

Master Plan

Reexamination Report and Update

January 13, 2021

Adopted: _____

Borough of Bay Head

Ocean County, New Jersey



Prepared By

The Bay Head Planning Board

And

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1. SUMMARY

The Borough of Bay Head Master Plan is reexamined every ten years as required by the New Jersey Municipal Land Use Law. The Master Plan was initially adopted in 1997 and was reexamined in 2003, 2007 and 2017. This document is the *2017 Reexamination Report and Update* which uses data and information as of 2017. The final review and adoption, occurring in 2020, is further informed by significant changes since 2017.

This Report states that Bay Head remains a picturesque community of family homes, businesses and beautiful bodies of water: the Atlantic Ocean, Barnegat Bay and Twilight Lake. Efforts have been taken since 2007 to preserve the beauty and the character of our treasured community. The Report recognizes improvements throughout Bay Head in areas such as infrastructure, bicycle, vehicular and pedestrian safety, and mitigation of tidal water flooding. The Report also indicates that major changes to the Master Plan, ordinances or regulations are not required.

The most significant event since the 2007 Master Plan Reevaluation occurred on October 29, 2012 when Superstorm Sandy struck the coast of New Jersey. Bay Head witnessed major damage from extensive flooding. Although beach erosion occurred, the rock revetment protected many beachfront homes and greatly limited the extent of wave damage and flooding. Bay Head has mainly recovered thanks to the work of residents, town officials, state and federal government support and extensive outpouring of volunteer help. Construction and investment in recovering the beach, rebuilding the rock revetment, completion of a coastal beach protection system, and the rebuilding of homes, Borough facilities and businesses have resulted in the revitalization of the town which demonstrates the resiliency of this community. The revitalization and rebuilding also witnessed challenges associated with raising homes, increased vehicle activity and additional parking demands in the business district.

This *2017 Reevaluation Report and Update* provides a status and update of each of seven key goals identified in the 2007 Reevaluation Report. Progress has been made in each area. Recommendations are identified on how to further enhance each goal area.

Changes to the demographics, economic profile, and housing since the 2007 Report are reviewed. In general, no dramatic changes were noted. The Report concludes that “Bay Head enjoys a small but stable community.”

A review of the impact of Superstorm Sandy along with the risks of being surrounded by tidal waters identified repetitive areas of flooding and property loss. This review led to a discussion of resiliency and emergency planning to address future storms and sea level rise. The impact to the Bay Head infrastructure such as roadways, storm water management, and beach refurbishment are discussed along with mitigation strategies. The Report encourages the use of native materials and green infrastructure measures to help mitigate potential flooding.

The Borough of Bay Head has completed a number of initiatives which are described. Of note is the completion and adoption of the *Borough of Bay Head Municipal Access Plan* as required by the New Jersey Municipal Land Use Law.

A number of recommendations are included throughout this *2017 Reevaluation Report and Update* to enhance the effectiveness of the Master Plan and its implementation in preserving the charm and beauty of the Borough of Bay Head.

2. INTRODUCTION

Originally home to marshlands and abundant waterfowl, Bay Head's first known human visitors were Lenape Indians who came each summer to gather clams. Henry Hudson sailed past Bay Head twice and over the years duck hunters, fishermen, cranberry farmers and boat builders called Bay Head "home."

Bay Head's history is closely linked to the water. In 1854, Morton Johnson built the Borough's first life-saving station. His son, Hubert designed his very first boat as a 14-year-old student at Bay Head School in about 1901. That boat, a 20' Sneakbox named *Arran*, remains one of the winningest boats in Barnegat Bay history. Hubert later established his own boatyard on West Lake Avenue (at the west end of today's ballfield) where he designed and built thousands of boats, including the world-famous Blackjacks. During World War II, he designed and built silent running "picket boats" in a secret program for the US Navy. They were the first boats ashore during the "Operation Shingle" landings in Anzio, Italy.

Bay Head's land development began in the 1877 when three men from the Princeton area, David Mount, Edward Howe, and William Harris, formed the Bayhead Land Company. Its office, built in 1883 in the Queen Ann style on the northwest corner of Bridge and Lake Avenues, now houses Dune Grass Café.

The men designed a grid of compact lots, most only 50' x 100' and set the course for Bay Head to become a quiet, residential resort community with buildings designed not by architects but by the builders themselves.

In 1881, railroad lines from New York and Pennsylvania arrived. Bay Head flourished. A mix up with the railroad station sign led to the naming of Bay Head as two-words. By 1888, it claimed about 50 buildings, most of painted clapboard in the stick style. It also boasted several boatyards, its own post office, a yacht club (Bay Head Yacht Club, established 1888), two churches (All Saints Church and the Bay Head Chapel, both established 1889) and a number of hotels, including The Grenville (1890). By 1896, Bay Head had electricity and a trolley that ran from Johnson Street along Lake Avenue to Point Pleasant Beach's commercial center.

Bay Head has faced flooding risks throughout its history. Residents of 1882 constructed a wooden seawall along the oceanfront. In 1962, residents enhanced and expanded the seawall, constructing a large rock revetment. Oceanfront residents and the Bay Head Improvement Association (BHIA) maintained the dunes and the revetment provided crucial protection during Superstorm Sandy. As of 2020, federal and state agencies have developed and installed a coastal protection system running the length of the barrier island.

Bay Head suffered significant damage during Superstorm Sandy, mostly due to bay flooding. With the help of federal, state and private funds, the Borough has largely recovered. The challenge now is to preserve Bay Head's character while adapting to the new construction requirements. Among other things, this Report recommends that Bay Head cultivate greater community support for historic preservation.

The Borough is now more keenly aware of the environmental sensitivity of the lands we occupy and the importance of achieving greater resiliency, especially along Barnegat Bay and Twilight Lake. There is little we can do to control the tides, but increasing pervious cover and promoting greater use of indigenous plant and trees may help decrease nuisance flooding.

As Bay Head attracts more people than ever to its beaches and commercial districts, we are mindful of the demands of increased pedestrian, bicycle and vehicular traffic. The Borough continues to explore ways

to enable pedestrians and bicyclists to traverse the Borough safely and to provide adequate parking for our business community.

Bay Head remains a picturesque community of family homes and water views. The Borough's school, fire department and four churches are its main civic centers. Residents, both seasonal and year-round, treasure this place and seek to preserve its character.

THE PURPOSE AND SCOPE OF REEXAMINATION

The Municipal Land Use Law (MLUL) requires every municipality in New Jersey that has adopted a Master Plan and land development regulations to reexamine and, if necessary, revise, those documents every ten years (N.J.S.A. 40:55D-89). Bay Head's Master Plan was adopted in 1997 and reexamined in 2003 and 2007. The most recent Borough of Bay Head *Reexamination of the Master Plan and Development Ordinance Report* was adopted on June 6, 2007¹. The current reexamination process included meetings with representatives of various local groups such as the Environmental Commission and members of the local business community. The Planning Board discussed the re-examination in open session during several of its regular meetings and devoted special meetings to the topic to solicit public opinion.

This Reexamination Report will review the previous plans and provide updates to the Master Plan. It conforms to the requirements of the MLUL and addresses the five requirements of N.J.S.A. 40:55D-89 by including the following sections:

- A. The major problems and objectives relating to land development in the municipality at the time of the adoption of the last reexamination report.
- B. The extent to which such problems and objectives have been reduced or have increased subsequent to such date.
- C. The extent to which there have been significant changes in the assumptions, policies and objectives forming the basis for such plan or regulations as last revised, with particular regard to the density and distribution of population and land resources, energy conservation, collection, disposition and recycling of designated recyclable materials, and changes in State, County and municipal policies and objectives.
- D. The specific changes recommended for the Master Plan or development regulations, if any, including underlying objectives, policies and standards, or whether a new plan or regulations should be prepared.
- E. The recommendations of the Planning Board concerning the incorporation of redevelopment plans adopted pursuant to the "Local Redevelopment and Housing Law", P.L. 1992, c.79 (C.40A:12A-1 et seq.) into the land use plan element of the municipal Master Plan, and recommended changes, if any, in the local development regulations necessary to effectuate the redevelopment plans of the municipality.

¹ *Reexamination of the Master Plan and Development Ordinance Report*, prepared by Schoor Depalma, Inc., Adopted by the Borough of Bay Head Council on June 6, 2007

3. REEXAMINATION OF GOALS AND OBJECTIVES

This section reviews the 2007 Master Plan Reexamination Goals and Objectives against current conditions, provides a historical perspective for further recommendations and assesses the degree to which the land development problems and objectives have changed.

3.1. 2007 Master Plan Goals

The 2007 Master Plan Reexamination listed goals and objectives to be addressed. They are as follows:

- 1.) To preserve the single-family residential character and traditions of Bay Head, and to provide zoning which recognizes the established residential character of the Borough.
- 2.) To maintain the existing character of the commercial districts.
- 3.) To recognize the increasing importance of environmental protection in the establishment of development regulations and in the review of development proposals.
- 4.) To protect the dunes as an important environmental resource.
- 5.) To maintain the pattern of development established in the Borough and avoid those uses which would increase development intensity or density.
- 6.) To review and modernize the Bay Head Borough land development regulations relating to bulk standards and requirements in various zones.
- 7.) To complete the construction/addition of sidewalks in various “priority locations” in the Borough.

3.2. Review of Actions and Update of Recommendations

This chapter will examine the extent to which Bay Head has served its 2007 objectives and consider whether additional or different objectives should be set for the next ten years. Bay Head suffered significant damage by Superstorm Sandy in October, 2012. The Borough has significantly rebounded, with much of the damage having been repaired and major investments to the commercial district of the town ongoing. The revitalization of Bay Head is a testament to the resiliency of the community.

GOALS AND OBJECTIVES

1. **2007 Goal: “Preserve the single-family residential character and traditions of Bay Head.”**

In 2007, the Borough Tax Assessor reported that “as of May 2007, there were 945 total housing units in Bay Head, of which 910 were single-family detached. There were 15 two-family structures, two multi-family structures with five units or more, and 20 condominiums.”

Update:

As of 2017, the Borough Tax Assessor reports that there are 956 housing units, of which 928 are single-family detached, 8 are two-family and 2 are multi-family with five units or more, and 20 are condominiums. Census figures confirm that housing stock has remained stable in Bay Head. Nearly all of the Borough’s housing consists of single-family homes. After Superstorm Sandy, the Borough’s zoning regulations were amended to accommodate new standards for the raising of homes and improving resiliency without sacrificing the aesthetics and character of the community. While there were a number of demolitions and rebuilds, historic Bay Head has retained many of its Shingle Style, Stick Style and Queen Anne Style structures.

Recommendations:

The desire to preserve Bay Head's single-family residential character is as important to our residents now as it was in 2007. To advance this goal we recommend that the Borough work to:

- 1.) Develop design guidelines to assist residents in achieving well-scaled structures and maintaining an attractive streetscape.
- 2.) Consult with historic preservation experts about ways to encourage community support preserving the Borough's history.
- 3.) Consider passage of a historic preservation ordinance.
- 4.) Evaluate whether height, setback and lot coverage restrictions should be adjusted in light of new building code requirements and to appropriately respond to current FEMA/FIRM building elevation standards.
- 5.) Ensure that the Borough's website is up-to-date and that residents are notified about Planning Board meetings, agendas and resolutions, if possible, by an email, text messaging, or similar method to which residents may subscribe.

2. 2007 Goal: "Maintain the existing character of Bay Head's commercial districts."

The 2007 Reexamination Report recommended a number of steps to address the business community's concerns and preserve Bay Head's small commercial districts. In particular, it recommended amending the Borough's ordinances to permit more than one business use within a building and allow non-owner occupancy of the rental units above businesses. It also recommended that business employees be encouraged to park in the municipal lot to keep street parking open and that the Borough conduct an inventory of parking spaces.

Update:

The Borough amended its zoning ordinances as recommended and Bay Head's business zones attracted new tenants and businesses, with some structures housing two or more businesses.

Most of Bay Head's businesses were severely damaged by Superstorm Sandy. Many lost all of their equipment and had to completely rebuild. Commercial, retail and office space in the Lake Avenue and Mount Street district is fully occupied, with the former Applegate's Hardware site now housing multiple businesses and, as of 2020, a second-floor residence. The commercial space on Bridge Avenue is also fully occupied. A new restaurant, Charlie's of Bay Head, has opened and the commercial area on Lake Avenue north of Bridge Avenue has been cleared for construction of new retail and residential structures. The historic commercial structures at 62 and 68 Bridge Avenue will be preserved and have welcomed popular, seasonal businesses since Superstorm Sandy.

Since 2017, the restaurant and renewed commercial vitality have led to increased vehicular and pedestrian traffic as well as additional parking demands. The challenge remains how best to achieve a balance between the requirements of a vital local business community with the priorities of local neighborhoods and residents. Both must go hand-in-hand; one cannot succeed without the other.

Recommendations:

Bay Head residents have embraced, and are devoted to, the Borough's commercial districts. The small shops and local services are an important part of the Bay Head community.

To ensure that they thrive, we recommend the following steps.

- 1.) Consider zoning regulations to ensure that historically retail spaces will be used for retail rather than professional or service enterprises.
- 2.) Monitor parking demands and increased traffic as new business development becomes a reality.
- 3.) Thoroughly review circulation, parking and ways to accommodate alternative modes of transportation including expanded walk and bike ways and improved bicycle parking.

3. 2007 Goal: “Recognize the increasing importance of environmental protection.”

Noting that no set of measures is capable of stopping flooding, the 2007 Reexamination Report recommended that the Borough adopt a flood mitigation plan that would identify risks, “approach mitigation through a combination of local and regional measures,” and develop a prioritized list of desired local flood mitigation actions.

Update

The Borough of Bay Head participated in preparing Ocean County’s *2018 Multi-Jurisdictional All-Hazard Mitigation Plan*². This Plan addressed the goal of the 2007 Re-Examination and is available online. The Borough should continue to monitor flooding problems and stay current on advancing trends in mitigation strategies.

In October 2019, the Borough of Bay Head published a *Coastal Vulnerability Assessment Report*³. The report, prepared under the direction of a Working Committee of Bay Head town officials and volunteers, analyzed and documented the potential impact upon the Borough from the combined effects of storm surge and sea level rise in the year 2050. The report concluded that “overall, the Borough of Bay Head’s critical infrastructures will fare well in the various scenarios analyzed in this report” and that key infrastructure elements in the town “should remain viable and return to normal operation” soon after a storm event though some of the locations may be impacted during the storm itself and immediately afterward.

Also, in October 2020, pursuant to court order, NJ Transit appeared before the Planning Board for a hearing on its plan to construct a new and much larger substation facility on the north shore of Twilight Lake, an environmentally sensitive area. The Board submitted to the New Jersey Department of Law and Public Safety a list of recommendations and environmental concerns raised by this plan and by NJ Transit’s performance history at the site. Work on this issue continues.

² *2018 Multi-Jurisdictional All-Hazard Mitigation Plan, Ocean County, New Jersey*, prepared by Michael Baker Jr., Inc., FEMA Approved July 16, 2020

³ The Borough of Bay Head: *Coastal Vulnerability Assessment Report*, prepared by Borough of Bay Head Officials and Volunteers, October 2019

Recommendations:

Surrounded by tidal waters, Bay Head is susceptible to flooding. Catastrophic flood events cannot be prevented, but the more common episodes of nuisance flooding can be ameliorated. One of the most frequently recommended pathways to resiliency is through the use of pervious surfaces and indigenous plants. It is, therefore, recommended that the Borough:

- 1.) Continue to investigate the use of permeable surfaces and other green infrastructure methods to abate flooding risk;
- 2.) Consider reducing lot coverage by impervious surface and requiring green coverage;
- 3.) Encourage native plantings and green spaces to allow for water percolation;
- 4.) Continue to work with the county and state on mitigation efforts;
- 5.) Engage residents in seeking solutions to water problems;
- 6.) Require new construction and other significant projects to provide grade elevations before and after construction to ensure that water is retained on each property or directed to the street.
- 7.) Evaluate ways to earn additional points in the Community Rating System. Bay Head is currently rated a 6, where the best is 1. The current rating affords residents some flood insurance discounts and those discounts increase as the rating improves.
- 8.) Actively monitor and review NJ Transit plans for any proposed developments and seek ways to minimize the potentially negative aesthetic, environmental and function impact and overall impact on Bay Head.

4. 2007 Goal: “Protect the dunes as an important environmental resource.”

The 2007 Master Plan Reexamination recommended that the zoning ordinances be modified “to consider improvable area of oceanfront properties to attempt to contain some of the overbuilding in evidence on the east side of East Avenue.” The 2003 Re-examination noted that the Borough had adopted a Dune Protection Ordinance to “limit dune disturbance and preserve this important environmental resource.”

Update

The Borough adopted ordinance revisions along the lines suggested in 2007. After Superstorm Sandy, oceanfront landowners and the Bay Head Improvement Association extended the rock revetment to a length of 10,000 feet. Private residents, the Borough and the BHIA have maintained the revetment and have protected the dunes through sand-pushing and planting. The dunes and revetment have played an important role in limiting damage to the beachfront portion of the Borough. After 2017, a project was undertaken to restore the groins along the Bay Head beach.

Since 2017, the US Army Corps of Engineers (USACE) Beachfill and Dune Project constructed a berm and beach system running the length of the barrier island to protect the dunes. A new dune system was installed rising to a level of 22 feet North American Vertical Datum (NAVD 1988). This Project also included planting dune grass along the berm. In addition, the Borough of Bay Head passed Ordinance 2020-04 on April 6, 2020 amending and upgrading Article II of Chapter 25 “Protection of Beaches and Dunes.” This Ordinance provides guidance and controls to protect the dune and recently constructed berm and beach protection system.

Recommendation:

It is recommended that Bay Head monitor the success of the US Army Corps of Engineers (USACE) Beachfill and Dune Project to protect the dunes, and mitigate the disruption of beach access and use, as well as other potential impacts.

5. 2007 Goal: “Maintain the pattern of development” and “avoid those uses which would increase development intensity or density.”

The 2007 Re-examination report stated that the pattern of development had been maintained and noted that the Borough had “addressed its fair share housing obligation by adopting a Housing Element and Fair Share Plan to its Master Plan on September 5, 2006, which was filed with the Council on Affordable Housing on September 6, 2006.”

Update:

Other than the rebuilding efforts resulting from Superstorm Sandy, there has been virtually no change to patterns of development within the Borough. Nearly all of the land within the Borough is fully built and most of it is within historic or environmentally sensitive districts.

Recommendation:

Given the lack of developable land and its desire to protect its historic designation and environmentally sensitive lands, the Borough should adhere to zoning regulations restricting commercial uses, multi-family and higher density housing.

6. 2007 Goal. “Review and modernize Land Use Ordinances relating to bulk standards and requirements in the various zones.”

Update:

The Planning Board in 2007 was in a process of evaluating the bulk standards and requirements of various zones, stating that: “Currently, the lot coverage in the residential zones (R-100, R-100-BF, and R-50) is 35 percent. In an effort to better regulate density and overdevelopment, while ensuring quality of natural light and better stormwater management principles the Borough should consider reducing building coverage from 35 to 30 percent in the R-100, R-100-BF, and R-50 zones. For the R-100-OF (Ocean Front Zone), it is recommended to increase the building coverage from 25 to 30 percent however the non-buildable, riparian rights portion of the lot should be excluded when calculating total building coverage.”

Update:

Bay Head’s Land Use Ordinances were revised to exclude the riparian portion of oceanfront lots from coverage calculations. The Borough elected not to reduce lot coverage in other areas.

Recommendations:

The Borough should re-examine lot coverage as noted above with a view toward flood mitigation and preservation of light, air and space.

- 1.) Decrease the impervious coverage area and increase green space in front yards of residential properties by defining a percentage of lot area that must be planted.

- 2.) To avoid unnecessary diminution of on-street parking, limit the amount of street frontage that can be used for vehicular access to residential properties based upon a formula of a maximum opening for access per the amount of street frontage.
- 3.) Direct the Planning Board Clerk to forward site plan approval requests to the Bay Head Environmental Commission for review and comment.
- 4.) Review allowable setbacks and coverages to adjust for the change in landscape due to structures being raised to higher elevations.

7. 2007 Goal: “Sidewalk Improvements”

The 2007 Reexamination Report noted that “sidewalks along residential and commercial streets are an important asset to the community for pedestrian circulation and safety.” It identified six “priority locations” for the completion/addition of sidewalks and recommended the enactment of an ordinance requiring that all new construction and major renovations include the construction of a sidewalk. The high-priority areas identified were:

- Bay Avenue between Bridge Avenue and Osborne Avenue
- Meadow Avenue (connects Club Drive to the Bay Head School and Public Library)
- Clayton Avenue along the western side of the street
- Osborne Avenue (western part primarily)
- Club Drive (on the eastern side, across from the ball park, south to the walkway to the bridge at Mount Street)
- Any other areas that are in close proximity to community facilities.

Update:

Since 2007, and due largely to reconstruction after Superstorm Sandy, many of the sidewalks, curbs and pedestrian crossings in town have been repaired, replaced, or improved. The Borough has also modified the Sidewalk Ordinance revising the requirements for sidewalks; Chapter 209 of Bay Head Ordinance (Ordinance No. 2016-20).

As of 2020, significant progress has been made installing sidewalks at the 2007 priority locations. Sidewalks have been added on the west side of Bay Avenue between Bridge and Osborne Avenues, along the western side of Clayton Avenue, and along the south side of the western part of Osborne Avenue. The Meadow Avenue and Club Drive sidewalks have not been installed. Bay Head school has recently changed where children are left off and picked up from school. Children now enter and leave from the back of the school which has dramatically increased both vehicle traffic and pedestrian traffic along Meadow Avenue. This increases the importance of installing a sidewalk along Meadow Avenue from the school to West Lake Avenue.

Recommendation:

It is recommended the Borough continue its commitment to maintaining and improving the sidewalks. It is recommended that sidewalks be installed at the two remaining 2007 Master Plan priority locations (Meadow Avenue and Club Drive), with increased priority on Meadow Avenue. Sidewalks not only improve the quality of life and improve pedestrian safety but also provide an important alternative means of transportation to driving in Bay Head.

4. THE EXTENT OF INCREASE OR REDUCTION OF PROBLEMS AND OBJECTIVES

4.1. Shifts since Superstorm Sandy

Superstorm Sandy, which was classified as an extratropical cyclone when it struck the coast of New Jersey on October 29, 2012, was a major destructive force categorized as a 100-year storm. The Borough's location along the Atlantic Ocean and at the head of the Barnegat Bay led to major flooding and erosion across much of the Borough. Southeasterly winds and unusually high tides caused water to funnel through Scow Ditch and rise until it spilled into the streets. Wave action along the beach caused erosion, but the healthy sand dune ecosystem, as well as a historic rock revetment, protected many of the beachfront homes. In fact, only one beachfront home in Bay Head was destroyed.

Sand dunes have historically been responsible for the formation of barrier islands because high peaks are created as they mature and move inland from the beaches and reducing elevation along the Back Bay. Most of the barrier island is presently developed and a slight natural elevation change is present along East Avenue and the Beachfront. Traveling west from the ocean, the sand dunes rise well above fifteen feet before reaching East Avenue. The elevation difference between East Avenue and the Bay to the west is frequently more than 10 feet.

The storm surge from Superstorm Sandy essentially followed the ten-foot contour which resulted in most of the Borough being inundated. Properties along the sections of the town by the bay, Scow Ditch and Twilight Lake saw several feet of water. The small downtown area, including Bridge Avenue, Lake Avenue, the police and fire stations and the Borough Hall, were also flooded.

After the initial storm surge, much of East Avenue and Route 35, as well as the northwesterly part of the Borough were the only areas above the floodwater. Despite the large amount of flooding, the total destruction of properties was minimal due to the presence of a 4,134-foot revetment that existed along the majority of the Bay Head beachfront. According to Jennifer Irish, geoscientist at Virginia Tech, "It was the difference between houses that were flooded in Bay Head and houses that were reduced to piles of rubble in Mantoloking." The revetment was reported to have reduced the potential load of waves during the Superstorm by a factor of two.⁴

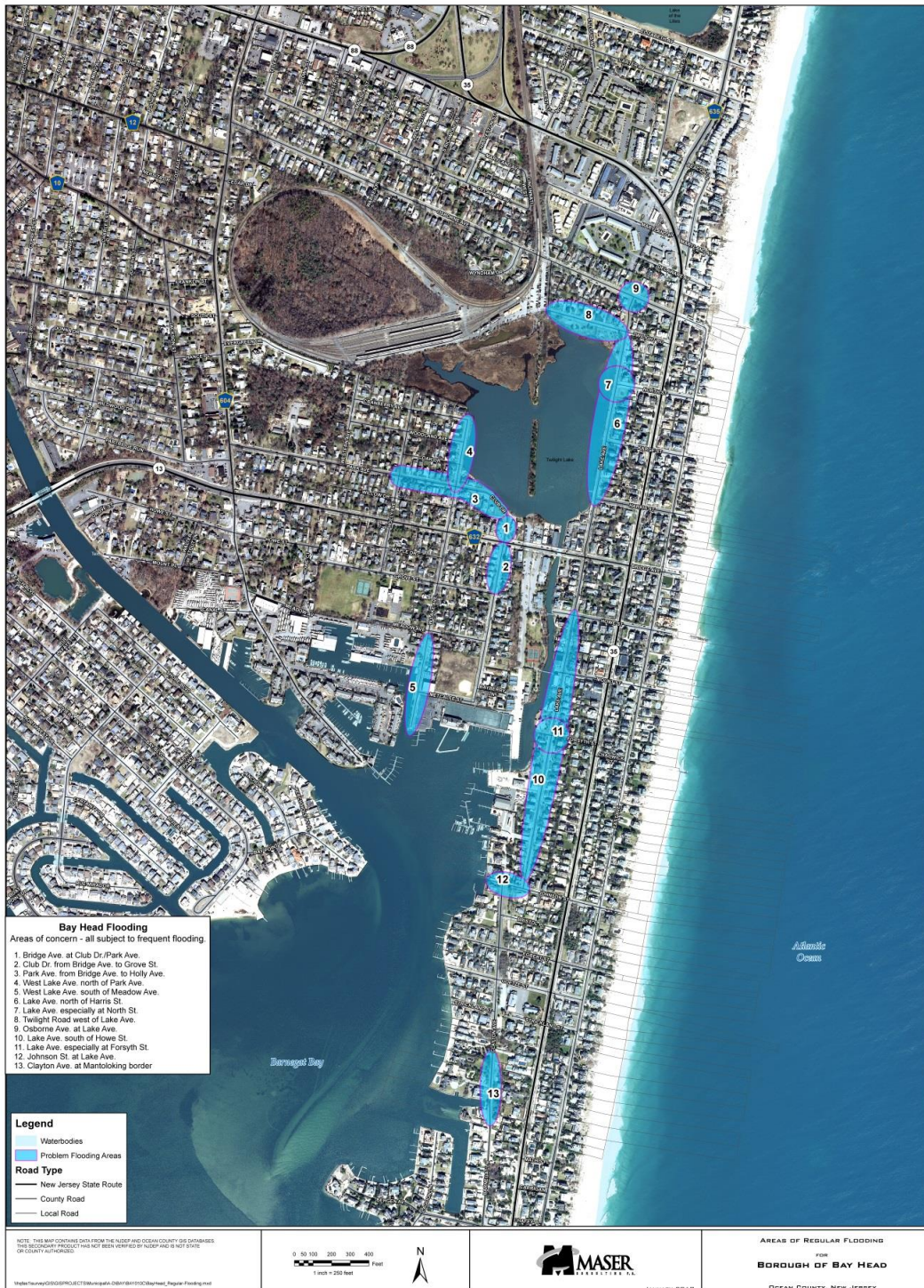
The National Flood Insurance Program (NFIP) maintains a database of loss claims. NFIP considers "repetitive loss properties" as parcels with structures insured under the program that had at least two paid flood losses of more than \$1,000 over any ten-year period since 1978. A property is considered a "severe repetitive loss property" when there are at least four losses (each exceeding \$5,000) or when there are two or more losses where the building payments exceed the property value. When Superstorm Sandy struck there were 732 National Flood Insurance Program (NFIP) policies in force within the Borough of Bay Head. By July 31, 2013, 735 claims totaling over \$60.6 million dollars had been paid. Additionally, there have been 108 "repetitive loss events" (at least two losses of \$1000 or more within 10 years) within the Borough since 1978. Those losses have resulted in payments of over \$9.3 million, representing 5.66% of all repetitive loss payments in Ocean County.

⁴ Press Release 13-126. *Long-Buried New Jersey Seawall Spared Coastal Homes from Hurricane Sandy's Wrath*, National Science Foundation. July 16, 2013.
http://www.nsf.gov/news/news_summ.jsp?cntn_id=128545&org=NSF&from=news

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Map 2: Areas of Regular Flooding (as identified by Borough officials, 2016)



5. THE EXTENT OF CHANGES IN POLICIES & OBJECTIVES

5.1. Demographics

The number of year-round residents in Bay Head has remained mostly steady. Borough policies and objectives are, therefore, unaffected by demographic change.

The US Census Bureau provides population data through Census reports every 10 years and provides population estimates every 5 years through American Community Survey (ACS) reports. The most recent Census data is from 2010⁵ and the most recent population estimates are from the 2014 ACS report.⁶

The 2014 ACS estimates put the Borough's year-round population at 997, a slight increase over the 2010 Census figures of 968. The estimated 997 residents live in 459 households within Bay Head.

Table 1: Borough of Bay Head Year-Round Population Change, 1950 – 2014

POPULATION 1950 - 2014			
Year	Population	Change	% Change
1950	808	-	-
1960	824	16	2.0%
1970	1,083	259	31.4%
1980	1,340	257	23.7%
1990	1,226	(114)	(8.5%)
2000	1,238	12	1.0%
2010	968	(270)	(21.8%)
2014 (est.)	997	29	3.0%
2040 (est.)	1,270	273	27.4%
Source: http://lwd.dol.state.nj.us/labor/lpa/dmograph/est/nj1790_2010.pdf ; DP-05 2014 ACS; http://www.njtpa.org/getattachment/Data-Maps/Demographics/Forecasts/Forecasts-for-RTP-rounded.pdf.aspx *(Parentheses) indicate a negative (-)			

⁵ The US Census Bureau 2010 Population Data Census Report

⁶ The US Census Bureau 2014 Population Estimate Report prepared by the American Community Survey (ACS)

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Bay Head has thousands of part-time residents and seasonal visitors, with the summer population increasing to 10,000 or more. Neither the Census nor the ACS figures include seasonal residents or visitors.

The North Jersey Transportation Planning Authority (NJTPA) projects that Bay Head's year-round population will increase to 1,270 by the year 2040⁷. Since the Borough is almost entirely developed, any increase in full-time population would likely come from second homes becoming primary residences. Demographic shifts suggest that retirees are the most likely to convert vacation homes to primary residences.

5.1.1. Composition of Population

Bay Head's population went from a median age of 51.5 in 2000 to 57.2 in 2010. The 2014 ACS estimated the Borough's median population age at 54.8.

Table 2: Borough of Bay Head Population and Age Characteristics, 2000 – 2014

Bay Head Population by Age 2000 - 2014	2000	2010	Percent Change 2000 - 2010	2014 ACS	Percent Change 2010 - 2014
Under 5	39	25	(35.9%)	20	(20.0%)
5 to 9	61	49	(19.7%)	36	(26.5%)
10 to 14	65	39	(40.0%)	66	69.2%
15 to 19	41	47	14.6%	45	(4.3%)
20 to 24	34	32	(5.9%)	20	-37.5%
25 to 34	97	42	(56.7%)	68	61.9%
35 to 44	172	83	(51.7%)	65	(21.7%)
45 to 54	191	135	(29.3%)	184	36.3%
55 to 59	109	76	(30.3%)	73	(3.9%)
60 to 64	117	107	(8.5%)	78	(27.1%)
65 to 74	185	170	(8.1%)	212	24.7%
75 to 84	95	120	26.3%	113	(5.8%)
85 and over	32	43	34.4%	17	(60.5%)
Total	1,238	968	(21.8%)	997	3.0%
Median Age	51.5	57.2	11.1%	54.8	(4.2%)
Source: DP-1 2000 & 2010, DP05 2014 ACS					
*(Parentheses) indicate a negative (-)					

The increase in median age between 2000 and 2010 is attributable to the decline of almost all age groups except the two oldest brackets, which saw increases in the 30% range.

Notably, because Bay Head is a small community, even slight changes can seem disproportionate. For example, a change of 6 people can translate to almost 5% points in some instances.

⁷ North Jersey 2012 Transportation Planning Authority (NJTPA) Population Projections

5.1.2. Educational Attainment

Census figures indicate that the percentage of year-round residents with college degrees went from 52.8% in 2000 to 33.4% in 2010, producing an average of 43.1% vs. the New Jersey state average of 34%. These figures exclude Bay Head's seasonal residents.

Table 3: Education attainment in Bay Head (2000 - 2014)

Educational Attainment	2000	2010	2014
Population 18 to 24 years	70	46	30
Less than high school graduate	19	9	8
High school graduate (includes equivalency)	20	12	0
Some college or associate's degree	17	10	5
Bachelor's degree or higher	14	15	17
Population 25 years and over	1,029	939	810
Less than 9th grade	13	5	0
9th to 12th grade, no diploma	16	19	3
High school graduate (includes equivalency)	192	111	113
Some college, no degree	191	99	121
Associate's degree	74	69	58
Bachelor's degree	338	389	295
Graduate or professional degree	205	247	220
Percent high school graduate or higher	97.2%	92.3%	90.3%
Percent bachelor's degree or higher	52.8%	33.4%	43.7%
Source: 2000 QT-P20; 2010 & 2014 ACS - S1501			

5.2. Housing

Superstorm Sandy damaged a good portion of the existing housing in 2012, temporarily displacing a segment of the population. Storm-related demolitions and rebuilding have allowed the Borough to upgrade and update housing to be more storm resilient.

Table 4: Housing stock in Bay Head (1990 - 2014)

Housing Units		
Year	Number	Change
1990	1,001	-
2000	1,053	52
2010	1,023	(30)
2014 (est.)	1,033	10
Source: http://lwd.dol.state.nj.us/labor/lpa/census/1990/hhgq90-1.htm ; 2000 DP-1; 2010 QT-H1; 2014 ACS DP04		

Borough officials report no decline in number of housing units since Superstorm Sandy. The 2014 ACS estimate⁸ indicates a decline of 20 residential units between 2000 and the 2014.

The most likely explanation for this divergence is that homes rendered uninhabitable after Superstorm Sandy have been rebuilt since the 2014 estimate.

5.2.1. Units in Structure

Table 5: Residential units in structure (2000 - 2014)

Type of Structure							
Type / Year	2000	2010	2011	2012	2013	2014	Change in Units (2000-2014)
Total housing units	1,053	1,079	1,078	1,072	1,063	1,033	(20)
1-unit, detached	931	927	960	961	961	947	16
1-unit, attached	27	30	29	30	27	13	(14)
2 units	35	54	47	47	41	37	2
3 to 4 units	13	22	8	14	6	5	(7)
5 to 9 units	27	28	18	6	16	18	(9)
10 to 19 units	27	15	13	14	12	13	(14)
Source: 2000 DP-4; 2010 ACS B25024; 2011-2014 ACS DP04							

⁸ 2014 American Community Survey (ACS) 2014 Housing Data Estimate

According to the ACS data, the total number of housing units has seen minimal fluctuation and the overwhelming majority (90%) of the Bay Head's housing is classified as single family detached.

5.2.2. Occupancy & Tenure

This section of the report relies on data gathered in the 2000 and 2010 Census reports and the 2014 ACS estimate. These sources do not reflect the resort nature of locations such as Bay Head.

An "owner-occupied" unit is one that is occupied as a primary residence. All other housing units within the Borough will be considered Seasonally Occupied housing units, as the Borough of Bay Head has no real vacant properties.

Bay Head enjoys a small but stable community.

Table 6: Housing occupancy (2000 - 2014)

Housing Occupancy			
Type	2000	2010	2014 (est.)
Occupied	584	459	459
Owner-Occupied	480	396	393
Renter-Occupied	104	63	66
Seasonal or Occasional Used Housing	469	564	574
Source: 2000 DP-1 & H005; 2010 DP-1; 2014 ACS DP04			

5.2.3. Age of Housing Structures

According to the 2014 ACS, 47.5% of the homes in Bay Head were built in or before 1939 and 14.1% between 1950 and 1959. In total, 82% of the housing was built in or prior to 1979.

Table 7: Year structure built in Bay Head as of 2014 ACS

Years	Estimate	Percent
1939 or earlier	491	47.5%
1940 to 1949	33	3.2%
1950 to 1959	146	14.1%
1960 to 1969	99	9.6%
1970 to 1979	75	7.3%
1980 to 1989	68	6.6%
1990 to 1999	74	7.2%
2000 to 2009	44	4.3%
2010 or later	3	0.3%
Total Units	1,033	
Source: 2014 ACS DP04		

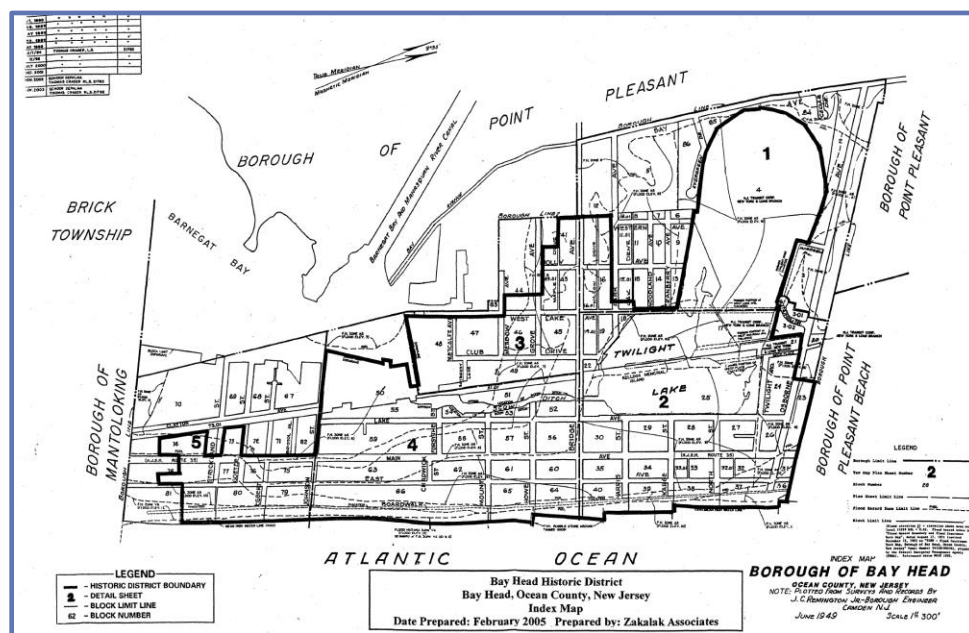
The historic nature of the housing helps define the character of the Borough. It is worth noting that many of the older homes damaged by Superstorm Sandy have been restored rather than torn down, thus maintaining the prevalence of Shingle Style, Stick Style, and Queen Anne Style architecture.

5.2.4 Historic District

The Bay Head Historic District was designated on the *New Jersey Register of Historic Places* on November 18, 2005 and on the National Register of Historic Places on February 1, 2006.

The Bay Head Historic District is primarily residential area, occupying most of the land area within the municipal boundaries of the Borough of Bay Head. General geographic boundaries of the approximately 52 block area includes the boundary of the Atlantic Ocean on the east, the boundary with the Borough of Mantoloking on the south, an irregular boundary on the west, and the border with the Boroughs of Point Pleasant Beach and Point Pleasant on the north. Map 3 shows the Historic District.

Map 3: Bay Head Historic District



There are a total of 649 primary buildings in the Bay Head Historic District, 1 structure (New Jersey Transit train loop), 228 secondary buildings, and two sites (Bay Head Yacht Club and Howe Park). The New Jersey Transit train loop is a Key structure and the Bay Head Yacht Club is a Key site. Of the primary buildings, 6 are Key, 384 are Contributing and 254 are Non-Contributing. The non-contributing fall into two categories: there are 159 newer buildings built between 1950 and 2004; and 95 older, altered buildings that have the potential for rehabilitation or have been renovated beyond recognition. There are 276 secondary buildings such as garages, carriage houses, and utilitarian buildings. Of these, 121 are Contributing and 155 are Non-Contributing.

On June 20, 2007, the Borough adopted a *Historic Preservation Plan Element of the Borough of Bay Head Master Plan*. This enabling legislation was adopted pursuant to N.J.S.A. 40:55D-65.1 which requires that a municipal planning board adopt a plan element as the foundation for a historic preservation ordinance. The Plan Element identifies the significance, location, and criteria for designating historic sites and the historic district. The Element incorporates all of the properties identified within the Borough's State and Federally approved Historic District.

Previously, the Planning Board developed and recommended passage of a preservation/demolition ordinance to encourage preservation of historic structures and establish a Historic Preservation Commission. The proposed ordinance met with opposition and, to date, no preservation ordinance has been adopted.

Recommendation:

The Borough should consider re-visiting this issue to gauge and cultivate public support for the preservation of Bay Head's historic structures and sites.

5.3. Economic Profile

The Great Recession (2008-2010) and Superstorm Sandy (2012) caused significant economic harm in New Jersey and are the most important changes since the 2007 Reexamination, but Bay Head appears to have recovered well.

5.3.1. Employment

The 2014 U.S. Census Bureau 5-Year American Community Survey (ACS) placed Bay Head's unemployment rate at 7.3%. One-quarter of the employed population were in professional, scientific, management, administrative and waste management services, 19.5% in educational, health care and social services and 13.2% in finance, insurance and real estate. Employment figures focus solely on the current labor force and exclude retirees.

5.3.2. Income

Bay Head's income levels suggest stability and relative affluence.

Table 8: Household and Family income in Bay Head, Ocean County and New Jersey (2000 - 2014)

Bay Head Income compared to the County and State				
		2000	2010	2014
Borough of Bay Head	Median Household Income	\$108,710	\$97,577	\$94,239
	Median Family Income	\$138,428	\$148,526	\$133,764
County of Ocean	Median Household Income	\$65,195	\$66,093	\$63,143
	Median Family Income	\$79,201	\$81,670	\$78,745
State of New Jersey	Median Household Income	\$55,146	\$69,811	\$72,062
	Median Family Income	\$65,370	\$84,904	\$87,999
Source: U.S. Census Bureau 2000 U.S. Census; 2010 and 2014 ACS				

5.4. Borough Initiatives

This section summarizes important planning, policy, and other significant programs that the Borough of Bay Head has advanced since the 2007 Reexamination.

5.4.1. Strategic Recovery Planning Report

The Strategic Recovery Planning Report (SRPR) was completed by planning consultants Maser Consulting, P.A., adopted by the Borough Council and approved by the New Jersey Department of Community Affairs (NJCA) May 2016.⁹

⁹ *The Strategic Recovery Planning Report (SRPR)*, prepared by Maser Consulting, P.A., Adopted by the Borough of Bay Head Council and approved by the New Jersey Department of Community Affairs (NJCA) May 2016.

The approval of the SRPR by the NJDCA allowed the Borough to be awarded funding from the State to complete five additional planning and engineering studies, which include this Master Plan Reexamination; updates to the Borough's Zoning Ordinances; Bayfront Neighborhood Plan; Twilight Lake Neighborhood Plan; and a Borough-specific Hazard Mitigation Plan. The Neighborhood Plans have not been approved.

5.4.2. Borough of Bay Head Hazard Mitigation Plan

In conjunction with the Zoning Ordinance Updates the Borough of Bay Head prepared a Borough-specific "*Hazard Mitigation Plan (HMP)*" in May 2017.¹⁰ The plan follows up on Ocean County's Multi-Jurisdictional All-Hazard Mitigation Plan with much more detail about the Borough's vulnerabilities and specifics for how to implement the recommendations.

5.4.3. Zoning Ordinance Updates

The Borough continues to update its zoning ordinances.

5.4.4. Complete Streets Policy

The Borough of Bay Head adopted a Complete Streets Policy by Resolution No. 2016-27 on January 4, 2016. The Policy was guided by the vision statement of the Borough of Bay Head Bicycle and Pedestrian Plan and the New Jersey Department of Transportation's (NJDOT) Complete Streets policy.

The Borough policy reaffirms that the Borough wishes to reinforce its commitment to a comprehensive, integrated, connected, and safe street network for all users and abilities.

The Resolution states:

"All public street projects, both new construction and reconstruction (excluding maintenance), undertaken by the Borough of Bay Head shall be designed and constructed as "complete streets" whenever feasible to do so as determined by the Borough of Bay Head Mayor and Council in order to safely accommodate travel by pedestrians, bicyclists, public transit, and motorized vehicles and their passengers, with special priority given to bicyclist and pedestrian safety, and subject to the following conditions:

- a. Pedestrian and bicycle facilities shall not be required where they are prohibited by law.
- b. Public transit facilities shall not be required on streets not serving as transit routes and the desirability of transit facilities will be determined on a project specific basis."

¹⁰ Borough of Bay Head: *Hazard Mitigation Plan (HMP)*, prepared by Remington, Venick & Vena Engineers, May 2017.

5.4.5. Borough of Bay Head Complete Streets – Bicycle and Pedestrian Plan

The *Borough of Bay Head Complete Streets - Bicycle and Pedestrian Plan* was prepared by The RBA Group with Stokes Creative Group for The New Jersey Department of Transportation and The Borough of Bay Head.¹¹ The Plan provides an overview, vision, goals and objectives, evaluation and analysis, recommendations, and implementation and funding strategies to create a safer, stronger, and more efficient bicycle and pedestrian network throughout the Borough.

5.4.6. National Flood Insurance Program (NFIP) Community Rating System (CRS)

The Borough of Bay Head is one of sixteen communities in Ocean County currently participating in the *Community Rating System* (CRS) through the National Flood Insurance Program (NFIP).¹² According to the State of New Jersey Office of Emergency Management, “CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS:

- 1) reduce flood losses;
- 2) facilitate accurate insurance rating; and
- 3) promote the awareness of flood insurance.”

The rating system ranges from Class 1 (best-rated) to Class 9 and Bay Head is rated Class 6. This rating generates a flood insurance discount of 20% for properties in Special Flood Hazard Areas (SFHAs) and 10% for non-SFHA properties. In 2020, the Bay Head Borough Administrator is leading a project to maintain/improve the Borough’s CRS rating.

Recommendation:

It is recommended that the Borough of Bay Head continue to explore efforts to raise the Community Rating System Class level to higher levels.

5.4.7. Adoption of Master Plan Elements

The Borough of Bay Head has enhanced the Master Plan by adopting three Master Plan Elements:

- 1) On September 6, 2006, the Borough adopted the *Master Plan Housing Element and Fair Share Plan*, prepared by Schoor Depalma, Inc.¹³ This document was adopted pursuant to N.J.S.A. 40:55D-28b (3) which requires that a municipal planning board adopt a plan element to address its fair share housing obligation.

¹¹ Borough of Bay Head: *Complete Streets - Bicycle and Pedestrian Plan*, prepared by The RBA Group with Stokes Creative Group for The New Jersey Department of Transportation and The Borough of Bay Head, December 2015.

¹² Table 5.6-1. *Participating Community Rating System (CRS) Communities in New Jersey*, Contained in “New Jersey State 2019 Hazard Mitigation Plan,” prepared by Michael Baker International, Inc., January 25, 2019.

¹³ Borough of Bay Head: *Master Plan Housing Element and Fair Share Plan*, prepared by Schoor Depalma, Inc., September 6, 2006.

- 2) On June 20, 2007, the Borough adopted a *Historic Preservation Plan Element of the Borough of Bay Head Master Plan* prepared by Schoor Depalma, Inc.¹⁴ This document was adopted pursuant to N.J.S.A. 40:55D-65.1 which requires that a municipal planning board adopt a plan element as the foundation for a historic preservation ordinance.
- 3) On February 3, 2020, the Borough adopted a *Municipal Public Access Plan Element of the Borough of Bay Head Master Plan* prepared by Maser Consulting, PA¹⁵ This document was adopted pursuant to N.S.J.A. 40:55D which requires the municipal planning board adopt a plan element to preserve and enhance public access to tidal waters and shorelines.

The Bay Head Access Plan has been approved by the New Jersey Department of Environmental Protection. It includes an inventory of public physical and visual access locations and plans to preserve and enhance access to tidal waters and shorelines within Bay Head which include:

- Atlantic Ocean
- Scow Ditch
- Barnegat Bay
- Scow Ditch
- Twilight Lake
- Bay Head Harbor

The Plan includes consideration of maintenance of and enhancements to accessways, parking, rest rooms, signage and disability access.

5.4.8. Open Space Rehabilitation

In 2020 the Borough rehabilitated the field at Metcalf and Club Drive, commonly known as “Howe Field.”

5.5. County Changes

Changes and planning efforts initiated by Ocean County and potentially impacting Bay Head are highlighted in this section.

5.5.1. Ocean County Planning Board 2011 Comprehensive Master Plan

The most recent County Master Plan is *Ocean County, New Jersey 2011 Comprehensive Master Plan* dated December 2011.¹⁶ The County Plan does not contain any specific recommendations for Bay Head, however many of the recommendations in this Mater Plan Reexamination and Update are consistent with those contained in the 2011 County Plan.

¹⁴ Borough of Bay Head: *Historic Preservation Plan Element of the Borough of Bay Head Master Plan* prepared by Schoor Depalma, Inc., June 20, 2007

¹⁵ Borough of Bay Head: *Municipal Public Access Plan*, prepared by Maser Consulting, P.A., Approved by the NJ DEP and approved for incorporation into the Bay Head Master Plan, February 3, 2020.

¹⁶ *Ocean County, New Jersey 2011 Comprehensive Master Plan*, prepared by the Ocean County Planning Board, December 2011.

5.5.2. Ocean County Multi-Jurisdictional All-Hazard Mitigation Plan

The Borough of Bay Head participated with Ocean County in the preparation of the 2014 Multi-Jurisdictional All-Hazard Mitigation Plan (OCHMP), which was approved by FEMA on May 13, 2014. In addition, the Borough also participated with Ocean County in the preparation of the 2018 OCHMP, which was approved by FEMA on July 16, 2020. The updated 2018 OCHMP contains a thorough analysis of vulnerability, natural hazards, human-made hazards and climate change hazards, with special focus on their effect upon critical facilities and populations. The OCHMP contained recommendations for Bay Head (described in the Recommendations section of this document).

5.5.3. Ocean County Long-Term Community Recovery Plan

The Ocean County Long-Term Community Recovery Plan, dated February 10, 2015¹⁷, addresses six areas of long-term recovery for the entirety of Ocean County, including: community planning and capacity building; economic recovery; health and social services; housing; infrastructure systems; and natural and cultural resources. The Recovery Plan provides a 'Recovery Needs Assessment' and a "SWOT" (Strengths, Weaknesses, Opportunities, and Threats) analysis, a Recovery Strategy and a summary of Recovery Value, which include regional connections, implementation, and next steps.

¹⁷ *Ocean County Long-Term Community Recovery Plan*, prepared by Michael Baker International, Inc. dated February 10, 2015

6. RESILIENCY PLANS AND ACTIONS

This Reexamination Report includes recommendations to the Planning Board concerning the incorporation of resiliency plans into the Land Use Plan Element of the Master Plan.

6.1. Resiliency Planning

Emergency readiness was tested and stressed in 2011 by Tropical Storm Irene and then in 2012 by Superstorm Sandy. Vulnerability to flooding, the lack of redundancy in the power network and gaps in our ability to communicate during a disaster were all exposed to varying degrees. The statutory master plan elements such as Land Use, Circulation, Housing, Utilities, Open Space & Recreation, Economic Development, etc., should now be examined through the lens of resiliency.

Resiliency planning can be summarized in four basic steps:

- 1) Generate awareness of coastal risk;
- 2) Assess coastal risks and opportunities;
- 3) Identify options or choices for addressing priority risks and vulnerabilities (short term); and
- 4) Develop and implement an action plan to put selected options or choices into place (long term).

Because Bay Head is a part of a barrier island system and was developed on top of what was once a natural dune system, the elevations are generally higher along the ocean and lower along the back bays. The ocean side of the island is exposed to storm surge from northeast winds, while the back bays rise up from tides hemmed in by south winds, which floods the lower elevations. These conditions occur multiple times per year. They become catastrophic when there are storm surges of the size that Superstorm Sandy created.

No planning can address these issues short of erecting walls to block the ocean and the bay and/or raising significant elements of Bay Head's infrastructure. The Borough has taken steps to repair bulkheading at vulnerable street ends and to elevate several sunken roads in town. It will continue to make repairs as needed. Private landowners and the BHIA have maintained the revetment that spared most of the Borough. As of 2020, the US Army Corps of Engineers (USACE) Beachfill and Dune Project was completed to protect against ocean flooding.

6.2. Sea Level Rise and the Future of Infrastructure

The Resiliency Plans for all Post Superstorm Sandy Planning areas have been developed to deal with the immediate needs of the community, as well as to anticipate measures for improving the resiliency of existing and future development to future storm events. It is important to recognize that evidence for the phenomenon of sea level rise, combined with the subsidence that is occurring along the New Jersey coastline, is compelling. A rising sea level, even if only measured in inches, may make the existing neighborhood pattern and infrastructure unsustainable in the most vulnerable areas. Appendix 1 provides additional information about resiliency of treating our shorelines and talks about open space within the Borough of Bay Head.

The *North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk (NACCS)* was published in January 2015.¹⁸ The NACCS was commissioned by Congress in the Disaster Relief Appropriations Act of 2013 (P.L. 113–2, H.R. 152, 127 Stat. 4, enacted January 29, 2013). The study notes that: "In New Jersey, coastal storm risk is managed along the Atlantic Ocean coast by a number of Federal coastal storm risk management projects. However, the low-lying areas of tidal rivers, back bays, and Delaware Bay coasts have a limited number of coastal storm risk management projects.

The areas identified in Maps 4, 5, and 6 show the potential impact of a two-foot sea level rise, a three-foot rise, and a five-foot rise respectively. The most vulnerable areas of the Borough are along Twilight Lake, Scow Ditch, and the bayfront, although a three-foot rise would inundate most of the Borough. The beachfront is one of the highest elevated areas of the Borough, but sea level rise will pose accessibility issues for residents.

There are various predictions regarding the number of years it will take for the sea level rise to reach two, three, five feet, or higher levels. According to one study, sea levels were rising at a rate of 4.1 mm per year for 100 years until 1992 when sea level rise slowed to 3.3 mm per year. Data from the National Oceanography Centre reported that, since 1992, the tide gauge reading showed a 3.3 mm/year sea level rise, but that the average over the past 100 years (century average) was 4.1 mm per year. At the more rapid rate of 4.1 mm of sea rise per year, it would take 149.25 years to reach the 2-foot level shown in Map 4.¹⁹

Recommendation:

Bay Head should closely monitor actions being taken by the State and the Army Corps of Engineers to preserve the integrity of the sand dunes along the ocean front.

¹⁸ *North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk (NACCS)*, prepared by the US Army Corps of Engineers, January 28, 2015

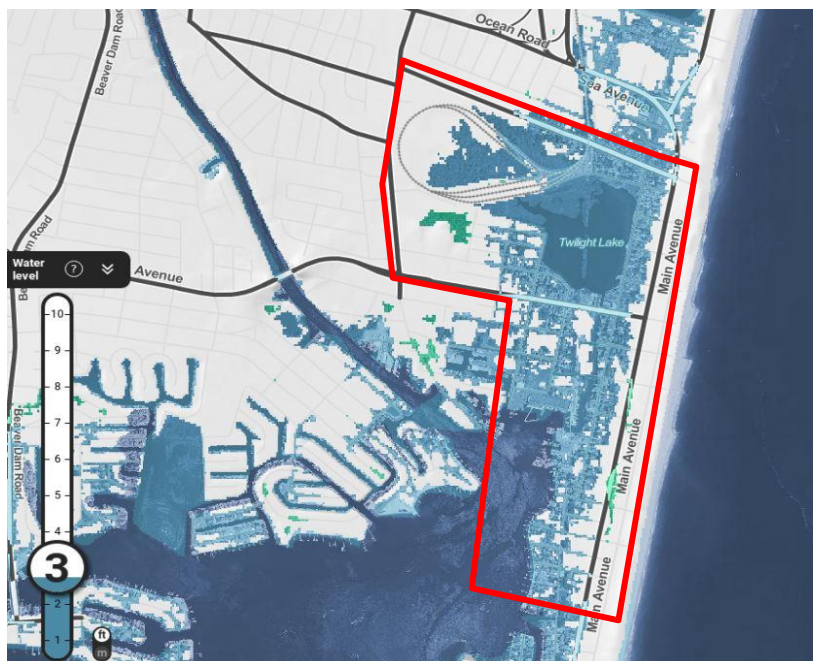
¹⁹ *Atlantic City Sea Level Rise Rate Below Average Since 1992*, by Steven Goddard, December 19, 2014, <https://stevengoddard.wordpress.com> Goddard, Steven. (2014, December 19). Atlantic City Sea Level Rise Rate Below Average Since 1992. Retrieved from <https://stevengoddard.wordpress.com/2014/12/19/atlantic-city-sea-level-rise-rate-below-average-since-1992/>

Maps 4, 5, 6, and 7 show the potential impact of two (2'), three (3'), five (5') feet and a composite map of Sea Level Rise, respectively, prepared in the Ocean County Multi-Jurisdictional Hazard Mitigation Plan:

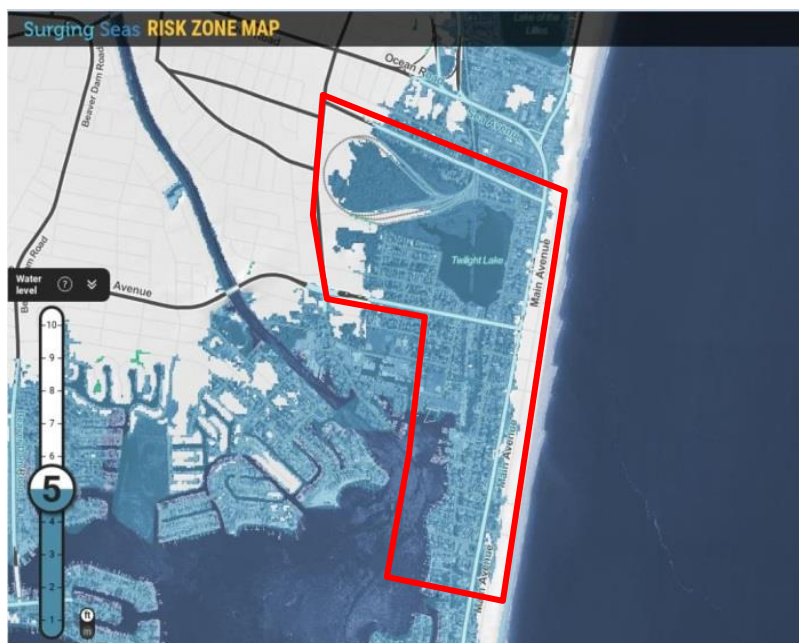
Map 4: Impact of two (2') feet of sea level rise in Bay Head



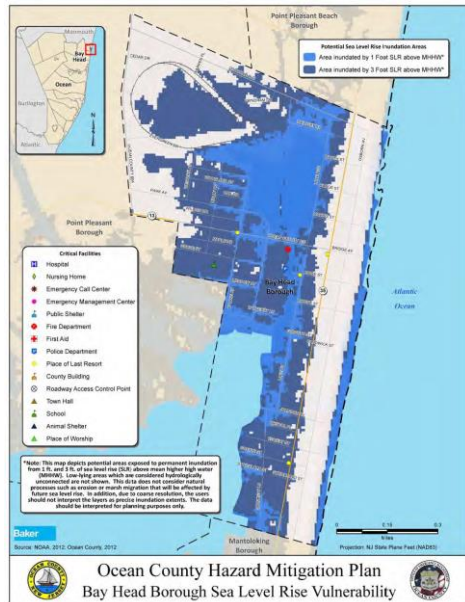
Map 5: Impact of three (3') feet of sea level rise in Bay Head



Map 6: Impact of five (5') feet of sea level rise in Bay Head



Map 7: Composite Sea Level Rise Vulnerability Map with Critical Facilities²



The most significant impact of the rise in sea level will be the flooding of existing utilities, in particular the stormwater and sewer systems. As Bay Head is a shore community with minimal changes in elevation, and utilities are often quite shallow, any permanent rise in sea level will require that these systems be revisited and possibly redesigned at a significant cost.

The roadway system, as is typical for this area, has the tendency to flood under intense storms and when storms are related to wind direction, full moons and tides. The potential rise in sea level will only

exacerbate this situation in the future, and require investigation of resiliency and green measures that can assist in mitigating flooding.

There are limited construction projects that could be completed to protect the Borough from the potential rise in sea level. Major protection efforts, such as building walls and elevating the entire Borough, would be cost prohibitive and are not practical. As future road improvement projects are completed and buildings are reconstructed, they can be raised to some extent.

6.3. Green Infrastructure Elements

The Green Infrastructure measures for shore communities incorporate both means of mitigating potential flooding through introduction of good planning and design practices, and an encouragement of the use of native materials, in particular plants that help the overall environment and reduce the need for artificial means of maintenance and watering. These green measures include:

- Rainwater management - reducing rainwater runoff is imperative through:
 - Planting areas with native or adapted plant material (e.g., trees shrubs, etc.)
 - Using permeable paving
 - Installing permanent infiltration or collection features, including:
 - ✓ Vegetated bioswales
 - ✓ Rain garden
 - ✓ Rainwater cistern or rain barrels to disconnect gutter systems and potentially capture and re-use rainwater

- Renewable energy production

Portions of Bay Head are ideally situated for solar systems, as the nature of the sea air and high wind levels limits large vegetation in what is largely a grassland (salt marsh) ecosystem. In addition, the street grid, in some areas, is oriented so that the long portions of the blocks face southwest (about 50 degrees west of due south), while the general lot configurations cause the long facades of buildings to be oriented at about 20 degrees east of due south. Optimal solar orientation for temperate climate zones is 17.5 degrees east of due south.

In August 2020, the New Jersey Department of Environmental Protection awarded the Borough of Bay Head a grant to develop water quality protection and management plan for Twilight Lake including ongoing monitoring of water conditions and further planning for green infrastructure improvements.

6.4. Green Checklist Elements

In addition to the Green Infrastructure Elements listed above and the recommendations for the use of Native Plantings in Shore Areas discussed below, the following is a listing of possible Green Checklist items:

- Use of managed wetlands for stormwater management for any newly or re-developed lots;
- Capturing rainwater on green roof surfaces or in cisterns to reduce stormwater runoff and substitute rainwater for potable water used for irrigation and other purposes;
- Standards designed to reduce noise emission through introduction of performance standards for building equipment, including generators for emergency power supply;

- Better control of lighting, including building lighting and infrastructure lighting (street lights, traffic signals, etc.) to reduce energy consumption and reduce night glare and reduce light pollution.
- Reduce heat island effects with requirements for reflective surfaces for building roofs and ground surfaces, as well as for tree-lined and shaded streets.

6.5. Native Plantings in Shore Areas

There are a number of native trees and plants that are of both ornamental value and tolerant of both salt spray and salty soils. The advantage of using these species is that they are naturally adapted to the conditions that can sometimes be severe, which occur along the seashore fringe and that by being native plants, they require less maintenance and ongoing care.

As discussed above the use of native plants will help manage and control water demands, reduce the need for irrigation and thereby reduce the need for plant fertilization in Bay Head and should be considered, when feasible.

7. OTHER RECOMMENDATIONS

The recommendations in this section are provided for reference purposes. The various recommendations have been culled from other planning efforts as well as responses to recent storm events. The recommendations offer a variety of possible actions while not drastically changing the existing infrastructure or pattern of development for the Borough of Bay Head.

The Bay Head Planning Board does not specifically recommend each of these items for action at this time but presents them as suggestions for further consideration.

A comprehensive list of all recommendations in this document is provided in APPENDIX 3 - List of Recommendations.

7.1. General Recommendations

The following is a list of additional General Recommendations based upon the evaluation of the 2007 Master Plan Re-Examination and discussions with Borough officials.

- 1.) Look to develop and provide residents timely and relevant information from sources relating to recovery resources, evacuation routes, etc.
- 2.) Continue participation in Community Rating System Program and National Flood Insurance Program.
- 3.) Encourage the investigation and potential use of green building and green infrastructure techniques adapted for the unique shore environment, such as pervious American Disabilities Act (ADA) accessible paving for walkways and parking lots, and the use of native plant material wherever possible to reduce the need for irrigation and fertilization in the sensitive shore environment.
- 4.) Encourage the continued evaluation of Resiliency Planning techniques as they relate to shore environments, including the awareness of coastal risk and prioritization of risks and vulnerabilities.
- 5.) The Borough should investigate balancing the needs of automobile access and parking with those for pedestrian and bicyclists. Traffic of all types is increasing, and Bay Head residents and visitors will benefit from safe crossings, more accessible and safer routes for walking and biking; improved bicycle parking; and other user-friendly amenities.
- 6.) The Borough should consider developing unique wayfinding signage to direct visitors to landmarks and recreation access points, such as the beach and the bay, while creating an identity unique to Bay Head. At the same time, the Borough should review and possibly reduce the growing number of signs throughout community that distract from the visual aesthetic in Bay Head and that cause confusion or sign overload.
- 7.) Revisit implementation of the Bay Head Historic District as part of the land development ordinances and adoption of the Historic Preservation Element of the Master Plan.
- 8.) The Borough should evaluate existing open spaces and look for ways to link neighborhoods and encourage a variety of recreation opportunities for all age groups, such as developing an environmental education park at the corner of Twilight Road and Lake Avenue.

7.2. Land Use Recommendations

The following recommendations are directed toward the Land Use Plan Element which serves as the foundation and basis for the Zoning Ordinances. The Master Plan will generally include a Statement of Objectives and Recommendations while the Land Use Plan Element is the actual enforcement and regulatory document consisting of the Zoning Ordinance and Codes for the Borough.

Possible zoning Ordinance revisions include:

- 1.) Decrease the impervious coverage area and increase green space in front yards of residential properties by introducing a percentage of area that must be planted.
- 2.) Review allowable setbacks and coverages to adjust for the change in landscape due to structures being raised to higher elevations.
- 3.) Review the value of a tree ordinance to encourage retaining existing trees and planting new trees to maintain the beauty of Bay Head.

7.3. Ocean County Multi-Jurisdictional All Hazard Mitigation Plan

The Ocean County 2018 Multi-Jurisdictional All Hazard Mitigation Plan lists recommendations for Bay Head (Appendix B.3 - Action 6.4.3-1 through 6.4.3-25), and are listed below for information only:

- 1.) Elevation of 165 homes to the new FEMA ABFM in Bay Head Borough
- 2.) Verbal Mutual Aid Agreement among Point Pleasant Beach, Point Pleasant, Bay Head, and Mantoloking
- 3.) USACE replenishment project and dune restoration (dunes are located on the street side)
- 4.) Yearly Fall Dune grass planting
- 5.) Upgrade CRS Class Level
- 6.) Raise Six Road Intersections
- 7.) Raise Four Roads
- 8.) Point Pleasant Pump Station Diversion
- 9.) Install Flood Gates at Scow Ditch
- 10.) Replace/Raise Bulkheads at the Bay Head Yacht Club
- 11.) Installation of Tide Flex Valves along West Lake Avenue
- 12.) Flood Proof One Commercial Property
- 13.) Storm Sewer Assessment
- 14.) Neighborhood Flood Mitigation and Resiliency Plans

Map 8: Map of Public Lands or Publicly Open Spaces in Bay Head



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launching of small non-motorized watercraft, such as paddleboards and kayaks. To the northeast, at the corner of Lake Avenue and Twilight Road, there is a sizeable piece of public land, which remains open space and was resurfaced with Twilight Lake dredge spoils, seeded and small trees planted. Twilight Lake was dredged in 2014 to remove debris deposited in the Lake from Superstorm Sandy and to increase the overall depth of the Lake.

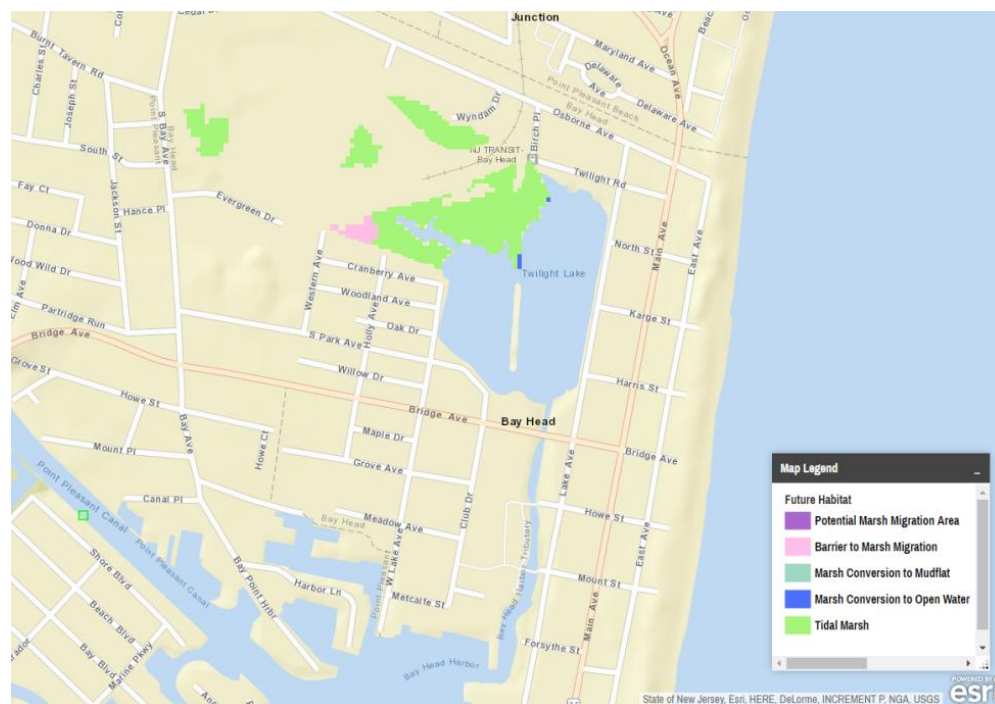
The northwestern portion of Twilight Lake is mostly inaccessible marshland and/or under New Jersey Transit ownership. The west side of the Lake is also bordered by a narrow strip of Borough-owned land that is mostly vegetated with some benches to sit.

Twilight Lake is Bay Head's major open space area with the Scow Ditch connection to the Bay as accessory open space, making the entire area tidally influenced.

Shoreline Treatments

Storms and flood events may increase the rate of erosion or movement of sediment, in addition to flooding nearby properties, which make them more vulnerable to flooding in the future. Although accretion of sediment also occurs along the shoreline and within Scow Ditch, it is often sediment brought downstream that causes backup or deflection of water elsewhere. The accretion is likely also minimal compared to the impact of sea level rise. Map 9 shows the projected shoreline change around Twilight Lake, as well as the future habitat in 2050 with a 1-foot sea level rise.

Map 9: Future Habitat Change in Twilight Lake in 2050, 1 Foot of Sea Level Rise



The Nature Conservancy (TNC) developed the Restoration Explorer App that maps out the New Jersey shorelines and proposes enhancement techniques for areas experiencing disturbance, such as erosion. TNC and researchers at the Center for Remote Sensing and Spatial Analysis at Rutgers University in New Jersey found that at least 85% of the seven set parameters affecting shoreline disturbance (6 out of 7)

must be met in order to qualify the technique as applicable to an area of shoreline.²⁰ These parameters were only available for Scow Ditch, so the mapping done for Twilight Lake is estimated based on best practices for existing conditions.

Parameters described as “not applicable”, or N/A, are counted as a “yes”. The parameters are listed below:

- Tidal Range (ft)
- Shoreline Change (Erosion vs. Accretion) (ft/yr.)
- Coastal Ice Cover (frequency)
- Wave Height (ft)
- Slope (%)
 - Shoreline Slope
 - Nearshore Slope
- Salinity (ppt/parts per trillion)

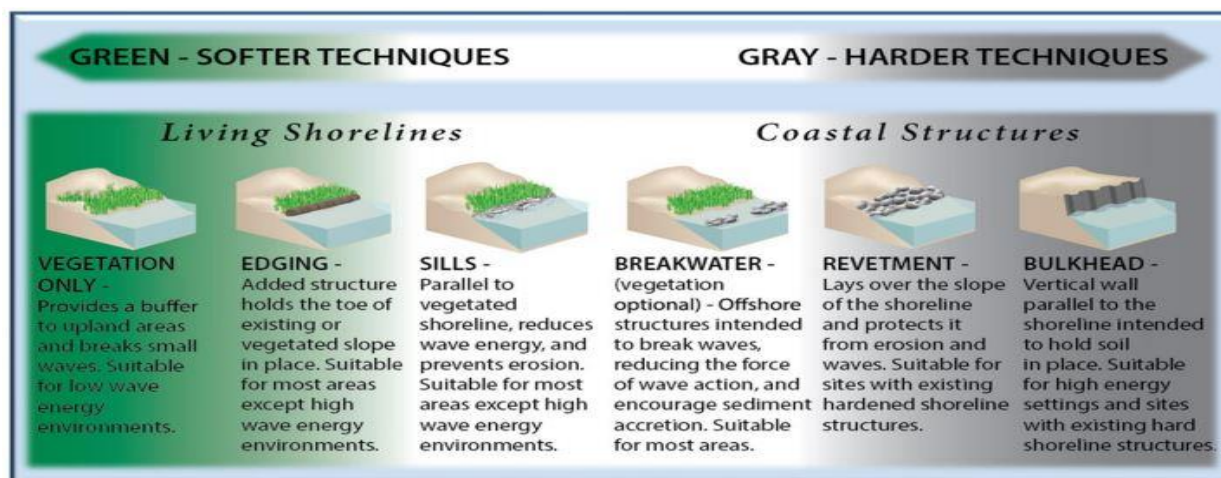
Additionally, the U.S. Army Corps of Engineers has identified twenty (20) risk management strategies for coastal communities through their *2015 North Atlantic Coast Comprehensive Study Report*.²¹ Some of the approaches are structural, while others are natural and nature-based features (NNBF), and others are non-structural (policy-based). Some strategies may not be applicable to the Twilight Lake or Scow Ditch shoreline, but may need to be considered at a larger-scale to minimize risk around the Borough. Those that may be considered, to varying degrees, are included below, divided between areas of low-level wave energy and moderate to high-level wave energy. Some of the non-structural strategies are included in the Zoning and Land Use recommendations section. It is important to consider all alternatives strategically and for their short and long-term impacts on the community.

The US Army Corps of Engineers stated further study must be done for each solution and appropriate locations. While some areas may have several possible solutions that could be effective, it is possible that they will not all work together and that one solution may be more effective than others.

²⁰ Lathrop, Richard. *Documentation for The Nature Conservancy Restoration Explorer App*. August 2015. <https://coastalresilience.org/project/restoration-explorer/>

²¹ *North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk (NACCS)*, prepared by the US Army Corps of Engineers, January 28, 2015

Table 9: Various shoreline stabilization methods are shown ranging from “green” living shorelines to hardened structures, shown in gray (Image: NOAA)



Tidal Marshes (Low-Level Wave Energy)

Tidal marshes are marine landscapes that contain wetlands along the coasts of tidal basins, including estuaries, which are frequently inundated by flooding from the daily tidal flow of the adjacent ocean or major water body. Within the Twilight Lake area, there are tidal marshes located toward the north and northwest of the Lake, which are influenced by the Barnegat Bay and Atlantic Ocean via Scow Ditch.

Tidal marshes can range between freshwater, brackish, and saline, and are normally categorized into the lower, or intertidal, marsh and the upper, or high, marsh. The intertidal zone in saline marshes is flooded daily and then re-exposed by the tide. Tidal marshes are typically characterized as having a mix of tall and short saline-tolerant grasses, such as tall and short Smooth Cordgrass (*Spartina alterniflora*), Spike Grass, and Saltmeadow Rush (*Juncus gerardii*). Tidal marshes are important because they help to buffer stormy seas, slow shoreline erosion, and are able to absorb excess nutrients before they reach oceans and estuaries.²²

For the saline and brackish tidal marsh shorelines, which exist primarily along the north and northwest portions of Twilight Lake along the New Jersey Transit property, there are at least five shoreline enhancement options that can address shoreline edge erosion and marsh migration. Techniques that may be appropriate to consider for Twilight Lake include nature-based living shorelines and marsh sills because the area is protected from wave action.

Living Shorelines

The US Army Corps of Engineers suggests that the Borough may want to consider “living shorelines” along much of Twilight Lake. Living shorelines have a beach, strand of coastal wetlands, breakwater of rocks, then a bank, and an upland buffer. Wetlands and natural structures are better at absorbing the impact of floodwater, particularly long-term.

²² *Community Rating System Classification and Types of Wetlands*, US Environmental Protection Agency, EPA Website

In certain strategic areas where bulkheads and other hard structures exist, but that are relatively protected from wave action, the Army Corps of Engineers suggests that the Borough could conduct a study about replacing the hard structures with living shorelines. This may not be practical along certain areas on the Bay due to potential high-level wave action and sediment erosion; however, Scow Ditch and Twilight Lake provide an easier and calmer transition zone.

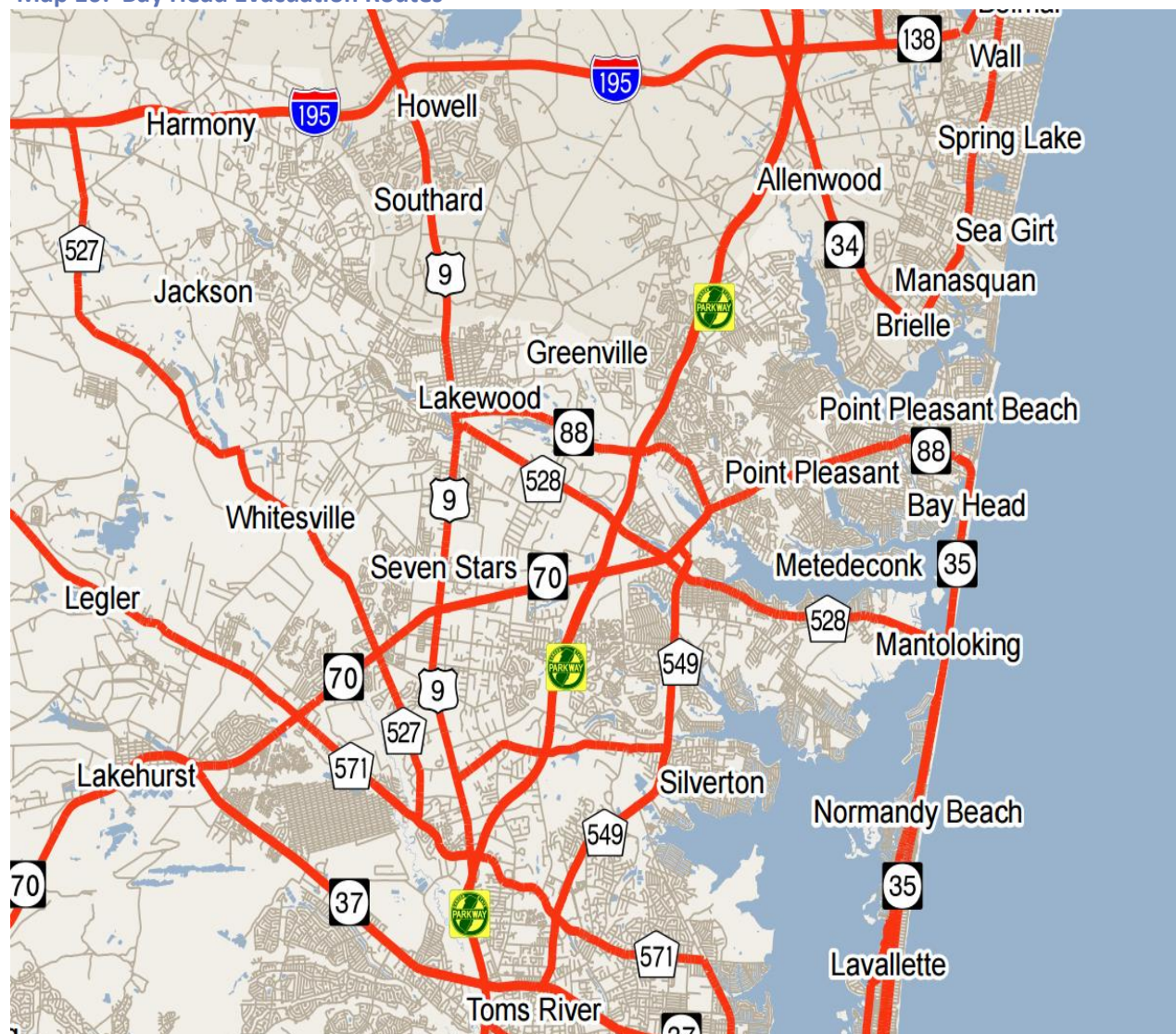
In addition, living shorelines provide a healthy habitat and nesting and breeding area for some marine species, as well as a transition zone for wetlands that is protected. Educational components, including signage and programming can be incorporated to teach residents and visitors about the importance of these areas when they are placed along existing accessible parks and street-ends.

APPENDIX 2 - EVACUATION ROUTES

Evacuation Routes

With potentially increased sea level and frequency and intensity of storms that affect storm surge and flooding, it is critical for coastal communities to have contingency plans for residents to get to safety or for emergency access into an area. There is currently one main and one alternative evacuation route established for the Borough of Bay Head. The Ocean County evacuation route uses Route 35 North and then Route 88 through the Borough of Point Pleasant for this portion of the County, or optionally Route 35 South to Mantoloking and Route 528.

Map 10: Bay Head Evacuation Routes



APPENDIX 3 - LIST OF RECOMMENDATIONS

Item	Page	Recommendations
1	6	...this Report recommends that Bay Head cultivate greater community support for historic preservation...
2	9	...To advance this goal (preserve Bay Head single family residential character) we recommend that the Borough work to: 1) Develop design guidelines to assist residents in achieving well-scaled structures and maintaining an attractive streetscape.
3	9	2) Consult with historic preservation experts about ways to encourage community support preserving the Borough's history.
4	9	3) Consider passage of a historic preservation ordinance.
5	9	4) Evaluate whether height, setback and lot coverage restrictions should be adjusted in light of new building code requirements and to appropriately respond to current FEMA/FIRM building elevation standards.
6	9	5) Ensure that the Borough's website is up-to-date and that residents are notified about Planning Board meetings, agendas and resolutions, if possible, by an email, text messaging, or similar method to which residents may subscribe.
7	10	...To ensure that they (Commercial Districts) thrive, we recommend the following steps. 1) Consider zoning regulations to ensure that historically retail spaces will be used for retail rather than professional or service enterprises.
8	10	2) Monitor parking demands and increased traffic as new business development becomes a reality.
9	10	3) Thoroughly review circulation, parking and ways to accommodate alternative modes of transportation including expanded walk and bike ways and improved bicycle parking.
10	10	...The Borough should continue to monitor flooding problems and stay current on advancing trends in mitigation strategies.
11	11	...It is, therefore, recommended that the Borough: 1) Continue to investigate the use of permeable surfaces and other green infrastructure methods to abate flooding risk;
12	11	2) Consider reducing lot coverage by impervious surface and requiring green coverage;
13	11	3) Encourage native plantings and green spaces to allow for water percolation;
14	11	4) Continue to work with the county and state on mitigation efforts;

Item	Page	Recommendations
15	11	5) Engage residents in seeking solutions to water problems;
16	11	6) Require new construction and other significant projects to provide grade elevations before and after construction to ensure that water is retained on each property or directed to the street.
17	11	7) Evaluate ways to earn additional points in the Community Rating System. Bay Head is currently rated a 6 where the best is 1. The current rating affords residents some flood insurance discounts and those discounts increase as the rating improves.
18	11	8) Actively monitor and review NJ Transit plans for any proposed development and seek ways to minimize the potentially negative aesthetic, environmental and functional impact and overall impact on Bay Head.
19	12	It is recommended that the US Army Corps of Engineers (USACE) Beachfill and Dune Project be closely monitored to help mitigate the impact of possible disruption of beach access and use, as well as other potential impacts.
20	12	Given the lack of developable land and its desire to protect its historic designation and environmentally sensitive lands, the Borough should adhere to zoning regulations restricting commercial uses and multi-family housing.
21	12	The Borough should re-examine lot coverage area with a view toward flood mitigation and preservation of light, air and space. The Borough should: 1) Decrease the impervious coverage area and increase green space in front yards of residential properties by defining a percentage of lot area that must be planted.
22	13	2) To avoid unnecessary diminution of on-street parking, limit the amount of street frontage that can be used for vehicular access to residential properties based upon a formula of a maximum opening for access per the amount of street frontage.
23	13	3) Direct the Planning Board Clerk to forward site plan approval requests to the Bay Head Environmental Commission for review and comment.
24	13	4) Review allowable setbacks and coverages to adjust for the change in landscape due to structures being raised to higher elevations.
25	13	It is recommended the Borough continue its commitment to maintaining and improving the sidewalks. It is specifically recommended that sidewalks be installed at the two remaining 2007 Master Plan priority locations (Meadow Avenue and Club Drive), with increased priority on Meadow Avenue.
26	23	The Borough should consider re-visiting this issue (... passage of a preservation/demolition ordinance to encourage preservation of historic structures and establish a Historic Preservation Commission...) to cultivate public support for the preservation of Bay Head's historic structures and sites.

Item	Page	Recommendations
27	26	It is recommended that the Borough of Bay Head continue to explore efforts to raise the Community Rating System Class level to higher levels.
28	30	Bay Head should closely monitor actions being taken by the State and the Army Corps of Engineers to preserve the integrity of the sand dunes along the ocean front.
29	34	The use of native plants will help manage and control water demands, reduce the need for irrigation and thereby reduce the need for plant fertilization in Bay Head and should be considered, when feasible.
30	35	The following is a list of General Recommendations based upon the evaluation of the 2007 Master Plan Re-Examination and discussions with Borough officials. They are presented here solely as <u>suggestions for further consideration</u> . 1) Look to develop and provide residents timely and relevant information from sources relating to recovery resources, evacuation routes, etc.
32	35	2) Continue participation in Community Rating System Program and National Flood Insurance Program.
33	35	3) Encourage the investigation and potential use of green building and green infrastructure techniques adapted for the unique shore environment, such as previous American Disabilities Act (ADA) accessible paving for walkways and parking lots, and the use of native plant material wherever possible to reduce the need for irrigation and fertilization in the sensitive shore environment.
34	35	4) Encourage the continued evaluation of Resiliency Planning techniques as they relate to shore environments, including the awareness of coastal risk and prioritization of risks and vulnerabilities
35	35	5) The Borough should investigate balancing the needs of automobile access and parking with those for pedestrian and bicyclists. Traffic of all types is increasing and Bay Head residents and visitors will benefit from safe crossings, more accessible and safer routes for walking and biking; improved bicycle parking; and other user-friendly amenities.
36	35	6) The Borough should consider developing unique wayfinding signage to direct visitors to landmarks and recreation access points, such as the beach and the bay, while creating an identity unique to Bay Head. At the same time, the Borough should review and possibly reduce the growing number of signs throughout community that distract from the visual aesthetic in Bay Head and that cause confusion or sign overload.
37	35	7) Revisit implementation of the Bay Head Historic District as part of the land development ordinances and adoption of the Historic Preservation Element of the Master Plan.
38	35	8) The Borough should evaluate existing open spaces and look for ways to link neighborhoods and encourage a variety of recreation opportunities

Item	Page	Recommendations
		for all age groups such as developing an environmental education park at the corner of Twilight Road and Lake Drive.
39	36	<p>The following recommendations are directed toward the Land Use Plan Element which serves as the foundation and basis for the Zoning Ordinances. They are presented here solely as suggestions for further consideration.</p> <p>1) Decrease the impervious coverage area and increase green space in front yards of residential properties by introducing a percentage of area that must be planted.</p>
40	36	2) Review allowable setbacks and coverages to adjust for the change in landscape due to structures being raised to higher elevations.
41	36	3) Review the value of a tree ordinance to encourage retaining existing trees and planting new trees to maintain the beauty of Bay Head.

APPENDIX 4 - LIST OF REFERENCED REPORTS

REPORT PAGE	REFERENCED REPORT	AVAILABILITY
7	¹ Borough of Bay Head: <i>Reexamination of the Master Plan and Development Ordinance</i> , prepared by Schoor Depalma, Inc., Adopted by the Borough of Bay Head Council on June 6, 2007	http://bayheadnj.org/bhni/Departments/Planning%20Board/Various%20Planning%20Reports/Borough%20of%20Bay%20Head%20-%20Reexamination%20of%20Master%20Plan%20-%2006-6-07.pdf?1604257672
10	² <i>2018 Multi-Jurisdictional All-Hazard Mitigation Plan, Ocean County, New Jersey</i> , prepared by Michael Baker Jr. Inc., FEMA Approved July 16, 2020	http://www.co.ocean.nj.us//WebContentFiles//d99c7d03-cbe7-47ca-9d49-8fea931376c5.pdf
10	³ Borough of Bay Head: <i>Coastal Vulnerability Assessment Report</i> , prepared by the Borough of Bay Head Officials and Volunteers, October 2019	http://www.bayheadnj.org/bhni/Community/Environmental%20Commission/Resources/Coastal%20Vulnerability%20Report%20-10-31-2019.pdf
14	⁴ Press Release 13-126. <i>Long-Buried New Jersey Seawall Spared Coastal Homes from Hurricane Sandy's Wrath</i> , National Science Foundation, July 16, 2013.	http://www.nsf.gov/news/news_summ.jsp?cntn_id=128545&org=NSF&from=news
17	⁵ The US Census Bureau 2010 Population Data Census Report	https://2020census.gov/en/search-results.html?q=2010+population+data&page=1&stateGeo=none&searchtype=web&cssp=SERP&_charset=UTF-8
17	⁶ The US Census Bureau 2014 Population Estimate Report prepared by the American Community Survey (ACS)	https://nj.gov/labor/lpa/acs/2014/acs14_5Yr_MCD_OCE_ndx.html
18	⁷ North Jersey 2012 Transportation Planning Authority (NJTPA) Population Projections	https://www.njtpa.org/NJTPA/media/Documents/Archive/Planning/Plan%202040/Plan2040Appendices_approved_draft.pdf
20	⁸ American Community Survey (ACS) 2014 Housing Data Estimate	https://nj.gov/labor/lpa/acs/2014/acs14_5Yr_MCD_OCE_ndx.html
24	⁹ Borough of Bay Head: <i>Strategic Recovery Planning Report (SRPR)</i> , prepared by Maser Consulting, P.A., Adopted by the Bay Head Council and approved by the New Jersey Department of Community Affairs (NJCA) May 2016.	http://bayheadnj.org/bhni/Departments/Planning%20Board/Various%20Planning%20Reports/Borough%20of%20Bay%20Head%20-%20Strategic%20Recovery%20Planning%20Report.pdf?1604257672

Borough of Bay Head

REPORT PAGE	REFERENCED REPORT	AVAILABILITY
25	¹⁰ Borough of Bay Head: <i>Hazard Mitigation Plan</i> , prepared by Remington, Venick & Vena Engineers, May 2017.	http://bayheadnj.org/bhnj/Departments/Planning%20Board/Various%20Planning%20Reports/Borough%20of%20Bay%20Head%20-%20Hazard%20Mitigation%20Plan%20Final.pdf?1604257672
26	¹¹ Borough of Bay Head: <i>Complete Streets - Bicycle and Pedestrian Plan</i> , prepared by The RBA Group with Stokes Creative Group for The New Jersey Department of Transportation and The Borough of Bay Head, December 2015.	http://togethernorthjersey.com/wp-content/uploads/2019/06/OC-LTCR-Plan-Submission-12022014.pdf
26	¹² <i>Participating Community Rating System (CRS) Communities in New Jersey</i> , Contained in <i>New Jersey State 2019 Hazard Mitigation Plan</i> , prepared by Michael Baker International, Inc., January 25, 2019.	http://ready.nj.gov/mitigation/pdf/2019/mit2019_section5-6_Flood.pdf
26	¹³ Borough of Bay Head: <i>Master Plan Housing Element and Fair Share Plan</i> , prepared by Schoor Depalma, Inc., September 6, 2006.	The Plan is available in the Borough of Bay Head offices
27	¹⁴ Borough of Bay Head: <i>Historic Preservation Plan Element of the Borough of Bay Head Master Plan</i> prepared by Schoor Depalma, Inc., June 20, 2007	The Plan is available in the Borough of Bay Head offices
27	¹⁵ Borough of Bay Head: <i>Municipal Public Access Plan</i> , prepared by Maser Consulting, P.A., Approved by the NJ DEP and approved by the Bay Head Council for incorporation into the Bay Head Master Plan, February 3, 2020.	http://bayheadnj.org/bhnj/Departments/Planning%20Board/Various%20Planning%20Reports/Borough%20of%20Bay%20Head%20-%20Municipal%20Public%20Access%20Plan.pdf?1605649620
27	¹⁶ Ocean County, New Jersey: <i>2011 Comprehensive Master Plan</i> , prepared by the Ocean County Planning Board, December 2011.	http://www.co.ocean.nj.us/WebContentFiles/fedb8826-cb81-4b9f-be8d-e71e4fcd1fa4.pdf
28	¹⁷ Ocean County, New Jersey: <i>Long-Term Community Recovery Plan</i> , prepared by Michael Baker International, Inc., February 10, 2015.	http://togethernorthjersey.com/wp-content/uploads/2019/06/OC-LTCR-Plan-Submission-12022014.pdf
30	¹⁸ <i>North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk (NACCS)</i> , US Army Corps of Engineers, January 2015.	https://www.nad.usace.army.mil/Portals/40/docs/NACCS/NACCS_main_report.pdf

REPORT PAGE	REFERENCED REPORT	AVAILABILITY
30	¹⁹ <i>Atlantic City Sea Level Rise Rate Below Average Since 1992</i> , by Steven Goddard, December 19, 2014.	https://stevengoddard.wordpress.com/2014/12/19/atlantic-city-sea-level-rise-rate-below-average-since-1992/
39	²⁰ Lathrop, Richard. <i>Documentation for The Nature Conservancy Restoration Explorer App.</i> , August 2015.	https://coastalresilience.org/project/restoration-explorer/
39	²¹ <i>North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk (NACCS)</i> , US Army Corps of Engineers, January 28, 2015.	https://www.nad.usace.army.mil/Portals/40/docs/NACCS/NACCS_main_report.pdf
40	²² <i>Community Rating System; Classification and Types of Wetlands</i> , US Environmental Protection Agency, EPA Website.	https://www.epa.gov/wetlands/wetlands-classification-and-types#marshes