REQUEST FOR PROPOSALS

RCN 3.0: Coordinated Assessment of Northeastern Diamond-backed Terrapin Populations

The Northeast Association of Fish and Wildlife Agencies (NEAFWA) Fish and Wildlife Diversity Technical Committee requests proposals for three separate investigations that must be completed by the end of 2027. You may submit a proposal for one, two or all three investigations described in this RFP as Job 1, Job 2, and Job 3. A regional terrapin team of state agency staff from eight northeast states will work with contractors to coordinate these Jobs. The Wildlife Management Institute (WMI) will provide administrative support to NEAFWA and will administer this RFP.

Why You are Receiving this RFP?

NEAFWA and the regional terrapin team recognize your substantial past efforts in terrapin conservation and/or conservation work aligned with the job objectives and request you to consider applying.

Proposal Guidelines

Provide a description of your approach, timeline, and budget to achieve the components listed in the Scope of Work section that follows. As stated, you may submit proposals for 1, 2 or all 3 Jobs.

Pricing

Budgets for each of the jobs advertised here shall not exceed the indicated pricing cap:

Job 1: Standardized Terrapin Population Assessments – not to exceed $50,000.
Job 2: Drone-based Terrapin Surveys – not to exceed $30,000.
Job 3: Spatial Ecology of Terrapins using Telemetry – not to exceed $60,000 per two 4-state subregions (total: $120,000).

Funding Period

April 1st, 2023 – December 31st, 2027

Matching Funds

Typically, non-federal match at a level equal to 35% of the total cost is required, however, it is expected that citizen-scientists under Job 1 will provide the match for all 3 jobs (i.e., $107,692.28). Thus, no match is required.

Timeline for Review and Decision

Submit proposals to Scot Williamson, WMI (swilliamson@wildlifemgt.org) and Meghan Gilbart, WMI (mgilbart@wildlifemgt.org) **by 5:00 PM EDST on June 15, 2023**. NEAFWA and the regional terrapin team anticipate decision making on proposals within 30 days. Please limit the narrative to four pages. Budget and supporting materials may exceed four pp. In your supporting letter, please address your capacity to address each of the major deliverables.

How Award Decisions Will Be Made

NEAFWA and the regional terrapin team will evaluate the approach contained in your proposal, including timeline and budget.

For More Information Please Contact:

Jonathan McKnight, Maryland DNR (jonathan.mcknight@maryland.gov) and/or Scott Smith, Maryland DNR (scott.smith@maryland.gov).

General Project Background:

The diamond-backed terrapin (*Malaclemys terrapin*) is a northeast Regional Species of Greatest Conservation Need (RSGCN) and a Species of Greatest Conservation Need (SGCN) in the northeast State Wildlife Action Plans (SWAP). It is found in eight states of the region (CT, DE, MA, MD, NJ, NY, RI, VA), and is state-listed as threatened in MA, endangered in RI, special concern in CT, and a candidate for special concern in NJ. In a synthesis of northeast SWAPs, terrapins are one of only four RSGCN reptile species ranked High for state agency management responsibility and Very High for conservation concern. However, the quality and confidence in state data was low so additional surveys are needed to inform future risk and conservation actions.

A regional terrapin project was funded with a previous RCN 1.0 award, resulting in "The Northern Diamondback Terrapin (*Malaclemys terrapin terrapin*) in the Northeast United States: A Regional Conservation Strategy. (2016)". However, implementation of the regional conservation plan has not begun and needs dedicated funded projects to make progress with the species' conservation needs. Due to other species needs in other freshwater and terrestrial systems, the diamond-backed terrapin was not a focus of the RCN 2.0 turtle project and has not received Competitive SWG funding in the northeastern states. Terrapin populations are threatened by shoreline development, sea-level rise, road strikes, blue crab trap mortality, high nest predation rates, boat strikes, and collection for the global pet, food, and traditional medicine trades.

Guided by the 2016 RCN-funded Terrapin Conservation Strategy, this project will identify, assess, maintain, and improve populations of terrapins throughout their northeast range through implementation of high-priority conservation actions. Specifically, applicants will develop a data portal for regionwide data from standardized headcount surveys conducted by citizen-scientists, identify state and regionally important conservation areas for terrapins, compare headcount surveys to drone surveys, and conduct terrapin spatial ecology studies using acoustic telemetry, VHF telemetry, and/or GPS. Information from these efforts will better guide regional terrapin management and conservation.

Collectively, the Northeastern states (through State Wildlife Grants programs) have made a nationally significant investment in Conservation Planning for at-risk turtle species. This Regional Conservation Need (RCN) project will protect the regional investment of Northeastern State Wildlife Agencies and the U.S. Fish and Wildlife Service.

SCOPE OF WORK

This project will conduct three investigations by the end of 2027. These investigations will result in a regional database of terrapin survey data collected by citizen-scientists, a regional terrapin conservation area network, development of methods to conduct drone-based terrapin surveys, and detailed information on spatial ecology of terrapins.

Job 1: Standardized Terrapin Population Assessments
Job 2: Drone-based Terrapin Surveys
Job 3: Spatial Ecology of Terrapins using Telemetry

All jobs will be implemented via subcontracts with oversight from the Northeast Fish and Wildlife Diversity Technical Committee and the regional terrapin team. Job approaches are detailed below.

Job 1. Standardized Terrapin Population Assessments

Implement standardized population assessments—focused on a coordinated "headcount" monitoring strategy—to identify, update, and map the extent of priority terrapin populations across the northeast. Harden et al. (2009) developed water-based terrapin headcount survey methods in North Carolina. Subsequently these were modified for use in Maryland and have been employed there from 2011 through 2021, using primarily citizen scientists and conservation partners. Tulipani (2012) developed land-based headcount survey methods in Virginia in 2011 used exclusively by citizen scientists. These methods were also used in Maryland from 2015 through 2021, primarily by citizen scientists. Levasseur et al. (2019) field-tested a standardized protocol in Massachusetts, and Rhode Island field-tested land-based headcount surveys in 2020 and 2021 (S. Buchanan pers. comm.). The approach will be for the applicant to develop a web portal for citizen scientists to input field data collected using any of these land and water-based headcount survey methods. The applicant will also input legacy headcount survey data from states where it exists. Citizen scientists will be recruited by state biologists and conservation partners through other funding sources. The citizen-scientists will collect headcount data during the spring and summer of 2023-2027. This will generate all the required 35% non-federal match for the entire project (Jobs 1-3). The web portal will include inputs to capture citizen-scientist match hours. State biologists and conservation partners will direct citizen scientists to conduct surveys in areas deemed as data-deficient or for which more information is needed on terrapin population parameters.

A contractor will be identified through this Request for Proposals (RFP) and will be vetted and chosen by the regional terrapin team. The contractor will develop (by end of 2023) and maintain a secure web portal for on-line submission of headcount data collected by citizen scientists from each participating state, compile the 2023-2027 data at the end of each field season, collect and enter state's legacy headcount survey data, conduct quality control, enter all headcount data into a GIS database, and model state-by-state terrapin concentration areas and a regional terrapin conservation area network (in 2026-2027). The contractor will also incorporate inputs for citizen-scientist match documentation in the web portal and provide annual state-by-state match summaries. Expected products from the contractor include the terrapin web portal, GIS database, model of terrapin concentration areas in each state and a proposed regional terrapin conservation area network, tabulation of annual match from citizen-scientists, and a final project report. The final report will include state-by-state summaries of terrapin headcount surveys conducted each year of the project, Species Distribution Models (SDM) of terrapin concentration areas in each state, and a proposed regional terrapin conservation area network. Publication of results in a peer-reviewed scientific journal is expected by the contractor.

Scope of Work:
The contractor will develop a web-based secure data portal where citizen-scientists in eight northeast states (CT, DE, MA, MD, NJ, NY, RI, VA) can enter terrapin headcount data based on survey type (land vs water-based survey) and methodology (modified Harden et al. 2009, Levasseur et al. 2019, Tulipani 2012). The data portal will be linked to a centralized, secure database developed and maintained by the contractor. All population assessment data obtained through standardized headcount surveys will be maintained by the contractor. A draft data management schema will be developed.

The contractor will gather available legacy headcount data from state Natural Heritage and nongame programs and other partners to augment headcount data collected during the grant period and build Species

Distribution Models (SDM) to inform the development of terrapin concentration areas by state, and a Regional Conservation Area Network (CAN) for terrapins.

Deliverables

1. Participate in quarterly meetings led by the regional terrapin team and NEAFWA, presenting quarterly progress towards the deliverables (Quarterly).
2. Develop and maintain diamondback terrapin web portal and linked database for citizen-scientists to enter headcount data and match hours (by December 30th, 2023).
3. Develop draft data management schema (by October 30th, 2023).
4. Entry of legacy headcount data (by January 1st, 2025).
5. Quality control of legacy and current headcount data (the latter entered by citizen scientists at web portal; annually by March 1st starting in 2024).
6. Maintain web-linked database of head count data (annually by March 1st starting in 2024)
7. Develop Species Distribution Models (SDM) for terrapins in Northeast Region based upon legacy and 2023-2027 headcount data (by April 30th, 2027).
    a. Spatial layers of Terrapin Concentration Areas by state (by April 30th, 2027)
    b. Spatial layer(s) of Regional Terrapin Conservation Area Network (CAN; by April 30th, 2027)
8. Prepare and submit draft Final Project Report (by October 30th, 2027).
9. Make changes requested by regional terrapin team and NEAFWA and submit the accepted Final Project Report (by Dec. 30, 2027).

Grant Management

Specify your proposed approach to managing the grant.

Match

Assist states in documenting citizen-scientist match through web portal.

Other Information

Identify any other relevant financial information (including detailed project budget), and the university department(s) or organization(s) that would contract with WMI; the overhead rate (if any); and key personnel details. Provide detailed information on each participant and their roles in this contract.

Ranking Criteria

Proposals will be ranked by the regional terrapin team based upon:

- Contractor's ability to achieve each of the major stated deliverables.
- Contractor's experience with developing web portals and web-linked databases.
- Contractor's experience with spatial monitoring and modeling.
- Contractor's experience with terrapin headcount survey methodology.
- Contractor's experience with regional (e.g., SWG, RCN, LCC) conservation projects.
- The cost-effectiveness of proposed project budget.

Final details will be refined through a scope of work with Wildlife Management Institute (WMI).

Project Conditions

Entities awarded funding under this request will enter into a General Services Agreement with the Wildlife Management Institute Incorporated (WMI). WMI administers the Regional Conservation Needs program on behalf of the Northeast Association of Fish and Wildlife Agencies.

- Coordination with partners may include federal, state, NGO, and academic members.
- Quarterly progress and financial reports are required.
- Participation in quarterly meetings with the regional terrapin team and NEAFWA representative is required.
- Insurance that protects the contractor and WMI will be required prior to initiation of work.
- Contractors will be required to present preliminary results when requested by the Chair of the Northeast Fish and Wildlife Diversity Technical Committee. Presentations may take place at the annual meeting of the Committee, or at one or more annual meetings of the Northeast Association of Fish and Wildlife Agencies Directors or Administrators. All presentations that utilize results of this study shall acknowledge the source of funds and RCN Program.

Job 2: Drone-based Terrapin Surveys

Harden et al. (2009) developed water-based terrapin headcount survey methods in North Carolina. Subsequently these were modified for use in Maryland and have been employed there from 2011 through 2021, using primarily citizen scientists and conservation partners. Tulipani (2012) developed land-based headcount survey methods in Virginia in 2011 used exclusively by citizen scientists. These methods were also used in Maryland from 2015 through 2021, primarily by citizen scientists. Levasseur et al. (2019) field-tested a standardized protocol in Massachusetts, and Rhode Island field-tested land-based headcount surveys in 2020 and 2021 (S. Buchanan pers. comm.). Recently an additional terrapin survey method, using drones, has been tested in New Jersey (Sterrett et al. 2021) and in Job 2 will be used to assess accuracy of water- and land-based headcount surveys. Drone headcount surveys will be conducted in one of eight northeast states (CT, DE, MA, MD, NJ, NY, RI, VA) using a qualified contractor. The contractor will develop a drone-based terrapin survey methodology that could be used by state biologists, citizen scientists, and other conservation partners. The method needs to be tested under various habitat, weather, tidal regimes, and drone altitudes to determine the range of acceptable survey conditions. Drone methodology results will also be statistically compared to water- and land-based headcount surveys. The contractor is expected to conduct field-testing over a minimum of two field seasons during the 2023-2027 project period in at least 3 study areas. Expected products include a detailed methodology for drone-based terrapin surveys that is non-technical enough that it could be used by citizen scientists, as many citizens now own drones, and could be a tremendous data source in the future. The report will also include a comparison of results from traditional land and water-based headcount surveys to results from drone-based surveys, specifically detailed statistical analysis examining factors influencing detection for drone surveys. The contractor will prepare a final report, including this detailed methodology and analysis, and is expected to publish findings in a peer-reviewed scientific journal.

Scope of Work:

The contractor will develop and test standardized, flexible methodologies for drone-based terrapin surveys at ≥3 study areas over a minimum of two field seasons during the 2023-2027 period and statistically compare them to standard water- and land-based headcount surveys conducted by the contractor or partner. The contractor must supply their own drone(s); grant funds cannot be used for drone purchase. Survey areas should not include areas where federal or state listed bird species are nesting to avoid disturbance and impacts to those species.

Deliverables

1. Participate in quarterly meetings led by the regional terrapin team and NEAFWA, presenting quarterly progress towards the deliverables (Quarterly).
2. Conduct drone headcount surveys at ≥3 study areas over a minimum of two field seasons paired with conventional headcount surveys (by end of 2027 field season).
3. Develop a Standardized Diamondback Terrapin Headcount Survey Protocol for use by drone technology (by July 30th, 2027).
4. Conduct statistical comparison of headcount surveys by drones vs conventional water- and land-based headcount surveys analysis, especially examining factors influencing detection for drone surveys (by July 30th, 2027)
5. Prepare and submit draft Final Project Report (by October 30th, 2027).
6. Make changes requested by regional terrapin team and NEAFWA and submit the accepted Final Project Report (by Dec. 30, 2027).

Grant Management
Specify your proposed approach to managing the grant.

Match
None required.

Other Information
Identify any other relevant financial information (including detailed project budget), and the university department(s) or organization(s) that would contract with WMI; the overhead rate (if any); and key personnel details. Provide detailed information on each participant and their roles in this contract. Provide information on what state(s) the proposed activities will occur in.

Ranking Criteria
Proposals will be ranked by the regional terrapin team based upon:

- Contractor's ability to achieve each of the major stated deliverables.
- Contractor's experience with drone technology.
- Contractor's experience with Diamond-backed Terrapin biology.
- Contractor's experience with terrapin headcount survey methodology.
- Contractors experience with statistical analysis comparing survey results from different methodologies.
- Contractor's experience with regional (e.g., SWG, RCN, LCC) conservation projects.
- Contractor's plan to determine what potential study areas are occupied by nesting federal or state listed bird species to avoid disturbance and impacts to those species.
- The cost-effectiveness of proposed project budget.

Final details will be refined through a scope of work with Wildlife Management Institute (WMI).

Project Conditions
Entities awarded funding under this request will enter into a General Services Agreement with the Wildlife Management Institute Incorporated (WMI). WMI administers the Regional Conservation Needs program on behalf of the Northeast Association of Fish and Wildlife Agencies.

- Coordination with partners may include federal, state, NGO, and academic members.
- Quarterly progress and financial reports are required.
- Participation in quarterly meetings with the regional terrapin team and NEAFWA representative is required.

- State and/or federal permits must be obtained prior to beginning field work, when and where applicable.
- Insurance that protects the contractor and WMI will be required prior to initiation of work.
- For any field work in aquatic or wetland habitats, field gear must be sanitized between visits following NEPARC protocols: (http://northeastparc.org/wp-content/uploads/2023/04/NEPARC_Pub_2022-02_Disinfection_Protocol.pdf).
- Contractors will be required to present preliminary results when requested by the Chair of the Northeast Fish and Wildlife Diversity Technical Committee. Presentations may take place at the annual meeting of the Committee, or at one or more annual meetings of the Northeast Association of Fish and Wildlife Agencies Directors or Administrators. All presentations that utilize results of this study shall acknowledge the source of funds and RCN Program.

Job 3: Spatial Ecology of Terrapins using Telemetry.

There have been surprisingly few published telemetry studies of terrapin spatial ecology (Harden et al. 2007, Harden and Williard 2012, Tulipani 2013; Castro-Santos et al. 2019) and only two conducted in the northeast region (Tulipani 2013—Virginia; Castro-Santos et al. 2019—Massachusetts). The 2016 RCN-funded Terrapin Conservation Strategy identified the need for telemetry and GPS studies to help identify important hibernating and nesting areas. Job 3 will augment headcount survey data and can be extrapolated to help identify potential hibernating and nesting areas in all 8 northeast states. There is also a need from some states (New Jersey, Connecticut) to have state-specific data on terrapin locations relative to shorelines to aid in promulgation of regulations used in environmental review. The New England states would also benefit from site-specific movement data generated through telemetry (VHF, acoustic, or GPS transmitters) and capture-recapture in two different methods. This project will be divided evenly between contractors in two different northeast states within two subregions, $60,000 to each subregion (i.e., one state per subregion). The northern subregion is MA, RI, CT, and NY, while the southern subregion is NJ, MD, DE, and VA. A contractor in each subregion will conduct telemetry for a minimum of two years in the 2023-2027 period, choosing sample sizes large enough for broader regional applications, and collecting location data on both nesting and over-wintering habitat use and movements. The large budget for this project is indicative of the high cost of advanced telemetry technology and the sample sizes needed for this project. This is one of the main reasons why there have been so few studies of terrapin movements. We have the opportunity with these funds to support cutting edge research into terrapin spatial ecology.

Scope of Work:
Each of the two contractors will capture a minimum of 10 terrapins per study area (i.e., per contractor) and track movements and habitat use via telemetry for a minimum of 2 years during the 2023-2027 period. Choice of transmitters will be determined by contractors but need to balance sample size and budgetary restrictions, but could include VHF, acoustic, and or GPS transmitters. Contractors will analyze data and provide annual and final project reports that include individual home range by sex, habitat use by sex including nesting sites, hibernacula (brumation sites), and distance to shorelines. Contractors will develop a GIS database and develop shapefiles that are shared with the regional terrapin team. Contractors are expected to publish results in peer-reviewed scientific journals.

Deliverables
1. Participate in quarterly meetings led by the regional terrapin team and NEAFWA, presenting quarterly progress towards the deliverables (Quarterly).

2. Document 10 terrapins tracked per study area per year through providing spreadsheets including date of capture, sex, age class, transmitter type, and sampling frequency (annually by June 30th starting in 2024).
3. Develop GIS database and spatial shapefiles of individual terrapin movements (annually by June 30th starting in 2024).
4. Prepare and submit a draft Final Project Report including individual home range by sex and/or age class, habitat use by sex and/or age class including nesting sites, hibernacula (brumation sites), and distance to shorelines (by October 30th, 2027).
5. Make changes requested by regional terrapin team and NEAFWA and submit the accepted Final Project Report (by Dec. 30, 2027).

Grant Management
Specify your proposed approach to managing the grant.

Match
None required.

Other Information
Identify any other relevant financial information (including detailed project budget), and the university department(s) or organization(s) that would contract with WMI; the overhead rate (if any); and key personnel details. Provide detailed information on each participant and their roles in this contract. Provide information on what state(s) the proposed activities will occur in.

Ranking Criteria
Proposals will be ranked by the regional terrapin team based upon:

- Contractor's ability to achieve each of the major stated deliverables.
- Contractor's experience with telemetry technology in estuarine habitats.
- Contractor's experience with GIS databases and analyzing spatial data generated by telemetry.
- Contractor's experience with Diamond-backed Terrapin biology.
- Contractor's experience with regional (e.g., SWG, RCN, LCC) conservation projects.
- The cost-effectiveness of proposed project budget.

Final details will be refined through a scope of work with Wildlife Management Institute (WMI).

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annual meeting of the Committee, or at one or more annual meetings of the Northeast Association of Fish and Wildlife Agencies Directors or Administrators. All presentations that utilize results of this study shall acknowledge the source of funds and RCN Program.