

# Little Duarte's Pond Preserve

## Oak Bluffs, Tisbury and West Tisbury Massachusetts

### Management Plan



**May 16, 2017**

*Approved by the Oak Bluffs and Tisbury Town Advisory Board (January 31, 2017)*

*Approved by the Martha's Vineyard Land Bank Commission (February 6, 2017)*

*Approved by Secretary Bowles of the Executive Office of Energy & Environmental Affairs (May 16, 2017)*

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## Executive Summary

Little Duarte's Pond Preserve comprises 6.5 acres of fee-simple land and 64 acres in agricultural preservation restriction. The preserve is named for the small fresh pond of which a portion is included in the preserve. Eighteenth-century deeds describe property boundaries extending into the center or through the pond. Historic deeds refer to the pond as "a little fresh pond" (1699, Dukes County Registry of Deeds (DCRD) 3:273), "a fresh pond" (1729, DCRD C:32; 1870, DCRD 45:363), "the pond" (1776, DCRD 11:211; 1892, DCRD 88:334; 1899, DCRD 99:274), "old house pond" (1869, DCRD 44:540; 1896, DCRD 98:28; 1913; 1933, DCRD 186:395), "Lily Pond" (1869, DCRD 44:540) and "Duart Ice Pond" (1939, DCRD 198:257) for Antone Francise Duart who owned property on the pond and the Duart Farm off Old Pond Road in the 19<sup>th</sup> Century. The pond is labeled on a map created by Banks in the early 1900's of the 18<sup>th</sup> century Nobnocket area as "Roach Pond" or "Duart Pond". The spelling of the pond has changed to Duarte's Pond over the years and later renamed Little Duarte's Pond by the land bank's Oak Bluffs town advisory board; outside of the historic references toward the pond, it will be written as Little Duarte's Pond in this plan.

The land surrounding Little Duarte's Pond was used by native people as a village site for several thousand years (Mullholland et. al. 1999). At the turn of the 18<sup>th</sup> century the land around the pond was sold into European hands by the native chief (DCRD 3:273). The Luce family owned land in the vicinity of the preserve if not the preserve itself for two centuries (1699-1892) through 6 generations of farmers and mariners (DCRD 3:273, Proprietors Book C:32, 3:166, 37:167, 6:112, 6:201, 10:600, 11:83, 10:601, 9:178, 15:20023:201, 39:329, 57:129, 45:363, 48:137, 88:334). However, it was not until 1784 maps that open farm land is depicted on or near the preserve. During the 19<sup>th</sup> century the preserve was incorporated into the Red Hill Farm owned by the Smith family (DCRD 127:574, 186:395), following which it was incorporated into the Duart Farm owned by Antone Francise Duart (DCRD 58:408). The land surrounding the preserve has seen, over several hundred years, thousands of turkeys, strawberry fields, grapes, hydroponic tomatoes, community crops and an assortment of livestock.

The preserve is situated north of the four-town bound and is located in the towns of Oak Bluffs, Tisbury and West Tisbury, Massachusetts south of Head of the Pond Road (also known as Stoney Hill Road) and north of Checama Path and Little Pond Road.

Though small in acreage this preserve's appeal is in its especially diverse array of habitats. The property comprises 1.1 acres of fresh water pond, 0.38 to  $\pm$  0.74 acres of coastal plain pond shore (depending on ground water level), 1.0 acres of red maple swamp, 3.28 acres of mixed-oak woodland on the hill south of the pond, 4.36 acres of heathland/old field and 60 acres of agricultural fields and woods (Thimble Farm and Willow Farm).

One Massachusetts-listed plant species, two watch-listed plant species – thyme-leaved pinweed (*Lechea minor*) and post oak (*Quercus stelatta*), and three Massachusetts-listed moth species are known to occur on the property. Additionally, the preserve is designated

by the Natural Heritage and Endangered Species Program as belonging to priority habitat of a rare bird.

The Little Duarte's Pond Preserve is connected by trail easements and ancient ways to other conservation land, viz., the land bank's Wapatequa Woods Reservation, Bare Hill Preserve and Tisbury Meadow Preserve; the town of West Tisbury's Margaret K Littlefield Greenlands; and the Manuel F. Correllus State Forest.

The Martha's Vineyard land bank commission purchased interests, over the course of 13 years, in a total of 70.5 acres for the ultimate sum of \$2,733,750. A management plan was written in 2007 for the initial 4 acres purchased from the Mathiesen family in 2001. This updated management plan proposes moderate public use that includes an additional 0.11 miles of trails for hiking, horseback-riding and non-motorized bicycling; bird watching and other similar passive recreational uses; and creation of a viewing platform and split-rail fence to provide views of the pond and to discourage erosion and the creation of trails over the bank of the pond onto the shoreline. Removal of invasive species and restoration of heath/old field are additional goals of the management plan.

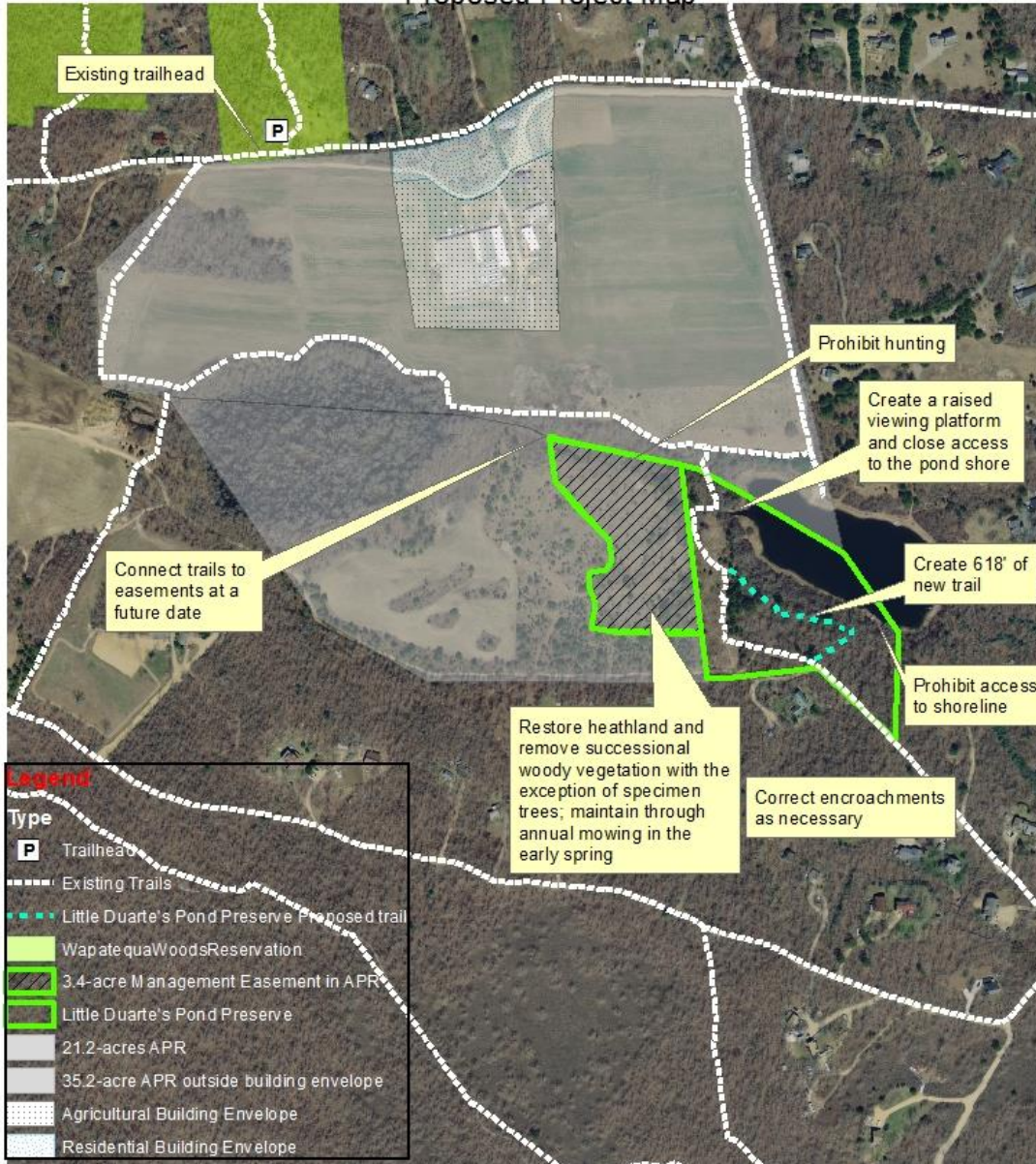
All planning goals, objectives and strategies are outlined in detail in the final section of this management plan. To be implemented, this plan must be presented at a public hearing and approved by the land bank's Oak Bluffs and Tisbury town advisory boards, the Martha's Vineyard land bank commission and the secretary of the Executive Office of Environmental Affairs (EOEA). The West Tisbury town advisory board need not approve the plan, as no fee-simple preserve land is located in that town. Additionally, a Massachusetts endangered species act (MESA) review will be filed with the Natural Heritage and Endangered Species Program (MA-NHESP) for activity proposed in the estimated and priority habitat for rare species and with the Oak Bluffs Conservation Commission for activity proposed in wetland and resource areas.

#### About the Authors

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**Map 1: Proposed Project Map**  
**Little Duarte's Pond Preserve**  
**Tisbury/Oak Bluffs/West Tisbury, MA**

Little Duarte's Pond Preserve  
 Tisbury/Oak Bluffs/West Tisbury  
 6.5 Acres (fee simple) 64 Acres (APR)  
 Proposed Project Map

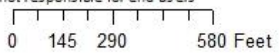


**Legend**

Type

- P Trailhead
- Existing Trails
- Little Duarte's Pond Preserve Proposed trail
- Wapatequa Woods Reservation
- 3.4-acre Management Easement in APR
- Little Duarte's Pond Preserve
- 21.2-acres APR
- 35.2-acre APR outside building envelope
- Agricultural Building Envelope
- Residential Building Envelope

Sources : Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs :USGS TopographicImages -1978, Martha's Vineyard Commission (MVC): parcel data- town assessors and MVC - 2011, Coordinate Ref: State Plane, Mass Mainland, Feet,NAD 83 Notes: Map prepared by the Martha's Vineyard land Bank for planning purposes only. The land bank is not responsible for end-users interpretation of the map.  
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## I. Natural Resource Inventory

### A. Physical Characteristics

#### 1. Locus

Little Duarte's Pond Preserve is located at roughly 41' 27' 14.76"N latitude and 70' 33' 45" W longitude. The property consists of 6.5 acres of fee-simple land located off Little Pond Road and is in both Oak Bluffs and Tisbury. The preserve is depicted on Oak Bluffs tax map-parcel no. 52-2, 52-3 and Tisbury tax map-parcel no. 46A-1. The preserve also includes two areas with agricultural preservation restrictions (APR) over them. One APR area is 43 acres and is depicted on Oak Bluffs tax map-parcel 39-3, West Tisbury tax map-parcel 9-3.2 and Tisbury tax map-parcel 45-1 and a portion of 45-1.1, 1.2 and 1.3. The second APR area is 21.1 acres and is depicted on Tisbury tax-parcel map 46-1. The **Locus Map**, **Topography Map** (1973 USGS topographic map 1:24,000), **Aerial Photography Map** of the Preserve (2014) and **Wetlands Map** follow in Appendix A.

#### 2. Survey Maps

Larger copies of all surveys are on file at the land bank office and are available for inspection by appointment. Pertinent deeds and agreements to the preserve are recorded at the Dukes County Registry of Deeds and listed in Appendix B, Table 1.

#### 3. Soils and Geology

The **General Soils Map** (Appendix C) depicts general classes of soils across Martha's Vineyard. Soils found in Little Duarte's Pond Preserve consist of "Outwash atop Martha's Vineyard Moraine" (Soil Conservation Service (SCS) 1986). The Outwash from Martha's Vineyard Moraine consists mainly of sand and gravel (SCS 1986). The layered deposits are a result of two glacial advances. The moraine of the late Wisconsinan period formed first as the Buzzards Bay lobe advanced and the outwash plain formed later by meltwater from the Cape Cod Bay lobe as the glacier began to retreat (Oldale 1992).

Little Duarte's Pond Preserve and land under APR consists of four soil series: Carver loamy coarse sand (CeA, CeC), Haven very fine sandy loam (HaA), Tisbury very fine sandy loam (TaA) and Riverhead sandy loam (RvA, RvB, RvC). The majority of the preserve is in Riverhead sandy loam with a moderate slope of 3-8%. This soil is well suited to farming and woodland productivity (SCS 1986).

#### 4. Topography

Little Duarte's Pond Preserve is situated on land that follows a small ridge-line at 60 feet above sea level along the southern border of the preserve and descends towards the northeast into Little Duarte's Pond which is at 18 feet above sea level. The preserve is located on the northern edge of the flat "Great Plain" that is situated in the center of the island.



The bulk of the preserve and surrounding APR land is relatively flat, with the exception of the raised rows from the vineyard that cross the open portion of the heath/old field from north to south. The overgrown portion of the heath/old field was disturbed at one time, leaving pits and mounds of soil. The general topography of the property is illustrated in the USGS Vineyard Haven quadrangle labeled Locus Map in Appendix A.

## 5. Hydrology

The wetland resource areas of the Little Duarte's Pond Preserve include a quarter of the 4-acre pond itself, 750' of shoreline, and a portion (0.63 acres) of the red maple swamp centered on a 975' intermittent stream that flows east from the 6-acre red-maple swamp located in the APR along the northern border of the preserve and into the pond. The pond is a kettle pond in a topographic depression that has no natural outflow. Both Island Grown Initiative (Thimble Farm) and Vineyard Meadow LLC (Willow Farm) have access to the pond via irrigation mains to pump water from the pond. According to the former Chacama Vineyard owner Catherine Mathiesen, water has not been pumped from the pond for at least 24 years (Mathiesen C. 2007). The irrigation main from Thimble Farm is silted in and does not appear to be active at this time.

Water inputs to the pond include overland flow from the intermittent stream, precipitation and groundwater. Although the streambed from the intermittent stream along the northern border of the preserve does not empty directly into the pond, overland flow is evident. During low groundwater years the pond drains, leaving a thick surface of cracked mud; the vegetated shoreline during this period extends into the pond by approximately 10 to 15 feet. The most recent intense drought with impacts on Little Duarte's Pond and other ponds in the area was in 2002. Although this is not a regular phenomenon, it is not the first time that Little Duarte's Pond has dried; according to Catherine Mathiesen (2007), Craig Kingsbury grew cabbage in the pond bottom when it dried some previous 30 years earlier.

Little Duarte's Pond during an average water year comprises approximately 4 acres with an estimated volume of 5.2 million gallons of water, compared to a low water year where the pond may be 3.3 acres with 4.3 million gallons of water. The pond is relatively shallow. In March 2007, the pond was on average four feet deep with a range from nearly two feet to nearly seven feet. Pond size and volume fluctuate with seasonal and annual water levels and, based on high-water marks on surrounding vegetation and banks, may change by  $\pm 1.6$  million gallons. Pond volume is calculated from surface area in acres multiplied by average depth in feet from 11 random locations along one northwest-to-southeast transect where one acre-foot equals 325,850 gallons (Norland and Stockdale 1999).

The northern half of the preserve is within the 500-year flood zone with a 2% chance of annual flooding as defined by FEMA (Wetland Map, Appendix A). The entirety of the preserve is located within the Lagoon Pond watershed. The Lagoon

Pond watershed constitutes approximately 4,465 acres. All of the preserve except the northwest corner of the Thimble Farm APR is located within the Upper Lagoon Pond sub-watershed that comprises 812 acres (Wetlands Map, Appendix A).

The Lagoon Pond is a coastal pond on the north side of Martha's Vineyard that is open to the ocean. The Upper Lagoon Pond is separated from the main pond by a causeway. Groundwater springs contribute freshwater to the Upper Lagoon Pond by way of inlets at the head of the pond. The freshwater springs were historically a source of commercially bottled water and currently feed a town well.

## 6. Ecological Processes

Ecological processes are described by the USGS (2012) as "dynamic biological interactions that occur among and between biotic and abiotic components of the biosphere." Within the Little Duarte's Pond Preserve six major ecological processes occur: disturbance, structural complexity, hydrological patterns, nutrient cycling, biotic interactions and population dynamics.

### Disturbance –

The natural disturbance regime for northeastern deciduous woodlands typically includes fire, wind and insect damage. Fire is a less frequent means of natural disturbance, as fire suppression is an active part of forest management. Wind remains an active force of nature, although not as strongly on woodlands located further inland. Recent insect damage in various forms has initiated an alteration in the woodlands of various areas of Martha's Vineyard. However, the woodland on the preserve has minimal damage. How often, long and intensely an ecosystem is disturbed are factors that are considered in management actions in order to best protect the dynamic nature of natural communities (EPA 1999).

Kettle ponds are fragile wetland systems that are highly susceptible to natural and anthropogenic disturbances. The primary threats to kettle ponds and their shorelines are excessive drawdown from wells; repeated trampling over the same area; off-road vehicles; the addition of sand for beach construction; heavy boat use; and nutrient loading from improperly maintained septic systems and from fertilizer runoff (Department of Environmental Management, Rhode Island Natural Heritage Program, date unknown).

Cleared agricultural fields are an act of anthropogenic disturbance that halts succession for as long as they are being managed. Once farming ceases on a previously cleared piece of land, such as the old vineyard on the preserve, succession begins anew. The next habitat is dependent on what state the land was in when farming stopped. Opportunistic heathland species that are tolerant of thin, low-nutrient soils may succeed a farm field left fallow if prior farming practices were conducted on land with poor soil types.

### Structural complexity –

The preserve has a complex structure of plant species ranging from low-growing shoreline plants to taller woodland trees that allows the preserve to accommodate more species by providing a more diverse array of habitats for species to survive in. The woodland has the greatest structural complexity on the preserve and includes ground-cover vegetation such as dewberry and mosses; low-growing shrubs and herbs such as low-bush blueberry and goldenrods; taller shrubs such as highbush blueberry, hazelnut and arrowwood; and various oak tree species including snags that, when leaning or fallen, add to the structural complexity of the woodland. The coastal plain pond shore has modest spatial heterogeneity and structural diversity due to the presence of grasses, rushes and sedges, flowering herbs and carnivorous plants with variable seasonal flowering patterns. Removing invasive plants; allowing dead trees to exist; creating uneven patterns of mowing; and cutting of vegetation all contribute to spatial complexity (EPA 1999).

### Hydrological patterns –

It is important to consider the impact of the vegetation communities on the water cycle in an ecosystem. Vegetation layers help catch water and aid in soil infiltration whereas larger-scale cleared woodlands and various heterogeneous agricultural practices can result in increased overland flow, groundwater contamination, channel incision and fragmentation of wetland habitats (EPA 1999). Maintaining wooded and dense shrublands around wetlands, especially kettle ponds, helps buffer and filter water before it reaches a wetland. The Little Duarte's Pond has a 0.81-acre shrub swamp that surrounds it and it is wooded on the south side where the topography is greatest and most susceptible to overland flow. Vegetation slows down water, allowing sediments to drop out prior to entering a pond. This helps maintain pond depth which in turn results in cooler water temperatures that slow the growth of organisms. Phosphorus is most often bound to soil particles. As those phosphorus-laden soil particles move slowly over land and through vegetation the phosphorus-soil particles drop out of water before reaching a pond or stream, thus essentially filtering the phosphorus out of the water prior to contact with a water body.

### Nutrient cycling –

Important elements such as nitrogen, phosphorus and carbon naturally travel through ecosystems and when combined with water and sunlight determine the productivity of an ecosystem (EPA 1999). Activities that increase (use of fertilizers) or decrease (erosion) nutrients can alter the nutrient cycle and change the ecological integrity of the ecosystem. Protecting soils from erosion and keeping snags and downed logs helps maintain the nutrient richness in the ecosystem.

Additionally, human-enhancing and -depleting nutrient practices each lead to increased colonization by opportunistic non-native plants that have different nutrient cycling characteristics, which in turn alters the nutrient cycling of the invaded ecosystem (EPA 1999).

All ponds begin as pure, unproductive, water bodies. Over time organic matter accumulates on the pond bottom, bottom dwellers increase respiration, water turbidity increases and oxygen levels decrease. The rate at which ponds undergo eutrophication depends on many variables such as underlying soils, surrounding land use and human activities.

Nutrients such as nitrate, phosphorus and ammonium play a major role in eutrophication by increasing productivity. They enter ponds either naturally or as a result of human activities. Nitrogen is primarily added to ponds via rain and groundwater and phosphorus travels to ponds attached to soil particles and primarily enters via shoreline soil erosion (Horne and Goldman 1994). Phosphorus is a primary limiting factor of algae growth and a reduction of phosphorus in freshwater ponds can reduce eutrophication. A natural buffering system exists for phosphorus and other nutrients in ponds. Increasing sediments in ponds can have a negative effect on this balance by increasing soil-bound nutrients. These soil-bound nutrients are released at a much greater concentration than can be removed from the water column (Horne and Goldman 1994). Ponds surrounded by vegetation are less susceptible to sedimentation through erosion and are limited in phosphorus (Horne and Goldman 1994). In addition to rainwater and sedimentation ponds experience "cultural eutrophication" when nutrient concentrations in ponds increase as a result from human activities such as septic systems (Stiling 1996).

#### Biotic interactions –

The distribution and abundance of a particular species can be heavily dependent on other organisms for growth and reproduction. Basic interactions include interspecific and intraspecific competition, predation, parasitism, and symbiosis (EPA 1999). Disturbances such as introduction of exotic species; over-collection of a species; and disease not only affect the "target species" but have a trickle-down effect that depends on the nature and strength of interactions that the "target species" had within its community (EPA 1999). Pollinators and exotic plants play both positive and negative roles, respectively, in biotic interactions of an ecosystem.

Spraying pesticides and introducing exotic pollinators can impact other non-target pollinators sometimes, resulting in a major decrease in the diversity of plants that are reproductively dependent on native pollinators.

The introduction of exotic species disrupts the interactive patterns of native plants and animals, potentially influencing a trophic cascade that weakens the native ecosystem functions. Ecosystem niches of one species can be replaced by another, more opportunistic and aggressive species. Plants such as Japanese honeysuckle (*Lonicera japonica*), spotted knapweed (*Centaurea stoebe*) and multiflora rose (*Rosa multiflora*) are exotic species residing within the property boundaries of the Little Duarte's Pond Preserve.

Protecting species with high community values such as oaks; removing invasive species before they become dominant; protecting the pond from introduction of exotic invasive plants or wildlife; and implementing elastic management strategies

that are modified in response to monitoring are all strategies that can reduce effects on biotic interactions.

#### Population dynamics –

The loss of a species can have many unseen effects on a community, depending on the interactions that the species had in its environment. Species dispersion, recruitment, fertility and mortality compose a species' population dynamics and, along with genetic diversity, play an important role in the success of a species (EPA 1999). Small populations isolated by reduced habitat or habitat fragmentation are vulnerable to extinction, locally and globally. Other species are more widespread but occur in few numbers and are vulnerable due to low genetic diversity. Ecosystems are not static and species require genetic diversity in order to adapt to their ever-changing world or risk extinction. This concept is particularly important when management actions must consider rare habitats, plants and animal species.

During high water periods in a kettle pond such as Little Duarte's Pond plants that cannot grow underwater wait in seed banks or as vegetative basal leaves until water levels recede so they may grow and flower. Some species' seed banks contain as many as 6,500 seeds per meter squared (Keddy and Reznicek 1982). Prohibiting use of the pond shore will protect the seed bank of future plants so they might grow during low-water years. Maintaining a mosaic of woodlands and cleared fields will protect the habitat for rare moth and bird species that utilize the habitats within the boundaries of the preserve.

## **B. Biological Characteristics**

### 1. Vegetation

Little Duarte's Pond Preserve comprises six general habitat communities: red maple swamp, mixed-oak woodland, heathland/old field, pond, coastal plain pond shore and agricultural fields and pastures. They are described in detail and shown on the **Ecological Communities Maps** in Appendix D. The dominant vegetation community on the preserve (not including the APR land) is the heathland/old field.

A total of 189 plant species is known to occur on Little Duarte's Pond Preserve. The shoreline contributes the greatest to the floristic richness of plants occurring on the property and was represented by 51% of the total number of plant species known to occur on the property (Appendix D, Table 2). Species richness is the number of species present in a community (Begon et al. 1990).

One Massachusetts-listed plant species and two watch-listed plant species – thyme-leaved pinweed and post oak – were observed in the pond shore of the preserve. The heath/old field supports the majority of invasive plants on the property including japanese honeysuckle, spotted knapweed, oriental bittersweet (*Celastrus orbiculatus*) and multiflora rose.

Additional data regarding methods used for sampling and a table of the flora of the Little Duarte's Pond Preserve are included in Appendix D.

## 2. Wildlife Habitat

Formal avian and invertebrate black-light traps were the primary tools used for analysis of rare wildlife habitat. Additional direct observations of wildlife occurrences and signs throughout the year contribute to the understanding of the habitat value of the preserve. Three commonwealth-listed wildlife species were recorded during wildlife surveys. A complete list of wildlife species known to occur on the property is included as Appendix E.

### *a. Invertebrates*

**Lepidoptera species:** A total of 200 moth species representing 11 Macro families was identified from nocturnal black-light traps set in the mixed-oak woodland and heathland during the summer of 2013 (Appendix E, Table 4). Mixed-oak woodland is a draw to various upland moth species as it provides forage, breeding habitat and cover. Both the woodland and heathland provide habitat for the threatened moth species on the preserve. However, the heathland has a greater diversity of overall moth species (151 species) than the mixed-oak woodland (121 species).

**Odonate Species:** The shoreline and pond provide nesting and foraging habitat for dragonflies and damselflies. Fourteen Odonate species are known to occur on the property (Appendix E, Table 3). A general Odonata survey of the shoreline and pond was conducted during the summer of 2002, 2005, 2006 and 2013. Six dragonflies and eight damselflies were identified. The amount of vegetated wetland influences the diversity of Odonata species observed. The larvae of Odonata species have an advantage during times when fish, who prey on them, are not present in the pond. An increase in species diversity and density would be expected during these times.

**Other Invertebrate Species:** Other Lepidoptera species observed on the property in the heathland include two common butterfly species, mourning cloak and cabbage white. Field crickets and grasshoppers were observed in the heath/old field. Biting insects such as mosquitoes, deer flies and ticks are common to the property during the spring and summer months. More detailed information regarding invertebrates on the property is included in Appendix E.

### *b. Birds*

Avian 5-minute point count surveys were conducted on Little Duarte's Pond Preserve during spring and fall migration and the summer breeding season. A breeding owl survey was conducted in March 2002 and July 2013 using a Johnny Stewart Bird Wildlife Caller. A total of 43 avian species is known to occur on the preserve (Appendix F, Tables 5-8).

*c. Amphibian and Reptiles*

The open water of the pond provides breeding and forage habitat for frogs and forage and hibernating habitat for turtles. Land bank staff conducted one amphibian calling survey following methods described by Scott and Woodward (1994) to survey breeding frog species in the pond, shoreline and red maple swamp in 2006. Spring peepers were audible in the pond and green frogs and bull frogs were visible in the littoral zone of the pond. Eastern painted turtles also were observed swimming and sunning in the pond during the summer.

Informal surveys for reptiles revealed two snakes – the eastern garter snake and smooth green snake – in the grassy shoreline during the summer of 2006.

*d. Mammals*

Four common mammal species or signs thereof were observed on the Little Duarte's Pond Preserve (Appendix E, Table 3). Evidence of two domestic species – the dog (*Canis lupus*) and horse (*Equus ferus*) – were observed in the heath/old field and shoreline of the preserve. Evidence of white-tailed deer (*Odocoileus virginianus*), river otter (*Lontra Canadensis*) and grey squirrels (*Sciurus carolinensis*) were observed on the property in the upland, shoreline and pond habitat.

*e. Fish*

Little Duarte's Pond provides habitat to an assortment of freshwater fish including large-mouth bass, pickerel, yellow perch and occasionally brown bullheads (Tomkins 2016).

*f. Rare and Endangered Species*

The Massachusetts natural heritage and endangered species program (MA NHESP) designates that the preserve is located within priority habitat of rare wildlife (MA-NHESP GIS Map 2008). Details about the various species are located in Appendix G.

## **C. Cultural Characteristics**

### 1. Land History

#### Pre-European Settlement

Prior to European settlement of Martha's Vineyard the island of Noe-pe was inhabited by the Algonquian Indians of the Wampanoag tribe and presided over by sachems or sagamores (Silverman 2005).

Archaeological evidence for the surrounding area of the preserve suggests heavy use by Wampanoags during the Late Archaic, Woodland and Contact periods on level areas around water (Mullholland et. al, 1999). The loosely constructed wigwams of the Wampanoag suggest a nomadic life style with movement based



on the hunting/gathering/fishing system with seasonal to semi-sedintary villages (Mulholland et.al. 1999). Archaeological reconnaissance surveys of the area indicate soils are more heavily disturbed near Little Duarte's Pond. A village site is recorded on the north and south sides of the swamp and stream that drain into Little Duarte's Pond (Mullholland et. al. 1999).

### 17<sup>th</sup> Century

Townships on the Island were settled and incorporated by Europeans between 1642 when Edgartown was settled and 1855 when Gay Head was separated from Chilmark (Banks Vol II, 1966). The preserve is located on land that represented at least at some time in history four Island towns – West Tisbury, Tisbury, Oak Bluffs (Cottage City) and Edgartown.

Trails during the 17<sup>th</sup> century likely connected the Lagoon Pond/Holmes Hole area to coastal ponds to the south, Gay Head and Chappaquiddick thus connecting the tribal groups (Connolly 1987). The area of Little Duarte's Pond was located near the crossroad for these paths. Little Duarte's Pond and Little Pond are the only two fresh water sources for those making the long journey across the dry scrublands from the Lagoon and Holmes Hole to points elsewhere on the island. The fresh water ponds offered native populations fish such as bass, trout and perch. The surrounding wetlands provided cover for game species such as deer and small mammals. They also provided resources such as fiddleheads, blueberries, cranberries, sassafras and other fruits and nuts.

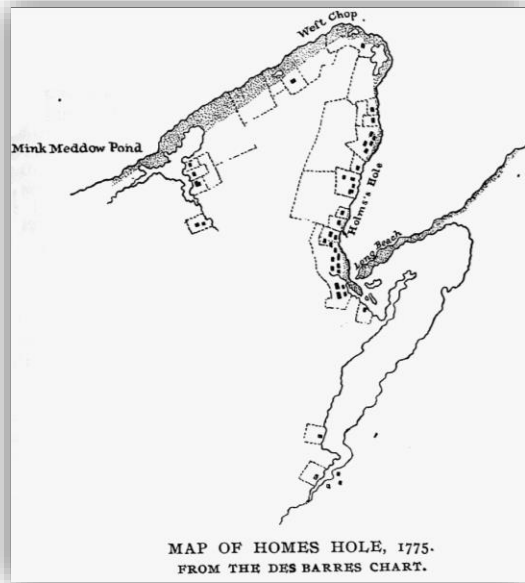
The first purchase of land near the preserve in which Little Duarte's Pond is mentioned in the deed was by Ebenezer Rogers, a Tisbury farmer, in 1699 from Ponit, sachem of Holmes Hole. Ebenezer purchased 60 acres, more or less (DCRD 3:273). Almost all of Oak Bluffs and Tisbury at this time was rural and dependent on agriculture. The early settlers adopted the mixed crop and husbandry agricultural system with native corn a staple crop and cattle roaming the salt meadows. Typical farms of this time were less than 100 acres and only small portions were cleared for cultivation (Connolly 1987).

### 18<sup>th</sup> Century

At the turn of the 18<sup>th</sup> century the settlement in the harbor towns increased in response to the rise in importance of fishing and whaling. Land outside these seafaring settlements remained rural and agriculturally important in response to the need to outfit the whaling ships as well as during the Revolutionary War (1775-1783) when the sea was too dangerous for fishing and whaling voyages. Sheep, cattle and crops were necessary to support the growing coastal towns and land near freshwater was valued by farmers (Mullholland et al. 1999). Sheep farming was booming especially in up-island towns; there were said to be 13,000 sheep on the Vineyard in 1778 (Railton 1983).

Many of the residents of the area of Oak Bluffs made their living by farming in addition to other pursuits such as salt-making which was lucrative in the late 18<sup>th</sup>

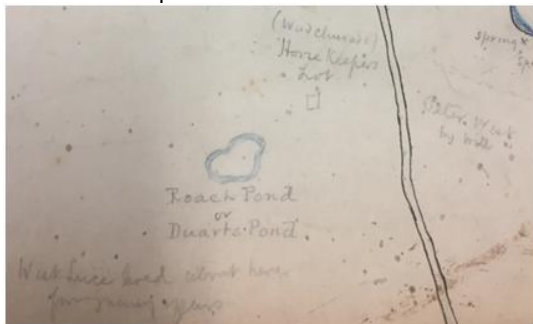
century to early 19<sup>th</sup> century (Mullholland et al. 1999). According to late 1700's maps there were houses at the Head of the Lagoon and farms at East Chop, West Chop, Head of the Lagoon and along the shore of Sengekontacket Pond but neither farms nor houses in the area of the preserve.



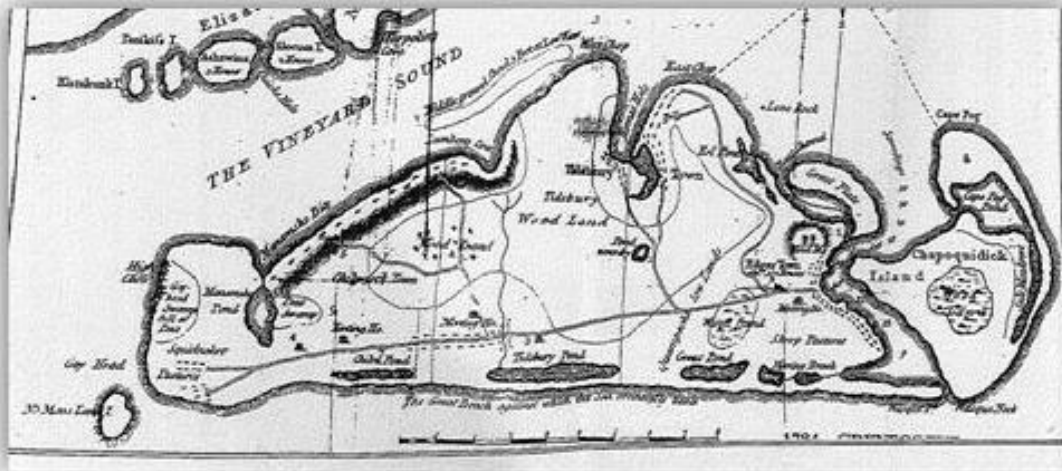
Des Barres Map 1775



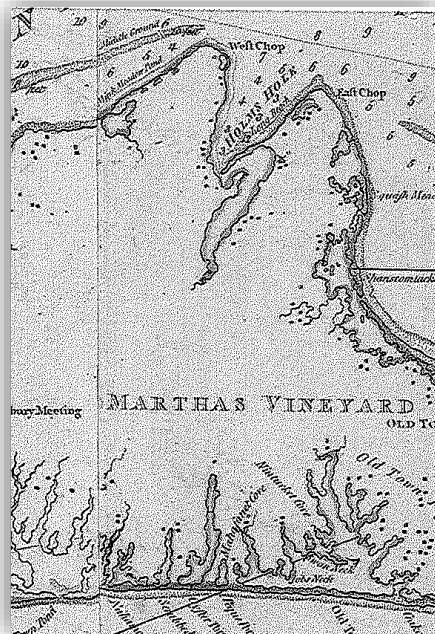
Banks Early Sketches of Nobnocket (1900)



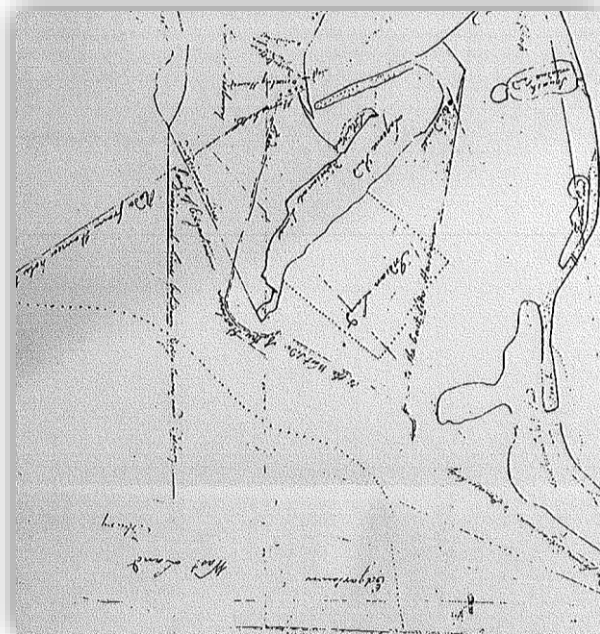
Banks Early Sketches of Nobnocket (1900)



1784 Crevecoeur map from Banks 1966 (1911)



Des Barres Map 1781



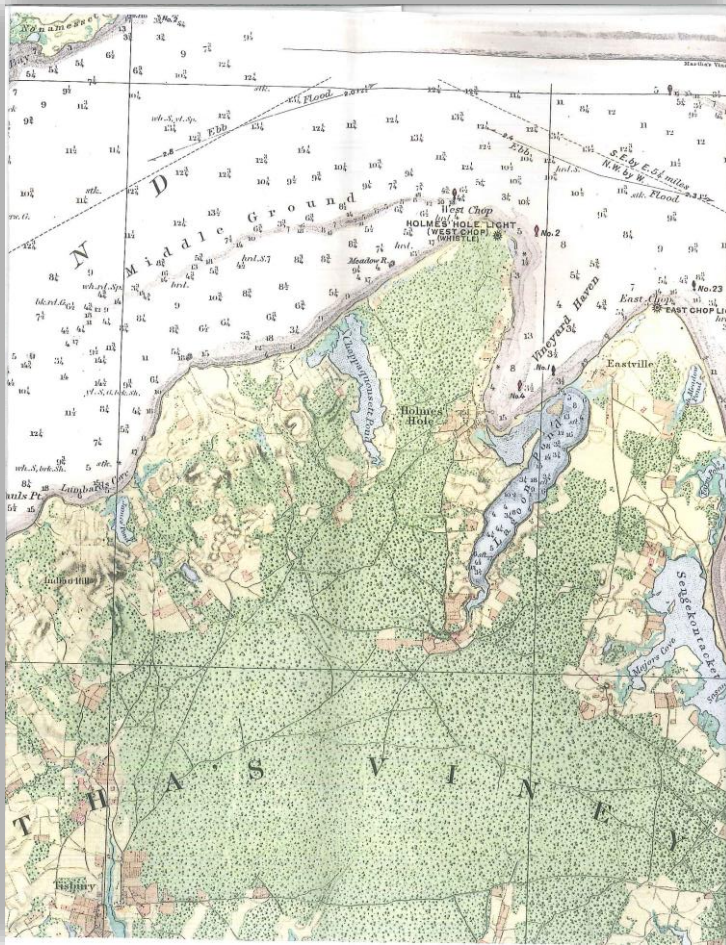
1795 Plan of Oak Bluffs, Massachusetts Survey (Smith 1795)

The land around Little Duarte's Pond quickly shifted from Rogers ownership into the Luce family (DCRD B:610). Henry<sup>2</sup> Luce, also known as "white-eyed Henry", is described to be from Tisbury and is presumed to be the son of Henry<sup>1</sup> Luce, the patriarch of the family (Banks Vol. III, 1966). The land in and around the preserve passed down through six generations of Luces, who were mariners and farmers depending on the generation. The preserve may not have been used as homestead land until later in the 18<sup>th</sup> century. However, it may have been used as a woodlot or for wooded pasture considering it was centrally located to the large Luce family that was spread out over Tisbury and Edgartown during the 18<sup>th</sup> and 19<sup>th</sup> centuries (Banks Vol. III, 1966).

### 19<sup>th</sup> Century

The whaling industry peaked in the mid-19<sup>th</sup> century and with its collapse agricultural employment rose 19.7% (Connolly 1987). The height of farming occurred on the island in the early 1800's with 15,000 sheep, 2,800 cattle, 800 swine, and 400 horses (Freeman 1971).

The Civil War (1861-1865) contributed to the huge depletion of woodlands cut for railroad ties, ship masts, pitch and tar. The Whiting Map of 1860 and Hodgkins Map of 1898 indicate that there is a considerable amount of cleared land around the Head of the Lagoon and south along Head of Pond Road to the preserve. Little Duarte's Pond is located at a convergence of five cart paths that lead from the farm in various directions towards the populated towns (Mullholland et al. 1999). The Great Plain land south of the preserve remained a woodland/shrubland throughout the agricultural period of the 19<sup>th</sup> century and was cut intensively for fuel (Foster and Motzkin 1999).



U.S. Coast and Geodetic Survey 1860

During the mid-1800's smaller farms were often a mix of orchard, woodland, meadow land, pasture and tillage with buildings and fences (Vineyard Gazette September 28, 1860, April 1852, 1854, 1857, 1858, 1860, 1862). Towards the end of the 19<sup>th</sup> century, farming practices shifted from grain production to dairying, poultry farming and specialty crops. In 1910 there were 136 farms in Dukes County with 19,209 acres in farmland, 825 cows, 241 horses, 302 pigs, 3,951 sheep and 8,231 poultry (Agricultural Census- Massachusetts 1910).

The Luce family members began to sell the family land around the Little Duarte's Pond Preserve throughout the 18<sup>th</sup> century. Thomas Smith, Benjamin Trask and William Buckley purchased land in this area.

Thomas Smith and his heirs built the Red Hill Farm or Smith Farm that over several centuries reached from the Head of the Lagoon Pond north to Featherstone Farm, West to Chicama Vineyard and Whippoorwill Farm, south towards the airport, and to the east of Barnes Road; the preserve was part of this farm. The farm according to Elisha T Smith was at least 600 acres in size (Gazette Sept 26, 1851). The farm was then whittled and shaped over the years until 1937 when a large acreage was sold and only a small portion remained (Meras 2010).

Benjamin Trask, William Buckley, and the remaining Luce owners – Ichabod Norton Luce, Fred Luce and the heirs of James Norton Luce – eventually sold their land in and around the pond to Antone Francis Duart, Joseph Silva Duart and Joseph Viera (DCRD bk:pg: 61:322, 64:514, 114:92, 39:329, 57:129, 44:462, 58:360, 58:408, 58:427, 88:334, 114:386, 99:274, 100:220, 98:28, 133:486, 133:484). Antone F. Duart was an early Portuguese settler who came to the Vineyard in around 1864. He was a farmer and “ice dealer” at the Head of the Pond (Vineyard Gazette March 1928, 1907 Oak Bluffs Directory). He was married to Mary Emelia and later her sister Mary Ann DaCosta. He had four children of whom Joseph Silva Duart was his eldest son (<http://history.vineyard.net/mvpgp/duart.htm>). Antone F. Duart purchased land along the boundary line between Tisbury and Cottage City (formerly Edgartown). The foundation for the campground cottage that once stood on the Duart Farm located south of the Stoney Hill Road and west of the Edgartown Road remains (Mullholland et al. 1999).

### 20<sup>th</sup> Century

In 1905 the number of sheep in farming had declined drastically due to the low prices of wool; dairy farming was on the rise. By 1940 there were 208 farms in Dukes County covering 67,840 acres with a dozen or more dairy farms in each town on the Vineyard. By 1950 the number of farms in Dukes county were cut in half (Agricultural Census of 1954) and by the mid-1960s the Dairy Cooperative shut down due to the decline in milk prices and changes in how milk was distributed (Walthers 2008). By 1974 there were 22 farms in Dukes County covering 9,116 acres (Agricultural Census 1974).



During the early 1900's the Red Hill Farm and acreages in and around the preserve passed through the Smith family and eventually came to be in the care of George, Nellie and Ralph Smith (DCRD 121:574, 198:250, 257). Much of the farm was sold including the area around the preserve to Henry Cronig after George Smith died (DCRD 198:250, 257).

In 1939 Henry Cronig paid the back taxes on a parcel that the town of Tisbury acquired through taking. Among the parcels in which Henry Cronig received title was a 50-acre Smith parcel and a 25-acre George Luce lot (DCRD 197:503). In 1954, Cronig sold the 75 acres to Elisha R. Smith (DCRD 226:195) who sold it one month later to Heathland Farm Inc., a turkey farming endeavor established by Peter Mitchell (DCRD 226:196, 197, Vineyard Gazette November 18, 2010). The above-mentioned parcels were later owned by Alvin E Strock, an oral surgeon and land developer (DCRD 253:85, 326:549) until 1978. A 50-acre portion was split and sold to David O Douglas, a cattle breeder and owner of Rainbow Farm in West Tisbury and Chilmark until 1981 (DCRD 366:480); and to Bencion and Patricia Moscow who owned Thimble Farm, a pick-your-own-strawberries and hydroponic tomatoes farm, until 2002 (DCRD 384:604), at which time the land bank purchased an APR over it.

In 2001, George and Catherine Mathiesen sold a 1.03 acre parcel of land – located partly in Oak Bluffs and partly in Tisbury – to the Martha's Vineyard Land Bank thus creating Little Duarte's Pond Preserve. The land bank later purchased an APR from the Mathiesens over the Tisbury portion of the Chicama Vineyard as well (DCRD 921:176, 190) and a subsequent owner later conveyed a management easement to the land bank (DCRD 1168:467, 1328:837, 1328:842, 1328:846).

A 2.57-acre portion of Chicama Vineyard was partitioned and granted to Lemuel Drake in 1980 (DCRD 376:71). Lemuel F. Drake Jr. sold this parcel to Gregory Drake in 2005 (DCRD 1033:44) who later sold it to the land bank in 2008 (DCRD 1146:874, Plan: Case File #28).

## 2. Planning Concerns

The land bank must address the following when planning for the management of the Little Duarte's Pond Preserve:

### *a. Wetlands Protection Act.*

Little Duarte's Pond, the intermittent stream and red maple swamp are the "wetland resource areas" on the preserve under the Massachusetts wetlands protection act. The "resource areas" and a 100-foot buffer zone around those areas are subject to the jurisdiction of the Oak Bluffs conservation commission. The creation of 460 linear feet (0.06 acres) of new trail is within the buffer zone of the wetland resource areas and the creation of a raised viewing platform (64 ft<sup>2</sup>, 0.001 acres) in the red maple swamp that abuts Little Duarte's Pond is within a resource area.

*b. Restrictions and Deeded easements:*

There are several restrictions and easements that the land bank holds overportions of the preserve and one easement that private owners have retained over the land bank's fee-simple portion of the preserve.

The land bank holds two agricultural preservation restrictions over 64 acres of the preserve. In addition the land bank holds an agricultural use easement over the Thimble Farm APR and a management use easement over 3.4 acres of the Willow Farm APR. The land bank has view easements over the APR lands to ensure a scenic vista is viewable from public trails and ways. The land bank also has trail easements over both the Thimble Farm APR and Willow Farm. The land bank's fee-simple portion of the preserve is subject to an easement in which the grantor reserves the right to access the pond over a 25' stretch along the northern boundary for the purpose of drawing water for irrigation.

*c. Massachusetts Endangered Species Act:*

The creation of an additional 0.11 miles of trail is proposed within the boundaries of priority habitat for rare species (NHESP Map, Appendix G). The creation of the additional trail will generate a Massachusetts endangered species act project review filing for a total of 0.08 acres.

### 3. Abutters

A list of those owning land abutting or within 200 feet of Little Duarte's Pond Preserve appears in Appendix H, as do the accompanying Tisbury, West Tisbury and Oak Bluffs Assessors Maps.

### 4. Existing Use and Infrastructure on the fee-simple portion of the preserve

The following are existing uses (Appendix I, Existing Use Map):

(1) *Boardwalk* – A 25'-long ground-level boardwalk exists where the trail crosses through the red maple swamp. The boardwalk is 3 feet wide.

(2) *Trail* – There are 1,200 feet of existing trail on the preserve.

(3) *Vineyard* – The heath/old field on the preserve was part of a larger vineyard field that is part of Willow Farm. Raised rows of soil, plus wood posts remain in the field.

(4) *Irrigation* – The outlet of an irrigation main is visible along the pond bank and heads in the direction of Thimble Farm; it is silted in and at this time not being used. An irrigation main for the former Chicama Vineyard sits above ground on the property and has not been used to pump water from the pond in at least 24 years.



## II. Inventory Analysis

In this section, problems and opportunities that may arise in the management of the Little Duarte's Pond Preserve are analyzed.

### A. Constraints & Issues

#### 1. Ecological Context

The conservation of the Little Duarte's Pond Preserve protects approximately half of the pond and nearly a quarter of the coastal plain pond shoreline. It also protects approximately 2.57 acres of priority habitat for rare species as defined by NHESP.

#### 2. Natural Resource Concerns

There are three main areas of concern at Little Duarte's Pond Preserve, each briefly addressed below and then addressed in more detail in the land management section of the plan:

*a. Commonwealth/federal-listed species as well as regionally uncommon species:*

##### Plants:

One Massachusetts-listed plant species occurs on the pond shore and two watch-listed plant species – thyme-leaved pinweed and post oak – occur in the heathland. Succession, trampling and disturbance are factors that negatively impact shoreline and heathland plants.

##### Wildlife:

There rare invertebrates known to occur on the preserve in the upland of the preserve. Additionally, the preserve is designated by the natural heritage and endangered species program as belonging to priority habitat of a rare bird. Preserving thickets of scrub oak and by setting trails in such a manner as to minimize cutting of trees in the woodland will protect the moth species that depend on these habitats. Additionally, restoring the heathland by removing encroaching shrubs and trees, with the exception of preserving patches of scrub oak, would return the habitat to open an open heathland mowing for hunting habitat for the rare bird.

*b. Invasive exotic species:*

The northeastern corner of the heath/old field is a tangle of Japanese honeysuckle, oriental bittersweet and multiflora rose. It is a relatively small area that can be managed to prevent the spread of these species and other invasive exotic species into vulnerable surrounding areas such as the heath/old field and pond shore.

*c. Pond:*

The management plan does not propose any activity that would impact the pond beyond its traditional uses such as boating and fishing. The pond shoreline is susceptible to trampling and waterfowl that use it for nesting are

sensitive to human disturbance. Requiring leashing of dogs would help protect this habitat and the breeding waterfowl. Using fencing and signs would deter off-trail excursions in the shoreline by visitors.

### 3. Sociological Context

The Little Duarte's Pond Preserve is located between the Head of Pond Road/Stoney Hill Road and Little Pond Road and is primarily in Tisbury and Oak Bluffs. It provides an important trail link between land bank properties to the north (Wapatequa Woods Reservation and Tisbury Meadow Preserve) and the town of West Tisbury's Greenlands and the commonwealth's Manuel F. Correllus State Forest to the south.

### 4. Neighborhood Concerns

The land bank considers the concerns of neighbors as part of the planning process. All abutting property owners and the local conservation commission are sent written notice of a public hearing on the draft plan. All neighbors – and all members of the public – are invited to review the draft plan, attend the public hearing and make written or oral comments. The land bank's Oak Bluffs and Tisbury town advisory board and the Martha's Vineyard land bank commission review all comments and can change the draft plan if desired.

Anyone may also express concerns at any public meeting of the Martha's Vineyard land bank commission and Oak Bluffs and Tisbury town advisory boards, or may simply contact land bank staff.

No planning concerns have been brought to the attention of the land bank by neighbors since the completion and implementation of the preserve's prior management plan.

## **B. Addressing Problems and Opportunities**

### 1. Land Bank Mandate

In 1986, the voters of Martha's Vineyard created the land bank to acquire, hold and manage land in a predominantly natural, scenic, or open condition. The land bank keeps open space open and allows modest public use. Its "shared-use" policy strives to provide a range of public benefits, from low-impact recreation and aesthetics to wildlife conservation and watershed protection. Protection of natural resources is the land bank's highest priority, yet "shared-use" demands balancing the public use of natural resources with protection of the same.

### 2. Goals at Purchase

The purchase of the Little Duarte's Pond Preserve meets seven of the land bank's nine criteria for property acquisition: protection of agriculture lands, forest lands, wildlife habitats, wetlands, scenic vista, easements for trails and for publicly owned lands and sites for passive recreation. Preliminary management plans were

adopted by the land bank commission and the Oak Bluffs and Tisbury town advisory boards and are attached as Appendix B.

### 3. Opportunities

*a. Access:* The proposed vehicular access to the Little Duarte's Pond Preserve is through the Wapatequa Woods Reservation trailhead situated on Stoney Hill Road. Trail easements across Thimble Farm and Willow Farm connect the trailhead to the preserve. An easement allows the land bank to install a trailhead adjacent to the pond in the future if needed.

*b. Bird-watching:* The preserve offers opportunities for viewing both upland birds of the heathland and deciduous woodland as well as those birds that prefer wetland habitats such as the pond, shoreline and red-maple swamp.

*c. Views:* The preserve offers splendid views of the agricultural fields as well as intimate views of Little Duarte's Pond. Restoring the heathland and removing invasive plants will enhance the views of this habitat.

*d. Hunting:* The property is not well suited to hunting due to the close proximity of homes to the preserve. Discharge of a firearm and arrows is prohibited within 500 feet of an occupied dwelling.

*e. Trails:* Approximately 2.3 miles of existing and proposed trails and ancient ways offer the walker, bicyclist, Nordic skier and equestrian the chance to admire views of the pond and vineyard fields and travel through the property to nearby conservation properties.

*f. Pond:* The pond provides opportunities for fishing and ice-skating.

### 4. Universal Access (UA)

Little Duarte's Pond Preserve is not well suited for universal accessibility due to the distance of the amenities from the trailhead. Additionally, the sandy soil, uneven topography and wetlands make universal access difficult on the preserve.

The properties Recreational Opportunities Spectrum (ROS) classification is "less-developed." Further details are included in Appendix J.

## III. Land Management Planning

This final section of the management plan states goals for the Little Duarte's Pond Preserve and outlines strategies for achieving them. These goals and strategies are designed to fit within the social and ecological constraints defined previously. The plan addresses five areas of planning concern: nature conservation, recreation and aesthetics, natural products, community interaction and land administration.

## A. Nature Conservation

Goal: Provide long-term protection for plants, animals and natural processes occurring on the Little Duarte's Pond Preserve.

Objective 1: Protect and encourage rare and endangered species on the preserve.

*Strategies:*

- A. Monitor the property for rare plants and animals during regular property checks and survey existing populations on a regular schedule.
- B. Develop and implement a strategy to protect any additional rare species observed on the property.
- C. Report new observations of rare and endangered species to the proper commonwealth authority.
- D. Promote a sustainable woodland community on the preserve by:
  - i. monitoring and removing invasive plants;
  - ii. utilizing existing trails as much as possible on the preserve;
  - iii. and manage views, site new trails and create trailheads in such a way as to minimize cutting established deciduous trees in the mixed-oak woodland.
- E. Reroute or close trails in the event that the recreational use interferes with rare species' ability to forage and reproduce.
- F. Protect pond shoreline from trampling, compaction and excessive disturbance by:
  - i. using signs and fencing to prevent off-trail excursions into the shoreline by visitors and their pets;
  - ii. posting interpretive signs at sign station;
  - iii. prohibiting use of motorized vehicles on the preserve;
  - iv. cutting or pruning trees and shrubs by hand along pond shore if they establish during extensive droughts and pose a threat to other shoreline plants, all subject to approval of the Oak Bluffs conservation commission through an NOI filing;
  - v. requiring that dogs be leashed at all times on the preserve;
  - vi. and by directing visitors to use existing Thimble Farm Pond access, where vegetated shoreline is not present.
- G. Promote habitat diversity on the preserve by maintaining and restoring the heathland and other open habitats on the preserve that may serve as hunting habitat for the barn owl and other birds of prey.
- H. Preserve thickets of scrub oak in the heathland while maintaining a general openness in the habitat.

Objective 2: Monitor for and control the spread of invasive plants.

*Strategies:*

- A. Cut, uproot or mow where possible invasive plants such as oriental bittersweet, spotted knapweed, Japanese honeysuckle and multiflora rose.

- B. Monitor for regrowth and continue to manage invasive plants.
- C. Properly dispose of collected invasive species.
- D. Explore other control methods and implement with permission of NHESP and the town conservation commission if physical control methods fail.

Objective 3: Protect the value of the preserve as migratory and breeding habitat for avian and other wildlife species.

*Strategies:*

- A. Retain an assortment of snags in woodland where these trees do not pose unacceptable safety or fire hazards.
- B. Protect wetland habitats by:
  - i. using rustic-style, low-profile, pin-foundation raised boardwalks in combination with ground-level boardwalks to traverse the red maple swamp or as directed otherwise by the Oak Bluffs conservation commission;
  - ii. locating trail through the red maple swamp outside of the wetland buffer zone where possible, while maximizing views of the pond;
  - iii. maintaining shrub swamp buffer around the pond to protect avian breeding habitat; hand cut vegetation only when necessary to maintain intimate views of the pond from the viewing platform;
  - iv. and prohibiting pedestrian, animal and vehicle access along the pond shore of the preserve
- C. Reroute trails if passive recreational use is disturbing to nesting wildlife species or causes compaction or erosion into the pond.
- D. Create a raised viewing platform of the pond and use split-rail fence to prevent unauthorized access to the pond shore from the trail system.
- E. Control aquatic invasive species through education by posting informative signs about invasive exotic species at preserve's sign station.
- F. Monitor changes in vegetative cover during regular property checks and by updating ecological inventory by 2026.
- G. Remove existing shed on management use easement land

Objective 4: Reduce and control erosion of trails.

*Strategies:*

- A. Reroute or temporarily close trails where necessary.
- B. Cover trails with woodchips as needed to prevent surface soil erosion.
- C. Prohibit use of motorized vehicles such as dirt bikes and all-terrain vehicles on the trail system.

Objective 5: Reduce forest fire danger on the preserve.

*Strategies:*

- A. Prohibit open fires on the preserve.
- B. Prohibit storage of brush piles on the preserve.

- C. Prohibit camping on the preserve.

Objective 6: Restore heath/old field habitat to open heath-grassland.

*Strategies:*

- A. Remove trees and invasive shrubs and vines through cutting and stump-grinding with the exception of a select few specimen trees.
- B. Remove vineyard posts and old metal fence line.
- C. Reseed with native grassland seed stock.
- D. Perform restoration work during winter to minimize disturbance to breeding wildlife and heath plants.

**B. Recreation and Aesthetics**

Allow limited, low-impact recreational use of the area for passive recreational uses provided that these uses do not preclude attainment of nature conservation objectives

Objective 1: Open the property for low-impact recreation

*Strategies*

- A. Open the property for hiking, non-motorized biking, horseback-riding and other passive uses.
- B. Utilize existing trails and install new trail(s) where appropriate.
- C. Monitor impact of passive recreation use on the preserve annually and manage accordingly.

Objective 2: Designate the existing trailhead for Wapatequa Woods Reservation on Stoney Hill Road as the primary access to the preserve and utilize trailhead easement adjacent to the Little Duarte's Pond only if deemed necessary in the future.

*Strategies*

- A. Locate a future 3-vehicle trailhead at Little Duarte's Pond in the existing cleared area only if existing trailhead at Wapatequa Woods Reservation is deemed inadequate.
- B. Maintain the existing sign station at Little Duarte's Pond that designates the appropriate uses and rules of the preserve.
- C. Screen future trailhead as necessary using native vegetation.

Objective 3: Create trail system as shown on the Proposed Project Map in Appendix A.

*Strategies:*

- A. Create trail network as shown on the Proposed Project Map:
  - i. create  $\pm$  618 linear feet of new trail.
  - ii. make trail corridors six feet wide and eight feet tall when possible;

- iii. free trails of rocks, roots and other obstacles where practical;
  - iv. install erosion control measures where needed;
  - v. site trails so that they are as unobtrusive as possible to nearby homes and sensitive plant and wildlife habitat;
  - vi. site new trails as needed so that they connect, as well as possible, to other conservation land, ancient ways and trail easements;
  - vii. and mark trails with directional signs if needed.
- B. Allow land bank staff the discretion to close, relocate and add new trails, such as spur trails for off-property trail connections.
  - C. Screen views of houses as necessary from trails and viewpoints using native vegetation.
  - D. Allow multiple uses of trails where appropriate by hikers, Nordic skiers, horseback-riders and bicyclists.
  - E. Prohibit visitors' use of motorized vehicles, such as but not limited to dirt bikes and all-terrain vehicles.
  - F. Expand existing boardwalk and additional 3' and extend it by 4'x6' to create a viewing platform with views of the pond.
  - G. Check and maintain trails on a regular schedule.

Objective 4: Entertain possibilities for other trail links.

*Strategies:*

- A. Use existing trails on the preserve where possible and create new trails as necessary to connect the preserve to future conservation land and trail easements.
- B. Maintain existing links to other conserved properties.
- C. Create links to other conserved land and easements.

Objective 5: Allow skating, non-motorized boating and fishing in the portion of the pond which is included in the preserve.

*Strategies:*

- A. Allow access for skating, non-motorized boating and fishing via land bank trailhead at the Wapatequa Woods Reservation.
- B. Post signs informing visitors of aquatic invasive plants and proper boat cleaning to ensure that these species are not introduced into the pond.
- C. Restrict boating, for relevant periods of time, if the activity is deemed disruptive to breeding waterfowl.
- D. Prohibit access to the pond shore from the preserve.

Objective 6: Require visitors to leash dogs at all times per the Tisbury dog bylaw, which is more restrictive than the Oak Bluffs bylaw.

*Strategies:*

- A. Allow dogs on the preserve providing they are leashed.



- B. Encourage visitors to clean up after their pets.
- C. Post the dog policy on the sign station as visitors enter the property and at the trailhead at Wapatequa Woods Reservation.
- D. Indicate the dog policy in the land bank map under the description for the property.

### **C. Natural Products**

Allow gathering of natural products; prohibit the use of the property for hunting and camping.

Objective 1: Prohibit hunting on the preserve due to the close proximity of occupied dwellings.

*Strategies:*

- A. Post hunting regulations clearly at all sign stations during hunting season.
- B. Indicate the hunting policy for the preserve in the land bank map under the description for the property.

Objective 2: Prohibit camping.

*Strategies:*

- A. Prohibit camping on the preserve unless special permission is granted by the land bank commission for scouting and like groups and it is in compliance with appropriate town bylaws.
- B. Monitor the preserve for squatters and remove unauthorized campers promptly.

Objective 3: Allow gathering of natural products according to the land bank's Public Use Policy.

*Strategies:*

- A. Prohibit gathering of commonwealth-listed and locally rare plants and wildlife on the preserve.
- B. Prohibit gathering of invasive plants for personal use in order to minimize the spread of seeds elsewhere.
- C. Prohibit gathering of plants and wildlife in the shoreline habitat.

### **D. Community Interaction**

Provide helpful and interesting information about the property for visitors; allow educational use of the property.

Objective 1: Help people find the property and avoid trespassing.

*Strategies*

- A. Mark the property on the land bank website ([www.mvlandbank.com](http://www.mvlandbank.com)) and map and provide directions.
- B. Install "end of land bank property" signs where appropriate.
- C. Install land bank logo markers on property.

- D. Limit trespassing by closing existing trails not intended for use.
- E. Install gates or fencing as needed.
- F. Inform visitors, in the land bank map, how to access the preserve's trailhead and its permitted uses.
- G. Post map of property and trails as well as an aerial overview of the connecting conservation land and trails on sign station and website as they are updated.
- H. Plant vegetation where residential dwellings are visible from the trail, as necessary, that blends in with the natural context of its environs in order to define and screen the boundaries.

Objective 2: Present useful and interesting information about the Little Duarte's Pond Preserve to the public.

*Strategies:*

- A. Provide Oak Bluffs and Tisbury public libraries and conservation commissions with copies of this management plan if so desired.
- B. Make a copy of this plan available at the land bank office and, when file size is not restrictive, on the land bank website.
- C. Post information about the cultural and natural history of the preserve at the trailheads.

**E. Land Administration**

Oversee and police Little Duarte's Pond Preserve on a regular basis and develop good neighborhood relations.

Objective 1: Maintain good relations with abutters and neighbors.

*Strategies:*

- A. Establish contact and working relations with neighbors.
- B. Maintain contact and working relations with the Martha's Vineyard Museum, the Oak Bluffs and Tisbury conservation commissions; send a draft copy of the plan to them prior to the public hearing.
- C. Post the activities allowed and prohibited on the preserve.

Objective 2: Keep property well-maintained.

*Strategies:*

- A. Inspect property at least monthly.
- B. Clean up any litter and junk which may occur.
- C. Promptly respond to problems.
- D. Employ adequate staff to effectively implement land management goals.

**Objective 3: Maintain set hours for use.**

*Strategies:*

- A. Open property every day of the year from sunrise to sunset.
- B. Prohibit nighttime use unless special permission is granted by the land bank

- commission.
- C. Post "closed at dark" signs on the sign station.

Objective 4: Keep well-maintained boundaries.

*Strategies:*

- A. Locate and GPS corners.
- B. Walk boundaries annually.
- C. Post boundary markers where appropriate.
- D. Correct encroachments as they occur.

Objective 5: Keep good records of all land management activities and natural events.

*Strategies:*

- A. Record all significant events, natural or otherwise.
- B. Continue to update plant and wildlife inventories.
- C. Maintain photographic record of landscape appearance.

Objective 6: Comply with all applicable regulations and agreements.

*Strategies:*

- A. Comply with Massachusetts endangered species act.
- B. Comply with wetlands protection act and local by-laws.  
Request recommendations from the Massachusetts historical commission regarding the proposed activities in the plan.

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**Appendix A. Property Maps**

**Map 2: Locus Map**

Little Duarte's Pond Preserve  
Tisbury/Oak Bluffs/ West Tisbury  
6.5 Acres (fee simple) 64 Acres (APR)  
Locus Map



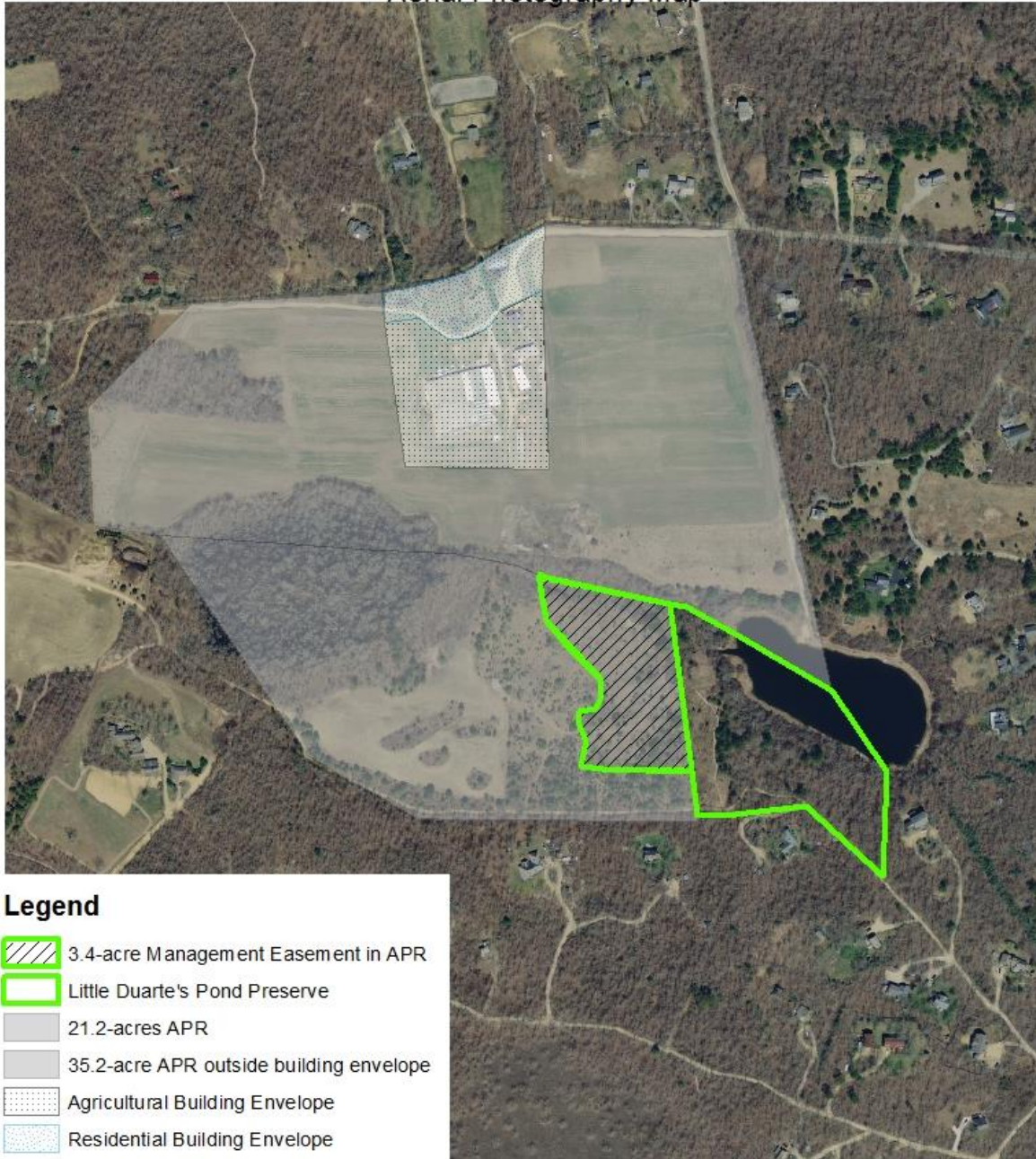
Sources : Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs :2014 Aerial Photograph-Mass GIS, Martha's Vineyard Commission (MVC): parcel data- town assessors and MVC - 2011, Coordinate Ref: State Plane, Mass Mainland, Feet,NAD 83 Notes: Map prepared by the Martha's Vineyard land Bank for planning purposes only. The land bank is not responsible for end-users interpretation of the map.  
File:Locus\_2016mapLDP.mxd Date:09-09-2016

0 2,350,700 9,400 Feet









**Map 3: Aerial Photography Map 1**

Little Duarte's Pond Preserve  
 Tisbury/Oak Bluffs/West Tisbury  
 6.5 Acres (fee simple) 64 Acres (APR)  
 Aerial Photography Map



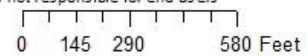
**Legend**

-  3.4-acre Management Easement in APR
-  Little Duarte's Pond Preserve
-  21.2-acres APR
-  35.2-acre APR outside building envelope
-  Agricultural Building Envelope
-  Residential Building Envelope

Sources : Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs :USGS TopographicImages -1978, Martha's Vineyard Commission (MVC): parcel data- town assessors and MVC - 2011, Coordinate Ref: State Plane, Mass Mainland, Feet,NAD 83 Notes: Map prepared by the Martha's Vineyard land Bank for planning purposes only. The land bank is not responsible for end-users interpretation of the map.

File: Topo\_2016mapLDP.mxd

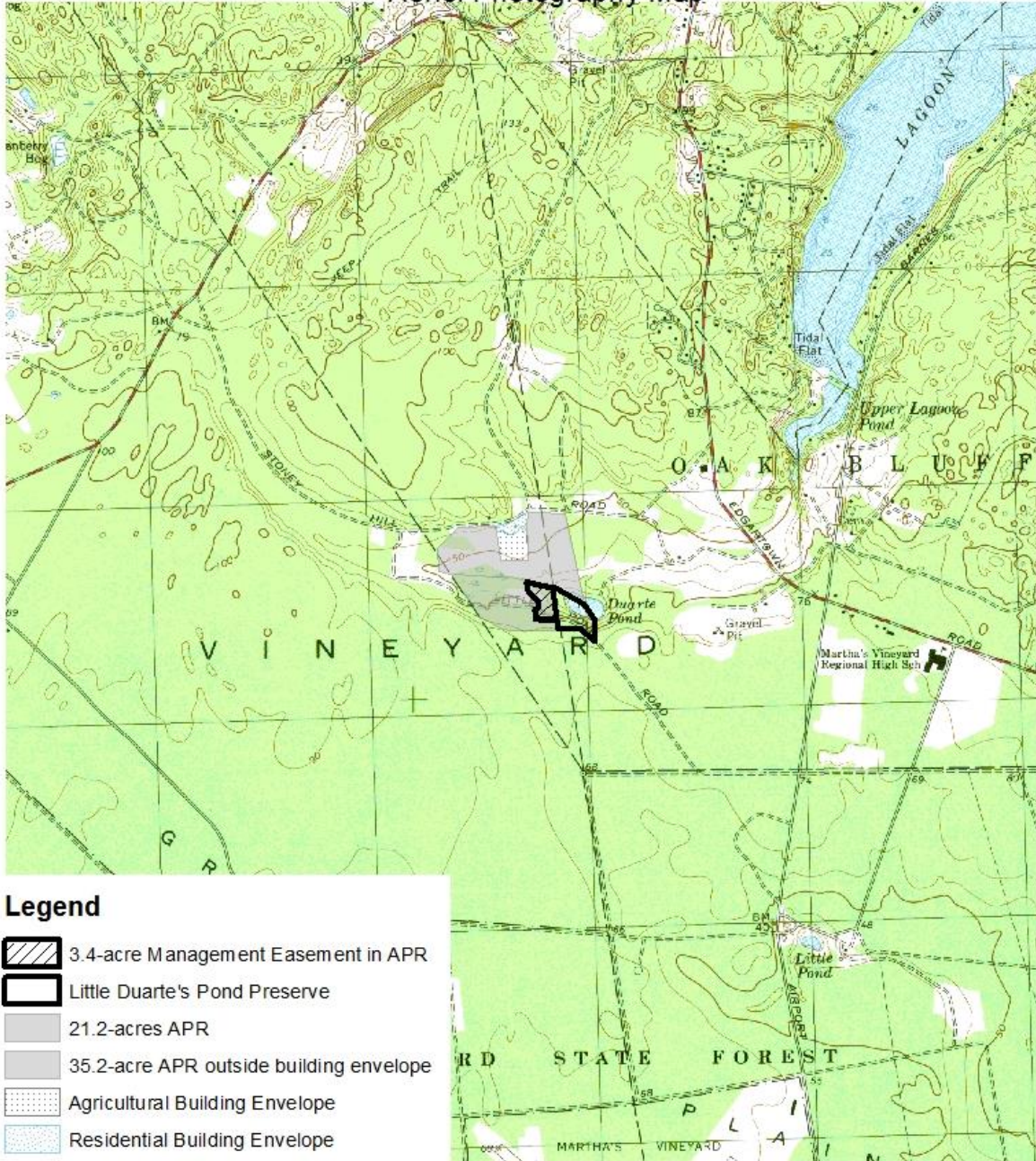
Date:09-09-2016, ST





**Map 4: Aerial Photography Map 2**

Little Duarte's Pond Preserve  
 Tisbury/Oak Bluffs/West Tisbury  
 6.5 Acres (fee simple) 64 Acres (APR)  
 Aerial Photography Map



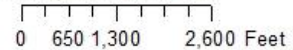
**Legend**

-  3.4-acre Management Easement in APR
-  Little Duarte's Pond Preserve
-  21.2-acres APR
-  35.2-acre APR outside building envelope
-  Agricultural Building Envelope
-  Residential Building Envelope

Sources : Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs :USGS TopographicImages -1978, Martha's Vineyard Commission (MVC) : parcel data- town assessors and MVC - 2011,Coordinate Ref: State Plane, Mass Mainland, Feet,NAD 83 Notes: Map prepared by the Martha's Vineyard land Bank for planning purposes only. The land bank is not responsible for end-users interpretation of the map.

File: Topo\_2016mapLDP.mxd

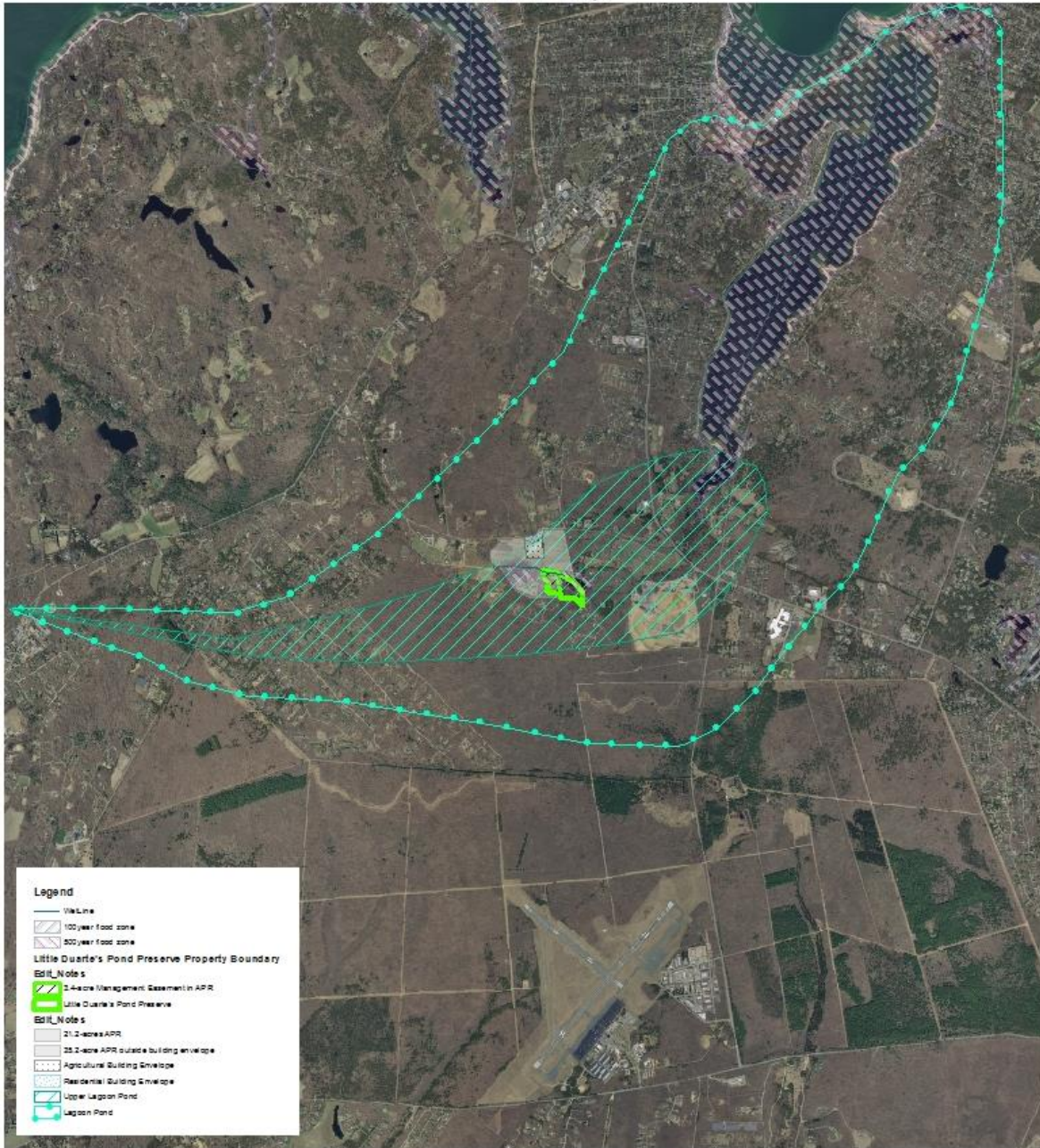
Date:09-09-2016, ST





### Map 5: Wetland Map

Little Duarte's Pond Preserve  
 Tisbury/Oak Bluffs/West Tisbury  
 6.5 Acres (fee simple) 46 Acres (APR)  
 Wetland Map



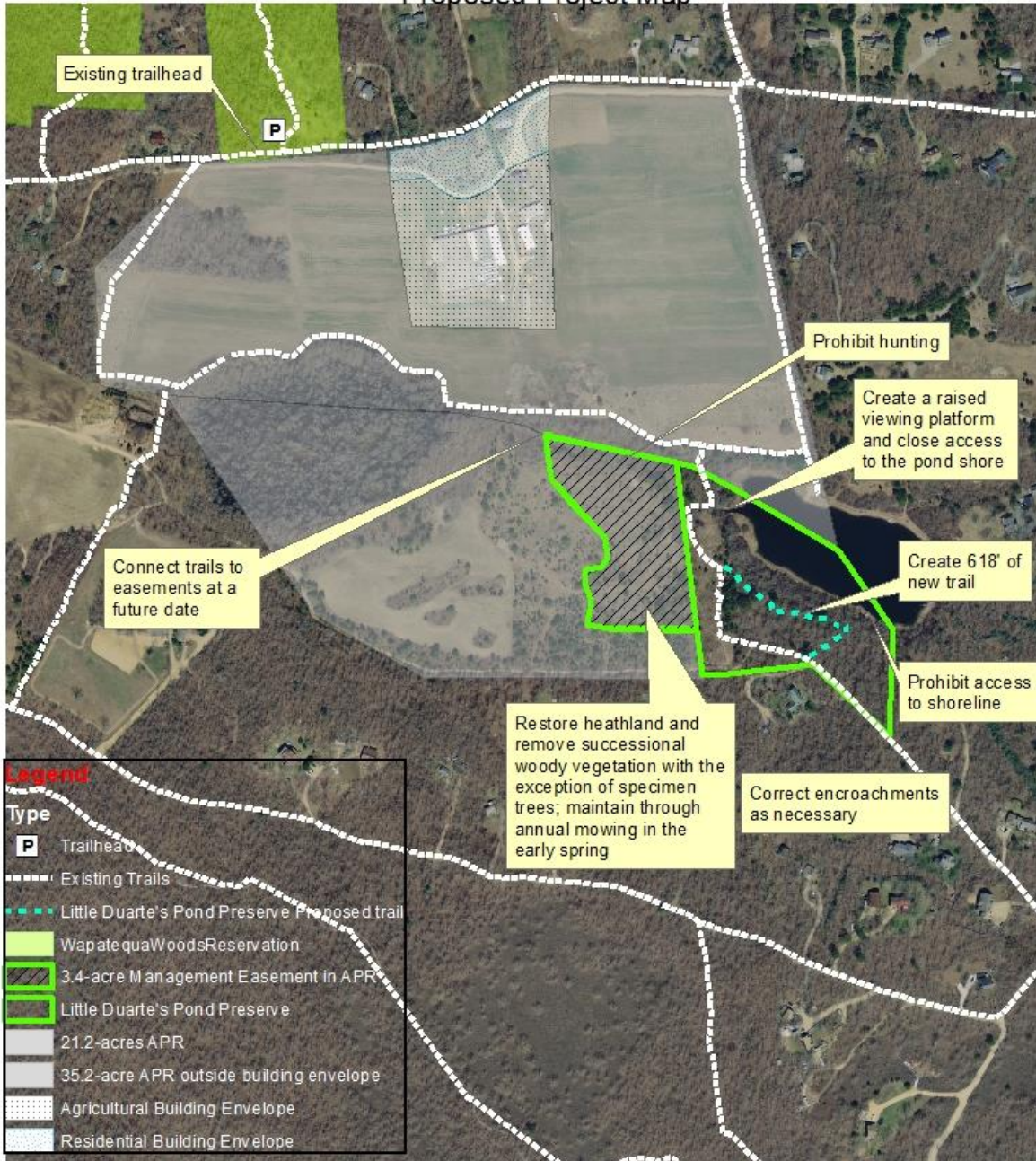
0 1,150 2,300 4,600 Feet

Sources : Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs :Aerial Color Ortho Imagery-2014, parcel data- town assessors and MVC - 2011/2014, trails , FEMA data- MassGIS, Coordinate Ref: State Plane, Mass Mainland, Feet, NAD 83  
 Notes: Map prepared by the Martha's Vineyard land Bank for planning purposes only. The land bank is not responsible for end-users interpretation of the map.  
 File:Wetland\_2016map.mxd Date:09-09-2016, ST



### Map 6: Proposed Project Map

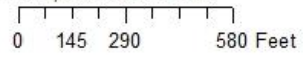
Little Duarte's Pond Preserve  
 Tisbury/Oak Bluffs/West Tisbury  
 6.5 Acres (fee simple) 64 Acres (APR)  
 Proposed Project Map



**Legend**

Type	Description
<b>P</b>	Trailhead
--- (dashed white line)	Existing Trails
- - - - (dashed green line)	Little Duarte's Pond Preserve Proposed trail
■ (light green)	Wapatequa Woods Reservation
■ (hatched)	3.4-acre Management Easement in APR
■ (green outline)	Little Duarte's Pond Preserve
■ (grey)	21.2-acres APR
■ (light grey)	35.2-acre APR outside building envelope
■ (dotted)	Agricultural Building Envelope
■ (stippled)	Residential Building Envelope

Sources : Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs ;USGS TopographicImages -1978, Martha's Vineyard Commission (MVC) : parcel data- town assessors and MVC - 2011,Coordinate Ref: State Plane, Mass Mainland, Feet,NAD 83 Notes: Map prepared by the Martha's Vineyard land Bank for planning purposes only. The land bank is not responsible for end-users interpretation of the map.



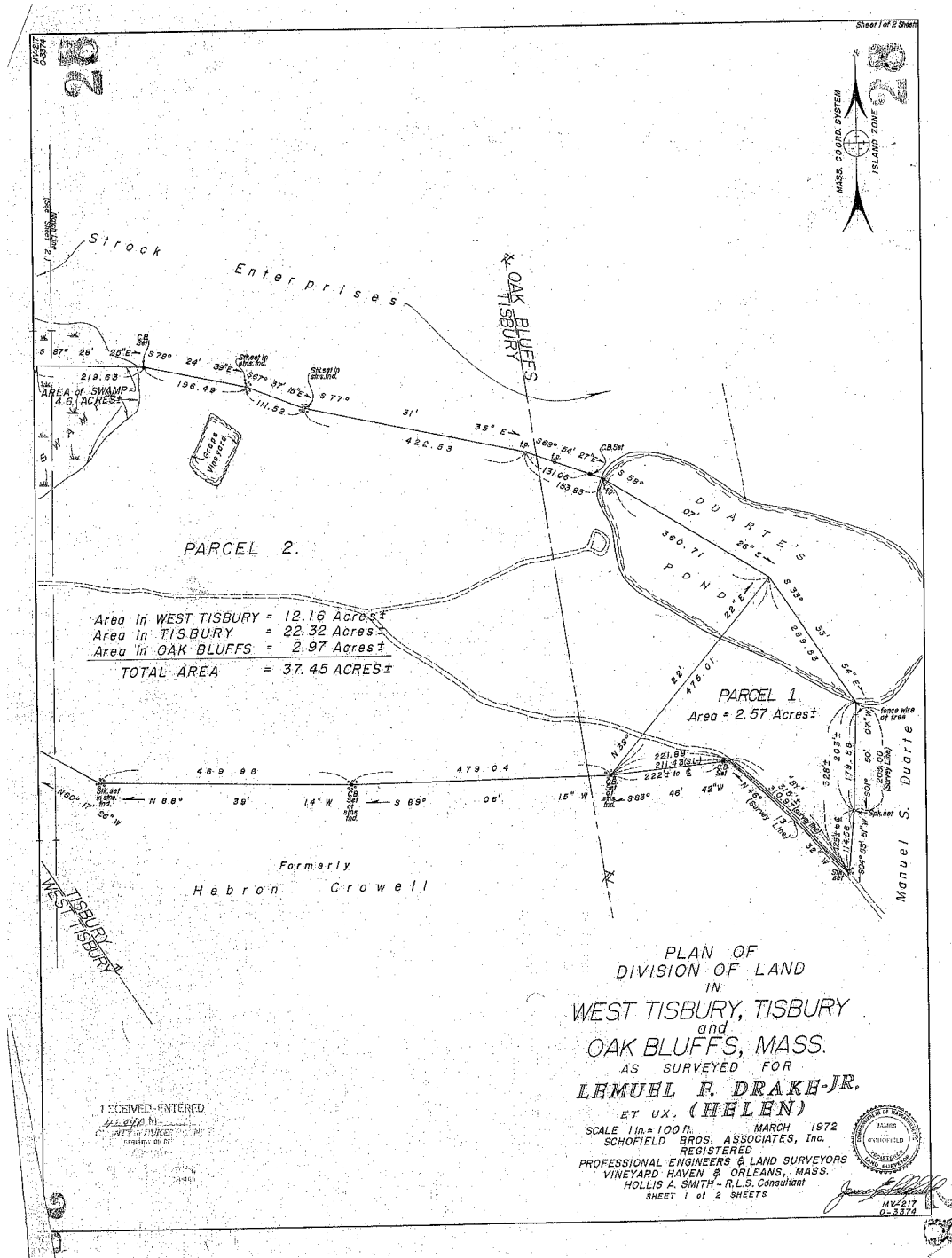
## Appendix B. Deeds, Surveys and Preliminary Plans

Deeds and larger copies of the surveys are on file at the land bank office. The following is the list of purchases made by the land bank to create the Little Duarte's Pond Preserve.

**Table 1. Parcels, easements and restrictions sold to the land bank, the date of sale and the registry book and page as recorded in the Dukes County Registry of Deeds.**

Seller	Date	Citation (book-page)
George H. Mathiesen et al.	01-19-2001	820-512
Bencion Moskow et al.	04-25-2001	47869, 235-80, 37-371
Bencion Moskow et al.	04-25-2001	47870, 235-92, 37-371
Bencion Moskow et al.	04-25-2001	47871, 235-98, 37-171
George H. Mathiesen et al.	01-14-2003	921-176
George H. Mathiesen et al.	01-14-2003	921-190
Gregory Drake	03-28-2008	1146-874
Vineyard Meadow LLC	09-11-2013	1328-837
Vineyard Meadow LLC	09-11-2013	1328-842
Vineyard Meadow LLC	09-11-2013	1328-846

Figure 1: Plan of Division of Land 1  
Little Duarte's Pond Preserve  
Tisbury, Oak Bluffs, West Tisbury, MA



**Figure 2: Plan of Division of Land 2**  
**Little Duarte's Pond Preserve**  
**Tisbury, Oak Bluffs, West Tisbury, MA**

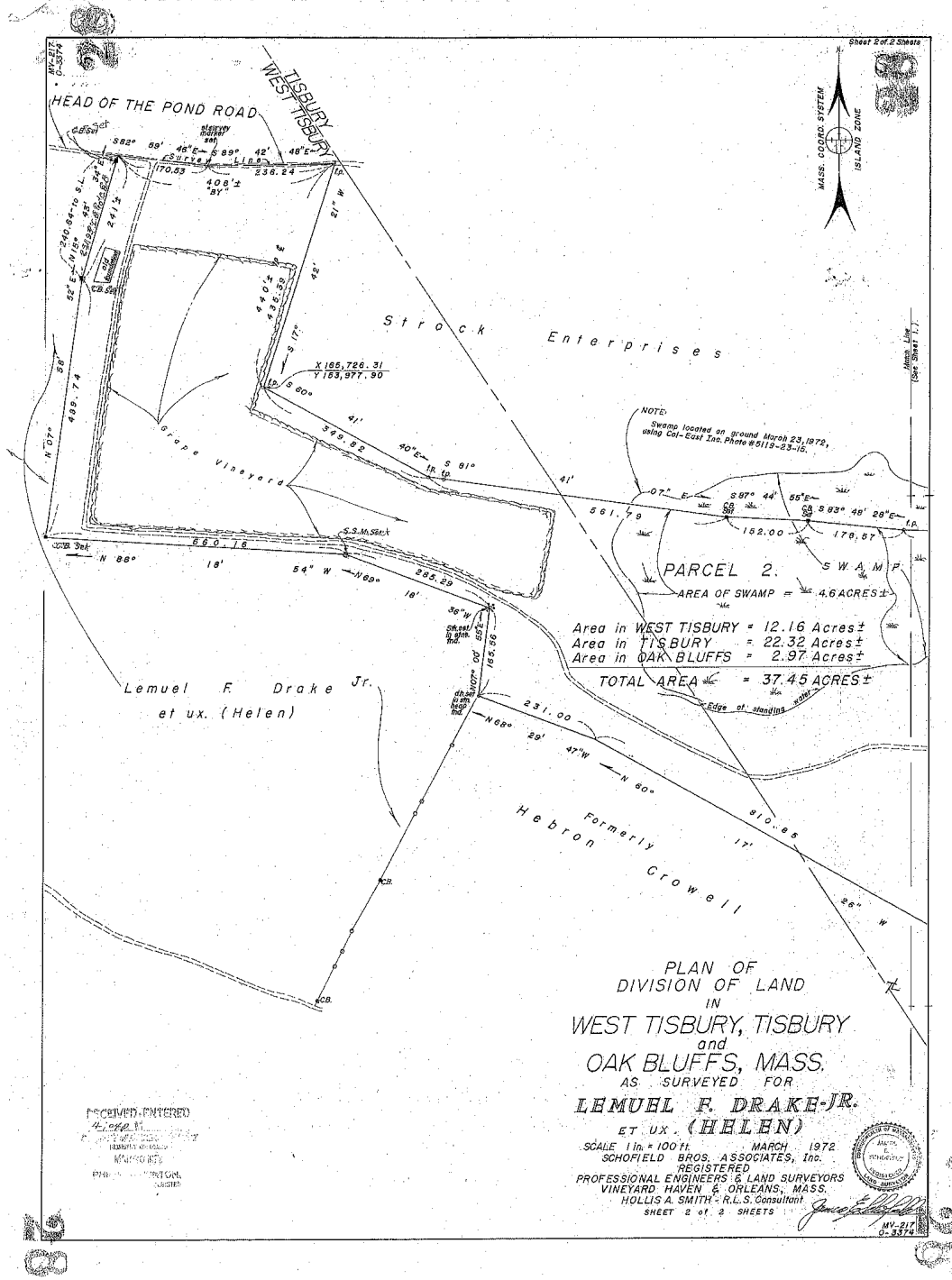


Figure 3: Plan of Land  
Little Duarte's Pond Preserve  
Tisbury, Oak Bluffs, West Tisbury, MA

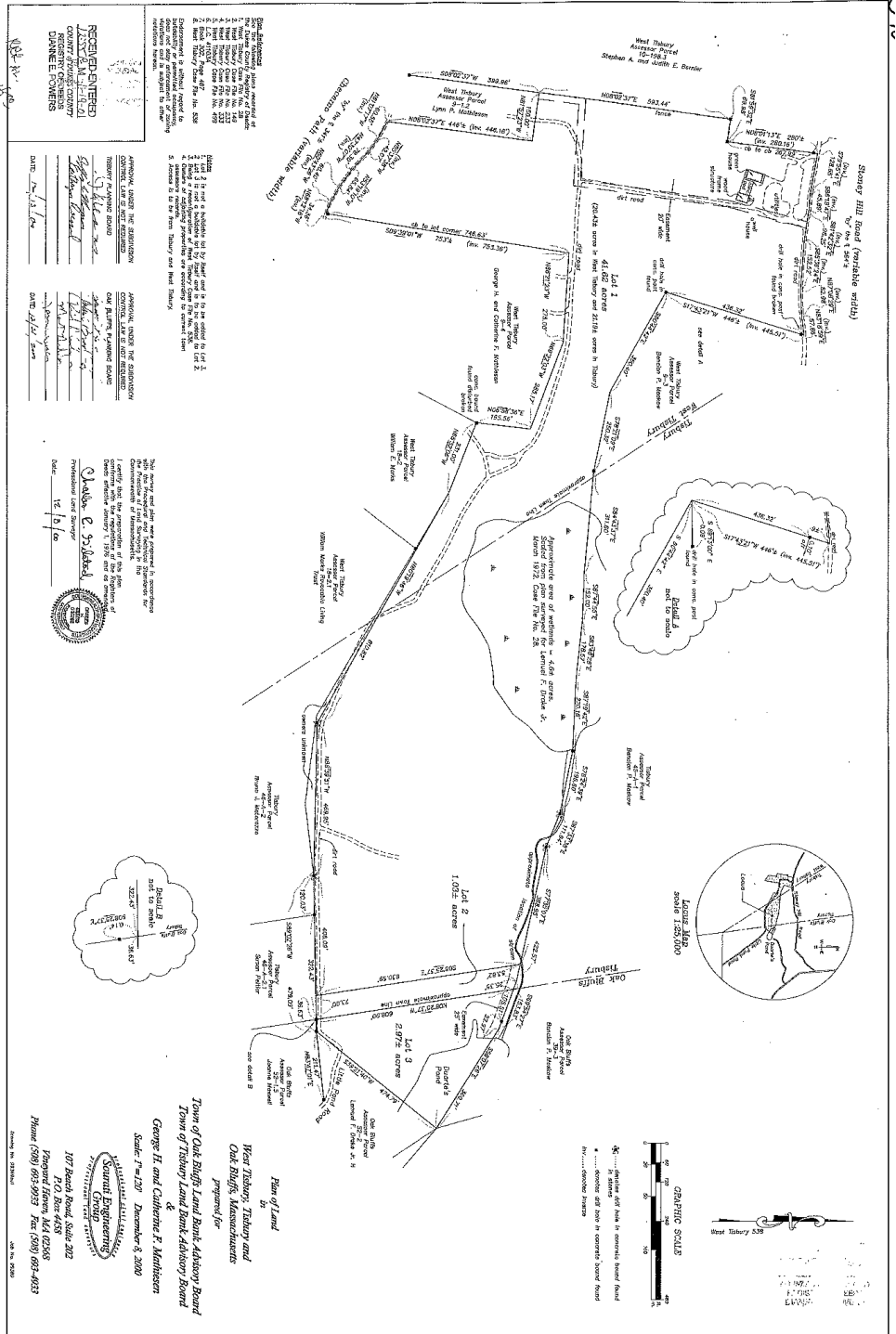
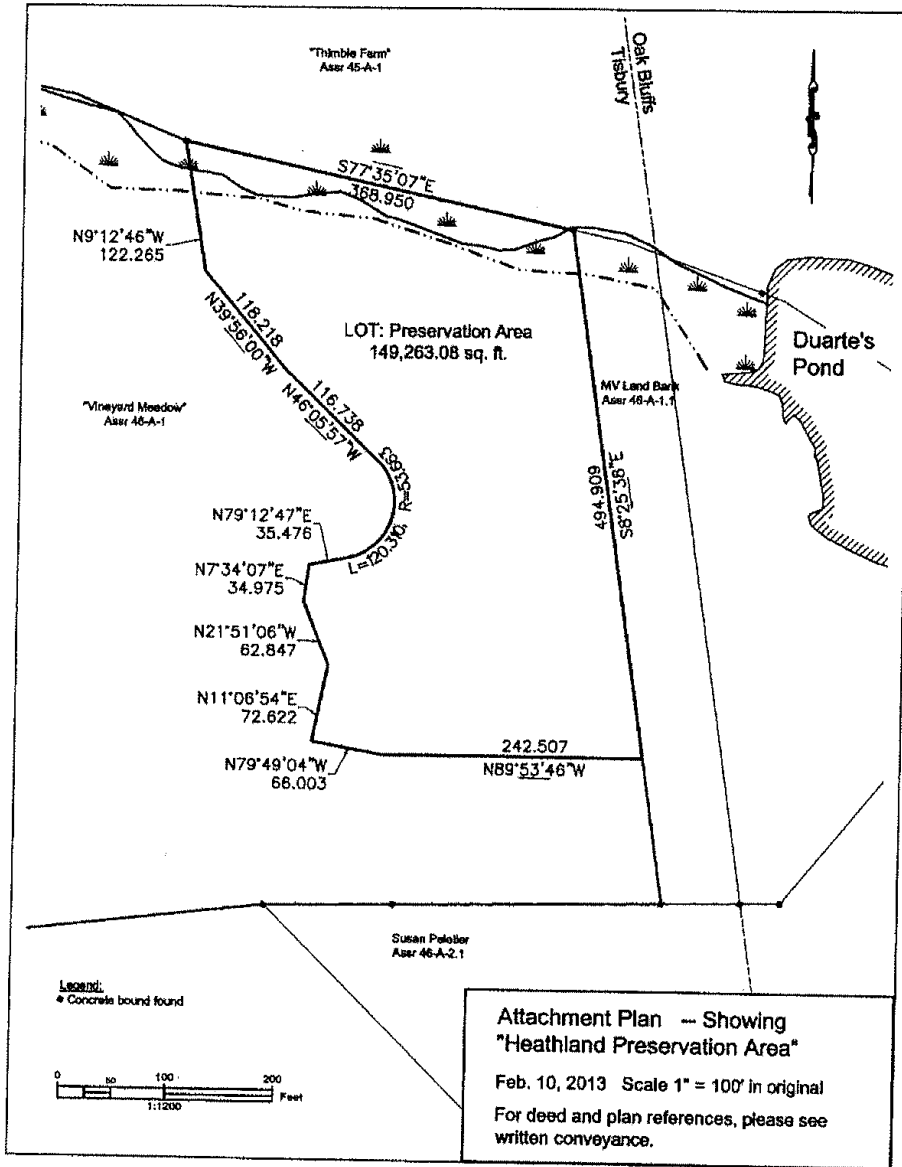




Figure 4: Attachment Plan -- Showing "Heathland Preservation Area"

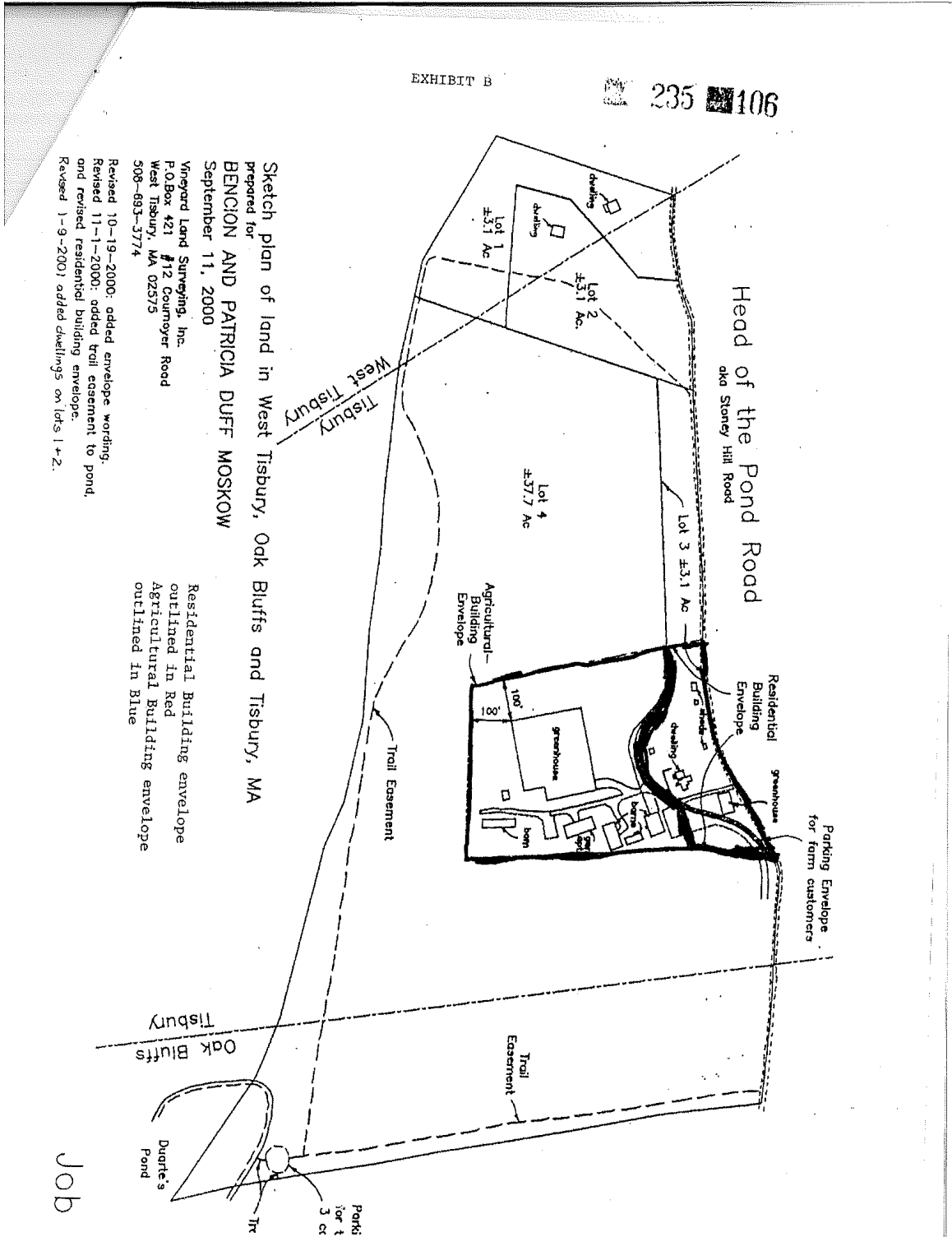
Little Duarte's Pond Preserve  
Tisbury, Oak Bluffs, West Tisbury, MA

EXHIBIT A



Attest:  
*Diane E. Patten* Register

Figure 5: Sketch Plan of Land  
Little Duarte's Pond Preserve  
Tisbury, Oak Bluffs, West Tisbury, MA







October 3, 2000

## Martha's Vineyard Land Bank Commission

*Little Duarte's Pond*  
 [ name ]  
 preliminary management plan

- |                           |                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| acreage                   | 4.0 acres                                                                                                                                                                                                                                                                                                                                                  |
| tax parcel nos.           | 52-3 (Oak Bluffs)<br>46-A-1 (Tisbury) [portion]                                                                                                                                                                                                                                                                                                            |
| nature conservation goals | <ol style="list-style-type: none"> <li>(1) conduct biological survey of property to serve as base for formulation of management objectives.</li> <li>(2) identify rare and endangered species, if any, and create plan to protect and encourage their populations.</li> </ol>                                                                              |
| natural products goals    | <ol style="list-style-type: none"> <li>(1) designate property as a category "e" property in the land bank's hunting policy (viz., archery only), but investigate whether broader hunting could be feasible.</li> <li>(2) permit fishing in Duarte's Pond.</li> <li>(3) continue, as fitting, the agricultural use of the property.</li> </ol>              |
| recreational goals        | <ol style="list-style-type: none"> <li>(1) open property for hiking, non-motorized biking and horseback-riding and other passive uses; maintain existing trails and install new trails, as needed and appropriate, to cross property and to provide access to the pond.</li> <li>(2) work to connect property with other conservation areas and</li> </ol> |

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printed on recycled paper

2

neighborhoods by means of trails and nearby roads.

(3) locate trailhead nearby.

*administrative goals*

(1) oversee and police land on regular basis in order to maintain property as an attractive conservation area.

(2) complete management plan before December of 2003.

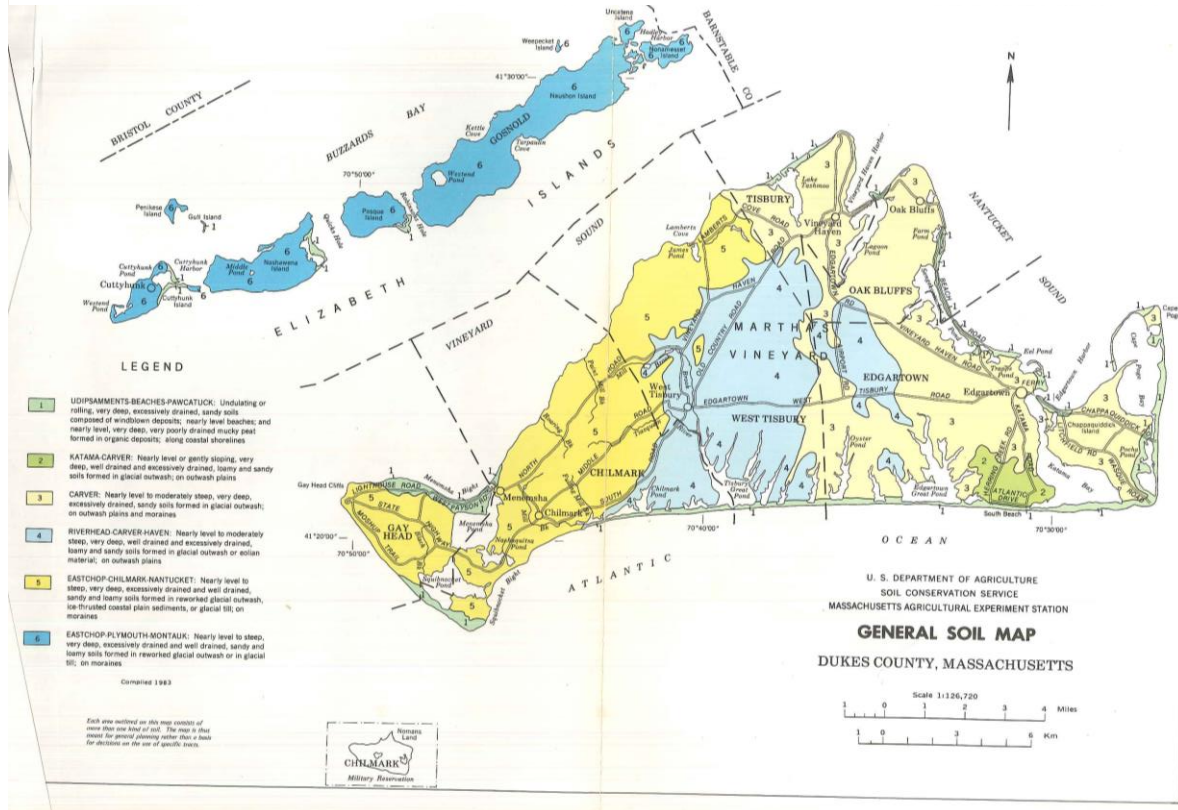
approved by vote of the Oak Bluffs town advisory board: October 3, 2000

approved by vote of the Tisbury town advisory board: September 11, 2000

approved by vote of the land bank commission: September 11, 2000

Appendix C. Soils Maps and Descriptions

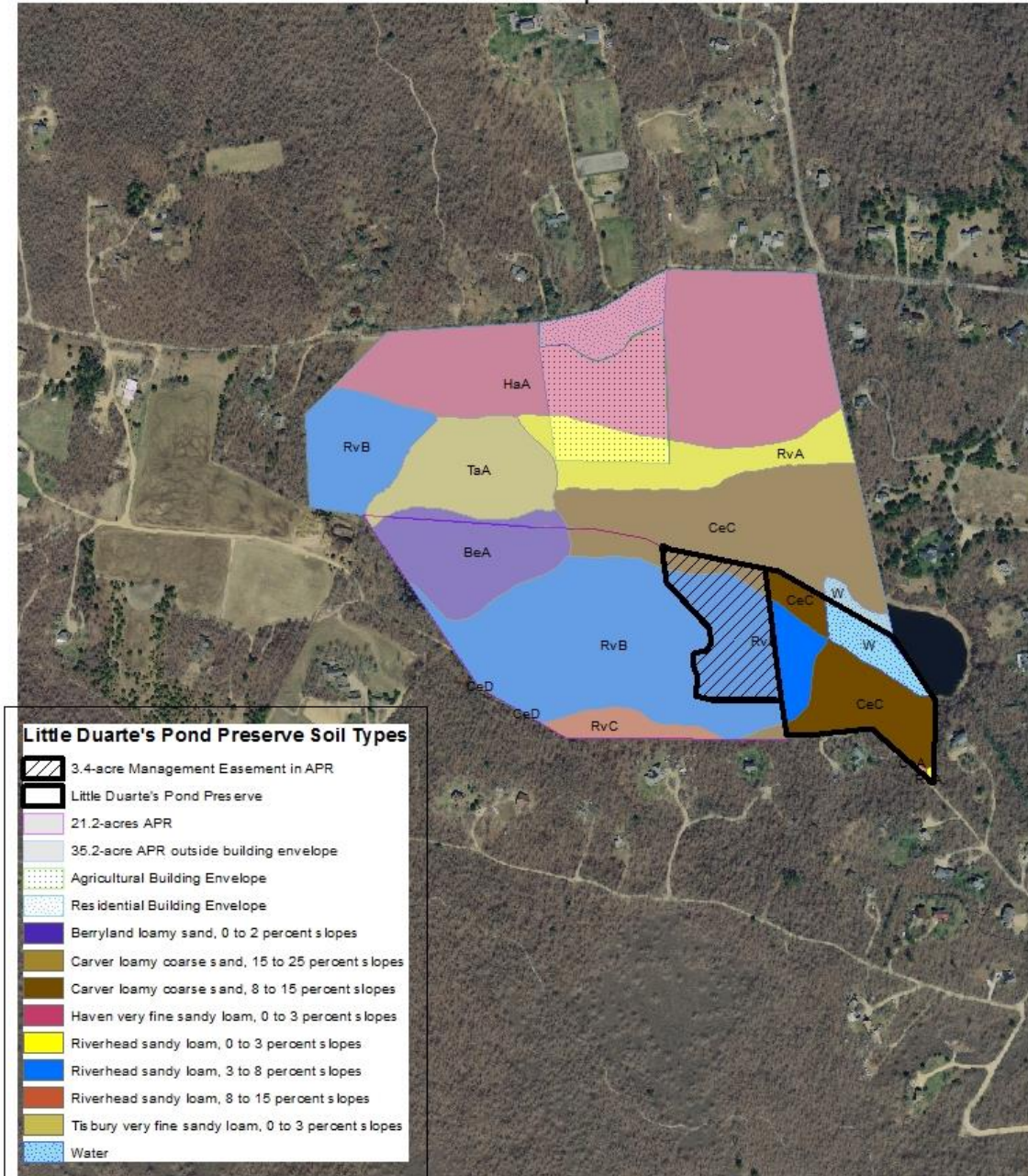
Map 7: General Soils Map  
 Little Duarte's Pond Preserve  
 Tisbury/Oak Bluffs/West Tisbury, MA



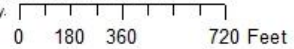
General soils map of Martha's Vineyard (SCS 1986)

### Map 8: Soils Map

Little Duarte's Pond Preserve  
 Tisbury/Oak Bluffs/West Tisbury  
 6.5 Acres (fee simple), 64 acres APR  
 Soils Map



Sources : Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs :2014 Aerial Photograph-Mass GIS, Martha's Vineyard Commission (MVC): parcel data- town assessors and MVC - 2011, Coordinate Ref. State Plane, Mass Mainland, Feet,NAD 83 Notes : Map prepared by the Martha's Vineyard Land Bank for planning purposes only. The land bank is not responsible for end-users interpretation of the map.  
 File: Soils\_2016mapLDP.mxd Date: 09-09-2016



The soils on the preserve are from the Carver and Riverhead-Carver-Haven General Soils series. There are five different soil series represented on the preserve. The following soil descriptions are derived from SCS (1986) Dukes County Soil Surveys.

a. Carver Loamy Coarse Sand (CeC, CeD)

CeC – A very deep soil excessively sloping of 8-15% that is excessively drained. This soil is poorly suited to cultivated crops, hay, pasture and woodland productivity and is generally suitable for building sites due to slope (SCS 1986).

CeD – A very deep soil, moderately sloping of 15-25%, and is an excessively drained soil. This carver soil is very permeable with a low available water capacity. The severe hazard of erosion makes the soil unsuitable for cultivated crops, hay, and pasture. The hazard of erosion presents a management concern for trails, landings, and access roads. Land shaping is generally for building on CeD soil (SCS 1986).

b. Haven Very Fine Sandy Loam (HaA)

HaA – A very deep soil, nearly level at 0-3% slope, and is a well-draining soil. Permeability and available water capacity is moderate. The soil is well suited for cultivated crops, hay, and pasture. HaA soil is well suited for woodland productivity (SCS 1986).

c. Riverhead Sandy Loam (RvA, RvB, RvC)

RvA – A very deep soil, nearly level at 0-3% slope, and is a well-draining soil. RvA soil is well suited to cultivate crops, hay, pasture, woodland productivity, and buildings, but soil may be droughty during periods of low rainfall (SCS 1986).

RvB – A very deep soil, with a gentle slope of 3-8%, and well-drained soil. Water capacity is moderate, mainly in grassland and some areas in cropland. Other areas are used as home sites. Soil is well suited to cultivate crops, hay, and pasture. Suitable as a site for building, with or without basements (SCS 1986).

RvC – A very deep soil, moderately sloping at 8-15%, and well drained. RvC is similar to RvA in that it too is well suited to cultivate crops, hay, pasture, woodland productivity, and buildings. However, the soil's sloping nature increases the challenges of building and is more inclined to erode for the same reason (SCS 1986).

d. Berryland Loamy Sand (BeA)

BeA – A deep nearly level and poorly drained soil with a slope of 0 to 2%. This soil has a seasonal high water table at or near the surface in fall, winter and spring making this soil unsuitable to farming and woodland production (SCS 1986).



e. Tisbury Very Fine Sandy Loam (TaA)

TaA – A deep nearly level and moderately well drained soil with a slope of 0 to 3%. This soil typically occurs in woodlands and grasslands and is well suited to cultivated crops, hay and pasturing. However, this soil has a seasonally high water table that can delay seeding of crops in the spring (SCS 1986).

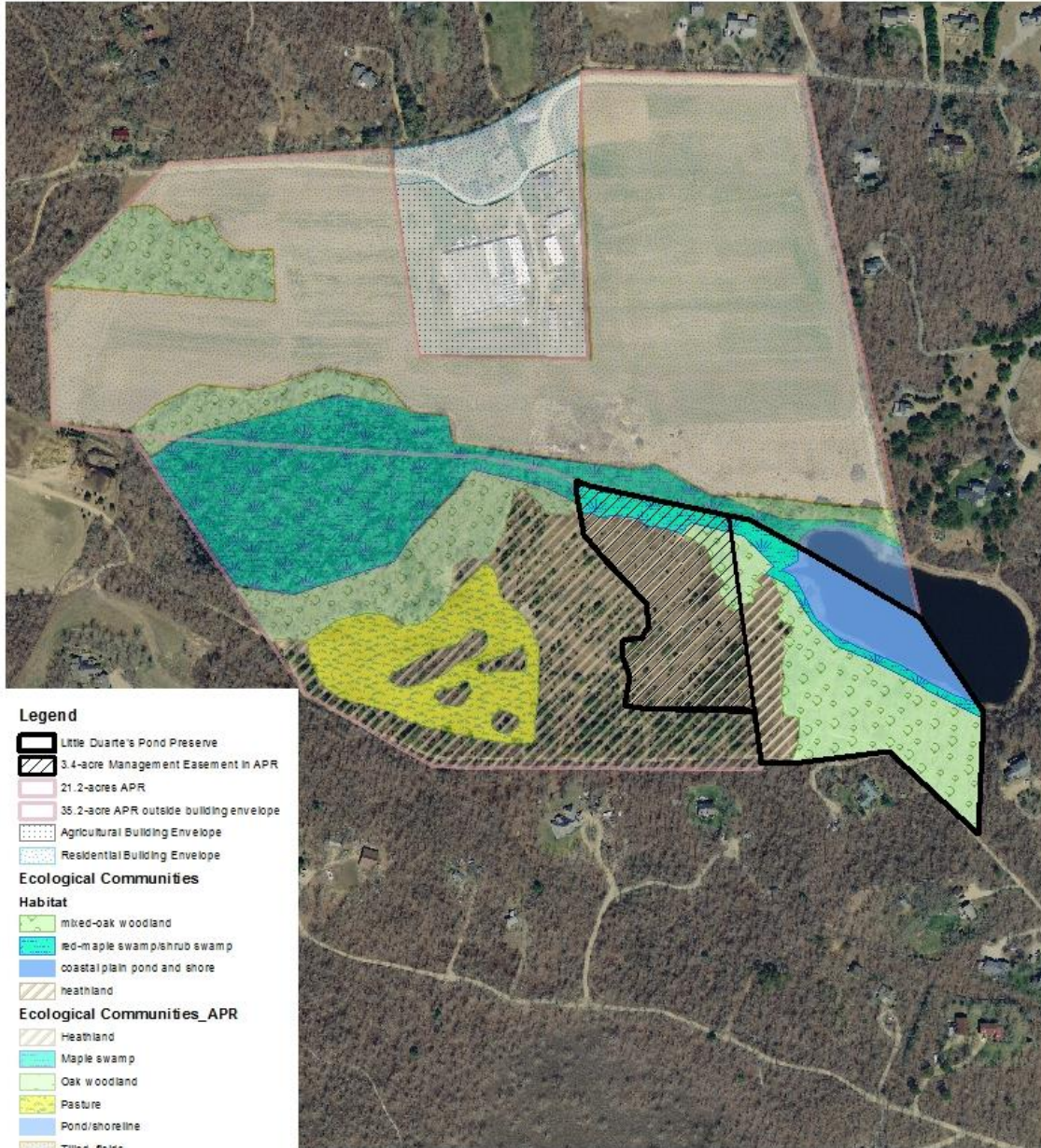
## Appendix D. Vegetation

### Methods

Vegetation inventories and surveys of the Little Duarte's Pond Preserve were conducted in 2002, 2005, 2006, 2013 and 2016. The non-point sampling method as described by Avery and Burkhart (1994) was used to inventory the trees of the woodlands. Ten points were inventoried in the mixed-oak woodland in 2002 and 2013. Three-meter squared circular plots were used to inventory the understory at each woodland point. Species diversity, density and percent cover of understory vegetation were recorded for all plots following methods described by Dunwiddie (1986). The heathland/old field was inventoried in 2013 following modified methods described by Dunwiddie (1986). Species diversity and density were recorded within 20 random 1-m<sup>2</sup> circular plots located along four transects. The line transect method was used by land bank staff and Duke University Ph.D candidate, Claire Berger, to survey the pond shoreline. Land bank staff sampled three transects and Claire Berger sampled seven transects. Species diversity and density were recorded and frequency of occurrence was calculated from the data for a total of 94 (1-meter) plots. Tree density in the heathland/old field was recorded in eight equally spaced 20-m<sup>2</sup> square plots. Tree species and counts were recorded for each plot. Flora at the Little Duarte's Pond Preserve is listed in Table 2 with proper nomenclature according to Flora Novae Angliae (Haines 2011).

### Map 9: Ecological Communities Map

Little Duarte's Pond Preserve  
 Tisbury/Oak Bluffs/West Tisbury  
 604 Acres (fee simple) 64 Acres (APR)  
 Ecological Communities Map



0 120 240 480 Feet

Sources : Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs :Aerial Color Ortho Imagery-2014, parcel data- town assessors and MVC - 2011/2014, trails , Coordinate Ref: State Plane, Mass Mainland, Feet, NAD 83 Notes: Map prepared by the Martha's Vineyard land Bank for planning purposes only. The land bank is not responsible for end-users interpretation of the map.  
 File:Eco\_2010mapLDP.mxd Date: 09-09-2016

## Habitat Descriptions

Five cover types compose the Little Duarte's Pond Preserve. These five cover types are divided between two general vegetation communities: upland and wetland. The red maple swamp/shrub swamp (1.1 acres), pond (1.1 acres) and intermittently exposed shoreline (0.41 acres) compose the wetland community and the mixed-oak woodland (3.78 acres) and the heath/old field (4.00 acres) represent the upland community.

### Wetland

#### A. Red-Maple Swamp (0.77 acres)

The red-maple swamp on the preserve occurs along the intermittent stream that runs from the pond to the larger red-maple swamp that occurs on the APR. The swamp has an overstory of mostly red maple (*Acer rubra*) and beetlebung (*Nyssa sylvatica*) with an understory of highbush blueberry (*Vaccinium corymbosum*) and sweet pepperbush (*Clethra alterniflora*).

#### B. Shrub swamp (0.33 acres)

The shrub swamp occurs around the pond between the shoreline and the woodland. It is between 5 and 15 feet deep. Wetland shrubs such as highbush blueberry, sweet pepperbush, winterberry (*Ilex verticillata*) and swamp azalea (*Rhododendron viscosum*) dominate this habitat.

#### C. Shoreline (0.41 acres)

The shoreline contributes the greatest to the floristic richness of plants occurring on the property and represents 51% of the total number of plant species known to occur on the property (Appendix D, Table 2). Species richness is the number of species present in a community (Begon et al. 1990). The shoreline comprises rings of plant species with certain plants dominating each ring. The plant ring nearest the water with freshly exposed soil is dominated by low-growing plants such as golden pert (*Gratiola aurea*) and dwarf St. John's-wort (*Hypericum mutilum*). The second plant ring is dominated by sedges, rushes and wetland grasses such as soft rush (*Juncus effusus*), Canada rush (*Juncus canadensis*), broom sedge (*Carex scoparia*) and fringed brome (*Bromus ciliates*). The third ring of plants is dominated by goldenrod species and is followed by herbaceous plants such as steeple bush (*Spiraea tomentosa*) and blueberry species.

Transects of the pond shore were surveyed in 2005 and again in 2006 for comparison. The community similarity coefficients of the community for the shoreline in 2005 and 2006 ranged from 0% to 61% and are based on the Jaccard coefficient as reported by Mueller, Dornbois and Ellenberg 1974 in Brower et al. 1998. The 0% coefficient represents transects that were underwater during 2006 and not during 2005. Water level has a considerable impact on species diversity along the shoreline.

#### B. Mixed-oak Woodland (3.78 acres)

The mixed-oak woodland covers 58% of the preserve and supports habitat for 24% of plants known to occur on the preserve. The ancient ways and paths contribute to the diversity of this habitat. Paths maintained through hundreds of years of use provide disturbed openings for species to colonize and ample light and water or growth due to the slight interruption in the tree canopy.

The woodland in the preserve has an average percent cover of 70% with black and white oak dominating the overstory. In the understory low bush blueberry and black huckleberry are the dominant species with importance values of 44 and 39, respectively. Importance values are the compilations of relative dominance, density and frequency. Trees in the woodland are, on average, 40 feet high and 9.6 inches in diameter at breast height. The estimated basal area per acre is 86 square feet for the entire woodland. There are approximately 82 trees per acre in the dbh class of 10 inches and greater.

#### C. Heathland (4 acres)

The heathland/old field on the preserve was a vineyard for 20 years. In 2008, the vineyard closed its doors. However, the fields on the preserve has been left fallow several years prior. What was once open habitat is now overgrown and dominated by young pitch pine, red cedar and black cherry trees with average number of trees per acre between 252 and 170. The fence posts and raised rows are still visible in the field. Although the trees are plentiful they are small and congregated, leaving large areas of open heathland and creating a mosaic of colors. The bright green and grey bunches of fruticose lichen and dark green polytrichum moss species provide an aesthetic backdrop for the clumps of silver-green upland willow (*Salix humilis*) and specks of bright yellow flowers of sickle-leaved golden-aster (*Pityopsis falcate*), purple flowers of flax-leaved stiff-aster (*Ionactis linariifolia*) and red berries of bearberry (*Arctostaphylos urva-ursi*).

The heathland/old field is the second greatest contributor to the floristic diversity on the preserve and represents 40% of species known to occur on the preserve. The heathland is dominated by little bluestem (*Schizachyrium scoparium*), bearberry (*Arctostaphylos uva-ursi*), hair fescue (*Fesctuca filliformis*), indigo (*Baptisia australis*), and dewberry (*Rubus flagellaris*) according to importance values and percent frequency of occurrence in plot samples.

Table 2. Flora of Little Duarte's Pond Preserve, Oak Bluffs and Tisbury, MA.

	Scientific name	Common name	Rank <sup>b</sup>	Type	Coastal plain pond	pond	mixed-oak woodland	red-maple swamp/ shrub swamp	heathland/old field
	<b>Non-vascular plants</b>								
	<b>Lichen</b>								
1	<i>Cladina rangiferina</i>	reindeer lichen	X	lichen					c
2	<i>Cladina subtenuis</i>	reindeer lichen	X	lichen					x
3	<i>Cladonia cristatella</i>	British soldiers	X	lichen					x
4	<i>Ephebe lanata</i>	tree lichen	X	lichen			x		
5	<i>Usnea strigosa</i>	tree lichen	X	lichen			x		
	<b>Moss</b>								
1	<i>Dicranella palustris</i>	matt moss	X	moss					
2	<i>Leucobryum glaucum</i>	pincushion moss	X	moss					
3	<i>Polytrichum ohioense</i>	haircap moss	X	moss	c				u
4	<i>Sphagnum teres</i>	shpagnum	X	moss	x				
	<b>Vascular Plants</b>								
	<b>GRAMINOID</b>								
	<b>Cyperaceae</b>								
1	<i>Cladium marisioides</i>	twigrush	UN	graminoid					
2	<i>Carex pensylvanica</i>	pennsylvania sedge	AN	graminoid	x		u		
3	<i>Carex scoparia</i>	broom sedge	UN	graminoid	c				
4	<i>Carex straminea</i>	straw sedge	UN	graminoid	x				
5	<i>Cyperus acuminatus</i>	flatsedge	U	graminoid	u				
6	<i>Cyperus dentatus</i>	pondshore flatsedge	UN	graminoid	u				
7	<i>Cyperus diandrus</i>	umbrella flatsedge	UN	graminoid	u				
8	<i>Cyperus strigosus</i>	straw-colored flatsedge	UN	graminoid	x				
9	[Redacted]	[Redacted]	[Redacted]	[Redacted]					
10	<i>Eleocharis obtusa</i>	softstem spikesedge	UN	graminoid	u				
11	<i>Fimbristylis autumnalis</i>	Northern fimbry	RN	graminoid	x				
12	<i>Rhynchospora capitellata</i>	brown beaksedge	UN	graminoid	u				
13	<i>Scirpus americanus</i>	common three square	UN	graminoid	x				

14	<i>Scirpus cyperinus</i>	woolgrass	FN	graminoid	x				
15	<i>Scirpus pungens</i>	chairmaker's rush	FN	graminoid	x				
	<b>Scientific name</b>	<b>Common name</b>	<b>Rank<sup>b</sup></b>	<b>Type</b>	<b>Coastal plain pond</b>	<b>pond</b>	<b>mixed-oak woodland</b>	<b>red-maple swamp/ shrub swamp</b>	<b>heathland/old field</b>
16	<i>Schoenoplectus smithii</i>	Smith's bulrush	UN	graminoid	u				
17	<i>Schoenoplectus purshianus</i>	weak-stalked bulrush	HN	graminoid	x				
	<b>Juncaceae</b>								
18	<i>Juncus acuminatus</i>	sharp-fruited rush	RN	graminoid	x				
19	<i>Juncus canadensis</i>	Canada rush	FN	graminoid	a				
20	<i>Juncus effusus</i>	soft rush	AN	graminoid	a				
21	<i>Juncus greenei</i>	greene's rush	FN	graminoid					u
22	<i>Juncus pelocarpus</i>	pondshore rush	RN	graminoid	x				
23	<i>Juncus tenuis</i>	path rush	AN	graminoid	x				u
	<b>Poaceae</b>								
24	<i>Agrostis gigantea</i>	red top	FI	graminoid	u				u
25	<i>Agrostis stolonifera</i>	creeping bentgrass	UN	graminoid	u				x
26	<i>Anthoxanthum odoratum</i>	sweet vernal grass	FI	graminoid					u
27	<i>Bromus ciliatus</i>	fringed brome	X	graminoid	c				
28	<i>Descampsia flexuosa</i>	common hairgrass	FN	graminoid	x				x
29	<i>Digitaria sp.</i>	crab grass	X	graminoid	x				
30	<i>Donthonia spicata</i>	oat grass	FN	graminoid					x
31	<i>Echinochloa colona</i>	jungle rice	U	graminoid	x				
32	<i>Eragrostis spectabilis</i>	purple lovegrass	ON	graminoid					u
33	<i>Festuca filiformis</i>	hair fescue	UI	graminoid					a
34	<i>Festuca ovina</i>	sheep fescue	FI	graminoid					a
35	<i>Glyceria obtusa</i>	coastal mannagrass	UN	graminoid	x				
36	<i>Holcus lanatus</i>	velvet grass	AI	graminoid	u				
37	<i>Leersia oryzoidea</i>	rice cutgrass	RN	graminoid	u				
38	<i>Panicum languinosum</i>	panicum grass	X	graminoid	u				u
39	<i>Panicum virgatum</i>	switchgrass	FN	graminoid	c				
40	<i>Paspalum sp.</i>	paspalum grass	X	graminoid	u				
41	<i>Schizachyrium scoparium</i>	little blue stem	FN	graminoid	c				a

FERN									
Dennstaedtiaceae									
	Scientific name	Common name	Rank <sup>b</sup>	Type	Coastal plain pond	pond	mixed-oak woodland	red-maple swamp/ shrub swamp	heathland/old field
42	<i>Pteridium aquilifolium</i>	bracken fern		fern			x		
Onocleaceae									
43	<i>Onoclea sensibilis</i>	sensitive fern	AN	fern	x			x	
HERB									
Apiaceae									
44	<i>Daucus carota</i>	queen anne's lace	FI	herb	x				x
Apocynaceae									
45	<i>Asclepias tuberosa</i>	butterflyweed	FN	herb					u
Araliaceae									
46	<i>Aralia nudicaulis</i>	wild sarsaparilla	FN	herb			u		
Asteraceae									
47	<i>Achillae millefolium</i> var. <i>millefolium</i>	yarrow	AI	herb	u				x
48	<i>Ambrosia artemisiifolia</i>	ragweed	FN	herb	u				x
49	<i>Symphyotricum dumosus</i>	bushy aster	FN	herb	c				x
50	<i>Sericocarpus linifolius</i>	stiff aster	AN	herb					x
51	<i>Sericocarpus paternus</i>	white-topped aster	AN	herb					x
52	<i>Symphyotricum racemosus</i>	small white aster	RN	herb					x
53	<i>Eurybia spectabilis</i>	showy aster	FN	herb					x
54	<i>Bidens connata</i>	swamp beggar ticks	UN	herb	u				
55	<i>Centaurea stoebe</i>	spotted knapweed	FI	herb					x
56	<i>Pityopsis falcata</i>	sickle-leaved golden-aster	AN	herb	u				c
57	<i>Cirsium discolor</i>	field thistle	ON	herb					u
58	<i>Conyza canadensis</i>	horseweed	ON	herb	u				
59	<i>Coreopsis rosea</i>	rose coreopsis	RN	herb	x				
60	<i>Eriqeron strigosus</i>	daisy fleabane	ON	herb					x
61	<i>Eupatorium hyssopifolium</i>	hyssop-leaved boneset	FN	herb	u				u
62	<i>Eupatorium perfoliatum</i>	boneset	ON	herb	x				
63	<i>Euthamia graminifolia</i>	grass-leaved goldenrod	AN	herb	u				u



64	<i>Euthamia tenuifolia</i>	slender-leaved goldenrod	AN	herb	c				u
65	<i>Gnaphalium obtusifolium</i>	sweet everlasting	AN	herb	c				
	<b>Scientific name</b>	<b>Common name</b>	<b>Rank<sup>b</sup></b>	<b>Type</b>	<b>Coastal plain pond</b>	<b>pond</b>	<b>mixed-oak woodland</b>	<b>red-maple swamp/ shrub swamp</b>	<b>heathland/old field</b>
66	<i>Gratiola aurea</i>	golden pert	ON	herb	x				
67	<i>Hieracium aurantiacum</i>	orange hawkweed	X	herb	c				
68	<i>Hieracium pilosella</i>	mouse ear hawkweed	UI	herb					u
69	<i>Hieracium venosum</i>	rattlesnake weed	FN	herb			x		
70	<i>Hypochaeris radicata</i>	cat's ear	FI	herb	u				u
71	<i>Ionactis linariifolia</i>	flax-leaved stiff-aster	ON	herb					x
72	<i>Nabalus trifoliata</i>	fall rattlesnake-root	ON	herb			x		
73	<i>Solidago odora</i>	sweet goldenrod	AN	herb					x
74	<i>Solidago rugosa</i>	rough-stemmed goldenrod	AN	herb	a				
75	<i>Symphyotrichum ericoides</i>	heath aster	RN	herb					x
76	<i>Symphyotrichum lateriflorus</i>	calico aster	RN	herb					x
77	<i>Symphyotrichum pilosum</i>	downy aster	FN	herb					u
78	<i>Tanacetum vulgare</i>	common tansy	FI	herb					x
79	<i>Taraxacum officinale</i>	common dandelion	AI	herb			x		
	<b>Cabombaceae</b>								
80	<i>Brasenia schreiberi</i>	water-shield	ON	herb		x			
	<b>Caryophyllaceae</b>								
81	<i>Dianthus armeria</i>	deptford pink	OI	herb					x
	<b>Cistaceae</b>								
82	<i>Crochanthemum canadensis</i>	frostweed	FN	herb					u
83	<i>Hudsonia ericoidea</i>	golden heather	AN	herb					x
84	<i>Lechea minor</i>	thymeleaf pinweed	ON-WL	herb	x				
	<b>Droseraceae</b>								
85	<i>Drosera intermedia</i>	spatulate-leaved sundew	ON	herb	x				
86	<i>Drosera rotundifolia</i>	round-leaved sundew	ON	herb	x				
	<b>Ericaceae</b>								
87	<i>Arctostaphylos uva-ursi</i>	bearberry	AN	herb			u		a
88	<i>Epigaea repens</i>	trailing arbutus	AN	herb			c		x
89	<i>Gaultheria procumbens</i>	wintergreen	AN	herb			u		



90	<i>Monotropa uniflora</i>	indian pipe	FN	herb			x		
	<b>Eriocaulaceae</b>								
	<b>Scientific name</b>	<b>Common name</b>	<b>Rank<sup>b</sup></b>	<b>Type</b>	<b>Coastal plain pond</b>	<b>pond</b>	<b>mixed-oak woodland</b>	<b>red-maple swamp/ shrub swamp</b>	<b>heathland/old field</b>
91	<i>Eriocaulon aquaticum</i>	pipewort	RN	herb			x		
	<b>Fabaceae</b>								
92	<i>Baptisia tinctoria</i>	wild indigo	FN	herb	u				a
93	<i>Lespedeza capitata</i>	roundhead bushclover	FN	herb	u				u
94	<i>Vicia tetrasperma</i>	sparrow vetch	UI	herb	u				
	<b>Haloragaceae</b>								
95	<i>Myriophyllum humile</i>	low watermilfoil	UN	herb		x			
	<b>Hypericaceae</b>								
96	<i>Eleocharis acicularis</i>	little spike sedge	UN	herb	x				
97	<i>Hypericum canadense</i>	canada st. john's-wort	ON	herb	u				u
98	<i>Hypericum gentianoides</i>	orange grass	FN	herb					u
99	<i>Hypericum multilum</i>	dwarf st. john's wort	ON	herb	x				
100	<i>Triadenum virginicum</i>	marsh st. john's wort	FN	herb	x				
	<b>Iridaceae</b>								
101	<i>Sisyrinchium atlanticum</i>	eastern blue-eyed grass	UN	herb	x				
102	<i>Sisyrinchium montanum</i>	meadow blue-eyed grass	RN	herb	c				
	<b>Isoetaceae</b>								
103	<i>Isoetes tuckermanii</i>	tuckermanii quillwort	HN	herb		x			
	<b>Lamiaceae</b>								
104	<i>Lycopus anplectens</i>	horehound	HN	herb	x				
105	<i>Lycopus uniflorus</i>	northern bugleweed	UN	herb	c				
106	<i>Scutellaria galericulata</i>	marsh skullcap	RN	herb	x				
107	<i>Teucrium canadense</i>	american germander	FN	herb	x				
	<b>Lycopodiaceae</b>								
108	<i>Lycopodium obscurum</i>	ground pine	ON	herb			x		x
	<b>Melastomataceae</b>								
109	<i>Rhexia virginica</i>	meadow beauty	RN	herb	x				
	<b>Orchidaceae</b>								

110	<i>Spiranthes tuberosa</i>	little laddies' tresses	ON	herb						x
	<b>Plantaginaceae</b>									
	<b>Scientific name</b>	<b>Common name</b>	<b>Rank<sup>b</sup></b>	<b>Type</b>	<b>Coastal plain pond</b>	<b>pond</b>	<b>mixed-oak woodland</b>	<b>red-maple swamp/ shrub swamp</b>	<b>heathland/old field</b>	
111	<i>Callitriche heterophylla</i>	water-star wort	UN	herb		x				
	<b>Persecaria</b>									
112	<i>Persecaria punctata</i>	annual water-smartweed	UN	herb	x					
113	<i>Persecaria hydropiperoides</i>	mild water pepper	UN	herb	u					
114	<i>Persecaria lapathifolium</i>	nodding smartweed	UN	herb	x					
115	<i>Persecaria maculosa</i>	lady's thumb	UN	herb	x					
	<b>Polygonaceae</b>									
116	<i>Rumex acetosella</i>	sheep sorrel	AI	herb	c					
	<b>Portulacaceae</b>									
117	<i>Ludwigia palustris</i>	water purslane	ON	herb		x				
	<b>Potamogetonaceae</b>									
118	<i>Potamogeton pectinatus</i>	pondweed	U	herb		x				
	<b>Primulaceae</b>									
119	<i>Anagallis arvensis</i>	scarlet pimpernel	OI	herb	x					x
120	<i>Lysimachia terrestris</i>	swamp candles	ON	herb	x					
121	<i>Trientalis borealis</i>	starflower	FN	herb			u			
	<b>Pyrolaceae</b>									
122	<i>Chimaphila maculata</i>	striped wintergreen	FN	herb			x			
123	<i>Pyrola americana</i>	roundleaf pyrola	FN	herb				x		
	<b>Nymphaeaceae</b>									
124	<i>Nymphaea odorata</i>	white waterlily	ON	herb		x				
	<b>Rosaceae</b>									
125	<i>Fragaria virginiana</i>	wild strawberry	ON	herb	u					
126	<i>Potentilla canadensis</i>	dwarf cinquefoil	FN	herb	c					x
127	<i>Spirea tomentosa</i>	steeple bush	FN	herb	c					
	<b>Rubiaceae</b>									
128	<i>Galium paluste</i>	marsh bedstraw	UN	herb	u					
129	<i>Galium trifidum</i>	small bedstraw	UN	herb	x					

	<b>Scophulariaceae</b>								
	<b>Scientific name</b>	<b>Common name</b>	<b>Rank<sup>b</sup></b>	<b>Type</b>	<b>Coastal plain pond</b>	<b>pond</b>	<b>mixed-oak woodland</b>	<b>red-maple swamp/ shrub swamp</b>	<b>heathland/old field</b>
130	<i>Gratiola aurea</i>	golden pert	ON	herb	u				
131	<i>Aureolaria virginica</i>	downy false foxglove	RN	herb	u				
132	<i>Lindernia dubia</i>	false pimpernel	RN	herb	x				
133	<i>Nuttallanthus canadensis (Linaria)</i>	blue toadflax	FN	herb	u				
	<b>Violaceae</b>								
134	<i>Viola lanceolata</i>	lanceleaf violet	FN	herb	c				
	<b>Xyridaceae</b>								
135	<i>Xyris difformis</i>	yellow-eyed grass	RN	herb	x				
	<b>SHRUB</b>								
	<b>Anacardaceae</b>								
136	<i>Rhus copallinum</i>	shining sumac	FN	shrub	u				c
137	<i>Rhus glabra</i>	smooth sumac	ON	shrub				x	
	<b>Aquifoliaceae</b>								
138	<i>Ilex verticillata</i>	winterberry	FN	shrub				x	
	<b>Caprifoliaceae</b>								
139	<i>Lonicera japonica</i>	japanese honeysuckle	AI	shrub	u		u		u
140	<i>Viburnum recognitum</i>	northern arrowwood	AN	shrub			u	x	u
	<b>Clethraceae</b>								
141	<i>Clethra alnifolia</i>	sweetpepper bush	AN	shrub			u	x	
	<b>Ericaceae</b>								
142	<i>Gaylussacia baccata</i>	black huckleberry	AN	shrub			c		u
143	<i>Gaylussacia frondosa</i>	dangleberry	FN	shrub			x		
144	<i>Kalmia angustifolia</i>	sheep laurel	AN	shrub			u		
145	<i>Vaccinium angustifolium</i>	late lowbush blueberry	AN	shrub			a		u
146	<i>Vaccinium corymbosum</i>	highbush blueberry	FN	shrub			u	x	u
147	<i>Vaccinium pallidum</i>	early sweet lowbush blueberry	FN	shrub			c		
148	<i>Rhododendron viscosum</i>	swamp azalea	FN	shrub				x	
	<b>Myricaceae</b>								
149	<i>Comptonia peregrina</i>	Sweet fern	AN	shrub					x

150	<i>Myrica pensylvanica</i>	bayberry	AN	shrub			x	x	x
	<b>Roseaceae</b>								
	<b>Scientific name</b>	<b>Common name</b>	<b>Rank<sup>b</sup></b>	<b>Type</b>	<b>Coastal plain pond</b>	<b>pond</b>	<b>mixed-oak woodland</b>	<b>red-maple swamp/ shrub swamp</b>	<b>heathland/old field</b>
151	<i>Amelanchier sp.</i>	american shadbush	FN	shrub			x		
152	<i>Rosa multiflora</i>	multiflora rose	FI	shrub			x		x
153	<i>Rosa virginiana</i>	Virginia rose	FN	herb	u				u
	<b>TREE</b>								
	<b>Aceraceae</b>								
154	<i>Acer rubrum</i>	red maple	AN	tree				x	
	<b>Betulaceae</b>								
155	<i>Betula populifolia</i>	grey birch	ON	tree			U	x	
	<b>Cornaceae</b>								
156	<i>Nyssa sylvatica</i>	beetlebung	AN	tree			U	x	
	<b>Cupressaceae</b>								
157	<i>Juniperus virginiana</i>	red cedar	AN	tree					a
	<b>Fagaceae</b>								
158	<i>Fagus grandifolia</i>	american beech	FN	tree			x		
159	<i>Quercus alba</i>	white oak	AN	tree			A/c	x	c
160	<i>Quercus coccinea</i>	scarlet oak	AN	tree			C		u
161	<i>Quercus ilicifolia</i>	scrub oak	AN	tree			u		a
162	<i>Quercus stellata</i>	post oak	FN	tree					u
163	<i>Quercus velutina</i>	black oak	AN	tree			A/a		a
	<b>Lauraceae</b>								
164	<i>Sassafras albidum</i>	sassafras	FN	tree			x		u
	<b>Pinaceae</b>								
165	<i>Pinus rigida</i>	pitch pine	AN	tree			C	x	a
166	<i>Pinus strobus</i>	white pine	FI	tree			x		
167	<i>Pinus syvestris</i>	Scotch pine	U	tree			x		
	<b>Rosaceae</b>								
168	<i>Amelanchier laevis</i>	smooth shadbush	UN	tree			c	x	
169	<i>Prunus serotina</i>	black cherry	AN	tree			U/c	x	a

	<b>Salicaceae</b>								
170	<i>Salix cinerea</i>	grey willow	CI	tree				x	
	<b>Scientific name</b>	<b>Common name</b>	<b>Rank<sup>b</sup></b>	<b>Type</b>	<b>Coastal plain pond</b>	<b>pond</b>	<b>mixed-oak woodland</b>	<b>red-maple swamp/ shrub swamp</b>	<b>heathland/old field</b>
171	<i>Salix humilis</i>	upland willow	UN	tree					x
172	<i>Salix nigra</i>	black willow	UN	tree				x	
	<b>VINE</b>								
	<b>Anacardaceae</b>								
173	<i>Toxicodendron radicans</i>	poison ivy	AN	vine	c		u		
	<b>Celastraceae</b>								
174	<i>Celastrus orbiculatus</i>	oriental bittersweet	AI	vine	u				u
	<b>Rosaceae</b>								
175	<i>Rubus flagellaris</i>	prickly dewberry	FN	vine	u		u		a
176	<i>Rubus hispida</i>	bristly dewberry	AN	vine	a			x	
177	<i>Rubus allegheniensis</i>	blackberry	FN				u		x
	<b>Smilacaceae</b>								
178	<i>Smilax rotundifolia</i>	common greenbrier	AN	vine			x		
179	<i>Smilax glauca</i>	sawbrier	FN	vine					u
	<b>Vitaceae</b>								
180	<i>Parthenocissus quinquefolia</i>	Virginia creeper	AN	vine	u				
	<b>Total species</b>				97	7	45	19	76
	<b>% of total species on Preserve</b>				51%	4%	24%	10%	40%

<sup>a</sup>A = abundant (percent occurrence greater than 50%), C = common (percent occurrence greater than 20% but less than or equal to 50%), U = uncommon (percent occurrence less than or equal to 20%), x = present on the preserve but not detected in a survey plot; Upper case = woodland survey; lower case = shoreline or understory survey; shoreline survey (n=94; 2002, 2005 and 2006); woodland survey (n=10; 2002 and 2013), heathland survey (n=20; 2013).

<sup>b</sup>Rarity of plants on Martha's Vineyard: U = unknown, A = abundant (almost always occur in typical habitat), F = frequent (often occur in typical habitat), O = occasional (occur in more than 10 sites but are not expected to occur in typical habitat), R = rare (occur in ten or fewer sites), H = historic (recorded but not sighted in past 40 years), N =

native, I = introduced, X = no data, WL = watch-listed by MA, SC = special concern by MA, E = endangered, T = threatened (Swanson and Knapp 1999).

## Appendix E. Wildlife Table

Table 3. Wildlife at Little Duarte's Pond Preserve, Oak Bluffs and Tisbury, MA.

Scientific name	Common name	Wetland <sup>a</sup>	Upland <sup>b</sup>
<b>Kingdom Animalia</b>			
<b>Phylum Arthropoda</b>			
<b>Class Insecta</b>			
<b>Order Hymenoptera (sawflies, ants, wasps, and bees)</b>			
Family Sphecidae: <i>Eremnophila aureonotata</i>	thread-waisted wasp		W
<b>Order Lepidoptera (butterflies and moths)<sup>b</sup></b>			
<b>Superfamily Papilionoidea (butterflies)</b>			
Family Nymphalidae: <i>Nymphalis antiopa</i>	mourning cloak	Sp	
Family Pieridae: <i>Pieris rapae</i>	cabbage white	Sp	S
<b>Order Diptera (flies)</b>			
Family Culicidae: species unknown	mosquitoes	S	S, Sp
Family Tabanidae: <i>Chrysops</i> sp.	deer flies	S	S
Family Bombyliidae: <i>Anthrax analis</i>	bee flies		Sp
<b>Order Odonata</b>			
<b>Suborder Anisoptera (dragonflies)</b>			
Family Aeshnidae: <i>Anax junius</i>	Common green darner	S	
Family Libellulidae: <i>Celithemis elisa</i>	Calico pennant	S	
Family Libellulidae: <i>Libellula exusta</i>	White corporal	S	
Family Libellulidae: <i>Libellula lydia</i>	Common whitetail	S	
Family Libellulidae: <i>Perithemis tenera</i>	Eastern amberwing	S	
Family Libellulidae: <i>Erythemis simplicicollis</i>	Eastern pondhawk	S	
<b>Suborder Zygoptera (damselflies)</b>			
Family Coenagrionidae: <i>Enallagma doubledayi</i>	Atlantic bluet	S	
Family Coenagrionidae: <i>Enallagma signatum</i>	Orange bluet	S	
Family Coenagrionidae: <i>Enallagma aspersum</i>	Azure bluet	S	
Family Coenagrionidae: <i>Enallagma geminatum</i>	Skimming bluet	S	
Family Coenagrionidae: <i>Ischnura verticalis</i>	Eastern forktail	S	
Family Coenagrionidae: <i>Ischnura hastata</i>	Citrine forktail	S	

Scientific name	Common name	Wetland <sup>a</sup>	Upland <sup>b</sup>
Family Lestidae: <i>Lestes eurinus</i>	Amber-winged spreadwing	S	
Family Lestidae: <i>Lestes congener</i>	Spotted spreadwing	S	
<b>Order Orthoptera (grasshoppers and crickets)</b>			
Family Gryllidae: <i>Gryllus pennsylvanicus</i>	field cricket	S	
Family Acrididae: <i>Chorthippus brunneus</i>	common field grasshopper	S	F
<b>Class Arachnida</b>			
<b>Order Acarina</b>			
Family Araneidae: <i>Argiope aurantia</i>	deer tick	S, SP	S
<b>Phylum Chordata</b>			
<b>Class Mammalia</b>			
<b>Order Rodentia</b>			
Family Sciuridae: <i>Sciurus carolinensis</i>	grey squirrel		W
<b>Order Carnivora</b>			
Family Canidae: <i>Canis lupus</i>	domestic dog	S, W, Sp, F	W
<b>Order Artiodactyla</b>			
Family Cervidae: <i>Odocoileus virginianus</i>	white-tailed deer	S, W, Sp, F	S
<b>Order Perissodactyla</b>			
Family Equidae: <i>Equus canallus</i>	horse	S, W, SP, F	
<b>Order Mustelidae</b>			
Family Lutrinae: <i>Lontra canadensis</i>	river otter	W	
<b>Class Reptilia</b>			
<b>Order Anura</b>			
Family Hylidae: <i>Pseudacris crucifer</i>	spring peeper	Sp	
Family Ranidae: <i>Rana catesbeiana</i>	bull frog	S, Sp	
Family Ranidae: <i>Rana clamitans melanota</i>	green frog	S, Sp	
<b>Order Squamata</b>			
Family Colubridae: <i>Thamnophis sirtalis sirtalis</i>	eastern garter snake	S	
Family Colubridae: <i>Ophedrys vernalis</i>	smooth green snake	S	
<b>Order Testudines</b>			
Family Emydidae: <i>Chrysemys picta picta</i>	eastern painted turtle	S	

<sup>a</sup>Season and frequency of occurrence: SP = spring, S = summer, F = fall, W = winter.

<sup>b</sup>wetland = pond, shoreline and red maple swamp; upland = mixed-oak woodland and heath/old field.



sources: Pelikan 2007, Nikula et al. 2003, Glassberg 1999, Conant and Collins 1998, Milne and Milne 1980 and Lawlor 1979.

**Table 4. List of moths by station (LDH-heathland; LDM-woodland) and date collected by Martha's Vineyard Land Bank staff during 2013 on Little Duarte's Pond Preserve, Oak Bluffs, Tisbury and West Tisbury Massachusetts.**

Month	June				July				August		Sept	Total
Date	5	5	12	12	8	17	30	30	28	28	4	
Station	LDM	LDH	LDM	LDH	LDH	LDH	LDH	LDM	LDH	LDM	LDM	
<b>DREPANIDAE</b>												
<b>Oretinae</b>												
<i>Oreta rosea</i>				1								1
<b>GEOMETRIDAE</b>												
<b>Ennominae</b>												
<i>Speranza (= "Itame") pustularia</i>								1				1
<i>Macaria aemulitaria</i>										1		1
<i>Macaria transitaria</i>				1			1	1		1		4
<i>Macaria minorata</i>								1	1			2
<i>Macaria bicolorata</i>								1	1	1		3
<i>Macaria bisignata</i>	1		1		1			1	1	1		6
<i>Macaria granitata</i>			1					1	1	1		4
<i>Macaria multilineata</i>								1				1
<i>Digrammia continuata</i>						1						1
<i>Glena cribrataria</i>		1	1	1	1							4
<i>Iridopsis vellivolata</i>					1							1
<i>Anavitrinella pampinaria</i>			1				1	1				3
<i>Ectropis crepuscularia</i>				1								1
<i>Protopoarmia porcelaria</i>	1	1		1								3
<i>Melanolophia canadaria</i>						1	1					2
<i>Eufidonia notataria</i>				1								1
<i>Hypagyrtis unipunctata</i>			1							1		2
<i>Lomographa vestaliata</i>				1								1
<i>Lytrosis unitaria</i>					1							1
<i>Euchlaena serrata</i>					1							1
<i>Euchlaena irraria</i>			1	1								2
<i>Pero ancetaria (= "hubneraria")</i>						1	1	1				3
<i>Campaea perlata</i>	1											1
<i>Metarranthis angularia</i>	1		1	1								3
<i>Probole alienaria (in this complex)</i>	1		1									2
<i>Plagodis fervidaria</i>	1		1			1		1				4
<i>Caripeta sp. nr. piniata</i>				1	1	1						3



<i>Sphinx gordius/poecilla</i>		1			1							2	
	<b>Month</b>	June				July				August		Sept	
	<b>Date</b>	5	5	12	12	8	17	30	30	28	28	4	Total
	<b>Station</b>	LDM	LDH	LDM	LDH	LDH	LDH	LDH	LDM	LDH	LDM	LDM	
<i>Lapara bombycoides</i>						1							1
<b>Smerinthinae</b>													
<i>Paonias excaecatus</i>					1		1	1	1				4
<i>Paonias myops</i>						1	1	1					3
<b>Macroglossinae</b>													
<i>Darapsa pholus</i>						1		1					2
<b>NOTODONTIDAE</b>													
<b>Notodontinae</b>													
<i>Hyperaeschra georgica</i>		1		1									2
<b>Phalerinae</b>													
<i>Datana ministra</i>				1			1						2
<i>Datana drexelii</i>				1		1	1	1					4
<i>Datana contracta</i>				1		1	1						3
<i>Nadata gibbosa</i>		1	1	1	1	1	1		1				7
<i>Peridea angulosa</i>		1				1	1		1		1		5
<i>Peridea ferruginea</i>						1							1
<b>Heterocampinae</b>													
<i>Macruocampa marthesia</i>							1						1
<i>Heterocampa obliqua</i>						1	1						2
<i>Heterocampa umbrata</i>		1		1					1				3
<i>Heterocampa guttivitta</i>		1	1	1									3
<i>Heterocampa biundata</i>		1		1				1					3
<i>Lochmaeus manteo</i>				1					1				2
<i>Schizura ipomoeae</i>				1		1							2
<i>Schizura badia</i>						1							1
<i>Oligocentria lignicolor</i>				1					1				2
<b>Nystaleinae</b>													
<i>Symmerista albifrons</i>				1	1	1							3
<i>Dasylophia thyatiroides</i>					1	1							2
<b>EREBIDAE</b>													
<b>Lymantriinae</b>													
<i>Lymantria dispar</i>									1				1
<i>Dasyshira obliquata</i>						1	1	1	1		1	1	6
<i>Orgyia leucostigma</i>						1							1
<b>Arctiinae</b>													
<i>Cisthene packardi</i>									1		1		2
<i>Grammia figurata</i>			1		1								2
<i>Apantesis phalerata</i>			1		1					1		1	4

<i>Apantesis nais</i>		1	1									2
<b>Month</b>	June				July				August		Sept	
<b>Date</b>	5	5	12	12	8	17	30	30	28	28	4	Total
<b>Station</b>	LDM	LDH	LDM	LDH	LDH	LDH	LDH	LDM	LDH	LDM	LDM	
<i>Apantesis carlotta</i>									1			1
<i>Virbia</i> (= " <i>Holomelina</i> ") <i>opella</i>	1		1	1	1	1	1					6
<i>Virbia aurantiaca</i>				1					1	1		3
<i>Spilosoma congrua</i>	1	1	1		1		1					5
<i>Spilosoma virginica</i>	1											1
<i>Hypercompe</i> (= " <i>Ecpantheria</i> ") <i>scribonia</i>			1									1
<i>Pyrrharctia isabella</i>				1	1							2
<i>Halysidota tessellaris</i>			1		1							2
<i>Lophocampa caryae</i>	1		1									2
<i>Cisseps fulvicollis</i>						1			1			2
<b>Herminiinae</b>												
<i>Idia americalis</i>										1		1
<i>Idia rotundalis</i>										1		1
<i>Idia diminuendis</i>						1						1
<i>Zanclognatha theralis</i>								1				1
<i>Zanclognatha jacchusalis</i> ("orchreipennis")						1		1				2
<i>Chytolita morbidalis</i>			1									1
<i>Chytolita petrealis</i>	1											1
<i>Bleptina caradrinalis</i>				1	1	1			1	1	1	6
<i>Renia factiosalis</i>							1	1				2
<i>Renia nemoralis</i>								1	1	1		3
<i>Renia discoloralis</i>							1	1		1		3
<i>Palthis angulalis</i>							1					1
<b>Pangraptinae</b>												
<i>Pangrapta decoralis</i>			1	1			1	1		1		5
<b>Hypheninae</b>												
<i>Hypena baltimoralis</i>										1		1
<i>Hypena scabra</i>						1			1			2
<b>Rivulinae</b>												
<i>Rivula propinqualis</i>							1					1
<b>Scolecocampinae</b>												
<i>Gabara subnivosella</i>						1						1
<b>Phytometrinae</b>												
<i>Hyperstrotia villificans</i>				1			1	1				3
<i>Hyperstrotia flaviguttata</i>				1			1	1				3
<b>Erebinae</b>												
<i>Catocala ilia</i>								1				1



<i>Acronicta afflicta</i>			1							1	1	1	4
	<b>Month</b>	June				July				August		Sept	
	<b>Date</b>	5	5	12	12	8	17	30	30	28	28	4	Total
	<b>Station</b>	LDM	LDH	LDM	LDH	LDH	LDH	LDH	LDM	LDH	LDM	LDM	
<i>Acronicta impleta</i>		1		1									2
<i>Acronicta sperata</i>					1	1							2
<i>Acronicta noctivaga</i>				1									1
<i>Acronicta lithospila</i>		1		1	1					1			4
<i>Agriopodes fallax</i>				1				1		1			3
<i>Polygrammate hebraeicum</i>						1	1	1	1				4
<i>Harrisimemna trisignata</i>				1		1							2
<b>Amphipyriinae</b>													
<i>Amphipyra pyramidoides</i>										1			1
<b>Condicinae</b>													
<i>Condica videns</i>								1					1
<i>Ogdoconta cinereola</i>										1			1
<b>Heliothinae</b>													
<i>Derrima stellata</i>									1				1
<i>Schinia gracilentata</i> ("bifascia")							1						1
<i>Schinia lynx</i>											1		1
<i>Schinia arcigera</i>											1		1
<b>Noctuinae</b>													
<i>Pseudeustrotia carneola</i>				1									1
<i>Elaphria versicolor</i>									1				1
<i>Elaphria alapallida</i>				1	1								2
<i>Proxenus miranda</i>			1										1
<i>Athetis tarda</i>		1							1		1		3
<i>Loscopia</i> ("Amphipoea") <i>velata</i>							1						1
<i>Oligia strigilis</i>		1		1	1								3
<i>Papaipema baptisiae</i>										1			1
<i>Hyppa xylinoides</i>								1					1
<i>Cosmia calami</i>						1							1
<i>Chytonix palliatricula</i>				1	1	1	1		1				5
<i>Morrisonia mucens</i>					1								1
<i>Morrisonia confusa</i>			1										1
<i>Morrisonia latex</i>					1								1
<i>Spiramater grandis</i>				1									1
<i>Spiramater lutra</i>		1			1								2
<i>Sideridis maryx</i>					1								1
<i>Dargida</i> ("Faronta") <i>diffusa</i>									1				1
<i>Mythimna unipuncta</i>							1			1	1		3
<i>Leucania phragmatidicola</i>										1			1

<i>Leucania commoides</i>					1							1	
	<b>Month</b>	June				July				August		Sept	
	<b>Date</b>	5	5	12	12	8	17	30	30	28	28	4	Total
	<b>Station</b>	LDM	LDH	LDM	LDH	LDH	LDH	LDH	LDM	LDH	LDM	LDM	
<i>Leucania insueta</i>					1								1
<i>Lacinipolia renigera</i>			1	1	1					1			4
<i>Protorthodes oviduca</i>			1										1
<i>Ulolonche modesta</i>			1	1									2
<i>Orthodes majuscula</i>				1				1		1			3
<i>Orthodes cynica</i>		1											1
<i>Orthodes ("Polia") detracta</i>				1									1
<i>Anicla illapsa</i>					1					1	1	1	4
<i>Feltia geniculata</i>										1		1	2
<i>Feltia subgothica</i>										1			1
<i>Feltia herilis</i>										1		1	2
<i>Ochropleura implecta</i>								1		1			2
<i>Lycophotia phyllophora</i>						1	1						2
<i>Noctua pronuba</i>				1	1	1	1			1	1	1	7
<i>Xestia praevia</i>								1					1
<i>Xestia c-nigrum</i>										1			1
<i>Pseudohermonassa bicarnea</i>										1			1
<i>Protolampra brunneicollis</i>							1			1			2
<i>Abagrotis alternata</i>							1	1			1	1	4
	# Species	33	17	65	48	48	38	38	43	37	30	10	200

## **Appendix F. Avian Checklist and Seasonal Tables**

Land bank staff conducted seasonal 5-minute point count surveys of birds at the Little Duarte's Pond Preserve in 2002 and 2013. The presence of occasional migrant and resident birds throughout spring and fall migrations, winter, and breeding seasons were recorded during a total of 27 visits. From the woodland/pond and heathland sample locations, all birds seen or heard during a 5-minute period were recorded. Birds seen or heard outside of the count period were noted as present on the property but were not included in quantitative analyses.

Bird species on the preserve are seasonally dependent. Some birds occur in more than one habitat type and during more than one season. Total species counts do not include multiple sightings of an individual species. Dominant species varied among seasons. The breeding season followed by the spring, fall, and then winter season yielded the greatest richness of bird species (Tables 5-8). Most of the birds that occur on the preserve during the breeding season are tree/shrub nesters compared to ground- and cavity-nesters. The Little Duarte's Pond Preserve provides suitable habitat for all 3 types of nesters.

Species richness between birds observed in the two habitats in 2002 and 2013 were similar.

Observations in behavior of birds nesting or rearing young – such as adults carrying nesting materials or food, carrying fecal sacs from a nest, or attending hatchlings – can confirm that a species is breeding on the property. Locating an active nest as well as multiple singing territorial males within suitable habitat are recognizable indications of breeding adult birds. Out of the 27 bird species observed on the preserve during the summer breeding season, 9 are probable breeders; 14 are possible breeders; and 4 are non-breeders due to lack of occurrence in required habitat during the survey (Table 8). The rooster was from the nearby farm and does not breed on the preserve. The breeding owl survey revealed the eastern screech owl as a possible breeder on the preserve during the winter.



**Table 5. Fall abundance of avian species on Little Duarte's Pond Preserve, Oak Bluffs, Tisbury and West Tisbury, MA.**

Species <sup>b</sup>	Habitat <sup>a</sup>	
	Pond/Woodland <sup>c</sup>	Heathland
<b>Year-round</b>		
American crow	U	O
American goldfinch		U
black-capped chickadee		C
blue jay	C	O
Canada goose	C	U
Carolina wren	U	
common grackle		P
downy woodpecker	U	P
eastern towhee		P
field sparrow		U
grey catbird	P	P
great blue heron	C	
mallard	C	
northern cardinal	O	O
northern mockingbird		U
red-tailed hawk	U <sup>OH</sup>	P <sup>OH</sup>
song sparrow		U
<b>Migrants</b>		
green-winged teal	C	
<b>Summer Breeding</b>		
common yellowthroat		U
ovenbird	P	
double-crested cormorant	C	U <sup>OH</sup>
great crested flycatcher		P

<sup>a</sup> 2002 (n=4); 2013 (n=1)

<sup>b</sup> Seasonal grouping organized according to Cornell All About Birds ([www.allaboutbirds.org/guide](http://www.allaboutbirds.org/guide))

<sup>c</sup> C=common birds (detected in more than 50% of the survey visits); O=occasional birds (detected in 26-50% of the survey visits); U=uncommon birds (detected in 25% and fewer of the survey visits); P=present birds (not detected during a survey period but observed on the property); and OH=overhead.

**Table 6. Spring abundance of avian species on Little Duarte's Pond Preserve, Oak Bluffs, Tisbury and West Tisbury, MA.**

Species <sup>b</sup>	Habitat <sup>a</sup>	
	Pond/Woodland <sup>c</sup>	Heathland
<b>Year-round species</b>		
American crow	O	O
American goldfinch		U
American robin	U	U
black-capped chickadee	O	
Canada goose	U	
Carolina wren	U	U
chipping sparrow	P	U
eastern screech owl		U
eastern towhee	C	C
grey catbird	C	C
mallard	U	U
mourning dove	O	U
northern cardinal	O	C
northern flicker	U	U
northern mockingbird	U	U
red-winged blackbird	O	U
song sparrow	U	C
white-breasted nuthatch		U
<b>Summer Breeding</b>		
barn swallow	O	U
osprey	U <sup>OH</sup>	
ruby-throated hummingbird		U
tree swallow	C <sup>OH</sup>	

<sup>a</sup> 2002 (n=4); 2013 (n=5)

<sup>b</sup> Seasonal grouping organized according to Cornell All About Birds ([www.allaboutbirds.org/guide](http://www.allaboutbirds.org/guide))

<sup>c</sup>C=common birds (detected in more than 50% of the survey visits), O=occasional birds (detected in 26-50% of the survey visits), U=uncommon birds (detected in 25% and fewer of the survey visits) and P=present birds (not detected during a survey period but observed on the property).

**Table 7. Winter seasonal abundance of avian species on Little Duarte's Pond Preserve, Tisbury, Oak Bluffs and West Tisbury, MA.**

Species <sup>b</sup>	Habitat <sup>a</sup>	
	Pond/Woodland <sup>c</sup>	Heathland
<b>Year-round Species</b>		
American crow	C	O
black-capped chickadee	C	C
dark-eyed junco		O
eastern towhee	U	
house finch	U	U
mallard	U	
northern cardinal	O	C
northern flicker	U	U
red-bellied woodpecker	U	
song sparrow	O	U
white-breasted nuthatch	O	

<sup>a</sup> 2002 (n=4)

<sup>b</sup> Seasonal grouping organized according Cornell All About Birds ([www.allaboutbirds.org/guide](http://www.allaboutbirds.org/guide))

<sup>c</sup> C=common birds (detected in more than 50% of the survey visits), O=occasional birds (detected in 26-50% of the survey visits), U=uncommon birds (detected in 25% and fewer of the survey visits) and P=present birds (not detected during a survey period but observed on the property).

**Table 8. Breeding season abundance of avian species on Little Duarte's Pond Preserve, Oak Bluffs, Tisbury and West Tisbury, MA.**

Species <sup>b</sup>		Habitat <sup>a</sup>	
		Pond/Woodland <sup>c</sup>	Heathland
<b>Year-round</b>			
American crow	PO <sup>d</sup>	U	U
American goldfinch	PR	U	U
American robin	PO	U	U
black-capped chickadee	NB	C	U
blue jay	PO	O	U
Carolina wren	PO	U	U
Canada goose	PO	U	U
chipping sparrow	PR		O
downy woodpecker	PO		U
eastern towhee	PR	C	C
gray catbird	PR	C	C
mallard	PO	U	
mourning dove	PR	U	O
northern cardinal	PR	U	C
northern mockingbird	PR	U	O
red-winged blackbird	PO	U	U
rooster	NB		U
song sparrow	PO	U	C
white-breasted nuthatch	PO	U	U
<b>Summer Breeding</b>			
barn swallow	NB		O <sup>OH</sup>
common yellowthroat	PR		O
eastern kingbird	PO		U
great-crested flycatcher	PO	U	U
northern oriole	PO	U	
scarlet tanager	NB	U	
tree swallow	PR	O <sup>OH</sup>	U
yellow warbler	PO		U

<sup>a</sup> pond and shoreline: 2002 (n=4); heathland and woodland: 2002 (n=4); woodland= mixed-oak woodland and red maple swamp

<sup>b</sup> Seasonal grouping organized according Cornell All About Birds ([www.allaboutbirds.org/guide](http://www.allaboutbirds.org/guide))

<sup>c</sup> C=common birds (detected in more than 50% of the survey visits), O=occasional birds (detected in 26-50% of the survey visits), U=uncommon birds (detected in 25% and fewer of the survey visits) and P=present birds (not detected during a survey period but observed on the property).

<sup>d</sup> Breeding status: NY=nearby habitat, NB=nonbreeding, PO=possible breeding (species detected in suitable breeding habitat), PR=probable breeding (species heard singing on two occasions over one week apart in suitable breeding habitat). CO=confirmed breeding (species carrying food, CF; feeding young, FY; with begging hatch-year fledglings, HY; or a located nest, N).

### **Appendix G. Rare and Endangered Species List**

The commonwealth has designated the area in and around the Little Duarte's Pond Preserve as habitat for a rare bird. Additionally, land bank surveys of wildlife and plants on the preserve revealed one Massachusetts-listed plant species; two Massachusetts-watch-listed plant species; and three Massachusetts-listed moth species.

Suitable habitat exists for all species listed for the preserve by MA-NHESP. The heathland and agricultural land provide hunting grounds and breeding habitat for a rare bird. The rare moth utilizes both deciduous and evergreen trees. However, pitch pine is the primary larval hostplant for the rare moth on the Vineyard and is not a dominant tree in the woodland of the preserve. Two other rare moths prefer scrub oak thickets with little to no canopy on the Vineyard. Scrub oak is sparsely present in the heathland and woodland of the preserve. The grassy portions of the heathland provide habitat for thyme-leaved pinweed and the pond shore provides suitable habitat for a rare plant.

**Appendix H. Abutters List****Table 9. Landowners owning property abutting or within 200 feet of Little Duarte's Pond Preserve, West Tisbury, Oak Bluffs and Tisbury, Massachusetts.**

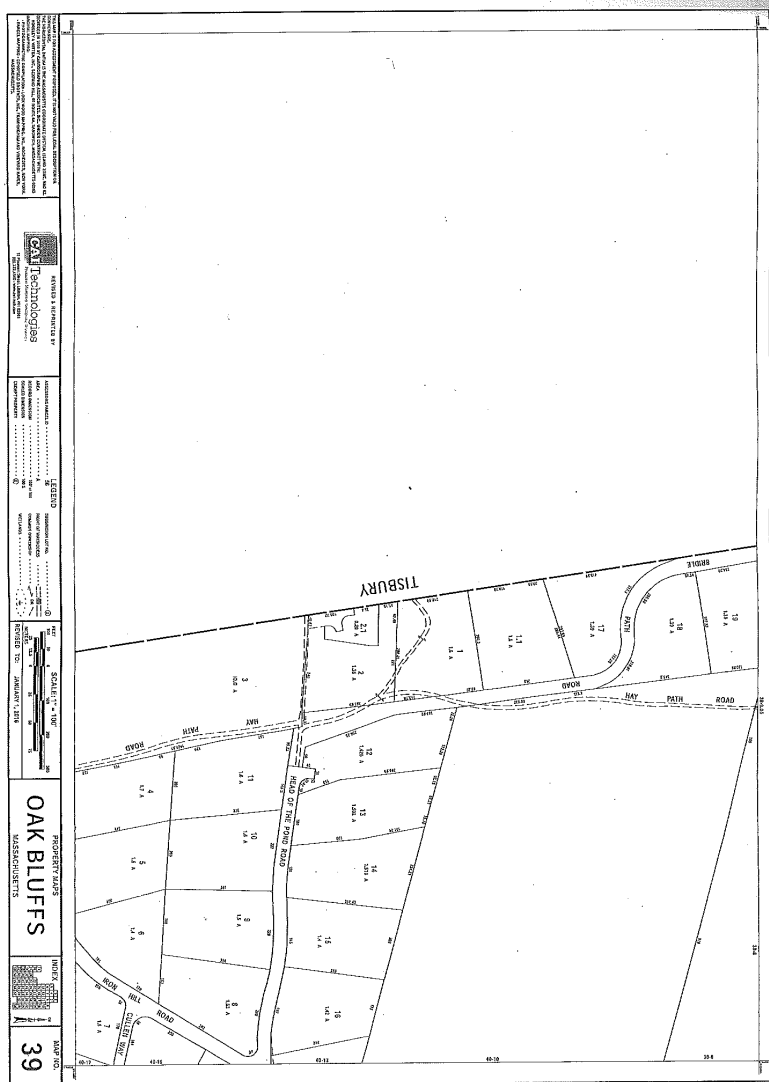
Parcel Number	Property Address	Owner Name	Owner Address	State	Owner City	Owner Zip
44-A-1	22 BRIDLE PATH RD	SYLVA SONYA E TRUSTEE	22 BRIDLE PATH RD	MA	VINEYARD HAVEN	02568
44-A-2	81 STONEY HILL RD	LOBDELL JAMES H & VIRGINIA A TRS	81 STONEY HILL RD	MA	VINEYARD HAVEN	02568
44-A-2.1	71 STONEY HILL RD	LOBDELL DARREN C	71 STONEY HILL RD	MA	VINEYARD HAVEN	02568
44-A-3	85 STONEY HILL RD	LEVIN CLEMENT	BOX 2590	MA	VINEYARD HAVEN	02568
44-A-5.1	163 STONEY HILL RD	PROPER KEITH L	163 STONEY HILL RD	MA	VINEYARD HAVEN	02568
44-A-7	145 STONEY HILL RD	ARMSTRONG ROGER A TR	PO BOX 4384	MA	VINEYARD HAVEN	02568
45-A-1	104 STONEY HILL RD	THE ISLAND GROWN INITIATIVE LTD	PO BOX 622	MA	VINEYARD HAVEN	02568
45-A-1.2 9-3-1	205 STONEY HILL RD	SMITH SARAH WYATT	PO BOX 4987	MA	TISBURY	02568
45-A-1 45-A-1.1 9-3-2 39-3	104 STONEY HILL RD	THE ISLAND GROWN INITIATIVE LTD	PO BOX 622	MA	VINEYARD HAVEN	02568
45-A-1.3 45-A-1.4 9-3	199 STONEY HILL RD	MACKEY ASHLEY K	12 OLD CASTLE DRIVE	CT	NEWTOWN	06470
46-A-2	77 CHECAMO RD	LANKIEWICZ THOMAS E	RR 3 BOX 9577 CHECAMO RD	MA	VINEYARD HAVEN	02568
46-A-2.1	71 CHECAMO RD	PELTIER SUSAN	BOX 2792	MA	EDGARTOWN	02539
46-A-3	103 CHECAMO RD	PRESTON CHARLES DOUGLAS	PO BOX 18	MA	VINEYARD HAVEN	02568
52-1	53 BENJAMIN LUCE PATH	FRIENDS OF MV SCOUTING INC	PO BOX 1032	MA	EDGARTOWN	02539
52-1-4	3 LITTLE POND RD	BURKE DUSTIN M	PO BOX 114	MA	OAK BLUFFS	02557
52-1-5	6 LITTLE POND RD	MAXWELL JOANNE	PO BOX 364	MA	WEST TISBURY	02575
39-2	61 Head of the Pond Road	Kelly Risdal and Walter Tomkins	P.O. Box 2018	MA	Oak Bluffs	02557
39-2.1	63 Head of the Pond Road	Michael and Mandy Tomkins	P. O. Box 4303	MA	Vineyard Haven	02568
52-10	0 IRON HILL RD	IRON HILL HOMEOWNERS ASSOC	PO BOX 2174	MA	OAK BLUFFS	02557
39-4	15 Winkler Way R	Marianne Galvez	P. O. Box 2147	MA	Acton	01720
39-5	15 Winkler Way	Rony Elia Shaoul	50 Temple Street	MA	Arlington	02476
39-10	52 Head of the Pond Road	Bruce Lattmann	P. O. Box 207	MA	Amherst	01004
39-11	56 Head of the Pond Road	David and Patricia Barnicle	7 Ladd Road	MA	Sturbridge	01566

39-12	11 Bridle Path Road	AnneMarie and Leonard Reid	P. O. Box 2124	MA	Vineyard Haven	02568
39-13	53 Head of the Pond Road	Giancarlo Guizzardi TRS	2316 Mary Goodwyn Rd	VA	Powhatan	23139
52-11	21 Iron Hill Road	Marc and Toni White Hanover	P.O. Box 3009	MA	Oak Bluffs	02557
52-12	19 Winkler Way	Paula White	269 Halsey St	NY	Brooklyn	11216
9-1-1, 9-4, 46-A-1	191 STONEY HILL RD	VINEYARD MEADOW LLC	PO BOX 7138	NY	GARDEN CITY	11530
52-1-1	4 LITTLE POND RD	MCGROARTY SAMPAO HUMBERTO	PO BOX 402	MA	OAK BLUFFS	02557
9-5	196 STONEY HILL RD	JACKSON GLENN D &	PO BOX 1471	MA	WEST TISBURY	02575

Map 10: Abutters Map 1

Little Duarte's Pond Preserve, Oak Bluffs, MA

Map #39



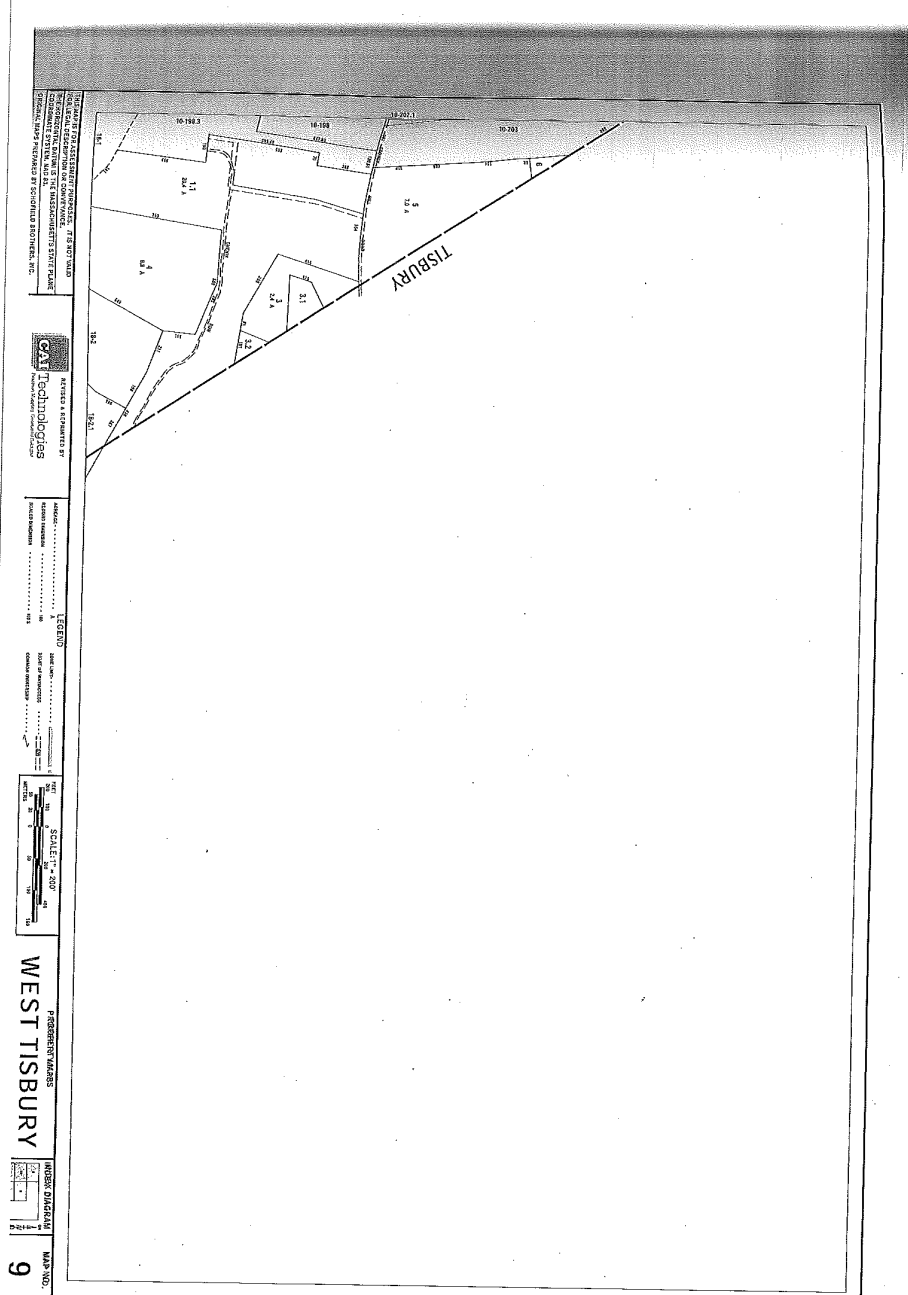








**Map 14: Abutters Map 5**  
**Little Duarte's Pond Preserve, West Tisbury, MA**  
**Map #9**



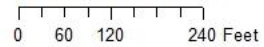
Appendix I. Existing Use

Map 15: Existing Use Map

Little Duarte's Pond Preserve  
Tisbury/Oak Bluffs/West Tisbury  
6.5 Acrea (fee simple) 46 Acres (APR)  
Existing Use Map



Sources : Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs :2014 Aerial Photograph-Mass GIS, Martha's Vineyard Commission (MVC): parcel data- town assessors and MVC - 2011, Coordinate Ref: State Plane, Mass Mainland, Feet,NAD 83 Notes: Map prepared by the Martha's Vineyard land Bank for planning purposes only. The land bank is not responsible for end-users interpretation of the map.  
File: Use\_2016mapLDP.mxd Date: 09-09-2016



## Appendix J. Universal Access

<b>Property Name:</b>	Little Duarte's Pond Preserve
<b>Size:</b>	6.5 acres
<b>Primary Activities:</b>	hiking, horseback-riding, bicycling, Nordic skiing and skating
<b>Primary Elements:</b>	none
<b>Primary Spaces:</b>	pond and heath/old field
<b>Obstacles that Limit Accessibility:</b>	distance from nearby trailhead, topography and soils
<b>Existing or Potential Alternatives:</b>	Manaquayak Preserve, Blackwater Pond Reservation
<b>Proposed ROS Classification:</b>	less-developed
<b>Proposed Expectation of Accessibility:</b>	poor

For all less-developed land bank conservation areas, the Universal Access Plan states the following (Potter 1997):

*Use outdoor recreation access routes to link primary elements and primary spaces within one-quarter mile of a trailhead or drop-off and use accessible recreation trails to connect other primary elements and primary spaces on all less-developed land bank conservation areas.*

Vehicle parking for Little Duarte's Pond Preserve is supplied through an off-premises trailhead at the Wapatequa Woods Reservation that is connected to the preserve via nearly 0.5 miles of trails. The topography on the property, distance from a trailhead and either sandy or wetland soils are prohibitive for creating a UA trail system on the preserve and therefore such a trail would not be practical. However, a universal access space is possible using the trailhead easement at Thimble Farm and would provide views and access to the pond.