AMENDMENT #3
TO THE
VERMONT IN-LIEU FEE PROGRAM INSTRUMENT

WHEREAS, the approved Ducks Unlimited, Inc. Vermont In-lieu Fee Program instrument, was signed by Ducks Unlimited on January 6, 2011. Amendment #1 was signed by Ducks Unlimited on March 9, 2015 and the Corps on January 30, 2015. Amendment #2 was signed by Ducks Unlimited on June 10, 2015 and the Corps of June 29, 2015.

NOW THEREFORE,
This amendment modifies the instrument to include the 3 Mile Bridge Road compensatory mitigation site in the Richelieu Service Area off 3 Mile Bridge Road in Middlebury, Vermont.

The mitigation plan includes the re-establishment, rehabilitation and preservation of 139.7 acres of wetlands and uplands adjacent to the Middlebury River and Otter Creek to compensate for authorized impacts to waters of the United States in the Richelieu River Basin for which payments into the DU-VT-ILF program were made in lieu of the permittees doing their own mitigation. This mitigation plan involves the construction of a berm to restore hydrology on the site as well as grading and plantings, and is described in the attached plan entitled "RICHELIEU SERVICE AREA MITIGATION PLAN 3 Mile Bridge Road Site Middlebury, VT", and dated "April 8, 2016".

IN WITNESS WHEREOF, the undersigned have caused this amendment to be duly executed.

H. Dale Hall Date: 11/11/16
H. Dale Hall
CEO, Program Sponsor
Ducks Unlimited, Inc.

Date: 19 Oct 2016
COL Christopher J. Barron
Colonel, New England District Corps of Engineers
District Engineer

DUCKS UNLIMITED | MITIGATION & ECOLOGICAL SERVICES

# RICHELIEU SERVICE AREA MITIGATION PLAN

## 3 Mile Bridge Road Site
## Middlebury, VT

Prepared For:
United States Army Corps of Engineers
New England District
Regulatory Division
696 Virginia Road
Concord, MA 01742-2751

Prepared By:
Ducks Unlimited, Inc.
Great Lakes Atlantic Regional Office
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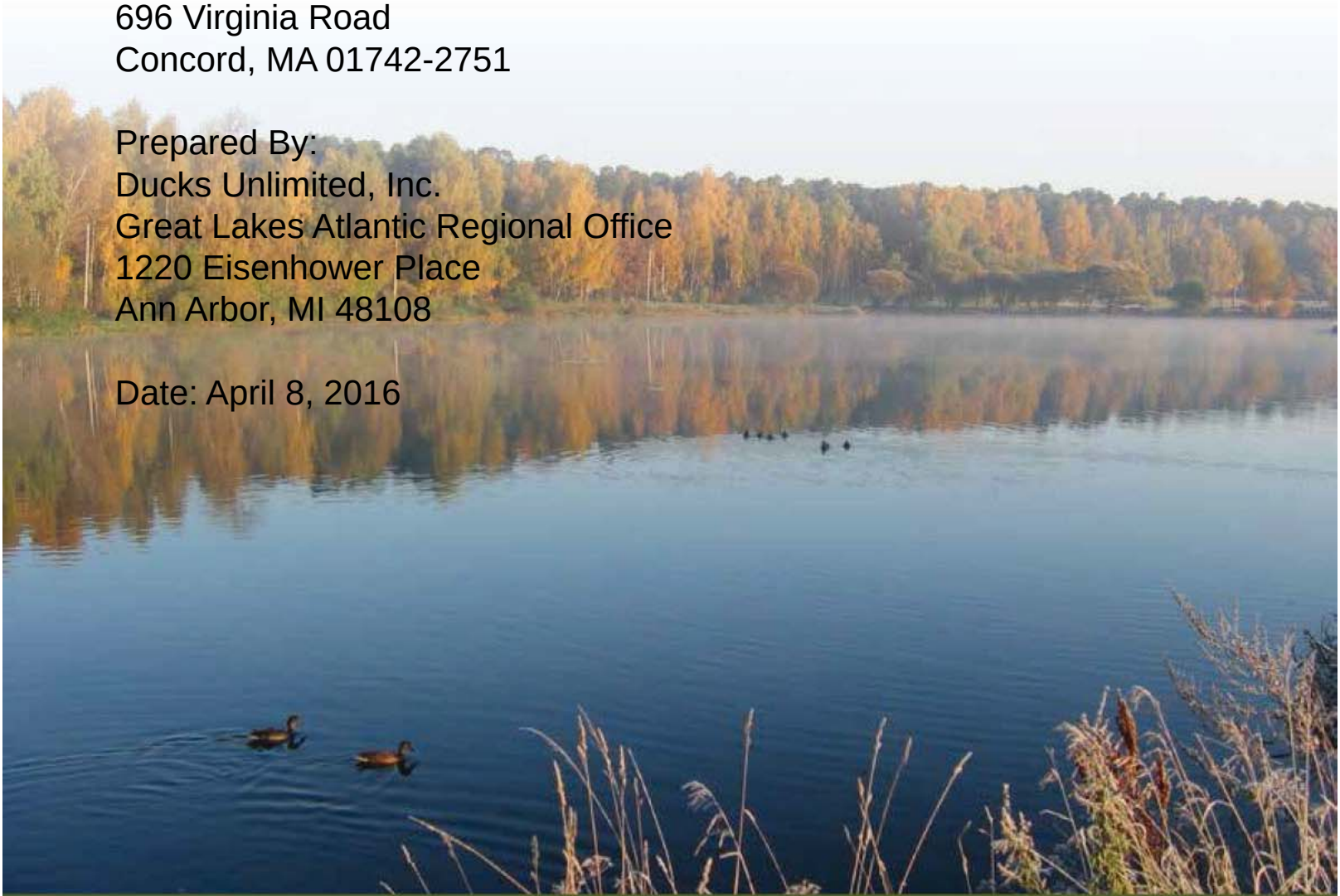
Date: April 8, 2016



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## 0.0 INTRODUCTION

Ducks Unlimited, Inc. (DU) established the Ducks Unlimited, Inc. Vermont In-Lieu Fee Program (DU-VT ILF Program) to provide a third party compensatory mitigation option to permit applicants under the permit programs of the U.S. Army Corps of Engineers (USACE) and the Vermont Department of Environmental Conservation (VT DEC). The program instrument was signed on January 6, 2011. The DU-VT ILF Program has sold 9.09 credits to permittees to compensate for wetland impacts in the Lake Champlain - Richelieu River basin (HUC 041504) (Appendix A). Credits were purchased to compensate for permanent and temporary impacts to palustrine forested (PFO) wetlands, palustrine emergent (PEM), palustrine scrub-shrub (PSS), riverine lower perennial unconsolidated bottom (R2UB) wetlands, and rivers, streams, or brooks (RSB) in the Lake Champlain – Richelieu River Basin (Appendix A and Appendix B, Fig 1)

DU identified and evaluated an extensive list of potential mitigation sites in coordination with State, Federal and NGO partners. The best potential mitigation site was located at Latitude: 43.96940 and Longitude: -73.15128 on 3 Mile Bridge Road south of the village of Middlebury in the Town of Middlebury, Addison County, Vermont. The 3 Mile Bridge Road site (hereinafter Mitigation Site) was selected as having the highest opportunity for restoration and meaningful preservation based on location, size, likelihood of success, and types of existing and potential aquatic resources. The following mitigation plan has been prepared and will be implemented by DU in accordance with the "U.S. Army Corps of Engineers New England District Compensatory Mitigation Guidance" (USACE, 2010).

## 1.0 MITIGATION GOALS AND OBJECTIVES

The overall goal of this compensatory wetland mitigation plan is to re-establish, rehabilitate and protect 139.74 acres of wetlands and associated upland buffers to compensate for the impacts to wetlands in the Lake Champlain – Richelieu River Basin, United States Geological Survey (USGS) Cataloging Unit and Hydrologic Unit Code (HUC): 041504. The functions and values that will be realized by this proposed wetland mitigation plan aim to replace, at a minimum, the functions and values of the wetlands impacted.

The wetland mitigation plan will use methods of wetland re-establishment, rehabilitation, upland buffer establishment and preservation to meet, at a minimum, the required compensatory mitigation wetland credits (9.09 credits). The proposed mitigation design emphasizes heterogeneity in microtopography, vegetation and hydrology to maximize diversity and ecological resilience of the wetland. The wetland functions and values that will be restored and/or enhanced at the Mitigation Site are groundwater recharge/discharge, flood attenuation, flood flow alterations, sediment/toxicant retention, nutrient removal, sediment/shoreline stabilization, wildlife habitat, and visual quality/aesthetics. Performance objectives will be evaluated to measure success in achieving the overall goal.

The wetland mitigation goal will be based on maximizing the wetland potential at the Mitigation Site and generating credits to offset impacts authorized by USACE permits using the USACE recommended compensatory mitigation ratios for re-established, rehabilitated, and preserved wetlands to impacted wetlands. The mitigation plan's objectives are to re-establish 55.1 acres of

PFO wetlands, preserve 55.8 acres of PFO wetlands, rehabilitate 22.1 acres of PEM wetlands, and re-establish 6.7 acres of PEM wetlands. These acreages are estimates and exact acreages of re-established, rehabilitated and preserved wetlands will be based on topographic survey data and wetland delineation data. Costs associated with the land acquisition, preparation of this mitigation plan, permitting, construction, seeding, as-built survey, monitoring and maintenance for the additional wetland acreage will be covered by funds from in-lieu fee mitigation credits sold to permittees for wetland impacts in the Lake Champlain – Richelieu River Basin.

## 2.0 MITIGATION SITE SELECTION

The mitigation site was selected for the following reasons:

1. It is in the Lake Champlain - Richelieu River Basin (HUC 041504).
2. The site is located at the confluence of Otter Creek and Middlebury River and adjacent to reaches of these water bodies listed on the VT DEC's 2014 List of Priority Surface Waters, Part D (VT DEC, 2014).
3. It has the hydric soils, adequate hydrology, and topography conductive to successful wetland restoration.
4. There are 440 acres of wetland habitat immediately adjacent to the site which will provide reference wetlands and seed source for colonization by wetland species.
5. The site is adjacent to lands protected by the Middlebury Area Land Trust (MALT) (Appendix B, Fig. 9). The proximity to protected land ensures the surrounding landscape will be protected from development.
6. The site provides a high contribution to biological diversity based on factors such as riparian connectivity, uncommon natural communities, uncommon species, wetlands and riparian areas.
7. The site presents a cost-effective opportunity to create a greater amount of wetland habitat than the minimum required amount and with a high likelihood of success in replacing wetland functions lost at the impact sites.
8. Wetland mitigation at this site will realize positive impacts to a diversity of wildlife species and will not negatively impact known endangered or threatened plants or animals.
9. The proposed mitigation plan is not expected to negatively impact cultural resources.
10. It is in the Otter Creek Sub-basin (HUC 04150402) which is the focus of ecological work by the US Fish and Wildlife Service (USFWS) and the US Department of Agriculture Natural Resource Conservation Service (NRCS) and considered an impaired waterway within the State of Vermont.

## 3.0 BASELINE INFORMATION

Mitigation Site Background

The Mitigation Site is located at Latitude: 43.96940 and Longitude: -73.15128 south of the village of Middlebury in the Town of Middlebury, Addison County, Vermont in the Otter Creek Sub-basin (HUC 04150402). The Site encompasses 139.74 acres and is privately owned. Based

on aerial photography (Appendix B, Fig 2), the Mitigation Site is divided into five sections by 3 Mile Bridge Road and the Middlebury River. The house at 1804 3 Mile Bridge Road is not part of the Mitigation Site. The topography of the Mitigation Site is relatively flat with an elevation of approximately 344 ft. above mean sea level (Appendix B, Fig. 3). According to the land cover map (Appendix B, Fig. 15) the Mitigation Site includes agricultural land, and woody and emergent wetlands.

The 80.20 acre section north of 3 Mile Bridge Road is mostly former agricultural land that is now dominated by reed canary grass (*Phalaris arundinacea*). Several relic oxbows are present in this northern section and it transitions to emergent and forested wetlands towards the site's northern boundary (Appendix B, Fig. 5 and 6). These forested wetlands are classified as a Red or Silver Maple-Green Ash Swamp (Appendix B, Fig. 7), which is an uncommon significant natural community according to the Vermont Fish and Wildlife Department (VT FWD) (Thompson & Sorenson, 2000).

The 42.67 acre section south of 3 Mile Bridge Road is mostly actively farmed with row crops (i.e., corn). This southern section is in the floodplain of the Middlebury River (Appendix B, Fig. 9) and was most likely forested before it was cleared for agriculture. This southern section has several remnant floodplain forests, and one of them is a Silver Maple-Ostrich Fern Riverine Floodplain Forest (Appendix B, Fig. 7), which is an uncommon significant natural community according to the VT FWD. Swales meander through this southern section of the Mitigation Site and are indicative of modified relic oxbows.

The third section of the Mitigation Site is 15.33 acres south of 3 Mile Bridge Road at the confluence of Otter Creek and Middlebury River. This confluence section is entirely forested wetland (Appendix B, Fig. 5 and 6) classified as Silver Maple-Ostrich Fern Riverine Floodplain Forest by the VT FWD (Appendix B, Fig. 7).

A 1.29 acre section is west of Creek Road and borders Otter Creek. This 1.29 acre section is primarily herbaceous vegetation and starting to revert back to emergent wetlands. and within the floodplain of Otter Creek. A 0.25 acre section is immediately south of the 1.29 acre section adjacent to Creek Road. This 0.25 acre section is forested and at the confluence of Otter Creek and Middlebury River.

Watershed

The Mitigation Site is part of the Otter Creek Sub-basin (HUC 04150402) (Appendix B, Fig. 11) which is a large watershed in the Lake Champlain – Richelieu River Basin (HUC 041504). The Otter Creek Sub-basin includes all surface waters which drain into the Otter Creek, which is the longest river in the state of Vermont (Addison County River Watch Collaborative, n.d.). The watershed upstream of the confluence of Otter Creek and Middlebury River at the site is 623 square miles in area (Appendix B, Fig. 11). The Site drains an area of 230 acres, including the footprint of the site (Appendix B, Fig. 10).

The wetland mitigation plan takes into consideration the priority issues and recommendations set forth by the Vermont's Wildlife Action Plan (VT FWD, 2005) the Otter Creek Basin Water Quality Management Plan (VT DEC, 2012), the Lake Champlain Basin Program (LCBP)'s

management plan (LCBP, 2010) and the Addison County River Watch Collaborative (Addison County River Watch Collaborative, n.d.). Priority issues addressed by these documents include habitat conservation and degradation, water quality concerns, floodplain protection, and invasive and exotic species control. The site is located within one of the Vermont Partners for Fish & Wildlife Priority Areas, specifically the Lake Champlain Valley Rivers and Wetlands focus area, which is a priority area for the National Resources Conservation Service (NRCS) and the United States Fish & Wildlife Service (USFWS) (USFWS, 2010). Volunteer land owners have completed many restoration projects in the watershed through the Vermont Partners for Fish & Wildlife program.

The watershed is part of the Atlantic Coast Joint Venture's (ACJV) Lower Great Lakes/St. Lawrence Plain Bird Conservation Region's (BCR 13) Lower St. Lawrence/Champlain/Ottawa/ Richelieu River Priority Region, which is one of the most important areas to advance conservation objectives for bird species in BCR 13 (Hartley, 2007). Wetlands in the BCR 13 Lake Champlain Valley Focus Area provide important breeding, staging and migration habitat for waterfowl species along a natural migration corridor. Development and conversion to agriculture led to habitat loss and degradation of wetlands in the Lake Champlain Valley Focus Area.

Surrounding Land Use

The site borders 440 acres of continuous wetland habitat to the north. Immediately adjacent to the site is an area of Wet Clayplain Forest (Appendix B, Fig. 7), which is classified as an exemplary wetland natural community by the Vermont Non-Game Natural Heritage Program. Restoring wetlands at the mitigation site will improve habitat connectivity between the remnant floodplain forests at the site and the wetlands immediately north of the site.

Agricultural land borders most of the site. Most of the agricultural lands bordering the site are under easements by MALT. These agricultural lands will remain in use as agriculture under the easements held by MALT. The mitigation site is adjacent to reaches of Middlebury River and Otter Creek on the VT DEC's 2014 List of Priority Surface Waters, Part D. Impaired Surface Waters with Completed and Approved TMDLs (Total Maximum Daily Load) (VT DEC, 2014). The previously identified problem identified at these reaches was agricultural runoff. Restoring wetlands at the mitigation site will reduce agricultural runoff from the surrounding landscape from entering Middlebury River and Otter Creek, thereby improving water quality.

Cultural Resources

DU has submitted a request for review letter to the Vermont State Historic Preservation Office (VT SHPO) and the Stockbridge-Munsee Community Tribal Historical Preservation Officer. Based on a preliminary review, VT SHPO has requested completion of an Archaeological Resource Assessment (ARA). The results of the ARA will determine if further archaeological studies are necessary at the site. Based on findings from all completed archaeological studies, the design plans will be modified to ensure no damage will occur on historic sites.

Wildlife Usage

The site is within the observed summer range of the federally-listed endangered Indiana Bat (*Myotis sodalis*). The wetland restoration would not negatively impact Indiana Bat habitat.

Efforts will be made within the restoration area to improve Indiana Bat habitat if possible. It is also within the summer and winter range of the Northern Long-eared Bat. There will be no cutting of trees 3" or greater as part of this project, therefore there will be no impacts to this species. According to the Vermont Fish & Wildlife Department, there has been a confirmed observation of the state-listed endangered Sedge Wren (*Cistothorus platensis*) at the Mitigation Site. The Sedge Wren is a high priority species of greatest conservation need (SGCN) associated with marshes and sedge meadows, and would benefit from wetland restoration at the Mitigation Site. According to the Vermont 2003 – 2007 Breeding Bird Atlas, the Mitigation Site is in an area where the American bittern was observed. The American bittern is a high priority SGCN associated with marshes and sedge meadows, and would also benefit from wetland restoration at the Mitigation Site.

The Mitigation Site is part of the BCR 13 Cornwall Swamp Sub-Focus Area, which provides important breeding and migration habitat for waterfowl species such as American Black Duck, Wood Duck, and Common Goldeneye. These three waterfowl species are high priority species in emergent and forested wetlands in BCR 13.

This mitigation plan supports the Partners in Flight North America Landbird Conservation Plan by restoring forested wetland habitat associated with species of continental importance in BCR 13 (e.g., rusty blackbird and willow flycatcher) (Rich et al., 2004).

Wetland restoration at the Mitigation Site will also provide habitat for reptile and amphibian SGCN listed in the Vermont Wildlife Action Plan (VT FWD, 2005) such as Jefferson salamander, blue-spotted salamander, spotted salamander, four-toed salamander, western chorus frog and wood turtle.

Wetlands

According to the National Wetland Inventory (NWI), there are already wetlands present at the site (Appendix B, Fig. 5). In the northern section of the site there are palustrine emergent wetlands (PEM1B) transitioning to Red or Silver Maple – Green Ash Swamp towards the northern border of the site (Appendix B, Fig 7.). In the southern section there are two areas of floodplain forests including an area classified as Silver Maple – Ostrich Fern Riverine Floodplain Forest by the VT FWD (Appendix B, Fig 7.). The section of the site at the confluence of Otter Creek and Middlebury River is all classified as Silver Maple – Ostrich Fern Riverine Floodplain Forest (Appendix B, Fig 7.). Areas classified as prior converted cropland (PC) occur along the oxbows and swales throughout the southern section of the Mitigation Site, while the rest of the site agricultural area is classified as farmed wetlands hay and pasture (FWP) (Appendix B, Fig. 8).

Hydrology

The inputs of water to the site are direct precipitation, surface runoff from the contributing watershed, floodplain inundation and groundwater seepage. According to the NOAA NCDC, average annual precipitation for this area of Vermont is approximately 37 inches. The precipitation is generally well distributed throughout the year and peaks in the summer months. According to the Northeast Regional Climate Center, a 2.4 inch rainfall event is likely to occur every 2 years.

According to Federal Emergency Management Agency (FEMA) Flood Maps, the site is in a special flood hazard area (SFHA) subject to inundation by the 100-year flood (Appendix B, Fig. 12). The average annual discharge from the Otter Creek is 1,239 cubic feet per second based on stream gauge data from Middlebury. The site is in the floodplain of Otter Creek and Middlebury River, so flood events contribute to the Mitigation Site's hydrology. Surface runoff from an area of 122 acres contributes to the site's hydrology (Appendix B, Fig. 10).

The depth to the water table for the most prevalent soil map unit - Limerick silt loam (Le) - at the site is 0 – 18 inches. Saturated hydraulic conductivity for Limerick silt loam (Le) is 9.17 micrometers per second.

A field study conducted with reed canary grass (*Phalaris arundinacea)* in Iowa (Schilling and Kiniry, 2007) was used as a conservative approach to estimating water loss due to evapotranspiration. The value of 23.9 inches of water loss due to evapotranspiration during the growing season (May – October) will be used. Reed canary grass has been shown to have one of the largest evapotranspiration rates and is used as a conservative value. Estimated water loss due to pan evaporation based on measurements taken at Burlington from November – April is 8.2 inches. The average annual total water loss due to evapotranspiration during the growing season and evaporation during the rest of the year is approximately 32 inches.

In an average year, the wetland will have enough water from direct precipitation to overcome the total water lost due to evapotranspiration during the growing season and evaporation during the rest of the year by 5 inches. A high water table will help the mitigation wetland retain water and contribute to the site's hydrology. The site's location means that the planned wetland areas will intercept surface runoff flowing towards Otter Creek and Middlebury River.

Vegetation

The northern section of the site is abandoned agriculture dominated by reed canary grass (*Phalaris arundinacea*). Most of the southern section of the site is actively farmed for corn. The floodplain forests at the site consist of Silver Maple, Green Ash, American Elm, Slippery Elm, Boxelder and Nannyberry. The northeastern open field of the property is planted to a hay crop with mixed wetland vegetation.

Soils

The following soil series are present at the Mitigation Site according to the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) (Appendix B, Fig. 4).

Limerick series consists of very deep, poorly drained soils on flood plains. Limerick silt loam (Le) and Limerick silt loam, very wet (Lf) are both classified as hydric soils with hydric ratings of 95% and 100% respectively. Le and Lf both have a depth to water table of 9 inches. Saturated hydraulic conductivity is moderately high in Le and Lf.

Winooski series consists of very deep, moderately-well drained soils. Winooski very fine sandy loam (Wo) is classified as a hydric soil with a hydric rating of 5%. Wo has a depth to water table of 27 inches. Saturated hydraulic conductivity is moderately high in Wo.

Muck and Peat (Mv) is classified as a hydric soil with a hydric rating of 100%. Mv has a water table at the soil surface. Saturated hydraulic conductivity is high in Mv.

The soil map unit where most of the wetland re-establishment/rehabilitation activities will occur is Le. Le has soil qualities suitable for wetland restoration. High quality wetlands already occur on Le soils at the Mitigation Site. According to the hydrologic soil group map (Appendix B, Fig. 13) most of the Mitigation Site has soils with a moderate infiltration rate when thoroughly wet wherever drained, and a very slow infiltration rate when thoroughly wet wherever undrained (i.e. Hydrologic Soil Group B/D). According to the map illustrating the depth to the water table (Appendix B, Fig 14) most of the Mitigation Site has a water table within 12 inches of the soil surface.

## 4.0 MITIGATION WORK PLAN

### 4.1 CONSTRUCTION AND PLANNED HYDROLOGY

The following work plan is for a wetland mitigation concept based on site visits and existing data including USGS topographic maps, USDA soil surveys, state and federal wetland and floodplain maps, tax maps and aerial photos. A concept plan has been prepared (Appendix C) and the final wetland design will be based on input and an approval of this concept by the USACE and the Interagency Review Team and verification of existing site data. The final design will include a full-size construction plan with the following components:

1. Overall property map showing the property boundary, the Mitigation Site boundary, and the existing wetland delineation. The overall map will show areas to be re-established, rehabilitated, and protected.
2. Project site plan and grading plan showing the proposed restored wetland areas including current and proposed elevations.
3. Details for construction of proposed ridge.
4. Cross sections of proposed earth moving activities.
5. A planting plan showing the areas of different planting regimes.
6. An Erosion and Sediment Control Plan.
7. A Monitoring Plan detailing the location of transects, photo points, and hydrology sampling points.
8. Specifications that include applicable construction methods and materials.

Construction of the mitigation wetland shall commence in summer 2016, depending on permit approval and appropriate site conditions. DU will secure a qualified contractor to construct the wetland mitigation plan. An erosion and sediment control plan will be implemented and maintained during construction. DU staff shall be on-site to monitor construction of the wetland mitigation areas to ensure compliance with the mitigation plan and to make adjustments when appropriate to meet mitigation goals.

The mitigation work plan will utilize the existing hydrology provided by the swales and oxbows at the site. Areas around these swales and oxbows are already classified as palustrine farmed (Pf) wetlands, so the necessary hydrology is already present to re-

establish wetlands. The existing swales will be modified to mimic the existing oxbows at the site and provide similar diverse habitat. If necessary, a low ridge will be constructed across the swale where it exits the agricultural field to support and maintain the appropriate hydrology in the southern section of the site. This constructed ridge would enhance the hydrology in the PFO/PEM floodplain community. The ridge would have a 25 ft top width and 10:1 side slopes. The specific location of the ridge is dependent on the topographic survey data that is in the process of being collected.

## 4.2 PLANNED VEGETATION AND HABITAT FEATURES

Invasive plant species have degraded the site's seed bank as evident from the dense stands of invasive reed canary grass (*Phalaris arundinacea*) in areas of abandoned agriculture. These dense stands of invasive plant species present at the site require an intensive approach to vegetation establishment. The areas of reed canary grass will be tilled for seeding and planting. Invasive plant species control methods may include herbicide application and mechanical removal. Seeding with cottongrass bulrush (*Scripus cyperinus*), rattlesnake manna grass (*Glyceria canadensis*), fowl manna grass (*Glyceria striata*), and soft-stem club-rush (*Schoenoplectus tabernaemontani*) at a minimum, will be used to out-compete invasive plant species and promote natural recruitment. The primary purpose of seeding/planting is to out-compete reed canary grass and establish a diverse PFO/PSS/PEM community. Inclusion of habitat structures for threatened and endangered species will be included in the final design plan. Habitat structures for threatened and endangered species may include placement of snags, partially buried logs, or whole trees. The following planting/seeding lists are primarily for the agricultural field south of 3 Mile Bridge Road.

**Recommended Planting List for PFO community**

The PFO community will be planted to most closely represent the Silver Maple-Ostrich Fern Riverine Floodplain Forest, and Red or Silver Maple-Green Ash Swamp natural communities as defined by the Vermont Fish and Wildlife Department.

**Table 1.** Planting list for planned PFO wetland plant community (all plants are 3' – 4' bare root plants)

| Common Name | Scientific Name | Wetland Indicator Status | Quantity |
|---|---|---|---|
| Red Maple | *Acer rubrum* | FAC | 2475 |
| Silver Maple | *Acer saccharinum* | FACW | 2750 |
| Speckled Alder | *Alnus incana* | FACW | 550 |
| Yellow birch | *Betula alleghaniensis* | FAC | 1100 |
| Buttonbush | *Cepthalanthus occidentalis* | OBL | 825 |
| Silky Dogwood | *Cornus amomum* | FACW | 275 |
| Red-osier Dogwood | *Cornus sericea* | FACW | 275 |
| Winterberry | *Ilex verticillata* | FACW | 275 |
| Swamp White Oak | *Quercus bicolor* | FACW | 3300 |
| Black Willow | *Salix nigra* | OBL | 1100 |
| American Elm | *Ulmus americana* | FACW | 1650 |
| Slippery Elm | *Ulmus rubra* | FAC | 1375 |
| Nannyberry | *Viburnum lentago* | FAC | 275 |
| Riverbank Grape | *Vitis riparia* | FAC | 275 |
| | | **TOTAL** | **16500** |

**Recommended Seeding List for PEM community**

The PEM community will be planted to closely represent shallow emergent marsh and sedge meadow natural communities as defined by the Vermont Fish and Wildlife Department.

**Table 2.** Seeding list for planned PEM wet meadow/shallow emergent marsh wetland plant community.

| Common Name | Scientific Name | WIS* | CoC** | Percent by weight |
|---|---|---|---|---|
| American Water Plantain | *Alisma subcordatum* | OBL | 4 | 2 |
| Bearded Sedge | *Carex comosa* | OBL | 7 | 1 |
| Shallow Sedge | *Carex lurida* | OBL | 4 | 10 |
| Common Fox Sedge | *Carex vulpinoidea* | OBL | 2 | 30 |
| Common Spike-Rush | *Eleocharis palustris* | OBL | 3 | 1 |
| Rattlesnake Manna Grass | *Glyceria canadensis* | OBL | 4 | 1 |
| Fowl Manna Grass | *Glyceria striata* | OBL | 3 | 1 |
| Lamp Rush | *Juncus effusus* | OBL | 3 | 5 |
| Rice Cut-Grass | *Leersia oryzoides* | OBL | 7 | 3 |
| Fowl Blue Grass | *Poa palustris* | FACW | 4 | 25 |
| Soft-Stem Club-Rush | *Schoenoplectus tabernaemontai* | OBL | 7 | 1 |
| Dark-Green Bulrush | *Scirpus atrovirens* | OBL | 5 | 3 |
| Cottongrass Bulrush | *Scirpus cyperinus* | OBL | 5 | 2 |
| American Burr-Reed | *Sparganium americanum* | OBL | 5 | 1 |
| Giant Burr-Reed | *Sparganium eurycarpum* | OBL | 6 | 5 |
| Simpler's Joy | *Verbena hastata* | FACW | 4 | 10 |

*WIS: Wetland Indicator Status
**CoC: Coefficienct of Conservatism

## 5.0 PERFORMANCE AND SUCCESS STANDARDS

The following performance standards are based on the goals and objectives of the mitigation project as well as the character of existing wetlands surrounding the mitigation site. These standards will be used to evaluate development and overall success of the mitigation project:

1. Construction has been completed in accordance with approved plans and specifications in the permit.
2. The soils on the site will be stable and any non-biodegradable erosion controls will be removed.

3. The wetland reestablishment areas have soil saturation and/or evidence of inundation via water potential or water height measurements during five out of the ten growing seasons but not exceeding the hydrology appropriate for the proposed wetland type.
4. All areas with soil disturbance will have at least 80% vegetative cover by the end of the first growing season and at least 90% by the end of the second growing season.
5. The PFO wetlands shall have at least 60 percent coverage rate of native hydrophytic plants (those with a regional indicator status of FAC, FACW, or OBL in the report entitled "Northcentral and Northeast 2014 Regional Wetland Plant List" (USACE)). The PEM wetlands shall have at least 70 percent coverage rate of native hydrophytic plants.
6. At the end of the tenth monitoring year, there is at least 50% aerial coverage by woody species in the planned PFO zones.
7. At the end of the tenth monitoring year, no more than 15 percent of the aerial coverage of the vegetation will consist of the plant species identified by the USACE in the "New England District Compensatory Mitigation Guidelines - Appendix D: Invasive and other Unacceptable Plant Species."
8. At the end of the tenth monitoring year, the PFO area shall have a stem density of native woody plant species of at least 300 stems per acre, out of which 250 stems per acre will be tree species.
9. At the end of the tenth monitoring year, the established wetland will meet the federal wetland criteria outlined in the report entitled "Corps of Engineers Wetlands Delineation Manual", dated January, 1987, with the current Corps of Engineers' Northcentral and Northeast Regional Supplement.

The success of this wetland mitigation project will be assessed based on the performance standards outlined above and include any additional conditional standards identified and agreed upon by the USACE upon final design and during the permitting process.

## 6.0 CREDIT DETERMINATION

Credits will be generated from the proposed mitigation wetland after fulfilling the compensatory mitigation requirements for the credits already purchased. Approximately 27.65 credits will be generated from the proposed mitigation wetland based on the current New England District compensatory mitigation guidance ratios (Table 3) (USACE, 2010).

**Table 3.** Determination of credits based on community and mitigation type

| Community | Mitigation Type | Acreage | Ratio | Credits Generated |
|---|---|---|---|---|
| PEM | Rehabilitation | 22.1 | 10:1 | 2.21 |
| PEM | Re-Establishment | 6.7 | 2:1 | 3.35 |
| PFO | Re-Establishment | 55.1 | 3:1 | 18.37 |
| PFO | Preservation | 55.8 | 15:1 | 3.72 |
| Total | | 139.7 | | 27.65 |

The credit release schedule will include:

- All of the credits associated with the preservation will be released upon documentation of preservation (recorded deed) with associated approved stewardship plan (long-term management plan).
- 10% of the credits for re-establishment and rehabilitation will be released upon approval of this mitigation plan but after the preservation requirements are met.
- 20% of the credits for re-establishment and rehabilitation will be released at as-built production and approval by the IRT.
- 10% of the credits for re-establishment and rehabilitation will be released after the first year of successfully meeting the monitoring performance standards
- 10% of the credits for re-establishment and rehabilitation will be released after the second year of successfully meeting the monitoring performance standards
- 10% of the credits for re-establishment and rehabilitation will be released after the third year of successfully meeting the monitoring performance standards
- 20% of the credits for re-establishment and rehabilitation will be released after the fifth year of successfully meeting the monitoring performance standards
- 20% of the credits for re-establishment and rehabilitation will be released when the USACE signs off on the project, which is planned for the tenth year of monitoring.

## 7.0 MITIGATION SITE PROTECTION

Part of the site will be protected only for the generation of credits. The Site will always remain open to the public. A management plan approved by the USACE, and an agreement between DU and the final title holder of the property will be established to maintain the mitigated wetland area and buffer to protect it from incompatible use and habitat management activities. The Corps will have approval authority before the title is transferred to the final title holder. At this time a final title holder to this property has not been identified, but we have developed a couple of options that are listed below in priority order.

1. Donate the property to the VT DEC if they are interested in owning the land. A management plan will be established with VT DEC to establish long-term management and protection under VT DEC ownership.

2. Donate the property to Vermont Land Trust if they are interested in owning the land. A management plan and agreement will be established to maintain the Mitigation Site to protect it from incompatible use and habitat management activities.

## 8.0 MONITORING

DU staff, experienced with wetland restoration and mitigation, will coordinate and oversee monitoring activities. A surveyed drawing showing the As-Built conditions of the mitigated area will be submitted within 60 days following the completion of the mitigation project. The site will be monitored and a monitoring report will be submitted annually to the USACE for years

1,2,3,5,7, and 10 or when performance and success standards have been met. Observations will occur in June and again in late summer/early fall.

The reports will address the performance standards in the summary data section and will address the additional items noted in the monitoring report requirements, in the appropriate section. The reports will also include the monitoring-report appendices. The first year of monitoring will be the first year that the site has been through a full growing season after completion of construction and planting. Each annual monitoring report, in the format provided in the New England District Compensatory Mitigation Guidance, will be submitted to the USACE, Regulatory Division, Policy Analysis and Technical Support Branch and Vermont Project Office (VPO), no later than December 15 of each monitoring year and include the following information:

1. A surveyed drawing of the mitigation area, including water level elevations and acreage of wetland. Monitoring stations and/or transect locations, vegetation communities, and planting zones will also be identified on the drawings. Drawings will include overlays to show pre-construction conditions and temporal changes in the hydrology and vegetative community.
2. Color photographs from monitoring stations and a photograph location map showing all representative areas of each cover type within the mitigation site.
3. A plant species list that gives USFWS Wetland Indicator Status and strata (herb, shrub, tree). Dominant plants will be highlighted and the percent of the aerial cover noted. Plants introduced through seeding or planting will be indicated.
4. Water depth and the date of measurement from fixed locations and data-loggers within the wetland will be recorded. These sample points and data-logger locations will be plotted on the survey drawings.
5. Anecdotal list of wildlife species observed using the wetland.
6. Methodologies used to control nuisance vegetation (e.g., *Phalaris arundinacea, Phragmites australis, Lythrum salicaria*).
7. A quantitative assessment of monitoring data and a statement as to whether or not the goals of the mitigation project are being met and a plan with an implementation time table to correct any deficiencies.

A post-construction assessment report and wetland delineation survey will be submitted to the USACE in conjunction with the monitoring reports for the final year of the monitoring period.

## 9.0 MAINTENANCE AND ADAPTIVE MANAGEMENT PLAN

When monitoring indicates that a performance standard is not being met, then that standard will be evaluated to determine if simply more time is needed or a remedial action may be required. This will be accomplished by consulting wetland experts and permitting agencies to determine an appropriate course of action. Remedial actions may include seeding or planting, non-native plant control, and erosion control measures. Remedial actions will be implemented at least two years prior to the completion of the monitoring period to attain the success standards described below within 10 full growing seasons after completion of construction of the mitigation site. Should measures be required within two years of the end of the original monitoring period, the monitoring period will be extended to ensure two years of monitoring after the remedial work is

completed. Remedial actions requiring earth movement or changes in hydrology will not be implemented without written approval from the USACE. Once the monitoring period is over, the completed wetland will be protected by the title holder and managed only as needed and specified in the site management plan.

## 10.0 LONG-TERM STEWARDSHIP PLAN

Appropriate provisions will be made to support the mitigation site in perpetuity. DU will be responsible for the maintenance of the site during the monitoring period, and the final title holder or conservation easement holder is responsible for the long-term maintenance. Transfer of long-term management responsibilities will not occur until after performance standards have been met. The final title owner or conservation easement holder will be responsible for ensuring the mitigation site is in compliance with the permit in perpetuity. A stewardship endowment will be provided to the conservation easement holder using DU-VT ILF program funds. If the final title owner is a public authority or government agency, then they must provide a plan approved by the USACE for the long-term management of the site.

The long-term management of the property will include treatment of invasive species every three (3) years. It is anticipated that the only threat to the wetland beyond the initial 10 years of the project will be encroachment by invasive species. Although sufficient efforts will be made to eradicate invasive species from the site, it is likely that they will recolonize and need control. The stewardship endowment will be funded sufficiently to pay for these expenses with an expected three percent return on investment.

## 11.0 FINANCIAL ASSURANCES

Financial assurances for the construction and performance of the Mitigation Site will be provided by DU in the form of a “letter of credit.” The letter of credit will extend sufficient financial resources to complete significant alterations to the project if necessary to achieve success. The letter of credit will be in the full amount of the construction estimate (for a maximum of three years) and for the replanting of 25% of the PFO and Upland forest areas if these areas fail to meet stem count performance objectives (for the duration of the monitoring period). The letter of credit will not be called upon unless DU has exhausted the existing project budget, including all money set aside for contingency and wetland maintenance. As of March 22, 2016, the program has sold 9.09 credits for $1,193,764.94 in the Richelieu Service area. Approximately 1.18 % ($1,558.44) of each credit sold will be held as financial assurances ($14,086.43 total). DU will submit an annual report on financial assurances to the district engineer and IRT. The financial assurances report will include:

- Beginning and ending balances of the project account providing funds for financial assurances.
- Deposits into and any withdrawals from the project account providing funds for financial assurances
- Information on the amount of required financial assurances and the status of those assurances, including their potential expiration for the project.

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# APPENDIX A:

# SUMMARY OF IMPACTS

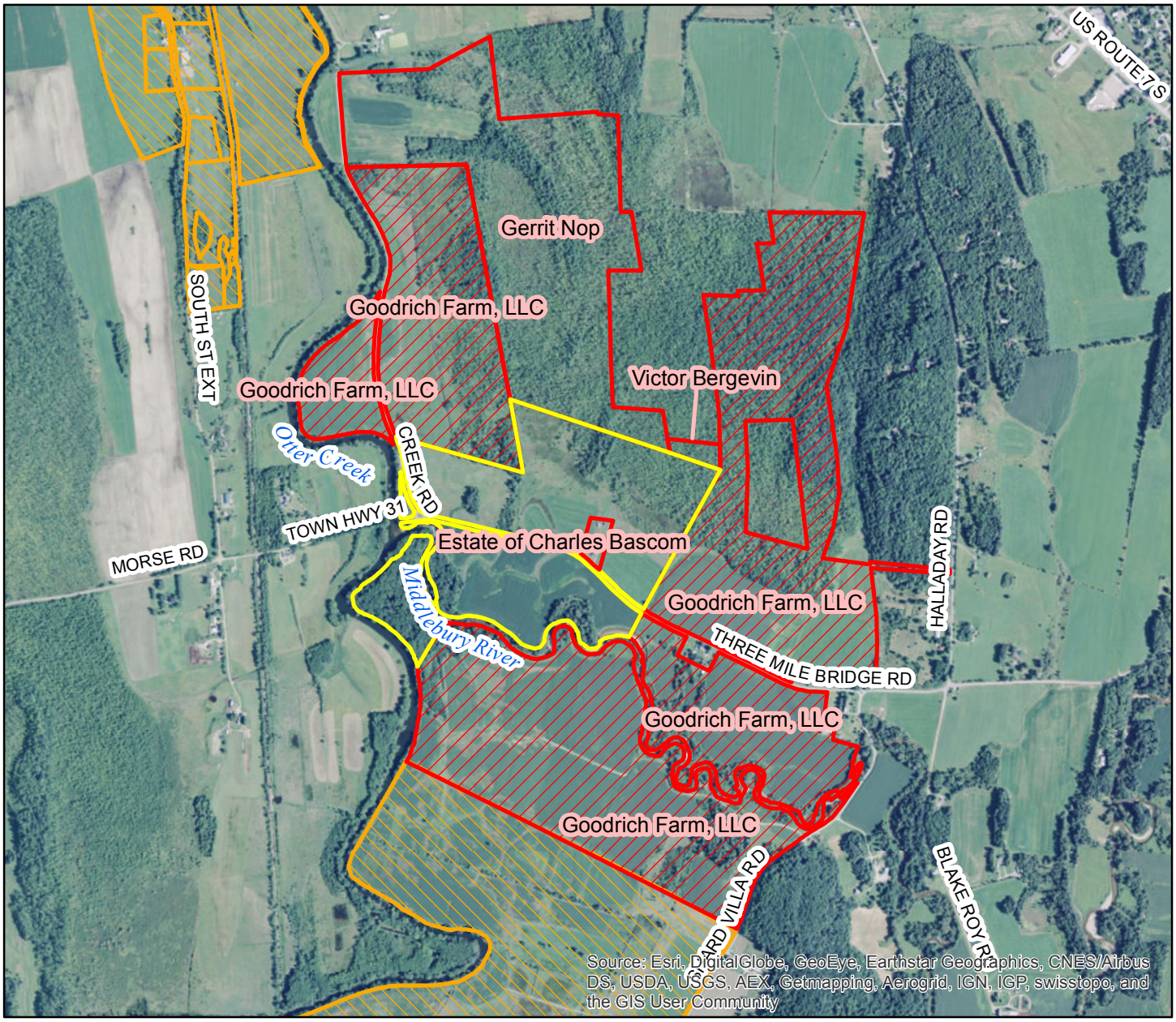
**Summary of DU-VT ILF Program Credits Purchased by Permit Applicants to Compensate for Authorized Wetland Impacts in the Lake Champlain – Richelieu River Basin (HUC 041504)**

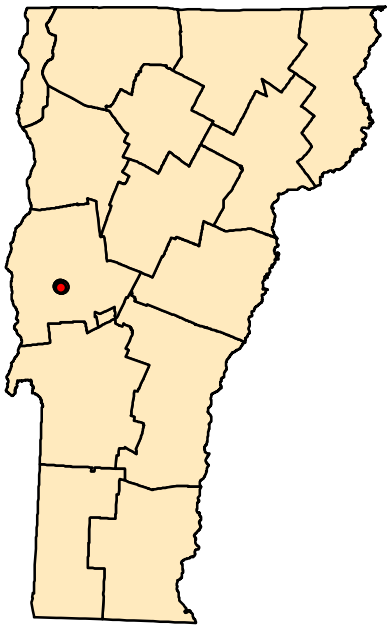
| USACE Permit | Location | Credits Purchased | Permanent Impacts (Acres) | Temporary Impacts (Acres) | Wetland Type (Cowardin) | Wetland Functions and Values* |
|---|---|---|---|---|---|---|
| **NAE-2004-4064** | **Burlington** | 0.18 | 0.22 | | PSS | GWR, STR, WH |
| **NAE-2009-0081** | **Essex** | 0.06 | 0.06 | | PSS/PEM | GWR, WH, STR |
| **NAE-2009-0587** | **Burlington** | 0.52 | 0.26 | 0.07 | PEM/PSS | STR, FF, WH |
| **NAE-2010-1881** | **Bristol** | 1.09 | 0.48 | 0.57 | PEM/PSS, R2UB | FF, STR, NR, SS, WH, VQ |
| **NAE-2012-0123** | **Extends over 40 miles from Colchester to Middlebury** | 0.60 | | 2.08 | PFO | GWR, WH, FF, SS, STR |
| **NAE-2012-0279** | **North Clarendon** | 2.01 | 2.67 | | PFO, PEM, RSB | GWR, WH, STR |
| **NAE-2012-0279-M2** | **Clarendon** | 1.23 | 1.23 | | PFO | GWR, WH, STR |
| **NAE-2012-0489** | **North Clarendon** | 0.17 | 0.34 | | PEM | GWR |
| **NAE-2012-2590** | **Williston** | 0.25 | 0.25 | 0.04 | PSS | GWR, WH, STR |
| **NAE-2013-0415** | **Morristown** | 1.24 | 0.02 | 4.16 | PFO, PEM, RSB | GWR, WH, STR |
| **NAE-2013-2592** | **Berlin** | 0.22 | 0.22 | | PEM | FF, STR |
| **NAE-2013-2639** | **Williston** | 0.28 | 0.03 | 0.83 | PEM, PFO | GWR, WH |
| **NAE-2014-0398** | **Rutland** | 0.15 | 0.02 | 0.46 | PEM, PFO | GWR, WH |
| **NAE-2014-1544** | **Castleton** | 0.04 | 0.04 | | PEM | GWR |
| **NAE-2014-1749** | **Essex** | 0.45 | 0.44 | 0.08 | PEM | GWR, STR, WH |
| **NAE-2014-2263** | **Shelburne** | 0.53 | 0.53 | | PSS | GWR, STR, WH |
| **NAE-2015-0626** | **Milton** | 0.07 | 0.07 | | PEM | STR |
| **TOTAL** | | 9.09 | 6.88 | 8.29 | | |

*GWR: groundwater recharge/discharge; FF: floodflow alterations; STR: sediment toxicant retention; NR: nutrient removal; SS: sediment/shoreline stabilization; WH: wildlife habitat; VQ: visual quality/aesthetics.

# APPENDIX B:

# BASELINE INFORMATION



# DU-VT ILF Program
# 3 Mile Bridge Road
# Neighboring Properties

- Mitigation Site Boundary (139.7 Acres)
- Neighboring Properties
- Protected by Middlebury Area Land Trust
- Vermont Land Trust

N

0 1,375 2,750 5,500 Feet

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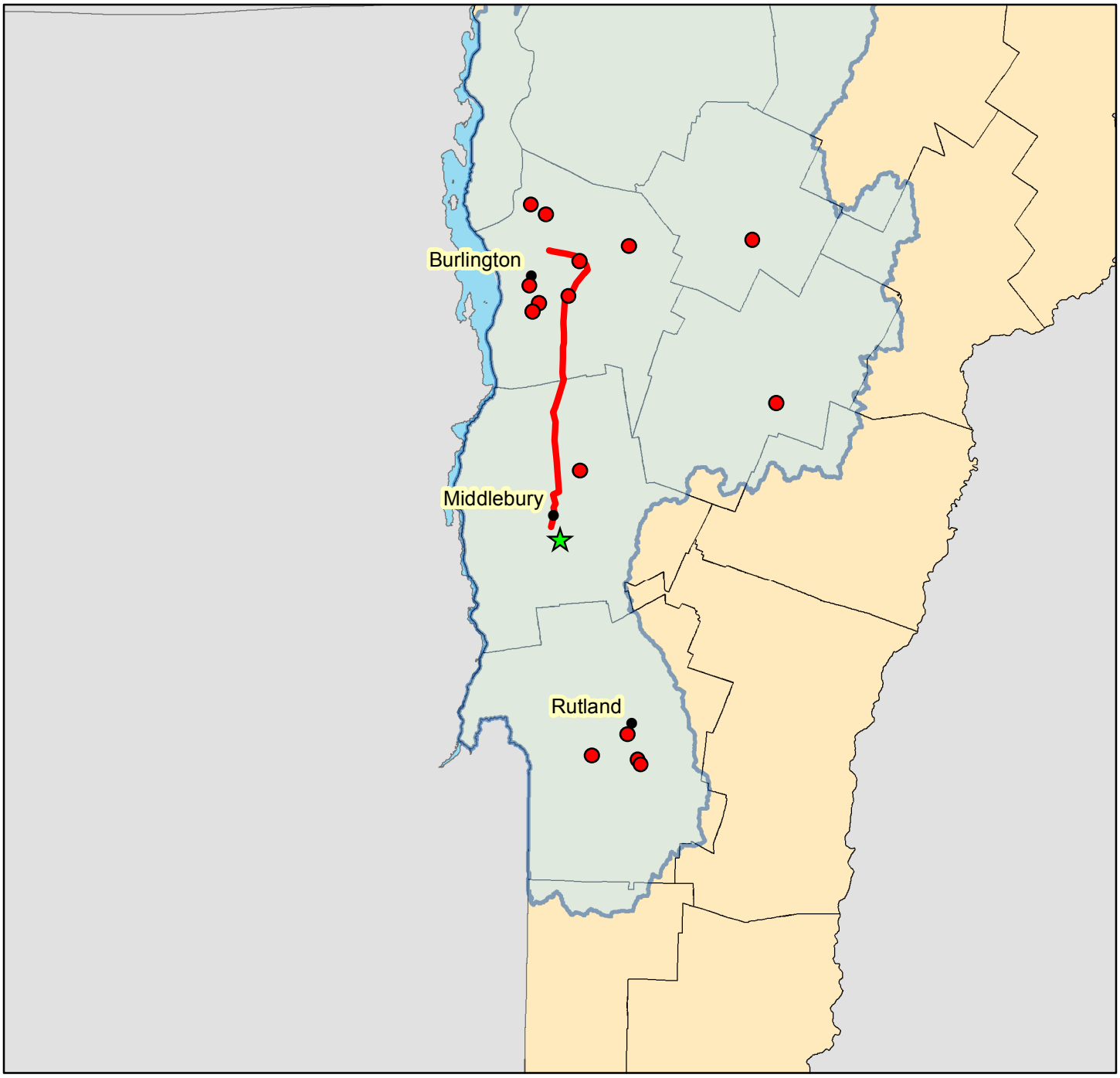


# Fig. 1: DU-VT ILF Program Locus Map

Mitigation Site

Impact Sites

Gas Pipeline*

*Note: individual impacts associated with the Addison Natural Gas Project - Phase 1 (NAE-2012-0123) were not mapped. These impacts occur over 40 miles between Colchester and Middlebury.

0 15 30 60 90 Miles

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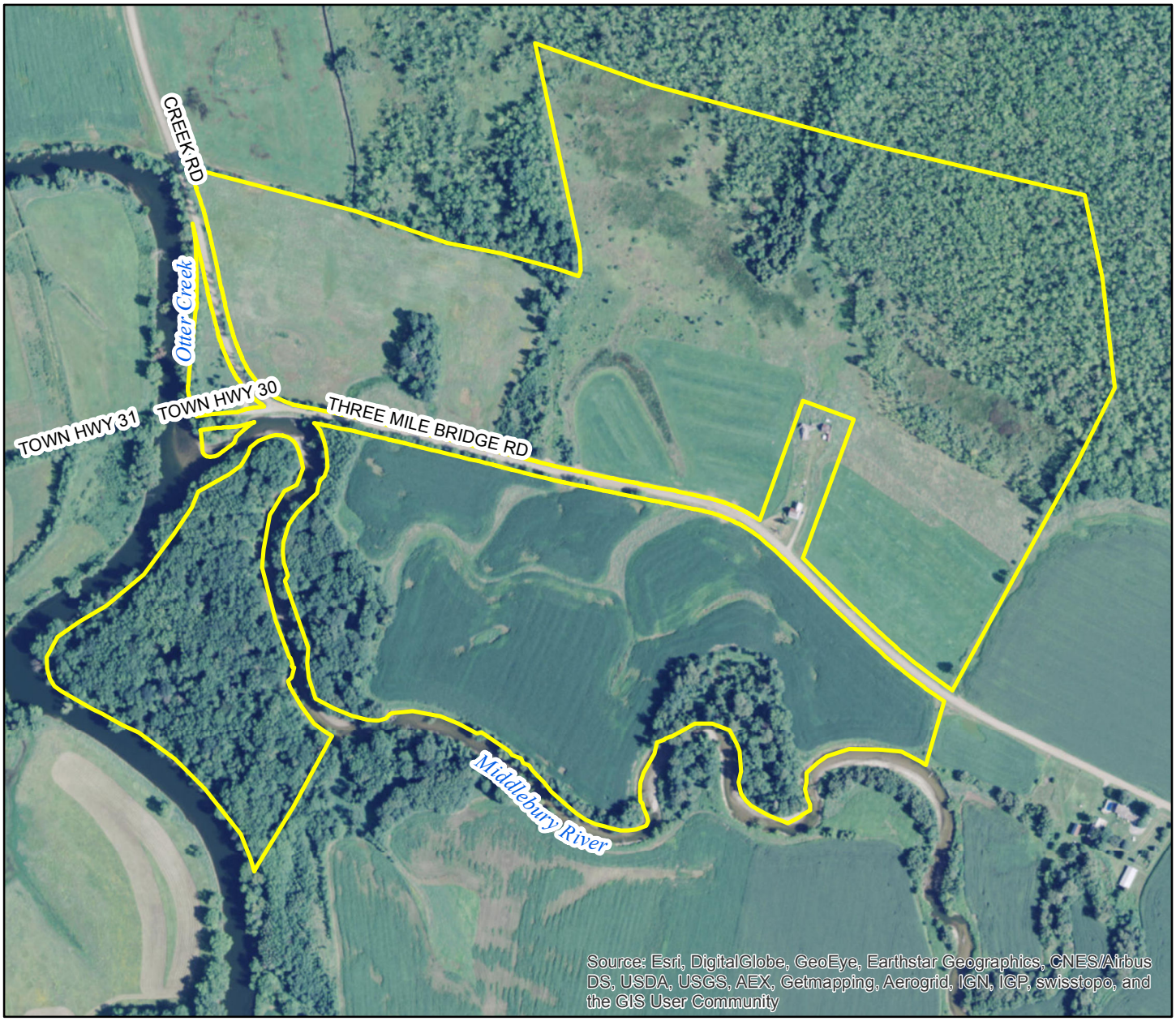
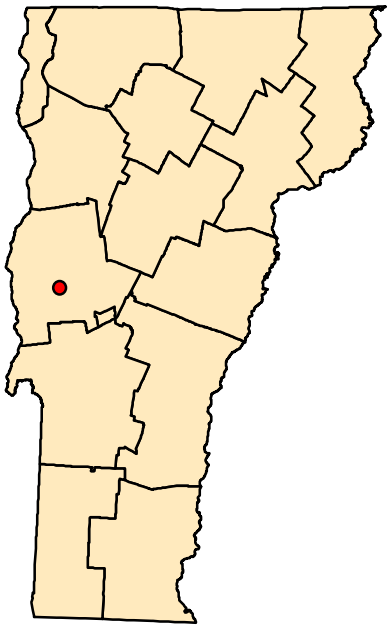
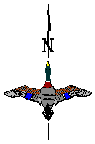


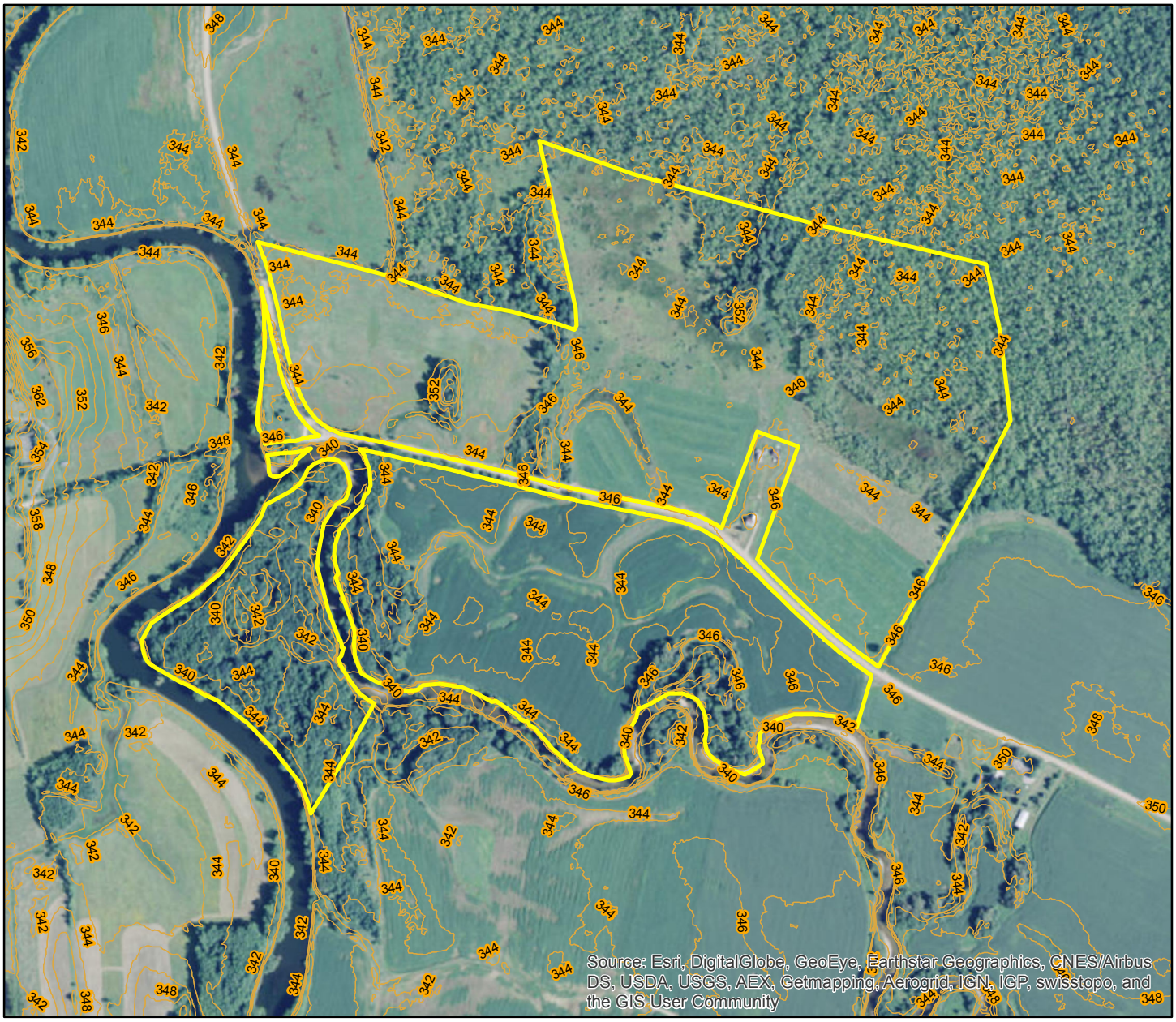
# Fig. 2: DU-VT ILF Program
# 3 Mile Bridge Road
# Aerial

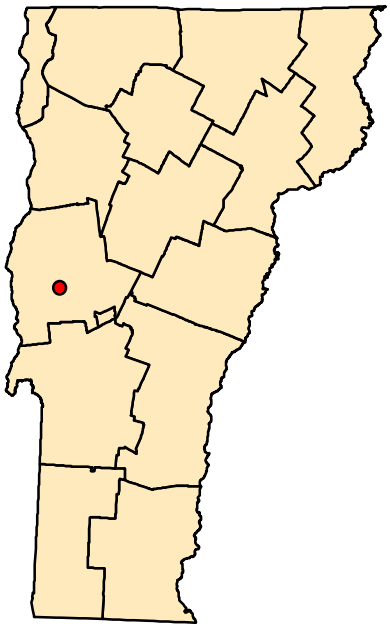
Mitigation Site Boundary (139.7 Acres)




0 445 890 1,780 Feet

DUCKS UNLIMITED



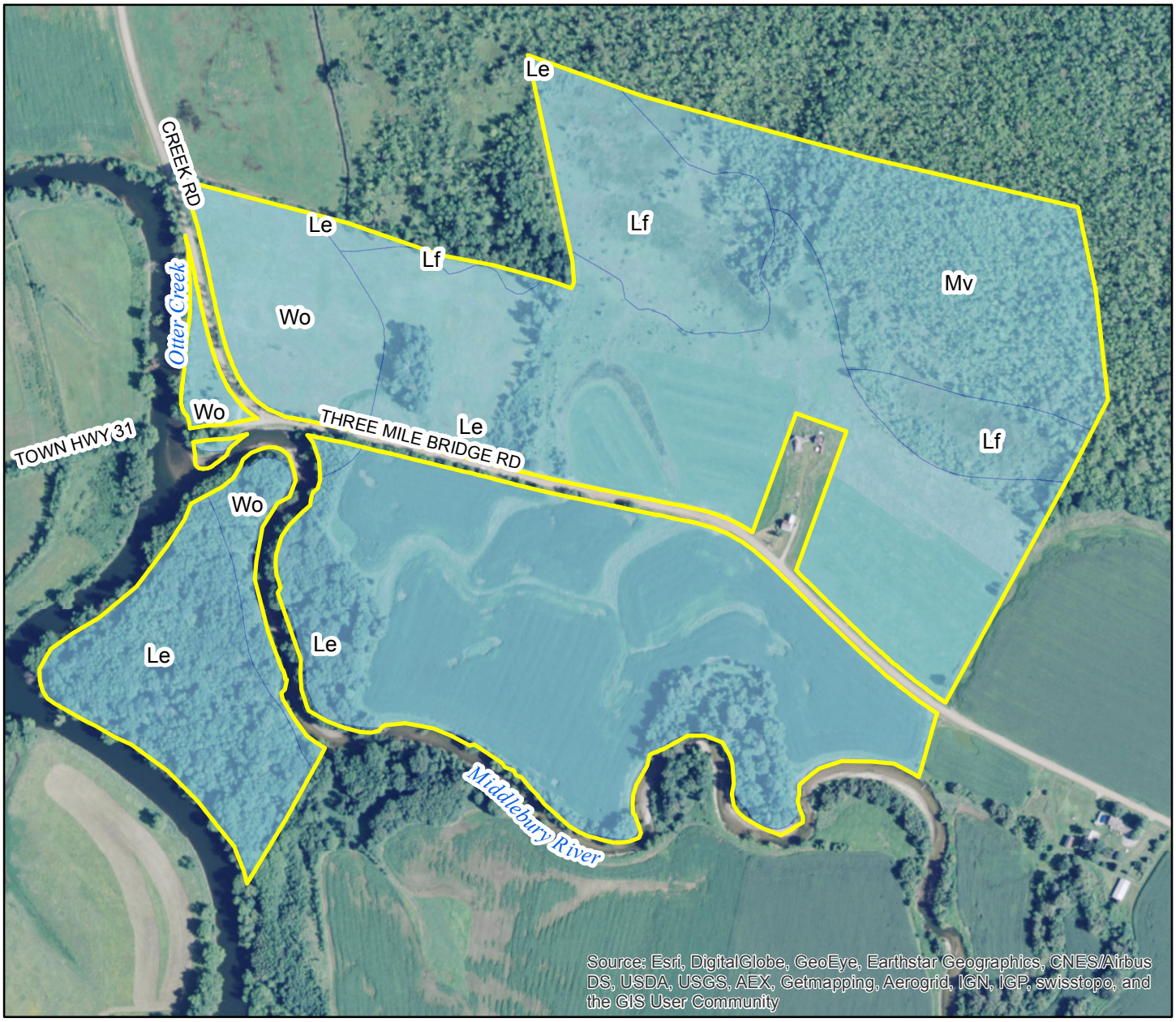
# Fig. 3: DU-VT ILF Program 3 Mile Bridge Road Topography

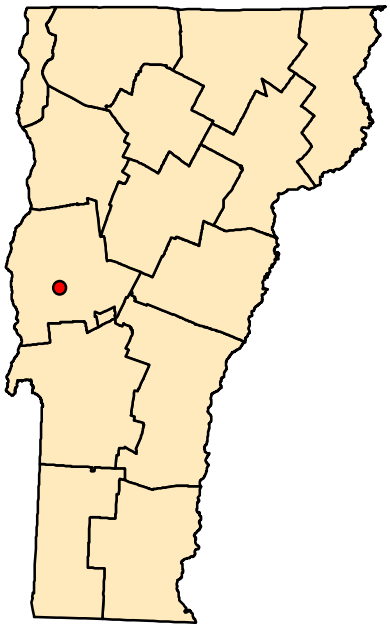
Mitigation Site Boundary (139.7 Acres)

N

0 500 1,000 2,000 Feet

DUCKS UNLIMITED



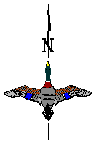



# Fig. 4: DU-VT ILF Program
# 3 Mile Bridge Road
# Hydric Soils

Mitigation Site Boundary (139.74 Acres)

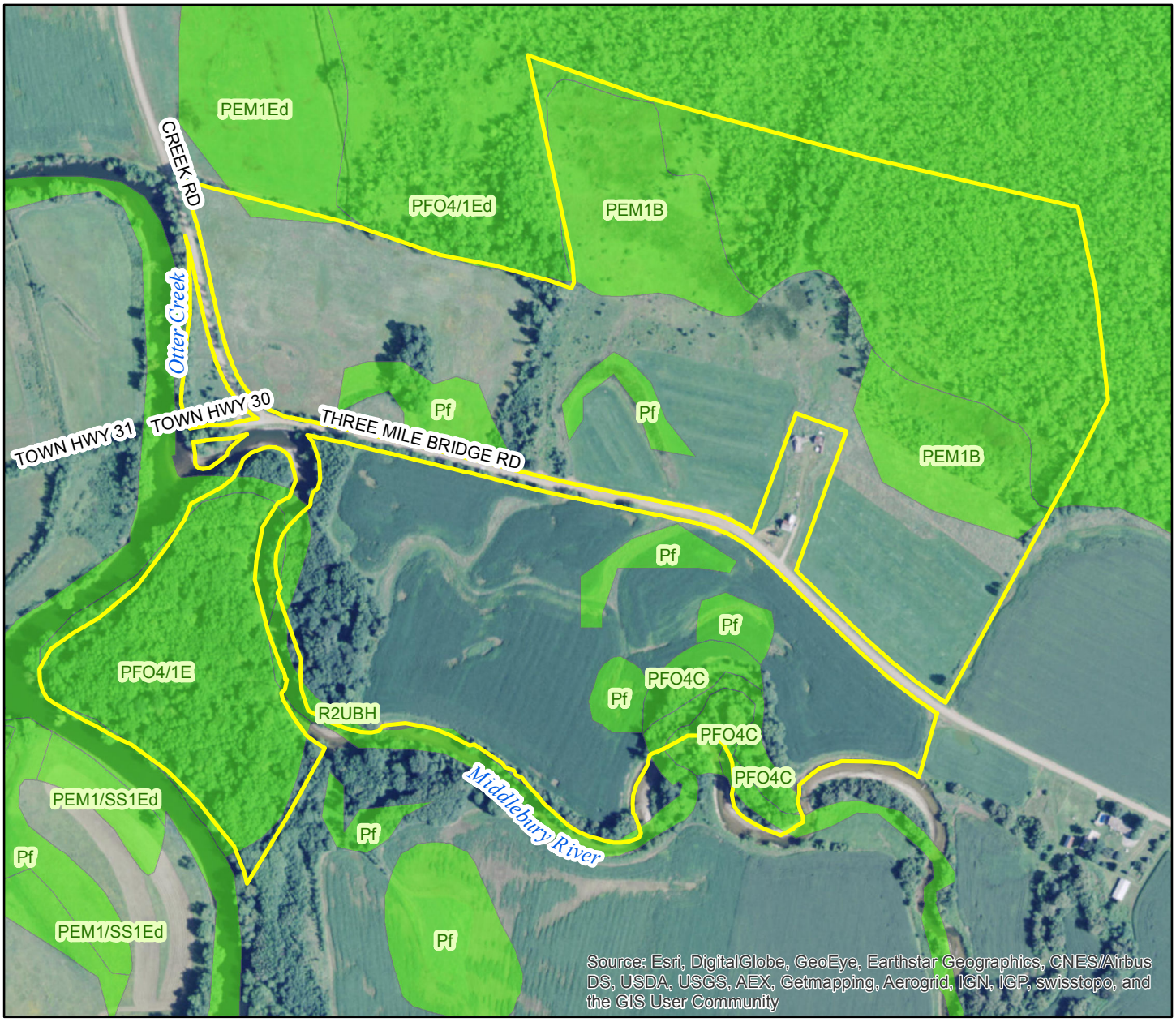
Hydric Soils

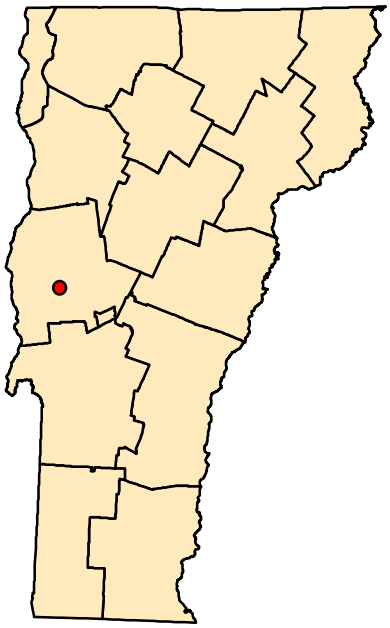
| Map Unit Symbol | Map Unit Name |
|---|---|
| Le | Limerick silt loam |
| Lf | Limerick silt loam, very wet |
| Mv | Muck and Peat |
| Wo | Winooski very fine sandy loam |




0 445 890 1,780 Feet

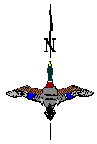
DUCKS UNLIMITED



# Fig. 5: DU-VT ILF Program 3 Mile Bridge Road Wetlands (NWI)

Mitigation Site Boundary (139.74 Acres)




0 445 890 1,780 Feet

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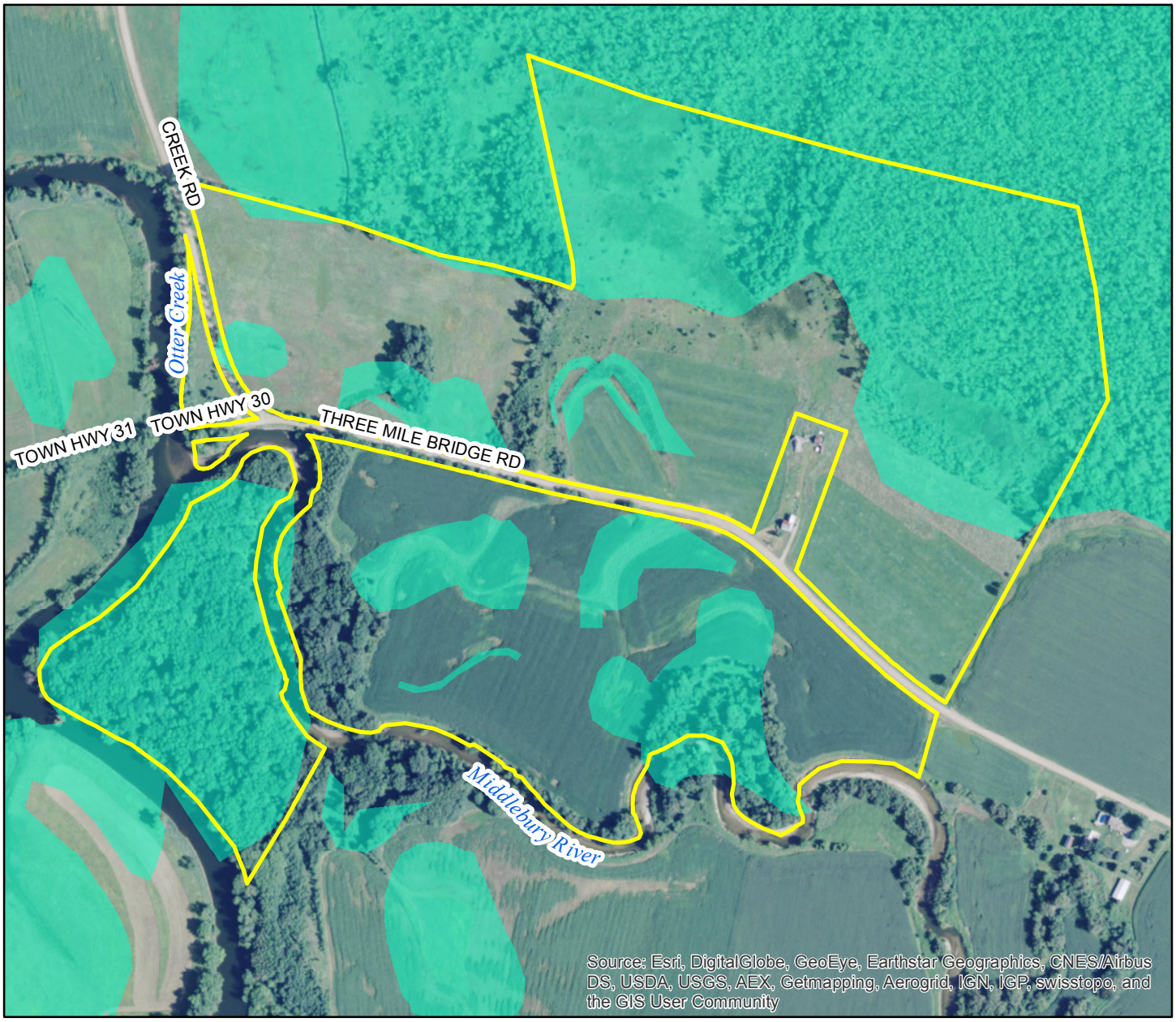
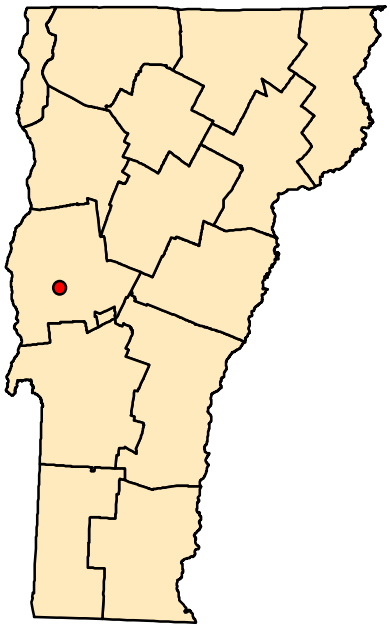
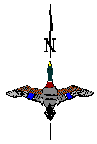


# Fig. 6: DU-VT ILF Program 3 Mile Bridge Road Wetlands (VSWI)

Mitigation Site Boundary (139.74 Acres)




0 445 890 1,780 Feet

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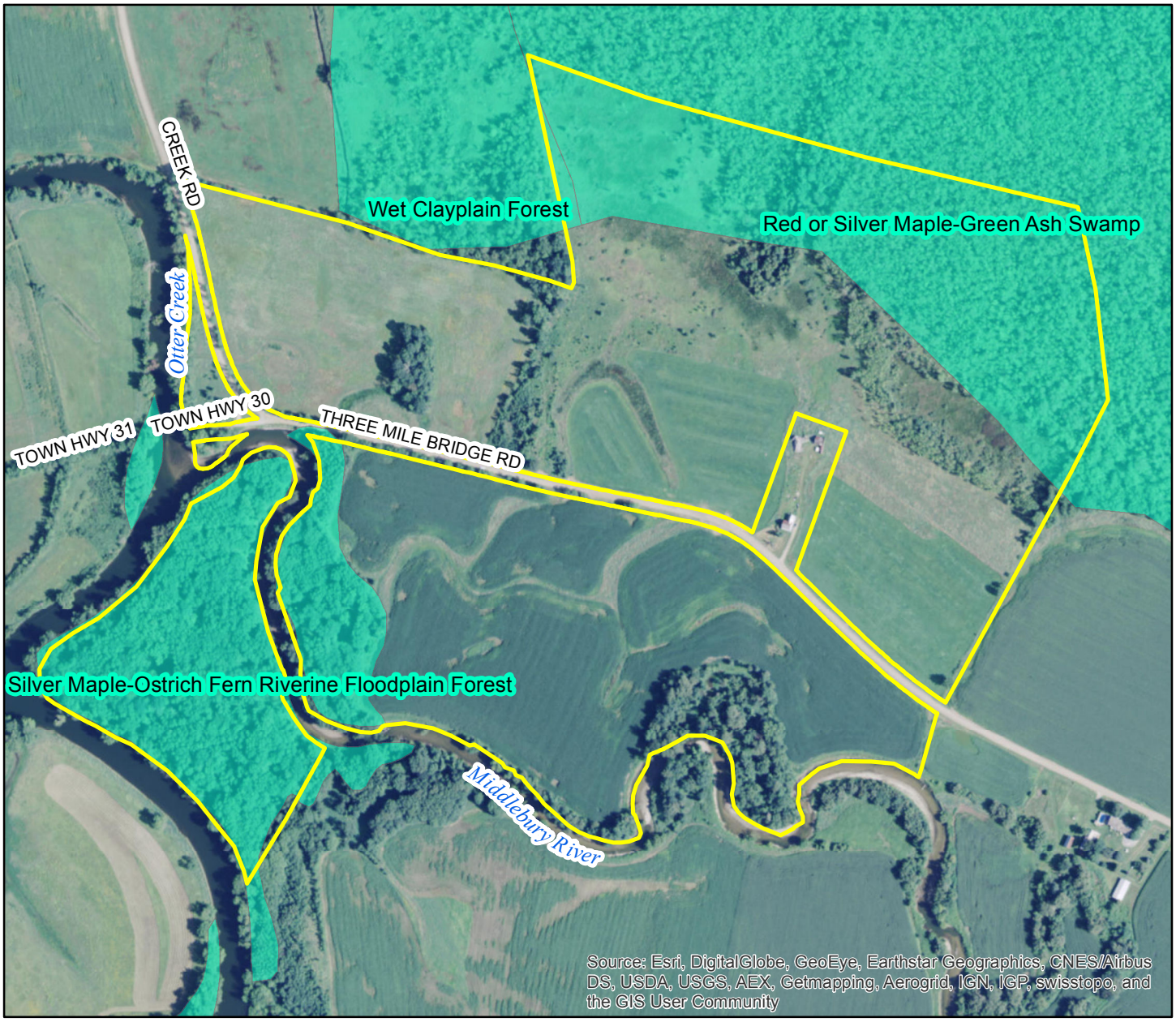
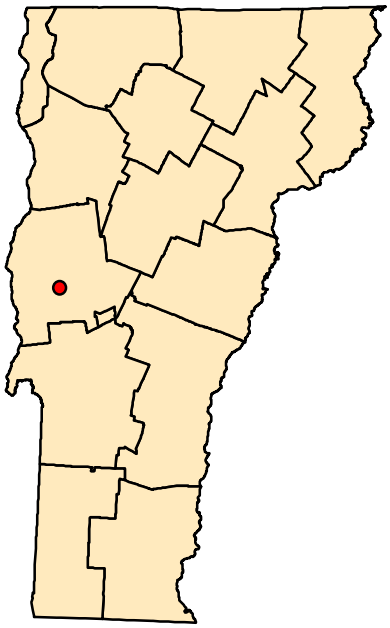
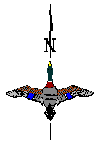


# Fig. 7: DU-VT ILF Program
# 3 Mile Bridge Road
# Significant Natural Communities (VT ANR)

Mitigation Site Boundary (139.74 Acres)

Significant Natural Community




0 445 890 1,780 Feet

DUCKS UNLIMITED

United States Department of Agriculture
Farm Service Agency

Operator:
Owner:

Farm #:1936
Tract #:10409

**Fig. 8: DU-VT ILF Program**
**3 Mile Bridge Rd.**
**Farmed Wetlands**


**Addison County**

**Wetland Determination Identifiers**

- Restricted Use
- Limited Restrictions
- Exempt from Conservation Compliance Provisions

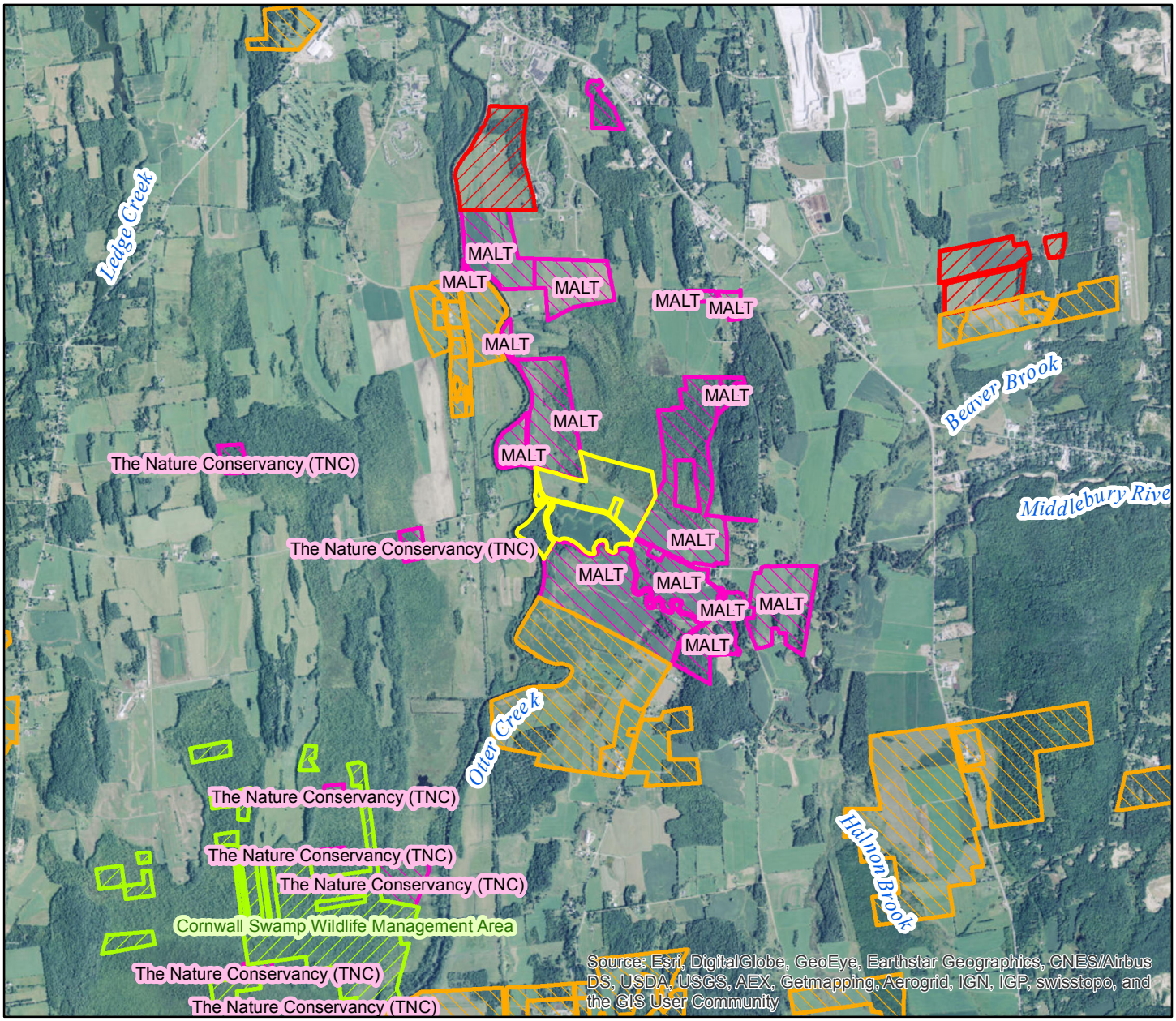
USDA FSA Maps are for FSA Program administration only. This map does not represent a legal survey or reflect actual ownership; rather it depicts the information provided directly from the producer and /or the 2012 ortho rectified imagery for Vermont. The producer accepts the data 'as is' and assumes all risks associated with its use. The USDA Farm Service Agency assumes no responsibility for actual or consequential damage incurred as a result of any user's reliance on this data outside of FSA Programs.

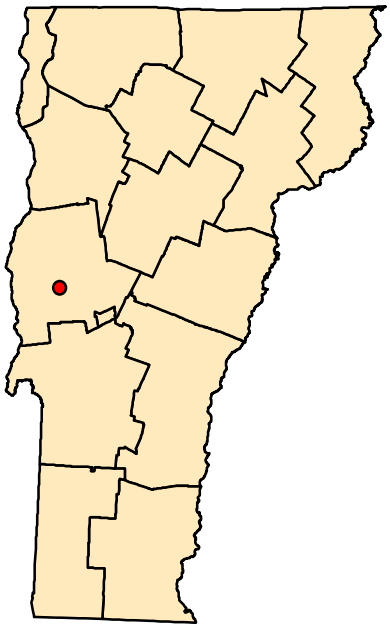
N

Not To Scale

Date: 11/6/2014

Disclaimer: Wetland identifiers do not represent the size, shape or specific determination of the area. Refer to your original determination (CPA -026 and attached maps) for exact wetland boundaries and determinations, or contact NRCS.

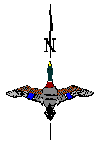


# Fig. 9: DU-VT ILF Program 3 Mile Bridge Road Protected Lands (NCED)

- Mitigation Site Boundary (139.74 Acres)
- Federal Land
- State Land
- Vermont Land Trust
- Other Non-Profit*

*MALT: Middlebury Area Land Trust




0 0.5 1 2 Miles

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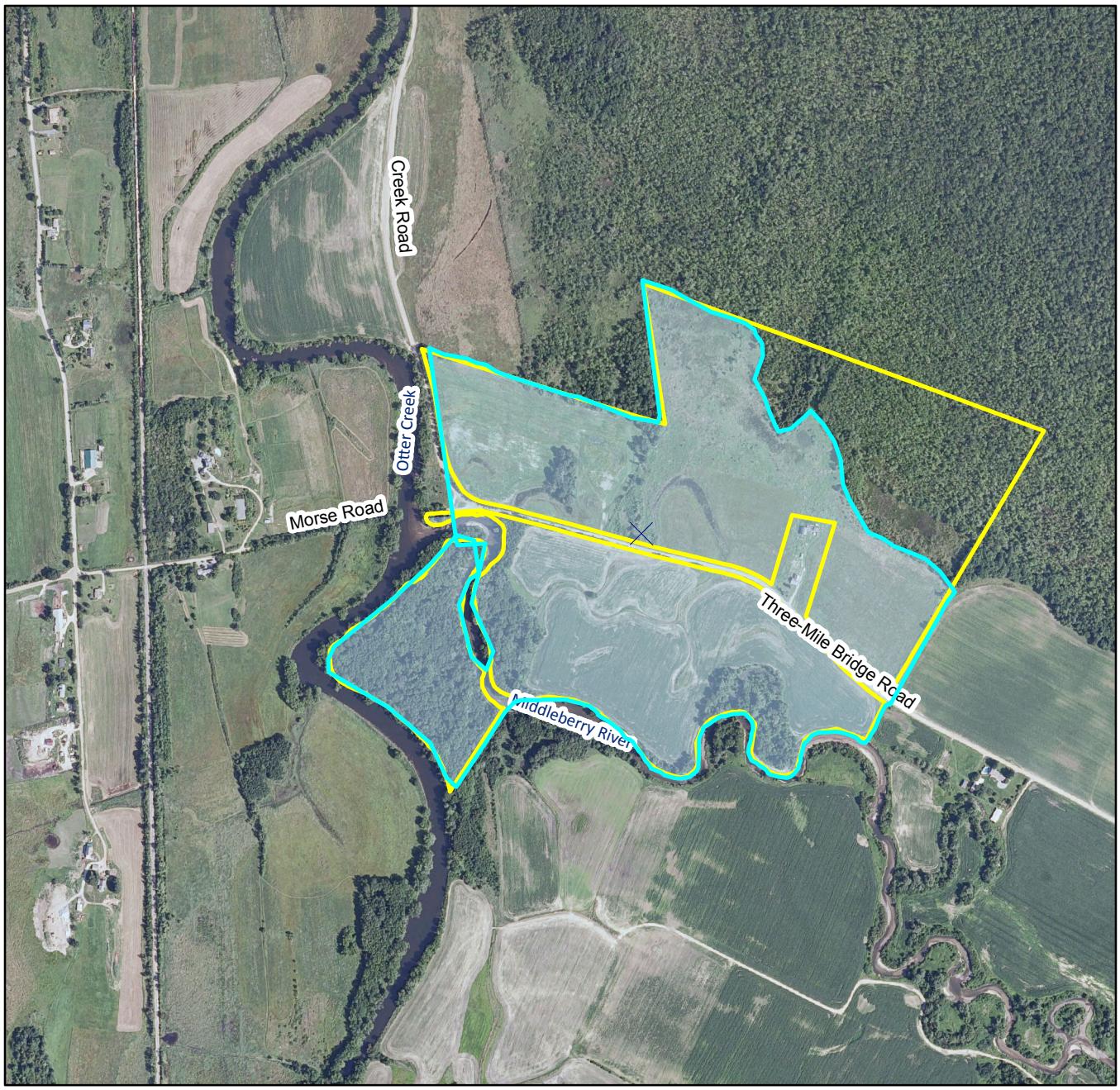
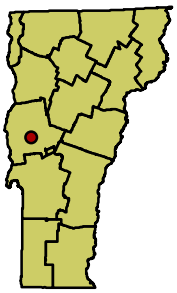
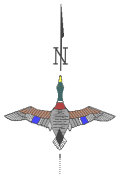



**Fig. 10: DU-VT ILF Program**
**3 Mile Bridge Road**
**Drainage Area**



Mitigation Site Boundary (136 acres)

Drainage Area (122 acres)

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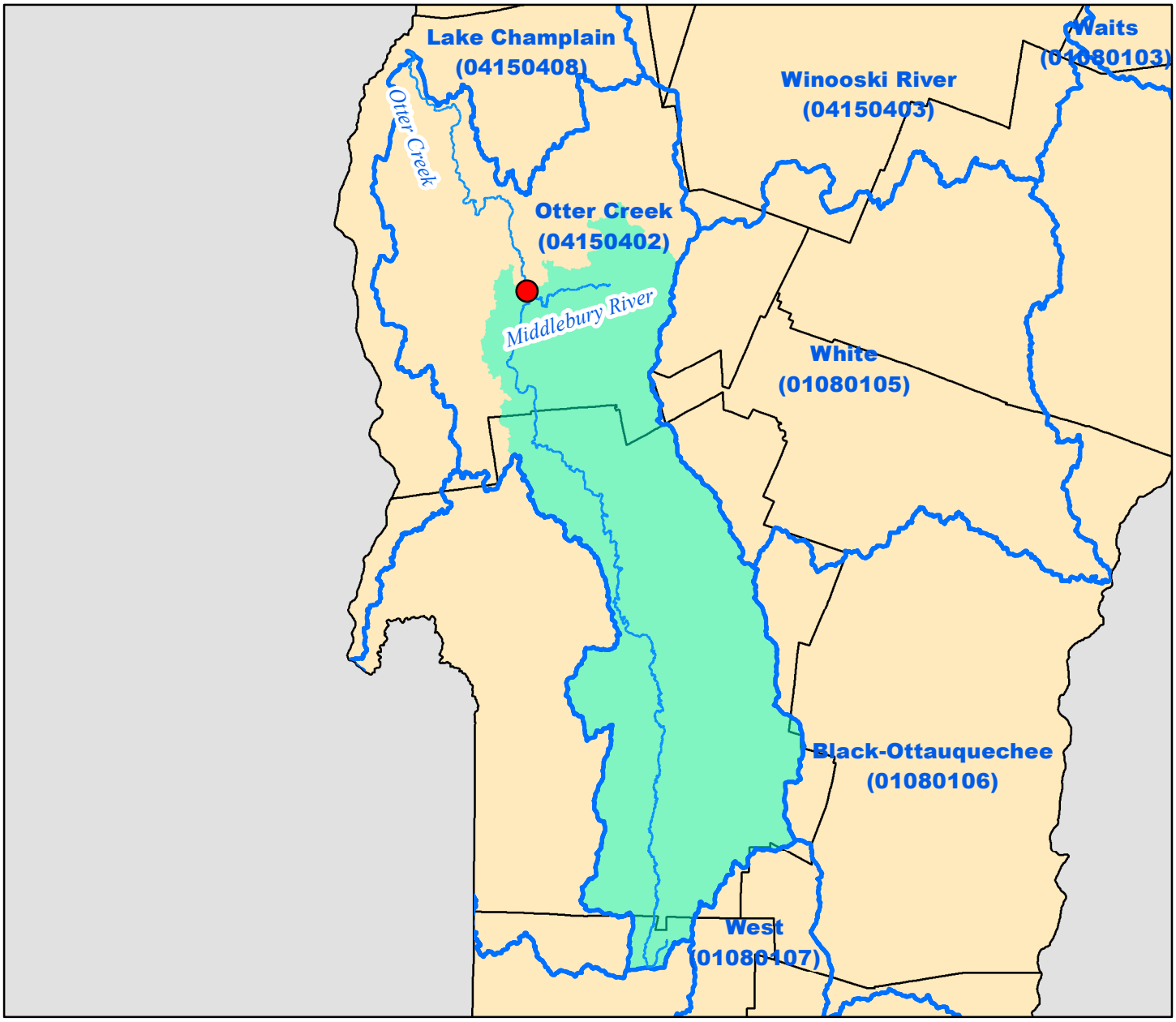
DUCKS UNLIMITED



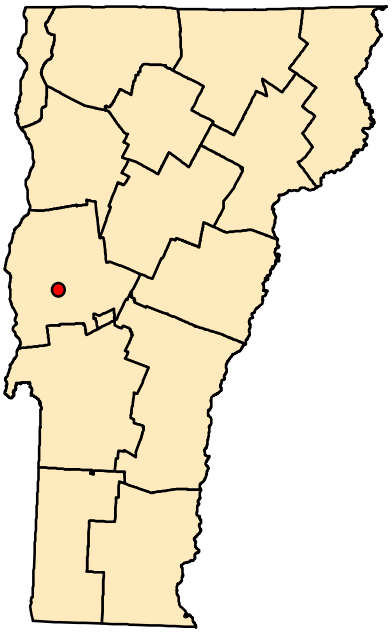



**Fig. 11: DU-VT ILF Program**
**3 Mile Bridge Road Watershed**

Mitigation Site

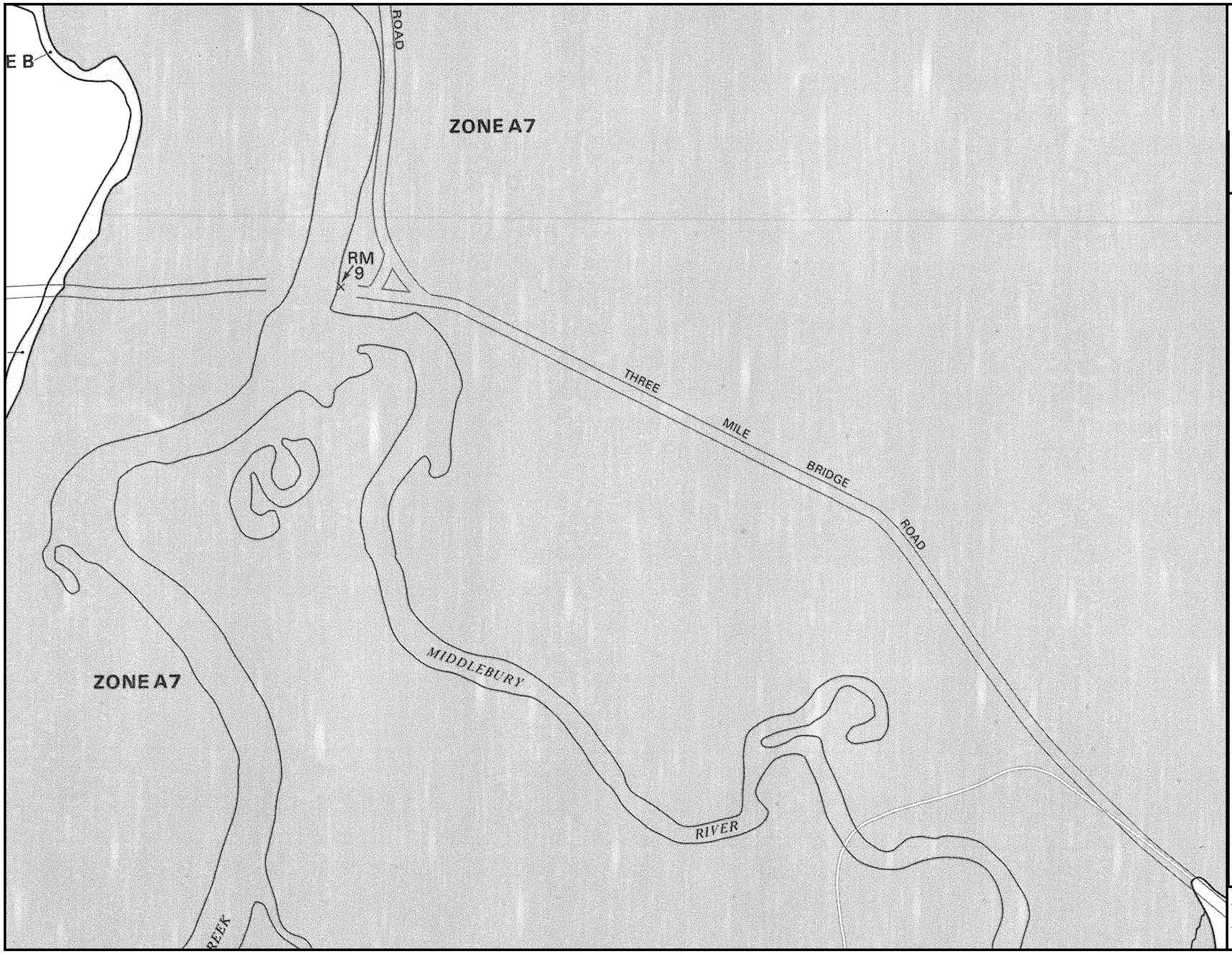
Watershed (HUC 8)

Watershed Upstream of Mitigation Site

N

0 4.5 9 18 27 36 Miles

DUCKS UNLIMITED




APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

# Fig. 12:
# FIRM
## FLOOD INSURANCE RATE MAP

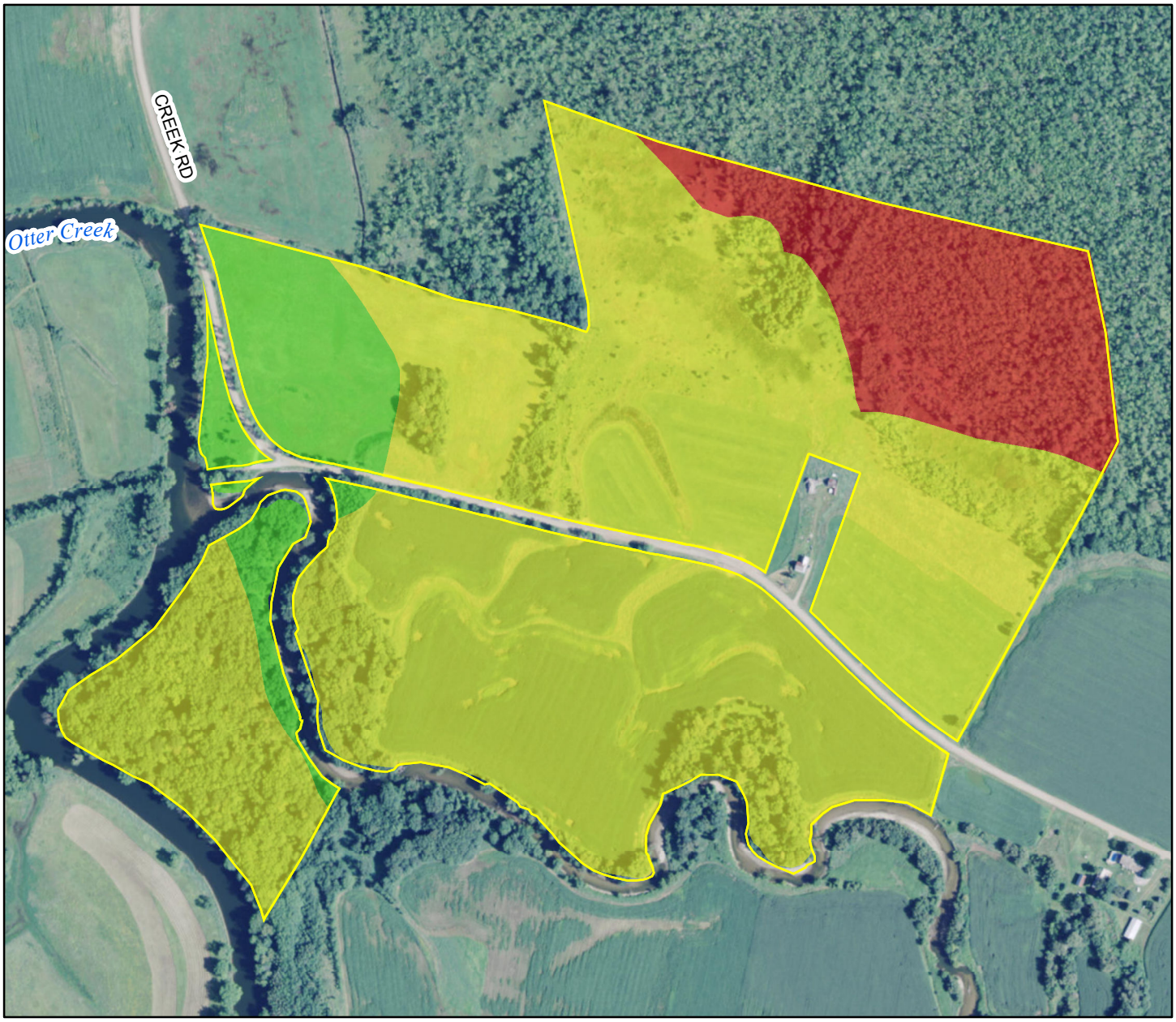
TOWN OF
**MIDDLEBURY,**
**VERMONT**
ADDISON COUNTY

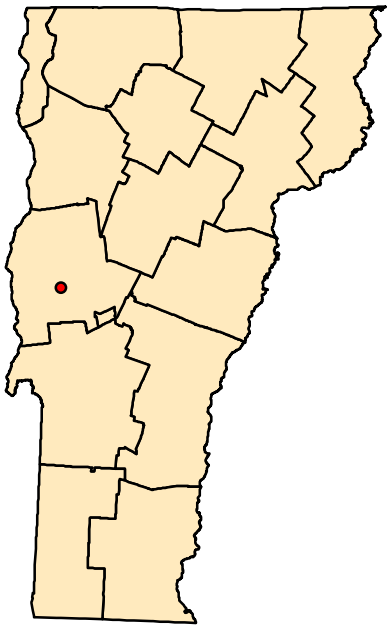
PANEL 13 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

**COMMUNITY-PANEL NUMBER**
500008 0013 A

**EFFECTIVE DATE:**
JANUARY 3, 1985

Federal Emergency Management Agency

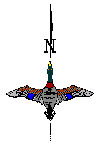


# Fig. 13: DU-VT ILF Program
# 3 Mile Bridge Road
# Hydrologic Soil Groups*

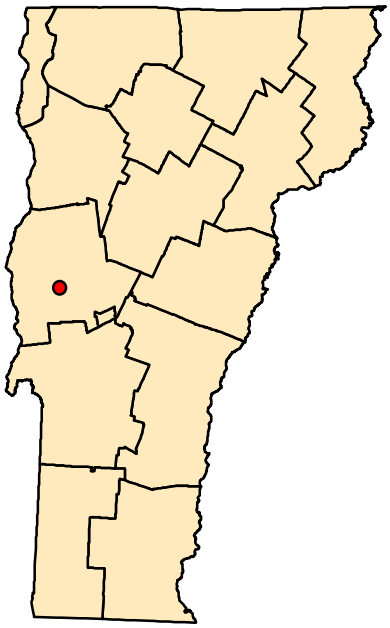
- Mitigation Site Boundary (139.74 Acres)
- A
- A/D
- B
- B/D
- C
- C/D
- D

*A: High infiltration rate when thoroughly wet, B: moderate infiltration rate when thorouthly wet, C: slow infiltration rate when throroughly wet, D: very slow infiltration rate when thoroughly wet. In dual classes (A/D, B/D, C/D) the first letter is for drained areas and the second letter is for undrained areas.



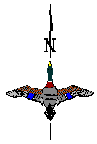

0 450 900 1,800 Feet

DUCKS UNLIMITED

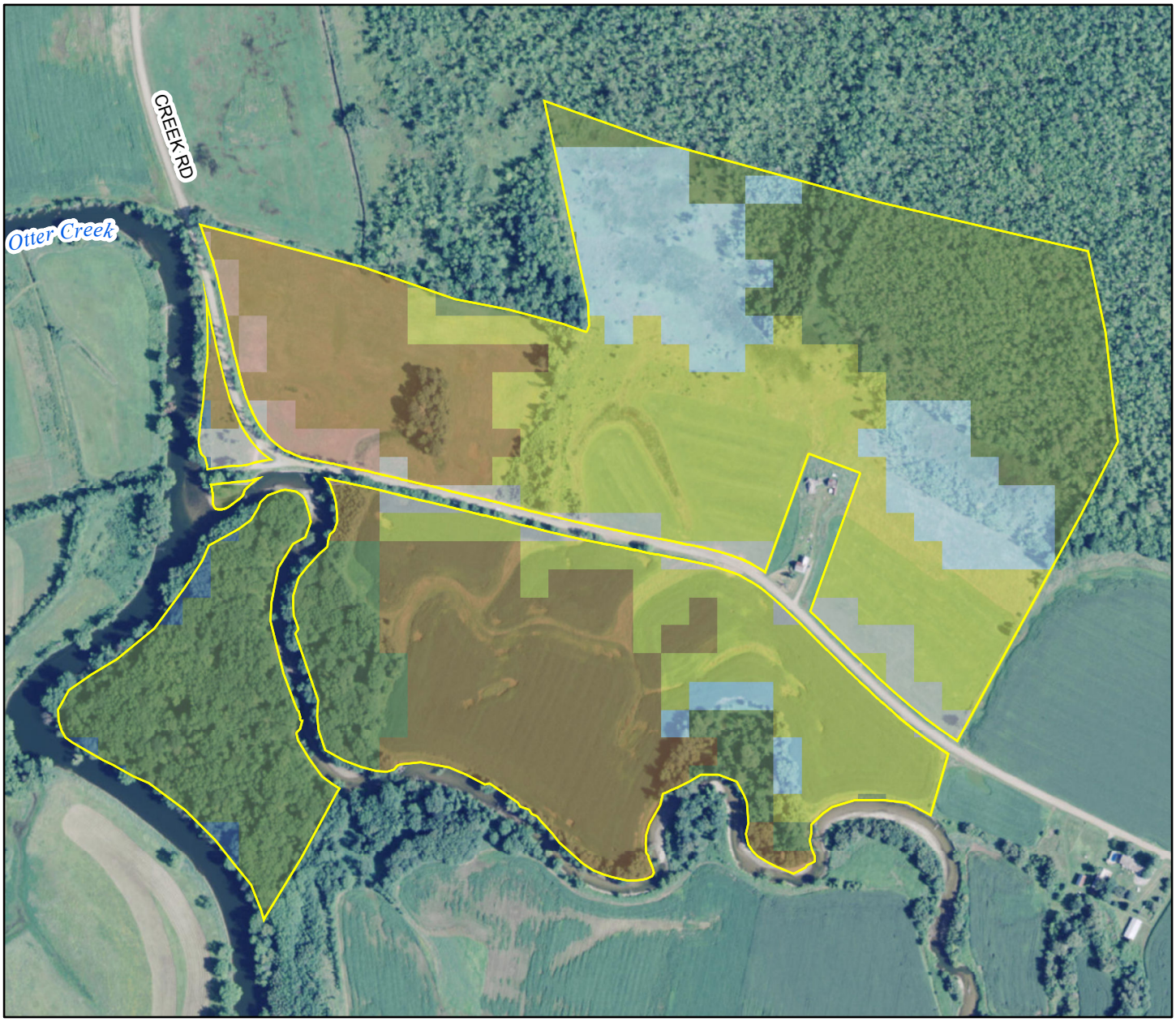
# Fig. 14: DU-VT ILF Program
# 3 Mile Bridge Road
# Depth to Water Table (inches)

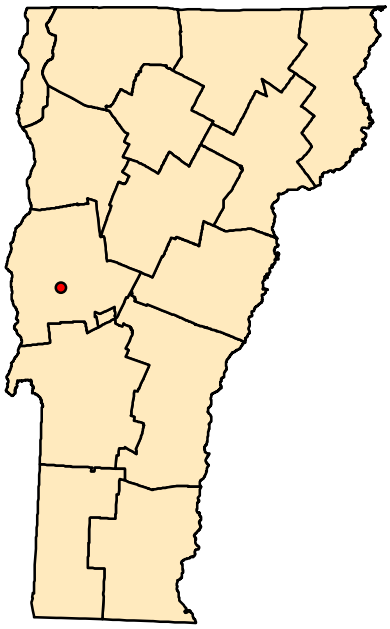
- Mitigation Site Boundary (139.74 Acres)
- 0
- 1 - 6
- 7 - 12
- 13 - 18
- 19 - 24
- > 24




0 450 900 1,800 Feet

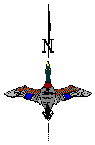
DUCKS UNLIMITED



# Fig. 15: DU-VT ILF Program
# 3 Mile Bridge Road
# Land Cover (NLCD)

- Mitigation Site Boundary (139.74 Acres)
- Woody Wetlands
- Open Water
- Hay/Pasture
- Emergent Herbaceuous Wetlands
- Developed, Open Space
- Developed, Low Intensity
- Cultivated Crops

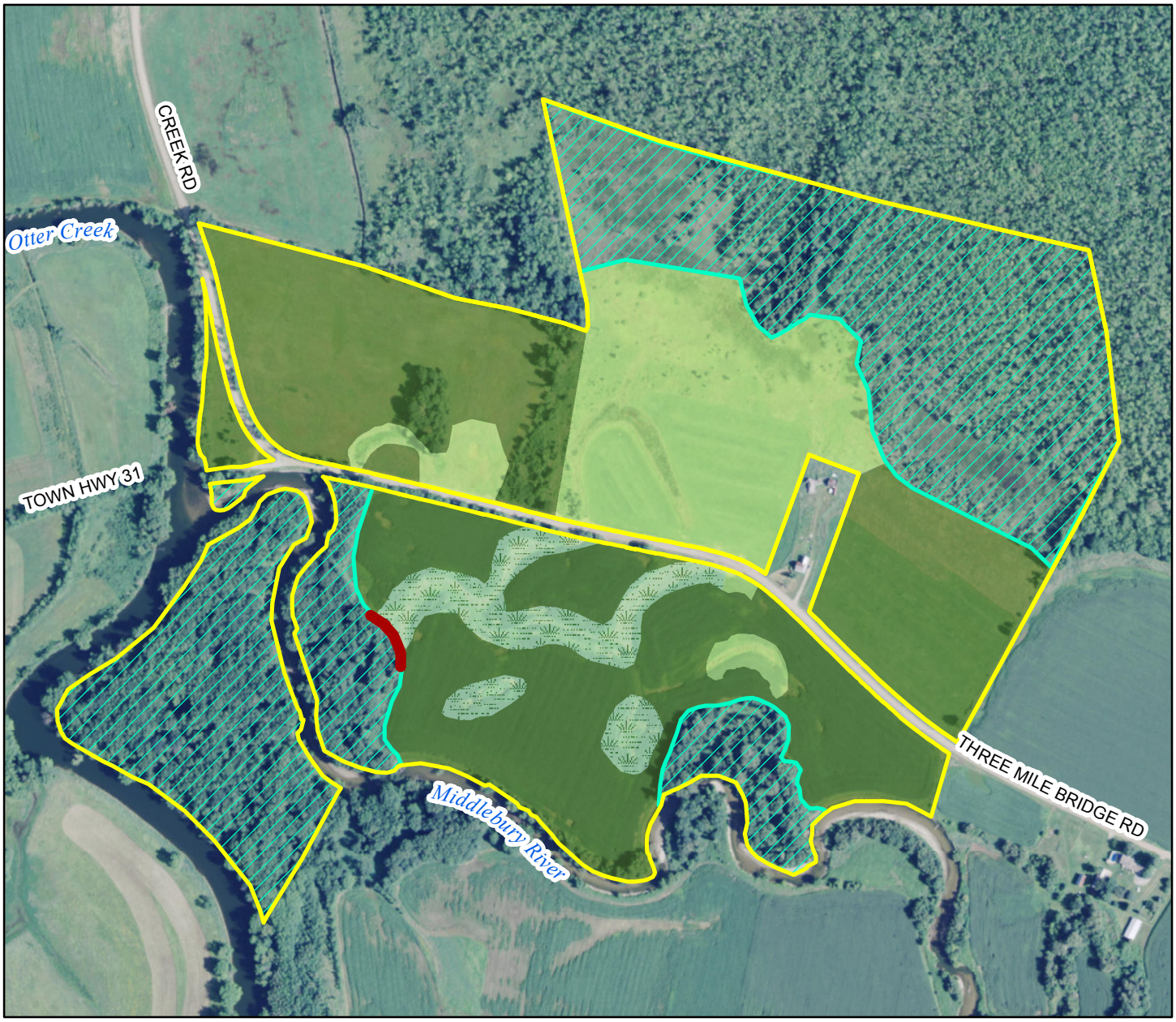


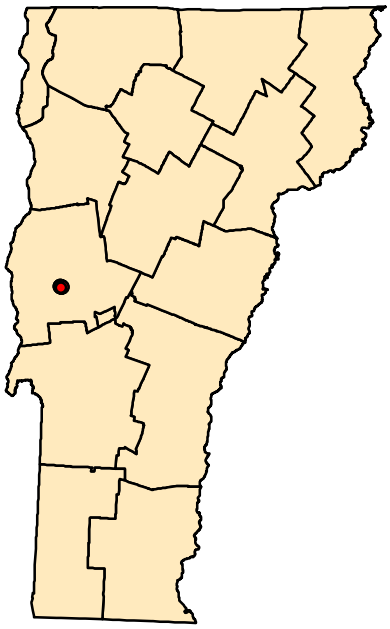

0 450 900 1,800 Feet

DUCKS UNLIMITED

# APPENDIX C:

## Site Concept Plan & Monitoring Plan



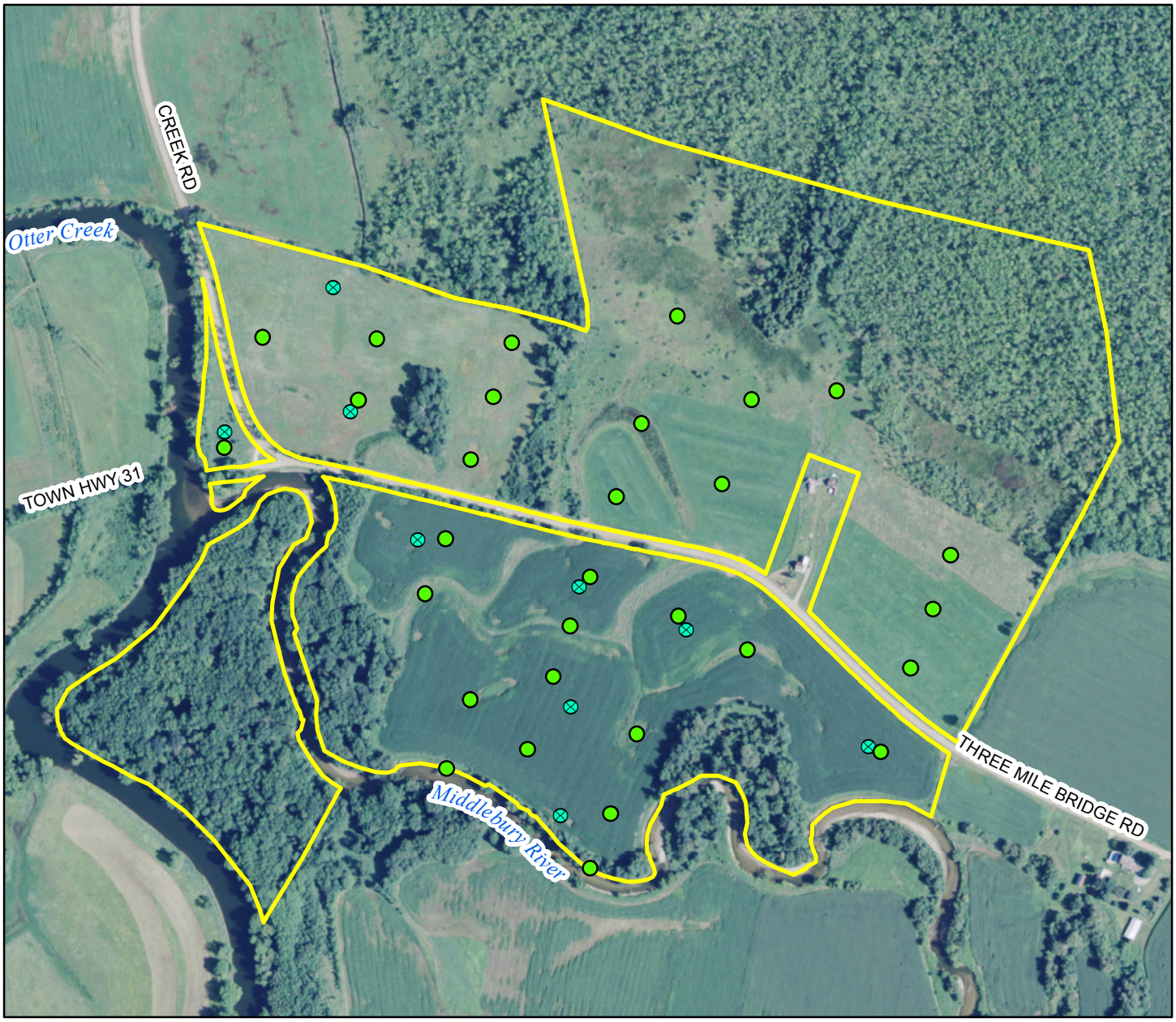
# Fig. 1: DU-VT ILF Program 3 Mile Bridge Road Concept Plan

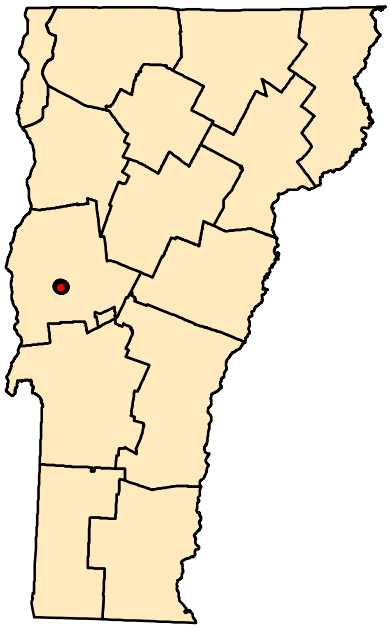
- Mitigation Site Boundary (139.74 Acres)
- PFO Re-Establishment (55.1 Acres)
- PEM Re-Establishment (6.7 Acres)
- PEM Rehabilitation (22.1 Acres)
- PFO Preservation (55.8 Acres)
- Ridge

N

0 450 900 1,800 Feet

DUCKS UNLIMITED



# Fig. 2: DU-VT ILF Program 3 Mile Bridge Road Monitoring Plan

Mitigation Site Boundary (139.74 Acres)

Monitoring Plots

Monitoring Wells

N

0 450 900 1,800 Feet

DUCKS UNLIMITED