Diamondback Dash 2023 Project Guide

Thank you for your interest in Diamondback Terrapins and DWR's Diamondback Dash! We are excited to see this project grow and to partner with volunteers, just like you, to collect data about Virginia's diamondback terrapin populations. Your participation in this project will not only help us better understand the status of terrapin populations in Virginia – it will also help us develop better management strategies to protect and conserve Diamondback Terrapins in the future.

This guide is designed to give you all the information you need to participate in the project and contribute high quality data in support of this research. It contains data collection protocols, an overview of the tools and technology you will be using, safety and logistics instructions, as well as information about our focal species, the Diamondback Terrapin. We hope you enjoy being a part of the Diamondback Dash!

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Project Overview

The primary goal of the Diamondback Dash is to collect information on Diamondback Terrapin occupancy across the state. Volunteers are asked to sign up for, or 'adopt', a roundtrip route which will be paddled multiple times a year in search of terrapins.

During these sampling trips, volunteer groups of 2-4 individuals will paddle to pre-determined points along the route where they will conduct a 5-minute, stationary, head count survey (visually scanning the water for terrapins). In addition to conducting a stationary survey at the designated point, volunteers will also report back on any terrapins or crab pots/traps observed BETWEEN points.

The sampling window for 2023 is September 1st-17th. We are asking that each loop be sampled one time during this date range in conjunction with the project protocols outlined within this guide and the online training which all volunteers are required to take.

Diamondback Terrapin Biology and Ecology

The Diamondback Terrapin is North America's only exclusively estuarine-inhabiting turtle. The species can be found in brackish waters where the salinity levels are higher than that of fresh water, but lower than that of ocean water. There are seven subspecies of Diamondback Terrapins which range from the coastlines of Massachusetts to Texas; the only subspecies that occurs in Virginia is the Northern Diamondback Terrapin. Terrapins feed primarily on snails (e.g. salt marsh periwinkles), bivalves, and crabs.

Diamondback Terrapins are incredibly variable in coloration and pattern of both their shells and their skin. The carapace (top shell) can be any shade of yellow, brown, olive, black, or grey, with variability in the appearance of patterning. Likewise, terrapin skin color ranges anywhere from white to grey to black, with darker spotting or mottling present. The below photos depict some of the variation that can be observed in individual appearance.

Like many other species of turtle in North America, terrapins exhibit female-biased sexual size dimorphism, which means that adult females are larger than adult males. Females average around 7-10 inches long while males average between 4.5-5 inches in length.

Diamondback Terrapin Conservation Status

Due to a variety of factors including but not limited to bycatch-related mortality, habitat loss, road mortality, sea level rise, and historic incidences of overharvest Diamondback Terrapin populations are in decline throughout much of their range. In Virginia the species is designated a Species of Greatest Conservation Need with a Tier 2 designation indicating that the species has a high risk of extinction or extirpation.

Photographer credit: Barbara J. Saffir

Safety Precautions

Please read and consider the following safety precautions related to the Diamondback Dash before deciding to participate.

Oysters—Oyster bed/reef areas are found at some point along most of the routes. Also, some launch sites have oyster shell in the sediments at the launch. Be aware that contact with oysters can result in painful, difficult-to-heal cuts. Wearing shoes while you launch and while you paddle, in case you have to get out of your boat, is important to protect your feet. We have mapped the routes to avoid major oyster reef areas, but you may still find yourself paddling over some oyster areas—stay aware and avoid getting hung up on oyster shells.

Boat traffic—The Intracoastal Waterway (ICWW) and other navigational channels can experience high levels of boat traffic during summer months and good weather. Routes have been charted to keep paddlers close to the mainland or dredge spoil islands, wherever possible, and to cut straight across the ICWW and navigational channels, where necessary. Try not to linger in the navigational channel when crossing. Although power boats should give way to non-motorized boats, be aware of oncoming boat traffic, stay with your partner/s, and minimize time spent in large channels. DO NOT stop in the navigational channel to record data. If an observation is made crossing the waterway, proceed across the channel, entering data when outside the channel and noting in the "description" field that the item was observed in the navigational channel.

Tidal influences—Coastal rivers which connect to a bay or ocean, can flow in both directions based on the tide. The portions of these waterways which are closer to the ocean have a flow which is more heavily influenced by tide, relative to portions of the waterway which are farther from the bay or ocean. Because the tidal stage at any given time dictates which direction the water will be flowing (i.e. either up river or down river) and how strong the current is, it is possible that participants could be paddling against the current for substantial portions of their survey. Checking the tides in advance can help you predict what the flow and current of the waterway will be like during your chosen sampling time. Likewise, by checking the tide schedule for the area, you can schedule your sampling efforts so that you can minimize the degree to which you are paddling against the current. Typically, the current is strongest at the halfway point between high and low tide.

PFDs—Personal flotation devices work. Wear one. Even experts can find themselves in unexpected situations—not only is wearing a pfd required for project participation, but a pfd can make a huge difference in the outcome of an unexpected swamping or tipping situation.

Sun protection and water—You know your needs best, just remember that in the sun and on the water, you probably need twice as much water and sunscreen as might first seem appropriate. Apply sunscreen before and during the event, if you burn easily. Keep water accessible during paddling to ensure dehydration does not become an issue. Dress appropriately for the conditions, including lightweight long sleeve shirts, pants and a hat.

Unexpected situations— In the event that you unexpectedly find yourself in the water, it is important to familiarize yourself with how to re-enter your vessel. You can find instruction for sit-on-top vessels, here, and touring/sit-in vessels, here. If you need to quit your route before completing it, or if a non-emergency situation occurs for which you need support, call your on-shore contact for help in determining the needed assistance and course of action.

Emergencies—In an emergency situation, follow normal protocols for emergencies—call 911 first, proceed as directed by the dispatcher.

Diamondback Dash — Kayak Float Plan Instructions

For your safety, we ask that you arrange to have a trustworthy contact person as an onshore contact on the day of your session. Provide them with details about when you will launch, where you will be, who you will be with, when you will return, and your contact info. You should call them when you return to shore or at the designated return time to report your status.

If they do not hear from you by the designated return time they should attempt to call you. If they cannot reach you within the agreed amount of time, they should contact the specified emergency search agency and provide all of the relevant information for a search to be launched.

Please complete the following Float Plan and deliver it, and a copy of your route map, to your designated onshore contact in advance of your survey. Ensure that this contact has all of the information they need and are prepared to make a report to the specified search agency in the event that you can not be contacted following your estimated return time.

COAST GUARD CONTACT INFORMATION BY REGION

Lower Chesapeake Bay Survey Regions (Rappahannock, York, James, and lower two thirds of the Eastern Shore) should contact the **Virginia Coast Guard Sector (757-483-8567)** in the event of an emergency.

Potomac and upper one third of Eastern Shore should contact the **Maryland Coast Guard Sector (410-576-2693)** in the event of an emergency.

Diamondback Dash — Kayak Float Plan

If we do not return by _____on _____, please call

time   *date*

_____ at _____.

Emergency/search agency   *Emergency/search agency phone number*

Report us as overdue/missing and provide the following information:

	Volunteer 1	**Volunteer 2**
Name:		
Age:		
Gender:		
Phone Number:		
Kayak colors:		
PFD colors:		
Clothing:		
	Volunteer 3	**Volunteer 4**
Name:		
Age:		
Gender:		
Phone Number:		
Kayak colors:		
PFD colors:		
Clothing:		

Launch Site: _____

Departure Date/Time: _____

Vehicle(s) Make/Model/Year/Color: _____

_____

Vehicle(s) License Plate Number: _____

Route/Destination: _____

_____

Diamondback Dash —Pre-Paddle Checklist

The following checklist outlines everything you should do prior to your survey date

☐ Attend a virtual training session or watch one of the recorded training sessions if you were unable to attend on the day-of

☐ Confirm that the individuals sampling with you have also attended or watched one of the training sessions and have submitted all needed information to DWR

☐ Download the Survey123 App, Diamondback Dash, and relevant offline base map for your route.

☐ Confirm the date, route, and time of your data collection session with the other volunteers who will be assisting you

☐ Check that your mandatory equipment is working properly — kayak, paddles, PFD, navigation lights, nighttime visual distress signal, noise maker (horn, whistle, or bell), etc.

☐ Gather any other equipment and important supplies you plan on bringing

☐ Identify an on-shore contact and discuss their responsibilities with them

☐ If you have been asked to contact/coordinate with someone at the launch site prior to conducting your survey, do so at least 72 hours in advance

☐ Review the training materials to ensure that all protocols are fresh in your mind

☐ Familiarize yourself with how to right your kayak and reboard it in the case that you capsize.

☐ Check what the tides will be like for your anticipated sampling date/time so you know whether or not you will be paddling against the current at times.

☐ Fill out your float plan and deliver it and a copy of your route map to your designated on-shore contact

☐ Complete a practice paddle (optional)

Downloading the Survey123 App

1. Go to the app store on your smartphone or tablet and download the free Survey123 app. You are looking for the app with this logo:
2. Open the app and press the option "continue without signing in" (Figure A).
3. Allow the app to access your location and camera while using the app (Figure B).
   a. If the app does not prompt you to allow this, check the location and photo settings on your phone.
4. Once you reach the home screen, you are ready to download the "Diamondback Dash" survey!
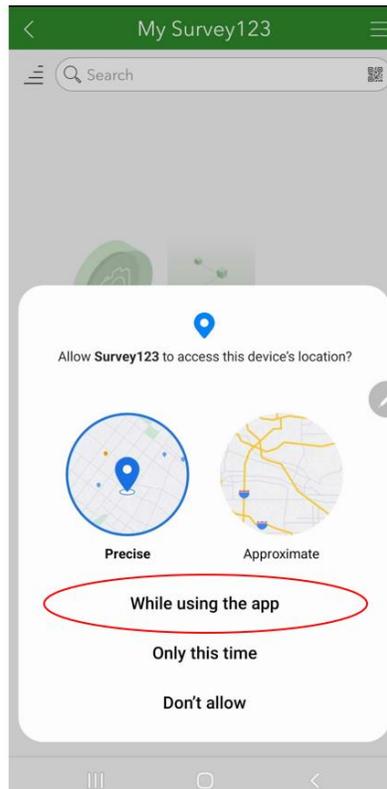
Figure A	Figure B	Figure C

Downloading the Survey

1. Press the QR code icon in the search bar (Figure C) and scan this QR code ➤

2. The "Diamondback Dash" survey will automatically open.

3. You have successfully downloaded the "Diamondback Dash" Survey! Close out of the survey (Figure D) and press "Close and lose changes" (Figure E). The survey is now saved in your app for easy accessibility.
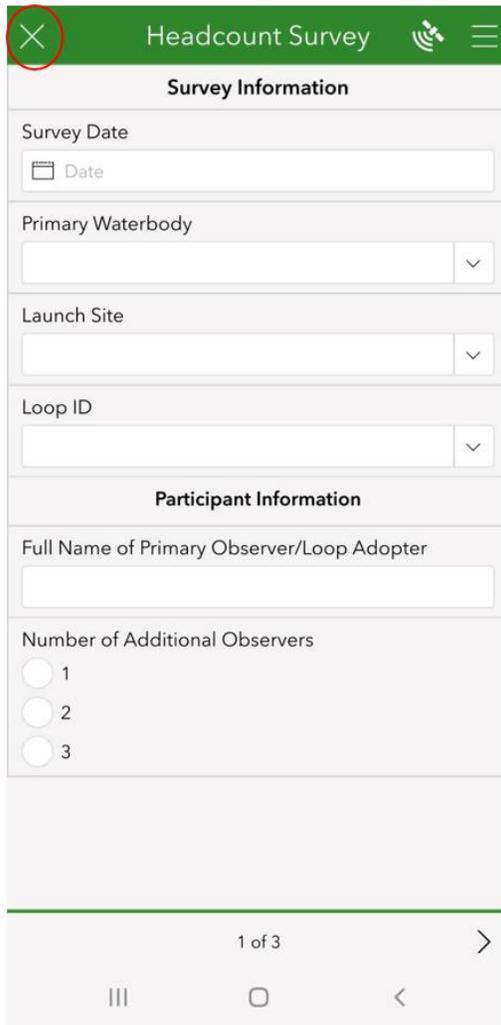
Figure D
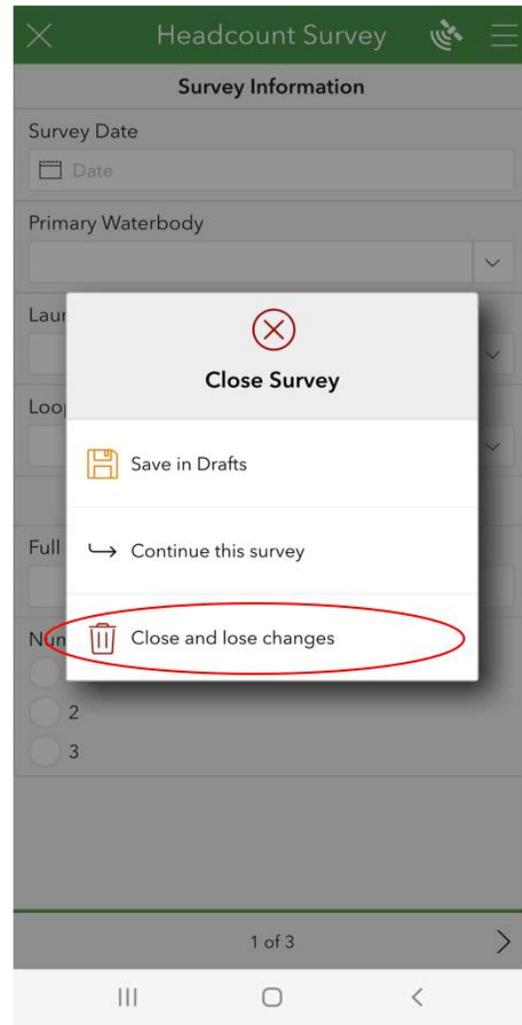
Figure E

Downloading the Offline Map

This step is imperative to your success in completing your route. This will allow you to download and view your specific route with predetermined headcount locations into the app. Please complete this step before traveling to complete your route in a place with a stable WiFi connection.

1. Reopen your "Diamondback Dash" survey. On the first screen, select the three lines in the top right corner (Figure F). Next, select "Offline Maps" from the menu (Figure G). A list will populate with all the water bodies associated with this project (Figure H). Select the cloud icon that corresponds to the water body you will be sampling in and the map will download. You do not need to download all of the maps, only the one that is associated with your loop.
    a. Note: If you are sampling a smaller water body or an area known by a colloquial name and are unsure what main water basin your route falls into, please consult the route map sent to you by DWR map. Your main water body will be located within the legend area.
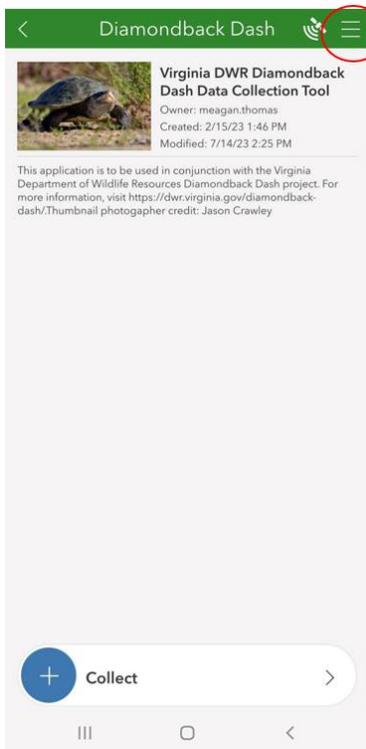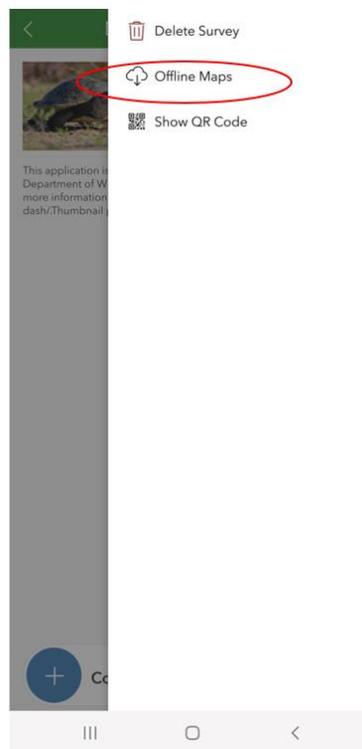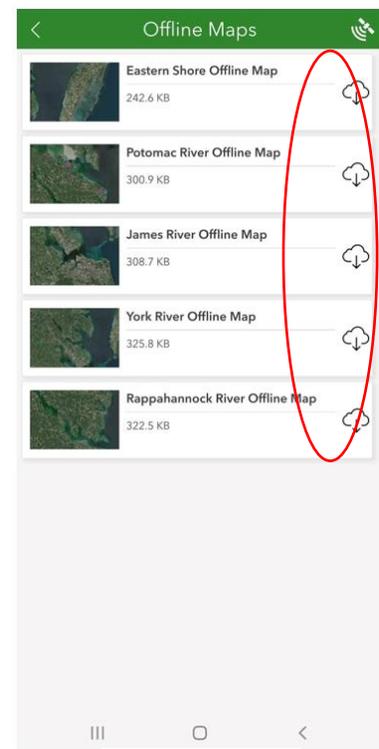

Figure F   **Figure G**   **Figure H**

Diamondback Dash —Data Collection Checklist

The following checklist and safety tips will help make sure you have all of the information and supplies you will need when conducting your survey.

Requirements:

☐ Firm understanding of project guidelines, safety information, and risks

☐ Confirmation that weather conditions meet the requirements needed to survey

☐ Completed Float Plan and copy of route map delivered to the on-shore contact

☐ At least one fully charged smart phone

☐ The Survey 123 application, Diamondback Dash project, and appropriate offline basemap have all been downloaded.

☐ Kayaks and paddles

☐ PFD (lifejacket)*****

☐ Horn, whistle, or bell*****

☐ Drybag/Ziplock for electronics

☐ Lots and lots of drinking water

* indicates that these items are required by law for all manually propelled vessels (i.e. kayaks). More information can be found at: https://dwr.virginia.gov/boating/boaters-guide/required-equipment/

Suggestions:

☐ Bungee straps/tie-downs for supplies

☐ Quick drying clothes

☐ Hat

☐ Sunglasses

☐ Waterproof sunscreen

☐ Bug spray

☐ Additional fully charged smart phone/s

☐ Portable phone charger

☐ Snacks

☐ Towel

☐ Tally counter/s

☐ Binoculars

☐ Printed Route Map

☐ First aid kit/supplies

IMPORTANT SAFETY REMINDERS

- Surveys **SHOULD NOT** be conducted if any of the following weather criteria are occurring within the area in which you will be surveying/paddling:
  - Wind speed is greater than 11mph
  - Any precipitation beyond a slight drizzle
  - Thunderstorms/lightning or low visibility conditions such as fog or smoke present

- Submitting your completed float plan and a copy of the route map to a trustworthy, on-shore contact is imperative to aiding in a quick and safe rescue in the event of an accident.

- All outdoor activities, including this one, include some sort of risk. Risk management refers to all the strategies we use to try to reduce the likelihood that some action we take will cause harm. Risk management is the responsibility of every volunteer and can be practiced by using the above checklist to prepare for your day on the water.

Day of Survey—Data Collection Protocols

1. **Prepare in advance.** Plan ahead and coordinate with the on-shore contact and other volunteers who will be sampling with you.

   a. Make sure you leave home with all the necessary and suggested items you will be taking with you.

   b. **Assign roles.** Designate one person to watch for terrapins (**observer**) and another to record the data and navigate using their phone (**recorder**). If you only have one pair of binoculars, the observer should be the individual using these.

2. **Arrival.** Park in appropriate, designated spaces or areas. Try your best to avoid interfering with other's use of the launching area or boat ramp when setting up

3. **Begin entering survey information.** Have the recorder open the Survey123 app and press on the "Diamondback Dash" survey (Figure A).
   a. Press "Collect" at the bottom of the screen (Figure B). You are now in the survey!
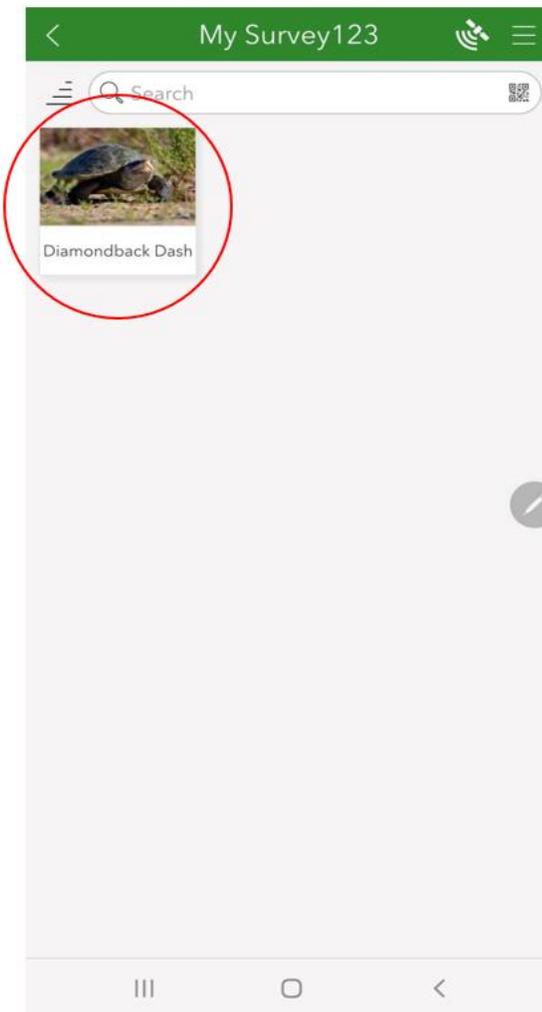
Figure A
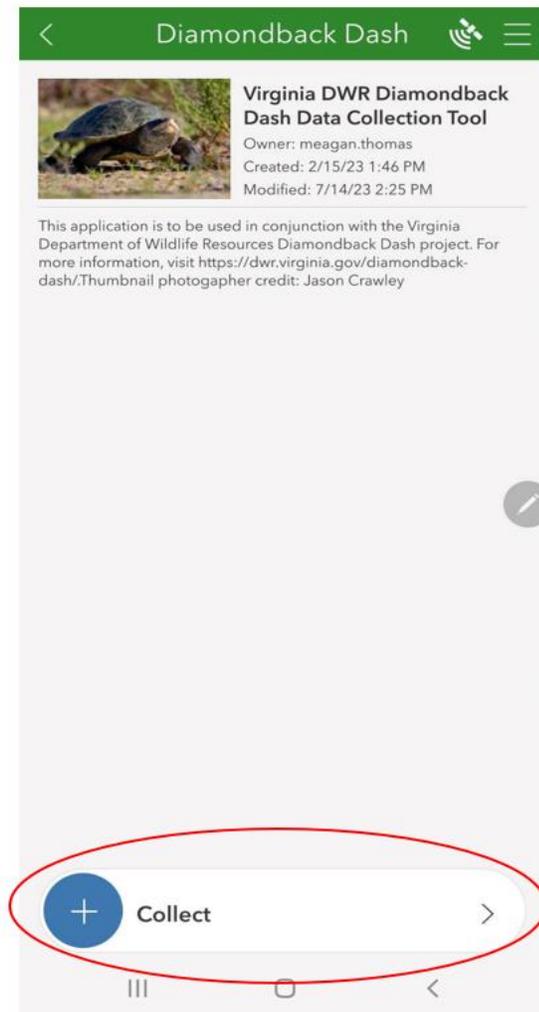
Figure B

b. Once in the survey, click on the box under "Survey Date" to fill in the date and use the drop down arrows to easily fill in the information requested for "Primary Waterbody", "Launch Site", and "Loop ID". **If you forget this information, it is all located on your route map sent to you by DWR staff**.

c. Fill in the name of the Loop Adopter, and indicate the number and name/s of ADDITIONAL volunteers (i.e. not including the Loop Adopter) that are participating in the sampling effort. Finally, indicate the name of the volunteer that will be sering in the data recorder/navigator role.

d. Press the arrow at the bottom right of the screen (Figure C) to go to the next page **but do not make any additional selections or enter any additional information at this time.**

4. **Time to launch.**
   a. Do a quick check to confirm that your group has all of the equipment needed for sampling, and when ready, launch your vessels at the designated launch area. Try your best to avoid interfering with others' use of the launching area or boat ramp when you and your team launch your vessels.
   b. After launching, position yourself in a location where you can take a few moments to enter the needed survey start data, while staying out of the way of anyone else who is attempting to launch a vessel.

Figure C

5. **Have the Recorder enter the first survey point at the starting location.** Survey123 should be on the "Survey Data" screen (page 2 of 3 should read when looking at the bottom of the screen). This screen is where you will enter your starting location, the observations from your head count locations, and your ending location.

   a. The screen will auto-populate a map with your location already GPS-located. Tap the map to expand it to full size (Figure D).

   b. If the base map has not already been set, click the 'windowpane' icon on the right side and a selection of different map options should be displayed (Figure E).

   c. Select the Offline map that you previously downloaded (reminder, this map should correspond to the primary water body which your loop is associated with). In this example, we're using James River (Figure F)
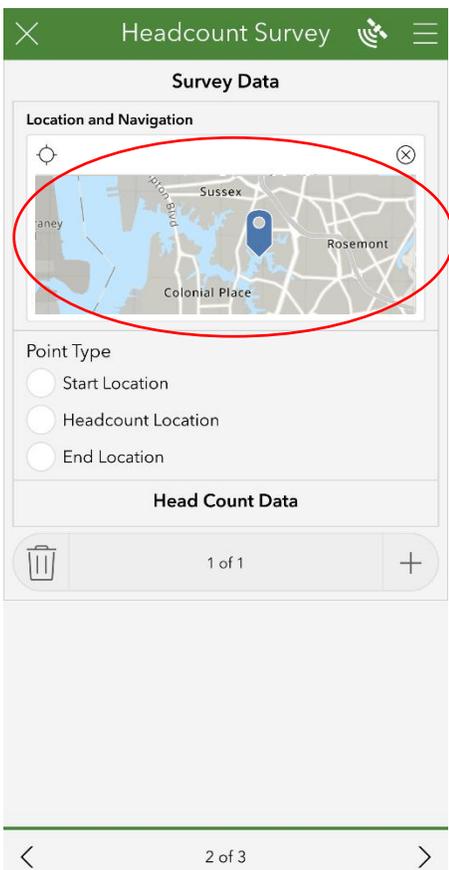

Figure D
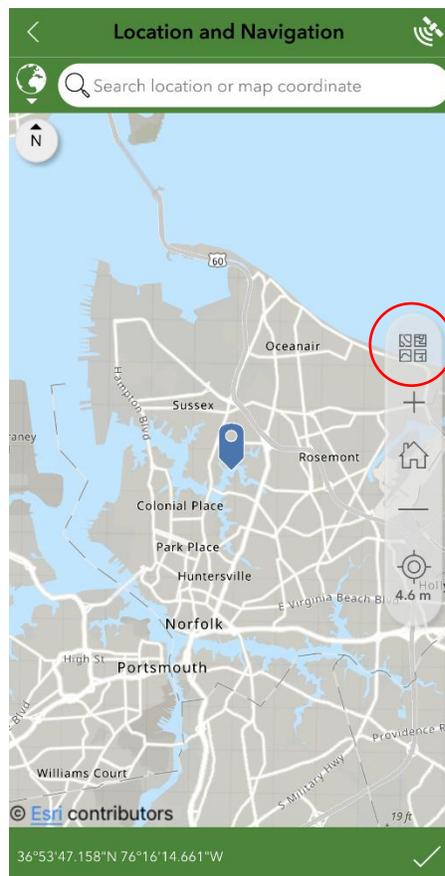
Figure E
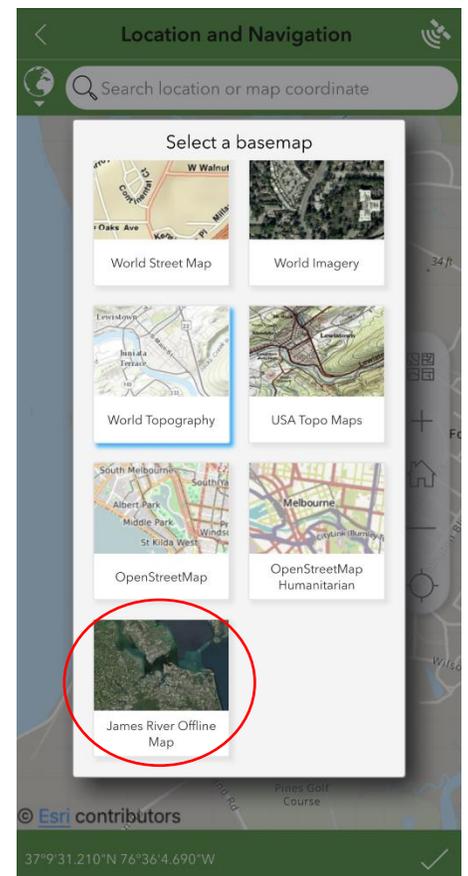
Figure F

d. You should now see your location relative to your route and the associated features like the launch site, navigation line, and headcount points all displayed on the map (you may need to pan or zoom around to see everything). If the map is not accurately displaying your current location, tap the cross hairs icon on the right side and the pin should update to your location (Figure G).

e. After confirming that the appropriate location is showing on the map, click the check mark at the bottom right of the screen to lock in the pin location. Then, click the arrow at the top left to navigate back to the main data collection page (Figure G).

f. Select the 'Start Location' option as seen in (Figure H). And then enter the Paddle Start Time by clicking on the designated field. This box should autopopulate with the current time.
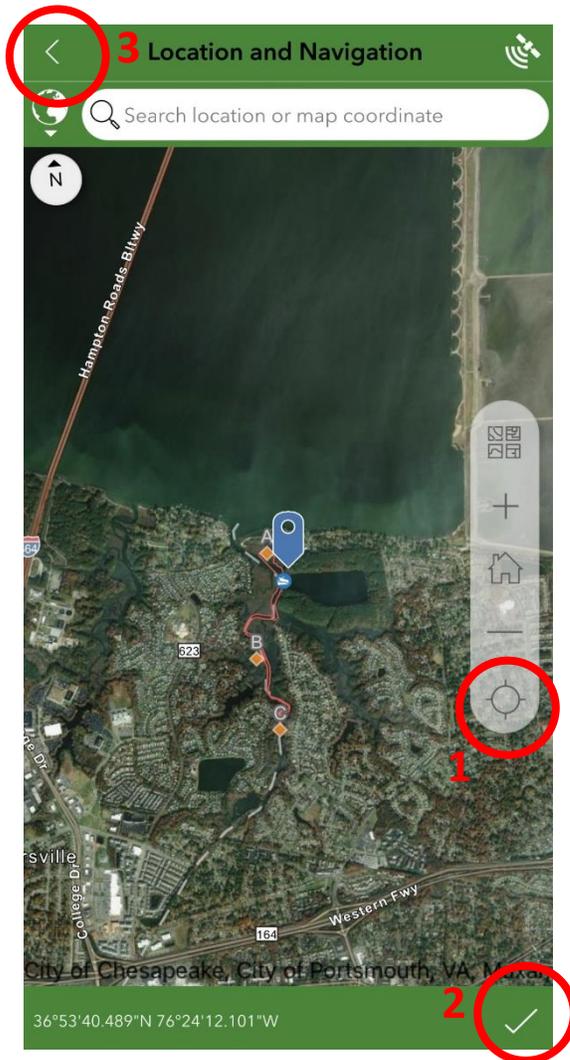

Figure G; **1**: the crosshairs icon to update your current location on the map. **2**: The check mark to confirm the dropped pin location. **3**: The arrow which returns to the Survey Data screen.
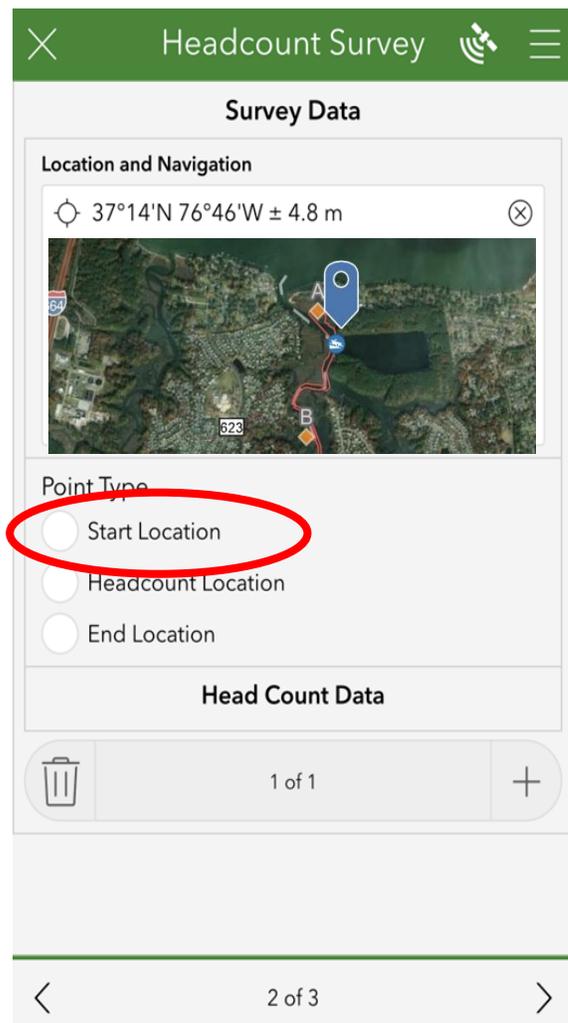
Figure H

g. Once the location and start time have been recorded. Click the **+** icon to submit the record (Figure I). This saves the record and generates a new point creation screen.

h. If you need to return to a previously saved record to make changes, you can do so by clicking on the arrow icon and shuffling back to the record you wish to edit (Figure J). Likewise, if you want to delete a record that you have already entered, you can hit the trash can icon which will delete the record that is currently displayed on the screen.
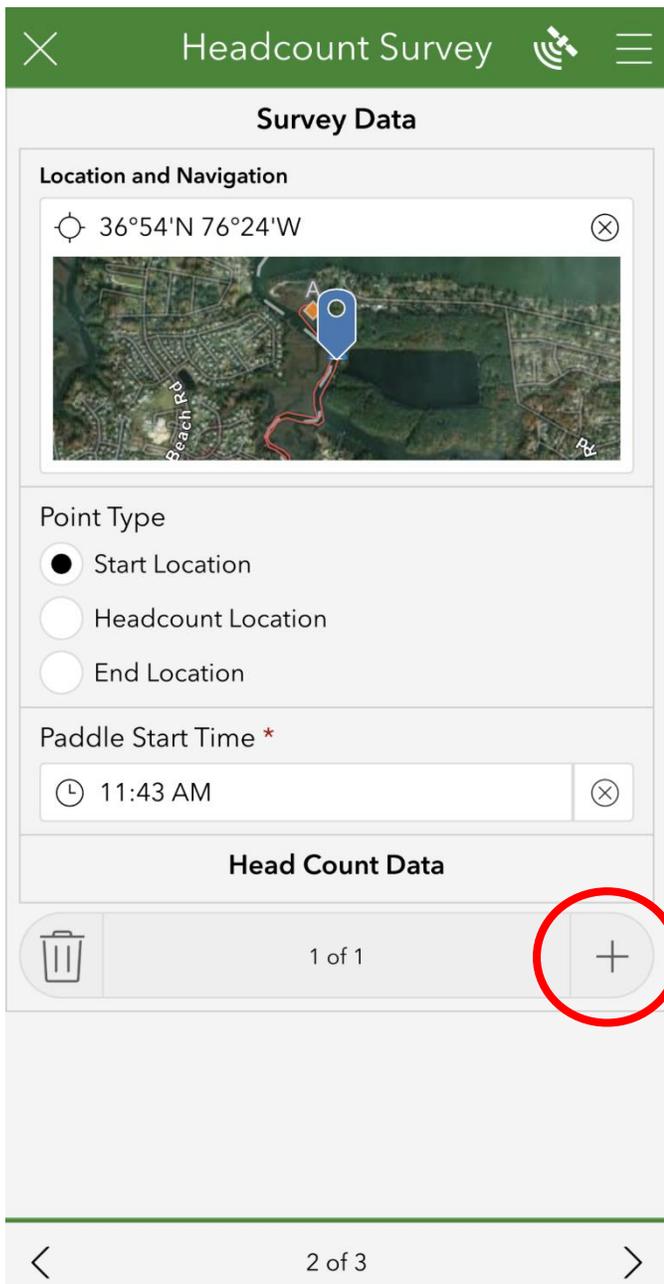
Figure I
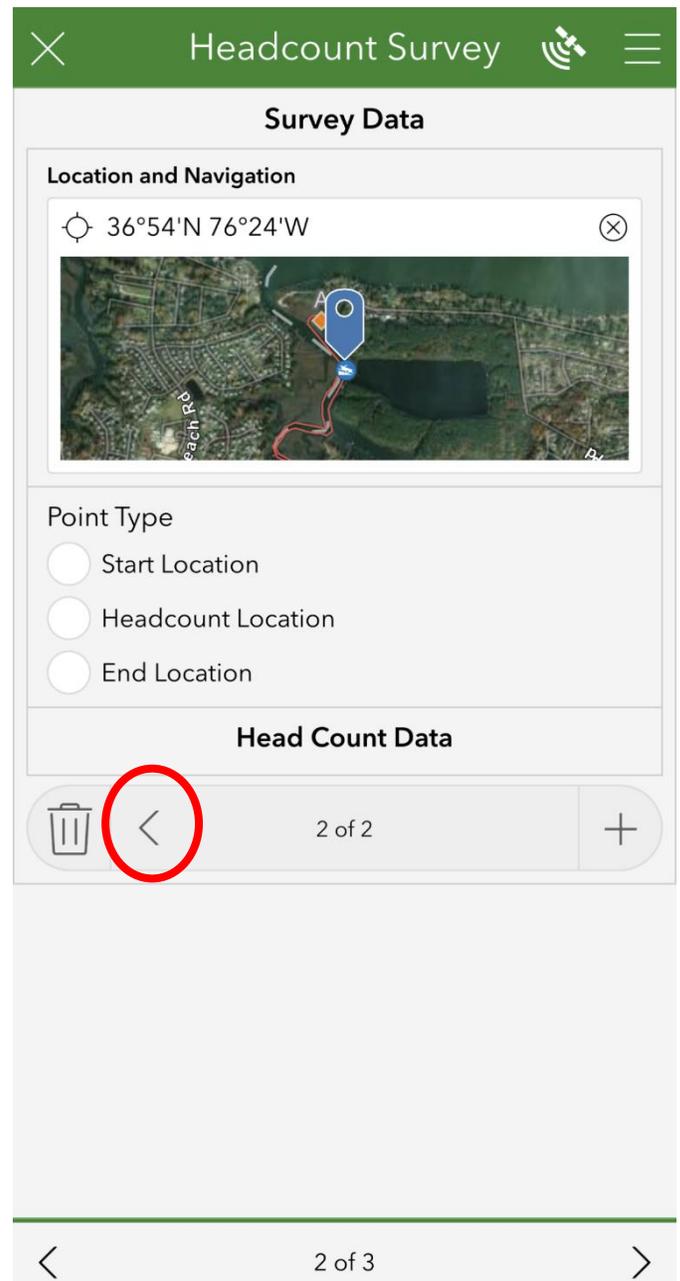
Figure J

i. You are now ready to navigate to your first headcount location. Don't forget to have the observer keep track of the number of turtles and crab traps you see along the way. This can be done very easily through the utilization of a tally counter and is more thoroughly explained in the following instructions.

6. **Begin to navigate to the first Head Count Location**.
   a. Toggle back to the main map view by once again clicking on the rectangular map under survey data to display a larger version of the basemap. Pan around the map and locate your first head count site along the route, which should be labeled A, and begin following the route to that location.

   b. To ensure that you are heading in the right direction, remember that you can press the crosshair icon at any time to refresh your current location along the route and confirm that you are headed in the right direction (shown above in Figure G).

   c. Please note that some launch sites have multiple routes associated with them. Please make sure that you are following the right route (i.e. the one that was assigned to you and matches the .PDF map that was previously emailed to you).

7. **Scan for terrapins and crab pots along the way.**
   a. Paddle along the route slowly and quietly, maintaining a steady pace. Terrapins are "shy" and may be more likely to hide from noisy paddlers and boats.

   b. Focus on the area directly in front and to the side of your vessel up to a field of 180° (Figure K). Look for terrapins heads poking out of the water as they typically raise their head above water to breathe or look around (Figure L). Sometimes they can look like sticks bobbing in the water, and may or may not resurface.

   c. Keep track of the number of terrapin heads you see between the start location and your destination (Head Count Point A) as you will be asked to record this information after arriving at the point. Using a tally counter can be incredibly helpful for keeping track of the number of turtles observed between points.

   d. Crab pots can be easily identified based on the presence of a float at the water surface. Typically the float is the only thing you will see unless the tide is low and the pot is exposed. Floats/buoys can very in shape and color.
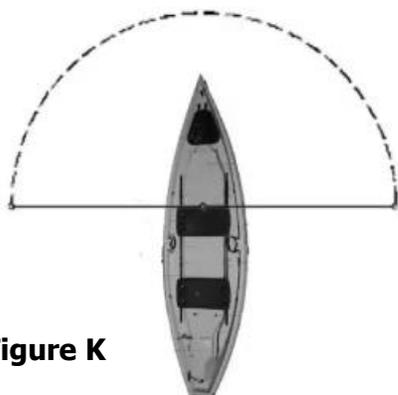

Figure K

**Figure L; Above- multiple terrapins.
Below- a single terrapin**

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8. Conduct the first Head Count Survey

a. Once you have arrived at the location of the headcount survey marked 'A', toggle back to the survey data screen by clicking the arrow in the top left corner. In the event that you are unable to access the location of the survey point for any reason (e.g. low water levels, barrier blocking access, etc.), get as close to the location of this point as possible, and conduct the head count survey there.

b. Similar to when you entered the start location, confirm that the location of the pin accurately reflects your current location, hit the check mark at the bottom right of the screen, then toggle back to the data entry page. Select the 'Headcount Location' option from the 'Point Type' section.

c. Select the letter associated with the head count location, in this case is should be 'A' seeing as this is the first survey spot.

d. Record the total number of terrapin heads and crab pots you saw between the starting location and your current location.

e. You are now ready to conduct your first standardized head count survey. Each survey should last for five minutes and will require you to remain in a stationary location and counting the number of terrapins you observe within that time period.

    i. Do your best to remain in the same spot during this time and only paddle if it is to keep your vessel in the same location.

    ii. Focus on the area directly in front and to the side of your vessel up to a field of 180°. If you can, arrange your kayaks so they are facing in opposite directions and as such, can position your group to have a 360° view of the surrounding water.

f. Once you have completed your survey, submit the record by clicking on the **+** icon (Figure M).

Figure M

9. **Continue on to the additional head count locations along your route.** These should be visited in alphabetical order, i.e. go from location A to location B, and Location B to Location C, etc. If you had only one head count location (Location A) continue on to Instruction 10.

   a. Repeat the steps outlined in instruction 8 to complete each additional head count survey associated with your route.

   b. Don't forget to be tallying the number of terrapins and crab pots observed BETWEEN locations. You should restart the tally of turtle heads and crab pots between locations each time you begin navigating to a new stop. That is, do not add on to the previous tally, instead, start a new one.

10. **Once you have completed a head count survey at each of the head count locations along your route, you can navigate back to the location where you initially launched.**

    a. You will be asked to record the number of terrapins and crab pots observed during your return paddle from the last head count location to the launch site. Remember that you should restart the tally of turtle heads and crab pots. That is, do not add on the previous tally, instead, start a new one.

    b. Once you have returned to the launching area, return to the Survey Data screen, and add an 'End Location' Point by dropping a point and select 'End Location' as the point type. Record the number of turtle heads and crab pots that you counted between the last point and your current location.

    c. Add the 'Paddle End Time' and then submit your record by clicking the plus icon.

    d. Proceed to the next screen by clicking the arrow on the bottom right of the page. If you would like to record any notes or additional information about the survey and what you encountered, for DWR staff to review, please do so here.

    e. When you're ready to submit, select the checkmark in the bottom righthand corner.

    f. Your survey observations have been recorded and submitted! Thank you for volunteering your time and efforts in support of this research study.

11. **Retreive your equipment from the water and reload it on/in your vehicle. Contact your on-shore contact to let them know that you have returned safely.** Try your best to avoid interfering with others' use of the launching area or boat ramp when you and your team launch your vessels.