Community Land & Water Coalition
A Project of Save the Pine Barrens, Inc.
P.O. Box 1699
Plymouth MA 02362
www.communitylandandwater.org

February 28, 2024

VIA CERTIFIED MAIL # 7020 1290 0001 4654 3141
RETURN RECEIPT REQUESTED

Via email to:
SERO NOI@mass.gov
maissoun.reda@mass.gov

Maissoun Reda
Chief, Wetlands Division
Massachusetts Department of Environmental Protection
Southeast Regional Office
20 Riverside Drive
Lakeville MA 02347

Request for Denial - Superseding Order of Conditions
403 Federal Furnace Road
DEP File No. # SE57-3295
Plymouth PCC 23-04
Map 58-Lot 000

Dear Ms. Reda,

This is a Request for Department Action (Request) regarding the Order of Conditions SE 57-3295 (OOC) issued by the Town of Plymouth Conservation Commission (Commission) on February 14, 2024 to Ricardo Baldissera (Baldissera). The Request asks the Department to issue a Superseding Order of Conditions (SOC) denying the Work. The Notice of Intent was filed February 2, 2023 (NOI). A copy of the Order is attached as **Exhibit 1.**

This appeal concerns Big West Pond, a Coastal Plain Pond with endemic species, some of which are found nowhere else on Earth. This includes the Northern Red-Bellied Cooter turtle and

the Plymouth Gentian, rare species iconic to Plymouth and the Atlantic Coastal Pine Barrens where the project is located.

The Order fails to protect the interests of the wetland Act or meet the requirements of the Act's implementing Regulations, 310 CMR 10.00 (the "Regulations"). This Request asks the Department to issue a Negative Superseding Order of Conditions and to remand the OOC to the Commission.

The Commission opened the hearing in 2023, continued it for a number of dates, held a public hearing on December 5, 2023, and closed the hearing on February 6, 2024. The Commission violated the Open Meeting Law by failing to conduct an open meeting within the meaning of G.L. c. 30A, Sections 18-25 on February 6, 2024. The Commission held the hearing in a room that was unable to hold all of the members of the public, requiring the public to "wait their turn" in the hallway. Therefore not all members of the public were able to attend the public hearing. An Open Meeting Law complaint has been filed against the Commission.

The Commission voted on February 6, 2024 to grant the OOC. It issued the OOC under both the Wetlands Protection Act, G.L. c. 131, Section 40 ("the Act") and the Plymouth Wetlands Protective Bylaw.

This Request is submitted on behalf of a Ten Residents Group[1] by Margaret Sheehan, Esq. as their Authorized Representative.

This request is filed in a timely manner, within ten business days after the issuance of the Order. It is filed in accordance with the provisions of 310 CMR 10.03(7)(a)(2) and 310 CMR 10.05(7)(a-d). Attached as **Exhibit 2** is a copy of the filing fee and filing fee transmittal form which have been sent to the DEP Lockbox.

Project and the Work Site

The Project site at 403 Federal Furnace Road is located within Priority Habitat on Big West Pond in Plymouth MA. The Work proposed under the OOC is the construction of a dock extending fifty feet into Big West Pond. The dock is ten feet wide. The plans show pilings placed on or in the bottom of the pond to support the dock.

[1] The Ten Residents of the Town of Plymouth MA are: Sharon Racette, 395 Federal Furnace Road; Ryan Racette, 395 Federal Furnace Road; Elizabeth Quintal, 11 Colonial Terrace; Nicole Quintal, 11 Colonial Terrace; Kerri Quintal, 11 Colonial Terrace; Joshua Lima, 11 Colonial Terrace; Sandra Fosgate, 22 Jaye Street; James Brennan, 17 Bradford Street; Kate Barnes, 57 Shallop Road; Anita Galletti, 122R Drew Road.

The Site is extremely environmentally sensitive and is on a Coastal Plain Pond, a globally rare ecosystem type. The Site is located in Priority and Estimated Habitat for seven species listed under the Massachusetts Endangered Species Act (MESA), and one species listed under the Federal Endangered Species Act (ESA), the *Pseudemys rubriventris*, or Northern Red-Bellied Cooter. A certified vernal pool is located on the Site (VP-54901). The site abuts Myles Standish State Forest, an Atlantic Coastal Pine Barrens core for the Northeast United States. This Pine Barrens ecosystem is one of three on Earth. NHESP's information fact sheets for the seven state-listed species are attached as **Exhibit 3**. For each species, NHESP states that it is a species of greatest conservation need in Massachusetts.

The Project requires a Chapter 91 license from the Commonwealth which it had not received as of the date of the OOC. The Work is unlikely to qualify for a Chapter 91 permit.

Since at least 2019, Baldissera has been violating the Act and the Regulations. Baldissera has conducted Work in Resource Areas without a notice of intent, altering and continuing to alter Resource Areas in violation of the Act. Baldissera's violations are the subject of a pending adjudicatory proceeding before the Office of Dispute Resolution. Residents of Plymouth have filed numerous requests for enforcement with the Commission, as recently as December 2023. On December 23, 2023, Baldissera violated the Act and the Regulations by clearing trees and vegetation from a Resource Area without a notice of intent.

The Site is within the Plymouth Carver Sole Source Aquifer, federally designated by the U.S. EPA under the Safe Drinking Water Act. The Aquifer is vulnerable to contamination due to its sandy soils and high permeability. It has high transmissivity and contaminants that enter the groundwater move quickly through its matrix. The Work is within the Zone II wellhead protection area of the Plymouth Water Department Well #395.

Baldissera maintains his construction business in Resource Areas on the site, including the storage of equipment and materials. This is an ongoing violation of the Act.

Baldissera has constructed a retaining wall in Resource Areas without complying with the Act.

Grounds for this Request

The OOC does not adequately protect the interests of the Act for the following reasons:

The Commission found the Work is significant to Prevention of Pollution and protection of Wildlife. The OOC does not protect these interests. The Commission erroneously found that

the Work was not significant to other interests protected under the Act, specifically Fisheries, Public Water Supply, Private Water Supply and Groundwater. This is another reason the OOC is not adequately protective.

State listed species are not adequately protected and the evidence before the Commission rebutted the NHESP "Conditional No Take" finding of Dec. 1, 2023

At the Public Hearings on the NOI, a wetlands expert, Brandon Faneuf, PWS made a clear showing that overcame the presumption that the NHESP letter finding of no take (NHESP File 23-8702) is unsupportable. The evidence before the Commission showed that the Project will have a short and long term effect on state-listed species under MESA. The testimony and documentary evidence of members of the public and a member of the Ten Resident Group also rebutted the presumption.

(See, 310 CMR 10.59: "Notwithstanding 310 CMR 10.53 through 10.58 and 10.60, if a proposed project is found by the issuing authority (the ConCom) to alter a resource area which is part of the habitat of a state-listed species, such project shall not be permitted to have any short or long term adverse effects on the habitat of the local population of that species. A determination of whether or not a proposed project will have such an adverse effect shall be made by the issuing authority. However, a written opinion of the Program (NHESP) on whether or not a proposed project will have such an adverse effect shall be presumed by the issuing authority to be correct. This presumption is rebuttable and may be overcome upon a clear showing to the contrary.")

The evidence overcame the finding. The OOC violates the Act.

The NOI was incomplete and the OOC is not protective.

Reasons include that the OOC:

- Fails to protect groundwater supply, public water supply and private water supply. The NOI and the OOC fail to address the fact that the Work is in the Sole Source Aquifer and Zone II of Well #395.
- Fails to address protection of fisheries and OOC does not identify Fisheries as an interest under the Act even though the Work is in a Pond.
- Fails to address the cumulative impacts from the past and ongoing Work in violation of the Act, including the clearing of Resource Areas as recently as December 23, 2023.
- Failed to require Baldissera to identify the location and number of private and public drinking water supplies, zones of influence, and projected future water demands.

- Fails to protect Resource Areas.
- Will allow adverse impacts to Wildlife, the Priority Habitat and protected species.

The Work is improperly segmented from the pending appeal of the Commission's 2020 Negative RDA and violates MESA anti-segmentation provisions.

The alterations of the Resource Areas allowed under the OOC should not be segmented from the past violations on the Site. The Work is a continuation of Work that was done improperly and in violation of the Act. The Department should combine this appeal with the pending OADR appeal and conduct a thorough investigation of the past and ongoing violations.

On July 23, 2020, NHESP issued a no adverse effects finding for Baldissera's work on the Site, which on information and belief was already done. The NHESP no adverse effects finding is for the same seven species as the December 2023 finding. The Work under the NHESP July 20, 2020 finding was "Proposed Storage Shed and Fence." See, NHESP 20-39374. The Work that has been done is far more than a shed and fence. Land has been cleared, and continues to be cleared under the alleged authority of this 2020 NHESP letter.

Members of the Ten Resident Group have documented the violations for several years. Photographs, video and requests for enforcement to the Commission are available on request. The Commission has failed to take enforcement action, failed to require the mandated site restoration, and has allowed and continues to allow Baldissera to violate the Act.

CONCLUSION

This Pond is one of the most ecologically significant and biodiverse habitats in the Commonwealth of Massachusetts. It is a globally rare Coastal Plain Pond with endemic species, some of which are found nowhere else on Earth. The Commission has systematically allowed the Pond's ecosystems and NHESP habitat to be degraded and destroyed.

The Ten Residents Group urges the Department to act at this Site to exercise the full extent of its authority to stem the cumulative loss of biodiversity and our state's environmental heritage happening in Southeastern Massachusetts. This project is emblematic of the impact of the failure to implement the Wetlands Protection Act and its Regulations throughout the region and especially in the Town of Plymouth. This NHESP Priority Habitat has been degraded and destroyed with only "after the fact" attention by the Commission. The Site has yet to be properly restored under a so-called restoration plan from about 2021.

For the foregoing reasons, the Ten Residents Group requests that MassDEP overturn the OOC and issue a Superseding Order of Conditions denying the Project. MassDEP should thoroughly investigate the violations, issue a cease and desist for all Work, and where appropriate, issue the maximum daily penalties of $25,000.00 per day.

Very truly yours,

Margaret Sheehan

Margaret E. Sheehan
Attorney and Representative for
Ten Residents Group
environmentwatchsoutheasternma@gmail.com
508-259-9154
Post Office Box 1699
Plymouth MA 02362

cc:
Ricardo Baldissera, 403 Federal Furnace Road, Plymouth MA, 02360, Certified Mail # 7020 1290 0001 4654 3158

Conservation Commision, Town of Plymouth, 26 Court Street, Plymouth, MA 02360, Certified Mail # 7020 1290 0001 4654 3165

Order of Conditions Instructions

☐ This is the "ORIGINAL" Order of Conditions ☒ **Approval** ☐ **Denial**

☐ This is a "COPY" of the Order of Conditions. The 'Original" was mailed to your representative Environmental Consulting & Restoration, LLC

PRIOR TO COMMENCING WORK

To complete this Order of Conditions and prevent unnecessary delays, please read and follow ALL Conditions. Contact the Conservation Office between 7:30 to 4 PM, Mon, Wed, Thu; 7:30 to 6:30 PM Tue and 7:30 to noon on Friday. 508-747-1620, x10139 or x10140 if clarification or assistance is needed.

BEFORE THE PROJECT CAN BEGIN

- Scheduled your pre-construction meeting with the Conservation Planner, 508-747-1620, x10139.
- If REVISED plans are requested as a condition in the Order, they must be submitted for approval at the pre-construction meeting.
- If a License Agreement with the Town Manager's Office is required, proof of license is to be provided at the pre-construction meeting.
- The Commission must be notified in writing of the start of your project, giving 24-hour notice.
- The "ORIGINAL" Approval Order must be recorded at the Registry of Deeds or at Land Court, located on Obery Street, in Plymouth. The Registry does not accept COPIES of the Order for recording (unless that copy is a "Certified True Copy" attested by the Plymouth Town Clerk). Sign the Order on page (12). After recording the Order, the Registry will stamp page 1 with recording information. You must return a copy of Pg. 12 (signed) to the Conservation Office, 26 Court St., 3rd floor. **We cannot sign off your building permit application until we have proof of recording of this Order.**
- Denial orders do not have to be recorded.
- There is a 10-day (business days) appeal period, from the "Date of Issuance" of the Order. No work may commence until this 10-day appeal period is over.
- If approved a sign must be posted on the site, with the following information:
  DEP Number: SE57-3295 **, PCC Number: PCC-** 23-04
  These numbers are located on the top right corner of your Order of Conditions.

ISSUANCE OF A CERTIFICATE OF COMPLIANCE (COC)

When the project is complete, you must request a COC by submitting a letter to the Commission stating that the project has been completed and in accordance with the Order of Conditions and approved plans. **Note: Some projects require engineering certification to be submitted with "as-built" plans.** A fee of $100 is charged for your request for a COC (check payable to Town of Plymouth). Any changes from the Conservation-approved plans must be noted in your request. A COC will be issued once the Agent has inspected and the Commission takes a vote (in a public meeting) that all work has been completed to the satisfaction of the Order. Once the COC is issued, you must record the original "signed" document at the Registry of Deeds on Obery Street in Plymouth. **Recording your COC is a very important final step.**

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

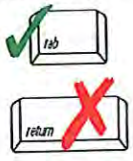
Provided by MassDEP:
SE57- 3295
MassDEP File #

eDEP Transaction #
PCC- 23-04
City/Town Plymouth

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. From: Plymouth Conservation Commission

2. This issuance is for (check one): a. [X] Order of Conditions b. [ ] Amended Order of Conditions

3. To: Applicant:

Ricardo (a. First Name) | Baldissera (b. Last Name)

c. Organization

403 Federal Furnace Road (d. Mailing Address)

Plymouth (e. City/Town) | MA (f. State) | 02360 (g. Zip Code)

4. Property Owner (if different from applicant):

a. First Name | b. Last Name

c. Organization

d. Mailing Address

e. City/Town | f. State | g. Zip Code

5. Project Location:

403 Federal Furnace Road (a. Street Address) | Plymouth (b. City/Town)

095 / 000 (c. Assessors Map/Plat Number) | 058 / 000 (d. Parcel/Lot Number)

Latitude and Longitude, if known: 41 d 54 m 58.853 s (d. Latitude) | 70 d 42 m 36.635 s (e. Longitude)

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Plymouth
a. County

b. Certificate Number (if registered land)

50088
c. Book

81
d. Page

7. Dates: February 2, 2023 (a. Date Notice of Intent Filed) February 6, 2024 (b. Date Public Hearing Closed) February 14, 2024 (c. Date of Issuance)

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

a. Plan Title

b. Prepared By

c. Signed and Stamped by

d. Final Revision Date

e. Scale

f. Additional Plan or Document Title

g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☐ Public Water Supply b. ☐ Land Containing Shellfish c. ☒ Prevention of Pollution

d. ☐ Private Water Supply e. ☐ Fisheries f. ☒ Protection of Wildlife Habitat

g. ☐ Groundwater Supply h. ☐ Storm Damage Prevention i. ☐ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) _____ a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☒ Bank	aprox 4 a. linear feet	b. linear feet	N/A c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☒ Land Under Waterbodies and Waterways	Aprox 240 a. square feet	b. square feet	N/A c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	N/A a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment aprox 4 cu yd
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

B. Findings (cont.)

* #23. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. ☐ Restoration/Enhancement *:

a. square feet of BVW _____ b. square feet of salt marsh _____

24. ☐ Stream Crossing(s):

a. number of new stream crossings _____ b. number of replacement stream crossings _____

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. The work is a maintenance dredging project as provided for in the Act; or
   b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on 02/14/2027 unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number SE57- 3295 " PCC- 23-04

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")
    (1) [X] is subject to the Massachusetts Stormwater Standards
    (2) [ ] is NOT subject to the Massachusetts Stormwater Standards

    If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

    a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

    b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:

    i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;

    ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;

    iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

See pages 9a, 9b, and 9c for Additional General Conditions issued under the Town By-Law
See page 13 for Special Conditions

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

C1. Town of Plymouth Conditions – Chapter 196

Findings

☐ Flood storage capacity	☐ Storm damage prevention	☒ Erosion & sedimentation control
☒ Water Pollution	☐ Waste Disposal	☐ Groundwater Aquifers
☐ Public water supplies	☐ Private water supplies	☐ Water Recharge Areas
☐ Fisheries	☐ Shellfish	☒ Wildlife Habitats
☐ Endangered plant species	☐ Agricultural values	☐ Aesthetic Values

☐ Recreational Values
Control of floodwater & runoff, to assure the continuation of the natural flow pattern of watercourses.

The Town of Plymouth Conservation Commission has found it necessary to include these additional General Conditions for all Approved projects.

Project Management

1. All construction must comply with the latest referenced plans and the conditions of this Order. Under this filing, no change in plan is permissible without prior written approval from the Commission. For any proposed change in the approved plans or in the work, the applicant shall inquire in writing of the Commission whether the change is substantial enough to require either an Amended Order of Conditions or a new Notice of Intent.

2. Copies of all required permits, including proof of recording of the Order from the Registry of Deeds (Book and Page No.), shall be submitted to the Commission prior to commencing any work on site.

3. The project engineer(s) and contractor(s) shall be provided with copies of this Order, the submitted Notice of Intent, and the above referenced plans and shall have these documents available on-site during construction.

4. Prior to Commencement of work with Conservation Jurisdiction, a pre-construction meeting shall be held amongst the Applicant's Engineer, Contractor and Conservation Staff to clearly delineate the responsibilities of the parties and clarify any ambiguities in this OOC.

5. The Conservation Commission shall be notified at least twenty-four (24) hours prior to commencement of the work. This notification must be in writing and sent by mail, electronically or hand delivered to the Conservation Office, Town Hall, 26 Court Street, Plymouth, MA 02360. This enables the Commission the opportunity to ensure all pre-construction conditions have been met.

6. This Order shall apply to and become the responsibility of the applicant, owner, their agent, successor or assignee.

7. No additional work shall be allowed in or within 100 feet of the wetland/resource area boundary, including but not limited to the cutting or removing, of vegetation or soil, unless it is specifically allowed by this Order and as is shown on the final approved plan, or unless it is first approved by the Conservation Commission.

8. Copies of all plans and/or other information received by the Commission for this project shall be submitted by the applicant, (via hard copy or email) to the Southeast Regional Office of the Department of Environmental Protection (DEP), 20 Riverside Drive, Route 105, Lakeville, MA 02347.

9. If work associated with this Order is subject to the Massachusetts Stormwater Policy Standards, then General Condition No. 19 (page 7) also becomes a part of this Order under the Town of Plymouth Wetland Bylaw.
10. If any unforeseen problems occur during construction that affect any of the statutory interests identified in MGL c. 13 1 §40 (3 10 CMR 10.00 et seq.) and/or the Town of Plymouth Wetlands By-Law, the Applicant shall notify the Conservation Commission upon discovery, and an immediate meeting shall be held between the Conservation Commission, the Applicant, the Applicant's Engineer, and the Contractor, and any other concerned parties, to determine the corrective measures to be employed. The Applicant shall then implement the agreed-upon corrective measures. In the event of a dispute between the meeting participants, the Commission's view shall prevail.

Sedimentation / Erosion Control

11. Prior to the commencement of any site activity, a Professional Engineer (PE), licensed by the Commonwealth of Massachusetts, shall inspect the installation of the erosion control barriers (ECB) for compliance with the final approved plan referenced (or mandated) by this Order of Conditions. The inspection results shall be submitted to the Conservation Commission in writing, signed and wet stamped by the PE who performed the inspection. No work can commence without this approval.
12. An extra 10% of ECB must be stored on site in the event of an emergency or storm.
13. The Contractor shall install ECB as shown on the plan referenced in this decision. The sedimentation barriers will also serve as the limit of work, and no work, disturbance, or alteration shall occur on the resource area side of the barrier except as described in these Conditions.
14. If siltation, erosion, or other adverse impacts to any resource areas occur, the Commission reserves the right to impose additional conditions as necessary to protect the interests of the Wetlands Protection Act and the Plymouth Wetlands Protection By-Law.
15. To assure the continued effective removal of sediments, the Contractor will inspect the barriers weekly and after each rainfall event to determine its condition. At the time of these inspections, accumulated sediments will be removed from the barriers and damaged barriers will be repaired or replaced as necessary. In no event shall silt be allowed to accumulate to a height greater than half of the height of the ECB. Any removed sediment will be disposed at a suitable location.
16. No ECB may be removed without the approval of the Commission or its staff.

Heavy Equipment

17. All machinery deployed within Conservation jurisdiction shall use biodegradable hydraulic fluid. Documentation shall be submitted to the Conservation Commission prior to initiation of site activity.
18. No vehicles/heavy equipment/machinery shall be stored within wetland resource areas or the 100-foot buffer zone resource areas.
19. There shall be no more than a total of 50 gallons of fuel (other than what is in vehicles) or maintenance chemicals relating to this construction stored on the site in an area subject to the Conservation Commission's jurisdiction at any one time. No routine servicing of vehicles used for this project shall be permitted on the site. The Conservation Commission and the Board of Health shall be notified prior to initiating any emergency repair on the site drainage system or wetland resource area.

20. Any leaks or spills of hydraulic fluid, gasoline, or other oils or hazardous material must be cleaned up immediately and disposed of at an appropriate off-site location in accordance with all federal, state, and local requirements and regulations. The Contractor must notify the Conservation Commission and the Board of Health within 24 hours of any spillage or leakage of oil or hazardous material, including appropriate amount of Speedy Dry on site.

Site Maintenance

21. Any fill used in connection with this project shall be clean fill, containing no trash, refuse, rubbish or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles or parts of any of the foregoing.

22. Any stockpiled or similar material must be enclosed within an erosion control barrier to prevent erosion or siltation migrating into resource areas or the undisturbed buffer zone.

23. The Contractor shall be responsible for removing and disposing of debris and excavated material to an off-site disposal area in accordance with all federal, state, and local requirements and regulations. Any excavated asphalt must be placed immediately on trucks and disposed of at an appropriate off-site location.

24. No debris, fill, and excavated material shall be stockpiled within 25 feet (horizontal distance) of the limit of work. At no time shall any debris or other material be buried or disposed of within wetland resource areas or the 100-foot buffer zone resource areas, other than fill that is shown on the above-referenced plans.

25. Any debris, sediment, or other material that falls into or otherwise enters the wetland resource area during the construction period must be immediately removed by hand.

Certificate of Compliance

26. Prior to the final inspection and before issuance of the Certificate of Compliance, the Engineer, or Consultant shall prepare an As-Built plan of the completed project work and attest to the Conservation Commission, in writing, that all the Conditions in this Order have been substantially complied with and the project, as constructed adheres to the approved plans and field changes on file with the Commission and/or any deviations.

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No

2. The Plymouth Conservation Commission hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:
   Plymouth
   1. Municipal Ordinance or Bylaw — 2. Citation

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☒ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:
   Plymouth
   1. Municipal Ordinance or Bylaw — 2. Citation

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.
   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

February 14, 2024
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

5
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

Sean Andersen, Chair

Lucas Nichols, Vice-Chair

Karen Edwards

Paul Churchill

Walter Morrison, III

James F. Carpenter

☐ by hand delivery on

Date

☐ by certified mail, return receipt requested, on

February 14, 2024

Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Plymouth
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Plymouth
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location _____ MassDEP File Number _____

Has been recorded at the Registry of Deeds of:

Plymouth
County _____ Book _____ Page _____

for: Property Owner _____

and has been noted in the chain of title of the affected property in:

Book _____ Page _____

In accordance with the Order of Conditions issued on:

Date _____

If recorded land, the instrument number identifying this transaction is:

Instrument Number _____

If registered land, the document number identifying this transaction is:

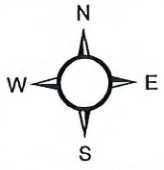
Document Number _____

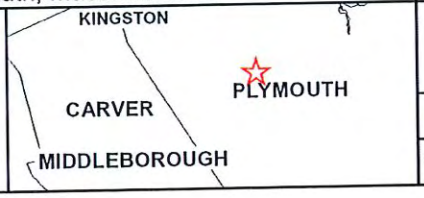
Signature of Applicant _____

DOCK CLOSE UP VIEW

Proposed Dock Plan
403 Federal Furnace Road
Plymouth, Massachusetts

NOTES:
1.) This plan has been prepared for conservation permitting only.
2.) Aerial Source: MA 2021 Aerial - MassMapper



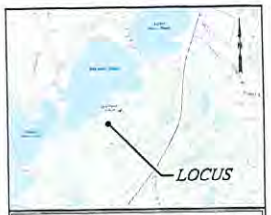


Feet
0 10 20 40 60 80

DATE: DEC. 4, 2023 | 1 inch = 40 feet

CREATED BY: C. LARSON

Environmental Consulting & Restoration, LLC
PO Box 4012, Plymouth, MA 02361



LOCATION MAP NOT TO SCALE

RECORD OWNER:

ASSESSORS PARCEL ID#: 085-000-058-000
#403 FEDERAL FURNACE ROAD

RICARDO & HARALAMPIA BALDISSERA
403 FEDERAL FURNACE ROAD
PLYMOUTH, MA 02360
DEED BOOK 30088 PAGE 81

FLOOD NOTE:

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS LOCATED IN ZONE X AND ZONE A (NO B.F.E.) OF THE FLOOD INSURANCE RATE MAP, AS SHOWN ON COMMUNITY MAP No. 25023C0326K, WHICH BEARS AN EFFECTIVE DATE OF JULY 6, 2021, AND IS PARTIALLY WITHIN A SPECIAL FLOOD HAZARD AREA.

NOTES:

1. PLAN REFERENCES:
   1.1. PLAN BOOK 23, PAGE 1042 (#548 OF 1883).
2. TOPOGRAPHIC AND DETAIL INFORMATION SHOWN HEREON IS BASED UPON AN ON THE GROUND SURVEY PERFORMED BY MERRILL ENGINEERS AND LAND SURVEYORS DURING MARCH OF 2023.
3. ALL ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988.
4. WETLAND RESOURCE AREAS SHOWN ON THIS PLAN WERE DELINEATED BY ENVIRONMENTAL CONSULTING AND RESTORATION, LLC DURING MARCH OF 2023 AND FIELD LOCATED BY MERRILL ENGINEERS AND LAND SURVEYORS.
5. SUBJECT SITE IS IN THE "R-25" DISTRICT AND PLYMOUTH AQUIFER PROTECTION AREA 2 (ZONE II) AND AREA 3 AS DEPICTED ON THE TOWN OF PLYMOUTH ZONING MAP.
6. EXISTING UTILITIES, WHERE SHOWN, HAVE BEEN COMPILED BASED ON OBSERVED ABOVE GROUND EVIDENCE AND AVAILABLE RECORD PLANS AND ARE TO BE CONSIDERED APPROXIMATE. MERRILL ENGINEERS AND LAND SURVEYORS DOES NOT GUARANTEE THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN OR THAT ALL EXISTING UTILITIES AND/OR SUBSURFACE STRUCTURES ARE SHOWN.

ENVIRONMENTAL NOTES:

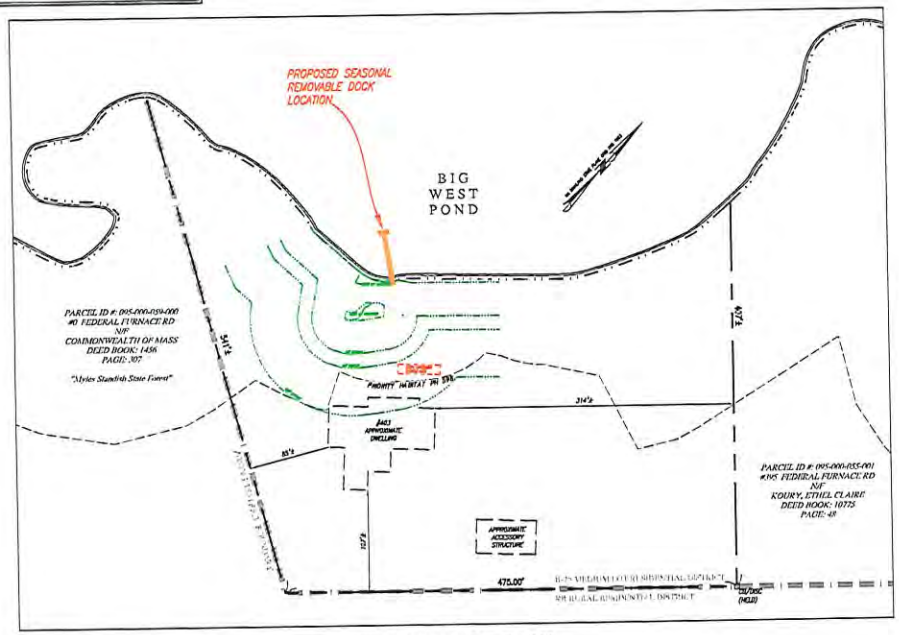
1. SITE IS NOT WITHIN AN A.C.E.C. (AREA OF CRITICAL ENVIRONMENTAL CONCERN).
2. SITE IS PARTIALLY LOCATED WITHIN AN AREA OF ESTIMATED HABITAT OF RARE WILDLIFE PER NHESP MAP "ESTIMATED HABITATS OF RARE WILDLIFE" FOR USE WITH THE MA WETLANDS PROTECTION ACT REGULATIONS (310 CMR 10)."
3. SITE DOES NOT CONTAIN A CERTIFIED VERNAL POOL PER NHESP MAP "CERTIFIED VERNAL POOLS."
4. SITE IS PARTIALLY LOCATED WITHIN A PRIORITY HABITAT (PH 598) PER NHESP MAP "PRIORITY HABITATS OF RARE SPECIES" FOR SPECIES UNDER THE MASSACHUSETTS ENDANGERED SPECIES ACT, REGULATIONS (321 CMR10).
5. SITE IS LOCATED WITHIN A STATE APPROVED ZONE II GROUND WATER RECHARGE PROTECTION AREA.

CONSTRUCTION NOTES:

1. FIELD STAKE DOCK INSTALLATION.
2. COMPLETE PRECONSTRUCTION REQUIREMENTS REQUIRED BY PERMITS.
3. SETUP MATERIAL STAGING AREA.
4. INSTALL PILES WITH MANUFACTURER SUPPLIED SKID PLATES (IF APPLICABLE)
5. USE GALVANIZED OR STAINLESS STEEL HARDWARE.
6. INSTALL DECKING AND RAILS. IF RAILS ARE NEEDED.
7. INSTALL DECKING AND RAILS. DECKING WILL HAVE A 3/4" SPACING TO ALLOW SUNLIGHT THROUGH.
8. REMOVE STRUCTURE IN OFF SEASON AND STORE AS SHOWN BELOW.

LEGEND

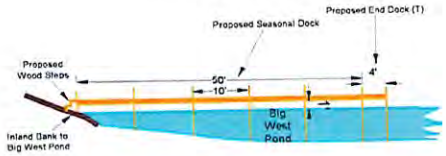
□	CB/DMH	CONCRETE MONUMENT
○	LP	LIGHT POLE (PUBLIC)
		DECIDUOUS TREE
---100---		CONTOUR LINE
	LS	LANDSCAPE AREA
	EOW	EDGE OF WATER



PERIMETER BOUNDARY

60 0 60 120 180

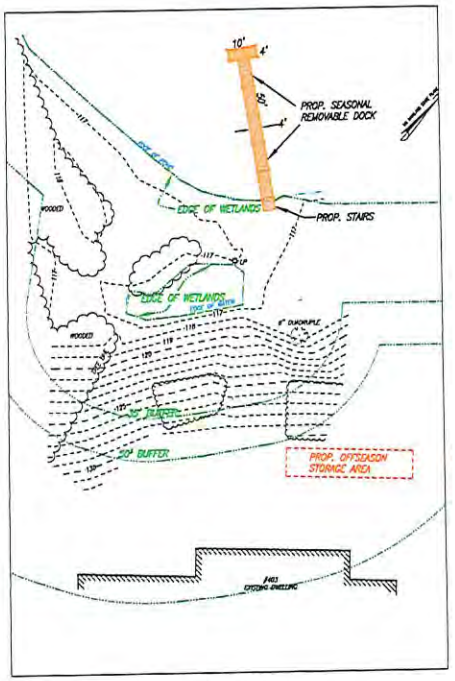
SCALE IN FEET



CROSS-SECTION

10 0 10 20 30

SCALE IN FEET



INSET DETAIL

20 0 20 40 60

SCALE IN FEET

merrillinc.com

REVISIONS

DRAWN BY: JPD

DESIGNED BY:

CHECKED BY: SM

THOMAS A. POLITSCHKO CIVIL No. 46808

Merrill
Engineers and Land Surveyors
427 Columbia Road
Hanover, MA 02339
781-829-0030
40 Court Street, Ste 24
Plymouth, MA 02360
508-746-6080
Norton Station
26 Union Street
Plymouth, MA 02360
508-746-6080
857 Main Street
Hanover, MA 02339
781-829-0157
448 N. Falmouth Highway Unit A
North Falmouth, MA 02556
508-563-2163

PROJECT #: 23-084

PROJECT
RESIDENTIAL DOCK PLAN
#403 FEDERAL FURNACE ROAD
PLYMOUTH, MASSACHUSETTS

CLIENT
RICARDO BALDISSERA
403 FEDERAL FURNACE ROAD
PLYMOUTH MASSACHUSETTS

DRAWING TITLE
23-084 SK.DWG

DATE
APRIL 20, 2023

SHEET #1 of 1

RESTORATION NOTES:

1. THE OVERVIEWING WETLAND SPECIALIST SHALL STAKE OUT THE LIMITS OF THE PROPOSED RESTORATION AREA TO INCLUDE THE 35 FOOT BUFFER ZONES.
2. THE BRUSH PILES STOCKPILES IN THE NORTHERN PORTION OF THE SITE AND ALONG THE B SERIES WETLAND SHALL BE REMOVED FROM THE 100 FOOT BUFFER ZONE. INCLUDED IN THIS TASK IS REMOVAL OF HISTORIC DEBRIS WITHIN THE BUFFER ZONE LEFT BY PRIOR PROPERTY OWNERS.
3. THE FIREWOOD PILE SHOULD BE REMOVED FROM THE 35 FOOT BUFFER ZONE AND STORED OUTSIDE THE 100 FOOT BUFFER ZONE.
4. THE 35-FOOT BUFFER ZONE SHALL BE HAND PLANTED WITH A MIXTURE OF NATIVE SHRUBS AND SAPLINGS. SHRUBS WILL BE SPACED 10 FEET ON CENTER AND SAPLINGS 15 FEET ON CENTER WITHIN THE 35-FOOT BUFFER ZONE IN ACCORDANCE WITH D.E.P. GUIDANCE. A TOTAL OF 53 SHRUBS AND 24 SAPLINGS WILL BE REQUIRED TO COVER THE 4,605 SQUARE FEET WITHIN THE 35-FOOT BUFFER ZONE.
5. UPON COMPLETION OF PLANTING THE ROOT ZONES OF THE PLANTS WILL BE MULCHED WITH NATURAL ORGANIC MULCH/WOOD CHIPS.
6. ANY BARE SURFACES WITHIN THE REMAINING RESTORATION AREA WILL BE SCRATCHED AND SEEDED WITH A CONSERVATION/WILDLIFE SEED MIX AT THE RATE SPECIFIED BY THE SUPPLIER. PLEASE REFER TO THE SEED MIX PROFILE ATTACHED FOR MORE INFORMATION. THE EXISTING TOPSOIL MAY BE SUPPLEMENTED WITH A LIGHT LAYER OF NEW LOAM.
7. EROSION CONTROL BARRIERS SHOULD BE INSTALLED ALONG THE DOWNGRADIENT LIMIT OF BARE SOILS WITHIN THE RESTORATION AREA, WHERE NECESSARY. STRAWWATTLES ARE THE RECOMMENDED EROSION CONTROL BARRIER.
8. AN IRRIGATION SCHEDULE SHALL BE ESTABLISHED BY THE PROPERTY OWNER.
9. UPON COMPLETION OF THE TASKS ABOVE, A RESTORATION COMPLETION REPORT WITH PHOTOGRAPHS WILL BE SUBMITTED TO THE CONSERVATION OFFICE.

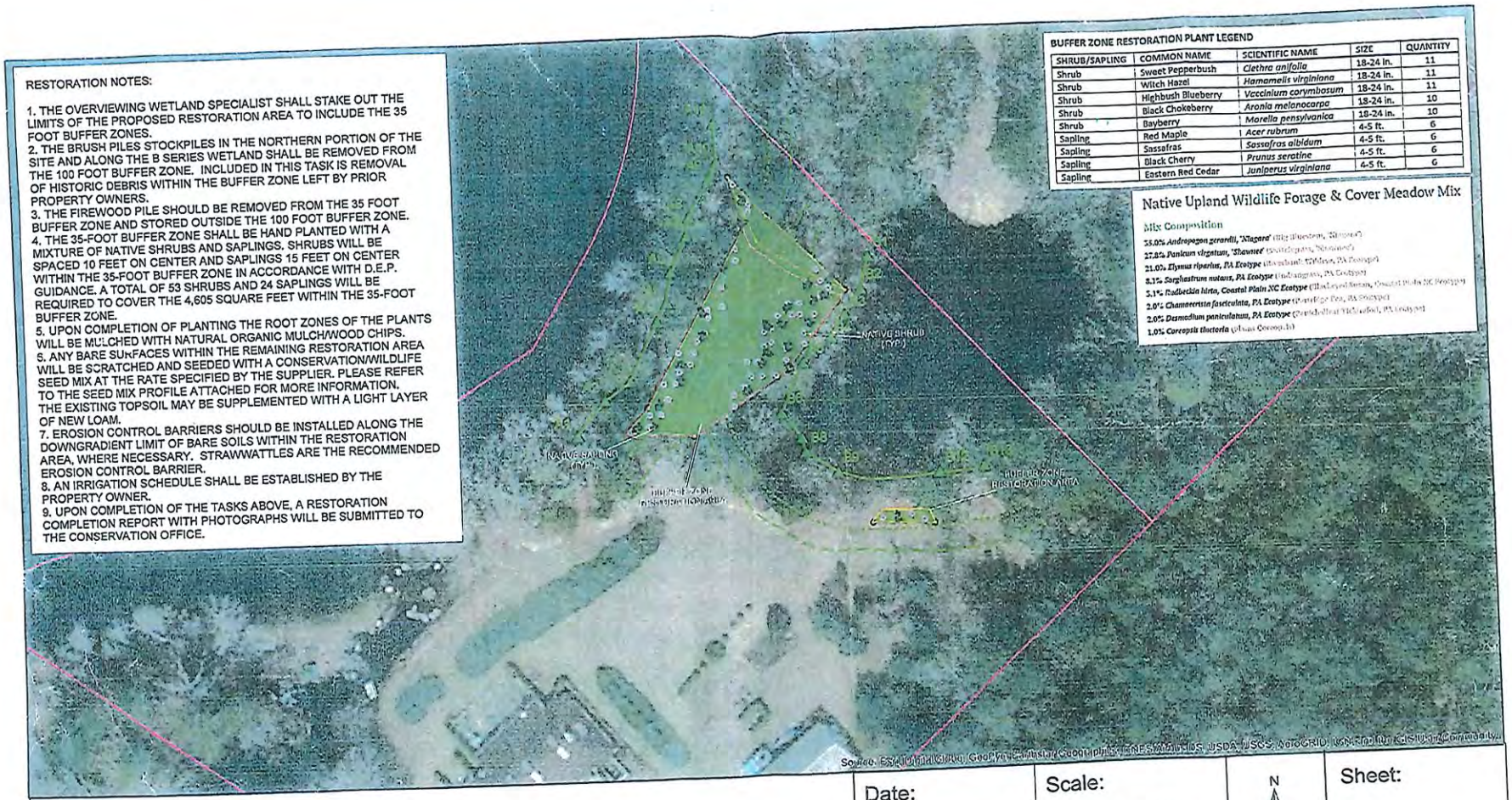
BUFFER ZONE RESTORATION PLANT LEGEND

SHRUB/SAPLING	COMMON NAME	SCIENTIFIC NAME	SIZE	QUANTITY
Shrub	Sweet Pepperbush	*Clethra anifolia*	18-24 in.	11
Shrub	Witch Hazel	*Hamamelis virginiana*	18-24 in.	11
Shrub	Highbush Blueberry	*Vaccinium corymbosum*	18-24 in.	11
Shrub	Black Chokeberry	*Aronia melanocarpa*	18-24 in.	10
Shrub	Bayberry	*Morella pensylvanica*	18-24 in.	10
Sapling	Red Maple	*Acer rubrum*	4-5 ft.	6
Sapling	Sassafras	*Sassafras albidum*	4-5 ft.	6
Sapling	Black Cherry	*Prunus serotina*	4-5 ft.	6
Sapling	Eastern Red Cedar	*Juniperus virginiana*	4-5 ft.	6

Native Upland Wildlife Forage & Cover Meadow Mix

Mix Composition

35.0% *Andropogon gerardii*, 'Niagara' (Big Bluestem, Ecotype)
27.5% *Panicum virgatum*, 'Shawnee' (Switchgrass, Ecotype)
21.0% *Elymus riparius*, PA Ecotype (Riverbank Wildrye, PA Ecotype)
8.1% *Sorghastrum nutans*, PA Ecotype (Indiangrass, PA Ecotype)
3.1% *Rudbeckia hirta*, Coastal Plain NC Ecotype (Blackeyed Susan, Coastal Plain NC Ecotype)
2.0% *Chamaecrista fasciculata*, PA Ecotype (Partridge Pea, PA Ecotype)
2.0% *Desmodium paniculatum*, PA Ecotype (Panicledleaf Ticktrefoil, PA Ecotype)
1.0% *Coreopsis tinctoria* (Plains Coreopsis)



BUFFER ZONE RESTORATION PLAN

403 Federal Furnace Road
Plymouth, Massachusetts

Environmental Consulting & Restoration, LLC

Notes:
1.) Base Map Source: ESRI
2.) Wetland delineation & GPS survey conducted by ECR on August 14, 2019

Legend

- Wetland Flag
- Wetland Delineation
- 35 Foot Buffer Zone
- 50 Foot Buffer Zone
- Parcel Boundary

Date: August 2019

Scale: 1 inch = 60 feet

N

0 30 60 120 180 240 Feet

Sheet: 2 of 2

In addition to General Conditions and Additional Conditions, the Commission has found it necessary to include the following Special Conditions pursuant to the Massachusetts Wetlands Protection Act and the Town of Plymouth Wetlands Bylaw. The listed General Conditions, Findings and Additional Special Conditions are automatically part of this Order of Conditions.

FINDINGS:

403 Federal Furnace Road **SE57-3295**
Parcel ID:095-000-058-000 *PCC-23-04*
Ricardo Balissera
Environmental Consulting & Restoration, LLC
A Notice of Intent to Construct a Seasonal Dock for recreation access to Big West Pond.

Regulatory References

The proposed project is located within the following Resource Areas. The analysis performed should address the impact of the project on the performance standards for the Resource Areas under both the State Act and the Plymouth By-law/Regulations.

- **Bordering Vegetated Wetland [BVW] - (Wet Meadows, Marshes, Swamps and Bogs):** 310 CMR 10.55 & **Vegetated Wetlands (Wet Meadows, Marshes, Swamps and Bogs); Vegetated Wetland** C. 196 Part II Section 10B.
- **NHESP:** 310 CMR 10.59 (Fresh Water Wetlands)
- **Buffer Zone (BZ):** C. 196 Part 1lI.
- **Waiver Request:** C.196 Section 12

SPECIAL CONDITIONS:

Seasonal Dock

1. The dock structure shall be continuously maintained in a manner that will ensure safe use.

2. All ramps, supports, decking and other parts of the proposed structure(s) must be removed from the waterways and wetland resource areas from November 1 until April 1st of each year and stored in a suitable upland area, away from the beach, inland bank, or other wetland resource area.

3. The floorboards of the dock shall be constructed to allow sunlight to pass through. Minimum of ¼" spacing is recommended.

4. Each dock section shall be inscribed with the Plymouth File Number, "***PCC- 23-04***".

5. The public shall not be hindered from free access over the proposed structure for the purposes of fishing, fowling or navigating.

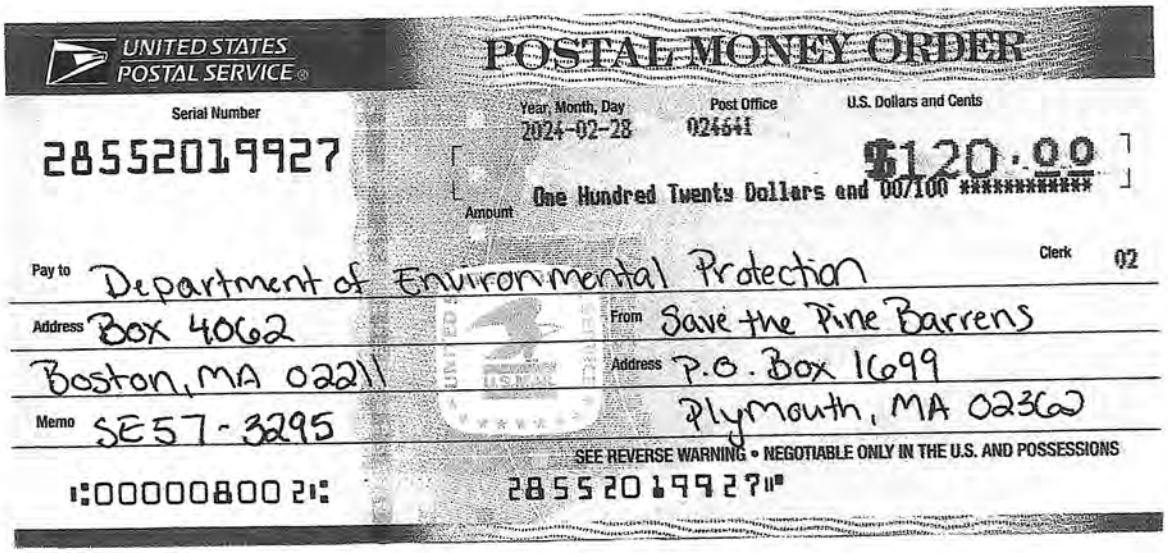
6. The applicant must inquire whether a Chapter 91 Waterways License from the Department of Environmental Protection is required for this dock. A Certificate of Compliance will not be issued for this project until a Chapter 91 license is obtained, if applicable, and all requirements are met. Copies of all correspondence shall be forwarded to the Conservation Office.

NHESP

Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife has determined that to avoid a prohibited Take of state listed species, the following conditions must be met.

1. **Plant Surveys:** A division approved botanist shall conduct botanical field surveys at appropriate times of year and in all suitable habitats within and adjacent to the proposed access and limit of work after both 3 and 5 years from the installation of the dock.

2. **Reporting:** At the completion of the survey, a survey report shall be submitted to the Division as outlined in the survey guidelines. Please note that survey data must be submitted via Heritage Hub (https://eeaonline.eea.state.ma.us/dfg/nhesp/#/home).



UNITED STATES POSTAL SERVICE

POSTAL MONEY ORDER

Serial Number
28552019927

Year, Month, Day
2024-02-28

Post Office
024641

U.S. Dollars and Cents
$120.00

Amount
One Hundred Twenty Dollars and 00/100 **********

Clerk
02

Pay to Department of Environmental Protection

Address Box 4062
Boston, MA 02211

From Save the Pine Barrens

Address P.O. Box 1699
Plymouth, MA 02360

Memo SE57-3295

SEE REVERSE WARNING • NEGOTIABLE ONLY IN THE U.S. AND POSSESSIONS

:00000800 2:

28552019927"

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

SE57-3295
Provided by DEP

A. Request Information

1. Location of Project

403 Federal Furnace Road
a. Street Address

Plymouth, MA 02360
b. City/Town, Zip

28552019927
c. Check number

$120.00
d. Fee amount

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

2. Person or party making request (if appropriate, name the citizen group's representative):

Save the Pine Barrens, Inc.
Name

P.O. Box 1699
Mailing Address

Plymouth
City/Town

MA
State

02362
Zip Code

(508) 259-9154
Phone Number

Fax Number

environmentwatchsoutheasternma@gmail.com
Email Address

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Ricardo Baldissera
Name

403 Federal Furnace Road
Mailing Address

Plymouth
City/Town

MA
State

02360
Zip Code

Phone Number

Fax Number

Email Address

4. DEP File Number:

SE57-3295

B. Instructions

1. When the Departmental action request is for (check one):

☒ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)

☐ Superseding Determination of Applicability – Fee: $120

☐ Superseding Order of Resource Area Delineation – Fee: $120

Send this form and check or money order, payable to the *Commonwealth of Massachusetts,* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

B. Instructions (cont.)

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see https://www.mass.gov/service-details/massdep-regional-offices-by-community).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Natural Heritage & Endangered Species Program

www.mass.gov/nhesp

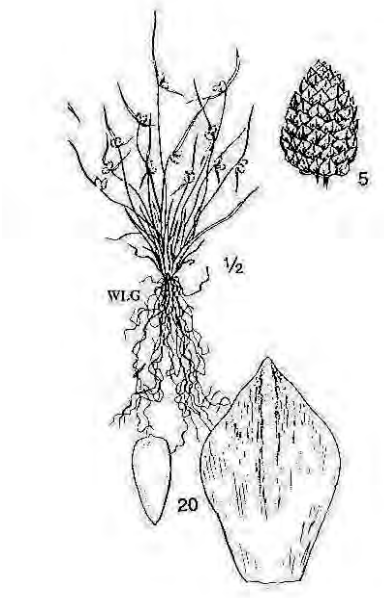
Massachusetts Division of Fisheries & Wildlife

Dwarf Bulrush
Lipocarpha micrantha
(Vahl.) G. Tucker

State Status: **Threatened**
Federal Status: **None**

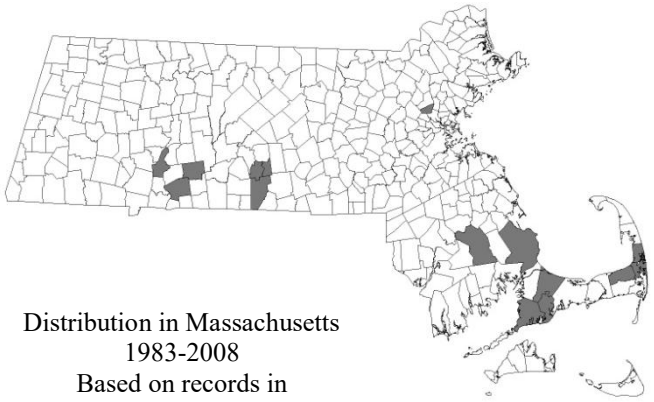
DESCRIPTION: Dwarf Bulrush (*Lipocarpha micrantha*) is a tiny, wiry annual sedge (family Cyperaceae), which inhabits sandy to peaty shores of low-nutrient ponds and lakes.

AIDS TO IDENTIFICATION: Reaching just 2 to 20 cm (<0.1–8 in.) in height, this tiny bulrush grows in small tufts, and has very slender stems, leaves, and bracts. The leaves are up to 10 cm (4 in.) in length, and just 0.5 mm wide. The terminal bract appears to be a continuation of the stem, and the inflorescence appears lateral. The stem bears 1 to 3 egg-shaped spikelets, each with numerous spirally-arranged, overlapping scales. The scales are 1 to 2 mm long, and narrowly rounded with a small awn (sharp tip). The flowers, which develop beneath the scales, have both female and male parts, and no bristles. The fruit, an achene, is cylindric, iridescent brown, and 0.5 to 0.7 mm long.



Holmgren, N.H. 1998. *The Illustrated Companion to Gleason and Cronquist's Manual*. NY Botanical Garden.

SIMILAR SPECIES: When examined at maturity, Dwarf Bulrush is not likely to be confused with other bulrushes in Massachusetts, due to its dwarf size and slender foliage.



Distribution in Massachusetts
1983-2008
Based on records in
Natural Heritage Database

HABITAT: Dwarf Bulrush inhabits sandy to peaty, gently sloping shores of acidic, low-nutrient freshwater ponds with dramatic water-level fluctuation. This annual sedge germinates in a band of shore exposed following late season water-level recession. In Massachusetts, it is found along the shores of coastal plain ponds, and of ponds outside of the coastal plain that have similar hydrology, and water chemistry.

Associated species include several species of flatsedge (*Cyperus* spp.), Autumn Fimbry (*Fimbristylis autumnalis*), Canadian St. John's-wort (*Hypericum canadense*), Golden Hedge-hyssop (*Gratiola aurea*), and several species of spike-sedge (*Eleocharis* ssp.).

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

1 Rabbit Hill Rd., Westborough, MA; tel: 508-389-6300; fax: 508-389-7890; www.mass.gov/dfw

THREATS: Threats to Dwarf Bulrush include any activities that change the natural hydrology, water quality, or soil integrity of its habitat. Examples include water table drawdown from local wells, eutrophication resulting from nutrient inputs from septic systems and lawns, and trampling and soil disturbance due to recreational use of pondshores (i.e., hiking, sunbathing, swimming, fishing, boat-launching, and raking or digging).

RANGE: The range of Dwarf Bulrush is broad, encompassing nearly all of the eastern and midwestern states, Quebec and Ontario, and a portion of the west. It is rare or extirpated throughout most of New England.

POPULATION IN MASSACHUSETTS: Dwarf Bulrush is listed under the Massachusetts Endangered Species Act as Threatened. All listed species are legally protected from killing, collection, possession, or sale, and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Dwarf Bulrush is currently known from Barnstable, Hampden, Middlesex, Plymouth, and Worcester Counties, and is historically known from Dukes, Essex, Hampshire, and Norfolk Counties.

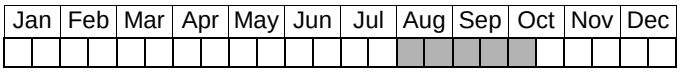
MANAGEMENT RECOMMENDATIONS:
Preservation of Dwarf Bulrush requires protection of the natural hydrology, water quality, and soil integrity of its habitat. Like other pondshore plant species that inhabit late-season exposed shores, it requires pronounced water-level fluctuations, and acidic, nutrient-poor water and substrate, free from major soil disturbance.

Dwarf Bulrush populations should be monitored regularly to identify possible threats. This species is best surveyed when mature fruit are present, mid-August to late September, depending on when water levels recede.

Protection of Dwarf Bulrush may require exclusion of new wells and septic systems, prohibitions on fertilizer use, and restrictions on recreational use of the pondshores. Recreational activities such as swimming, fishing, and boat-launching should be diverted from plant population locations by providing alternative locations for these activities.

Also, habitat should be monitored for exotic plant species invasions. The nature of coastal plain ponds makes them generally inhospitable to many exotic plants, but they can become established at sites that have major soil disturbance or heavy nutrient inputs. Exotic species that could establish along the shoreline of coastal plain ponds include Common Reed (*Phragmites australis* ssp. *australis*), Gray Willow (*Salix cinerea*), and Purple Loosestrife (*Lythrum salicaria*).
All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

Fruiting time in Massachusetts



Updated 2015

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Please allow the Natural Heritage & Endangered Species Program to continue to conserve the biodiversity of Massachusetts with a contribution for 'endangered wildlife conservation' on your state income tax form, as these donations comprise a significant portion of our operating budget.
www.mass.gov/nhesp

Natural Heritage & Endangered Species Program

www.mass.gov/nhesp

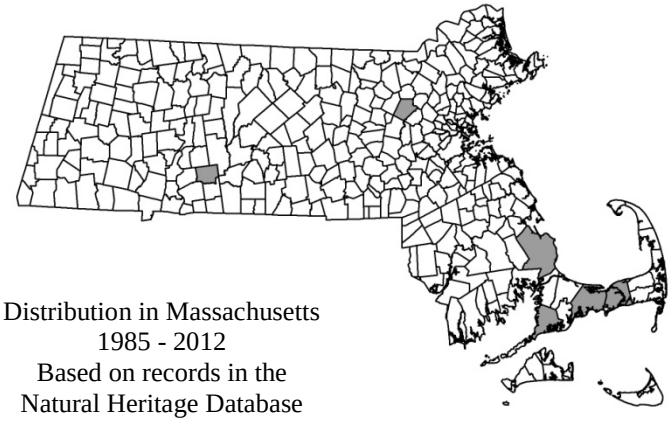
Massachusetts Division of Fisheries & Wildlife

Long-beaked Beaksedge
Rhynchospora scirpoides
(Torrey) A. Gray

State Status: **Special Concern**
Federal Status: **None**

DESCRIPTION: Long-beaked Beaksedge is a cespitose annual in the Sedge family (Cyperaceae) that occurs on coastal plain pond shores in Massachusetts. The genus name *Rhynchospora* ("beaked seed") refers to the tubercle (triangular projection) that is found at the summit of the achenes (one-seeded, dry, fruits). The species name *scirpoides* means "resembles a bulrush" (*Scirpus*), referring to the growth form and the shape of the spikes. Long-beaked Beaksedge grows 20 to 80 cm tall. It has both terminal and axillary inflorescences, with long, leafy bracts that exceed at least the axillary ones.

AIDS TO IDENTIFICATION: A technical manual and hand lens or microscope are needed for identification of Long-beaked Beaksedge and other *Rhynchospora* species. This species is best identified with mature fruits. The achenes are orbicular to lenticular, red-brown to dark brown, with a faintly rugose (horizontally wrinkled) body. The achene is 1 to 3 mm long, including a tall tubercle (0.5–0.9 mm) that is continuous with the ridged margin of the achene. The leaves are flat, narrow, 1 to 5 mm wide, and have glabrous sheaths. The lower portion of the culm (flowering stem) is leafy.



Distribution in Massachusetts
1985 - 2012
Based on records in the
Natural Heritage Database

Long-beaked Beaksedge has terminal and axillary inflorescences with long, leafy bracts (top); achenes are faintly rugose, with long tubercles (bottom). Photos by Jennifer Garrett.

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

1 Rabbit Hill Rd., Westborough, MA; tel: 508-389-6300; fax: 508-389-7890; www.mass.gov/dfw

SIMILAR SPECIES: Long-beaked Beaksedge is distinct from other beaksedges (*Rhynchospora* spp., often referred to as beaked-rushes) in having a relatively long tubercle (beak). This species is very similar to Short-beaked Beaksedge (*R. nitens*), a Threatened species in Massachusetts that grows in the same habitats and may be found with Long-beaked Beaksedge. Short-beaked Beaksedge has a shorter tubercle (0.1–0.3 mm tall) and distinctly rugose achenes with ridged margins that end abruptly at the tubercle. Long-beaked Beaksedge also may be mistaken for the more common Autumn Fimbry (*Fimbristylis autumnalis*), an associated species that is smaller, thinner, and does not have a tubercle on the achene.

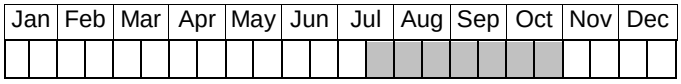
POPULATION STATUS IN MASSACHUSETTS: Long-beaked Beaksedge is listed under the Massachusetts Endangered Species Act as Special Concern. All listed species are protected from killing, collecting, possessing, or sale, and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Long-beaked Beaksedge is currently known from Barnstable, Plymouth, and Middlesex Counties, and an inland coastal plain pond shore in Hampden County. Curiously, this species has not been found in coastal plain pond habitats in Bristol, Dukes or Nantucket Counties.

RANGE: Long-beaked Beaksedge occurs in the eastern coastal states from Massachusetts, Connecticut, and Rhode Island south to Florida, where it can be found year-round. Its range extends west in the southern coastal states to Texas; it is also found in Michigan, Indiana, and Wisconsin.

HABITAT: Long-beaked Beaksedge is found in wet, peaty sands of gently sloping coastal pond shores and depressions with seasonal and annual water level fluctuations. This species can be found when pond levels are drawn down and the pond shore becomes exposed, often growing with a suite of annual sedges, grasses, and herbs characteristic of coastal plain ponds. Long-beaked Beaksedge grows with several other rare species, including Short-beaked Beaksedge, Wright's Rosette-grass (*Dichanthelium wrightianum*), and Plymouth Gentian (*Sabatia kennedyana*). Associated species on the Plant Watch List are Annual Umbrella-sedge *(Fuirena pumila*), Black-fruited Spike-sedge (*Eleocharis melanocarpa*), Pink Tickseed (*Coreopsis rosea*), and Hyssop Hedge-nettle (*Stachys hyssopifolia*). More common associates include other beaksedges (*Rhynchospora* spp.), spike-sedges (*Eleocharis* spp.), Autumn Fimbry, Canada Bluejoint (*Calamagrostis canadensis*), Warty Panic-grass (*Panicum verrucosum*), White Water-lily (*Nymphaea odorata*), Yellow-eyed Grass (*Xyris difformis*), and many other coastal plain pond shore species.

THREATS AND MANAGEMENT RECOMMENDATIONS: Protection of natural hydrological conditions is critical for conservation of Long-beaked Beaksedge and other species restricted to coastal plain pond shore habitats. Water withdrawals and residential development near coastal plain ponds should be limited to avoid disruptions to these sensitive ecosystems. Regular monitoring of known occurrences of rare pond shore species is important to identify threats to specific populations. Surveys should be conducted when water levels are low and pond shore habitat is exposed, as seeds survive in the seed bank and germinate on exposed substrate. Beach use and small boat launches should be located in areas that will not threaten known populations. Off-road vehicles and bicycles should be strictly prohibited on pond shores, and trails should be located along upper shore lines and shrub borders so that trampling of sensitive vegetation is avoided. Although invasive species monitoring is recommended, caution is needed with herbicide or other treatments to avoid damage to populations of rare species. All active management of state-listed plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

Flowering and Fruiting in Massachusetts



REFERENCES:

Flora of North America Editorial Committee, eds. 2002. *Flora of North America North of Mexico*, Vol. 23. Oxford University Press, NY.

NYNHP Conservation Guide - Long-beaked Beakrush (*Rhynchospora scirpoides*). New York Natural Heritage Program, Albany, NY.

Updated 2019

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Natural Heritage & Endangered Species Program

www.mass.gov/nhesp

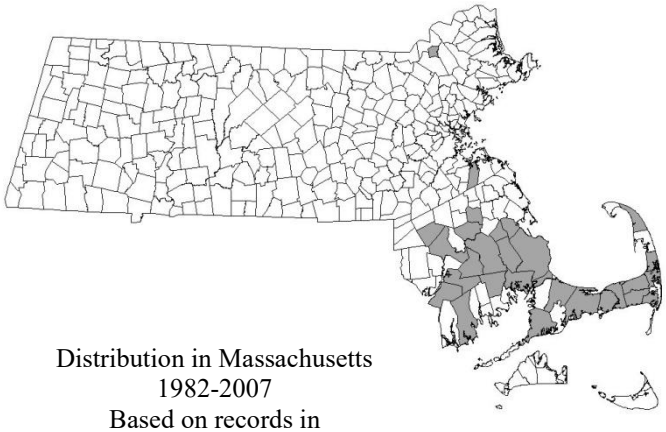
Massachusetts Division of Fisheries & Wildlife

Plymouth Gentian
Sabatia kennedyana
Fernald

State Status: **Special Concern**
Federal Status: **None**

DESCRIPTION: Plymouth Gentian (*Sabatia kennedyana*) is a globally rare and showy perennial herb of the gentian family (Gentianaceae), with striking pink and yellow flowers and opposite lance-shaped leaves. It inhabits the sandy and peaty shorelines of coastal plain ponds.

AIDS TO IDENTIFICATION: Plymouth Gentian reaches 12 to 28 inches (30–70 cm) in height, with opposite branches bearing narrowly lanceolate leaves. The leaves are entire, sessile, and 0.8 to 5 inches (2–5 cm) in length. The flowers, which form atop long pedicels, are pink with a yellow center bordered by red; they have 9 to 11 petals, each of which is 0.6 to 1.1 inches (1.5–3 cm) in length. Plymouth Gentian blooms between early July and mid-September, depending on when the water level of the site decreases enough to expose adequate shoreline. The fruit is a capsule with two valves.



Distribution in Massachusetts
1982-2007
Based on records in
Natural Heritage Database

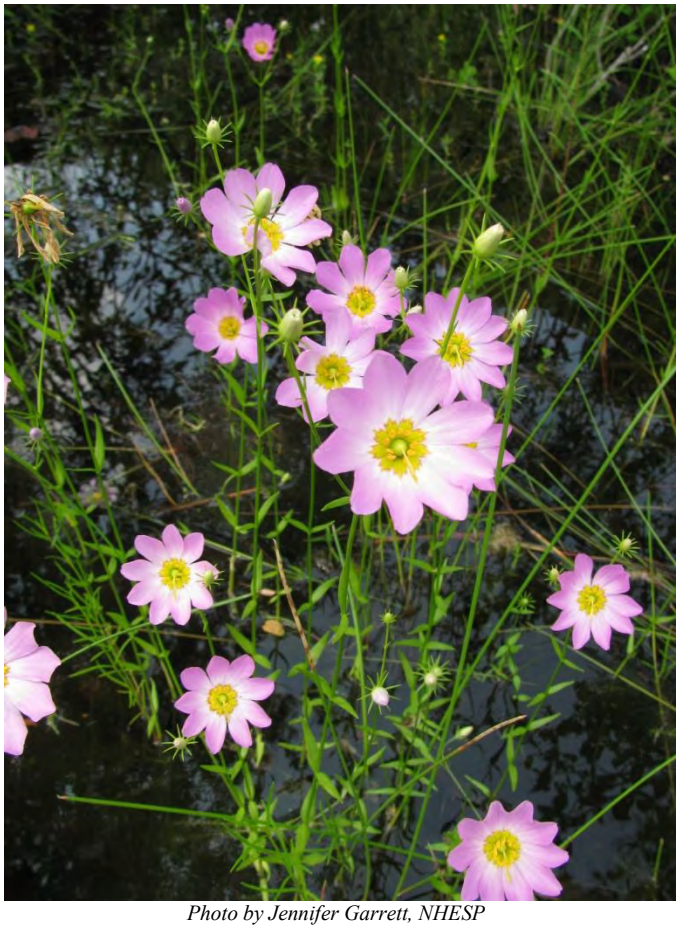


Photo by Jennifer Garrett, NHESP

SIMILAR SPECIES: Slender Marsh Pink (*Sabatia campanulata*, Endangered) occurs in similar habitat in Massachusetts, but has only 7 or fewer petals per flower. Rose Coreopsis (*Coreopsis rosea*), another showy flower of coastal plain pondshores, is somewhat similar to Plymouth Gentian due to its radial pink and yellow inflorescence. Rose Coreopsis, however, is a composite (family Asteraceae) with disc and ray flowers, and linear, rather than lanceolate, leaves.

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

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HABITAT IN MASSACHUSETTS: Plymouth Gentian grows along the seasonally wet, sandy to peaty soils of low-nutrient, acidic, coastal plain pondshores. It prefers full sun and does not compete well with shrubs; therefore, fluctuating water levels are important for the persistence of this species at a site. Associated species include Golden Hedge-hyssop (*Gratiola aurea*), Pondshore Rush (*Juncus pelocarpus*), Slender-leaved Goldenrod (*Euthamia tenuifolia*), Toothed Flatsedge (*Cyperus dentatus*), and Rose Coreopsis (*Coreopsis rosea*). Several rare species can be associated with Plymouth Gentian, including Long-beaked Bald-sedge (*Rhynchospora scirpoides*, Special Concern), Short-beaked Bald-sedge (*Rhynchospora nitens*, Threatened), Torrey's Beak-sedge (*Rhynchospora torreyana*, Endangered), Terete Arrowhead (*Sagittaria teres*, Special Concern), and Wright's Panic-grass (*Dichanthelium wrightianum*, Special Concern).

THREATS: Plymouth Gentian is threatened by any activity that changes the hydrologic regime, water, quality, or soil integrity of the coastal plain pond it inhabits. Region-wide, coastal plain ponds are imperiled due to shoreline development, water table drawdown (from wells), eutrophication (resulting from fertilizers and septic systems), and soil disturbance from heavy recreational use (ORV, horse, and foot traffic; camping; boat-launching; raking and digging).

RANGE: Plymouth Gentian has a very limited range, consisting of the coastal plain areas of Nova Scotia, Massachusetts, Rhode Island, North Carolina, South Carolina, and Virginia; it is rare in each of these locations except for Virginia (where it has been introduced).

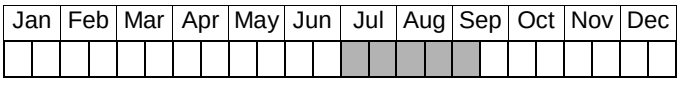
POPULATION STATUS IN MASSACHUSETTS: Plymouth Gentian is listed under the Massachusetts Endangered Species Act as a Species of Special Concern. All listed species are legally protected from killing, collection, possession, or sale, and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Plymouth Gentian is currently known from Barnstable, Essex, Norfolk, and Plymouth Counties, and is historically known from Nantucket County.

MANAGEMENT RECOMMENDATIONS: Management of Plymouth Gentian requires protection of the hydrology, water quality, and soil integrity of its habitat. Like many other coastal plain pondshore plant species, Plymouth Gentian requires pronounced water-level fluctuations; acidic, nutrient-poor water and substrate; and an open, exposed shoreline, free from major soil disturbance. The hydrologic regime is particularly important; coastal plain pondshore species often require low water years for reproduction, but their persistence at a site depends on high water years to keep dense woody vegetation from taking over the shoreline. Protection of Plymouth Gentian habitat may require regulation of new wells, exclusion of septic systems, prohibitions on fertilizer use, and restrictions on recreational use of the site. Recreational activities such as swimming, hiking, horseback riding, and ORV use should be diverted from the plant population location by re-routing trails, installing fences, and providing alternative locations for the activities.

Populations should be monitored to identify threats such as over-shading, invasive plant establishment, and soil disturbance. Plymouth Gentian is most likely to be observed in the middle to late summer when water levels have decreased to expose shoreline. Sites that have encroaching woody vegetation could be carefully thinned after the growing season (November–April).

Habitat sites should checked for the early stages of exotic plant species invasions. The low-nutrient, acidic shores inhabited by Plymouth Gentian are generally inhospitable for many exotic invasive plants, but invasives could become established at sites that have received heavy soil disturbance or nutrient input. Exotic species that could establish at such sites include Common Reed (*Phragmites australis* ssp. *australis*), Gray Willow (*Salix cinerea*), and Purple Loosestrife (*Lythrum salicaria*). To avoid inadvertent harm to rare plants, all active management of rare plant populations should be planned in consultation with the Massachusetts Natural Heritage and Endangered Species Program.

Flowering time in Massachusetts



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A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Natural Heritage & Endangered Species Program

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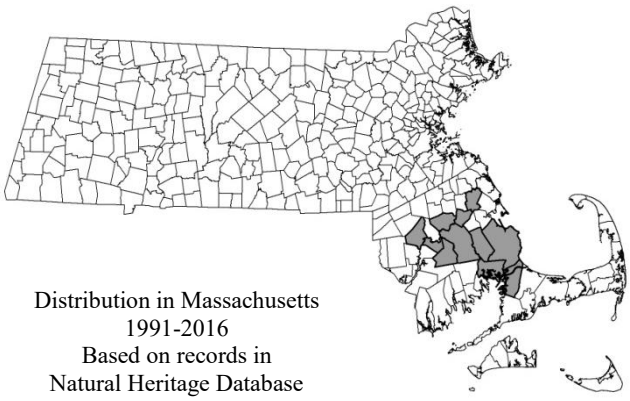
Massachusetts Division of Fisheries & Wildlife

Northern Red-bellied Cooter *Pseudemys rubriventris* pop.1

State Status: **Endangered**
Federal Status: **Endangered**

DESCRIPTION: The Northern Red-bellied Cooter (*Pseudemys rubriventris* LeConte, 1830) is a distinctive, large (25 to 34 cm [10 to 13.5 in.]), basking turtle that can weigh up to 5.8 kg (12.7 lbs). The carapace (upper shell) of an adult Red-bellied Cooter is black to brown with faint reddish markings. The plastron (bottom shell) of the males is pale pink with dark mottling, while females have red plastrons with borders of grey along the seams of the shell plates. The color of the head, neck, limbs, and tail is black, with yellow or ivory lines. The upper jaw is notched, and a yellow arrow-shaped stripe runs along the throat and neck. Both sexes may become progressively melanistic (blacken) with age. Some adult males develop a marbled reddish carapace. Males are smaller (average 27.2 cm; max. 30.7 cm), than females (average 29.8 cm; max. 34.3 cm), but have longer tails and longer front claws. Hatchlings are about 2.5 cm (1 in.) in length, and more circular in shape, than adults. They have a slightly keeled, olive or green carapace marked with greenish-yellow hieroglyphics. Like adults, juveniles have yellow stripes on the head, neck, and limbs.



Distribution in Massachusetts
1991-2016
Based on records in
Natural Heritage Database

Above: An adult female Northern Red-bellied Cooter from Plymouth, Mass., showing characteristic brownish carapace with red markings.

SIMILAR SPECIES: Eastern Painted Turtles (*Chrysemys picta*) are often mistaken for Red-bellied Cooters. Both species have yellow markings on the head and neck and both may have orange plastrons. Red-bellied Cooters lack a pronounced yellow spot behind the eye, have alternated patterned scutes across the back (unlike the Eastern Painted Turtle), can be five times as massive (as adults), and have a carapace that is normally flattened or slightly depressed on top. The Red-bellied Cooter's plastron is coral red or pink, often with dark markings and circular spots along the perimeter, whereas, the Painted Turtle in Plymouth County usually has a solid orange or yellow plastron with no dark markings and a striped perimeter. The Red-Eared Slider (*Trachemys scripta elegans*) is not native to Massachusetts, but has become common in some ponds in the Plymouth area. Sliders may be told from Red-bellied Cooters by the red stripe behind the eye and darker markings on the plastron. Other turtles from the pet trade occasionally show up, including southern species of Cooters and the Yellow-Bellied Slider (*Trachemys scripta scripta*).

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

1 Rabbit Hill Rd., Westborough, MA; tel: 508-389-6300; fax: 508-389-7890; www.mass.gov/dfw

TOP: A comparative photo of a female (left) and male (right) Northern Red-bellied Cooter from Plymouth, Mass. Note the pinkish red plastron color of the female and the larger overall size. MIDDLE: Some adult males (such as the one pictured here) become melanistic with age, losing their juvenile coloration. BOTTOM: Occasionally, older males will develop a marbled, salmon-colored carapace.

RANGE: Massachusetts populations of Northern Red-bellied Cooter comprise an isolated, disjunct population approximately 200 miles from the nearest populations in New Jersey. In Massachusetts, the species is currently confined to ponds and rivers within Plymouth County and eastern Bristol County. Massachusetts populations were formerly described as a distinct subspecies, *P. rubriventris bangsi* (Plymouth Redbelly Turtle). The primary range of the Northern Red-bellied Cooter extends from the Coastal Plain of New Jersey south to the Outer Banks of North Carolina, inland to West Virginia in the Potomac watershed. Archaeological evidence from Massachusetts midden sites indicates that prior to European settlement, Red-bellied Cooters occurred as far north as Ipswich, Essex County, as well as in the Sudbury River and on Martha's Vineyard.

HABITAT IN MASSACHUSETTS: In Massachusetts, the Northern Red-bellied Cooter primarily inhabits freshwater ponds and rivers that have abundant aquatic vegetation and suitable basking sites in the form of logs, rocks, and vegetation mats. Most of the original documented occurrences of Red-bellied Cooters were associated with coastal plain ponds, although they have also been documented in manmade reservoirs and cranberry ponds and introduced to larger lakes and rivers. Red-bellied Cooters nest in exposed sand and gravel, lawns, gardens, and roadsides near ponds and rivers from late May to early July.

Above: Exemplary coastal plain pond habitat of the Northern Red-bellied Cooter in Plymouth, Mass.

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

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www.mass.gov/nhesp

LIFE CYCLE & BEHAVIOR: Red-bellied Cooters overwinter at the bottom of ponds and rivers. During the active season, they are found almost exclusively in water. Females will emerge to nest and some individuals each year will move between nearby ponds. Red-bellied Cooters bask on logs, woody debris, rocks, vegetation mats, and manmade rafts throughout the active season.

The Red-bellied Cooter feeds primarily on aquatic vegetation, particularly milfoil (*Myriophyllum* spp.). Especially when young, it may occasionally eat crayfish and invertebrates.

It is known that mating occurs frequently in the spring. From late May to early July, the female begins nesting activity. Red-bellied Cooters have been found nesting on both vegetated and unvegetated areas and in disturbed as well as undisturbed soils. Females typically nest within 91 m (100 yds) of the water's edge. Females dig flask-shaped nests approximately 10 cm (4 in.) deep. In Massachusetts, females typically lay 10-20 eggs and incubation lasts approximately 73 to 80 days. Red-bellied Cooters exhibit temperature-dependent sex determination (TSD); warmer nest site temperatures produce females and cooler sites produce males. Hatchlings emerge from late August through October; overwintering in the nest has been observed very rarely in Plymouth. Hatchling emergence depends more on the conditions of the substrate, temperature patterns, and nest site location than on the timing of egg deposition by the females. Rainfall may also affect emergence. Some hatchlings may overwinter in the nest if the late summer weather is unseasonably cool.

Female Red-bellied Cooters reach maturity at approximately 13 to 20 years of age (later than males). Sexual dimorphism may be apparent at 5 to 7 years. The life expectancy is believed to be more than 50 years.

THREATS: Although the Northern Red-bellied Cooter appears to be a pond and riverine generalist across most of its range, it has unique biological needs that make it vulnerable to a variety of environmental changes at the northern edge of its range. Available nesting habitat has probably decreased over the last two decades due to residential construction and changes in certain land use practices, such as fire suppression. In the past, areas adjacent to the ponds burned with some regularity, creating pitch pine/scrub oak barrens dotted with openings and grasslands. Such openings were good nesting areas, allowing the heat of the sun to penetrate and incubate the eggs. Today, these areas burn infrequently and, as a result, consist more of closed-canopy forests. Residential expansion has also increased population densities of natural predators, collection as pets, water pollution, and road mortality.

In some instances, herbicide use in ponds to decrease pond vegetation and the infiltration of herbicides from adjacent cranberry bogs is believed to have altered the Red-bellied Cooter's food source and exposed it to chemical contamination. These impacts combined with the species' late maturation age and low rate of reproduction (less than one-third of females reproduce yearly) have made it difficult for the Red-bellied Cooter to thrive. Hatchling mortality is very high for this species, with intense predation on the eggs by skunks and raccoons (which increased in population size as residential areas increased) destroying as many as half of the Red-bellied Cooter's existing nests. Bullfrogs, water snakes, wading birds, and predatory fish such as pickerel and bass feed on hatchling turtles.

Above: Note the strongly cusped jaws of this adult female Northern Red-bellied Cooter.

MANAGEMENT RECOMMENDATIONS: Continued inventory and population studies, targeted habitat management, upland habitat conservation, and public outreach and education are vital to the recovery and persistence of the Northern Red-bellied Cooter in Massachusetts.

Management needs include periodic, standardized monitoring of known and potential populations. It is also of primary importance to protect occupied and potential

habitat, while improving habitat at ponds with known populations by clearing or creating nesting beaches and providing basking sites where necessary.

The Natural Heritage and Endangered Species Program has led a headstarting program for Red-bellied Cooters since 1984. MassWildlife, in cooperation with numerous partners, annually collects about 100 hatchlings each year and raises them in captivity for their first year, producing yearlings that at the time of release are approximately the size of a 3-year-old in the wild. The larger yearlings are significantly less likely to be predated and therefore more likely to make it to adulthood. From 1984 to 2016, more than 4,000 headstarted turtles have been released at more than 30 sites in southeastern Massachusetts. From 2013 to 2016, MassWildlife and the University of Massachusetts Amherst partnered on a study of the effectiveness of the headstart program, finding that annual survivorship rates appear to exceed 95% in many ponds and that reproduction and recruitment in headstarted populations is widespread but locally variable. Research is ongoing to determine the extent and status of the Northern Red-bellied Cooter population in Massachusetts.

ACTIVE PERIOD

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

REFERENCES:

Amaral, M. 1994. Plymouth Red-bellied Cooter Recovery Plan. Northeast Region U.S. Fish and Wildlife Service, Hadley, Massachusetts, 39 pp.

Babcock, H.L. 1916. An addition to the chelonian fauna of Massachusetts. Copeia 38: 95–98

Babcock, H.L. 1917. Further notes on *Pseudemys* at Plymouth, Massachusetts. 44: 52

Babcock, H.L. 1919. The Turtles of New England. Mem. Boston Soc. Nat. Hist. 8(3): 323–431.

Browne, R.A., N.A. Haskell, C.R. Griffin, and J.W. Ridgeway. 1996. Genetic variation among populations of the redbelly turtle (*Pseudemys rubriventris*). Copeia 1996: 192–195.

Conant, R. 1951. The red-bellied terrapin, *Pseudemys rubriventris* (LeConte) in Pennsylvania. Annals of the Carnegie Museum of Natural History 32: 281–291.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. *Turtles of the United States and Canada.* Smithsonian Institution Press, Washington and London.

Graham, T.E. 1969. Pursuit of the Plymouth Turtle. International Turtle and Tortoise Society Journal 3(1): 10–13.

Graham, T.E. 1971. Growth rate of the red-bellied turtle, *Chrysemys rubriventris,* at Plymouth, Massachusetts. Copeia 1971: 353–356.

Graham, T.E. 1980. Redbelly Blues. *Animals* 113: 17-21.

Graham, T.E. 1982. Second find of *Pseudemys rubriventris* at Ipswich, Massachusetts, and refutation of the Naushon Island record. Herpetological Review 12: 82–83.

Graham, T.E. 1984a. *Pseudemys rubriventris* (red-bellied turtle). Food. Herpetological Review 15: 50–51.

Graham, T.E. 1984b. *Pseudemys rubriventris* (red-bellied turtle). Predation. Herpetological Review 15: 19–20.

Graham, T.E. 1988. Recovery in red: preservation of the Plymouth redbelly turtle. South Shore Magazine 1: 23–26.

Haskell, N.A. 1993. Genetic variation, population dynamics, and conservation strategies for the federally endangered redbelly turtle (*Pseudemys rubriventris*) in Massachusetts. Masters of Science thesis, Dept. of Forestry and Wildlife Management, University of Massachusetts Amherst. 99 pp.

Haskell, A., T.E. Graham, C.R. Griffin, and J.B. Hestbeck. 1996. Size related survival of headstarted Redbelly Turtles (*Pseudemys rubriventris*) in Massachusetts. Journal of Herpetology 30: 524–527.

Innis, C.J., M. Tlusty, and D. Wunn. 2007. Hematologic and plasma biochemical analysis of juvenile head-started northern red-bellied cooters (*Pseudemys rubriventris*). Journal of Zoo and Wildlife Medicine 38(3): 425–432.

Lucas, F.A. 1916. Occurrence of *Pseudemys* at Plymouth, Mass. Copeia 38: 98–100.

Rhodin, A.G., and T. Largy. 1984. Prehistoric occurrence of the Red-belly Turtle (*Pseudemys rubriventris*) at Concord, Middlesex County, Massachusetts. Herpetological Review 15: 107.

Rhodin, A.G.J. 1992. Chelonian zooarchaeology of eastern New England: Turtle bone remains from Cedar Swamp and other prehistoric sites. Bulletin of the Massachusetts Archaeological Society 53(1): 21–30.

Swarth, C. 2003. Natural history and reproductive biology of the Red-Bellied Turtle (*Pseudemys rubriventris*). Jug Bay Wetlands Sanctuary; Lothian, Maryland.

van Dijk, P.P. 2013. *Pseudemys rubriventris*. The IUCN Red List of Threatened Species 2013: e.T18460A8299690.

Waters, J.H. 1962. Former distribution of the red-bellied turtle in the Northeast. Copeia 1962: 649.

Updated 2016

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Please allow the Natural Heritage & Endangered Species Program to continue to conserve the biodiversity of Massachusetts with a contribution for 'endangered wildlife conservation' on your state income tax form, as these donations comprise a significant portion of our operating budget.

Natural Heritage & Endangered Species Program

www.mass.gov/nhesp

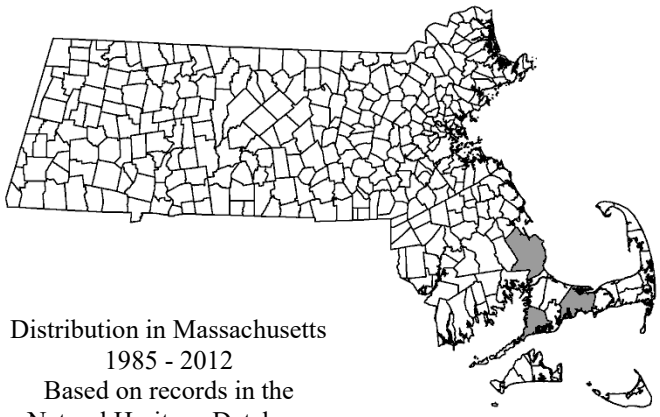
Massachusetts Division of Fisheries & Wildlife

Short-beaked Beaksedge
Rhynchospora nitens
(Vahl) A. Gray

State Status: **Threatened**
Federal Status: **None**

DESCRIPTION: Short-beaked Beaksedge (*Rhynchospora nitens*) is a tufted annual species in the Sedge family (Cyperaceae). In Massachusetts, plants are typically short, often under 15 cm tall. The leaves are linear, proximally flattened, and 1 to 5 mm wide. The flowering stem (or culm) is nearly rounded and many ribbed. Terminal and axillary umbel-like inflorescences are comprised of 1 to 5 diffuse flower clusters on glabrous stalks subtended by leafy bracts. Spikelets are many-flowered, dark brown to nearly black, ovoid, and 3 to 7 mm long. Achenes (dry, one-seeded fruits) are likely shed close to the parent plants. The seeds are long-lived and require drying and exposure of moist pond shore substrate for successful germination. Short-beaked Beaksedge was formerly placed within the genus *Psilocarya* by some botanists.

AIDS TO IDENTIFICATION: The spikelets of Short-beaked Beaksedge are many-flowered and subtended by spirally imbricate one-nerved scales (~ 3 mm). The achenes are slightly wider than long, 0.7 to 1.3 mm, and become dark brown or nearly black once mature. At the top of the achene is a very short and rather broad "horn" or tubercle, 0.1 to 0.3 mm tall. The achene has a strongly



Distribution in Massachusetts
1985 - 2012
Based on records in the
Natural Heritage Database

Short-beaked Beaksedge grows on the exposed sand of coastal plain pondshores. Photo by Bruce Sorrie.

Culms have terminal and axillary flower clusters on glabrous stalks subtended by leafy bracts. Photo by Bruce Sorrie.

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

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ridged surface characterized by wavy rows of vertical raised cells.

SIMILAR SPECIES: Short-beaked Beaksedge is similar in appearance and often confused with Long-beaked Beaksedge (*Rhynchospora scirpoides*), a species that is listed as Special Concern in Massachusetts. Both species are found in coastal plain pond habitats. The tubercle of Long-beaked Beaksedge is somewhat triangular in shape and is almost as long as the achene. The achene of Long-beaked Beaksedge has raised pale margins and is rather weakly ridged in comparison with the strongly ridged achene of Short-beaked Beaksedge.

POPULATION STATUS IN MASSACHUSETTS: Short-beaked Beaksedge is listed under the Massachusetts Endangered Species Act as Threatened. All listed species are protected from killing, collecting, possessing, or sale, and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Short-beaked Beaksedge occurs in Plymouth and Barnstable Counties; extant populations are small, consisting of a few hundred plants or fewer.

RANGE: Short-beaked Beaksedge is found from southeastern Massachusetts to Florida and eastern Texas. It is disjunct to Michigan and considered extirpated in Indiana. Short-beaked Beaksedge is considered rare throughout much of its range.

HABITAT: Short-beaked Beaksedge is an obligate wetland species found on the moist sandy shores of shallow freshwater coastal plain ponds. These ponds are highly acidic and water levels naturally rise and fall in relation to seasonal and yearly changes in the water table. Seeds of Short-beaked Beaksedge require a period of drying and exposure to germinate and may remain dormant in the soil seed bank for many years until conditions are appropriate for germination.

Typical associates of Short-beaked Beaksedge include Canadian St. John's-wort (*Hypericum canadense*), Dwarf St. John's-wort (*H. mutilum*), Spatulate-leaved Sundew (*Drosera intermedia)*, Northern Meadow-beauty (*Rhexia virginica*), Warty Panic-grass (*Panicum verrucosum*), Pondshore Flatsedge (*Cyperus dentatus*), Autumn Fimbry (*Fimbristylis autumnalis*), Reticulate Nut-sedge (*Scleria reticularis*), and Long-beaked Beaksedge (*Rhynchospora scirpoides*).

THREATS AND MANAGEMENT RECOMMENDATIONS: Artificial withdrawal of water and other changes in ground and surface water hydrology may alter the specialized cycle of flooding and drawdown required by Short-beaked Beaksedge. Extant populations should be monitored to gain a better understanding of population dynamics, cycles of flooding and drawdown, and current threats. Sites that supported Short-beaked Beaksedge historically should also be surveyed periodically, as this species may persist in the seed bank for many years until drawdown conditions are suitable for germination. Short-beaked Beaksedge may be damaged by off-road vehicles, raking and clearing of shoreline vegetation for beach use, loss of habitat for storage of boats, and conversion of wetland habitats for cranberry cultivation. These activities should be prohibited in coastal plain pondshore habitats. Best management practices should be implemented to prevent or reduce nutrient enrichment from lawn fertilizers, faulty septic systems, and flocks of grazing ducks or geese. Monitoring for invasive species is needed for early detection and control. All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

Fruiting in Massachusetts

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

REFERENCES:

Clark, F.H. 2003. *Rhynchospora nitens* (Vahl) A. Gray, Short-beaked Beaksedge, a Conservation and Research Plan for New England. Prepared for the New England Plant Conservation Program of the New England Wild Flower Society, Framingham, MA.

Fernald, M.L. 1950. *Gray's Manual of Botany*, 8th edition. American Book Company, Boston, MA.

NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. R*hynchospora nitens*. NatureServe, Arlington, VA. http://www.natureserve.org/explorer.

Reznicek, A.A., J.E. Fairey, and A.T. Whittemore. 2002. *Rhynchospora*. R. Kral. Pages 200-217 in Flora of North America Editorial Committee (Editors), *Flora of North America north of Mexico, Volume 23. Cyperaceae.* Oxford University Press, NY.

Updated 2019

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Natural Heritage & Endangered Species Program

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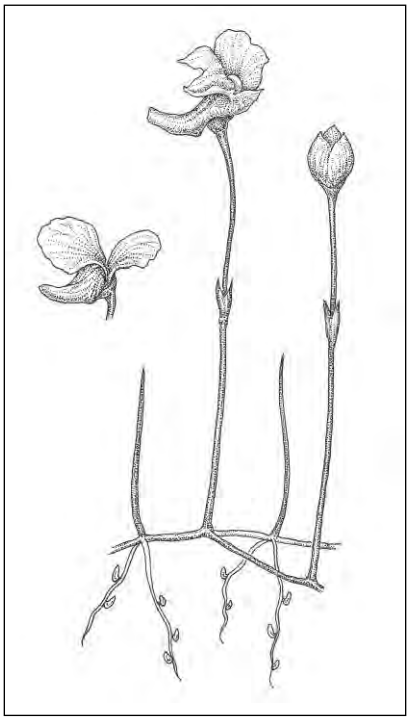
Massachusetts Division of Fisheries & Wildlife

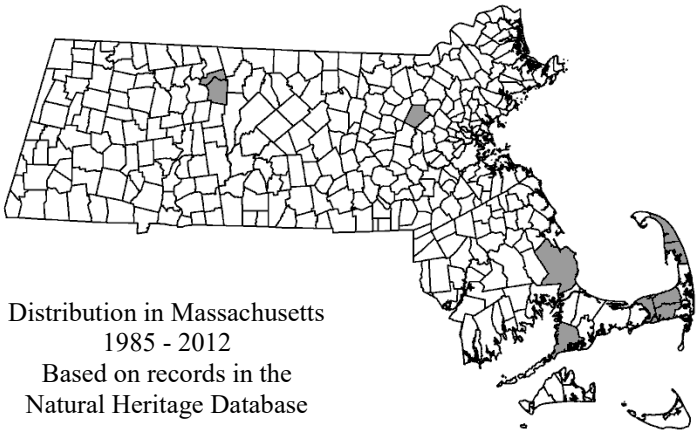
Resupinate Bladderwort
Utricularia resupinata
B.D. Greene *ex* Bigelow

State Status: **Threatened**
Federal Status: **None**

DESCRIPTION: Resupinate Bladderwort is a carnivorous aquatic species in the Bladderwort family (Lentibulariaceae). It is found in shallow to moderately deep waters (up to 3 m or more) of sandy ponds. The stems are thread-like and creep on or just below the substrate, producing tiny three-parted leaves. The center segment of each leaf is erect and looks like a tiny blade of grass, with one or more cross-septa. The two lateral segments of each leaf grow downward into the substrate, are white in color, and look superficially like roots. These root-like leaves bear tiny bladders that open abruptly when disturbed and suck in passing prey, which are digested to provide nutrients for the plant. Bladderworts do not have true roots. Flowering occurs when water levels drop sufficiently to strand plants on shore or in very shallow water; for some populations this occurs only in very dry years. Flowers are showy, purple, and occur singly at the tips of upright, unbranched flower stalks that are typically less than 15 cm long (occasionally up to ~ 30 cm). The flower is subtended by a tubular bract, and flower parts are fused into two lips, with a prominent spur protruding from the lower lip. Bladderwort species reproduce both sexually by seed and asexually by producing compact, starch-filled "winter buds" (turions) that detach from the parent plant and disperse.



Resupinate Bladderwort has single purple flowers at the top of unbranched flower stalks, cross-septa on erect leaf segments, and tiny bladders on downward growing lateral segments. Illustration by Elizabeth Farnsworth.



Distribution in Massachusetts
1985 - 2012
Based on records in the
Natural Heritage Database

AIDS TO IDENTIFICATION: It is not necessary to uproot Resupinate Bladderwort for positive identification. In flower, this species is identified by:

- A single purple flower at top of leafless stalk
- A tubular bract below the flower that surrounds the flower stalk
- Leaf cross-septa visible with a hand lens
- A single terminal seed capsule

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Massachusetts Division of Fisheries & Wildlife

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SIMILAR SPECIES: Two other bladderworts have growth forms and habitat affinities similar to those of Resupinate Bladderwort. Horned Bladderwort (*U. cornuta*) is common and may be found with Resupinate Bladderwort. Subulate Bladderwort (*U. subulata*) is uncommon and listed under the MA Endangered Species Act as Special Concern. Most botanists do not distinguish these three species when fertile material is lacking, although the leaf cross-septa of Resupinate Bladderwort are diagnostic. Resupinate Bladderwort is unique in having bracts below the flower that are fused into a cup-like structure that surrounds the flower stalk. Other bladderwort species have bracts that appear as green scales below the flowers.

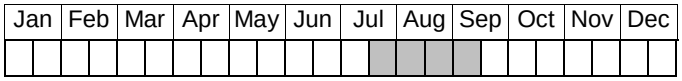
POPULATION STATUS IN MASSACHUSETTS: Resupinate Bladderwort is listed under the Massachusetts Endangered Species Act as Threatened. All listed species are protected from killing, collecting, possessing, or sale, and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Resupinate Bladderwort is currently recorded from Franklin, Middlesex, Plymouth, and Barnstable Counties. There are additional historical records from Berkshire, Hampshire, Hampden, and Essex Counties.

RANGE: Resupinate Bladderwort occurs on the coastal plain from the Atlantic Provinces of Canada south to Florida and Alabama, and from Nova Scotia and Quebec west to the Great Lakes States, and south to Pennsylvania, Indiana and Illinois.

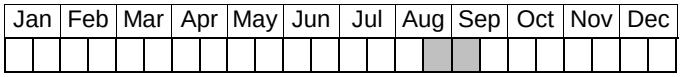
HABITAT: Resupinate Bladderwort grows submerged in sandy-bottomed ponds, most often occurring on the coastal plain. Flowering plants are only found along the edges of ponds when water levels have dropped to expose normally submerged habitat. In these areas, plants are typically found where there is thin peat or mud overlying wet sand.

THREATS AND MANAGEMENT RECOMMENDATIONS: The flat, sandy pondshore areas that are prime habitat for Resupinate Bladderwort sometimes experience heavy recreational use; monitoring of populations in such sites is needed to develop management guidelines. Best management practices should be followed to prevent nutrient enrichment of ponds from lawn fertilizers, faulty septic systems, and other sources. Competition from native or non-native aquatic species may potentially threaten populations of Resupinate Bladderwort, though this has not been well-documented. All active management of rare plant populations (including invasive species removal) is subject to review under the Massachusetts Endangered Species Act, and should be planned in close consultation with the Massachusetts Natural Heritage & Endangered Species Program.

Flowering in Massachusetts



Fruiting in Massachusetts



REFERENCES:

Crow, G.E., and C.B. Hellquist. 1985. Aquatic Vascular Plants of New England: Part 8. Lentibulariaceae. New Hampshire Agricultural Experiment Station Bulletin 528. Durham, NH.

Crow, G.E., and C.B. Hellquist. 2000. *Aquatic and Wetland Plants of Eastern North America: Volume 1. Pteridophytes, Gymnosperms and Angiosperms: Dicotyledons*. The University of Wisconsin Press, Madison.

Haines, A. 1994. Key to the genus *Utricularia* in Maine based on vegetative characteristics. *Maine Naturalist* 2: 47-49.

Haines, A. 2011. *Flora Novae Angliae – a Manual for the Identification of Native and Naturalized Higher Vascular Plants of New England*. New England Wildflower Society, Yale Univ. Press, New Haven, CT.

Scribailo, R.W., M.S. Alix, and S.A. Namestnik. 2011. Historical notes and new records for the rare Atlantic coastal plain species *Utricularia resupinata* (Lentibulariaceae) in Indiana. *Rhodora* 113: 32-46.

Updated 2015

Natural Heritage & Endangered Species Program

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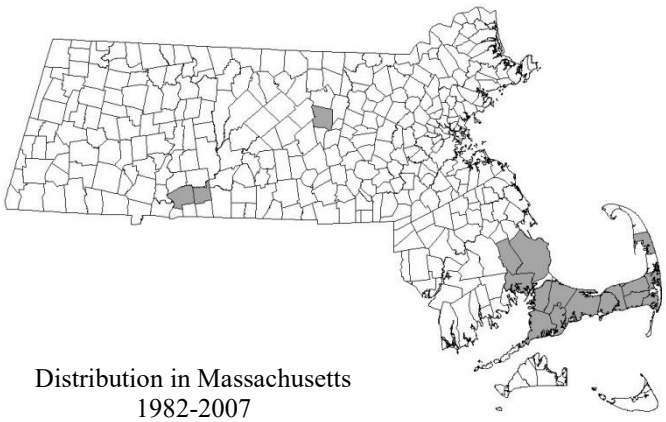
Massachusetts Division of Fisheries & Wildlife

Terete Arrowhead
Sagittaria teres
S. Watson

State Status: **Special Concern**
Federal Status: **None**

DESCRIPTION: Terete Arrowhead (*Sagittaria teres*) is a perennial emergent aquatic plant of the water-plantain family (Alismataceae), which grows in shallow water along the margins of coastal plain ponds. It has linear basal leaves and white flowers, which bloom from July to September.

AIDS TO IDENTIFICATION: Terete Arrowhead, unlike several other arrowheads, has linear, terete (rounded in cross section), and tapering leaves rather than sagittate, or arrow-shaped leaves. The leaves arise from a rhizome in a rosette; they vary in length, ranging from 1.2 to 8 inches (3–20 cm). The stem is erect, slender, and leafless, reaching 12 to 15 inches (30–38 cm) in height. The flowers, which have white petals and yellow centers, are 0.75 inch (2 cm) wide, and are borne in two to four whorls at the top of the stem. Fruits of this species are achenes (hard, one-seeded fruits), less than 0.1 inch (2–3 cm), with one to three prominent wings on each face.



Distribution in Massachusetts
1982-2007
Based on records in
Natural Heritage Database

Hellquist, C.B., and G.E. Crow. 1981. *Aquatic Vascular Plants of New England: Part 3. Alismataceae*. New Hampshire Agricultural Experiment Station, University of New Hampshire, Durham.

SIMILAR SPECIES: Most arrowheads in Massachusetts have some sagittate leaves present, thus differentiating them from Terete Arrowhead. One other state-listed species, River Arrowhead (*S. subulata*) (Endangered), and the more common Grass-leaved Arrowhead (*S. graminea*) most resemble Terete Arrowhead because of their linear, unlobed leaves. Both of these species however have flat, rather than terete leaves.

HABITAT IN MASSACHUSETTS: In Massachusetts, Terete Arrowhead inhabits muddy, sandy, or peaty soils in shallow water along the margins of acidic ponds, primarily coastal plain ponds. Associated species include Pipewort (*Eriocaulon aquaticum*), Water-lobelia (*Lobelia dortmanna*), bladderworts (*Utricularia* spp.), Golden Hedge-hyssop (*Gratiola aurea*), Pond-shore Rush (*Juncus pelocarpus*), and spike-sedges (*Eleocharis* spp.). Several rare species may be associated with Terete

Arrowhead, including Resupinate Bladderwort (*Utricularia resupinata*) (Threatened), Plymouth Gentian (*Sabatia kennedyana*) (Special Concern), Torrey's Beak-sedge (*Rhynchospora torreyana*) (Endangered), Long-beaked Bald-sedge (*R. scirpoides*) (Special Concern), and Short-beaked Bald-sedge (*R. nitens*) (Threatened).

RANGE: Terete Arrowhead occurs along the coastal regions of New Hampshire, New York, New Jersey, and North Carolina.

THREATS: Terete Arrowhead is threatened by any activity that changes the hydrologic regime, water quality, or soil integrity of the coastal plain pond it inhabits. Region-wide, coastal plain ponds are imperiled due to shoreline development, water table drawdown (from wells), eutrophication (resulting from fertilizers and septic systems), and soil disturbance from heavy recreational use (ORV, horse, and foot traffic; wading and swimming; camping; boat-launching; raking and digging).

POPULATION STATUS IN MASSACHUSETTS: Terete Arrowhead is listed under the Massachusetts Endangered Species Act as a species of Special Concern. All listed species are legally protected from killing, collection, possession, or sale, and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. Terete Arrowhead is currently known from Barnstable, Plymouth, Hampden, and Worcester Counties, and is historically known from Middlesex County.

MANAGEMENT RECOMMENDATIONS: Management of Terete Arrowhead requires protection of the hydrology, water quality, and soil integrity of its habitat. Like many other coastal plain pondshore plant species, Terete Arrowhead requires pronounced water-level fluctuations, acidic, nutrient-poor water and substrate, and an open, exposed shoreline, free from major soil disturbance.

Terete Arrowhead populations should be monitored regularly to identify possible threats. This species is most likely to be observed in mid to late summer during low water years.

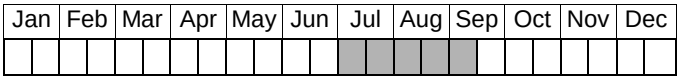
Protection of Terete Arrowhead habitat may require exclusion of new wells and septic systems, prohibitions on fertilizer use, and restrictions on recreational use of the coastal plain pondshore. Recreational activities such as swimming, fishing, and boat-launching should be diverted from the plant population location by providing alternative locations for the activities.

Also, habitat sites should be monitored to enable early detection of exotic plant species invasions. The nature of coastal plain ponds makes them generally inhospitable for many exotic invasive plants, but invasives could become established at sites that have received heavy soil disturbance or nutrient inputs. Exotic species that could establish along the shoreline of coastal plain ponds include Common Reed (*Phragmites australis* ssp. *australis*), Gray Willow (*Salix cinerea*), and Purple Loosestrife (*Lythrum salicaria*).

Boats are a very common vehicle for aquatic plant introductions, and habitat sites with boat access should be carefully monitored for introductions of non-native aquatic species, such Variable Water-milfoil (*Myriophyllum heterophyllum*) and Inflated Bladderwort (*Utricularia inflata*).

To avoid inadvertent harm to rare plants, all active management of rare plant populations (including exotic species removal) should be planned in consultation with the Massachusetts Natural Heritage and Endangered Species Program.

Flowering time in Massachusetts



Updated 2015

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