

# Terrapin Survey

Maryland Coastal Bays Program

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# Maryland Coastal Bays Program

- As a National Estuary Program, the Maryland Coastal Bays Program (MCBP) is a non-profit partnership among the towns of Ocean City and Berlin, the National Park Service (NPS), Worcester County, the U.S. Environmental Protection Agency, and the Maryland Departments of Natural Resources, Agriculture, and Planning.
- One of only 28 such programs nationwide, our goal is to protect and enhance the watershed, which includes Ocean City, Ocean Pines and Berlin, and Assateague Island.
- East of Route 113, the 175-square mile watershed is home to the treasured resources of the St. Martin River, Newport Bay, Assawoman Bay, Isle of Wight Bay, Sinepuxent Bay, and Chincoteague Bay.



# Northern Diamondback Terrapins

- MCBP, in partnership with the Maryland Department of Natural Resources, is conducting the Terrapin Survey to better understand the current distribution of diamondback terrapins (*Malaclemys terrapin*) in the Coastal Bays.



Photo: Martha Johnson



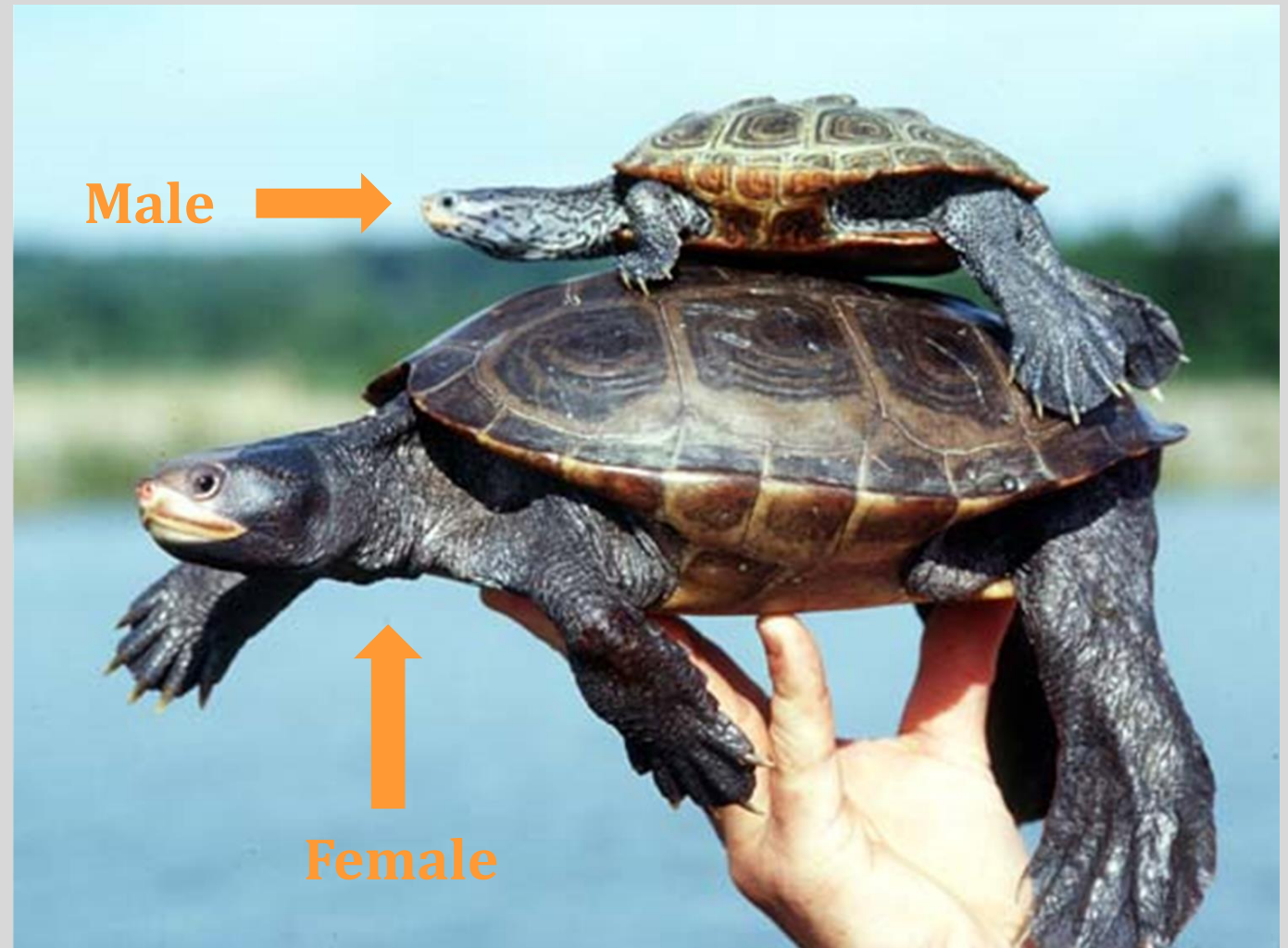
# Range & Habitat

- Live in coastal salt marshes, tidal creeks, estuaries, and brackish marshes along the East and Gulf coasts.
- Only exclusively brackish water turtle in the world.
- Found from Cape Cod, Massachusetts to Corpus Christi, Texas.
  - Seven subspecies found within this range.
  - Northern Diamondback Terrapin range is from Cape Cod, Massachusetts to Cape Hatteras, North Carolina.



# Size

- Females
  - Up to 9 inches
  - Larger, wider heads
  - Taller, rounded carapace
- Males
  - Up to 6 inches
  - Longer tails
  - Smaller heads
  - Flatter carapace



# Diet

- Bivalves
- Marine worms
- Shrimp
- Marine snails
- Blue crabs



# Nesting

- Mating: Mid-Spring
- Laying: Late May to Mid-July
  - 2 – 3 clutches annually
    - 8 – 10 eggs per clutch
- Hatching: 7 – 10 weeks after laying
  - Low egg and hatchling survival rates
- Temperature-dependent sex determination
  - $\geq 86$  degrees – mostly female
  - $\leq 82$  degrees – mostly male



# Threats

- Habitat Loss
  - Shoreline development
  - Wetland loss
- Vehicle Strikes
- Commercial Harvesting
  - Began in the late 18<sup>th</sup> Century
  - Ended in Maryland in 2007
- Derelict Crab Pots (“Ghost Pots”)
  - Bycatch Reduction Devices (BRDs) required for recreational crabbers in the Coastal Bays





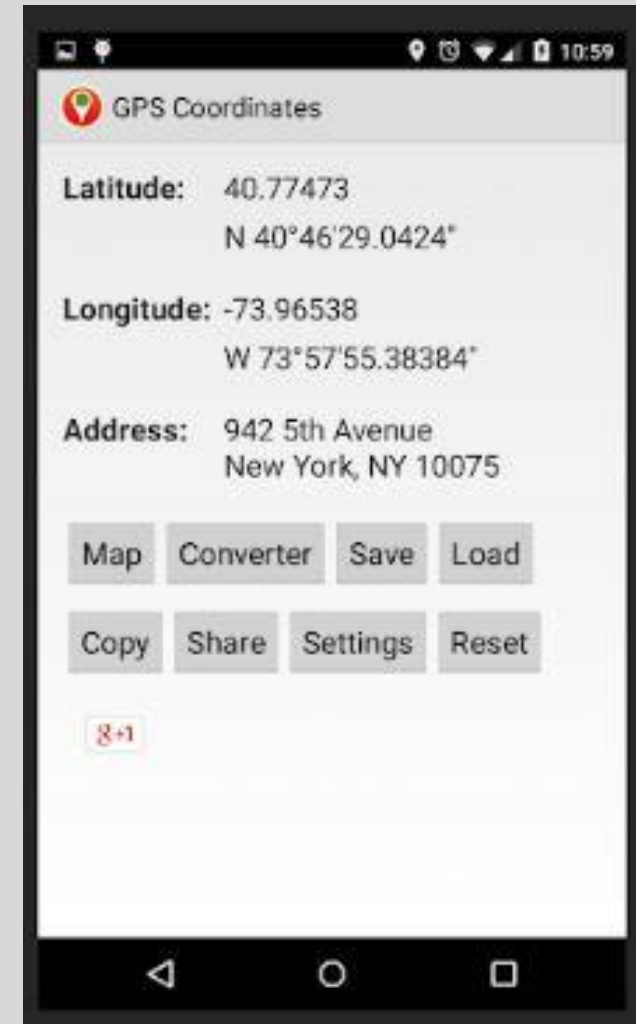
# Terrapin Survey

- Tuesday, May 31st through Saturday, June 11<sup>th</sup>
- Land-Based
  - Conducted from one of our public locations, chose from [this link](#).
  - 3 surveys, 15 minutes each
- Water-Based
  - Conducted via kayak, canoe, SUP, or motorboat at one of our monitored locations, chose from [this link](#).
  - One-way survey, with no time constraint



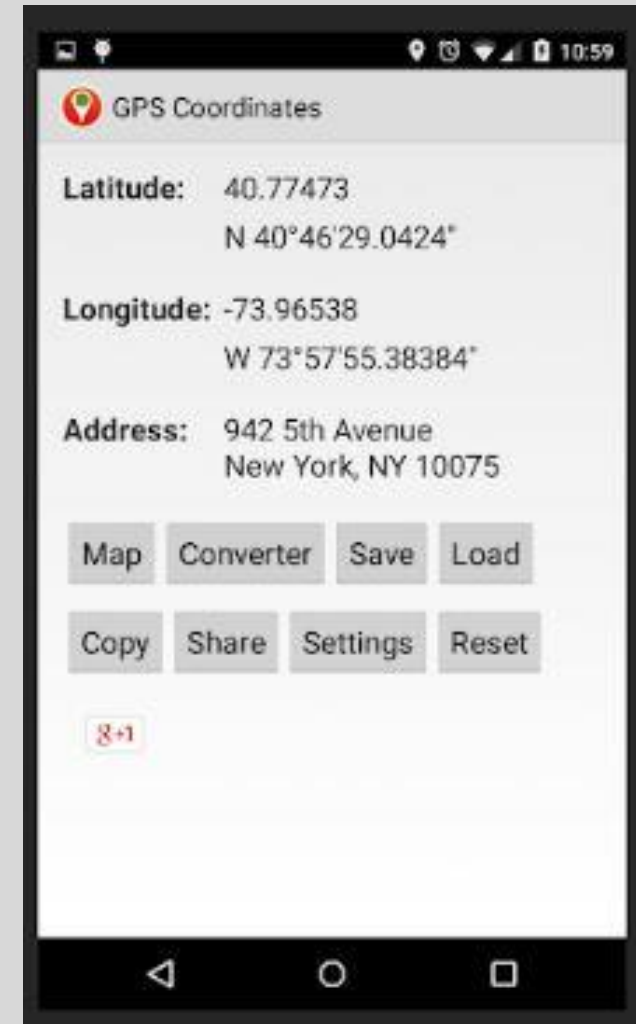
# Location

- Your location must be provided for the data to be useful.
- If you have a smart phone, there are a variety of apps available.
- **Coordinates must be in decimal degrees.**
  - Ex. Latitude: 40.77473 Longitude: -73.96538
- For boat surveys, take waypoints **every 10 minutes** if no terrapins are sighted.
- For land surveys, you may use an address if coordinates are not available.



# Location

- Coordinates" for iOS devices:
  - <https://itunes.apple.com/us/app/coordinates-calculate-convert/id494286614?mt=8>
- "GPS Coordinates" for Android devices:
  - <https://play.google.com/store/apps/details?id=com.latitudelongitude.gpscoordinates>
- Google Maps GPS Coordinates website. Can be used by someone who doesn't want to install an app but still has GPS enabled:
  - <http://www.gps-coordinates.net>
  - (Be sure to allow location services the first time you visit the website, if it asks.)
- "GPS Calculator" for Windows phones:
  - <http://www.windowsphone.com/en-us/store/app/gps-calculator/4e06928a-de12-e011-9264-00237de2db9e>



# When to Survey?

- Clear, sunny days are more likely to see basking terrapins.
- Rainy or windy days are less likely to see terrapins.
- Please do not survey in unsafe conditions!



# What to Expect

- Likely only the head will be visible.
- Observe with binoculars. If needed, go forward slowly to see if the head disappears underwater. If it does, it's a turtle! If not, it's probably a stick.



# Other Turtles vs. Terrapins



Northern Red-Bellied Cooter



Box Turtle



Snapping Turtle



Terrapin



# Supplies

- Binoculars or spotting scope\*
- Data sheets
- GPS, cell phone, or address\*
- Volunteer release form
- Contact form
- Hat, sunblock, bug spray, water

\*Land-survey only



# Water-Based Survey

- One-way survey
  - Motorboat, canoe, kayak, SUP
  - No time constraint
- Lat/longs of start, end, and locations of terrapins recorded
- Conditions recorded at start and end of survey
- Shoreline habitat at each survey location recorded
  - Marsh
  - Beach
  - Forest
  - Farmland/Agriculture
  - Developed





Water-Based Survey – we will provide you this data entry sheet when you register your location preference

| Date:  |           | Creek/River:                      |           | County:  |                  | Page ____ of ____ |  | <b>Diamondback<br/>Terrapin Head Count<br/>Survey Datasheet</b> |         |         |
|--|-----------|-----------------------------------|-----------|--|------------------|-------------------|--|---|---------|---------|
| Survey Type: <input type="checkbox"/> 30 Minute 2-Way Runs <input type="checkbox"/> 1-Way Survey (No Time Constraint)  |           |                                   |           |  |                  |                   |  |   |         |         |
| Type of Boat: <input type="checkbox"/> Motorboat <input type="checkbox"/> Canoe/Kayak <input type="checkbox"/> Other _____   |           |                                   |           |  |                  |                   |  |   |         |         |
| Boat Operator:   |           |                                   |           |  |                  |                   |  |   |         |         |
| Scribe:  |           |                                   |           |  |                  |                   |  |   |         |         |
| Observer(s):   |           |                                   |           |  |                  |                   |  |   |         |         |
| Start Time:  |           | Stop Time:                        |           | Tide at Start:   |                  | Tide at End:      |  | Overall Comments  |         |         |
| Weather at Start:  | Air Temp: | Water Temp:                       | % Clouds: | Wind Speed & Direction:  |                  | %RH:              |  |   |         |         |
| Weather at End:  | Air Temp: | Water Temp:                       | % Clouds: | Wind Speed & Direction:  |                  | %RH:              |  |   |         |         |
| Weather Comments:  |           |                                   |           |  |                  |                   |  | Total # Terrapins   |         |         |
| Please record lat-longs of start and stop points for each run plus some waypoints of route taken, and ALWAYS record Longitude as a negative number (for example: -76.15252). Note: Record all Lat-Longs in NAD 83 m DD |           |                                   |           |  |                  |                   |  | Ad F  | AdM/Juv | Undetm. |
|  |           | # of Terrapins<br>(if applicable) |           | Legend: MA=Marsh, BE=Beach, FO=Forest, AG=Farmland, DV=Developed |                  |                   |  | Comments  |         |         |
| Run #  | Ad F      | AdM/Juv                           | Undetm    | Waypt/Start/Stop   | Latitude (83mDD) | Longitude (83mDD) | Shoreline Habitat - Check All That Apply   |   |         |         |
|  |           |                                   |           | Start  |                  |                   | <input type="checkbox"/> MA <input type="checkbox"/> BE <input type="checkbox"/> FO <input type="checkbox"/> AG <input type="checkbox"/> DV <input type="checkbox"/> Other |   |         |         |
|  |           |                                   |           |  |                  |                   | <input type="checkbox"/> MA <input type="checkbox"/> BE <input type="checkbox"/> FO <input type="checkbox"/> AG <input type="checkbox"/> DV <input type="checkbox"/> Other |   |         |         |
|  |           |                                   |           |  |                  |                   | <input type="checkbox"/> MA <input type="checkbox"/> BE <input type="checkbox"/> FO <input type="checkbox"/> AG <input type="checkbox"/> DV <input type="checkbox"/> Other |   |         |         |
|  |           |                                   |           |  |                  |                   | <input type="checkbox"/> MA <input type="checkbox"/> BE <input type="checkbox"/> FO <input type="checkbox"/> AG <input type="checkbox"/> DV <input type="checkbox"/> Other |   |         |         |
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|  |           |                                   |           |  |                  |                   | <input type="checkbox"/> MA <input type="checkbox"/> BE <input type="checkbox"/> FO <input type="checkbox"/> AG <input type="checkbox"/> DV <input type="checkbox"/> Other |   |         |         |



# Land-Based Survey

- Three 15-minute long surveys per location
  - Stationary from a fixed location
- Lat/longs or address recorded at start of survey
- Conditions recorded at start of survey
- Can note shoreline type in comments



# Land-Based Survey- we will provide you this sheet when you register your location of preference

**Land-Based Terrapin Headcount Surveys**

Survey Point Latitude: \_\_\_\_\_ Dates: \_\_\_\_\_ Page \_\_\_\_ of \_\_\_\_

Survey Point Longitude: \_\_\_\_\_ Location (County & Area): \_\_\_\_\_

Surveyor Names: \_\_\_\_\_ Air Temp: \_\_\_\_\_ (°F or C)

Wind Direction & Speed: \_\_\_\_\_ % Cloud Cover: \_\_\_\_\_ Tide: \_\_\_\_\_ Water Temp: \_\_\_\_\_ (°F or C)

| Survey Period | Start Time | End Time | # Females | # Males/Juvs | #Unknown | Total # Terps | Comments |
|---------------|------------|----------|-----------|--------------|----------|---------------|----------|
| 1             |            |          |           |              |          |               |          |
| 2             |            |          |           |              |          |               |          |
| 3             |            |          |           |              |          |               |          |

Survey Equipment Used:  Binoculars  Spotting Scope  Other \_\_\_\_\_

**Land-Based Terrapin Headcount Surveys**

Survey Point Latitude: \_\_\_\_\_ Dates: \_\_\_\_\_ Page \_\_\_\_ of \_\_\_\_

Survey Point Longitude: \_\_\_\_\_ Location (County & Area): \_\_\_\_\_

Surveyor Names: \_\_\_\_\_ Air Temp: \_\_\_\_\_ (°F or C)

Wind Direction & Speed: \_\_\_\_\_ % Cloud Cover: \_\_\_\_\_ Tide: \_\_\_\_\_ Water Temp: \_\_\_\_\_ (°F or C)

| Survey Period | Start Time | End Time | # Females | # Males/Juvs | #Unknown | Total # Terps | Comments |
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| 1             |            |          |           |              |          |               |          |
| 2             |            |          |           |              |          |               |          |
| 3             |            |          |           |              |          |               |          |

Survey Equipment Used:  Binoculars  Spotting Scope  Other \_\_\_\_\_



# Questions?

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*This presentation was developed by Environmental Scientist Katherine Phillips who has left the program for a position with the state working with our beloved turtles!*

