



ENVIRONMENT / NATURAL RESOURCES

Overview

This booklet was prepared as part of the process of formulating a Master Plan for Oak Bluffs. The booklet includes the following topics:

- Natural Resources / Water Quality
- Open Space
- Chapter 61 Lands
- Coastal Resources
- Sea Level Rise / Climate Change
- Sustainability
- Resiliency

Overview

This “briefing booklet” has been prepared as part of the process of preparing an update to the 1998 Master Plan for Oak Bluffs.

This booklet is intended to provide some context about this topic for the members of the Master Plan Update Committee and others.

Water Quality



Coastal Resources



Reference Materials

1. Oak Bluffs Master Plan (1998)
2. Martha's Vineyard Island Plan (MVC, 2010)
3. Martha's Vineyard Coastal Conference Materials (2018)
4. Massachusetts Estuaries Project Reports - Sengekontacket Pond, Oak Bluffs Harbor, Farm Pond (2010 – 13)
5. North Bluff Seawall Extension Project (2015)
6. East Chop Coastal Bank Repairs Materials (2017)
7. Coastal Vulnerability Assessment / Adaptation Plan (2016)
8. Oak Bluffs Open Space and Recreation Plan (2014-16)

Survey Results

In the on-line survey conducted early in the planning process, participants identified “natural resources / water quality / beaches / ponds” as a high priority to be addressed in the Master Plan.

While this may be related to the fact that beaches were included in this category in the survey, there is little doubt that “natural resources / water quality / ponds” are also important.

Possible Natural Resource Strategies

The Master Plan could recommend:

1. Encourage or require the use of native species in Oak Bluffs.
2. Discourage or prohibit the use of invasive species in Oak Bluffs.
3. Promote efforts to maintain and improve air quality.
4. Create a map of wetland areas (and wetland buffer areas) to aid in management of development activities.
5. Consider increasing “freeboard” requirement for structures built in flood-prone areas.

Natural Resources / Water Quality

For the Master Plan, the term “natural resources” is considered to include:

- Water resources (including surface water and groundwater)
- Land / soil / air / plant / animal resources

Protecting natural resource is important since doing so helps promote environmental health, preserve environmental functions, enhance community character, and enhance the overall quality of life.

Overall, Oak Bluffs seems to have good tools and staff in place to protect natural resources. The key natural resource issue moving forward appears to be related to water quality in coastal ponds and embayments (which are showing evidence of nitrification related to septic systems and other activities). The coastal ponds are a reflection of what is going on in the overall groundwater system in Oak Bluffs. According to past studies, it has been estimated that 79 percent of the nitrogen originates from septic systems.

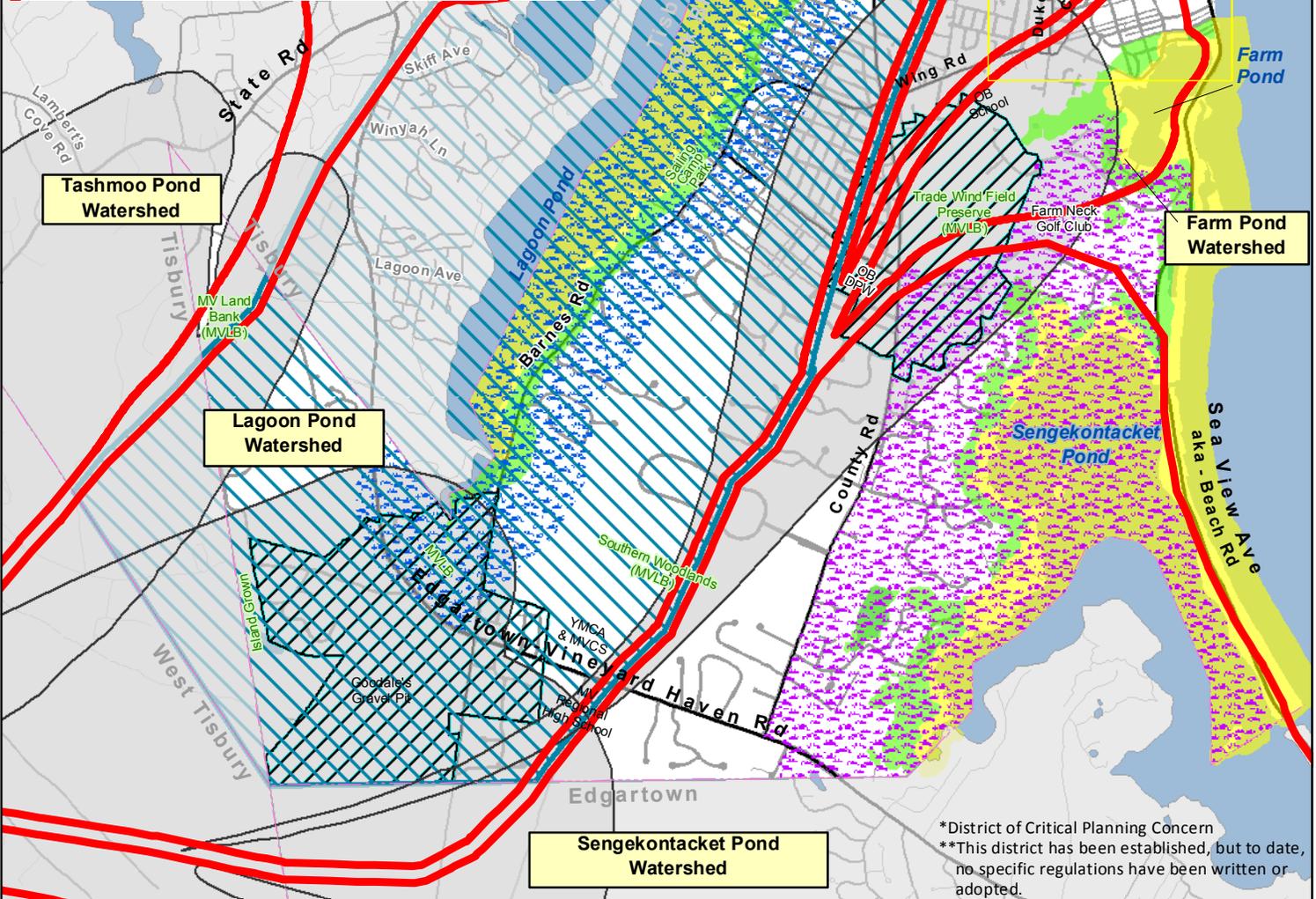
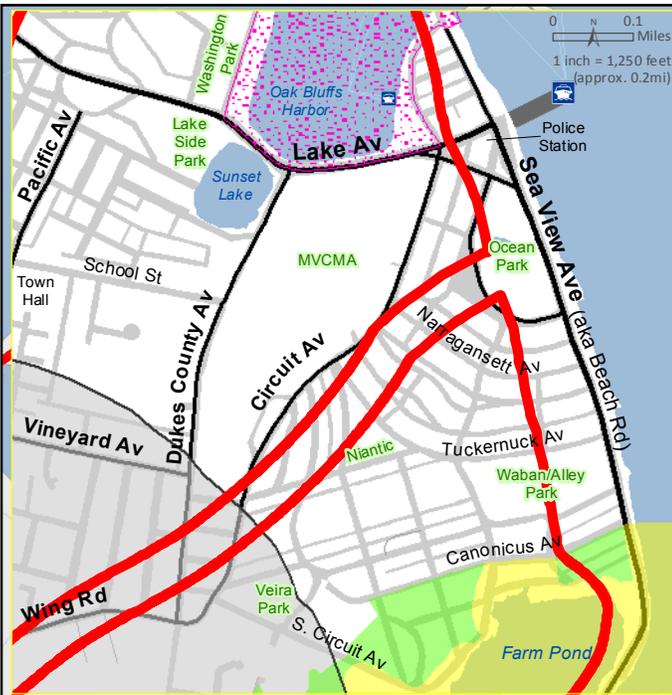
Given the high permeability of the soils and the discharge of waste water into the ground (from individual septic systems and the Town sewer system and fertilizers), strategies to reduce nitrogen loading could be important:

- **Require enhanced septic systems** in Oak Bluffs for new construction or septic system replacement or within a certain timeframe (standard septic systems remove bacteria but not nitrogen)
- **Expand the sewer system** to provide better treatment, especially in sensitive watersheds
- **Discourage use of lawn fertilizer / pesticide**
- **Other nitrogen mitigation strategies** (planting and harvesting of phragmites, permeable barriers, seeding of shellfish, apply a nitrogen “fee” related to the property use / septic type, etc.)
- **Improve the culverts** at Sengekontacket Pond and Farm Pond

The map on the facing page shows the location of some of the important water resources in Oak Bluffs.

Does Oak Bluffs have the appropriate natural resource protection tools in place?

How should Oak Bluffs address water quality issues?



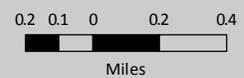
*District of Critical Planning Concern
 **This district has been established, but to date, no specific regulations have been written or adopted.

Overlay Zoning	Lagoon Pond Watershed District**
Water Resource Protection District	Wellhead Protection Area
Lagoon Pond District*	Zone II
Oak Bluffs Harbor District*	Watershed Boundary
Sengekontacket Pond District*	Overall Rating
Coastal District*	Impaired
Shore Zone	Unknown
Inland Zone	

Water-Related Resource Areas

Oak Bluffs, MA

1 inch = 3,000 feet (approx. 0.5mi)



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Open Space History

When the “Copeland Plan” was implemented, open spaces were laid out to enhance the development and the community. There was later a court case related to whether these lands could be developed and the continued reservation of the land as open space was a key ruling of the case.

The Subdivision Bylaw indicates the Planning Board may require the reservation of **up to 5 percent of a parcel** being subdivided as open space. The bylaw indicates this reservation shall remain for up to three years apparently to provide time for “public acquisition.”

Section 7.3 of the Zoning Bylaw contains provisions for **“flexible development”** to aid in the preservation of open space at the time of development.

Park / Recreation

The 2013 BOS Strategic Plan identified restoring neighborhood parks / recreation areas and restoring recreational as “priority level 2” projects.

Open Space

The term “open space” can mean different things to different people and it is helpful to understand this when discussing open space strategies. The map on the facing page shows the location of some parcels in Oak Bluffs that could be considered “open space” of one form or another.

Open space is important to Oak Bluffs residents. In an on-line community survey early in the planning process, participants identified open space as the #4 issue for consideration in the Master Plan.

In the 1998 Master Plan, survey respondents indicated that **“upkeep was a priority over expansion of parks.”** The 2015 Open Space and Recreation Plan echoed the same concept of improving park lands and recreation facilities and accomplishing three goals:

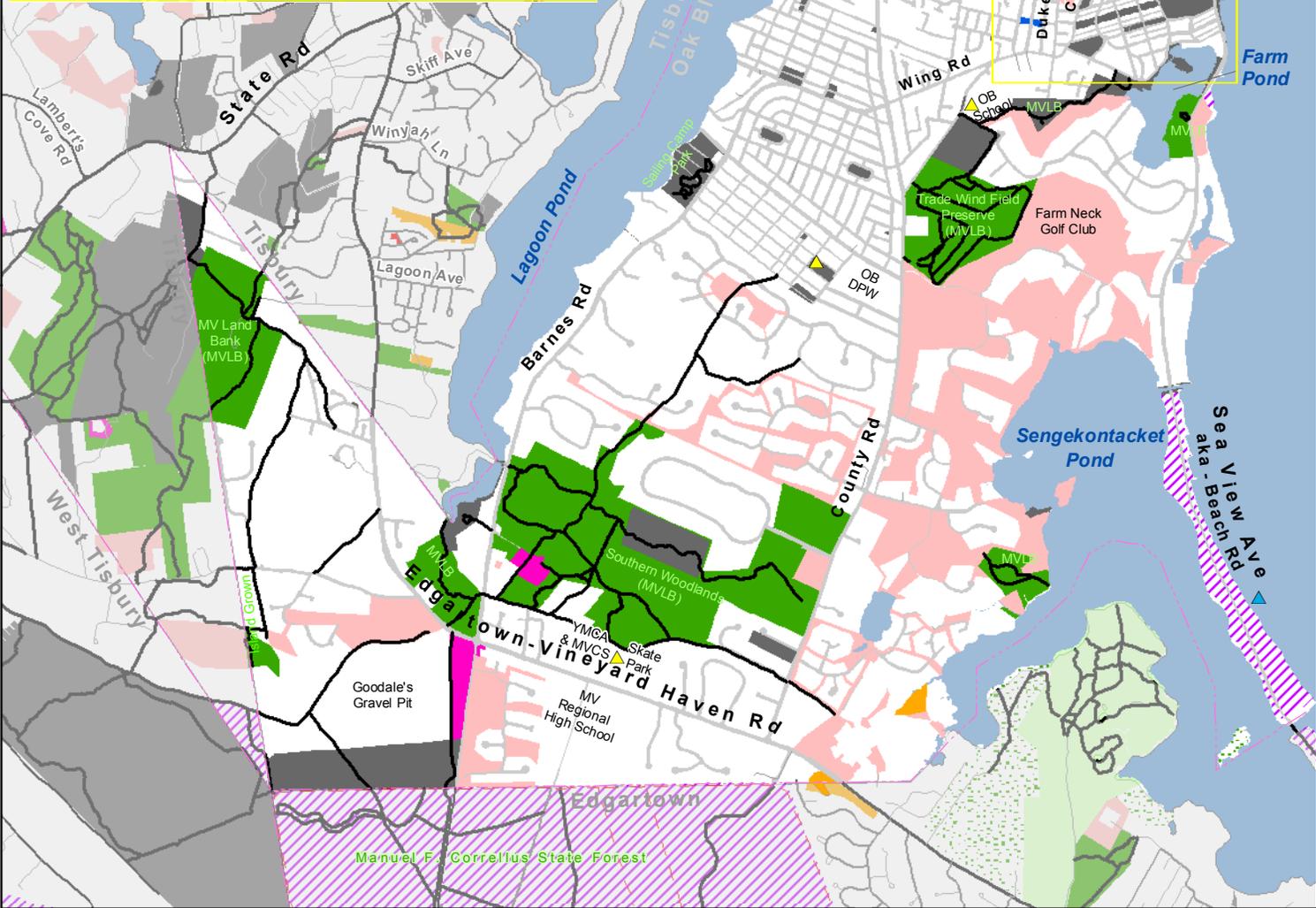
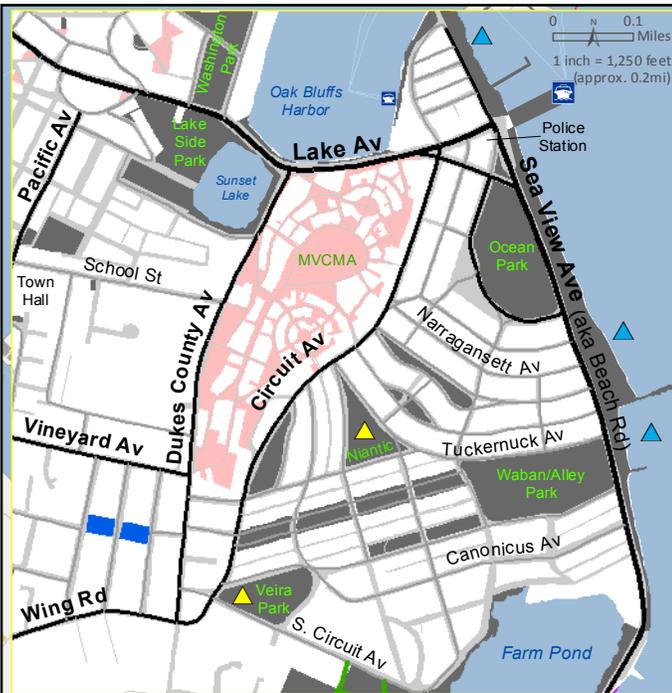
- Improving recreation facilities and parkland,
 - Maintaining adequate staffing
 - Adequate funding for maintaining properties / facilities
- Reducing nitrogen and other pollutants, and
- Adapting to climate change.

The mission of preserving open space is shared by the **Martha’s Vineyard Land Bank** (MVLB). Since being created in 1986, MVLB has collected a two-percent (2%) commission on the fair market value of property transfers (with some exceptions) and has acquired over 3,100 acres on the island (about five percent of the islands land area). In Oak Bluffs, MVLB has acquired about 453 acres in nine separate holdings.

According to the MVLB website:

- *Balance is key in land bank property management.*
- *Environmental protection leads the list of land bank goals with public use encouraged where and when possible.*
- *The land bank is ... a middle ground where the highest virtues of conservation can be realized: public enjoyment of nature, where limits and restraint secure the natural world’s future and prosperity.*

What should Oak Bluffs’ open space strategies include?



- Conservation Groups**
- Felix Neck Wildlife Trust
 - MA Audubon Society
 - MV Land Bank
 - Sheriff's Meadow Foundation
 - Vineyard Open Land Foundation

File: oak_MasterPlan; oak_MP_09_OS.mxd
See Master Plan report for data source info.

Conservation Land - by Owner

- Government**
- Town
 - County
 - Commonwealth
 - Federal
 - Trail
 - Fire Trail
 - Ferry Service

Miscellaneous

- Miscellaneous Non-Profits
- Private Owner or Home Owners Assoc.
- Unknown
- Parcel Data
- Right of Way
- Water
- Public Swimming

- Open Space**
- Playground &/or Sports Field

Open Space
Oak Bluffs, MA

1 inch = 3,000 feet (approx. 0.5mi)



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2/27/18

Advance Indications

There can be different types of signals to the community that land in the Chapter 61 program may be in the process of being contemplated for development:

- **Proposed Sale** – the Town receives notice that a bona fide offer to purchase the property is pending and the Town has 120 days to match the sale price
- **Proposed Conversion** – the Town receives notice that the owner intends to “convert” the property to development and the Town has 30 days to prepare an appraisal (with the possibility of additional appraisals) and then 120 days to act
- **Non-Renewal** – the Chapter 61 designation is not renewed (one year grace period where the right-of-first refusal is still operative and 5-year period to capture foregone taxes)

Chapter 61 Lands

Chapter 61 of the Massachusetts General Laws allows a community to assess land by its use value (forestry, agriculture, or open space/ recreation land) rather than its market value. The use assessment reduces the property taxes and thus makes it easier for people to retain undeveloped land longer.

Property owners elect to participate in the program. In exchange for the lower taxes, the property owner gives the municipality the opportunity to purchase land enrolled in the program if it is to be sold.

The map on the facing page shows the location of parcels in Oak Bluffs enrolled in the Chapter 61 program.

Given the relatively short time frame for the municipality to respond (see sidebar), Oak Bluffs may wish to identify a strategy about how to respond to Chapter 61 opportunities that may arise (including possible priorities).

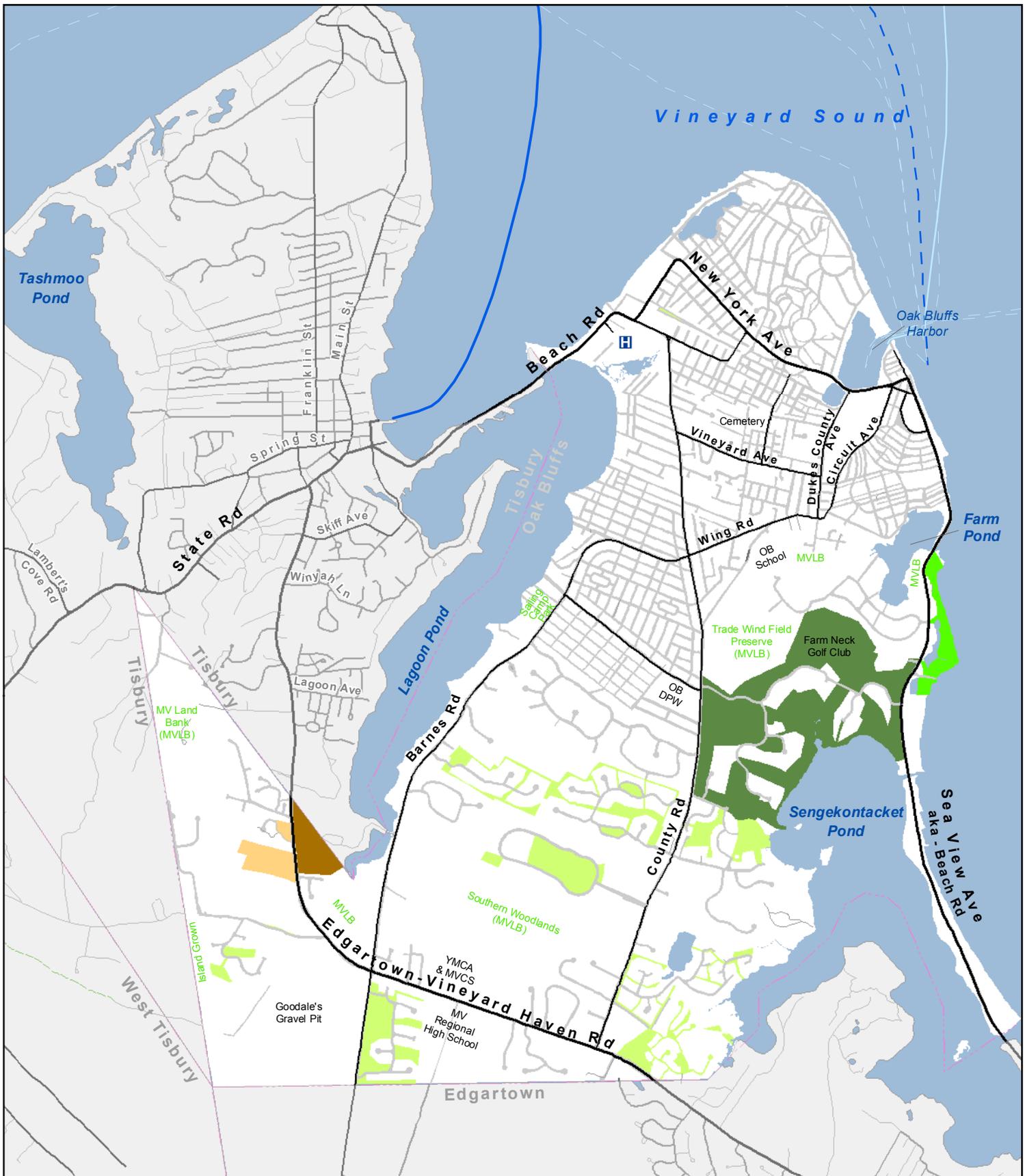
Should Oak Bluffs have strategies in place to address Chapter 61 parcels should they become available?

Farm Neck Golf Club



Harthaven Beach Area





 Chapter 61A - Productive Land	 Ferry Service
 Chapter 61A - Non-Productive Land	 Year-Round - Passengers and Vehicles
 Chapter 61B - Active Recreation	 Year-Round - Passengers
 Chapter 61B - Nature Recreation	 Seasonal - Passengers and Vehicles
 Non-Chapt. 61 - Open Land in Res. Area	 Seasonal - Passengers
 Right of Way	
 Water	

Chapter 61 Lands

Oak Bluffs, MA

1 inch = 3,000 feet (approx. 0.5mi)

0.2 0.1 0 0.2 0.4



1/22/18



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File: oak_MasterPlan; oak_MP_11_Chap61.mxd
See Master Plan report for data source information.

East Chop Bluff

Oak Bluffs is planning to stabilize about 2,400 feet of the eroding East Chop Bluff. Funding for the \$17 to \$20 million project is being pursued.

The 2013 BOS Strategic Plan identified East Chop Bluff as a “priority level 1” project.



Beach Nourishment

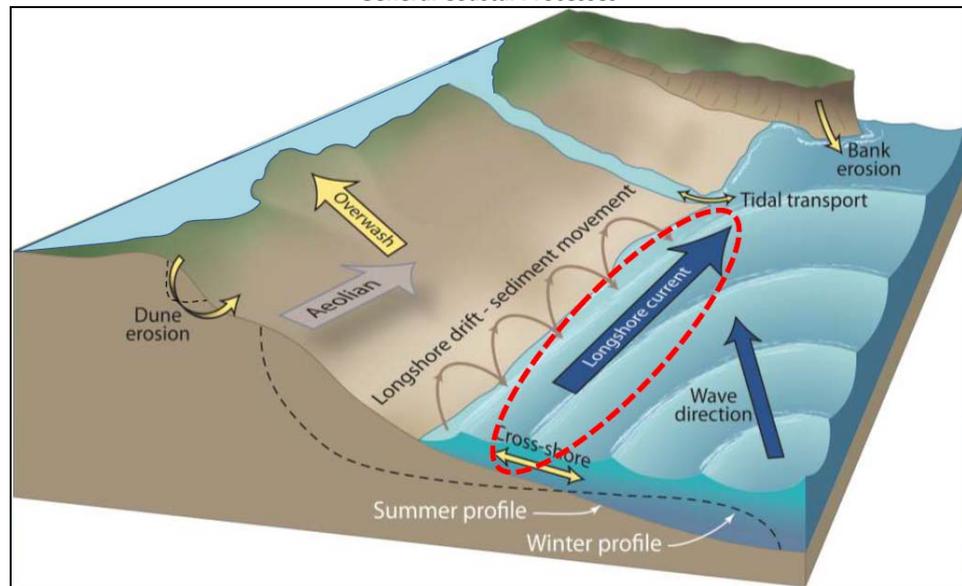
The 2013 BOS Strategic Plan identified beach nourishment (and other beach management strategies) as “priority level 2” projects.

Coastal Resources

Oak Bluffs has an extensive shoreline area and a variety of coastal resources:

Coastal Resource	Description
Coastal Waters <ul style="list-style-type: none"> Offshore Nearshore 	Areas (waters and their substrates) lying seaward of mean high water (may be further categorized by the 10 meter depth contour)
Shoreline – Land Features <ul style="list-style-type: none"> Bluffs / escarpments Rocky shorefronts Beaches and dunes Developed shorefront 	With key features as follows: <ul style="list-style-type: none"> Naturally eroding / supply sediment to other areas Highly erosion-resistant Beach systems and related dunes and sandflats Harbors and other engineered / developed areas
Shoreline – Water Features <ul style="list-style-type: none"> Estuarine embayments Coastal ponds Tidal wetlands Intertidal flats 	With key features as follows: <ul style="list-style-type: none"> Tidal rivers and coves connected to the sea Coastal ponds not connected to the sea Generally vegetated areas exposed by tides Generally un-vegetated areas exposed by tides
Other Features <ul style="list-style-type: none"> Coastal hazard areas Shellfish concentrations 	With key features as follows: <ul style="list-style-type: none"> Land areas inundated during coastal storm events Areas where shellfish aggregate

General Coastal Processes



Greg Berman, Woods Hole Oceanographic Institute

What strategies should Oak Bluffs have in place related to coastal resources?



Coastal Resource Areas

Oak Bluffs, MA

1 inch = 3,000 feet (approx. 0.5mi)

0.2 0.1 0 0.2 0.4



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- | | |
|------------------------|--------------------------------|
| Shoreline Type* | Open Space/Conservation Land |
| Tidal Flats | Right of Way |
| Beach/Dune | Water |
| Bluff/Escarpment | Ferry Service |
| Rocky Shorefront | |
| Developed Shorefront | *Marsh & Swamp areas excluded. |

File: oak_MasterPlan; oak_MP_07_CoastalRes.mxd
See Master Plan report for data source information.

8/2/18

Sea Level Rise / Climate Change

There is growing awareness of the threats posed by sea level and climate change and greater interest in addressing them. In Massachusetts, the issue has significant implications. In a recent Boston Globe article:

In the worst-case scenario, sea levels could rise more than 10 feet by the end of the century — nearly twice what was previously predicted — plunging about 30 percent of Boston under water. Temperatures in 2070 could exceed 90 degrees for 90 days a year, compared with an average of 11 days now. And changes in precipitation could mean a 50 percent decline in annual snowfall, punctuated by more frequent heavy storms such as nor'easters.

According to information presented at the 2018 Martha's Vineyard Coastal Conference by Jeff Donnelly from the Woods Hole Oceanographic Institute:

On our current emissions trajectory, we should expect global sea level to rise between 5 and 8 feet [on Martha's Vineyard] by 2100 if we include contributions from Antarctica.

For coastal communities like Oak Bluffs, sea level rise is an issue with serious implications and repercussions:

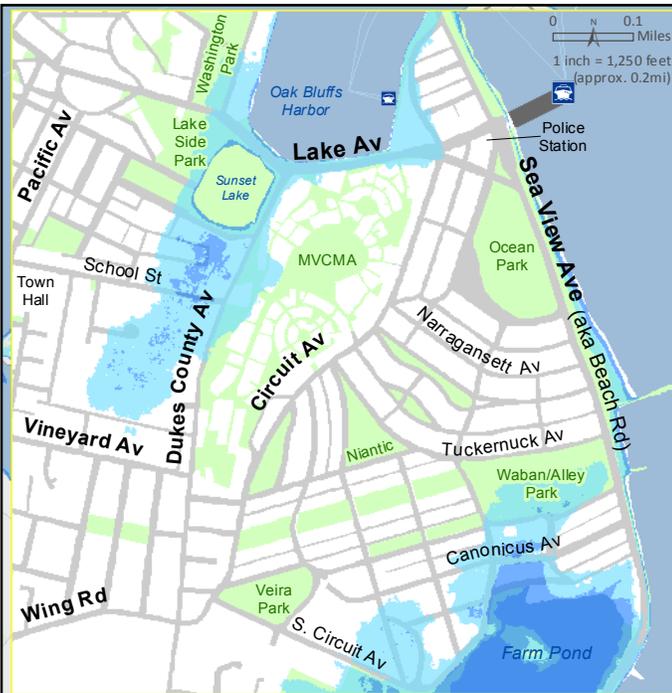
- Some low-lying areas (including the harbor boardwalk/walkway) could be under water
- Some key shoreline roads providing access to and from Oak Bluffs could be under water and/or impassable in storm events
- Some homes will be at risk
- The ferry terminal will be affected

Sea Level Rise



More Frequent / Intense Storms





Sea Level Rise Projection

Oak Bluffs, MA

1 inch = 3,000 feet (approx. 0.5mi)

0.2 0.1 0 0.2 0.4

Miles

8/3/18



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- Sea Level Rise**
- plus Mean High High Water Offset
- <=2.5ft
- >2.5ft to 6.0ft
- Open Space/Conservation Land
- Right of Way
- Water
- Ferry Service

Sea Level Rise Scenarios: 1.5ft and 5ft
Elevation Source: LiDAR 2010
Mean High High Water Present Average
Offset from NAVD88 Datum = +1.0ft

File: oak_MasterPlan; oak_MP_SeaLevelRise.mxd
See Master Plan report for data source information.

For communities that have looked at this issue, the following approaches are often mentioned:

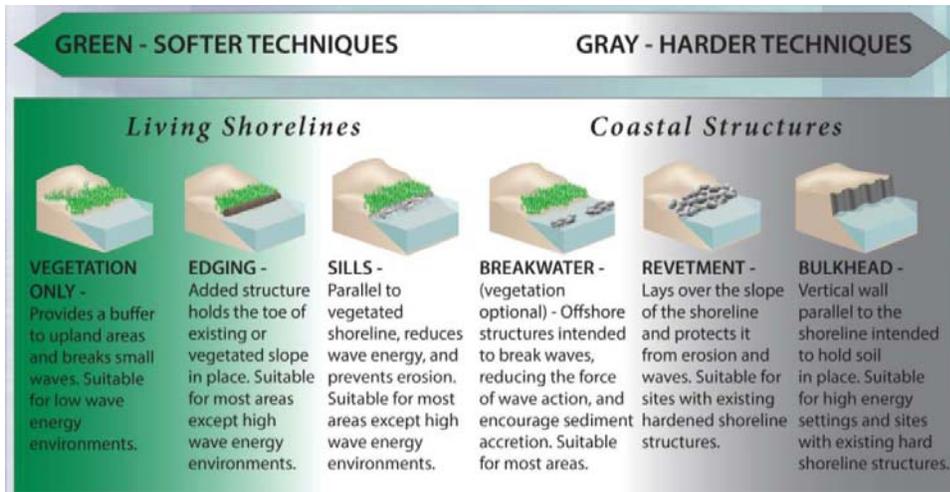
- **Protection / Armoring** - protecting the land from the sea so that existing land uses can continue.
- **Accommodation / Nourishment** - people continue to use the land *at risk* but do not attempt to prevent the land from being flooded. Structures may be raised.
- **Retreat** - the coastal zone is abandoned and there is no effort to protect the land from the sea.

Possible Resilience Strategy Alternatives



Peter Flinker, Dodson & Flinker

Strategies can also include some coastal modifications to address particular issues. “Softer techniques” are generally preferable to “harder techniques” if they will accomplish the desired results.



Adam Turner, Martha's Vineyard Commission

To help address these issues, the Massachusetts Executive Office of Energy & Environmental Affairs is implementing a “Municipal Vulnerability Preparedness (MVP) Program” to provide funding to help communities build resiliency to climate change. The program involves the following steps:

1. Engage Community
2. Identify climate change impacts and hazards
3. Complete assessment of vulnerabilities and strengths
4. Develop and prioritize actions
5. Take Action

Grants are available for planning (Chilmark and Tisbury participated in this program in 2017-18) and then for helping fund municipal actions.

What should our strategies be with regard to sea level rise and/or climate change?

Should the Coastal Vulnerability Assessment / Adaptation Plan be incorporated as a supplement to the Master Plan?

Sustainability

The Town of Oak Bluffs has a fleet of electric passenger-type vehicles as a way to be more sustainable in terms of energy use.

Section 6.1 of the Zoning Bylaw contains provisions allowing wind energy installations under certain conditions.

Section 12 of the Zoning Bylaw contains provisions allowing solar energy systems under certain conditions.

MV Transit Authority has purchased electric buses and is intending to convert its entire fleet to electric buses in the future.

Sustainability

For the purposes of the Master Plan, “sustainability” refers to:

- the philosophy of encouraging activities that allow present generations to meet their needs without compromising the ability of future generations to meet their needs.
- being efficient and economical in our use of resources using approaches that are economically viable, of social benefit, and environmentally responsible.

Some of the items to be considered as part of an overall approach to sustainability could include:

Energy-Related	<ul style="list-style-type: none"> • Reducing energy use (and considering life-cycle costing) • Becoming more efficient in use of energy resources • Promoting greater efficiency • Providing for alternative generation approaches (solar, wind, fuel cell, micro-grids, etc.) • Consider establishing a carbon reduction target
Water-Related	<ul style="list-style-type: none"> • Reducing water use • Reducing water waste / recycling water
Waste-Related	<ul style="list-style-type: none"> • Reducing waste (including food waste) • Increasing recycling
Education	<ul style="list-style-type: none"> • Educate residents about sustainability concepts

Are there policies or action steps you believe should be included in Oak Bluffs’ sustainability strategies?

Solar Panels On Houses



Recycling



Resiliency

For the purposes of the Master Plan, “resiliency” refers to the community’s ability to:

- withstand and/or absorb impactful events.
- respond to and/or readily recover from sudden changes or adversity in an efficient and timely way.

The elements of being a resilient community can include:

Avoidance-Related	<ul style="list-style-type: none"> • Identification / avoidance / risk reduction
Mitigation-Related	<ul style="list-style-type: none"> • Evaluating probability / risk scenarios • Evaluating approaches (protection / adaptation) • Balancing of cost / benefit • Hardening infrastructure (e.g. burying utilities) • Requiring resilient buildings in coastal areas • Promoting grid independence / interconnected community
Response-Related	<ul style="list-style-type: none"> • Pre-event education / training • Pre-event response plans

In 2015, the Martha’s Vineyard Commission prepared a Hazard Mitigation Plan for Dukes County and part of the plan focused on hazards specific to Oak Bluffs:

- Short term events (storm surge / flooding, hurricane, wildfire), and
- Long term events (coastal erosion, sea level rise).

Are there policies or action steps you believe should be included in Oak Bluffs’ resiliency strategies?

Hazard Avoidance / Mitigation



Emergency Response



