



# **BioInventory of Exeter River Floodplain Wetlands in the Towns of Danville, Fremont & Sandown**

January 2011

# Project Components



- Preliminary Floodplain Wetland Mapping
- Field Research & Documentation
- Habitat Assessment
- Digital Map Preparation
- Report
- Presentation to Towns

# Exeter River



## Exeter River

Watershed Area – 67,700 acres (fresh water portion)

River Length – 33 miles

Drainage Basin – 126 square miles

Forested Land – 67%

Developed Land – 16%

Farmland – 6%

Water and Barren Land – 6%

Wetlands – 3%

# Study Area



## **Study Area**

Overall reach of Exeter River approximately 15 miles

Sandown – 5 miles

Danville – 1 mile + tributaries

Fremont – south reach 2 miles

- north reach 7 miles



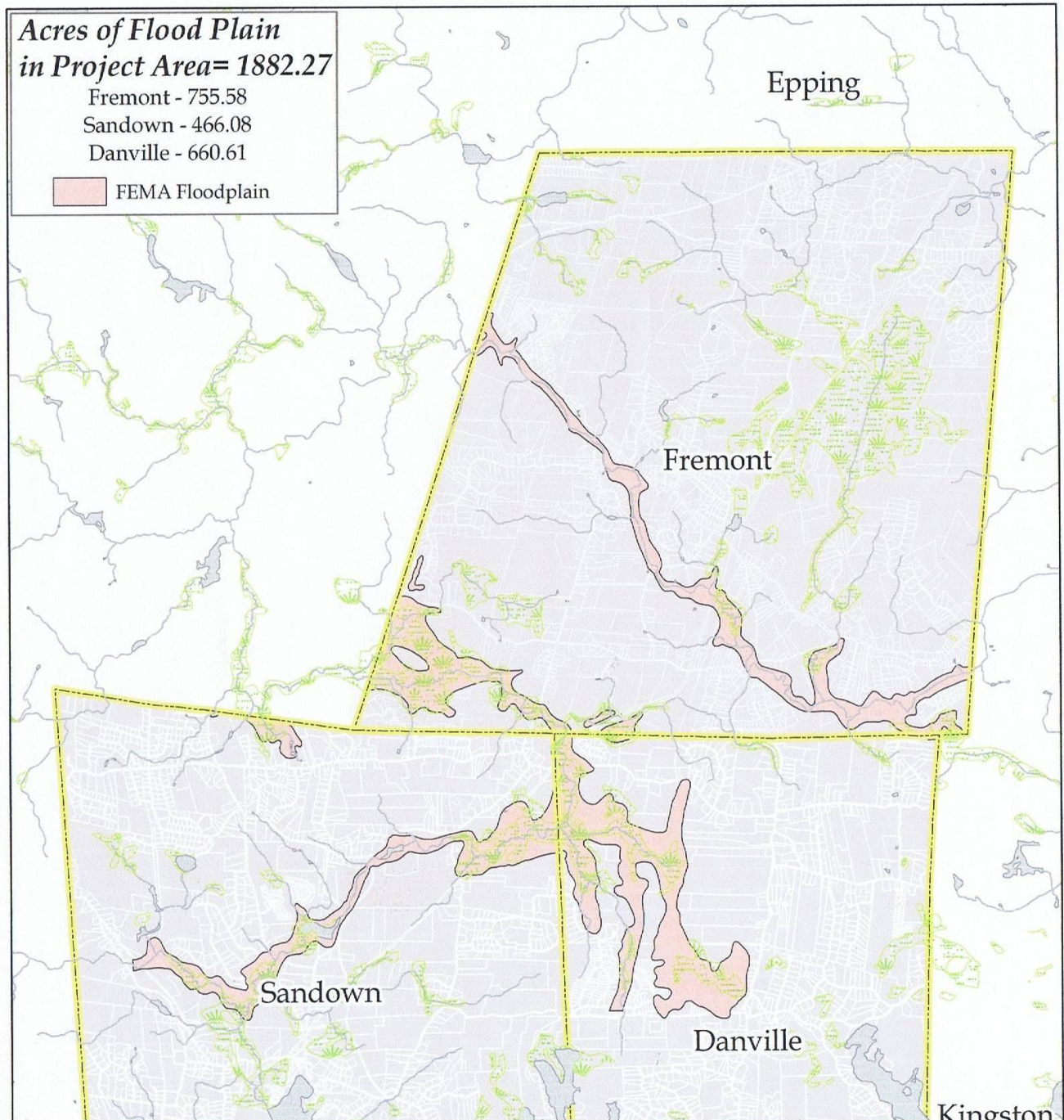
***Acres of Flood Plain  
in Project Area= 1882.27***

Fremont - 755.58

Sandown - 466.08

Danville - 660.61

 FEMA Floodplain





## EXETER RIVER FLOODPLAIN WETLANDS Overview and Map Tile Index

Map Tile for Detail Maps

Floodplain Study Area

Floodplain Wetland

Town Boundary

Waterbody

River

Major Road

Rail Trail



0 0.5 1 Miles

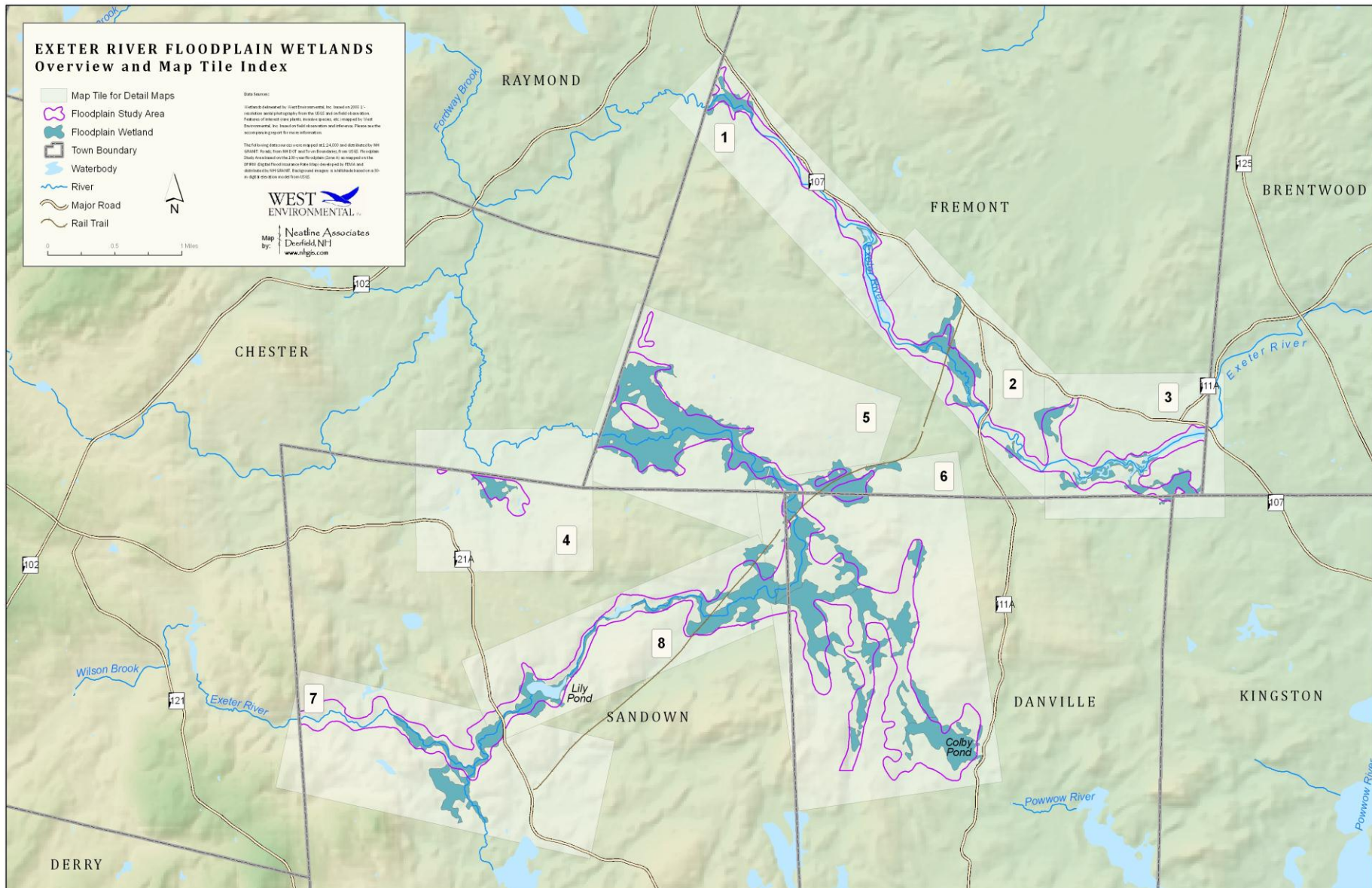
Data Sources:

Wetlands delineated by WEST Environmental, Inc. based on 2011 1:25,000 scale aerial imagery from the USGS and field observations. Features of interest (wetlands, floodplains, etc.) mapped by WEST Environmental, Inc. based on field observations and data. Please see the accompanying report for more information.

The following data sources were mapped at 1:24,000 scale and data includes the 100-year floodplain, 500-year floodplain, and 100-year floodplain. Data is based on the 2011 1:25,000 scale aerial imagery from the USGS and field observations. Features of interest (wetlands, floodplains, etc.) mapped by WEST Environmental, Inc. based on field observations and data. Please see the accompanying report for more information.

**WEST**  
ENVIRONMENTAL, INC.

Map by:  
**Neatline Associates**  
Deerfield, NH  
[www.neatline.com](http://www.neatline.com)



# Examples

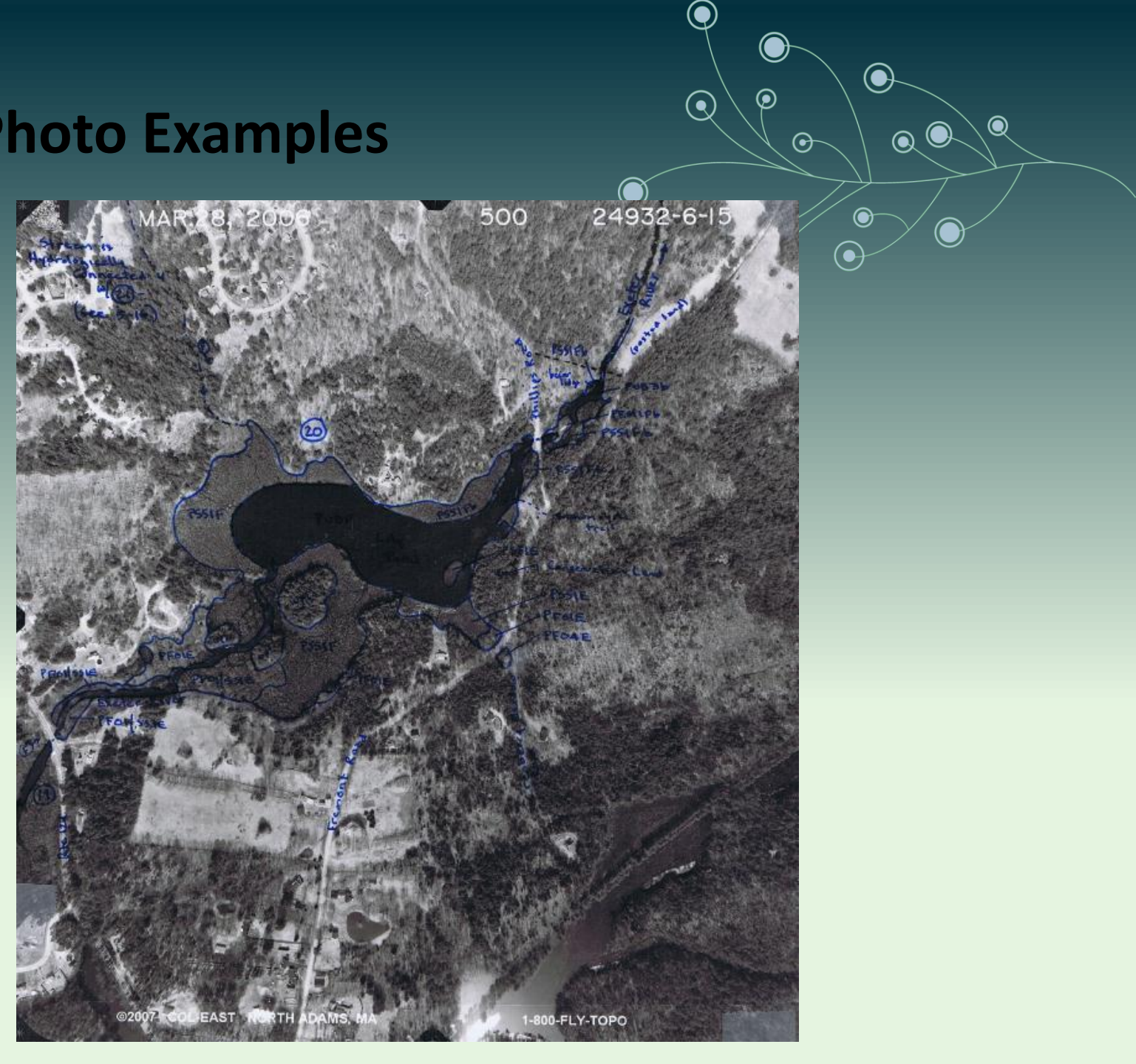


32-11-24

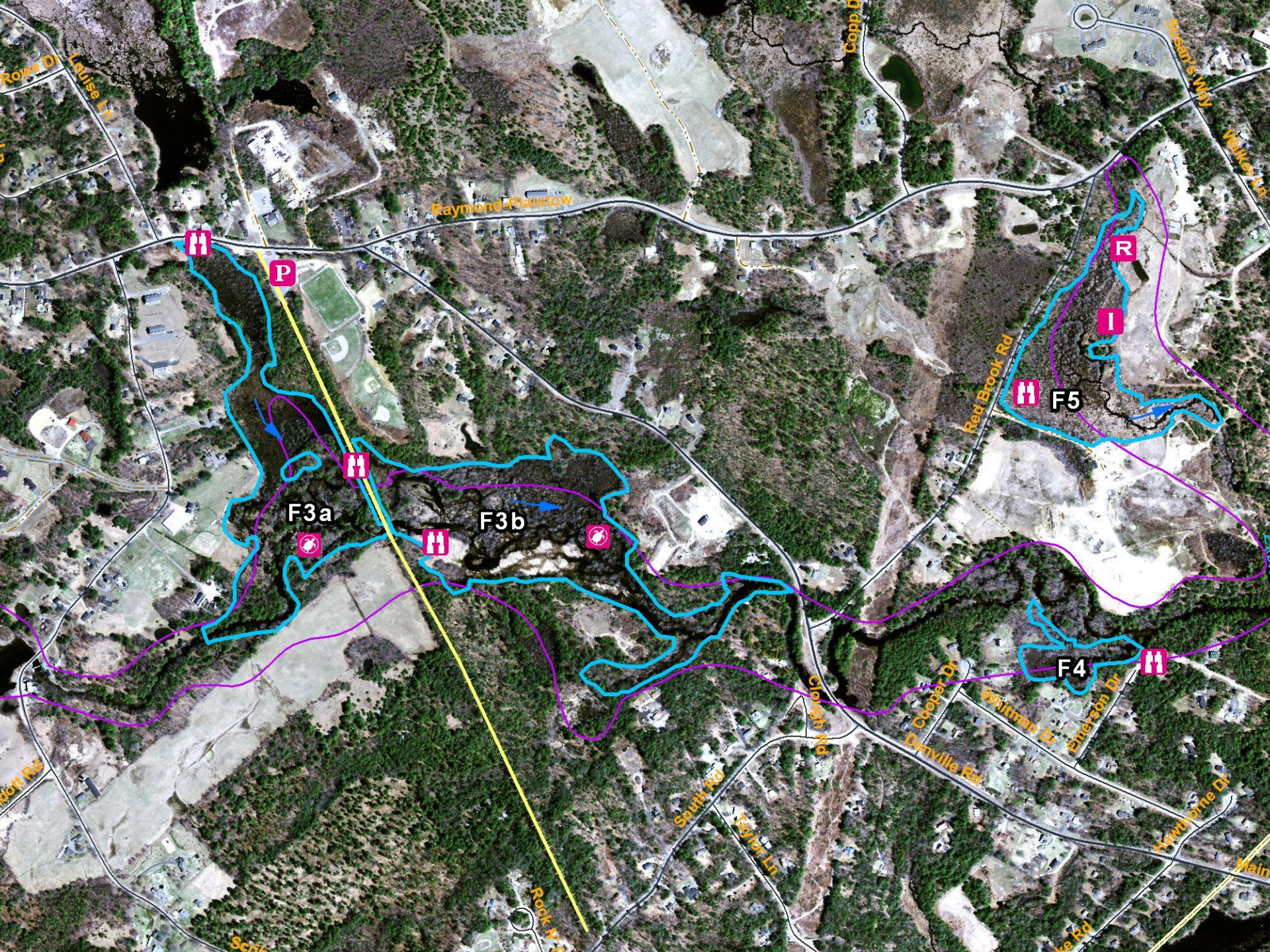
CIVIL













# EXETER RIVER FLOODPLAIN WETLANDS

## Tiles 1 & 2



Floodplain Wetland



Data Collection Points



Parking



Potential Restoration Site



Invasive Species



Rare Plant Community



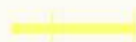
Potential Rare Wildlife Species Habitat



Direction of Flow



Floodplain Study Area



Rail Trail



Town Boundary

### Data Sources:

Wetlands delineated by West Environmental, Inc. based on 2008 1'-resolution aerial photography from the USGS and on field observation. Features of interest (rare plants, invasive species, etc.) mapped by West Environmental, Inc. based on field observation and inference. Please see the accompanying report for more information.

The following data sources were mapped at 1:24,000 and distributed by NH GRANIT: Roads, from NH DOT and Town Boundaries, from USGS. Floodplain Study Area based on the 100-year floodplain (Zone A) as mapped on the DFIRM (Digital Flood Insurance Rate Map) developed by FEMA and distributed by NH GRANIT. Background imagery is 2008 1'-resolution aerial photographs from USGS, provided by the Rockingham Planning Commission.



Map  
by:  
 Neatline Associates  
Deerfield, NH  
[www.nhgis.com](http://www.nhgis.com)

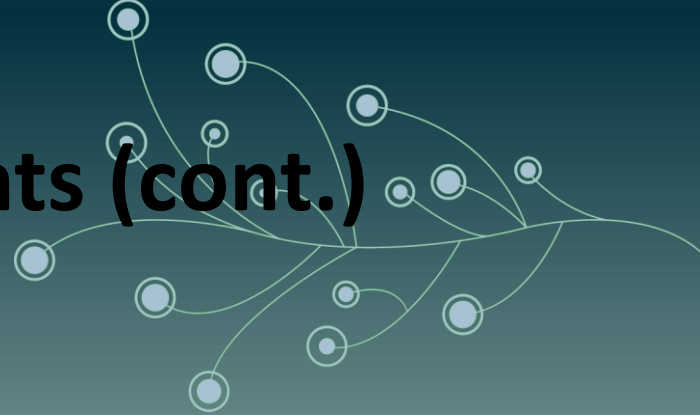


# Data Form Components



- **WETLAND ID: D1 CLASSIFICATION: PSS1/EM1bACREAGE:**
- **WETLAND TYPE:**
- WOODED SWAMP - Deciduous Evergreen Scrub-Shrub
- MARSH Freshwater Shallow Freshwater Deep
- WET MEADOW Ditched Grazed
- RIVER                      IOrder:
- STREAM Perennial Intermittent
- POND Name:
- VERNAL POOL Documented Potential
- HUMAN MADE or OTHER
- BEAVER FLOWAGE Active    AbandonedDam Present    Yes No

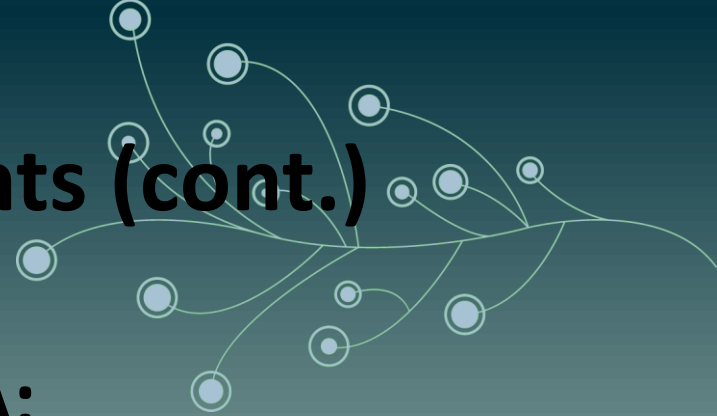
# Data Form Components (cont.)



- **WETLAND PLANT COMMUNITY DATA**
- **TREE LAYER** Red maple | Dead trees
- **SHRUB LAYER** Buttonbush, Winterberry, Leatherleaf
- **HERBACEOUS LAYER** Water willow, Broadleaf Cattail, Tussock sedge, Beggars tick, Blue joint grass, Eastern burreed and Royal fern - deep marsh habitat
- Rare Plant Community?    Yes        No
- Describe:

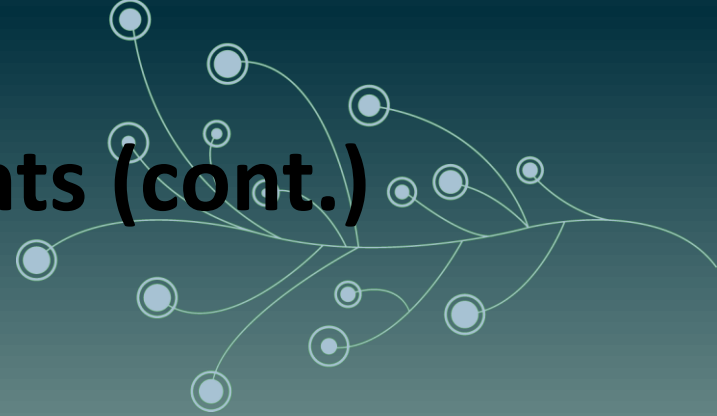


# Data Form Components (cont.)



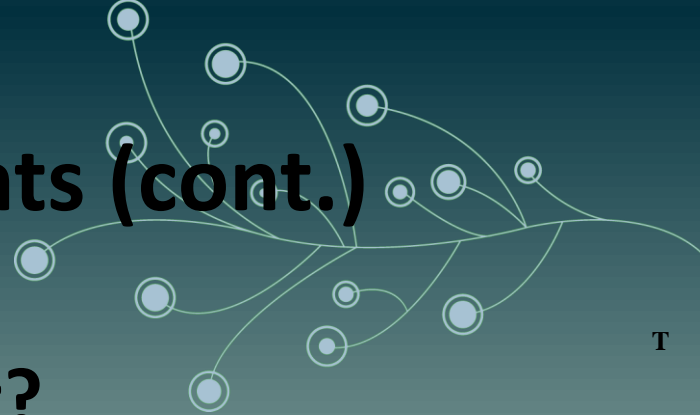
- **WETLAND HYDROLOGY DATA:**
- Open water in Exeter Rver channel to 4-6' deep
- Remaining wetland 2-3' deep
- Large deep water area
- New culvert at Sandown Road
- Beaver influenced

# Data Form Components (cont.)



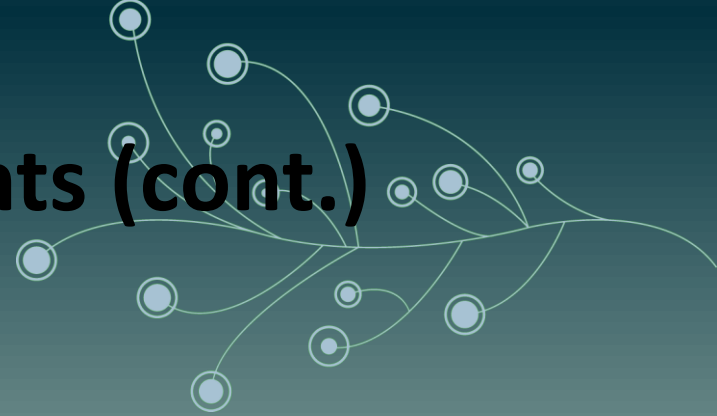
- **Diversity**
- Aquatic Insect Habitat?
- Amphibian Habitat?
- Fisheries Habitat?
- Cavity Trees?
- Food Sources?
- Cover?
- Prox. to Beaver/Mink/Otter?

# Data Form Components (cont.)



- **WAP Highest Ranked Habitat?**
- **State                      Region**
- **Existing Critical Habitat**
- **Critical Habitat Features**
- **Type: Blanding's & spotted turtle**
- **Specific Habitat Features: Soft muddy bottom, aquatic vegetation, loafing logs**

# Data Form Components (cont.)



- **Recreational Use**
- Parking Available?
- Watercraft Access?
- Fishing Available?
- Hunting Permitted?
- Walking/Biking Trails?
- ATV/4 Wheel?

# Data Form Components (cont.)



- **Restoration Stabilization Potential**
- Describe:
- **H2O Quality Degradation**
- Describe
- **Invasive species**
- List:

# Natural Heritage Data Response



Brook Floater – last reported 1953 NH - E

## Wildlife Species

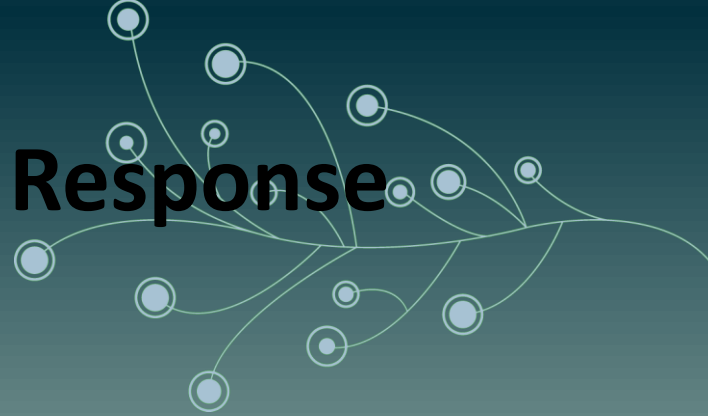
Blanding's Turtle – last reported 2008 NH - E

Spotted Turtle – last reported 2008 NH - T

Vesper Sparrow – last reported 2001 NH - SC

Great Blue Heron Rookery

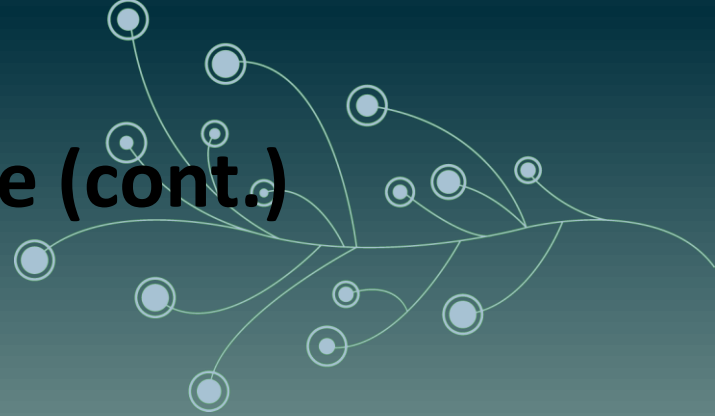
# Natural Heritage Data Response



## Fish:

- Redfin Pickerel – last reported 1984 NH-SC
- Banded Sunfish – last reported 2005 NH-SC
- Swamp Darter – last reported 1984 NH-SC
- Bridled Shiner – last reported 2006 NH-T

# Natural Heritage Data Response (cont.)

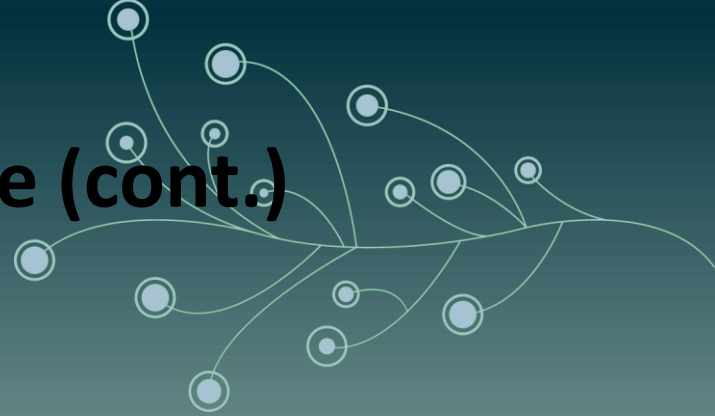


## Natural Communities:

- Sweet pepperbush wooded fen – last reported 2009 NH-S2
- Poor level fen/bog system – last reported 2009 NH-S3

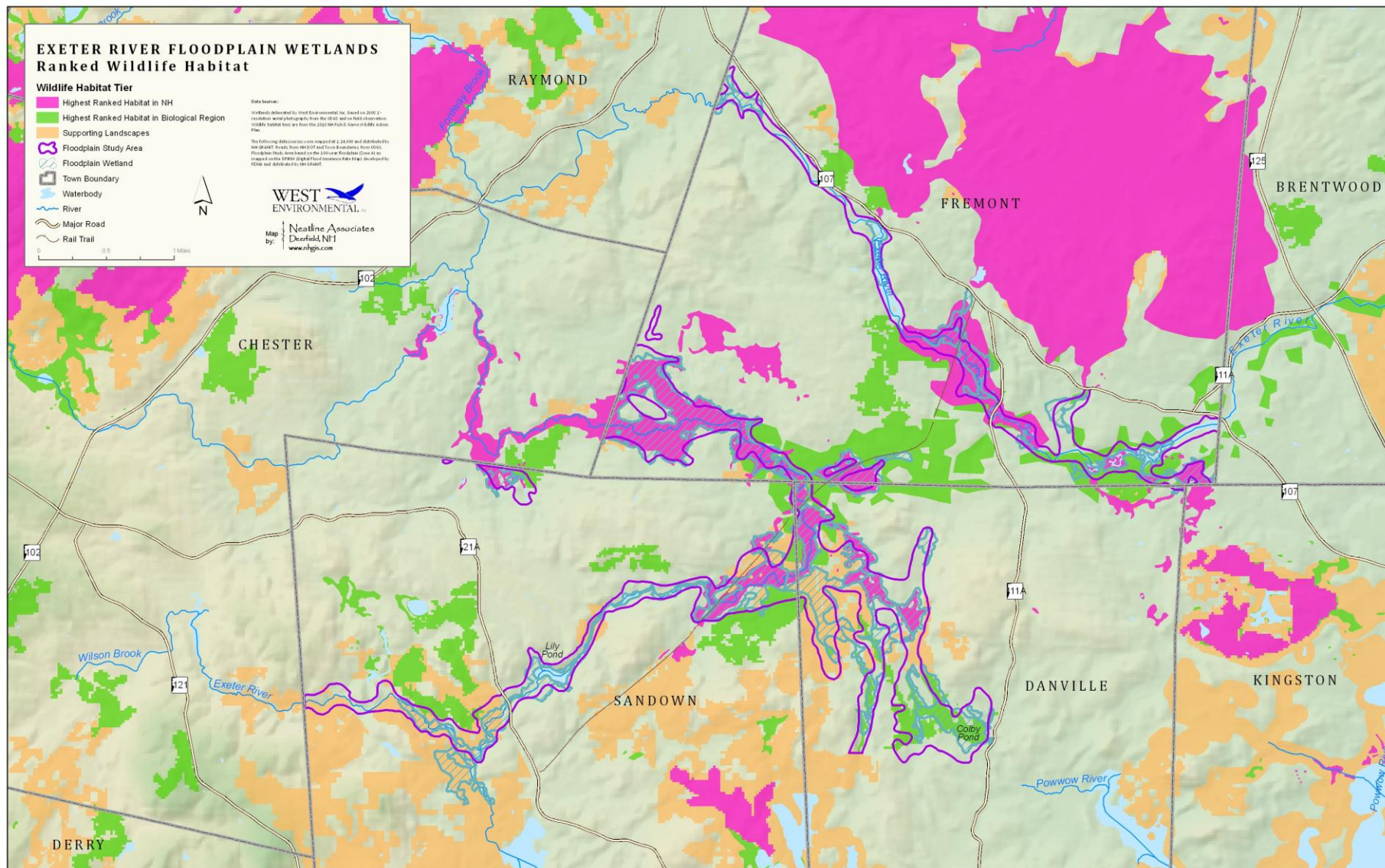


# Natural Heritage Data Response (cont.)

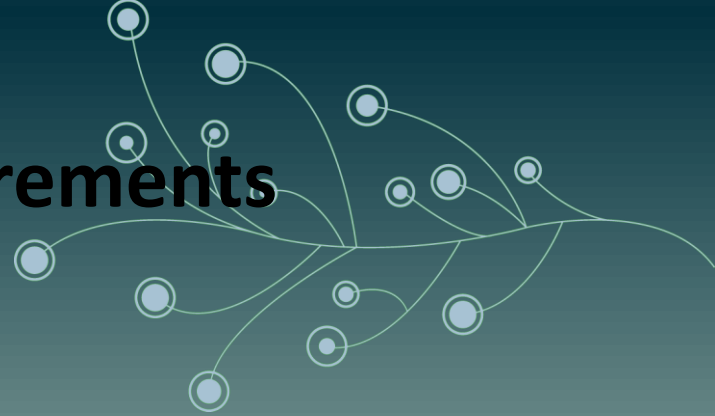


## Plant Species:

- Climbing Hempweed – last reported 1940
- Featherfoil – last reported 1940
- Piled-up Sedge – N/A



# Blandings Turtle Habitat Requirements



- Slow moving rivers with beaver ponds
- Aquatic vegetation
- Soft muddy bottoms
- Loafing logs





Blandings Turtles with Painted Turtles





Wetland F-8a Blandings turtle habitat





Potential turtle nesting habitat adjacent Wetland S-1c

# Spotted Turtle Habitat Requirements



- Unpolluted shallow water
- Marshes
- Vernal pools
- Forested wetlands









Wetland F-9 Spotted turtle habitat





Potential turtle nesting area near Wetland D-9c.

# Wood Turtle Habitat Requirements



- Slow moving meandering streams
- Sandy bottoms
- Overhanging wooded banks









Wetland F-3 Wood Turtle Habitat





Wetland S-9a Great Blue Heron Rookery in Colby Pond





Vesper Sparrow Habitat

# Natural Plant Communities



- Oxbow buttonbush swamp S3
- Deep emergent marsh – aquatic bed S4
- Vernal floodplain pool S2
- Leatherleaf-sheep laurel dwarf shrub bog S3
- Red maple floodplain forest S4
- Sweet pepperbush wooded fen S2





Wetland S-2 **Oxbow Buttonbush Swamp** taken from Rail Trail





Wetland D-1 **Buttonbush Swamp** taken from Sandown Road.  
Potential Pied -billed Grebe habitat





**Wetland F-3 deep emergent marsh-aquatic bed Community**





Wetland F-3 **Floodplain Marsh** with potential Sedge Wren habitat





**Wetland F-8b Deep emergent marsh - aquatic bed plant Community**





Wetland F-1 **Vernal Floodplain Pool** Community





Wetland F-8a - a **Leatherleaf/sheep laurel dwarf shrub bog** in Fremont and Danville





**Wetland F-10a Red Maple Floodplain Swamp**





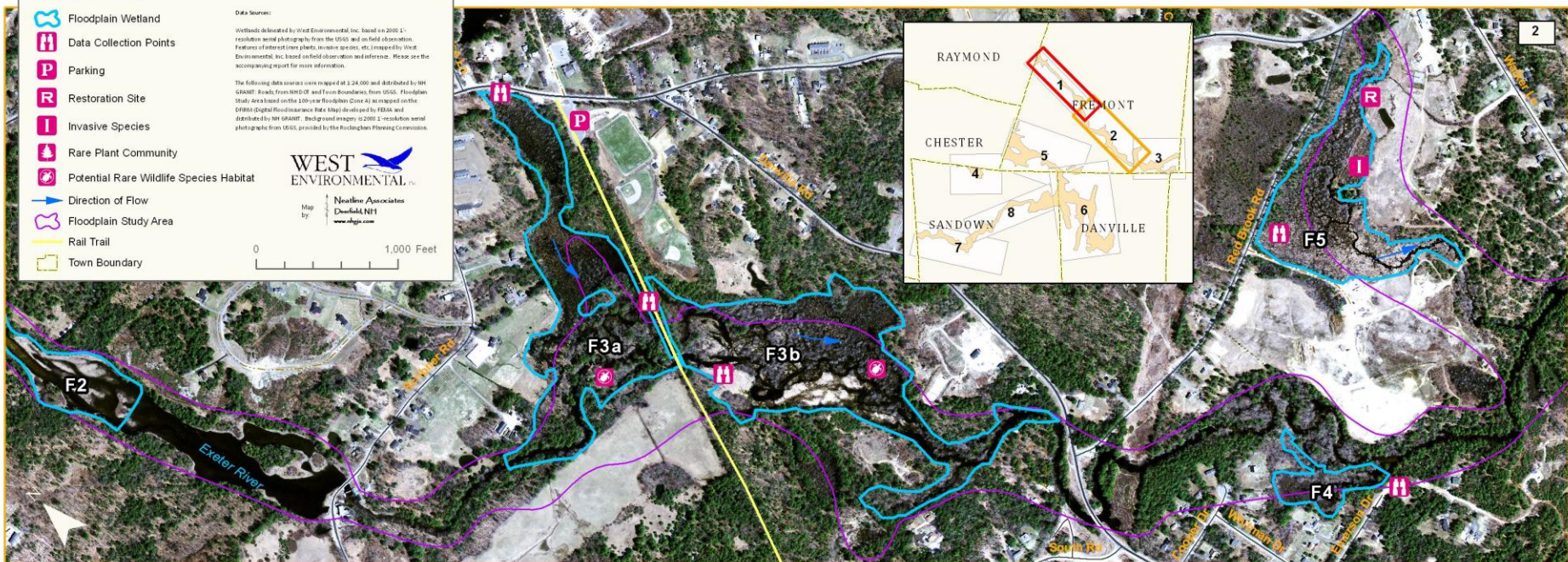
**Wetland S-3 Red Maple forested floodplain**



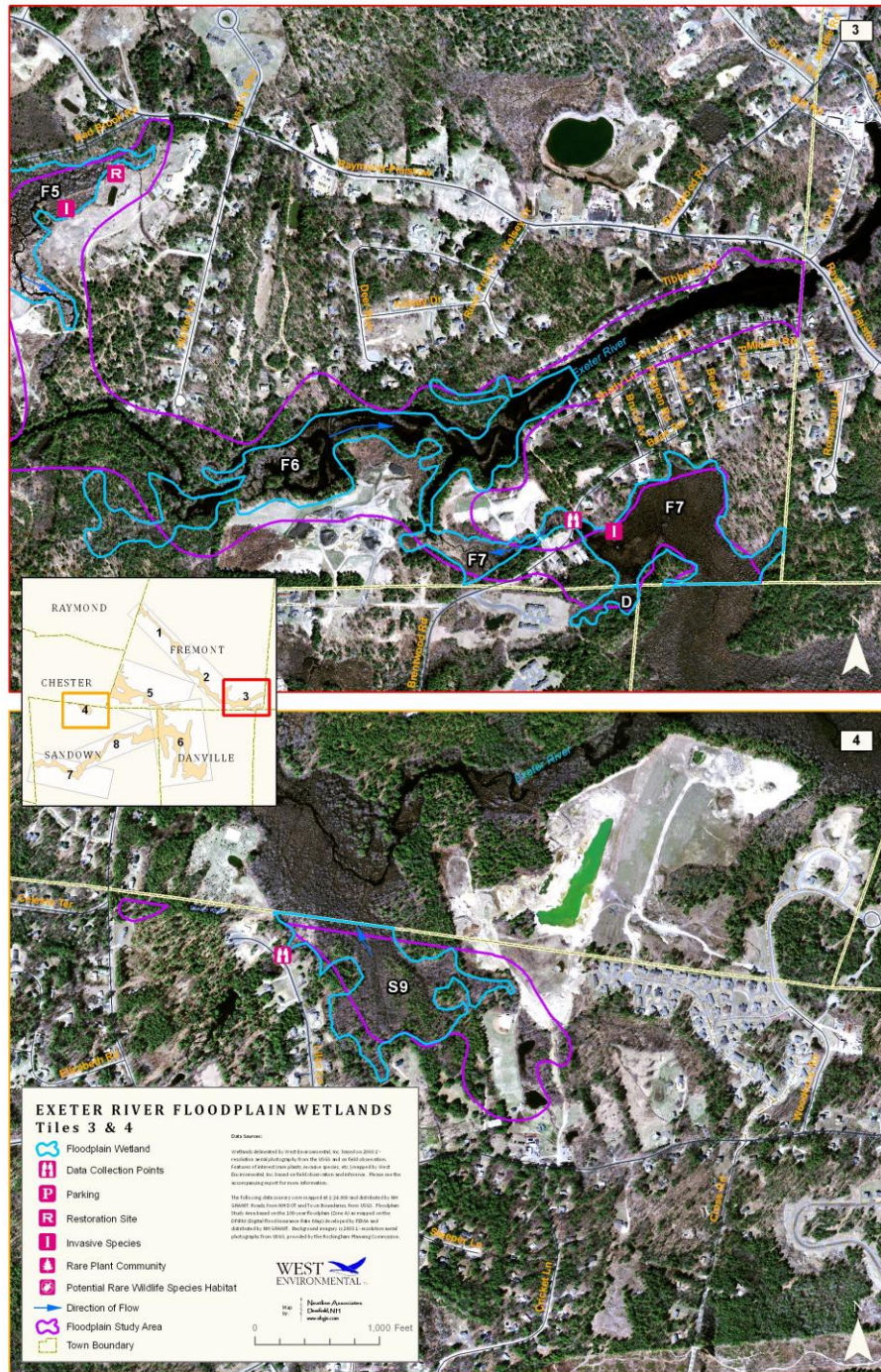


Wetland D-6a **Sweet pepperbush wooded fen**











5



## EXETER RIVER FLOODPLAIN WETLANDS Tile 5

- Floodplain Wetland
- Data Collection Points
- Parking
- Restoration Site
- Invasive Species
- Rare Plant Community
- Potential Rare Wildlife Species Habitat
- Direction of Flow
- Floodplain Study Area
- Rail Trail
- Town Boundary

### Data Sources:

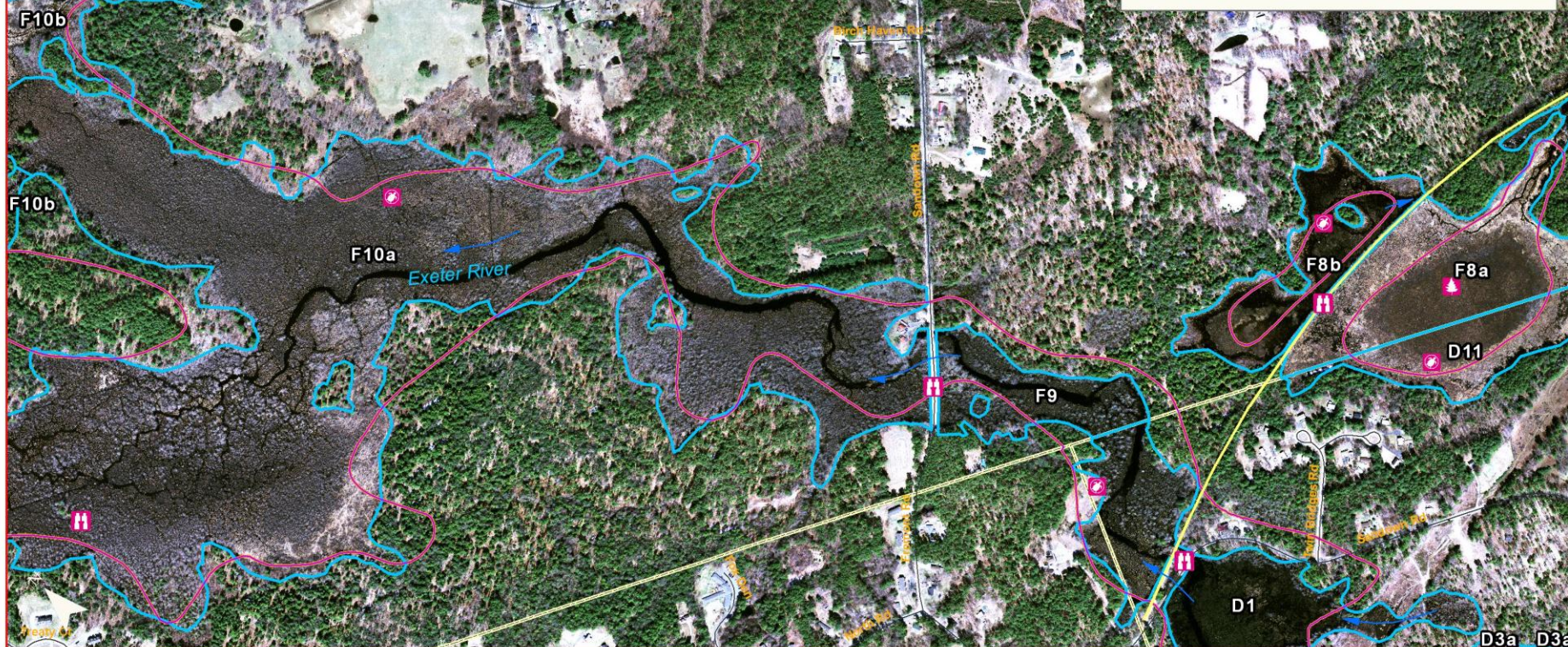
Wetlands delineated by West Environmental, Inc. based on 2008 1'-resolution aerial photography from the USGS and on field observation. Features of interest (rare plants, invasive species, etc.) mapped by West Environmental, Inc. based on field observation and inference. Please see the accompanying report for more information.

The following data sources were mapped at 1:24,000 and distributed by NH GRANIT: Roads, from NH DOT and Town Boundaries, from USGS. Floodplain Study Area based on the 100-year floodplain (Zone A) as mapped on the DFIRM (Digital Flood Insurance Rate Map) developed by FEMA and distributed by NH GRANIT. Background imagery is 2008 1'-resolution aerial photographs from USGS, provided by the Rockingham Planning Commission.

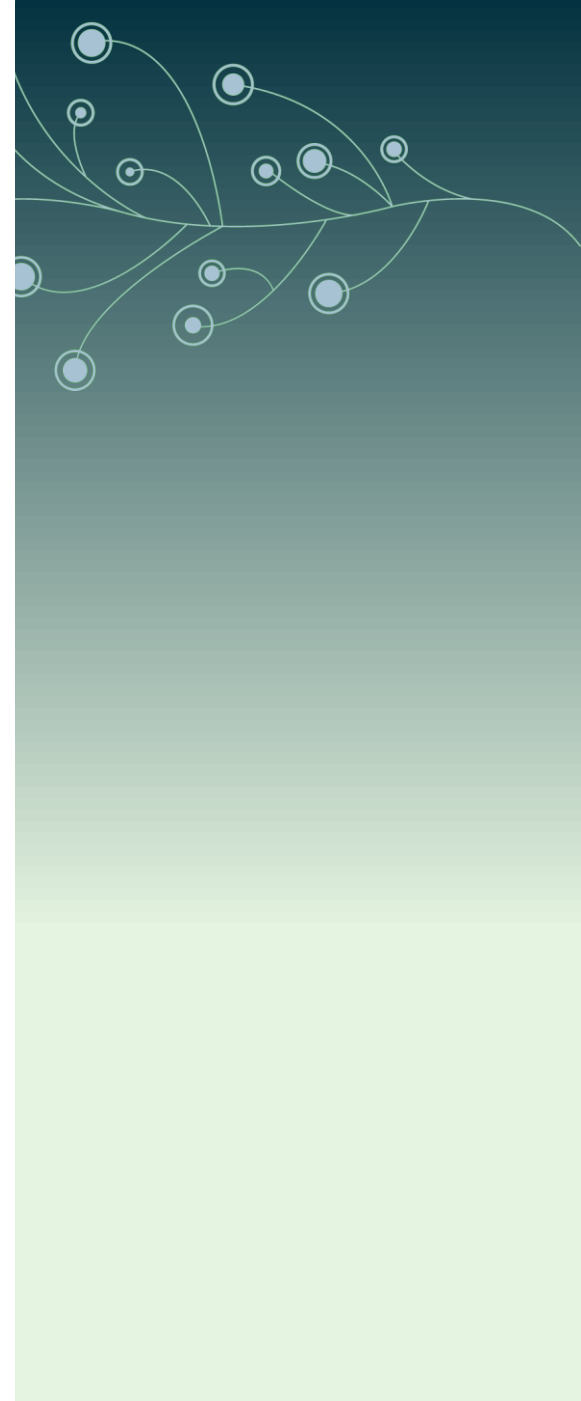
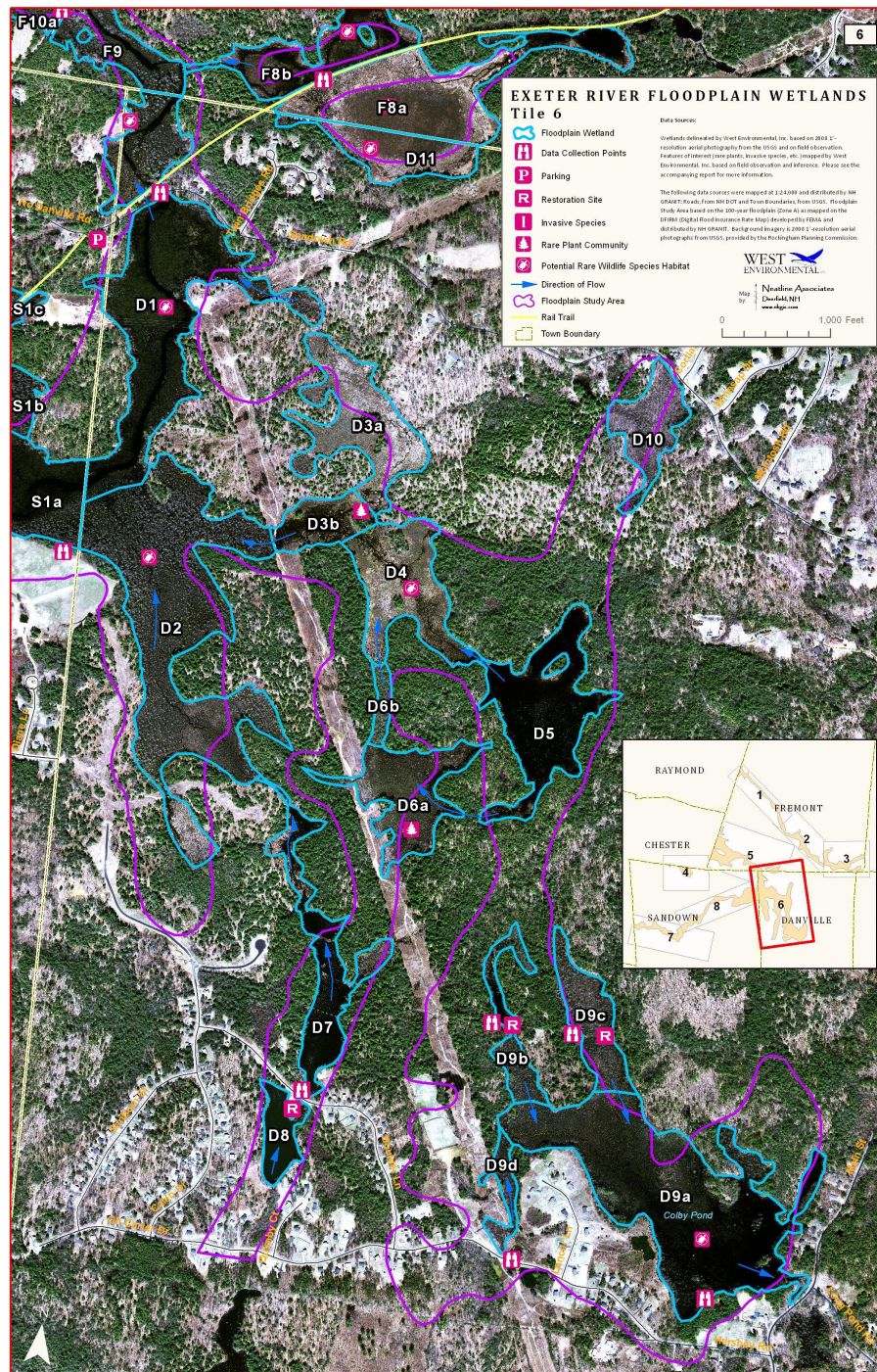
**WEST**  
ENVIRONMENTAL, INC.

Map by:  
Neeline Associates  
Dorchester, NH  
www.nafig.com

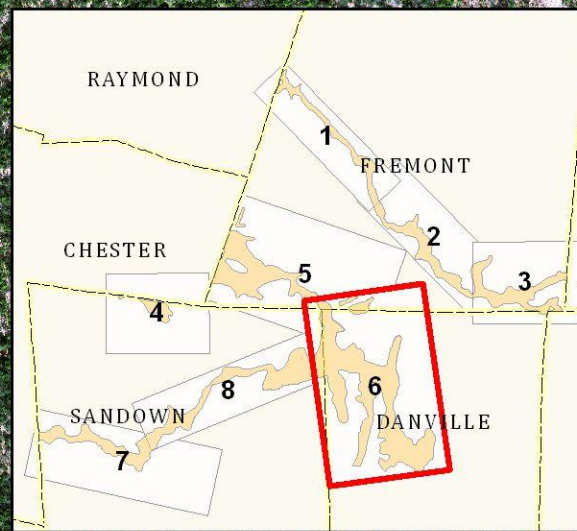
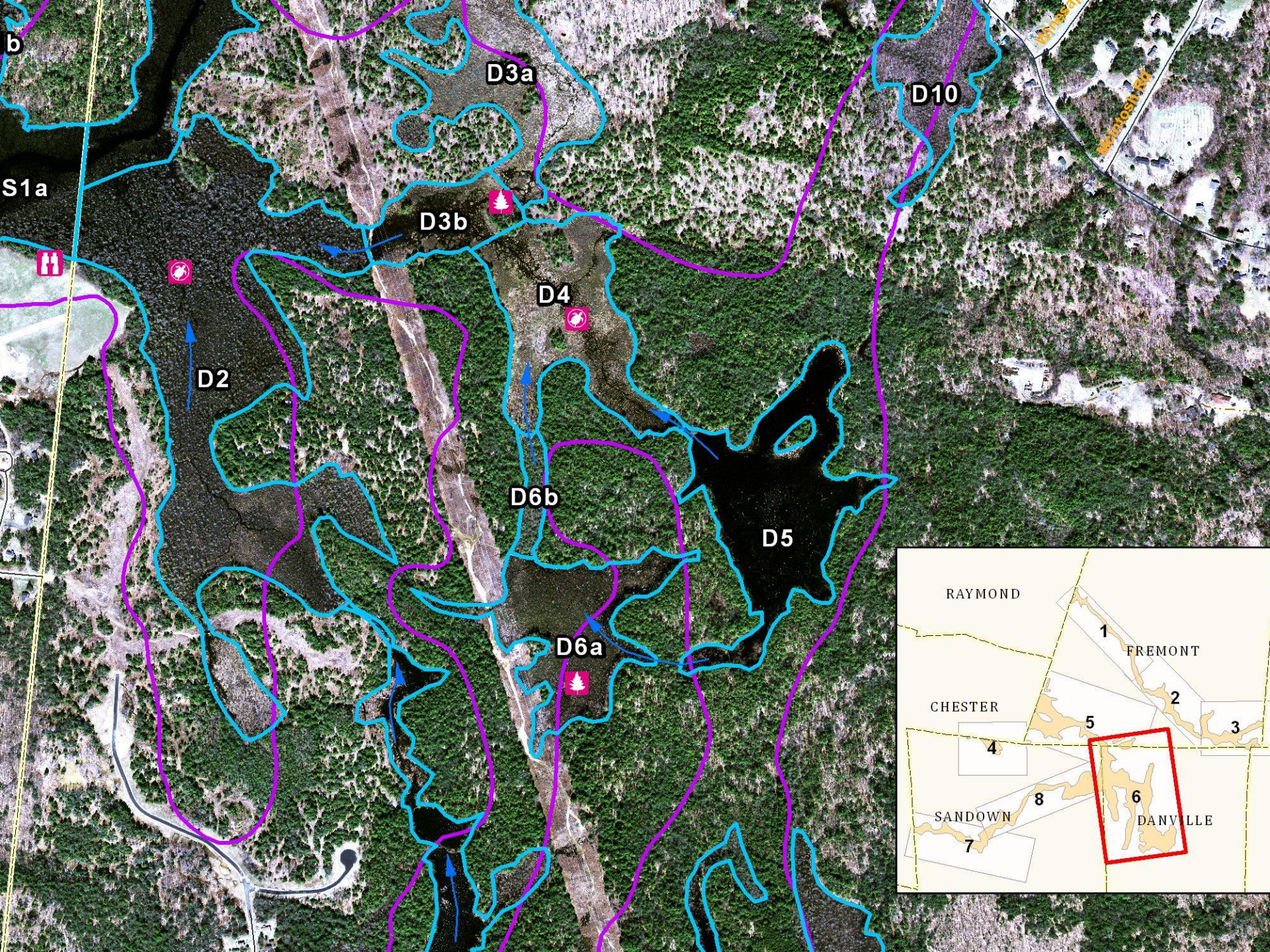
0 1,000 Feet



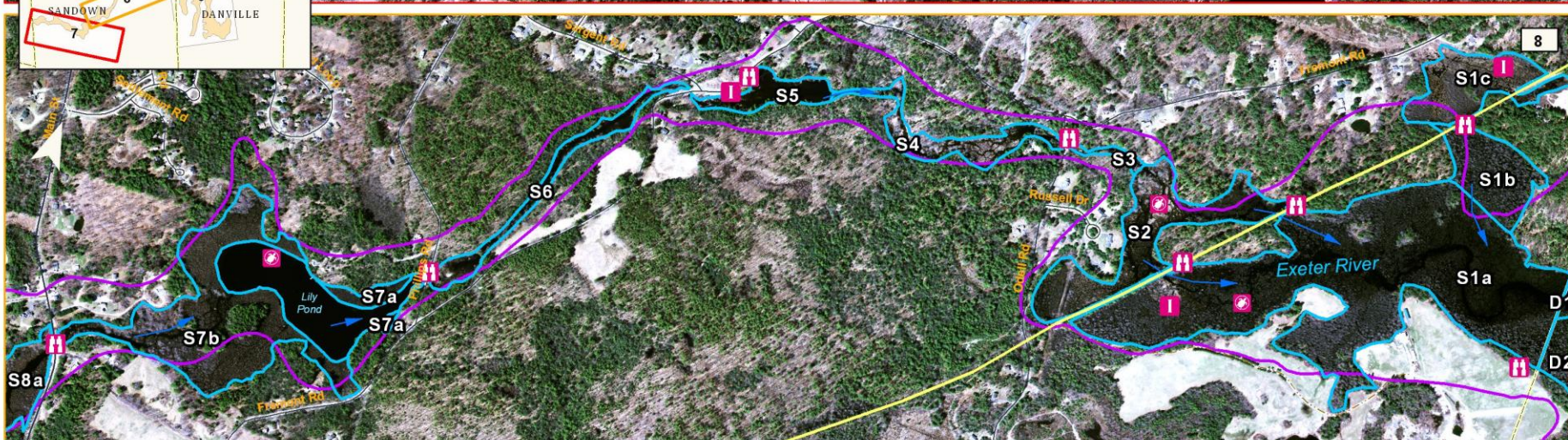
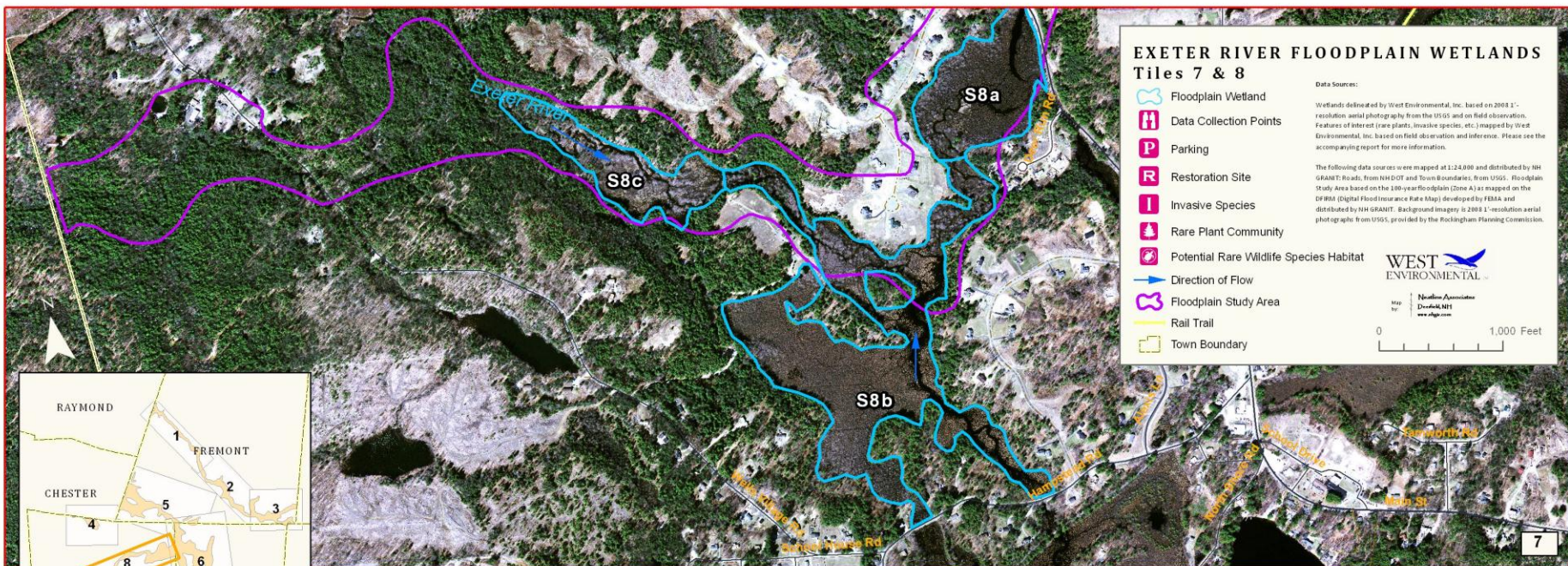














| Danville<br>Wetlands | Acres         |
|----------------------|---------------|
| D1                   | 56.0          |
| D2                   | 64.6          |
| D3a                  | 21.1          |
| D3b                  | 8.0           |
| <i>Total D3</i>      | <i>29.1</i>   |
| D4                   | 19.8          |
| D5                   | 24.0          |
| D6a                  | 17.0          |
| D6b                  | 2.4           |
| <i>Total D6</i>      | <i>19.4</i>   |
| D7                   | 17.1          |
| D8                   | 5.7           |
| D9a                  | 60.6          |
| D9b                  | 7.3           |
| D9c                  | 10.6          |
| D9d                  | 3.7           |
| <i>Total D9</i>      | <i>82.2</i>   |
| D10                  | 10.7          |
| D11                  | 11.92         |
|                      |               |
| <b>Total</b>         | <b>340.34</b> |





| Sandown Wetlands | Acres         |
|------------------|---------------|
| S1a              | 72.51         |
| S1b              | 9.23          |
| S1c              | 10.36         |
| <i>Total S1</i>  | <i>92.10</i>  |
| S2               | 16.90         |
| S3               | 1.00          |
| S4               | 6.89          |
| S5               | 4.57          |
| S6               | 5.80          |
| S7a              | 2.21          |
| S7b              | 28.45         |
| <i>Total S7</i>  | <i>30.66</i>  |
| S8a              | 18.93         |
| S8b              | 56.85         |
| S8c              | 14.99         |
| <i>Total S8</i>  | <i>90.77</i>  |
| S9               | 20.96         |
|                  |               |
| <b>Total</b>     | <b>269.65</b> |





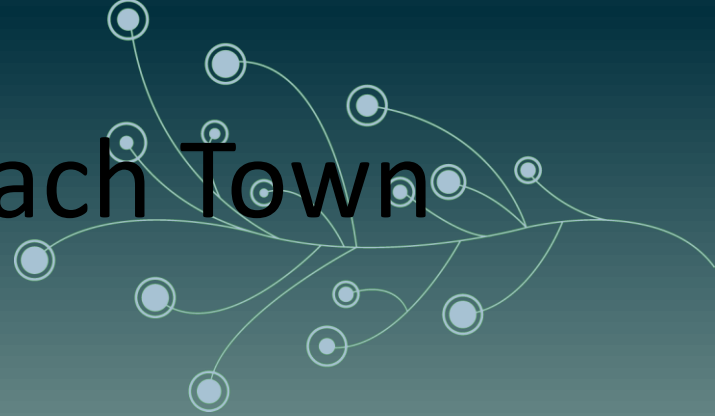
| Fremont Wetlands | Acres        |
|------------------|--------------|
| F1               | 21.0         |
| F2               | 19.4         |
| F3a              | 27.1         |
| F3b              | 34.5         |
| <i>Total F3</i>  | <i>61.6</i>  |
| F4               | 4.0          |
| F5               | 18.1         |
| F6               | 35.1         |
| F7               | 25.1         |
| F8a              | 31.5         |
| F8b              | 17.4         |
| <i>Total F8</i>  | <i>49.0</i>  |
| F9               | 12.6         |
| F10a             | 223.3        |
| F10b             | 39.7         |
| <i>Total F10</i> | <i>263.0</i> |
|                  |              |
| <b>Total</b>     | <b>509.0</b> |





# Total Wetlands in each Town

- Fremont - 509 acres
- Danville – 340 acres
- Sandown – 269 acres
- Total 1,118 acres







ATV on Rail Trail





Wetland restoration site in Wetland D-9b





Wetland S-1 from Rail trail showing Invasive Phragmites along river channel





Wetland S-7a Lilly Pond





Wetland D-9b Vernal Pool Habitat





Wetland S-1c large leaf cranberry





Wetland S-1b Black Gum Tree





Wetland S-8a frozen river channel in Sandown