONLY as a backup: Data sheet, clipboard & pencil
- Binoculars or spotting scope
- Sunscreen and head covering for sunny days
- Insect repellent
- Closed-toe shoes with soles are required.
- Water or other hydration, especially during hot weather
- Camera for recording some turtley-cool action shots!

Water-Based Terrapin Surveys

Safety First!

For the water-based survey, you will be embarking on a 1.5-3mile trip through some of the most beautiful marshes in the Inland Bays. Volunteers may encounter a number of potential hazards, with the potential for a number of different injuries. It is essential that all volunteers be familiar with and observe the following practices during the surveys. Volunteers who do not, or cannot, follow these rules will not be permitted to participate.

- All volunteers must sign a liability waiver form, including parents or guardians who accompany minors. Minors must be supervised by an adult at all times.
- All volunteers must complete the survey with another individual (two people including yourself maximum).
- If thunderstorms are in progress, **do not** attempt the survey. Additionally, surveys should not be completed in any foul weather due to the strict wind & cloud-cover requirements (see page 5).
- Wear appropriate clothing for weather and for being out on the water. Closed-toe shoes with soles are required. No bare feet, flip-flops, or neoprene booties are allowed. We recommend rubber boots, waterproof shoes (with soles), or old sneakers.
- Lifejackets are required for all boating/paddling trips.
- Keep an eye out for tripping hazards or debris that may cause injuries to you or other volunteers.
- 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 it is healed.
- Inform the project manager and the volunteer survey coordinators immediately if you sustain any type of injury, even if it seems minor. Consult a medical provider if you have any concerns, particularly if you sustain a cut or puncture wound that could become infected.
- Use sunscreen and insect repellent when needed.
- Do not take risks or do anything that makes you uncomfortable. Safety is always the most important consideration.

Survey Protocol

Background & Preparation

- Water-based surveys will occur in pairings of two observers (no more, no less) traveling by kayak or canoe, recording any terrapins seen, marking the locations with a GPS coordinate (decimal degrees, for example 38.4365, -75.1221)
- The routes traveled will be an out-and-back style, consisting of an "outbound" paddle and an identical "return" paddle, rather than a loop.
- Boats can also be used to complete this survey, but the locations selected are shallow and completed at low tide, and therefore will likely restrict boat access to all but shallow draft, flat-bottom skiffs.

- Any boat-based survey should be performed at the slowest speed possible and the volunteers must report the estimated speed they performed the survey.
- All surveys must happen with:
 - Wind speeds less than 8 mph
 - Cloud cover less than 50%
 - Air temperatures over 50° Fahrenheit
 - Within 2 hours of low tide (this makes for a 4-hour potential survey window)
- Water-based surveys will take approximately 2.5 hours to complete. Please budget enough time to complete the entire survey during the tide window. All surveys must occur during daylight hours.
- Before departing for the starting location, please be sure to consult the tide calendar specific to the location and the closest DEOS Station (<http://www.deos.udel.edu/>) for wind and air temperatures.

Arrival & Setup

- Once you arrive at your location, access your water-based data sheet by scanning the QR code (*see to the right*) with your phone or mobile device.
 - *Use hardcopy data sheets ONLY as a last resort in case the ArcGIS Survey123 data sheet or QR code is not working.*
- Fill out the background and weather portions of the data sheet as completely as possible. Use the Beaufort Wind Scale to describe and record wind conditions at the site. If possible, use an anemometer and record wind speed.
- Air and water temperatures can be taken from the nearest DEOS Station. Please be sure to note any changes in the weather throughout the course of the survey.
- Designate one individual as the data sheet operator. They will be collecting the terrapin counts on a phone or mobile device.
- Consult the survey map before departing.
- *Additional Notes:* Mention any special conditions at your site that might affect the count or would be interesting to report to the survey groups. Use the back of the data sheet as necessary.
- *NOTE: In case you have to use hardcopy data sheets, please follow the instructions below:*
 - Designate one individual as the GPS operator and one as the scribe. You will both look for turtles.
 - Smartphones are acceptable for use as a GPS, a few software options are available in the Equipment & Supplies section (see page 5).



Completing the Survey

- Once both you and your partner are on the water, take your first point to record a latitude and longitude reading, marking the start of your survey.
- Fill in the *Start Time for Run One*.

- As you paddle the route, record on the data sheet the GPS locations (by dropping a point in the data sheet map) for each turtle or turtle grouping seen.
 - If using a hardcopy record the latitude and longitude, as well as the number of terrapins seen per GPS point.
- Binoculars can be used, but the GPS point should be taken as close as possible to the terrapin's actual location.
- Both observers should look for terrapins.
- When a terrapin is spotted, one paddler will take the GPS point from the phone (or mobile device) and repeat the number counted out loud for the other paddler to verify.
 - If using a hardcopy record, when a terrapin is spotted, one paddler will take the GPS point from the handheld unit (or phone) and repeat this number out loud for the other paddler to record on a data sheet.
- If no terrapins are seen for 10 minutes, take a GPS point and write "0" under the *Terrapins Count point*.
- Continue to follow the pre-set path until you reach the end of the survey route. Take a GPS point marking the end of the first run, and fill in the *End Time* box as well.
- At this point, begin the return trip portion of the survey. Take another GPS point mark, note the *Start Time for Run Two*, and begin to count terrapins again while returning to your start point.
- For run two, count all terrapins again, marking GPS points, regardless of whether you think they are the same ones observed on run one.
- Continue until you reach the end of the second run and take the final GPS point.

Some Notes on Counting

- Submerged or floating sticks can look like terrapin heads from a distance but will remain in the same spot. Terrapin heads will move, submerge, and most likely reappear.
- Loud noises can startle basking terrapins. While talking is necessary, we recommend you keep the overall noise to a minimal level.
- A transect can be surveyed more than once if another pairing would like to do so. But our goal is to survey every site at least once, so please consider surveying an unclaimed transect before signing up for one that already has a team.

Once You Are Done Surveying

- Following the second run, fill out the remainder of the data sheet, including *End Time*, *Survey Equipment Used*, and add in any *additional notes*, and submit your data sheet.
- If something went wrong and you used a hardcopy data sheet, immediately scan or take a picture of it and shared it with Terrapin Survey Coordinators, Bill MacLachlan (billmacl221@gmail.com) and Joan Flaherty (flahertyj54@gmail.com).
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 - Completed Data Sheets
 - Completed Volunteer Timesheet with names and contact information for all volunteers

- Liability waiver forms for all volunteers and visitors (scans are also acceptable).

Equipment & Supplies

- Survey Partner
- Map of the survey location
- Kayak, canoe, or skiff
 - Paddle
 - Lifejacket
- Data sheet QR code
 - ONLY as a backup: Data sheet, clipboard & pencil
- Binoculars or spotting scope
- ONLY use as a backup: GPS (Phone works just fine)
 - iOS Devices
<https://itunes.apple.com/us/app/coordinates-calculateconvert/id494286614?mt=8>
 - Android Devices
<https://play.google.com/store/apps/details?id=com.latitudelongitude.gpscoordinates>
 - Google Maps GPS Coordinates website
<http://www.gps-coordinates.net> (Can be used by someone who doesn't want to install an app but still has GPS enabled. Be sure to allow location services the first time you visit the website if it asks.)
 - Windows Phones
<http://www.windowsphone.com/en-us/store/app/gpscalculator/4e06928ade12-e011-9264-00237de2db9e>
- Sunscreen and head covering for sunny days
- Insect repellent
- Aquatic sneakers or other appropriate footwear
 - Closed-toe shoes with soles are required.
- Water or other hydration, especially during hot weather
- Camera for recording some turtley-cool action shots!

Volunteer Terrapin Survey Contacts

Coordinators

- Bill MacLachlan (CIB-volunteer), Terrapin Survey Coordinator
Email: billmacl221@gmail.com
- Joan Flaherty (CIB-volunteer), Terrapin Survey Coordinator
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