

US EPA ARCHIVE DOCUMENT

Mapping and Inventory of Vernal Pools in the Wood-Pawcatuck Watershed



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Project Goal

Protect and conserve vernal pools and other vulnerable amphibian habitats by informing stakeholders of their locations and importance

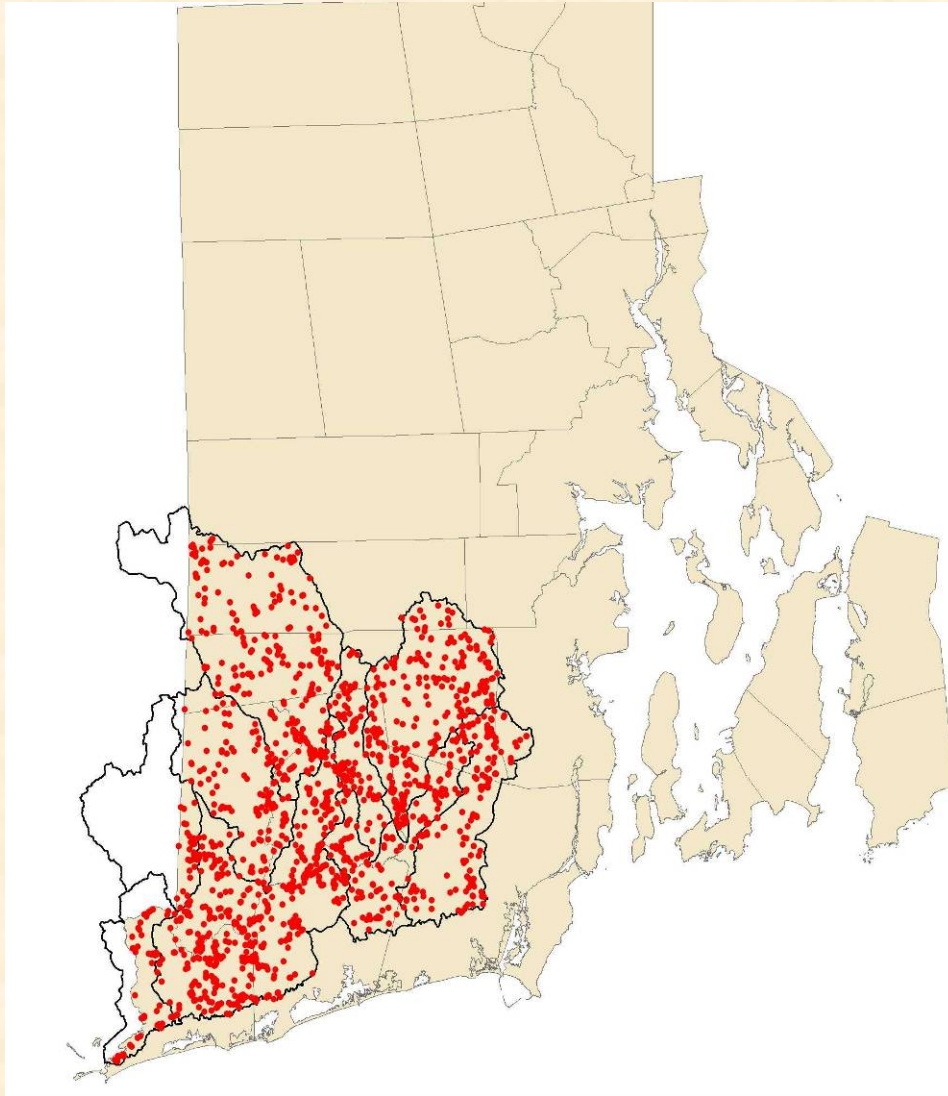
Project Objectives

1. Compile a comprehensive inventory of confirmed and potential vernal pools in the Wood-Pawcatuck watershed
2. Confirm viability of mapped pools for species of concern
3. Distribute mapping and confirmation information to stakeholders
4. Test and initiate a comprehensive inventory of RI vernal pools

Project Overview

- Base on a mapping effort by TNC 2003
- Focus on study area: Wood-Pawcatuck watershed
- Compile, classify and inventory all known vernal pool study data within Study Area
- Select potential pools of highest conservation concern for field verification
- Develop and implement viability criteria
- Develop training and materials for field work
- Train staff and conduct field verifications
- Apply viability criteria to compiled inventory
- Construct inter-operative dataset
- Distribute data

Methods: Study Area / Sources



DATA SOURCES

- TNC (2003) Mapping
- URI Studies
 - Egan 2001
 - Skidds 2003
 - Mitchell 2005
 - Mitchell et al. 2007
- 3. Unpublished data
 - Raithel, DEM DFW
 - Narcisi, URI MSC
 - Curtis, URI MSC
 - Skidds, NPS

Result: 1492 features

Methods: Study Site Selection

Focus on highest potential conservation value

1. Most Vulnerable

- Not on protected land

2. Highest Productivity Potential

- High surrounding forest cover (>50% within 1000')
- Low development intensity (<25% within 750')

Result: 678 study features

Methods: Confirmation Criteria

Confirmation based on indicator species:

- Wood Frog (*Rana sylvatica*)
- Spotted Salamander (*Ambystoma maculatum*)
- Marbled Salamander (*A. opacum*)
- Eastern Spadefoot (*Scaphiopus holbrookii*)
- Fairy Shrimp (*Eubranchipus* sp.)



Final status also based on:

- Ephemeral hydrology
- Basin confinement

Methods: Field Forms/Training

Field Date: WOOD-PAWCATUCK

REQUIRED IF P...

9. List of Photos

Notes:

This protocol was developed by the New England Interstate Water Pollution Control Commission (NEIWPCC) and the RI Department of Environmental Management (DEM) with funding provided by the Environmental Protection Agency (EPA) Wetlands Pilot Demonstration Grant.

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Field Date: WOOD-PAWCATUCK

8. Pool Diagram

OPTIONAL

Location

Location

Location

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Field Date: WOOD-PAWCATUCK

SUPPLEMENTARY

HYDROLOGY STRESSORS

Partial/Complete

Ditching

Ditching

In pond/mud

Outlet

Dam

Beaver

PLANT COMMUNITY

Removal of

from pool

from stream

Presence of

Plugging

HABITAT STRESSORS

Dumping

Old Tire

Demolition

Roads nearby

Traffic

Trails nearby

Railroad nearby

House(s) nearby

5. Pool Habitat Stressors

6. Pool Characteristics

DIMENSIONS

Depth:

Width:

Length:

Perimeter:

*SUBSTRATE

Dominant Substrate

Peat

Leaf Litter

Other:

*WATER QUALITY

Clear

Opalescent

Tea-Colored

Algae Green

Other:

7. Mapping Information

Map Attached:

Yes

No

GPS position recorded:

Yes

No

Check one:

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Field Date: WOOD-PAWCATUCK VERNAL POOLS

Site ID:

Date: (mm/dd/yyyy)

Status: (LEAVE BLANK)

REQUIRED

Observer Name:

Contact Info:

Training Session Date:

Town:

Place Name:

Arrival Time: (HH:MM) AM PM

Departure Time: (HH:MM) AM PM

Landowner Name:

GPS POSITION RECORDED: Yes No

MAP ATTACHED: Yes No

ACCESS: GAINED: With Permission No Permission

NOT GAINED: Posted Deeded No Answer Inaccessible

1. Pool Location

2. Observation of Indicator Species

Information in Shaded Boxes is key assessment data. Please provide as much additional information as time allows. Indicate all species observed (check unidentifed if uncertain).

PHOTO INCLUDED: Yes No

Photos are required for species identification. Please follow protocol and attach list in Section 9.

Indicator Species	Adult	Juvenile	Indicator Species	Adult	Juvenile
Wood Frog			Spotted Salamander		
Green Frog			Marbled Salamander		
Spring Peeper			Four Toed Salamander		
Gray Tree-Frog			Red-Spotted Newt		
Pickle Eel Frog			Unidentified:		
Northern Leopard Frog			Frog/Toad		
American Bittong			Salamander		
Eastern Spadefoot Toad					
American Toad					
Powder Mill Toad					

Did you see Tadpoles? Yes No

Were any larger than 2"? Yes No

EGG MASSES OBSERVED: Yes No

Indicate below if certain of species

Wood Frog

Spotted Salamander

Other:

How many? Binned Counted

OTHER WILDLIFE OBSERVED: Yes No

Turtles

Snake(s)

Leeches

Other:

Dragonfly nymph

Damselfly nymph

Water bug/beetle

Water scooper

Predators (dragon beetle)

FISH OBSERVED: Yes No

How many? 1-5 6-10 11-20 21-50 50+

Species identified: Yes List

3. Landscape Characteristics

REQUIRED 2009

POOL TYPE (select one)

Man-Made

Excavated Pond/Well

Impoundment

Quarry

Discharge System

Natural Depression

Upland Forest Depression

Non-Forested Depression

Wetland Forest Depression

Marsh Pool

Bog Pool

Presence of Inlet/Outlet? Flowing?

Inlet

Outlet

Yes No

Yes No

SURROUNDING HABITAT (check all that apply)

Forested Wetland

Deciduous

Coniferous

Mixed

Open Wetland

Emergent

Scrub-Shrub

Forested Upland

Deciduous

Coniferous

Mixed

Field/Grassland

Residential

Commercial

Highway/Road

4. Weather

SUPPLEMENTARY

Current Weather Conditions

Sunny

Partly Sunny

Cloudy

Rain Heavy

Rain Light

Snow Heavy

Snow Light

Other:

Rain Intermittent

Snow Intermittent

Air Temperature: °C °F

Days since last Rain/Snow event (if known):

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Version 3/10/2010

Methods: Verifications

Field Verification

- RIDEM Staff: Water Resources; Compliance and Inspection
- Wood-Pawcatuck Watershed Association
- Other organizations
- Two field seasons; spring 2008 and 2009
 - March 21 to May 8

Remote-sensed Verification

- Connectivity (confinement status)
- Water regime, when obvious

Draft Results: Effort and Basic Statistics

- 1525 potential vernal pools inventoried
- 270 features classified through interpretation of former studies
 - 81% (+) and 19% (–)
- 678 study sites selected
- 515 features field-assessed at least once
- 60 features assessed twice
- Viability determined at 91% of the field-assessed mapping features
 - 67% (+) and 33% (–)
- Confirmed the status of 738 features (48%)
- Verified 566 viable breeding areas (+)

Draft Results: Classification Results

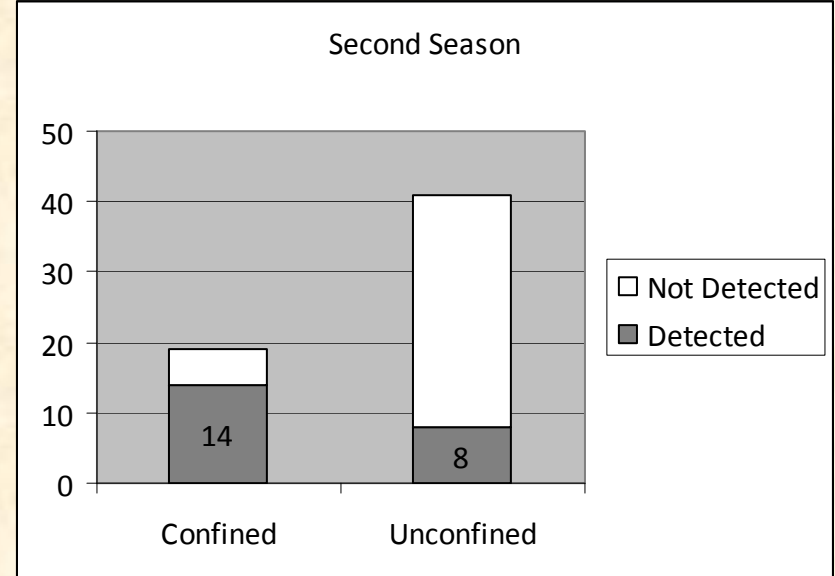
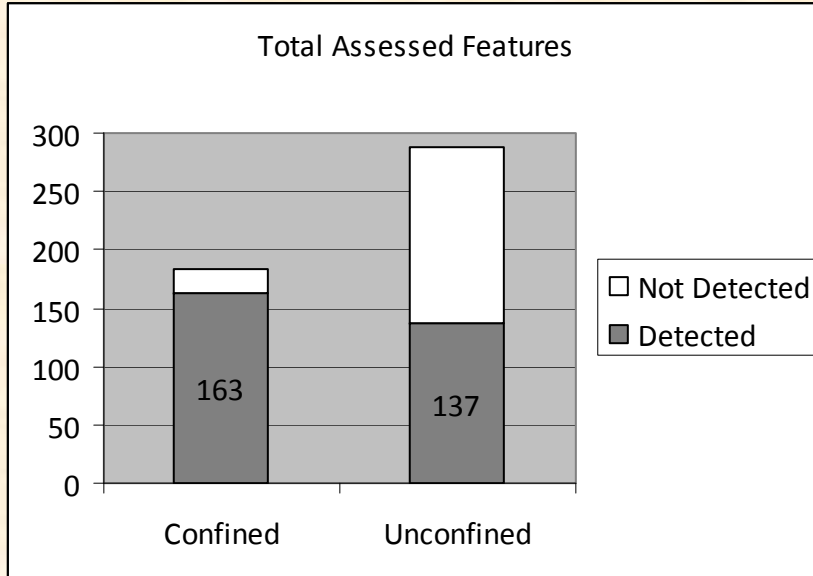
Final Viability Classification	Number of Mapping Features
Confirmed (+) Confined Vernal Pool	159
Confirmed (+) Unclassified ABA*	25
Confirmed (+) Wetland ABA*	131
Likely Vernal Pool	21
Confirmed (–) Non Vernal Pool	153
Potential Vernal Pool, Undetermined	26
Potential Vernal Pool, Un-assessed	163
Total	678

*Amphibian Breeding Area

Classification	Criteria	
	Ephemeral Hydrology and confined Basin	Indicator Species Present
1. <i>Confirmed (+) Confined Vernal Pool</i>	✓	✓
2. <i>Confirmed (+) Wetland Amphibian Breeding Area</i>	–	✓
3. <i>Likely Vernal Pool</i>	✓	–
4. <i>Non-Vernal Pool</i>	–	–
5. <i>Potential Vernal Pool</i>	Not Verified	Not Verified

Draft Results: Other Findings

- Indicator species detected at
 - 89% of confined vernal pools (163 of 184)
 - 48% of unconfined features (137 of 288)
 - 74% of confined pools previously undetected (14 of 19)
 - 20% of unconfined pools previously undetected (8 of 41)



Draft Results: Deliverables

1. Central GIS shapefile
 - Contains simplified classifications
 - Links to other electronic data
 - Intended for distribution
2. Field-verification data
 - Link to shapefile
 - Contain detailed data
 - Contain final classifications
3. Source data
 - Link to shapefile through FV data
4. Big hard-copy map



Discussion: Project Outcomes

- Expanded and enhanced the utility of the inventory
- Developed, tested and revised viability criteria
- Developed and tested field protocols
- Trained ~75 volunteers, 23 DEM staff, several staff from other federal and State agencies in functions, characteristics and identification of vernal pools

Discussion: Data Utility

- Municipalities, Land trusts
 - Inform decisions regarding land acquisition and management
- General Public, Landowners
 - Inform decisions regarding stewardship on private and public properties
- DEM Staff
 - Inform regulatory and management decisions
 - Signal need for further investigations
 - Analyses may inform policy

Discussion: Lessons and Next Steps

- Caution confirming as (–) after single visit
- Physical criteria sometimes difficult to determine
- Non-typical pools may provide important breeding habitat
- Department undertake policy discussions regarding outcomes
- Develop data forms to reflect final criteria
- Distribute shapefile
- Update at regular intervals
- Add probabilistic component



Thanks to Contributors



**Wood-Pawcatuck
Watershed Association**

