

# Wapatequa Woods Reservation Sailors' Burying Ground

Oak Bluffs and Tisbury,  
Massachusetts



## Management Plan



February 17, 2016

*Approved by the Tisbury Town Advisory Board (October 1, 2015)*

*Approved by the Oak Bluffs Town Advisory Board (September 28, 2015)*

*Approved by the Martha's Vineyard Land Bank Commission (September 28, 2015)*

*Approved by the Secretary of the Executive Office of Energy and Environmental Affairs (February 17, 2016)*

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# WAPATEQUA WOODS RESERVATION MANAGEMENT PLAN

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### Executive Summary

Wapatequa Woods Reservation comprises 195 acres primarily dominated by mixed-oak woodland with an open understory of huckleberry. The area of the reservation was historically referred to as the "Tisbury Wood Land" (Crevecoeur's "Lettres D'un Cultivateur Americain" London, 1784). Much of the woodland has experienced tree die-off as a result of insect damage and drought stress during the last decade resulting in a moderately-open overstory with limited young oak and sassafras saplings in the understory.

The woodland is encircled by various farms tucked in between neighborhoods. One such piece of farmland is actually located in the center of the reservation and provides an ideal site for overwintering and kidding of the land bank's goat herd or may be used by an agricultural lessee. The proposed clearing for pasture land is minor, a mere 4% of the otherwise wooded reservation.

The reservation straddles the Oak Bluffs and Tisbury line and is positioned north of the four-town bound. The majority of reservation acres are located in Oak Bluffs and Tisbury, though the reservation touches ever so slightly in West Tisbury through an Agricultural Preservation Restriction included in the total acreage of the property.

Situated in the far northeast corner of the reservation is the 127-year-old Sailors' Burying Ground that served as the final resting place for wounded and ill seaman treated at the Marine Hospital that was established in 1879. The Marine Hospital was located in the old lighthouse buildings on the bluff overlooking the inner Holmes Hole Harbor and the burying ground was located on the hilltop behind the hospital off Sailors Burying Ground Road. The Martha's Vineyard Museum (formerly the Historical Society) and the Martha's Vineyard Land Bank follow a joint manage agreement for the Sailors' Burying Ground.

The reservation is named for the ancient path, Road to Wapatequa, that crosses the reservation in the north. In 1944 USGS topography map the Road to Wapatequa runs from Lake Tashmoo to Lagoon Pond. The 1891 map of Martha's Vineyard by O.W. Walker, C.E. depicts parts of the Road to Wapatequa. The 1685 records of the bounds of Homes Hole Neck were described to have been set by the sachem as follows, "by a fut path which gose from weakuttockquayah unto cuttashimmoo on the other side of the neck" (Banks Vol. II 1966). The name Wapatequa comes from Wekwetuckauke or Weaquatickquayage, the Wampanoag name for the Lagoon which was the location for one of the subordinate Wampanoag villages of the Ogkeshkuppe sachem. The English spelling of the Wampanoag word for "the Lagoon" has varied throughout time. One modern spelling is Weahtaqua which is sometimes spelled Webbataqua (Banks Vol. II 1966).

The Martha's Vineyard land bank commission purchased, over a course of 27 years, a total of 195 acres for the ultimate sum of \$7,339,358. The reservation includes a 13.8-acre agricultural preservation restriction purchased in 2001 that protects the agrarian tradition of Stoney Hill Road and surrounding area.

## WAPATEQUA WOODS RESERVATION MANAGEMENT PLAN

Vegetation and wildlife inventories revealed two commonwealth-listed wildlife species – two rare moths – on the reservation.

This management plan proposes providing public access for birding, hiking, non-motorized bicycling, hunting, cross-country skiing and other passive uses through the creation of approximately 0.35 miles of new trail and maintenance of 2.75 miles of existing trails and old farm roads on the reservation; expansion of the existing 4-acre pasture to 13 acres and building an 4,500-square-foot barn nearby for overwintering and kidding of the land bank's goat herd; maintenance of the pasture by mowing; leasing of the pasture if and when the land bank has no further use for the pasture for grazing; restoring the 5 acres of tree canopy grassland with native grassland species; leasing the existing house for a caretaker of the reservation and nearby preserves; maintenance of the Sailors' Burying Ground through mowing and hand pruning; monitor for and remove invasive species; manage a sustainable woodlot program on the reservation to promote a healthy woodland; maintenance of the existing 4-vehicle trailhead along Stoney Hill Road; and locating a future 3-5 vehicle trailhead off Edgartown Road.

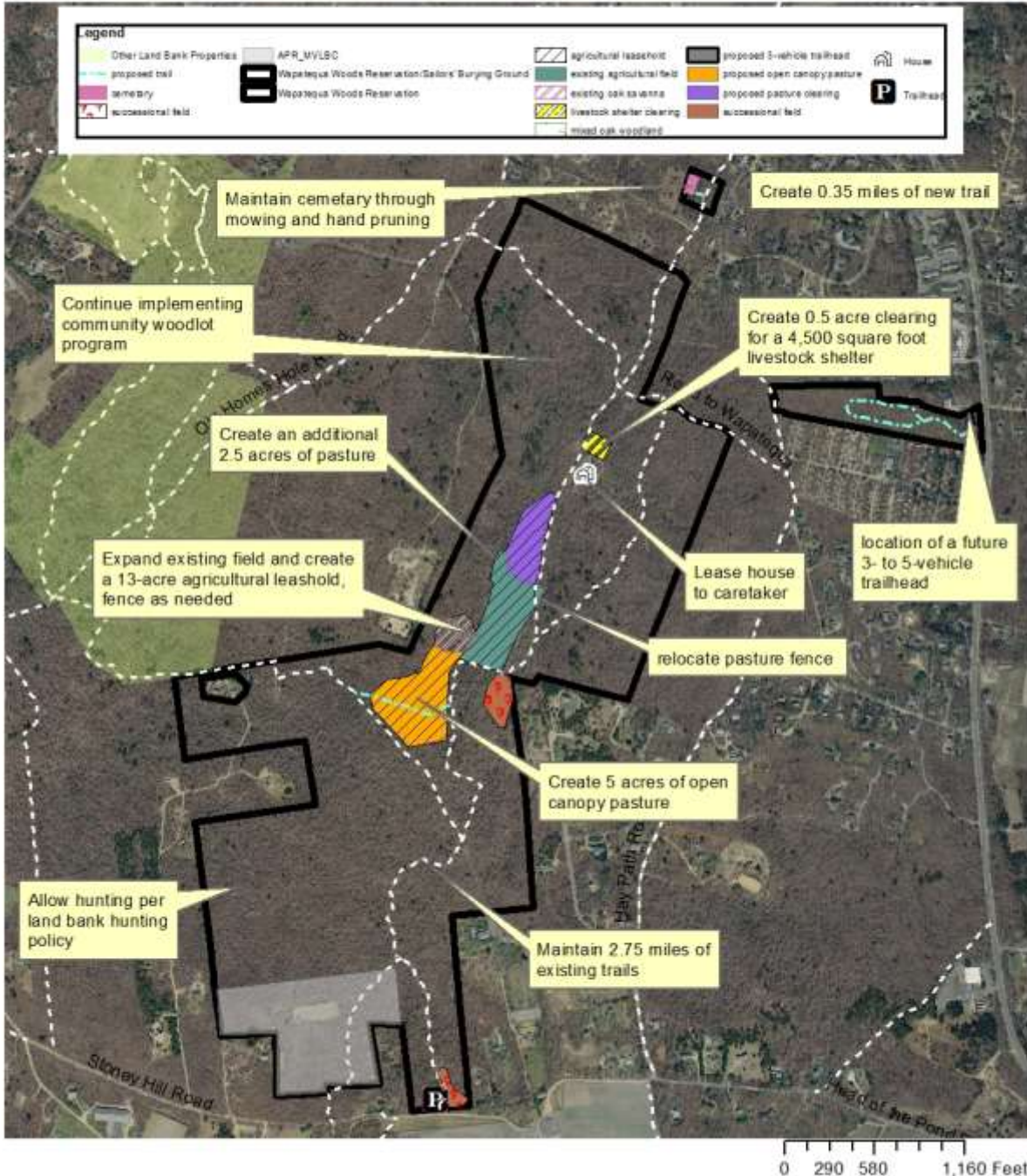
All planning goals, objectives and strategies are outlined in detail in the final section of this management plan. To be implemented, this plan must be presented at a public hearing and approved by the land bank's Oak Bluffs and Tisbury town advisory boards, the Martha's Vineyard land bank commission and the secretary of the Massachusetts executive office of energy and environmental affairs (EOEEA). 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 estimated and priority habitat for rare species.

### *About the authors*

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**Map 1: Management Planning Map**

**Wapatequa Woods Reservation  
Tisbury/Oak Bluffs - 195 Acres  
Management Planning Map**



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.  
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## I. Natural Resource Inventory

### A. Physical Characteristics

#### 1. Locus

Wapatequa Woods Reservation is located at roughly 41° 25' 55" N latitude and 70° 37' 13" W longitude. The property consists of 195 acres located off Stoney Hill Road, Edgartown-Vineyard Haven Road and Sailors Burying Ground Road in Oak Bluffs, Tisbury and West Tisbury. The reservation is depicted on West Tisbury tax map 9 (parcels 5 and 6); Tisbury tax maps 43 (parcels 1, 3, 4, 2, 5), 44 (parcels 6, 5, 5.2, 4, 4.1), 18 (parcels 8.2 and 8.1), 20 (parcel 20), 48 (parcels 3.1, 2.1, 5) and Oak Bluffs tax maps 24 (parcel 19), 25 (parcels 12, 14, 13, 9, 8, 7, 6), 38 (parcel 11). A Locus Map (USGS Topo 1973 1:24,000) and aerial photograph of the reservation follow as Appendix A.

#### 2. Survey Maps, Deeds and Preliminary Management Plan Goals

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 reservation are recorded at the Dukes County Registry of Deeds and listed in Appendix B.

#### 3. Geology and Soils

The **General Soils Map** (Appendix C) depicts general classes of soils across Martha's Vineyard. Soils found in Wapatequa Woods Reservation 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).

Wapatequa Woods Reservation consists of three soil series: Carver loamy coarse sand (CeB, CeC, CeD), Haven very fine sandy loam (HaA, HaB), and Riverhead sandy loam (RvA, RvB, RvC). The majority of the reservation is in Riverhead sandy loam with a moderate slope of 8 to 15% (RvB).

#### 4. Topography

The highest elevation at Wapatequa Woods Reservation is 150 feet above sea level. The elevation change for the reservation is from 60 to 150 feet above sea level. The reservation has a slope differential between 0 - 25% with greater variation in elevation at the north east section of the property. This area is a part of the "knob-and-kettle" terrain located between Lake Tashmoo and the Lagoon Pond springs, formed during the glacial melt and deposit of the Martha's Vineyard Moraine. The contours of the property are illustrated in a portion of the USGS map (Topography Map, Appendix A).



## 5. Hydrology

Wapatequa Woods Reservation is made up of approximately 97% woodland. There are no wetland resource areas on the reservation. However, there is a small 0.06-acre man-made watering hole in the pasture on the reservation.

The reservation is outside of the 100- and 500-year flood zone as defined by FEMA (Wetland Map, Appendix A).

Wapatequa Woods Reservation straddles the Lagoon Pond and Lake Tashmoo watersheds. The Lagoon Pond watershed composes approximately 4,465 acres, which include 145 acres of Wapatequa Woods; the Lake Tashmoo watershed is made up of 2,902 acres, which includes the remaining 23 acres of the reservation (Wetland Map, Appendix A).

Lagoon Pond and Lake Tashmoo are coastal ponds on the north side of Martha's Vineyard. Groundwater springs contribute freshwater to the streams that feed both bodies of water by way of narrow inlets at the head of the ponds. The fresh spring water mixes with saltwater at the mouth of both waterbodies, resulting in fluctuating levels of salinity. The freshwater springs are also a source for producing commercially bottled water, as well as the town's public water systems.

Both Lake Tashmoo and Lagoon Pond are important shellfishing grounds for recreational fishermen. Quahogs and soft shell clams are harvested year round but especially during the summer and bay scallops are harvested during the winter months. Shellfish are susceptible to water quality. Not only do they depend on clean water but as filter feeders they contribute immensely to maintaining clean water in the bays and estuaries along the shore.

The woodland cover type of the reservation contributes to the water quality of the 6000+ acres of watershed that it is a part of. Forester Gifford Pinchot in his 1905 *Primer on Forestry* wrote: "A forest, large or small, may render its service in many ways. It may reach its highest usefulness by standing as a safeguard against floods, winds, snow slides, moving sands, or especially against the dearth of water in the streams." Wooded watersheds protect water by reducing erosional run-off, shading surface waters, cycling nutrients and filtering pollutants (Brown and Binkley 1994). Water either evaporates from leafy vegetation or is absorbed and cycled through the woodland vegetation or is slowly absorbed and filtered through the ground. Woodland groundwater is typically cooler and generally contains fewer sediment, nutrients and chemicals than water from other land types (Dissmeyer 2000). This provides Lake Tashmoo and Lagoon Pond with a greater quality of freshwater.

## 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 Wapatequa Woods Reservation six major ecological processes occur: disturbance, structural complexity, hydrological patterns, nutrient cycling, biotic interactions and population dynamics.

### Disturbance

Natural disturbances which occur on the island of Martha’s Vineyard and much of the northeastern woodlands typically include wind, insect defoliation, and fire. As an active force of nature, wind constitutes a major role in disturbance along the northeast coast. The location of the Wapatequa Woods Reservation, however, provides the property with a reduced wind intensity and thus minimal wind disturbance. Recent insect infestation from 2011 through 2013 by two moth species, the winter moth and gypsy moth, have physically altered the woodlands by mortally disrupting oak stands reaching the upper forest canopy. This die-off resulted in areas of woodland with tree snags, which allows for a greater source of sunlight to reach understory shrubs and trees. The River Sandy Loam soils that dominate the reservation are moderately permeable, providing greater access for water to escape soil surfaces resulting in a slow tree sprout response to the woodland thinning.

Fire is a less frequent means of natural disturbance since fire suppression is an active part of the forest management. However, the lack of a mature oak tree population results in greater understory vegetation and enables soil evaporation to occur, making the property more susceptible to fire during drought periods. Human-induced fires have occurred on the property in the past. The fire that occurred on the property in 1999 was short-lived and did not yield canopy tree mortality. Typically, rapid successional growth would occur in the understory after a fire. However, with sunlight access still limited due to the closed canopy the understory remained for some time in a successional lull. It has since caught up to the surrounding woodland.

### Structural Complexity

Canopy cover in the Wapatequa Woods Reservation ranges from low-growing grassland plants to tall woodland trees which results in a diverse environment for species to inhabit. As the dominant habitat of the reservation, the woodland diversity includes ground-cover vegetation such as dewberry and mosses; an understory laden with low-bush blueberry, black huckleberry and other low-growing shrubs and herbs; a series of taller shrubs such as high-bush blueberry and arrowwood; and finally, various oak species in the upper canopy along with snags. The successional fields reveal modest spatial heterogeneity and diversity through the variable seasonal flowering patterns and the presence of herbaceous and woody vegetation.

### Hydrological Patterns

Vegetative communities impact the flow of rainfall into the hydrologic system through processes of evaporation and transpiration. Woodland ecosystems such as Wapatequa Woods Reservation can affect local microclimates and mitigate

events like overflow or downstream flooding that would persist from rainstorms or snowmelt. The woodland's environmental service includes intercepting precipitation at all levels of the canopy, resulting in evaporation of water vapor caught within the vegetation layers to the atmosphere. Such vegetative buffers also manage water that infiltrates the soil by transpiring soil water back to the atmosphere as well as offer soil stability from erosional runoff (EPA 1999).

### Nutrient Cycling

The primary productivity of an ecosystem is dependent on important elements such as nitrogen, phosphorous, and carbon to flow as nutrients through a vegetative system. Through photosynthesis, plants absorb carbon dioxide, convert the organic compound into carbon and oxygen, and finally, assimilate the carbon through fixation. The importance of carbon sequestration as an ecological function provides wooded ecosystems the ability to slow the accumulation of carbon dioxide in the atmosphere.

Anthropogenic activities such as the use of fertilizers or land development can alter the nutrient cycle and change the ecological integrity of the ecosystem. Agricultural and construction practices may enhance the possibility for opportunistic non-native plant species to compete with native vegetation for ecological niches. Resource competition, as a result, alters the nutrient cycling of the invaded ecosystem. The property was historically used to pasture livestock, which developed a nutrient-enriched substrate.

### Biotic Interactions

The abundance and distribution of a particular species may be heavily dependent on other organisms for growth and reproduction. Basic interactions include interspecific and intraspecific competition, predation, parasitism, and symbiosis. 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 spotted knapweed and multiflora rose are exotic species residing within the property boundaries of Wapatequa Woods Reservation. Protecting species with high community values such as oaks; removing invasive species before they become dominant; and implementing elastic management protocols can reduce adverse effects on biotic interactions.

### Population Dynamics

Species dispersion, recruitment, fertility, and mortality compose a species' population dynamic and, along with genetic diversity, play an important role in the success of a species (EPA 1999). Small populations that are isolated through habitat fragmentation or habitat reduction are vulnerable to extinction. In addition, a population too dispersed across an ecosystem may also be vulnerable due to low genetic diversity. The greater the total hectares of complete suitable habitat allows for more species richness and abundance, resulting in a wider range of

genetic diversity and heterogeneity. This concept is particularly important when management actions must consider rare plant and animal species. In regards to this property, rare moth species are dependent on the next-generational growth of oak canopy in order to continue existing within the boundaries of the reservation.

## B. Biological Characteristics

### 1. Vegetation

Wapatequa Woods Reservation comprises three general habitat communities: mixed-oak woodland, agricultural grassland and successional field. They are described in detail and shown on the **Ecological Communities Maps** in Appendix D. The dominant vegetation community is the mixed-oak woodland.

A total of 148 plant species is known to occur on Wapatequa Woods Reservation. Even as a later successional habitat compared to the residing grassland areas, the woodland contributes the greatest to the floristic richness of plants occurring on the reservation (Table 1, Appendix D). Species richness is the number of species present in a community (Begon et al. 1990).

### 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 reservation. Two commonwealth-listed wildlife species – rare moths – were recorded during Lepidoptera surveys.

#### (a) Invertebrates

**Moth Species:** A total of 197 moth species representing 10 Macro families was identified from nocturnal black-light traps set in the mixed-oak woodland during the summers of 2009 and 2014 (Appendix E, Table 4). Mixed-oak woodland is a draw to various upland moth species as it provides forage, breeding, and habitat cover. The woodland provides habitat for three rare moth species.

#### (b) Birds

Avian 5-minute point count surveys were conducted on Wapatequa Woods Reservation during spring and fall migration and the summer breeding season. A total of 39 avian species is known to occur on the reservation (Tables 5, 6a, 6b, 7 and 8 Appendix F).

#### (c) Mammals

Three common mammal species or signs thereof were observed on Wapatequa Woods Reservation (Appendix F, Table 3). Evidence of

white-tailed deer (*Odocoileus virginianus*), striped skunk (*Mephitis mephitis*) and grey squirrels (*Sciurus carolinensis*) were observed on the property in addition to the common flying and biting insects of the woodlands. A complete list of wildlife species is in Table 3, Appendix E).

(d) Rare and Endangered Species

The Massachusetts natural heritage and endangered species program (MA NHESP) designates that the reservation is located within priority habitat of rare wildlife. Details about the various species and a copy of the Endangered Species Maps are located in Appendix G.

## C. Cultural Characteristics

### 1. Land History

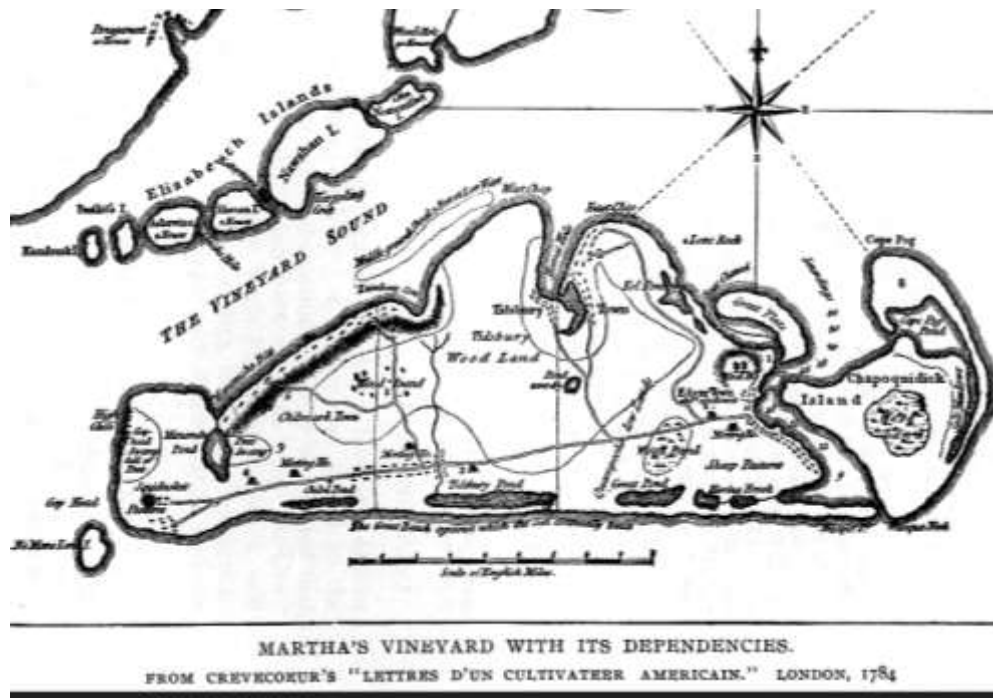
#### Pre-Settlement

Wapatequa Woods Reservation is located in a wooded area of the island through which historic foot paths ran for the purposes of getting from one place of purpose to another. Such paths connected the spring at Lake Tashmoo called Kuttashimmoo to the head of the lagoon, Weaquaticquayage. Both springs were locations of subordinate summer villages in the sachems Nobnocket and Ogkeshkuppe. These paths also connected Holmes Hole to places south, west and east.

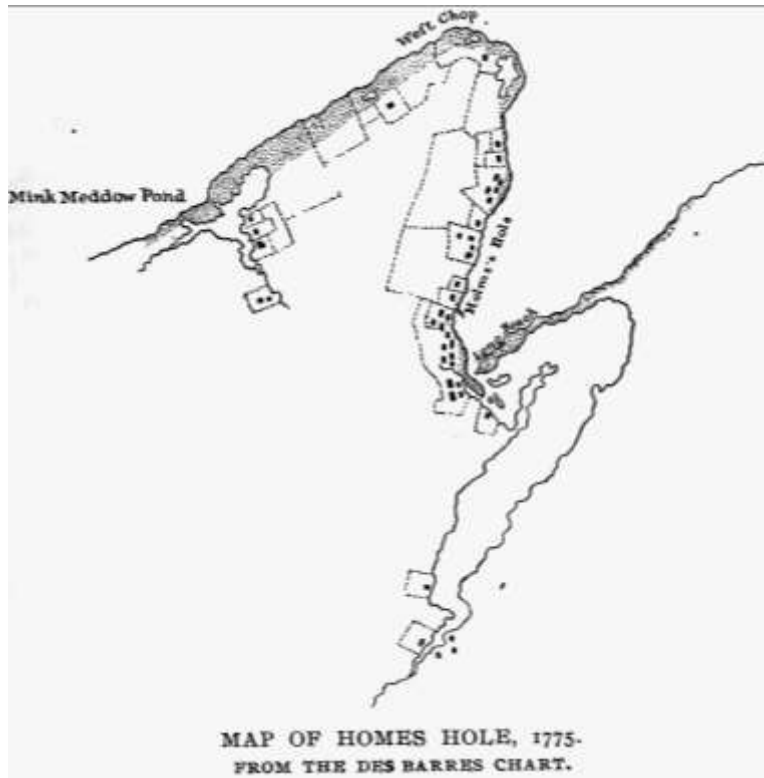
#### Settlement

##### 1600-1800

The area of the reservation remained wooded throughout the 1600s and 1700s. In a map from Crèvecoeur's *Lettres d'un cultivateur Américain* in 1784 the area was referred to as the Tidsbury Wood Land. Settlement occurred on the outskirts of the woodlands closer to the shore.



The area of the island referred to as “Holmes Hole” and “The Neck” was settled in the 1600s predominantly by three families; West, Chase and Cottle. For thirty years they were the only families to take up residency in this region. They were followed by Wheldon, Daggett and Norton (Banks Vol. II 1966). Most homesites were located along Holmes Hole with the exception of a few situated on Mink Meadow Pond, West Chop and the Head of the Lagoon (Des Barres 1776 Nautical Chart and Charles Blaskowitz Chart of Martha’s Vineyard and the Islands 1775).



One area of interest pertaining to the reservation is the land purchased and settled by Dr. Thomas West. He came to the island in around 1671 and first settled in what is known as West Tisbury. He was the first known practitioner of medicine and surgery on Martha's Vineyard. The West family produced many scholars and men of the cloth (Banks Vol. II 1966).

Dr. West started purchasing land in Holmes Hole in 1682 and over many years he acquired hundreds of acres stretching from Kuttashimmoo (Tashmoo) to the west

side of the Head of the Lagoon. His first purchase from Ponit, the sachem of that area, was for a house site in the location of the U.S. Marine Hospital. Upon his death he bequeathed his land to his four eldest sons Abner, Thomas, Peter and William. Over time Abner acquired most of the West land through purchase from the other heirs (Banks Vol. III 1966).

Abner West, born in 1683, was a carpenter and was married to Jane Cottle in 1707. They had six sons. In 1744, Abner granted 400 acres in Tisbury to his sons (Dukes County Registry of Deeds (Deeds), Book 7 page 157). Abner also granted in the year of his death (1756), to the inhabitants of Holmes Hole, a burying place of one acre in the northeast corner of his wood land bounded easterly by the road between Holmes Hole and Edgartown and northly by the road that leads from Abner's house to Tisbury (Deeds, Book 8, page 437).

The second youngest son of Abner West, Peter West, was born in 1718. Peter West was a valiant military man and was described as a man with deep courage and a splendid physique. Peter West took part in the New York Expeditions of Crown Point and Ticonderoga. Peter West was married to Elizabeth Chase in 1769. Peter died at Fort Edward of smallpox in 1757, a year after his father Abner died (Banks Vol. III 1966). Peter and Elizabeth had four sons of which George West, born in 1743 or 1744, was the oldest (Banks Vol. III 1966).

George West married Margaret Dunham in 1765 and then later Mary Chase in 1767. George had six children with his second wife. The eldest daughter was Peggy West, born in 1770 (Banks Vol. III 1966). At this juncture in history, the Vineyard Sound was a thoroughfare for ships sailing from Cape Cod and the mouth of Buzzard's Bay.

The Marine Hospital was born out of the need for medical care for the many sailors who frequented the harbor of Holmes Hole bringing with them contagious diseases, injuries and other ailments. Holmes Hole was a very busy international port this time in history. In 1763 Dr. Samuel Gelston of Nantucket was given permission to inoculate seaman for smallpox and the history of a public hospital on Martha's Vineyard began. Starting in 1798 the Justices of the County Court petitioned the General Court of Massachusetts to erect a proper hospital to treat destitute seamen. Three hospitals and nearby burial grounds were constructed, one at Eastville in 1798 where the state lobster hatchery is, one off Daggett Avenue in Vineyard Haven and the third nearly a century later at the bluff overlooking Holmes Hole Harbor (Vineyard Gazette, July 8, 1930: A History of Marine Hospital).

Peggy West married Lot Luce in 1787. Lot Luce was the town clerk in Tisbury and served in the Sea Coast Defense in 1776. Their eldest of four children, Captain Presbury Luce, was born in 1788 and married Peggy C. Dunham in 1815 (Banks Vol. III 1966). Upon the captain's death in 1861 a list of his estate was recorded in probate at the Dukes County Court House. Included in his estate were 60 acres of



woodland and one-half of an undivided farm at “Company Place” in Tisbury.

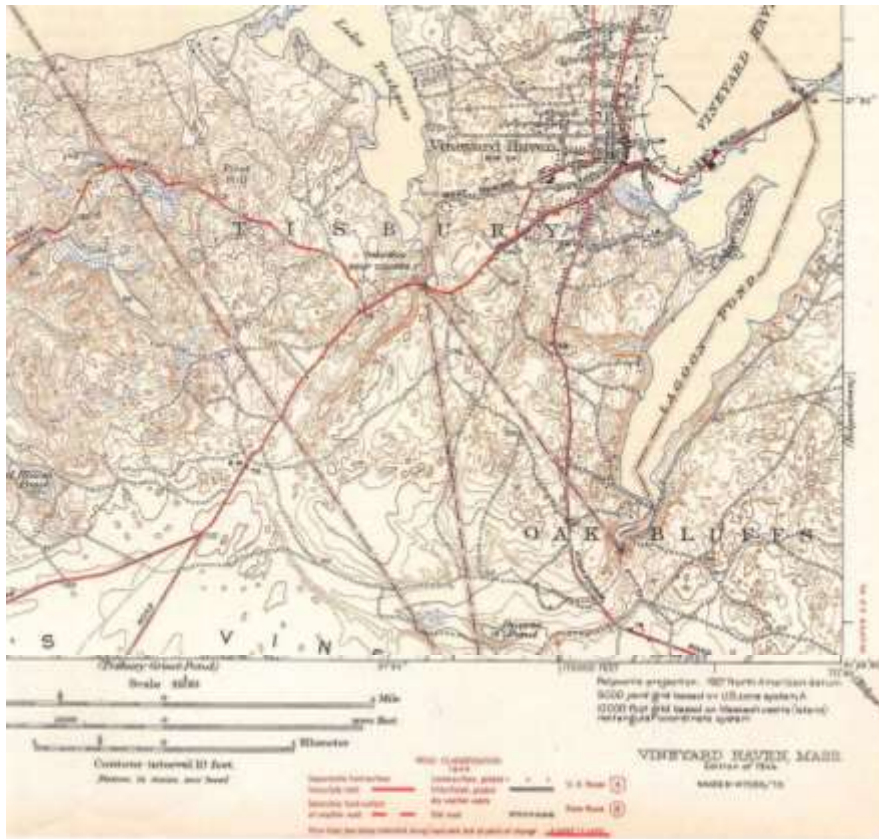
#### 1800-1900

Presbury and Peggy had a daughter, Caroline Luce, in 1816. Caroline married Captain George H. Dexter who died in 1848, ten years after their daughter Eliza was born. Caroline and George’s daughter, Eliza, married Reverend Stephen A. Thomas. Reverend Thomas was the pastor of the Baptist church in Holmes Hole for a time and owned and ran the Thomas’ Clothing Store with Leavitt T. Norton. Reverend Thomas ran the store until he died in 1873. Widow Eliza Dexter married William W. Douglas who opened “Boston Grocery Store” in Vineyard Haven, one of Mr. Douglas’ many entrepreneurial adventures. Mr. Douglas traveled to Colorado for a bit and returned to the Vineyard and opened a furniture store on Main Street in Vineyard Haven in 1882. After the fire of 1883, Eliza Douglas’ mother Caroline bought the Cynthia Chase homestead in Vineyard Haven and her son-in-law built the W.W. Douglas Hardware store (Bear, <http://history.vineyard.net/mainst/six/29/>). When Caroline Dexter died in 1885 she bequeathed to her daughter among many things the hardware store building as well as 40 acres of woodland in “Tisbury near Vineyard Haven” (Dukes County Probate, Caroline Dexter will, 1885). In 1886, Eliza and William Douglas donated a tract of land to the U.S. Government for the “use and purposes of the U. S. Marine Hospital Services of Vineyard Haven” (Deeds, Book 77 Page 6, 35).

The burial grounds for the third hospital was located on a hill a good distance behind the hospital due to the fear of contracting the contagious disease that had felled the buried seamen. In 1879, the Surgeon General Hamilton secured the abandoned lighthouse building at the head of Holmes Hole Harbor as temporary hospital quarters (Banks Vol. II 1966). In 1891 \$20,000 was allocated in the sundry civil bill for the purchase of land and building of the present hospital building adjacent to the old lighthouse grounds. The five-acre plot of land was purchased from Eliza Sparrow for \$1200, much below her asking price of \$3000. Mrs. Sparrow brought the price difference before the Circuit Court but did not prevail in getting her asking price. The new Marine Hospital was completed in 1895 with the old lighthouse buildings and ward serving as apartments for employees, store rooms etc. (Banks Vol. II 1966).

#### 1900-Present

The reservation remained woodland without houses well into the 1900’s. In a 1944 USGS topographic map the only signs of settlement were the cart paths that traversed the reservation. Homes were built along the Edgartown Road and in Tisbury town proper.



Evidence of wood harvesting is present in the woodland through multi-trunk trees that occur from a stump sprouting in the understory and even-aged growth.

Aerial photographs document the advance of development towards the sizeable woodland. The farm fields off-premises to the east on formerly Luce land (Registry of deeds Book 44 page 116), are visible on the 1938 photographs.

**Figure 1: Aerial Photographs 1938, 1969, 1971, 1996, and 2003**

**Wapatequa Woods Reservation**

**Oak Bluffs, Tisbury, MA**



1938



1969



1971



1996



2003

The field on the reservation was created by George H. Fisher, Jr. during the 1980's. George H. Fisher Jr. is the son of Mildred and George H. Fisher Sr. George H. Fisher Sr. married Mildred in 1956. George H. Fisher Sr. was the son of Stanley and Blanche Fisher. Stanley Fisher was a fisherman from Nantucket. George H. Fisher Sr. followed in his father Stanley's footsteps and was also a fisherman

(Vineyard Gazette April 27, 1962).

## 2. Planning Concerns

### (a) Massachusetts Endangered Species Act:

Many of the management activities proposed in this management plan are within the boundaries of priority and estimated habitat for rare species (NHESP Map, Appendix G). The creation of 0.35 miles or (0.34 acres) of new trails; creation of 900 square feet (0.02 acres) of new 3-vehicle trailhead; creation of 2.5 acres of new pasture; creation of 5.0 acres of open canopy pasture; clearing of 0.5 acres of woodland for a winter livestock shelter; and maintenance of 2.7 miles or (2.6 acres) of existing cart paths and woodland trails will generate a Massachusetts endangered species act project review filing for a total of 10.96 acres.

## 3. Abutters

A list of those owning land abutting or within 200 feet of the Wapatequa Woods Reservation appears in Appendix H, as do the accompanying Oak Bluffs, Tisbury, and West Tisbury Assessors Maps.

## 4. Existing Use and Infrastructure

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

- (a) Cemetery: A 0.17-acre clearing containing graves of seamen occurs on the reservation and is bounded by a post-and-wire fence.
- (b) House: A 3-bedroom, 1631 square foot, year-round house
- (c) Pasture: There is 4.26-acre pasture with a 1.1-acre area of thinned woodland where a small livestock shelter is located. There is a 0.06-acre depression within the fenced pasture that is used as a livestock watering hole. There are approximately 2,600 feet of post/wire fence bordering the pasture.
- (d) Livestock shelter and cleared woodland: A one-acre clearing of woodland and a small winter animal shelter occurs adjacent to the pasture.
- (e) Trail/cart paths: There are 2.7 miles of existing cart paths and woodland trails on the reservation.
- (f) Trailhead: There is an existing trailhead off Stoney Hill Road for 4 vehicles.

## II. Inventory Analysis

In this section, problems and opportunities that may arise in the management of Wapatequa Woods Reservation are analyzed.

### A. Constraints & Issues

#### 1. Ecological Context

Wapatequa Woods Reservation is home to a historic cemetery plus a small farm that has been in existence for approximately 40 years. The reservation has for

centuries and continues to remain predominantly woodland.

## 2. Natural and Cultural Resource Concerns

There are three main areas of concern at Wapatequa Woods Reservation, 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:

The post oak (*Quercus stellata*) is listed as uncommon in Massachusetts. The post oak prefers to grow in meadows and fields, ridges or ledges, on sand plains and barrens, taluses and rocky slopes, and also woodlands. The abundance of post oak is a feature which helps to make Wapatequa Woods Reservation unique. The cross-shaped leaves and very tough wood (the name 'post oak' comes from their use as fence posts) provide variety to the mixed-oak woodland amidst the more common oak species.

### Wildlife:

Both moth species of special concern, were observed on the reservation in the mixed-oak woodland.

One other regionally uncommon moth was observed in the mixed-oak woodland on the reservation as well.

Using existing trails, promoting scrub oak growth and colonization and creating healthy sustainable woodland will promote the habitat of the above-mentioned moth species.

- (b) Succession

Succession is a natural process. Without the use of agriculture, accompanied by mechanical mowing and trimming and cutting, woody vegetation will colonize the pasture and cemetery and alter the areas of open canopy habitat on the reservation.

- (c) Invasive Species

Invasive plant species occur on the reservation including spotted knapweed and multiflora rose in the pasture as well as autumn olive in the successional fields. They can be controlled through annual mowing, manually pulling and, if necessary, herbicide treatment. Annual monitoring and quick control and removal of invasive species are important to maintain an ecological balance and the integrity of habitats on the reservation.

## 3. Sociological Context

Wapatequa Woods Reservation is located north of the four towns bound, in

Oak Bluffs, Tisbury and West Tisbury off Stoney Hill Road, Sailors Burying Ground Road and Edgartown Road.

#### 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 reservation'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 Wapatequa Woods Reservastion meets six of the land bank's eight criteria for property acquisition: forest land; wildlife habitats; easements for trails and for publicly owned lands; scenic vistas; protection of agricultural lands; and sites for passive recreation. Preliminary management plans were adopted by the land bank commission and the Oak Bluffs and Tisbury advisory boards and are available for inspection at the land bank office.

#### 3. Opportunities

- a.) **Access:** The proposed vehicular access to the Wapatequa Woods Reservation is through an existing land bank trailhead situated on Stoney Hill Road. A future trailhead on the Edgartown Road is proposed as additional access to the reservation.

- b.) *Trails:* Approximately 3.0 miles of existing and proposed trails/old farm roads will provide loop trails, a connector trail to easements that service nearby conservation land, and portions of the cross-town trail systems. The trail system is proposed for passive recreational uses such as but not limited to hiking, non-motorized biking and horseback riding.
  - c.) *Views:* The reservation offers intimate views of the Sailors Burying Ground and the pasture. Cutting in and around the cemetery will enhance those views and provide clear access to the low-lying grave markers.
  - d.) *Agricultural Grassland:* The pasture and nearby livestock shelter area provides open land and has been farmed for several decades. Creating a 13-acre leasehold for agricultural use in the pasture and proposed wooded pasture will ensure that the agrarian use of the land will continue. Mowing the pasture and pasture woodland at least annually in the spring at times when the land is not being farmed will protect the open quality of the area. Locating the proposed goat barn near the house and field will provide the barn with access to existing water and electricity.
  - e.) *Hunting:* Wapatequa Woods Reservation has been part of the land bank's hunting policy since the early days of the reservation.
  - f.) *House:* A 3-bedroom house is located on the reservation. The house provides a year-round living arrangement for a caretaker of the reservation or for summer staff. Currently the house is occupied by a couple who are caretakers of Wapatequa Woods Reservation.
  - g.) *Berry-picking:* Wapatequa Woods Reservation offers abundant huckleberries and blueberries. Dangleberry, a taller species of huckleberry, is particularly plentiful and its large berries are easy to pick.
  - h.) *Bird-watching:* Wapatequa Woods Reservation offers opportunities for viewing both woodland species of birds and those birds that prefer edge and field habitat.
  - i.) *Firewood:* Wapatequa Woods Reservation is a potential fuel wood resource for island residents. The coppice form of oak grown on the reservation demonstrate evidence of past firewood cutting.
4. Universal Access (UA)

Wapatequa Woods Reservation is not well suited for universal accessibility. It is not possible to connect a UA trailhead to any amenities on the reservation due to the distance and hilly terrain.



The reservation's ROS ('Recreation Opportunities Spectrum') 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 Wapatequa Woods Reservation 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

**Provide long-term protection for plants, animals and natural processes occurring on the Wapatequa Woods Reservation.**

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

*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 reservation:
  - i. remove invasive plants;
  - ii. utilize existing trails as much as possible on the reservation
  - iii. manage views, site new trails and create trailheads in such a way as to avoid cutting post oak and scrub oak.
- e. Reroute or close trails in the event that the recreational use interferes with a rare species' ability to forage and reproduce.
- f. Promote habitat diversity on the reservation by maintaining and expanding the open habitats on the reservation that may serve as breeding habitat for rare turtles.

Objective 2: Reduce and control erosion of trails.

*Strategies:*

- a. Reroute or temporarily close any trail 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.
- d. Promote good farming practices to reduce erosion in the agricultural

leasehold such as but not limited to the use of cover crops, minimum tillage and sound animal rotation practices.

Objective 3: Protect the value of the reservation 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 hazard.
- b. Monitor changes in vegetation cover during regular property checks and by updating ecological inventory in 2025.
- c. Encourage native berry-producing shrubs to grow along the trails and elsewhere on the reservation.
- d. Mow open habitat areas that are outside the agricultural leasehold at least annually in the spring to maintain open habitats for hunting and nesting birds.
- e. Continue to allow the small successional fields to convert to pitch pine and aspen groves to add woodland diversity for wildlife forage and habitat.

Objective 4: Monitor for and control the spread of invasive species.

*Strategies:*

- a. Cut or uproot invasive species as they are observed.
- b. Monitor for re-growth and continue to manage invasive plants.
- c. Explore other control methods and implement with permission of the MVLBC and NHESP if physical control methods fail.

Objective 5: Reduce forest fire danger on the reservation.

*Strategies:*

- a. Prohibit open flame fires on the reservation.
- b. Prohibit storage of brush piles on the reservation.

Objective 6: Maintain agricultural grassland and foster other open canopy habitats.

*Strategies:*

- a. Mow grassland including the leasehold at least annually.
- b. Cut woody vegetation as it sprouts during the growing season.
- c. Create agricultural leasehold in the grassland and lease to a farmer for purposes that may include pasturing, haying or other such customary farming practice in the event that the land bank is no longer using the pastures for its goat land management program.
- d. Create 5 acres of open canopy land through pasturing and annual mowing of the understory and removal of dead tree snags.
- e. Create 2.5 acres of additional pasture through removal of woody vegetation, leaving sporadic shade trees, and via tilling and seeding;

fertilize with lime to maintain pasture habitat. Any surplus wood generated to be distributed to public via firewood policy.

Objective 7: Maintain a sustainable mixed-oak woodland community.

*Strategies:*

- a. Create a forestry plan for wood harvesting.
- b. Ensure that any program of firewood harvesting retains the mixed-oak woodland cover type.

## **B. Recreation and Aesthetics**

**Allow limited, low-impact recreational use of the area for hiking, bicycling, horseback-riding and picnicking; and maintain attractive views and landscapes 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 (see Site Management Map)
- c. Monitor impact of passive recreational use on the reservation annually and manage accordingly.

Objective 2: Designate the existing trailhead on Stoney Hill Road as the primary access to the reservation and locate a future satellite trailhead to provide access to the isolated portion of the reservation located on Edgartown Road.

*Strategies:*

- a. Locate a future 3 to 5-vehicle trailhead on the Edgartown Road in the area of an existing stone pile.
- b. Install a sign station at the future trailhead designating the appropriate uses and rules of the reservation.
- c. Screen future trailhead as necessary using native vegetation

Objective 3: Create trail system as shown on the Site Management Map.

*Strategies:*

- a. Create trail network as shown on the Site Management Map:
  - i. create  $\pm 1883$  linear feet of new trail;
  - ii. make trail corridors six to eight feet wide and eight feet tall when possible, with the exception of existing old roads which may be maintained at their present width;
  - iii. free trails of rocks, roots and other obstacles where practical;
  - iv. install erosion control measures where needed;
  - v. mark trails with markers or directional signs if needed;

- vi. site trails so that they are as unobtrusive as possible to nearby homes and sensitive wildlife habitat;
  - vii. site new trails as needed so that they connect, as well as possible, to other conservation land, ancient ways and trail easements.
  - viii. Remove dead snags along trails that pose a risk to the public.
- b. Screen views of houses as necessary from trails and viewpoints using native vegetation.
  - c. Minimize need for signs by locating trails appropriately.
  - d. Allow land bank staff discretion to close or relocate trails or add new trails, such as spur trails for off-property trail connections.
  - e. Allow multiple uses of trails where appropriate by hikers, Nordic skiers, horseback-riders and bicyclists.
  - f. Prohibit visitors' use of motorized vehicles, such as but not limited to dirt bikes and all-terrain vehicles.
  - g. Relocate a small portion of the pasture fence to allow Sailors Burying Ground Road to continue in its original location through the pasture.
  - h. Check and maintain trails monthly.

Objective 4: Entertain possibilities for other trail links.

*Strategies:*

- a. Use existing trails on the reservation where possible and create new trails as necessary to connect the reservation 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: Require that dog owners follow the Oak Bluffs town bylaw for dogs such that "all dogs owned or kept within the limits of the town shall be restrained from running at large or shall be kept within the immediate control of their owners or keepers" and the Tisbury bylaw for dogs which states that all dogs must be on a leash.

*Strategies:*

- a. Encourage visitors to clean up after their pets.
- b. Post the dog policy at the various sign stations and property entrances and in the land bank map.
- c. Impose a stricter dog policy as necessary if negative interactions that involve dogs occur on the reservation.

Objective 6: Use existing 3-bedroom dwelling located on the reservation as a caretaker's house.

*Strategies:*

- a. In the event that the house is not used for a caretaker of the reservation use the house for seasonal employees.
- b. Contact the affordable housing authorities for recycling or removing of the house if it no longer serves a purpose for the land bank.

Objective 7: Maintain Sailor's Burying Ground so that it remains open and accessible.

*Strategies:*

- a. Follow the management agreement for Sailors' Burying Ground that exists between the Martha's Vineyard Museum and the Martha's Vineyard Land Bank (See Appendix B).
- b. Within the burial area
  - i. mow and trim vegetation
  - ii. remove fallen limbs and trees
  - iii. gather and remove litter

## **C. Natural Products**

### **Allow hunting and gathering and prohibit camping**

Objective 1: Allow hunting on the reservation as per the land bank hunting regulations

*Strategies:*

- a. Notify the public of the hunting policy on the reservation, in the land bank hunting policy and on the land bank website.
- b. Post the reservation closed during shot-gun season.

Objective 2: Prohibit camping.

*Strategies:*

- a. Prohibit camping on the reservation 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 reservation for squatters and remove unauthorized campers promptly.

Objective 3: Allow gathering of natural products according to the land bank's Harvesting and Gathering of Natural Products policy.

*Strategies:*

- a. Prohibit gathering of commonwealth-listed and locally rare plants and wildlife on the reservation.
- b. Prohibit gathering of invasive plants for personal use in order to minimize the spread of seeds elsewhere.

Objective 4: Create 13-acre leasehold for agricultural uses, primarily pasturing, through the expansion of the existing 4.26-acre pasture and construct a barn.

*Strategies:*

- a. Clear a 0.5-acre area north of the house in close proximity to existing electric and water utilities and construct a 4,500 square foot overwintering livestock shelter and kidding house. Use the structure for the land bank goat grazing program or lease to a farmer in the event that the goat program no longer exists.
- b. Create a 5-acre open canopy pasture area adjacent to the existing pasture and mow annually if livestock are not keeping the understory cleared; remove dead trees in the 5-acre area.
- c. Create a 2.5-acre pasture through tree removal and mowing of understory to connect the winter structure with the existing pasture and proposed open canopy pasture.

**D. Community Interaction**

**Provide helpful and interesting information about the property for visitors; promote cultural resource conservation; and 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 reservation’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 Wapatequa Woods Reservation 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 reservation

at the trailheads.

## **E. Land Administration**

### **Oversee and police the Wapatequa Woods Reservation 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 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 reservation.

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.
- c. Request recommendations from the Massachusetts historical commission regarding the proposed activities in the plan.



#### IV. Literature Cited

- Avery, T. and H. Burkhardt. 2002. Forest Measurements. McGraw-Hill,. Boston, MA. 456 pp.
- Banks, C. E. 1966. The History of Martha's Vineyard Dukes County Massachusetts. Volume I, II and III. The Dukes County Historical Society, Edgartown, MA 565pp.
- Bear, C. 1995. <http://history.vineyard.net/mainst/six/29>
- Begon, M., J.L. Harper and C.R. Townsend. 1990. Ecology: individuals, Populations and Communities. Blackwell scientific Publications. Boston, MA 945pp.
- Brown, T.C.; Binkley, D. 1994. Effect of management on water quality in North American forests. Gen. Tech. Rep. RM-248. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 27 p.
- Cornell Ornithology Laboratory. 2009. All About Birds. <http://www.allaboutbirds.org>.
- Dexter, Caroline, 1885, Will of Caroline Dexter, Dukes County Probate Office, Edgartown, MA.
- Dissmeyer, G.E., ed. 2000. Drinking water from forests and grasslands: a synthesis of the scientific literature. Gen. Tech. Rep. SRS-039. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 246 p
- Dukes County Registry of Deeds: Book 44, Page 116; Book 77, pages 6,36; Book 8, Page 437; Book 7, Page 157.
- Dunwiddie, P.W. 1986. Holocene Vegetation History of Nantucket Island, Massachusetts. IV International Congress of Ecology Abstracts. 138p.
- Environmental Protection Agency. 1999. Considering Ecological Processes in Environmental Impact Assessments. <http://www.epa.gov/compliance/resources/policies/nepa/ecological-processes-eia-pg.pdf>
- Felix Neck. 1992. Checklist of Martha's Vineyard Birds. Felix Neck Wildlife Trust, Vineyard Haven, MA.3pp.
- Haines, A. 2011. Flora Novae Angliae. Yale University Press. New Haven, CT. 973pp.
- Kricher J. and G. Morrison. 1988. Ecology of Eastern Forests. Houghton Mifflin Company, New York, NY. 368 pp.

Martin, A., H. Zim, and A. Nelson. 1951. American Wildlife and Plants: A Guide to Wildlife Food Habits. Dover Publications, Inc. New York, New York. 500pp.

Oldale, R. 1992. Cape Cod and The Islands: The Geologic Story. Parnassus Imprints. New Orleans, MA.

Potter, J. 1997. Universal Access Plan. Martha's Vineyard Land Bank Commission publication. 53 pp.

Sibley, D.A. 2001. The Sibley Guide to Bird Life and Behavior. Alfred A Knopf, New York. Pp587.

Soil Conservation Service. 1986. Soil Survey of Dukes County, Massachusetts. United States Department of Agriculture. 144 pp.

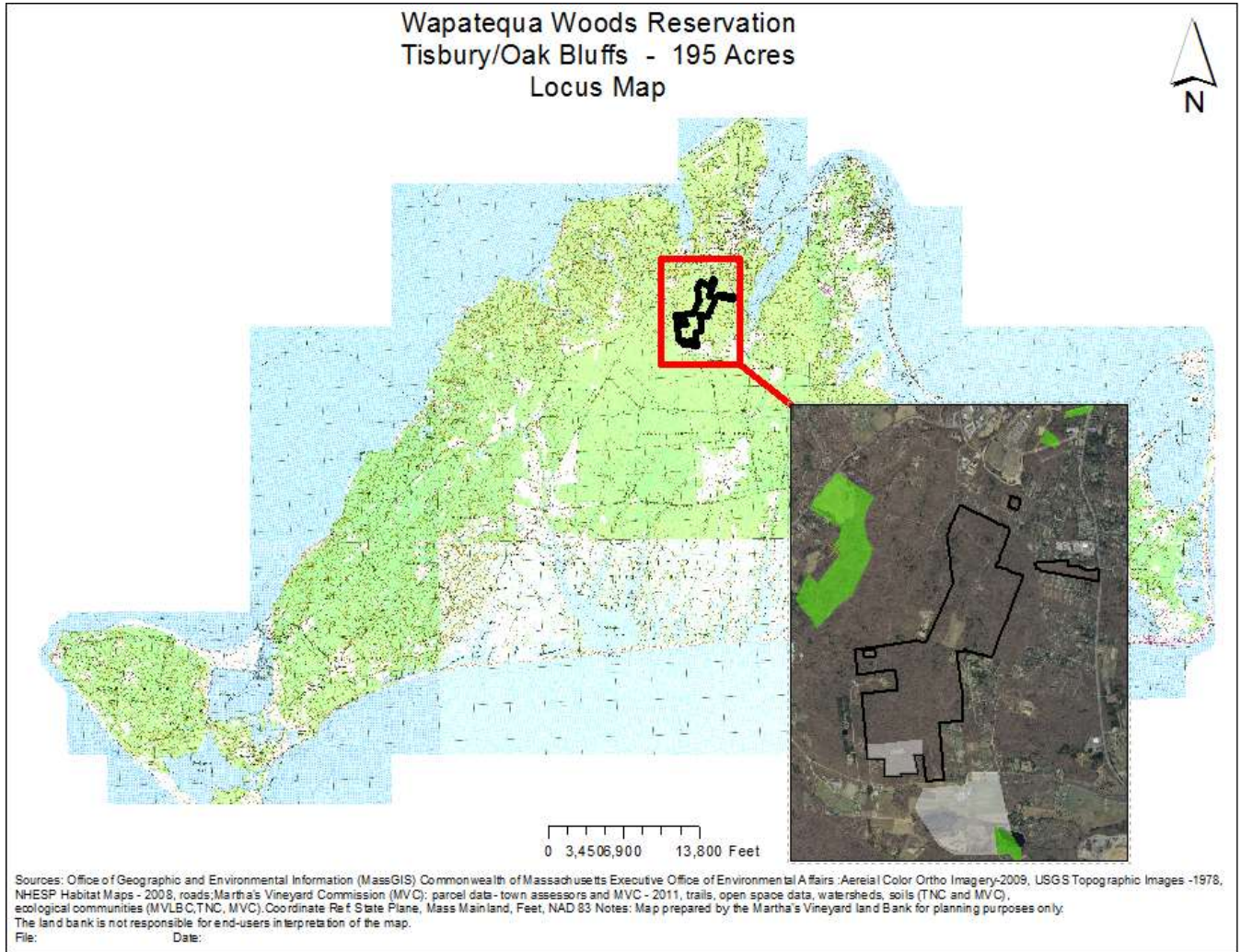
Swanson, D.L. and C. Knapp. 1999. The Flora of Martha's Vineyard. Martha's Vineyard Sandplain Restoration Project. 129 pp.

USGS. 2012. Science Topics: Biological and Physical Processes.  
<http://www.usgs.gov/science/science.php?term=310>

Vineyard Gazette. 1962, April 27. Fisherman Comes Up with Largest Catch of This or Any Season.

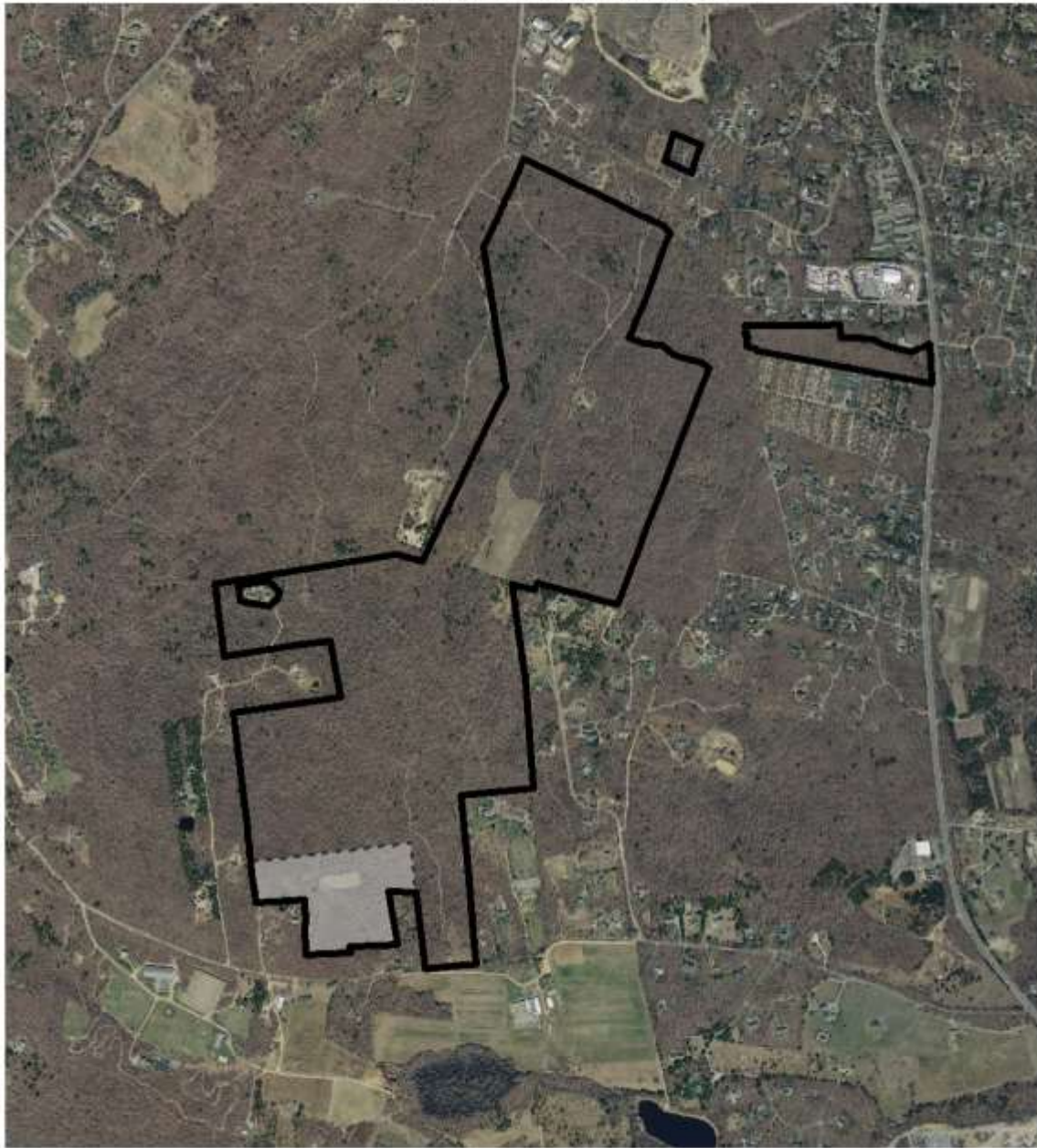
Appendix A. Locus, Topography and Aerial Maps

Map 1: Locus Map



### Map 2: Aerial Photograph Map

Wapatequa Woods Reservation  
Tisbury/Oak Bluffs - 195 Acres  
Aerial Photography Map



Sources: Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs 2014 Aerial Photograph-MassGIS, 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.

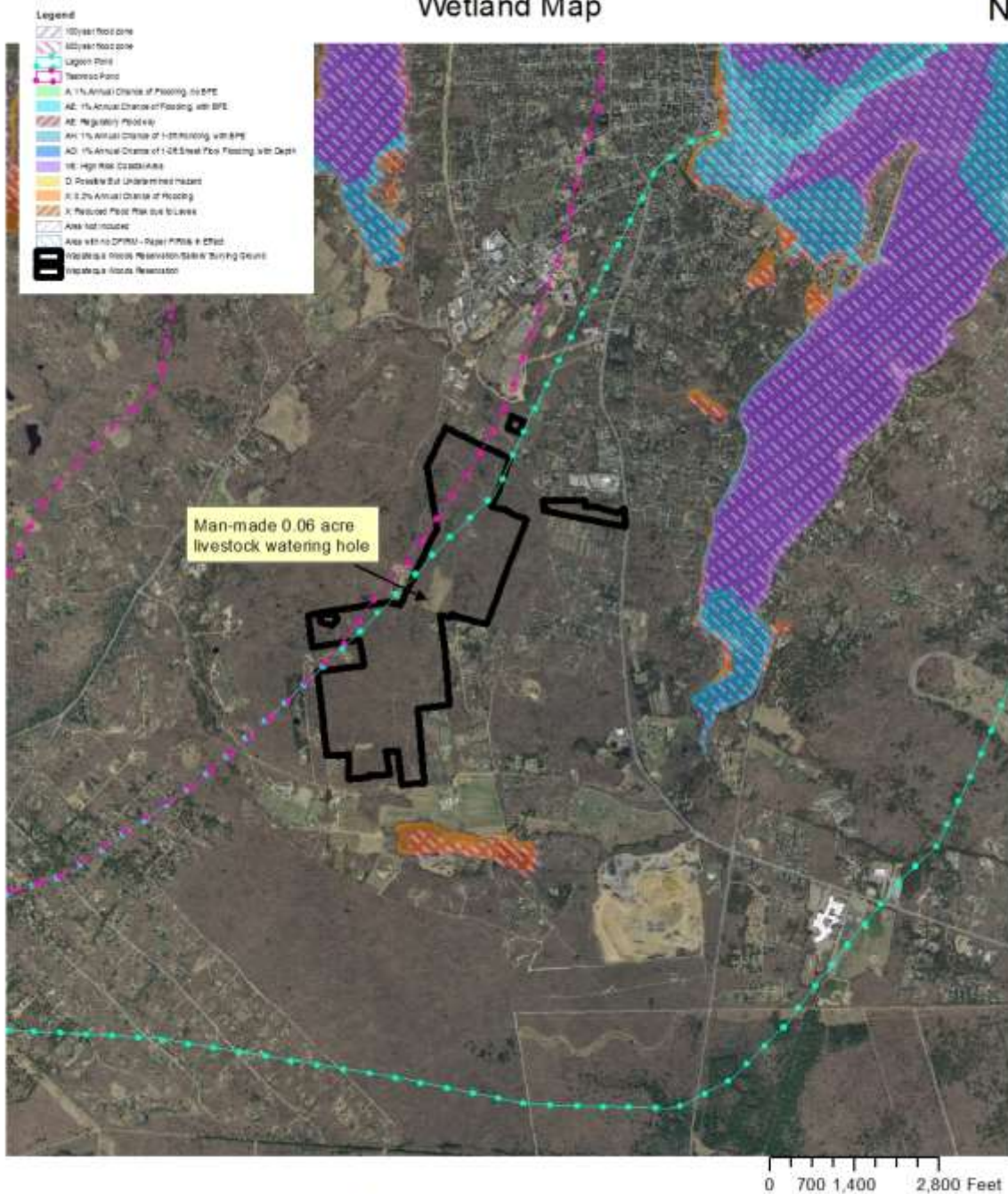
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0 325 650 1,300 Feet



Map 4: Wetland Map

Wapatequa Woods Reservation  
Tisbury/Oak Bluffs - 195 Acres  
Wetland Map



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: \_\_\_\_\_ Date: \_\_\_\_\_

### Appendix B. Surveys, Deeds and Preliminary Management Plan Goals

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 Wapatequa Woods Reservation.

**Table 1. Parcels 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	Book & Page
Philip J. Norton, Jr.	13-Dec-88	512-470
Robert A. Rippondi	15-Feb-89	516-245
George Fisher, Jr	10-Oct-96	686-405
Richard Silva	11-Oct-01	852-423
Joseph Silva	11-Oct-01	852-424
William H. Brine, Jr	11-Oct-01	852-426
Geoffrey E. Warburton, Jr.	11-Oct-01	852-428
Karin Stoll	15-Oct-01	852-784
Stanley Reed Call	14-May-02	883-374
Henry Burt	14-May-02	883-375
Otis Burt	14-May-02	883-376
Willis Burt	14-May-02	884-580
Abbe Burt et al	22-May-02	884-581
Richard Burt	22-May-02	884-583
Peter Marshall Burt et al trustees	22-May-02	884-584
Allen B. Flanders, et al trustees	4-Jun-02	886-307
Laurence Burt	4-Jun-02	886-309
Shirley Howell	4-Jun-02	886-310
David Cresswell	4-Jun-02	886-311
Marjorie Kelly Goepfert	4-Jun-02	886-312
Jeffrey Bezanson	13-Jun-02	887-487
June Bilodeau	5-Jul-02	890-241
Claire Keith	17-Dec-02	899-572
Ruth Burt	14-Mar-03	933-436
Carol E. Koury et al	19-Feb-04	989-219
James H. Lobdell et al	12-Aug-04	1012-025
Linda Kelsey et al	3-Nov-04	1020-899
Linda Kelsey et al	3-Nov-04	1020-895
Seller	Date	Book & Page
Taralyn Topley et al.	18-Feb-05	1031-371
Charlene Judge et al	12-Apr-05	1037-439
Rosemary Jackson et al	8-Aug-05	unrecorded
Patricia B. Wyatt	16-Sep-05	1055-449

Island Housing Trust Corp	6-Oct-05	1058-315
William F. Bunker	17-Oct-05	1059-771
Edward L. Bunker	10-Nov-05	1062-839
Island Housing Trust Corp	17-Nov-05	1063-448
Martha's Vineyard Hospital, Inc.	12-Dec-05	1066-140
John Andreson, Jr. et al	30-May-06	1084-342
Stuart W. Rapp, probate court	28-Jul-06	1091-031
Kent A. Ormondroyd	31-Jul-06	1091-141
Thomas J. Feeney	31-Jul-06	1091-150
Reba M. Benson	20-Apr-07	1118-308
Virginia B. Omar	21-Jun-07	1124-668
Kate L. Chase	12-Jul-07	1126-545
Peggy Largey	29-Aug-07	1130-048
Thomas J. Feeney	13-Dec-07	1138-197
Lottie L. Hufford	13-Feb-09	1169-712
Tisbury Board of Selectmen	24-Feb-09	unrecorded
Garry A. Rhodes	19-Mar-09	1173-387
Lucia Small	19-Mar-09	1173-389
Kenneth Vincent	19-Mar-09	1173-391
Nancy Vincent Hawksbee	19-Mar-09	1173-393
Priscilla Ann Webb Mazzella	19-Mar-09	1173-395
Shirley Kaeka	7-Apr-09	1175-406
Arlene Daigle	7-Apr-09	1175-408
Marian Docherty	7-Apr-09	1175-410
Barbara Maciel	16-Apr-09	1176-263
Marie Ann Pallatt	April 16-2009	1176-261
Angeline Pr'Out	April 16-2009	1176-265
Sandra Bahr	19-May-09	1179-760
Kathryn B. Stewart	16-Jun-09	1183-185
Eva M. Eaton et al	25-Jun-09	1184-465
Mary P. Shalvoy	16-Jul-09	1187-058
Seller	Date	Book & Page
Ruth A. Paine et al	30-Jul-09	1188-350
Patricia G. Waddleton	6-Aug-09	1189-069
Ethel J. Chapman	6-Aug-09	1189-071
Elizabeth P. Rich	11-Aug-09	1189-342
Anne C. Seadale et al.	25-Aug-09	1190-530
James Eaton et al.	2-Nov-09	1195-424
Eugene Philip Damm, Jr. et al	6-Aug-10	1219-885
Helen Manjourides et al	7-Sep-10	1220-528
Kimberly Aiksnoras et al	15-Jun-11	1248-635



Gwyneth Arnold et al	7-Jul-11	1250-094
Bayes Norton Farm, Inc.	31-Dec-12	1303-1058
Cynthia Kolnos et al.	4-Jun-13	1319-624
Lynne G. Silvia et al.	28-Feb-14	1342-916
George H. Fisher, Jr.	30-Jun-14	1352-315

## Memorandum of Understanding

April 24, 2007

### MEMORANDUM OF UNDERSTANDING

AGREEMENT made this 24 th day of April, 2007 by and between the MARTHA'S VINEYARD HISTORICAL SOCIETY ("Historical Society") and the MARTHA'S VINEYARD LAND BANK COMMISSION ("Land Bank");

WHEREAS the Historical Society and the Land Bank each own a 50% interest in a property known as the Sailors' Burying Ground, whose deed is recorded in book 1118 page 668 at the Dukes County registry of deeds (the "Premises"); and

WHEREAS the parties desire to manage the property cooperatively for the mutual benefit of each and, to such end, wish to memorialize each's respective responsibilities;

NOW THEREFORE IT IS HEREBY AGREED that:

- (1.) For management purposes, the Historical Society and the Land Bank shall divide the Premises into two zones; the burial area (the "Burial Area") and the balance of the land (the "Outlying Area"), all as illustrated on the attached Exhibit "A";
- (2.) The Land Bank shall manage the Outlying Area in the same manner as it manages all of its other holdings across the island, e.g., mowing and trimming of vegetation; removal of fallen limbs; creation and upkeep of a trail(s) and/or trailhead; and the like.
- (3.) Except as described in paragraph no. 4, the Historical Society shall manage the Burial Area, which management shall include but shall not be limited to repair and replacement of headstones and other memorial stones;

repair and replacement of existing fencing and stone pillars; installation of interpretive signs; erection of structures of any nature; and the like.

- (4.) Within the Burial Area the Land Bank shall, at the request of the Historical Society and otherwise on a periodic basis, mow and trim vegetation, remove fallen limbs and trees; gather and dispose of litter; and the like.
- (5.) No fences or structures shall be erected within the Outlying Area [a] without the mutual consent of both parties and [b] unless in conformity with the land bank law.
- (6.) No additional gravesites may be created on the Premises.
- (7.) The general public shall be free to use the Sailors Burying Ground Road; and shall access the Burial Area using the existing driveway connecting it and the road.
- (8.) Each party shall maintain adequate liability insurance, which insurance shall name the other party as an additional insured.

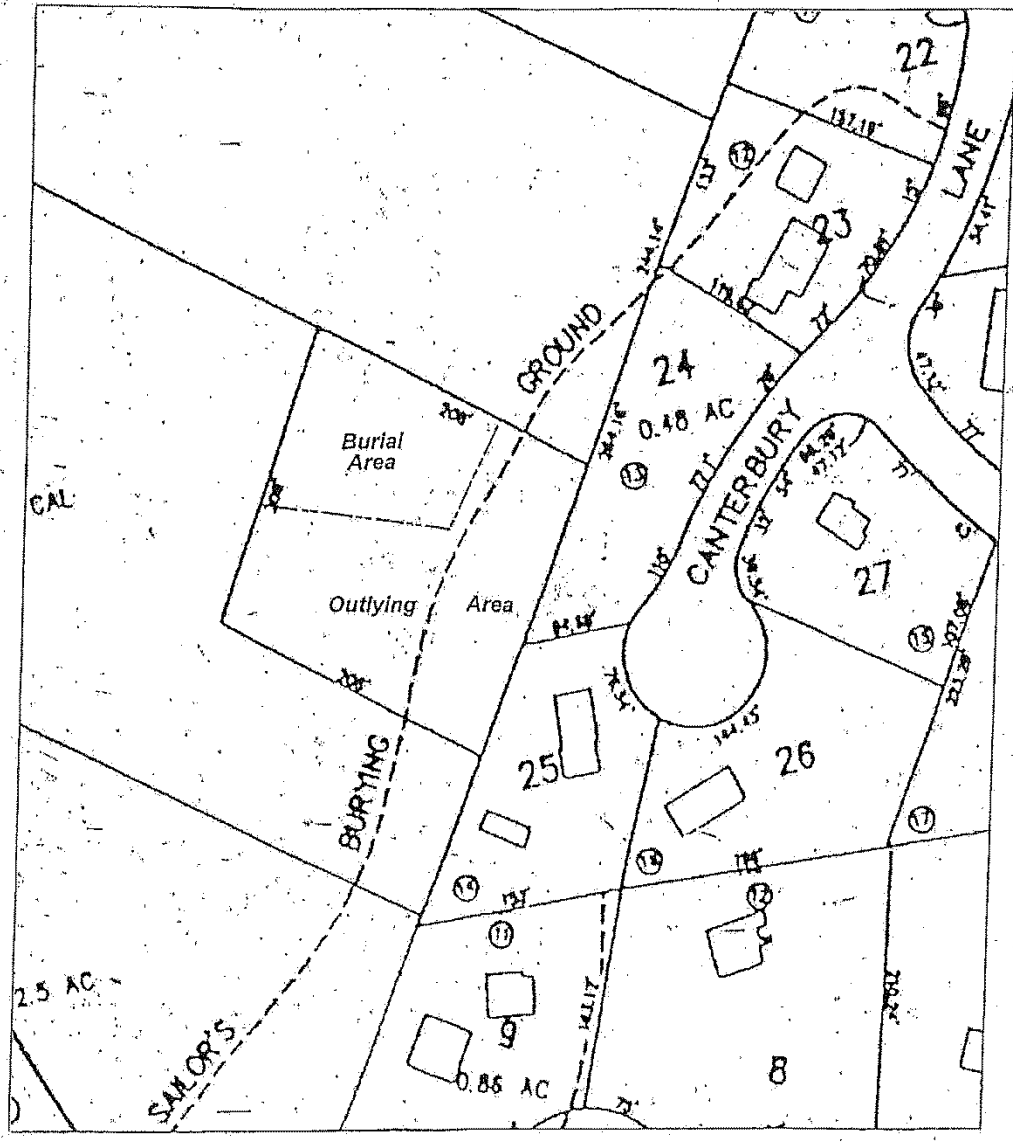
IN WITNESS WHEREOF the parties hereto have set their hands and seals this 24th day of April 2007.

by: Warren H. Hollinshead  
Warren H. Hollinshead, President duly authorized  
MARTHA'S VINEYARD HISTORICAL SOCIETY

by: Thomas Robinson  
Thomas Robinson, Chairman duly authorized  
MARTHA'S VINEYARD LAND BANK COMMISSION

3

Exhibit "A"



Appendix C. Soils Maps and Descriptions

Map 5: Generalized Geologic Map of Martha's Vineyard

Wapatequa Woods Reservation

Tisbury/Oak Bluffs, MA

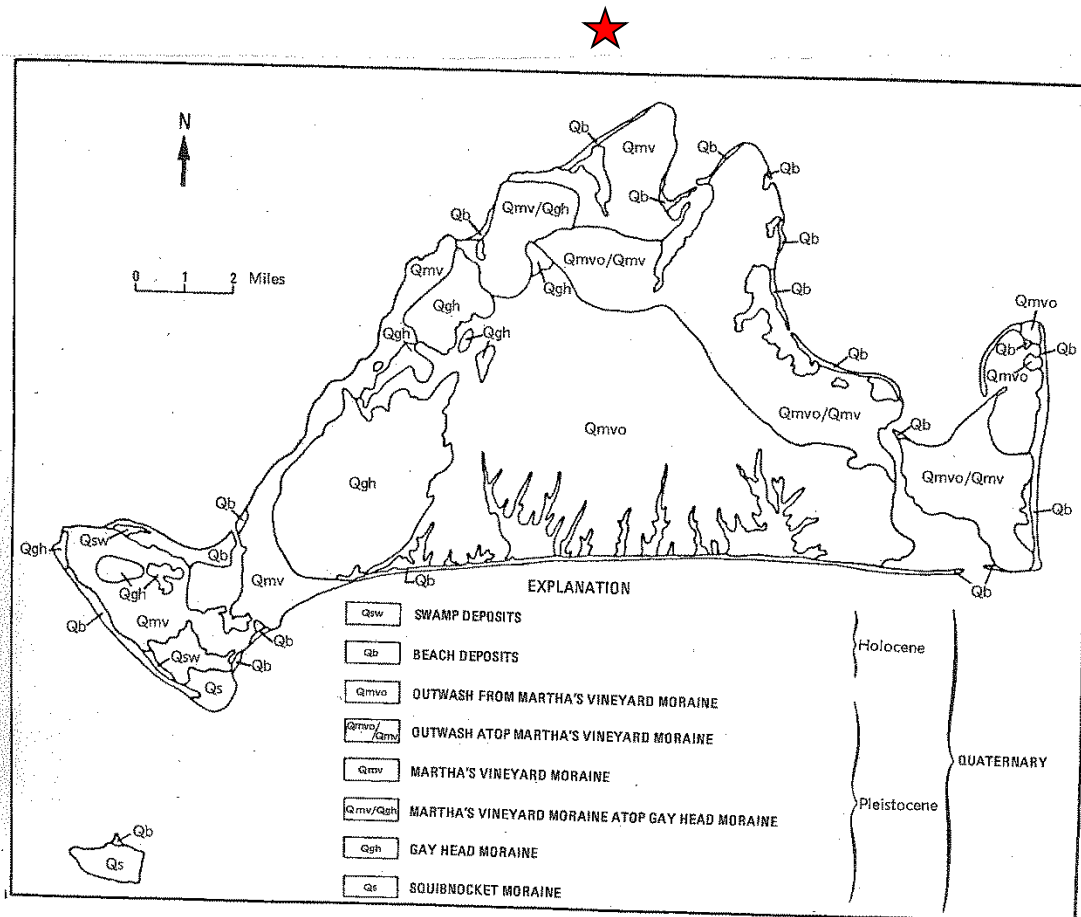
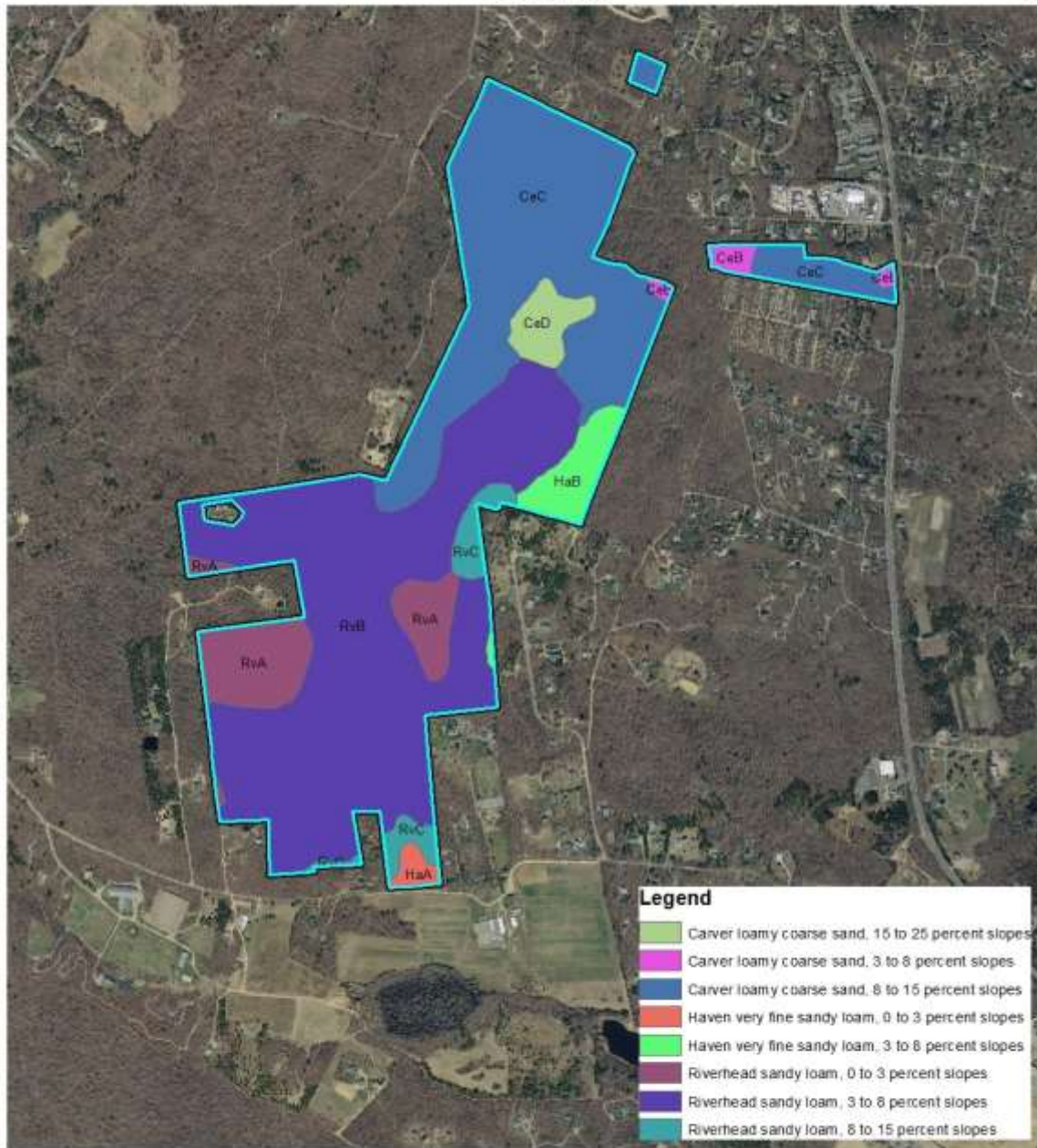


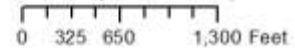
Figure 2.—Generalized geologic map of Martha's Vineyard.

**Map 6: Soil Map**

**Wapatequa Woods Reservation  
Tisbury/Oak Bluffs - 195 Acres  
Soil Map**



Sources: Office of Geographic and Environmental Information (MassGIS) Commonwealth of Massachusetts Executive Office of Environmental Affairs; USGS Topographic Images - 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: \_\_\_\_\_ Date: \_\_\_\_\_



**The soils on the reservation are from the Eastchop series. The following soil descriptions are derived from the SCS (1986) Dukes County Soil Surveys.**

a. Carver Loamy coarse sand (CeB, 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).

CeB – A very deep, gently sloping of 3-8%, and excessively drained soil. It is found in large, broad areas on the outwash plain and terminal moraines, mostly in the northern, central, and eastern parts of Martha's Vineyard. CeB soil is poorly suited to cultivated crops, hay, and pasture, because of the very low water capacity available. The soil is poorly suited to woodland productivity due to its inability to hold water. The soil is not good for building purposes due to areas of this soil not adequately able to filter effluent from septic tank absorption fields, causing a hazard of pollution to ground water (SCS 1986).

CeD – A very deep soil, moderately sloping of 15-25%, and is a 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, HaB)

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).

HaB – A very deep soil, gently sloping of 3-8%, and is a well draining soil. Permeability and water capacity is moderate. The soil is well suited for cultivated crops, hay, and pasture. HaB soil is well suited for woodland productivity and building purposes (SCS 1986).

c. Riverhead sandy loam (RvA, RvB, RvC)

RvA – The dominant soil variety on the reservation, this soil is very deep, well drained and nearly level with a slope of 0-3% slope. RvA soil is well suited to cultivated crops, hay, pasture, woodland productivity, and buildings, but soil may be droughty during periods of low rainfall (SCS 1986).

RvB – The soil is very deep, gently sloping of 3-8%, and a 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 cultivated crops, hay, and pasture. Suitable as a site for building, with or without basements (SCS 1986).

RvC – This soil is very deep, moderately sloping at 8-15%, and well drained. RvC is similar to RvA in that it too is well suited to cultivated 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).

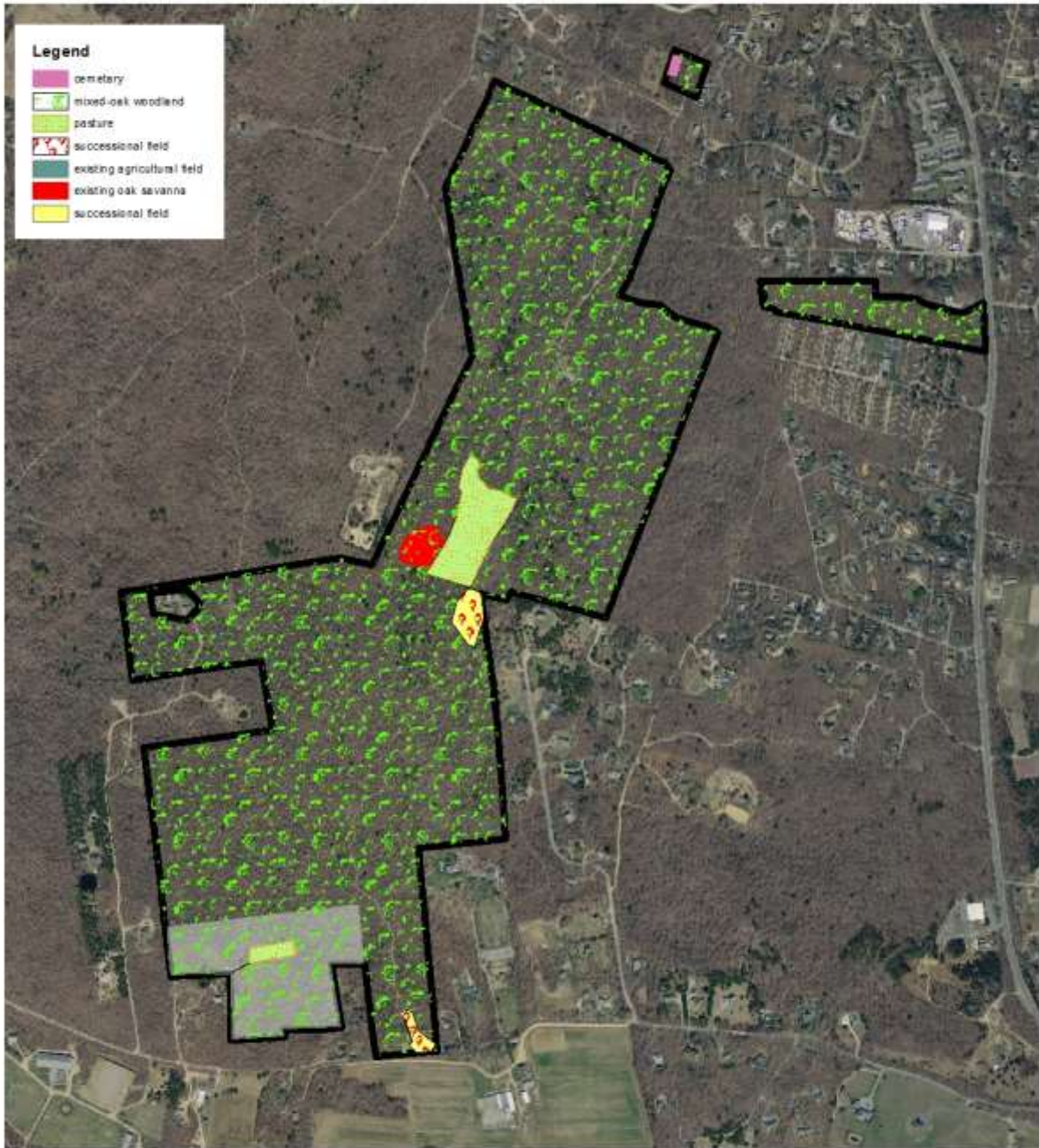
**Appendix D: Vegetation**

Vegetation inventories and surveys of the Wapatequa Woods Reservation were conducted from 1995 through 2015. A plot inventory of 20 acres of woodland on the reservation was conducted in 1996. Twenty-two plots at 36 meter squared each were surveyed for tree species, height and girth as well as dominant understory plants. In 2002 the point-sampling method as described by Avery and Burkhart (1994) was used to inventory 30 acres of woodland on the reservation. A total of 10 points was inventoried in the mixed-oak woodlands. Circular plots (3-meter<sup>2</sup>) were used to inventory the understory at each woodland point. Finally in 2014 the point sampling method as described by Avery and Burkhart (1994) was used again to inventory 170 acres of woodland on the reservation. A total of 37 points was inventoried in the mixed-oak woodlands. Circular plots (3-meter<sup>2</sup>) 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). Rare plant species were inventoried on the reservation during ongoing plant inventories conducted by land bank staff in 1995, 2002, 2007, 2009, 2014 and 2015 from April – October. Flora at Wapatequa Woods Reservation is listed in Table 2 with proper nomenclature according to *Flora Novae Angliae* (Haines (2011)). A description of each cover type and quantitative summary of surveys follows:



### Map 7: Ecological Communities Map

#### Wapatequa Woods Reservation Tisbury/Oak Bluffs - 195 Acres Ecological Communities Map



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: \_\_\_\_\_ Date: \_\_\_\_\_

## Habitat Description

### a. Pasture (4.26 acres)

A small agricultural grassland occurs on the reservation and has been used to pasture animals for the past 40 years. The pasture hosts a variety of species, supporting 44% of species on the reservation, although it is dominated by typical cool-season agricultural grasses. The small watering hole is ringed by bayberry and other small shrubs around the perimeter. The base of the pool during low water periods is a mix of mud and plants such as beggar's tick, soft rush and St. John's wort.

The pasture provides breeding habitat for the eastern box turtle. Although none has been observed on the reservation both winter and breeding habitat are present.

### b. Mixed-oak Woodland (189 acres)

The mixed-oak woodland covers 96% of the reservation and supports habitat for 56% of plants known to occur on the reservation. The old cart paths and their borders account for nearly half of the species observed in the woodland. The narrow foot-and-cart paths maintained through hundreds of years of use provide disturbed openings for species to colonize and ample light and water for growth due to the slight interruption in the tree canopy.

Woodland surveys in 1996, 2002 and 2014 suggest that the mixed-oak woodland on the reservation has changed very little. The black oak remains the dominant overstory tree and wintergreen and black huckleberry are the dominant understory species according to importance values. Importance values are the compilations of relative dominance, density and frequency. The most notable change in the woodland is the increase in snags due to insect damage. In 2002, four percent of the trees inventoried were snags. In 2014, 24% of the trees inventoried were snags. Average percent canopy cover also decreased from 62% in 2002 to 55% in 2014 as a result of tree die-offs associated with moth infestations.

Trees in the woodland are, on average, 33 feet high and 8 inches in diameter at breast height. The estimated basal area per acre is 91 square feet for the entire woodland. There are approximately 226 trees per acre in the dbh class of 10 inches and greater.

The canopy of the woodland is dominated by black and white oak with scattered post and scarlet oaks, pitch pine and sassafras. The canopy cover in the woodland is somewhat closed and has an average cover of 55%. White oak, although not an overstory dominant species, is the dominant sapling in the woodland understory. Understory vegetation in the woodland is dense and dominated by black huckleberry, wintergreen, lowbush blueberry, sheep laurel and bracken fern.

Groundcover in the mixed-oak woodland is very sparse and contains a number of herbs and grasses that are widely scattered over the reservation. The most abundant herbaceous and graminoid plants are wintergreen and Pennsylvania sedge. Both of these plants grow under the ericaceous shrub layer. Pink lady's slipper, pincushion moss, trailing arbutus, pinesap and Indian pipes grow in areas where the shrub layer parts and light flows through to the ground. Many of the less common members of the mixed-oak woodland community are presented in Table 2.

The pink lady's slipper is probably one of the most noticeable plants observed along the pathways through the woodland. Also called moccasin flower, the pink lady's slipper is a woodland orchid that thrives in the acidic soils of oak and pine woods. They flower in April and May and are most abundant where light penetrates through the canopy cover. One large flower sits atop a stalk and remains there for a few weeks. The large, oval leaves are visible all summer. Insect pollinators are attracted to the opening between petals, where the stigma captures pollen carried on the insect as it enters the flower. As the insect exits, it must climb through the anthers, where it receives a liberal dusting of pollen. This ensures that pollen reaching a flower is from another flower. They produce thousands of tiny seeds. Only a few seeds survive to grow and be nourished by soil fungi. The pink lady's slipper dies once picked and does not typically survive transplantation.

c. Successional field (1.6 acres)

There are two successional fields that occur on the reservation. Each field is less than one acre. One 0.7-acre field is located along an eastern boundary towards the middle of the reservation. The southern field is 0.5 acres and is located along Stoney Hill Road. Both these fields are undergoing old-field succession with less than 50 percent graminoid and herbaceous plant cover. Old-field succession is the most common form of succession observed in eastern North America (Kricher and Morrison 1988). An "old-field" is typically an abandoned agricultural field or disturbed upland habitat with a developed soil base (Kricher and Morrison 1988). Some forms of disturbance that can strip upland habitats to bare ground may include all-terrain vehicle use, intensive pasture and heavy vehicle or non-vehicle traffic. Old fields are colonized by pioneer species that are adapted to live and reproduce in disturbed areas. One plant community will replace the other until trees dominate the old field and create shade which limits the diversity of understory species (Kricher and Morrison 1988). The species that dominate an old field are an indication of how old the field is. Exotic introduced plants from Europe and Asia very often are the first to colonize old fields. Dominance of weed plants such as horseweed, ragweed and crab grass indicates that the field has been abandoned for one year. The presence of asters and goldenrod indicates the field is two to three years old. Woody species typically colonize a field after the third or fourth year of abandonment (Kricher and Morrison 1988). These fields have been abandoned for over 10 years.

Pasture grasses such as sweet vernal grass, timothy, velvet grass and redtop

dominate the central 0.7-acre field. Young pitch pine trees have seeded in one-third of the field and are approximately 15 to 30 feet tall. Pitch pines are shade-intolerant and can grow in nutrient-poor sandy soils. They are opportunistic of openings in the canopy cover and colonize where the sunlight is abundant.

The southern successional field was used in the past to graze a horse. This 0.5-acre field is dominated by a variety of herbaceous and graminoid species with pockets of prickly shrubs and a grove of aspen. The majority of herbaceous and graminoid plants that occur in the old field are exotic introduced plants. The growth form of these plants is an indication of their opportunistic strategy (Kricher and Morrison 1988). Some species of old-field colonizers have large numbers of small flowers such as milkweed, goldenrod, yarrow, bushy aster, common plantain and daisy fleabane. Other species such as, field bindweed, buttercup, black-eyed susan and asters, have fewer but larger flowers (Kricher and Morrison 1988). Aspens are very often successional trees that are ultimately replaced by shade-tolerant trees such as oak. However, aspen trees can persist indefinitely. They reproduce slowly by seed but are quick to colonize and area through root sprouts creating clones of one tree (Kricher and Morrison 1988). The aspen grove in this successional field is dense with 40' trees covering more than half of what was once open field.

The successional fields habitat features provide wildlife with cover and forage. The herbaceous and graminoid plants provide cover and their seeds provide forage by small mammals, birds, insects and reptiles. The resinous buds and catkins of aspen trees provide winter and spring food to bird species and the bark, twigs and leaves are eaten by rabbits and deer. Pitch pine trees provide cover to wildlife in winter and roosting habitat to many migratory birds in the spring and fall, and pine seeds and needles are eaten by various bird species (Martin et al. 1951).

**Table 2. Flora at Wapatequa Woods Reservation, Oak Bluffs, Tisbury, MA based on property surveys conducted from 1995-2015.**

	<i>Scientific name</i>	Common name	Rank	Morphology	Cultural Ground	Mixed Oak Woodland	Old Cartpath	Abandoned Field
	<b>Non-vascular plants</b>							
	<b>Lichen</b>							
1	<i>Cladonia rangiferina</i>	reindeer moss lichen				X		
2	<i>Usnea strigosus</i>	old mans beard		lichen		X		
	<b>Moss</b>							

3	<i>Leucobryum glaucum</i>	pincushion moss		moss		X		
4	<i>Polytrichum species</i>	haircap moss		moss	X	X		
	<b>Vascular plants</b>							
	<b>GRAMINOID</b>							
	<b>Cyperaceae</b>							
1	<i>Carex pensylvanica</i>	pennsylvania sedge	AN	graminoid	X		X	
	<b>Juncaceae</b>							
2	<i>Juncus effusus</i>	soft rush	AN	graminoid	X			X
3	<i>Juncus greenei</i>	Greene's rush	FN	graminoid		X	X	
4	<i>Juncus tenuis</i>	path rush	AN	graminoid			X	
	<b>Poaceae</b>							
5	<i>Agrostis gigantea</i>	redtop	FI	graminoid			X	
6	<i>Agrostis scabra</i>	rough bentgrass		graminoid	X			
7	<i>Bidens frondosa</i>	devil's beggartick		graminoid				X
8	<i>Anthoxanthum odoratum</i>	sweet vernal grass	FI	graminoid	X		X	
9	<i>Dactylis glomerata</i>	orchard grass	FI	graminoid			X	
10	<i>Danthonia spicata</i>	poverty grass	UN	graminoid		X	X	
11	<i>Descampsia flexuosa</i>	crinkled hairgrass	FN	graminoid		X	X	
12	<i>Dichanthelium clandestin</i>	deer tongue	FN	graminoid	X			
13	<i>Festuca cf. rubra</i>	red fescue	FN	graminoid	X			
14	<i>Festuca filiformes</i>	hair fescue	UI	graminoid	X			
15	<i>Festuca ovina</i>	sheep fescue	FI	graminoid	X			
16	<i>Festuca pratensis</i>	meadow fescue	UI	graminoid			X	
17	<i>Holcus lanatus</i>	velvet grass	AI	graminoid	X			X
18	<i>Luzula multiflora</i>	common woodrush	FN	graminoid		X		
19	<i>Panicum lanuginosum</i>	panic grass	U	graminoid	X	X	X	
20	<i>Panicum virgatum</i>	switchgrass	FN	graminoid	X			
21	<i>Schizachyrium scoparium</i>	little bluestem	FN	graminoid	X			
22	<i>Phleum pratense</i>	timothy	AI	graminoid				X
23	<i>Setaria faberi</i>	giant foxtail	RI	graminoid	X			
	<b>FERN</b>							
	<b>Dennstaedtiaceae</b>							
24	<i>Pteridium aquilinum</i>	bracken fern	AN	fern	X	X		
	<b>Myricaceae</b>							
25	<i>Comptonia peregrina</i>	sweet fern	AN	fern		X		X
	<b>Thelypteridaceae</b>							
26	<i>Thelypteris noveboracensis</i>	New York fern	FN	fern	X			
	<b>HERB</b>							
	<b>Anacardiaceae</b>							
27	<i>Toxicodendron radicans</i>	poison ivy	AN	herb	X	X	X	
	<b>Apiaceae</b>							

28	<i>Daucus carota</i>	Queen Anne's Lace	FI	herb					X
	<b>Apocynaceae</b>								
29	<i>Apocynum sp.</i>	dogbane	U	herb				X	
	<b>Araliaceae</b>								
30	<i>Aralia nudicaulis</i>	wild sarsaparilla	FN	herb		X	X		
	<b>Asclepiadaceae</b>								
31	<i>Asclepias syriaca</i>	common milkweed	AN	herb					X
	<b>Asteraceae</b>								
32	<i>Arctium minus</i>	common burdock	OI	herb					X
33	<i>Aster dumosus</i>	bushy aster	FN	herb				X	X
34	<i>Aster spectabilis</i>	showy aster	FN	herb				X	X
35	<i>Achillea millefolium</i>	yarrow	AI	herb					X
36	<i>Ambrosia artemisiifolia</i>	common ragweed	FN	herb	X				
37	<i>Aster paternus</i>	toothed white-topped aster	AN	herb		X	X		
38	<i>Aster solidagineus Michaux</i>	narrow white-topped aster	ON	herb	X				X
39	<i>Symphotrichum undulatum</i>	wavy-leaved aster	FN	herb				X	X
40	<i>Baccharis halimifolia</i>	groundsel tree							
41	<i>Leucanthemum vulgare</i>	oxeye daisy	AI	herb					X
42	<i>Centaurea maculosa</i>	spotted knapweed	FI	herb					
43	<i>Cichorium intybus</i>	chicory	OI	herb					X
44	<i>Conyza canadensis</i>	coastal horseweed	UN	herb	X				X
45	<i>Erigeron annus</i>	daisy fleabane	ON	herb					X
46	<i>Euthamia graminifolia</i>	lance-leaf goldenrod	AN	herb					X
47	<i>Euthamia tenuifolia</i>	slender-leaved goldenrod	AN	herb					X
48	<i>Hieracium caespitosum</i>	field hawkweed	UN	herb	X				
49	<i>Hieracium gronovii</i>	hairy hawkweed	UN	herb		X	X		
50	<i>Hieracium pilosella</i>	mouse-ear hawkweed	UI	herb	X				
51	<i>Hieracium venosum</i>	rattlesnake weed	FN	herb		X	X		
52	<i>Hypochaeris radicata</i>	cat's ear	FI	herb	X			X	
53	<i>Lactuca canadensis</i>	wild lettuce	FN	herb	X				
54	<i>Lapsana communis</i>	nipplewort	UI	herb					X
55	<i>Matricaria matricariodes</i>	pinneapple weed	UI	herb					X
56	<i>Rudbeckia hirta var. pulcherrima</i>	black-eyed susan	OI	herb					X
57	<i>Solidago bicolor</i>	white goldenrod	ON	herb				X	
58	<i>Solidago elliotii</i>	Elliott's goldenrod	FN	herb	X	X			
59	<i>Solidago nemoralis</i>	gray goldenrod	FN	herb		X	X		
60	<i>Solidago odora</i>	sweet goldenrod	AN	herb	X	X	X	X	
61	<i>Solidago rugosa</i>	rough-stemmed goldenrod	UN	herb	X	X	X	X	
62	<i>Solidago speciosa</i>	showy goldenrod	U	herb				X	
63	<i>Prenanthes trifoliolata</i>	tall rattlesnake root	ON	herb	X	X	X		

64	<i>Taraxacum officinale</i>	common dandelion	AI	herb	X		X	X
	<b>Caryophyllaceae</b>							
65	<i>Cerastium vulgatum</i>	mouse-ear chickweed	AI	herb	X			X
66	<i>Dianthus armeria</i>	deptford pink	OI	herb				X
	<b>Cistaceae</b>							
67	<i>Crocianthemum canadense</i>	Canadian frostweed	FN	herb	X	X		
	<b>Clusiaceae</b>							
68	<i>Hypericum perforatum</i>	common St. Johnswort	FI	herb				X
	<b>Convolvulaceae</b>							
69	<i>Convolvulus arvensis</i>	field bindweed	OI	herb				X
	<b>Ericaceae</b>							
70	<i>Arctostaphylos uva-ursi</i>	bearberry	AN	herb		X		
71	<i>Monotropa hypopithys</i>	pinemap	ON	herb		X		
	<b>Fabaceae</b>							
72	<i>Baptisia tinctoria</i>	wild indigo	FN	herb				X
73	<i>Lespedeza capitata</i>	round-headed bush clover	FN	herb	X			X
74	<i>Lotos corniculatus</i>	birds-foot trefoil	OI	herb				X
75	<i>Trifolium arvense</i>	rabbit-foot clover	FI	herb	X			
76	<i>Trifolium pratense</i>	red clover	FI	herb	X			
77	<i>Trifolium repens</i>	white clover	FI	herb	X			
78	<i>Vicia cracca</i>	cow vetch	OI	herb				X
79	<i>Vicia lathyroides</i>	spring vetch						
	<b>Hostaceae</b>							
80	<i>Hosta sp.</i>	hosta		herb	X			
	<b>Liliaceae</b>							
81	<i>Hypoxis hirsuta</i>	yellow stargrass	FN	herb		X		
82	<i>Cypripedium acaule</i>	lady slipper	FN	herb		X		
	<b>Monotropaceae</b>							
83	<i>Monotropa uniflora</i>	indian pipe	FN	herb		X		
	<b>Phytolaccaceae</b>							
84	<i>Phytolacca americana</i>	pokeweed	FN	herb			X	
	<b>Plantaginaceae</b>							
85	<i>Plantago major</i>	dooryard plantain	UI	herb	X		X	
86	<i>Plantago lanceolata</i>	english plantain	AI	herb	X		X	
	<b>Polygalaceae</b>							
87	<i>Polygala polygala</i>	racemed milkwort	ON/FN	herb				X
	<b>Polygonaceae</b>							
88	<i>Rumex acetosella</i>	field sorrel	AI	herb	X			
	<b>Primulaceae</b>							
89	<i>Lysimachia quadrifolia</i>	whorled loosestrife	FN	herb		X	X	
90	<i>Trientalis borealis Raf.</i>	Starflower	FN	herb		X		

	<b>Pyrolaceae</b>							
91	<i>Chimaphila maculata</i>	striped wintergreen	FN	herb		X	X	
	<b>Rosaceae</b>							
92	<i>Fragaria virginiana</i>	wild strawberry	ON	herb	X			
93	<i>Potentilla canadensis</i>	dwarf cinquefoil	FN	herb	X	X	X	X
94	<i>Rosa multiflora</i>	multiflora rose	AI	shrub			X	X
	<b>Ranunculaceae</b>							
95	<i>Ranunculus acris</i>	tall buttercup	UI	herb	X			
96	<i>Ranunculus bulbosus</i>	bulbous buttercup	FI	herb				X
	<b>Rubiaceae</b>							
97	<i>Houstonia caerulea</i>	little bluet	FN	herb	X			
98	<i>Rubia tinctorum</i>	wild madder		herb	X			X
	<b>Scrophulariaceae</b>							
99	<i>Linaria vulgaris</i>	butter-and-eggs	FI	herb	X			X
	<b>Violaceae</b>							
100	<i>Viola sororia</i>	common blue violet	UN	herb				X
	<b>SHRUB</b>							
	<b>Caprifoliaceae</b>							
101	<i>Viburnum dentatum var. venosum</i>	southern (hairy) arrowwood	UN	shrub		X	X	
	<b>Elaeagnaceae</b>							
102	<i>Elaeagnus umbellata</i>	autum olive	UI	shrub	X	X		
	<b>Ericaceae</b>							
103	<i>Epigens repend</i>	trailing arbutus	AN	shrub	X	X	X	
104	<i>Gaultheria procumbens</i>	wintergreen	AN	shrub		X	X	
105	<i>Gaylussacia baccata</i>	black huckleberry	AN	shrub	X	X		
106	<i>Gaylussacia frondosa</i>	dangleberry	FN	shrub		X		
107	<i>Kalmia angustifolia</i>	sheep laurel	FN	shrub		X		
108	<i>Lyonia ligustrina</i>	maleberry	FN	shrub		X		
109	<i>Rhododendron viscosum</i>	swamp azalea	FN	shrub	X			
110	<i>Vaccinium corymbosum</i>	highbush blueberry	FN	shrub		X		
111	<i>Vaccinium angustifolium</i>	early lowbush blueberry	FN	shrub	X	X		
112	<i>Vaccinium pallidum</i>	late lowbush blueberry	FN	shrub	X	X		
	<b>Lauraceae</b>							
113	<i>Sassafras albidum</i>	sassafras	AN	tree		X		
	<b>Myricaceae</b>							
114	<i>Myrica pensylvanica</i>	bayberry	AN	shrub		X		
	<b>Rosaceae</b>							
115	<i>Aronia arbutifolia</i>	red chokeberry	ON	shrub		X		
116	<i>Aronia melanocarpa</i>	black chokeberry	ON	shrub		X		
117	<i>Prunus serotina</i>	black cherry	AN	shrub	X	X		
118	<i>Prunus virginiana</i>	chokecherry	ON	shrub		X		



119	<i>Rosa carolina</i>	pasture rose	FN	shrub	X	X		
	<b>TREE</b>							
	<b>Aceraceae</b>							
120	<i>Acer rubrum</i>	red maple	AN	tree				
	<b>Betulaceae</b>							
121	<i>Betula populifolia</i>	grey birch	ON	tree		X	X	
	<b>Cupressaceae</b>							
122	<i>Juniperus virginiana</i>	eastern redcedar	AN	tree	X			
	<b>Fagaceae</b>							
123	<i>Fagus grandifolia Ehrh.</i>	American Beech	FN	tree		X		
124	<i>Quercus alba</i>	white oak	AN	tree	X	X		
125	<i>Quercus coccinea</i>	scarlet oak	AN	tree	X	X		
126	<i>Quercus ilicifolia</i>	scrub oak	AN	tree	X	X		
127	<i>Quercus stellata</i>	post oak	FN-WL	tree		X		
128	<i>Quercus velutina</i>	black oak	AN	tree	X	X		
	<b>Pinaceae</b>							
129	<i>Pinus rigida</i>	pitch pine	AN	tree	X	X		X
130	<i>Pinus strobus</i>	white pine	FI	tree	X	X		
	<b>Rosaceae</b>							
131	<i>Amelanchier laevis</i>	shadbush	UN	tree	X	X		
	<b>Salicaceae</b>							
132	<i>Populus grandidentata</i>	big tooth aspen	ON	tree	X			
133	<i>Populus tremuloides</i>	trembling aspen	ON	tree		X		
	<b>Sapindaceae</b>							
134	<i>Acer palunatum</i>	japanese maple		tree	X			
	<b>VINE</b>							
	<b>Caprifoliaceae</b>							
135	<i>Lonicera morrowii</i>	Morrow honeysuckle	AI	vine/shrub	X			
136	<i>Lonicera japonica</i>	Japanese honeysuckle	AI	herb/shrub				X
	<b>Celastraceae</b>							
137	<i>Celastrus orbiculatus</i>	Asian bittersweet	AI	vine			X	
	<b>Orobanchaceae</b>							
138	<i>Melampyrum lineare</i>	cow-wheat	UN	herb		X		
	<b>Rosaceae</b>							
139	<i>Rubus allegheniensis</i>	common blackberry	FN	vine	X			X
140	<i>Rubus flagellaris</i>	prickly dewberry	FN	vine			X	
141	<i>Rubus hispidus</i>	bristly dewberry	AN	vine		X		
	<b>Smilacaceae</b>							
142	<i>Smilax glauca</i>	sawbrier	FN	vine		X		
143	<i>Smilax rotundifolia</i>	common greenbrier	AN	vine	X	X	X	
	<b>Vitaceae</b>							

144	<i>Parthenocissus quinquefolia</i>	virginia creeper	AN	vine		X		
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<sup>a</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 10 or fewer sites, H = historic (recorded but not sighted in past 40 years), N = native, I = introduced, WL = watch listed by MA, SC = special concern by MA, E = endangered, T = threatened. Sources: Haines 2011, Swanson and Knapp 1999

### Appendix E. Wildlife

Wildlife species were observed on the reservation through general property surveys, UV black-light surveys and diurnal Odonata and Lepidoptera surveys. Wildlife species seen or heard and evidence of wildlife species such as tracks and scat were recorded during general observations, vegetation surveys and avian bird counts in 1995, 1996, 2002, 2007, 2008, 2009, 2014, and 2015. Nocturnal moth species were surveyed using a stainless-steel rigid vein 18-24 inch “leptrap” with a 32-40 Watt quantum black light. Traps were set using a photoelectric switch from dusk to dawn on seven trap nights in June, July, and September of 2014. Species were collected, packaged and sent to Mark Mello, an entomologist with the Lloyd Center for the Environment, in Dartmouth, MA, for positive identification.

Wapatequa Woods Reservation provides opportunities for nesting, roosting, and foraging wildlife species (Table 2). Fruiting shrubs and vines (i.e., huckleberry, blueberry, greenbrier, and bayberry) provide for summer and fall foraging of birds and mammals. Mast-bearing trees such as oaks provide a vital source of food to many wildlife species in the fall and winter when other nutritional foods are unavailable (Martin et al. 1951). Snags provide foraging and nesting habitat for songbirds, especially woodpeckers and second-cavity nesters (Sibley 2001). The grassland areas provide hunting grounds for birds of prey. Various moth species use the shrubs and trees on the reservation for at least a portion of their life cycle (Table 3).

**Table 3. Wildlife at Wapatequa Woods Reservation, Oak Bluffs, Tisbury, MA from general observations during property inventories conducted from 1995-2015.**

Scientific name	Common name	Mixed-oak Woodland <sup>a</sup>	Grassland
Kingdom Metazoa (Animalia)			
Phylum Arthropoda			
Class Insecta			
Order Hymenoptera (sawflies, ants, wasps, and bees)			

Family Formicidae: <i>Camponotus pennsylvanicus</i>	black carpenter ants	Sp	
Family Pelecinidae: <i>Pelecinus sp.</i>	pelecinid wasp species	S	
Family Apidae: <i>Bombus pennsylvanicus</i>	bumble bee	Sp	
Family Apidae: <i>Apis mellifera</i>	honey bee	SP	
Family Vespidae: <i>Vespula sp.</i>	yellow jacket	SP	
<b>Order Lepidoptera (butterflies and moths)</b>			
Family Pieridae: <i>Colias eurytheme</i>	orange sulphur		Sp
Family Papilionidae: <i>Papilio troilus</i>	spicebush swallowtail	S	S
Family Liparidae: <i>Halysidota tessellaris</i>	banded tussock moth	S	
Family Lycaenidae: <i>Celastrina argiolus</i>	spring azure	Sp	
Family Lycaenidae: <i>Lycaena phlaeas</i>	american copper		S
Family Noctuidae: <i>Chaetagnaea sericea</i>	silky sallow	S	
Family Nymphalidae: <i>Nymphalis antiopa</i>	mourning cloak	Sp	S
Family Hesperidae: <i>Erynnis brizo</i>	sleepy duskywing	Sp	
Family Hesperidae: <i>Erynnis juvenalis</i>	juvenal's duskywing	SP	
<b>Order Diptera (flies)</b>			
Family Culicidae: species unknown	mosquitoes	F, S, Sp	
<b>Order Orthoptera (grasshoppers and crickets)</b>			
Family Gryllidae: <i>Gryllus pennsylvanicus</i>	field cricket	S	S
<b>Class Arachnida</b>			
<b>Order Araneae</b>			
Family Araneidae: <i>Araneus marmoreus</i>	marbled orb weaver	S	
<b>Order Acarina</b>			
<b>Scientific name</b>	<b>Common name</b>	<b>Mixed-oak</b>	<b>Grassland</b>
Family Ixodidae: <i>Ixodes scapularis</i>	deer tick	S, Sp, F	
<b>Phylum Chordata</b>			
<b>Subphylum Vertebrata</b>			
<b>Class Mammalia</b>			
<b>Order Rodentia</b>			
Family Sciuridae: <i>Sciurus carolinensis</i>	eastern gray squirrel	F, Sp, S	
<b>Order Carnivora</b>			
Family Mustelidae: <i>Mephitis mephitis</i>	striped skunk	F	

Family Canidae: <i>Canis familiaris</i>	domestic dog	W	W
<b>Order Artiodactyla</b>			
Family Cervidae: <i>Odocoileus virginianus</i>	white-tailed deer	F	

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

Moth and bird species are listed in Tables 4-8.

**Table 4. List of moths by station and date collected by Martha's Vineyard Land Bank staff during 2008 and 2014 at Wapatequa Woods Reservation, Oak Bluffs, Tisbury MA.**

		WW44 = Wapatequa Woods south (trap 44) - mixed oak woodland      WW = Wapatequa Woods east (trapWW) WW45 = Wapatequa Woods north (trap 45) - mixed oak woodland															
		month	June 12	June 18	June 18	July 1	July 1	July 17	July 17	July 24	July 24	July 30	July 30	Aug 4	Sept 3	Sept 3	Total
		date	2008	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	
MONA	ZOOK.	station	WW	WW44	WW45	WW44	WW45	WW44	WW45	WW44	WW45	WW44	WW45	WW	WW44	WW45	
#	#	method	uv	Uv	Uv	Uv	Uv	Uv	Uv	Uv	Uv	Uv	Uv	UV	Uv	Uv	
		<b>GEOMETRIDAE</b>															0
		<b>Ennominae</b>															0
6273		<i>Speranza ("Itame") pustularia</i>					1										1
6282		<i>Speranza ("Itame") argillacearia</i>		1	1												2
6340		<i>Macaria minorata</i>															0
6342		<i>Macaria bisignata</i>		1	1		1							1			4
6352		<i>Macaria granitata</i>		1	1						1			1			4
6353		<i>Macaria multilineata</i>			1							1					2
6386		<i>Digrammia ocellinata</i>						1						1			2
6449		<i>Glena cribrataria</i>		1	1	1	1	1		1							6
6590		<i>Anavitrinella pampinaria</i>												1			1
6597		<i>Ectropis crepuscularia</i>							1			1					2
6598		<i>Protoarmia porcelaria</i>						1						1			2
6599		<i>Epimecis hortaria</i>					1										1
6620		<i>Melanolopia canadaria</i>			1						1		1				3
6638		<i>Eufidonia notataria</i>			1												1
6654		<i>Hypagyrtis unipunctata</i>	1	1	1	1	1										5
6667		<i>Lomographa vestaliata</i>		1	1		1										3
6720		<i>Lyctosis unitaria</i>				1											1
6724		<i>Euchlaena serrata</i>					1										1
6725		<i>Euchlaena muzaria</i>			1	1											2
6739		<i>Euchlaena irraria</i>		1	1	1	1										4
6754		<i>Pero ancetaria ("hubneraria")</i>								1		1	1	1			4













9266	9E+05	<i>Acronicta lithospila</i>		1		1	1							1			4
9285	9E+05	<i>Polygrammate hebraeicum</i>		1	1			1									3
8104	9E+05	<i>Comachara cadburyi</i>		1													1
9062	9E+05	<i>Cerma cerintha</i>		1													1
		<b>Eriopinae</b>															0
9633	9E+05	<i>Calloplistria cordata</i>		1	1		1										3
		<b>Noctuinae</b>															0
9618	9E+05	<i>Phosphila turbulenta</i>		1	1												2
9619	9E+05	<i>Phosphila miseloides</i>			1												1
9666	9E+05	<i>Spodoptera frugiperda</i>												1			1
9681	9E+05	<i>Elaphria alapallida</i>	1		1												2
9688	9E+05	<i>Galgula partita</i>												1			1
9650	9E+05	<i>Athetis tarda</i>	1													1	2
9545	9E+05	<i>Euplexia benesimilis</i>		1	1												2
9546	9E+05	<i>Phlogophora iris</i>					1										1
9329	9E+05	<i>Apamea cariosa</i> or 9328 <i>A. nigrior</i>					1										1
9415	9E+05	<i>Oligia strigilis</i>		1	1												2
9479	9E+05	<i>Papaipema lysimachiae</i>														1	1
9480	9E+05	<i>Papaipema ptersii</i>												1	1		2
9815	9E+05	<i>Cosmia calami</i>						1		1							2
9556	9E+05	<i>Chytonix palliatricula</i>		1	1	1	1		1		1						6
10521	9E+05	<i>Morrisonia confusa</i>															0
10291	9E+05	<i>Morrisonia latex</i>		1	1												2
10300	9E+05	<i>Lacanobia grandis</i>		1													1
10301	9E+05	<i>Spiramater lutra</i>				1											1
10431	9E+05	<i>Dargida</i> ("Faronta") <i>diffusa</i>	1		1												2
10438	9E+05	<i>Mythimna unipuncta</i>	1			1								1	1		4
10440	9E+05	<i>Leucania linita</i>			1												1
10444	9E+05	<i>Leucania phragmatidicola</i>		1		1								1			3
10445	9E+05	<i>Leucania linda</i>		1			1										2
10461	9E+05	<i>Leucania ursula</i>														1	1
10397	9E+05	<i>Lacinipolia renigera</i>	1	1	1												3
10532		<i>Homorthodes furfurata</i>	1														1
10532	9E+05	<i>Homorthodes lindseyi</i>												1	1		2

10567	9E+05	<i>Ulolonche culea</i>															0
10585	9E+05	<i>Orthodes majuscula</i> ("crenulata")															0
10587	9E+05	<i>Orthodes cynica</i>	1	1	1	1											4
10288	9E+05	" <i>Polia</i> " <i>detracta</i>	1	1	1												3
10915	9E+05	<i>Peridroma saucia</i>						1									1
10680	9E+05	<i>Feltia geniculata</i>												1	1		2
10674	9E+05	<i>Feltia subgothica</i>											1		1		2
10676	9E+05	<i>Feltia herilis</i>													1		1
10891	9E+05	<i>Ochropleura implecta</i>			1												1
11010	9E+05	<i>Lycophotia phyllophora</i>		1	1	1	1	1	1	1	1		1				9
11012	9E+05	<i>Noctua pronuba</i>		1	1									1			3
11000	9E+05	<i>Anaplectoides prasina</i>							1								1
10942	9E+05	<i>Xestia dolosa</i>		1													1
11006	9E+05	<i>Protolampra brunneicollis</i>		1													1
11029	9E+05	<i>Abagrotis alternata</i>	20	75	76	39	42	40	19	29	30	12	21	1	1	17	2
														28	17	17	

Yellow highlight depicts Commonwealth-listed species and green highlight depicts regionally uncommon species.

Species reflect the Zookeys 40:1-239, 2010, nomenclature catalog numbers although MONA numbers are included. Names changes made after 2010 are also reflected for *Zanclognatha jacchusalis* which is now *Z. ochreipennis*; *Z. jacchusalis* is now *Z. marcidilnea*; *Zale lunifera* or *Zale sp 1*.which is now *Z. intenta*; and Genus *Itame* is now *Speranza* and *Anagoga occiduaria* is now *Plagodis pulveraria*.

## Appendix F. Avian Checklist and Seasonal Tables

Land bank staff conducted seasonal 5-minute point count surveys of birds on Wapatequa Woods Reservation in 1995/96, 2002, 2007, 2008, 2009, and 2014. The presence of occasional migrant and resident birds throughout spring and fall migrations, winter, and breeding seasons were recorded during a total of 58 woodland and 15 field visits. From these 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 in the mixed-oak woodland habitat and field habitats 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. The breeding season followed by the spring, fall, and then winter season yielded the greatest richness of bird species (Tables 4, 5, 6, 7). Most of the birds that occur on the reservation during the breeding season are tree/shrub nesters compared to ground and cavity nesters (Table 5). Wapatequa Woods Reservation provides suitable habitat for all 3 types of nesters.

Since observations date back nearly 20 years, there are differences in species richness between the first decade (1995-2004) and the latest decade (2005-2014). Data show decreases in species richness across the spring, summer, and fall seasons. Specifically, species richness on the Wapatequa Woods Reservation has decreased by 62 percent over the spring (21 species to 8) and 38 percent over the breeding season (21 bird species to 13). This type of decline in diversity gives generalist species such as the American crow or wild turkey less competition for resources and greater opportunity to propagate into open ecological niches.

Year-round residents such as the American crow, black-capped chickadee, and blue jay can be found in both habitat types during all seasons. This also makes these species the most common birds observed throughout the year (Tables 4-7). These particular species are opportunistic with incredibly versatile behavior, which allows them to forage in a variety of habitats.

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 39 bird species observed on the reservation during the summer breeding season, 8 are probable breeders; 11 are possible breeders; 5 are potentially breeding in other habitat; and 1 is a non-breeder (Table 5a and 5b).

**Table 5. Avian species observed in the spring during 5 minute avian point counts at Wapatequa Woods Reservation, Oak Bluffs and Tisbury MA in 1996, 2002 and 2008.**

Spring	Mixed-oak Woodland <sup>b</sup>			Successional Grassland
	1996 n=5	2002 n=3	2008 n=2	2002 n=3
<b>Species<sup>a</sup></b>				
<b>Year-Round Residents</b>				
American crow	20	33	0	33
American goldfinch	20	0	0	0
American robin	20	33	50	33
Black-capped chickadee	60	100	100	67
Blue jay	60	0	50	33
Carolina wren	0	0	50	0
Common grackle	0	0	0	67
Downy woodpecker	20	0	0	0
Eastern wood-peewee	40	0	0	0
Grey catbird	20	0	0	0
Great-crested flycatcher	20	0	0	33
Herring gull	20	0	0	0
Mourning dove	20	0	0	0
Northern cardinal	0	0	100	67
Northern flicker	0	0	0	33
Osprey	0	0	0	33
Ovenbird	40	0	0	0
Red-bellied woodpecker	0	0	100	0
Rufous-sided towhee	80	33	0	67
Song sparrow	0	0	0	33
Tree swallow	20	0	0	0
White-breasted nuthatch	40	0	50	0
Wood thrush	0	0	50	0
<b>Summer Breeders</b>				
Common yellowthroat	40	33	0	0
Eastern towhee	0	0	0	0
Pine warbler	0	0	0	0

<sup>a</sup> seasonal and nest type data from Cornell ornithology lab range and species information data ([www.allaboutbirds.org](http://www.allaboutbirds.org))

<sup>b</sup> Percent frequency of observations given the number of times (n) an observer visited the location over the season



Eastern towhee	X			PR	100	0	33	50	50
Pine warbler		X		PO	20	0	0	0	0

<sup>a</sup> seasonal and nest type data from Cornell ornithology lab range and species information data ([www.allaboutbirds.org](http://www.allaboutbirds.org)) and the Felix Neck Field Checklist of Martha's Vineyard Birds, December 1992;

<sup>b</sup> Percent frequency of observations given the number of times (n) an observer visited the location over the season

<sup>c</sup> Breeding status: NB= observed during spring or summer but breeding habitat does not occur on the property, NB-P= observed during the spring or summer but not in breeding habitat although breeding habitat exists on the property; PO= possible breeding (species detected in suitable breeding habitat during breeding period), PR=probable breeding (species heard singing on two occasions over one week apart in suitable breeding habitat during breeding period). CO=confirmed breeding (species carrying food, CF; feeding young, FY; with begging hatch-year fledglings, HY; or a located nest, N), OS= observed out of breeding season and without suitable habitat on the property, OS-H= observed out of breeding season but with suitable habitat on the property.

**Table 7. Avian species observed during the summer breeding season on Wapatequa Woods Reservation, Oak Bluffs and Tisbury, MA following 5-minute point count surveys during 1996, 2002, 2007, 2009 and 2014.**

Summer	Nest Type <sup>a</sup>			Breeding Status	Habitat <sup>c</sup>		
	Ground	Raised in tree/shrub	Cavity or burrow		Successional Field		Agricultural Field
Species <sup>a</sup>							
Year-Round Residents					2002 n=4	2014 n=2	2014 n=2
American crow		X		P	75	0	0
American robin		X		P	0	100	100
Barn Swallow				P	0	50	0
Black-capped chickadee			X	P	75	50	50
Blue jay		X		P	25	0	0
Carolina wren			X	P	25	0	0
Eastern wood-pewee			X	P	25	0	0
Field Sparrow	X			PR	0	100	0
Gray catbird		X		PR	0	100	50
Mourning Dove		X		PO	0	0	50
Northern cardinal		X		PR	25	100	0
Red-breasted nuthatch			X	P	25	0	0
Red-eyed vireo		X		P	100	0	0
Red-winged Blackbird		X		NB	100	0	0
White-breasted nuthatch			X	P	25	0	0



Summer Breeders						
Eastern towhee	X		P	0	0	100

<sup>a</sup> seasonal and nest type data from Cornell ornithology lab range and species information data

([www.allaboutbirds.org](http://www.allaboutbirds.org)) and the Felix Neck Field Checklist of Martha's Vineyard Birds, December 1992;

<sup>b</sup> Percent frequency of observations given the number of times (n) an observer visited the location over the season

<sup>c</sup> Breeding status: NB= observed during spring or summer but breeding habitat does not occur on the property, NB-P= observed during the spring or summer but not in breeding habitat although breeding habitat exists on the property; PO= possible breeding (species detected in suitable breeding habitat during breeding period), PR=probable breeding (species heard singing on two occasions over one week apart in suitable breeding habitat during breeding period). CO=confirmed breeding (species carrying food, CF; feeding young, FY; with begging hatch-year fledglings, HY; or a located nest, N), OS= observed out of breeding season and without suitable habitat on the property, OS-H= observed out of breeding season but with suitable habitat on the property.

**Table 8. Avian species observed during the fall on Wapatequa Woods Reservation, Oak Bluffs and Tisbury, MA following 5-minute point count surveys during 1995, 2002, 2007 and 2014.**

Fall	Mixed-oak woodland			Successional Field		Agricultural Pasture
	1995 n=5	2002 n=4	201 4 n=3	2002 n=4	2014 n=3	2014 n=3
Species <sup>a</sup>						
<b>Year-Round Residents</b>						
American crow	80	25	33	50	100	33
Black-capped chickadee	100	75	0	0	67	67
Blue jay	60	100	67	100	100	100
Carolina wren	20	0	0	0	0	0
Common yellowthroat	0	0	0	25	0	0
Downy woodpecker	0	25	0	0	33	0
Eastern phoebe	0	0	0	0	33	0
Gray Catbird	0	0	0	0	33	0
Hermit thrush	20	0	0	0	0	0
Mourning dove	20	0	0	25	0	0
Northern cardinal	0	25	0	0	0	0
Red-bellied woodpecker	20	25	0	25	0	0
Tufted titmouse	0	0	0	0	33	0
White-breasted nuthatch	60	25	0	50	0	0
Wild turkey	0	0	0	0	33	0
Yellow-rumped warbler	20	0	0	0	0	0
<b>Summer Breeders</b>						
Eastern towhee	20	0	33	0	33	33
Pine warbler	0	0	33	0	0	67
Red-tailed hawk	0	0	33	0	0	0

<sup>a</sup> seasonal determination from Cornell ornithology lab range and species information

data ([www.allaboutbirds.org](http://www.allaboutbirds.org))

**Table 9. Avian species observed during the winter on Wapatequa Woods Reservation, Oak Bluffs and Tisbury, MA following 5-minute point count surveys during 1995, 1996 and 2002.**

Winter	Mixed-oak woodland		Successional Field
	1995/96 n=6	2002 n4	2002 n=4
Species <sup>a</sup>			
<b>Year-Round Residents</b>			
American crow	83	50	50
American goldfinch	17	0	0
Black-capped chickadee	50	50	75
Blue jay	33	75	50
Canada goose	0	25	0
Common grackle	0	25	0
Northern flicker	0	25	25
Red-bellied woodpecker	0	75	0
Red-tailed hawk	17	25	25
White-breasted nuthatch	0	50	0

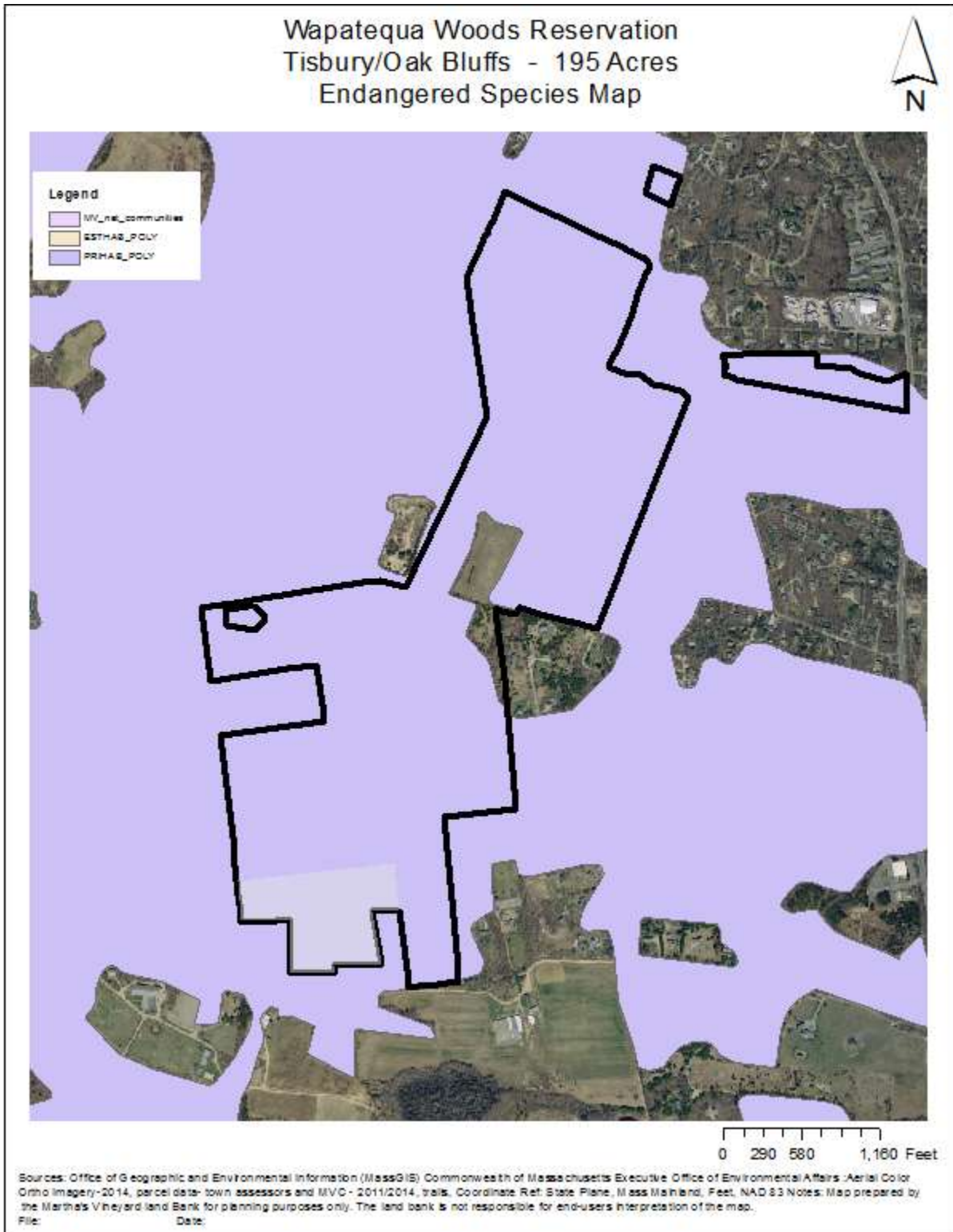
<sup>a</sup> seasonal determination from Cornell ornithology lab range and species information data ([www.allaboutbirds.org](http://www.allaboutbirds.org))

## Appendix G. Endangered Species

The commonwealth has designated the area in and around Wapatequa Woods as habitat for two listed species. Both species were observed on the property while UV light trapping in 2014. Suitable habitat exists for both species listed by NHESP as occurring on or near the reservation. Surveys were conducted during the flight periods of the rare moths mentioned previously. These moths utilize the oak woodland. Both species of rare moths prefer scrub oak- and post oak-dominated habitats, which are present but only sparsely on the property. The Wapatequa Woods Reservation is predominantly inhabited by black and white oak stands.

Impact to these commonwealth-listed species may be avoided through management actions that create a sustainable mixed-oak woodland; control invasive species; and promote scrub oak expansion. All land within the Wapatequa Woods Reservation, with the exception of the agricultural field and successional field, is considered by the NHESP to be priority habitat for endangered species.

### Map 8: Endangered Species Map



**Appendix H. Abutters List and Maps****Table 10. Abutters within 200 feet of Wapatequa Woods Reservation as recorded in the 2015 West Tisbury, Tisbury, and Oak Bluffs assessors' books.**

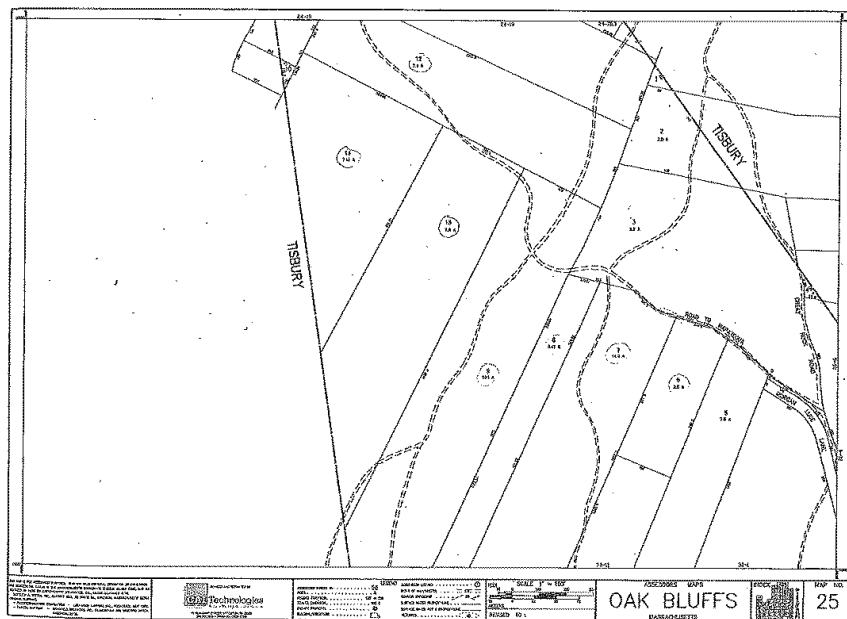
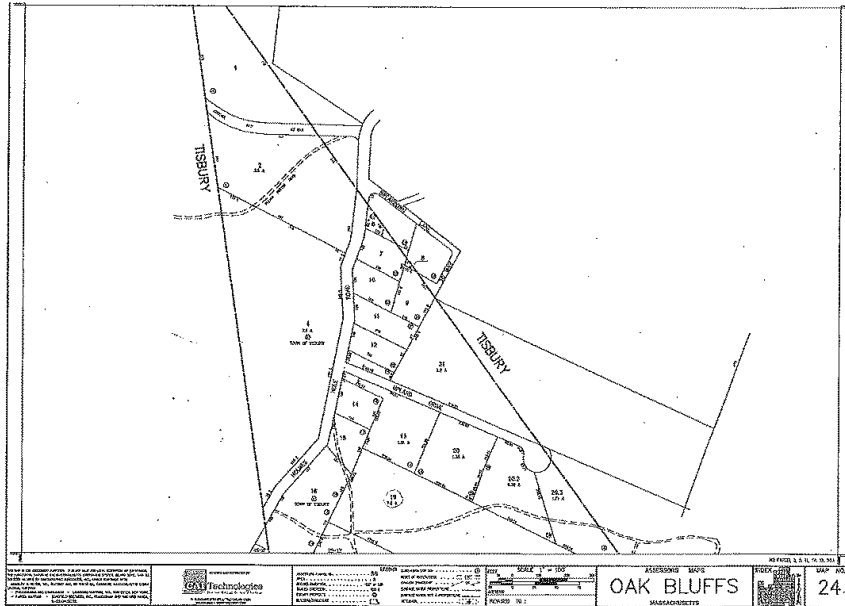
Parcel Number	Owner Name	Address	City	State	Zip Code
24-4, 16	Town of Tisbury	PO box 1239	Vineyard Haven	MA	02568
24-13	Amy & John Wajda	728 Lower Waterford Road	St. Johnsbury	VT	05848
24-14	Jonathan P. Gill, Trustee	RFD #1 Box 608	Vineyard Haven	MA	02568
24-15	Jeffrey Fisher & Sharon Roy	PO box 3273	Edgartown	MA	02539
24-20	Randy & Laura Hacker-Durbin	PO Box 504	Vineyard Haven	MA	02568
24-20.2	Mark Jenkins	PO box 2832	Vineyard Haven	MA	02568
24-20.3	Todd McGee & Susan Dunbar	PO Box 4315	Vineyard Haven	MA	02568
25-1	Jeffrey Robinson	PO box 600	Vineyard Haven	MA	02568
25-2	Michael Carroll, Trustee	PO Box 1209	Vineyard Haven	MA	02568
25-3, 18 A-7, 9	Charles & Jeanne Feeney	PO Box 1557	Vineyard Haven	MA	02568
25-5, 38-1	Ronald & Elizabeth Campbell	57 Algonquin Drive	Natick	MA	01760
26-4	Caleb Nicholson & Melissa Swansey	PO box 1702	Vineyard Haven	MA	02568
38-9.2	Christopher & Karin Welch	PO box 1008	Oak Bluffs	MA	02557
38-9.3	James E. Venable, Jr	3538 Akron Court	Denver	CO	80238
38-10.7	Mark & Elizabeth Luce	PO Box 1603	Oak Bluffs	MA	02557
38-10.8	Russell & Mary MacDonald	PO box 268	Oak Bluffs	MA	02557
19A-8	Charles Felder	PO Box 2380	Vineyard Haven	MA	02568
19A-9	Neil Franklin	30 Briarcliff Road	Marlton	NJ	08053

20A-1	Douglas Dias SBS Properties, LLC	59 Commerce Road	Brewster	MA	02631
20A-1.1, 1.3	Aaron & Benjamin Robinson	PO Box 600	Vineyard Haven	MA	02568
20A-23	Brett & Brenda Leonard	PO Box 2516	Vineyard Haven	MA	02568
20A-24	Brian T. Welch	18 Firehouse Lane	Oak Bluffs	MA	02557
20A-25	Francis J. Welch, Trustee	PO Box 1806	Vineyard Haven	MA	02568
20A-26	Joseph & Loretta Hovanec	3 Glenolden Road	Yardley	PA	19067
20A-27	George & Margaret Brown, Jr.	PO box 4232	Vineyard Haven	MA	02568
20A-3	Martha's Vineyard Hospital, Inc	Box 1477 1 Linton Lane	Oak Bluffs	MA	02557
18A-8.1, 8.11	Thomas J. Feeney	422 Falmouth Road	Falmouth	ME	04205 -2021
19A-23	Comcast Cable Comm, LLC	One Comcast Center 1701 John F. Kennedy Blvd	Philadelphia	PA	19103
19A-24	Thomas Neil Sullivan	PO box 774	Vineyard Haven	MA	02568
19A-25	Remo & Patricia Fullin	PO box 1824	Vineyard Haven	MA	02568
19A-26	Mary-Jean Miner	PO Box 3415	Oak Bluffs	MA	02557
19A-27	Deborah Davis	PO Box 1469	West Tisbury	MA	02575
19A-28	Edgar Pereira & Rosiane Silva	PO Box 743	Edgartown	MA	02539
16A-21.1	Malcolm & Roseann Watson, Jr.	20 Woods Grove Road	Westport	CT	06880
16A-25	Carol Dixon-Woolfolk, Trustee	635 Hempstead Ave	W. Hempstead	MA	11552
16B-1	Cheryl Pinkham	33 Park Ave	Vineyard Haven	MA	02568
16C-2.12	Keenan & Michelle Delaney	500 Edgartown Road	Vineyard Haven	MA	02568
16C-2.15	William & Leslie Carroll	PO Box 432	Edgartown	MA	02539

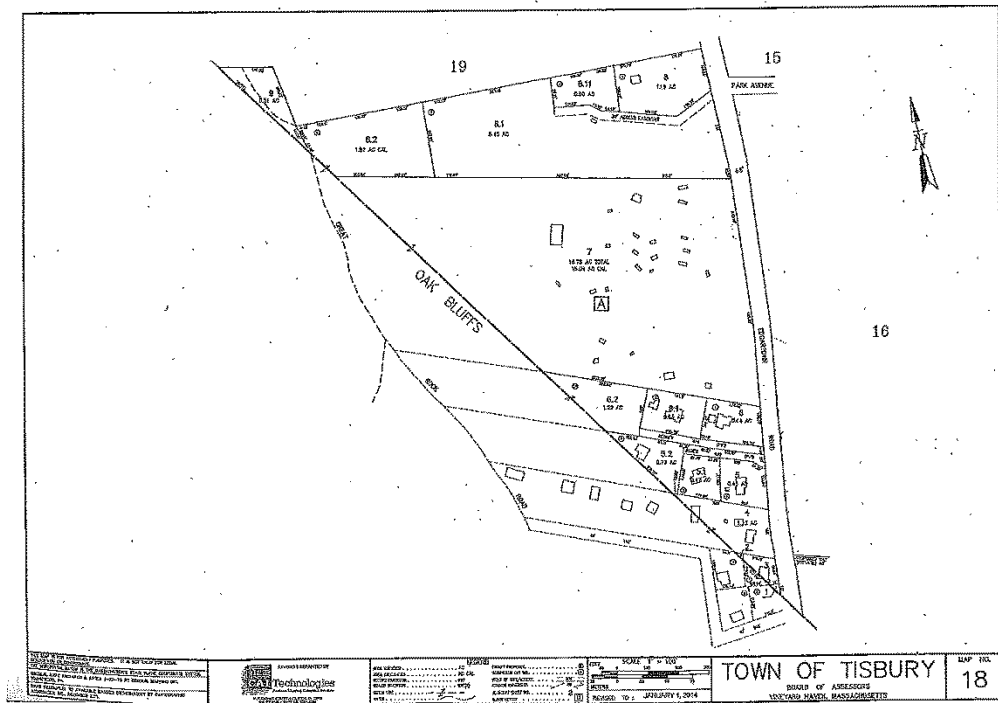
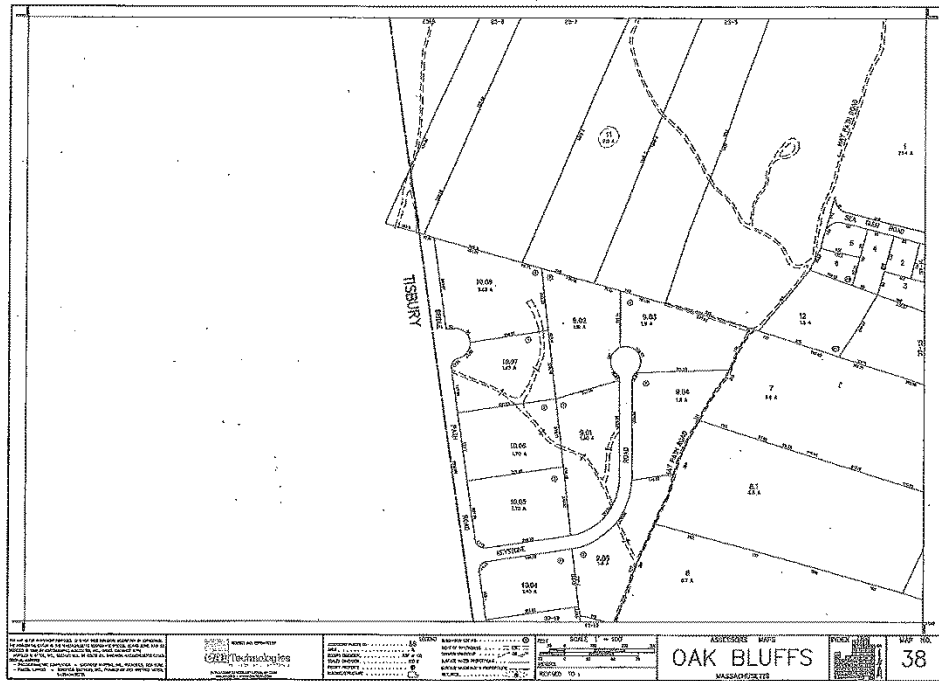
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18A-8	Kent Ormondroyd	PO box 2775	Vineyard Haven	MA	02568
19A-20, 30	Leigh & Michel Carroll, Trustees	PO Box 1209	Vineyard Haven	MA	02568
19A-29	Nancy Barlosky, Trustee	23 Carroll Street Trust PO Box 1911	Vineyard Haven	MA	02568
19A-31	Christopher Magee	PO Box 2487	Edgartown	MA	02539
19A-32	Jo-Ann Walker	PO box 1250	Vineyard Haven	MA	02568
43A-1	George Fisher	PO box 1655	Oak Bluffs	MA	02557
42A-18, 48A-4,5,6, 49A-2	Town of Tisbury	PO box 1239	Tisbury	MA	02568
43A-5	Carol Koury & Kenneth Jones	PO Box 1014	West Tisbury	MA	02575
44A-1.3	Pamela Burke, Trustee	48 Bridle Path Road	Vineyard Haven	MA	02568
44A-1.1	Robert & Linda Buono	10 Hunter Circle	Shrewsbury	MA	01545-1624
44A-1.2	Patricia Crosson	40 Bridle Path Road	Vineyard Haven	MA	02568
44A-2.1	Darren Lobdell	71 Stoney Hill Road	Vineyard Haven	MA	02568
44A-2	James, Virginia & Darren Lobdell, Trustees	81 Stoney Hill Road	Vineyard Haven	MA	02568
44A-3	Clement & Diane Levin	PO Box 2590	Vineyard Haven	MA	02568
44A-5 Tis, 9-5 WT	Glenn & Rosemary Jackson	PO Box 1471	West Tisbury	MA	02575
44A-5.1	Keith Proper & Randon Rynd	163 Stoney Hill Road	Vineyard Haven	MA	02568
44A-7	Roger Armstrong, Trustee	PO Box 2252	Edgartown	MA	02539
45A-1,	The Island Grown Initiative, LTD	PO Box 622	Vineyard Haven	MA	02568

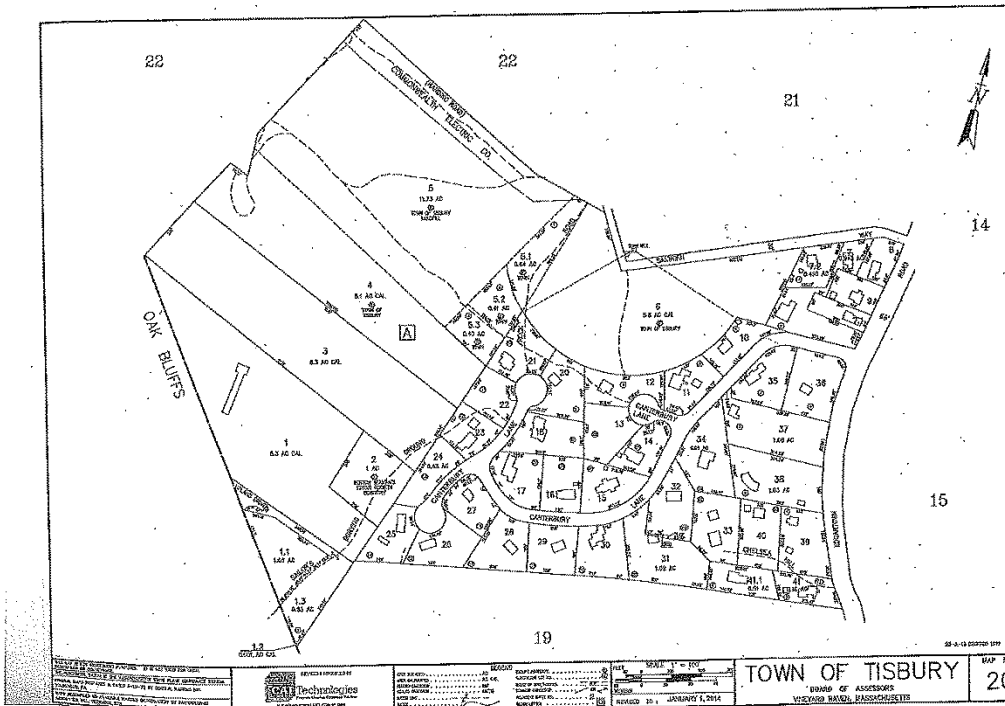
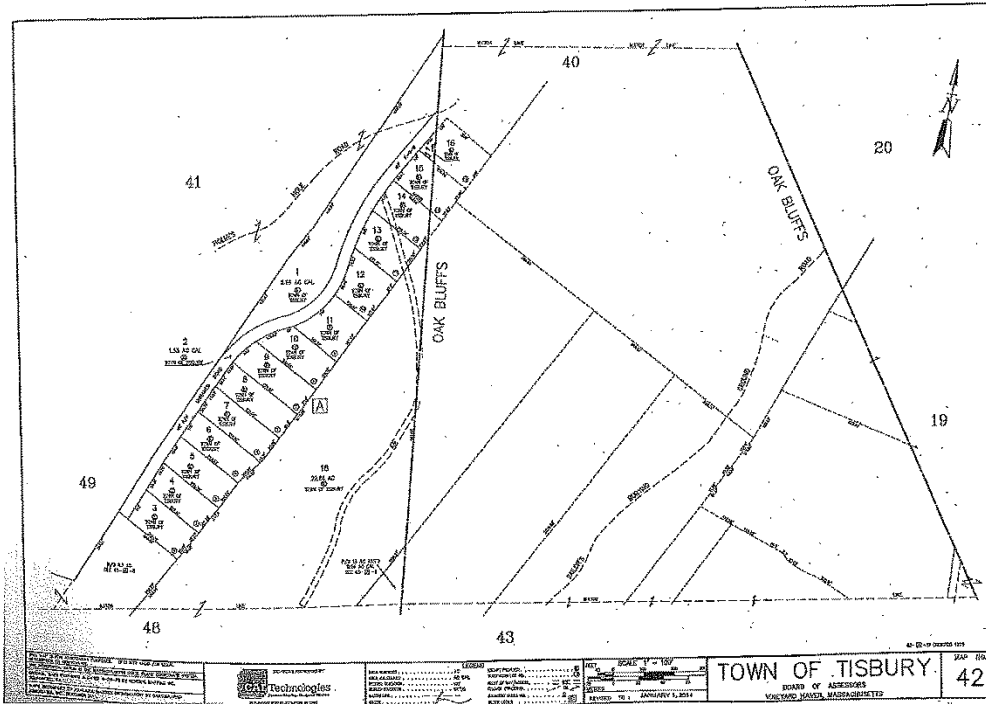
1.1					
48A-2	Taralyn Topley & Jeffrey Simmons	PO Box 1423	Vineyard Haven	MA	02568
48A-1.1	Curtis Friedman & Heidi Feldman	280 Takemmy Path	Vineyard Haven	MA	02568
48A-3	Island Housing Trust Corp	PO Box 779	West Tisbury	MA	02575
10-203	Peter & Margaret D'Angelo	PO Box 204	West Tisbury	MA	02575
10-198, 198.2	Vineyard Home, LLC	PO Box 7138	Garden City	NY	11530
9-1.1	Vineyard Meadow, LLC	PO Box 7138	Garden City	NY	11530
9-3	Ashley Mackey	12 Old Castle Drive	Newtown	CT	06470

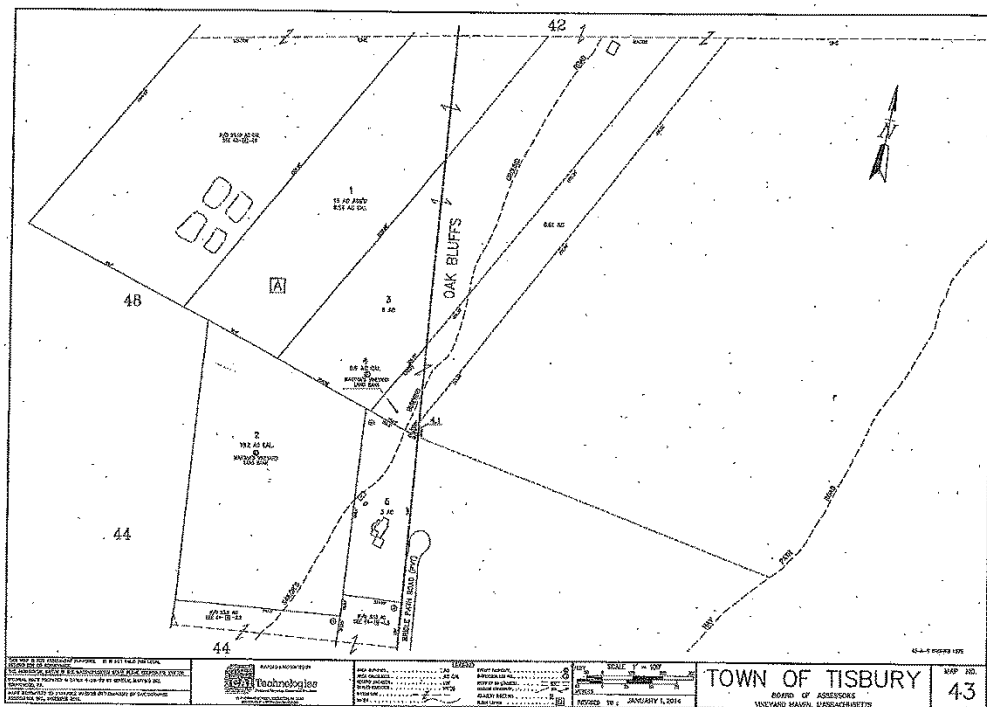
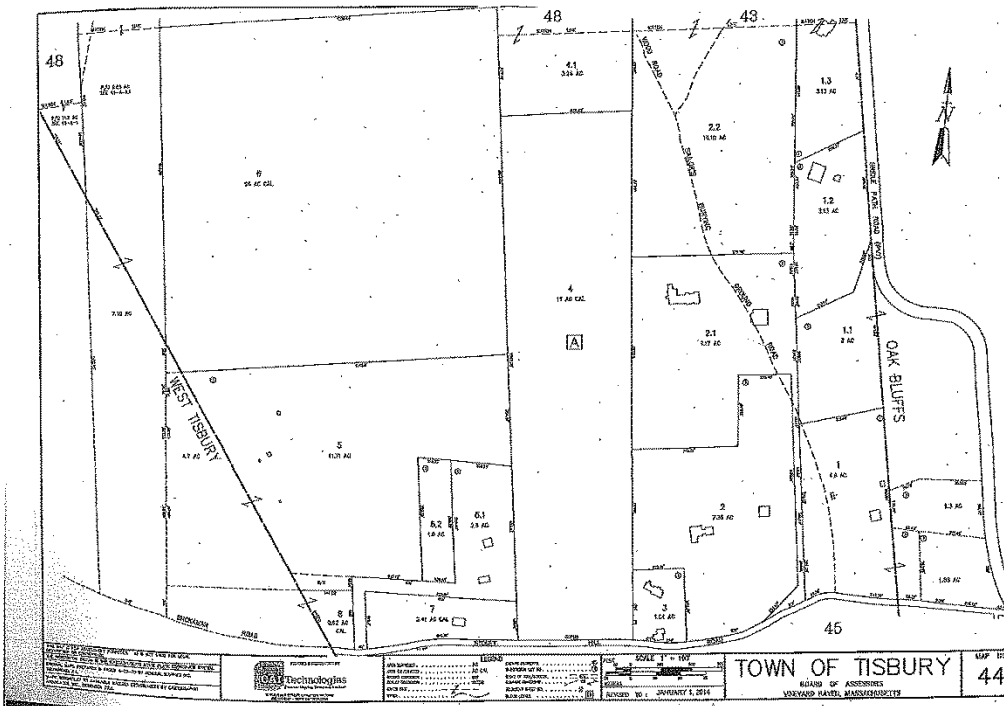
**Map 9: Abutters Maps**  
**Wapatequa Woods Reservation**  
**Oak Bluffs, Tisbury, West Tisbury, MA**

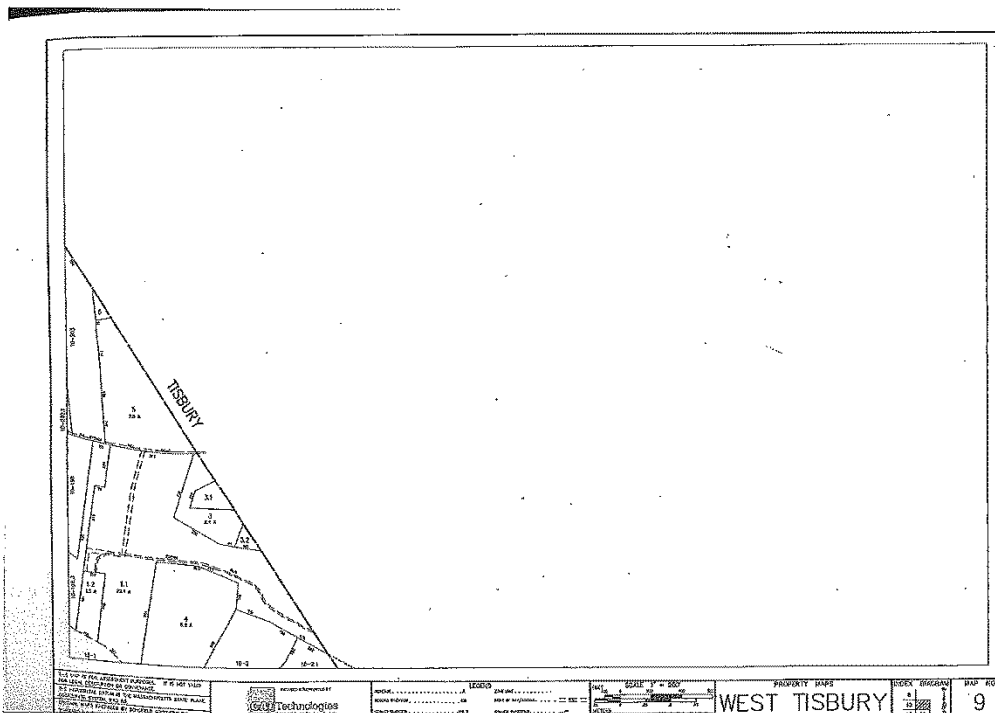
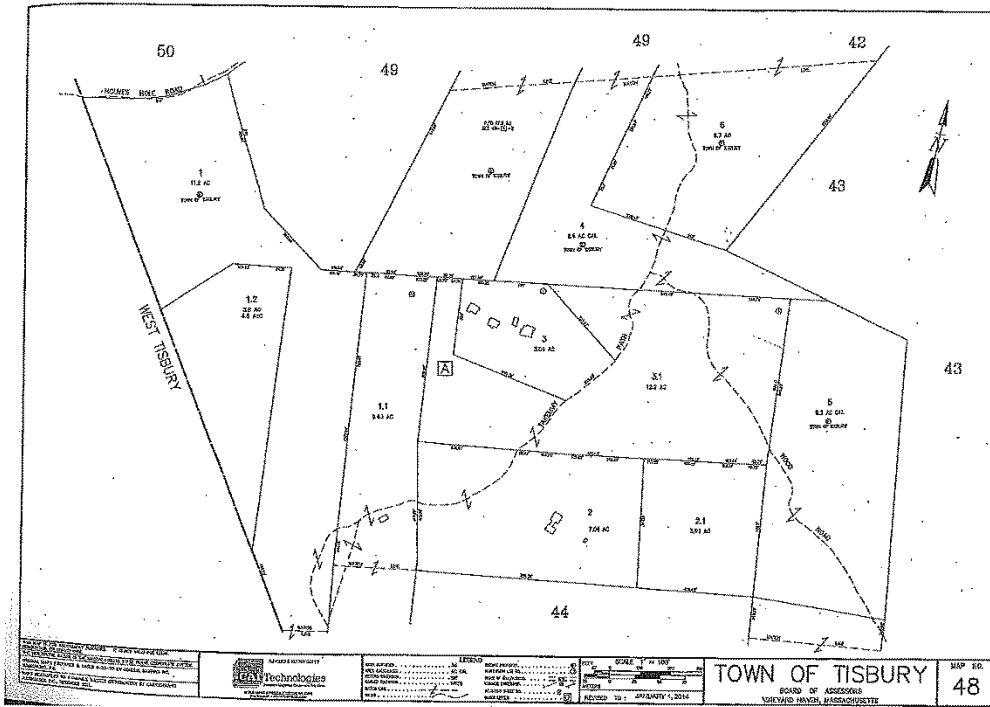








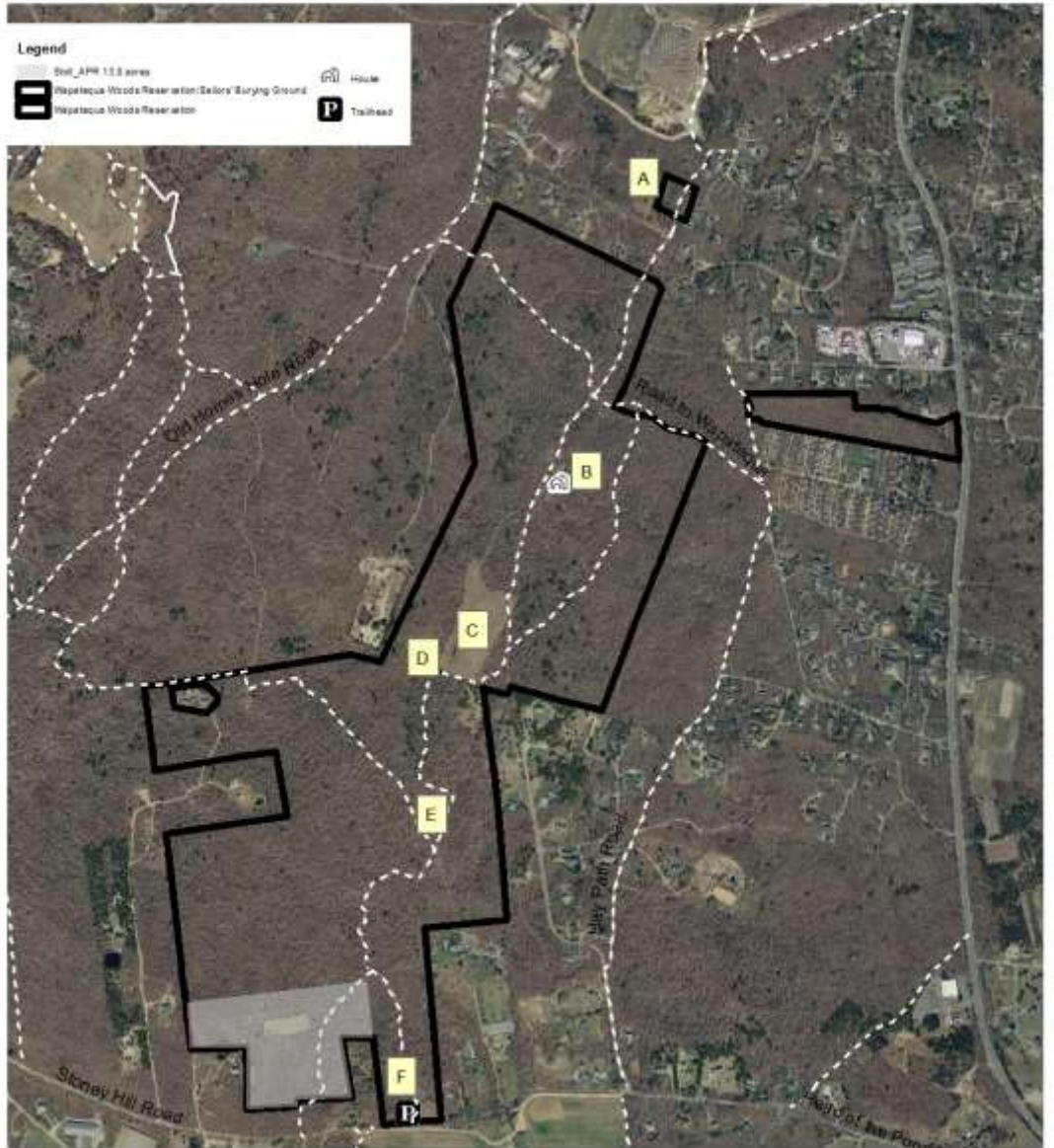




Appendix I. Existing Use Map

Map 10: Existing Use Map

Wapatequa Woods Reservation  
Tisbury/Oak Bluffs - 195 Acres  
Existing Use Map



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 Date

## Appendix J. Universal Access

The Recreational Opportunities Spectrum (ROS) classification for Wapatequa Woods Reservation is “less developed”. The ROS is a model designed and used by the U.S.D.A. Forest Service to categorize conservation areas or universal access planning. The land bank framework for describing the accessibility of its properties is applied to Wapatequa Woods Reservation as follows.

<b>Property Name:</b>	Wapatequa Woods Reservation
<b>Size:</b>	195 acres
<b>Primary Activities:</b>	birding, hiking and picnicking
<b>Primary Elements:</b>	two sign stations
<b>Primary Spaces:</b>	views of pastures, woodland
<b>Obstacles that Limit Accessibility:</b>	distance from trailhead and topography
<b>Existing or Potential Alternatives:</b>	Manuel F. Correllus State Forest
<b>Proposed ROS Classification:</b>	less-developed
<b>Proposed Expectation of Accessibility:</b>	not possible

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.

Universal access is not proposed for this reservation due to the distance of the amenities from the trailhead and the difficulty of the terrain throughout the reservation.