

## SECTION II INVENTORY AND ANALYSIS

### A. **Orientation and Community Profile**

The Village of Bayville is located on the north shore of Long Island, New York, in the eastern portion of Nassau County. The study area for this LWRP, which encompasses the entire Village of Bayville and is defined as the Local Waterfront Revitalization Area (LWRA), is in an incorporated area of the Town of Oyster Bay, and is one of several incorporated villages that lie adjacent to the Oyster Bay/Cold Spring Harbor Complex.

The Village of Bayville, incorporated in 1919, is greater than one square mile in area. The terrain is largely rolling and hilly, especially in the western portion of the Village, due to its position on the Harbor Hill terminal moraine. The portion of the Village to the east of Washington Avenue, and the Village's extreme western end, are low-lying.

The Village has shoreline on both the Oyster Bay Harbor Complex (including Mill Neck Creek and Oak Neck Creek) to the south and Long Island Sound to the north. The characteristics of these two water bodies are very different. Oyster Bay Harbor is an enclosed embayment, which is fairly well protected from the most damaging wave action during storms, but also experiences restricted tidal flushing which causes the accumulation of contaminants in its innermost reaches, especially in the Mill Neck/Oak Neck Creek system. Long Island Sound has better water quality than the harbor complex due to a greater degree of tidal circulation, but is also exposed to severe waves during major storms that can cause coastal erosion and physical damage to waterfront structures. The Village has more than five miles of shoreline, approximately equally divided between the Sound-side and the bay-side.

Land use in the Village is primarily residential. There are limited areas of open space, mostly in public parkland. A number of marine commercial uses are present along the southerly shoreline of the Village, primarily in the vicinity of the Bayville Bridge. Commercial uses also are important in the Village, especially in the business district extending from the intersection of Ludlam Avenue and Bayville Avenue.

The Village is essentially fully developed at the present time, with very limited future development potential.

#### **Historic Development**

The Village of Bayville, which was known as the Village of Oak Neck until 1859, has grown from a population of about 75 in 1840 to 1,000 in 1930, 2,000 in 1950, and about 8,800 at present. As with many other areas on Long Island, the Village of Bayville changed from agrarian to summer residential, and then to its present status as a year-round residential community.

The early settlers (in the area that is now the Village of Bayville) were heavily involved in oyster and clam fishing, and trading with the Native Americans. As an outgrowth of this effort, lime was manufactured from the accumulated shell residue for a short time around 1700. Shellfishing has continued to be an important activity in the community to this day, for both commercial and recreational use. At one time, lumber from Bayville was harvested for use in New York City, but this activity was discontinued because of tree depletion. The Village of Bayville became a major asparagus growing area from 1825 until about 1900, when a blight destroyed the crop. In the latter half of the 1800s, the mining of sand and gravel for construction projects in New York City was an active industry in this area.

There was a serious mosquito infestation problem in the area until about 1880, at which time scientific developments in mosquito extermination technologies resulted in the elimination of the problem. This made the area more attractive as a summer resort, and by 1885, affluent people began to purchase property for their summer estates. Bayville became a thriving summer community. The era of large summer estates lasted until the 1930s. Many of the summer residents decided to settle permanently in Bayville. Some of the houses are still used as summer homes by the owners, and are rented during the remainder of the year.

The only shellfishing company presently operating in the Village of Bayville, Frank M. Flower and Sons, Inc., was started in 1887 at Shu Swamp in Mill Neck. In 1900, the firm moved to a location on the Mill Neck side of the Bayville Bridge and, then in 1940, to its present location on the Bayville side of the bridge. Although there presently are about 40 employees, the firm has had as many as 60 employees. Flower provides oysters and clams primarily to the northeastern part of the United States, but has sold its product throughout the nation, as well as to Canada and Europe. Oyster Bay Harbor also is used for the harvesting of clams and lobsters by independent commercial baymen and lobstermen, as well as by persons involved in recreational shellfishing.

Until 1898, when the drawbridge from Bayville to Mill Neck was constructed, the only land access to Bayville was from the west through Locust Valley. The bridge provided another accessway, southward through Oyster Bay hamlet. Previously, access to Oyster Bay hamlet was long and indirect, past Factory Pond, through Mill Neck over Beaver Dam, onto Cleft Road, and finally to Oyster Bay. The current bridge was originally constructed in 1938, and was extensively renovated in 1992.

There are two Nassau County roadways (Bayville Avenue and Ludlum Avenue) and one Town of Oyster Bay roadway (West Harbor Drive) within the Village of Bayville. Perry Avenue, Creek Road, Mountain Avenue, Godfrey Avenue, School Street, and Merrit Lane are under the Village's jurisdiction. The remaining roads in the Village are privately owned. Bayville Avenue, the main east-west County roadway through Bayville, was originally built as a dirt road in 1754 through Oak Neck to Centre Island. Public and private roads were constructed gradually over the years. Sidewalks were first installed in the Village in 1920.



drilling and offshore seismic investigations have been carried out by the United States Geologic Survey (USGS) in the area from Great Neck to Bayville. While the information from this work is still being evaluated, the preliminary results indicate that the geologic history of this area is very complicated, and simple correlation of formations in this area with comparable units elsewhere on Long Island cannot be made with confidence. All that can be concluded with certainty regarding the lower portion of the geologic sequence in Bayville is that the Lloyd Sand is present and comprises the lowest geologic unit which rests upon the bedrock. The Jameco Gravel formation also may be present. However, other formations common to Long Island, including the Magothy formation, are entirely absent from the Bayville area. The Magothy layer, which is a primary source of drinking water on Long Island, has been removed by erosion in the Bayville area, as evidenced by north-south trending buried valleys under Long Island Sound, and has been replaced by deposits of Pleistocene age which are known collectively as the Upper Glacial Formation consisting mainly of silt and clay.

In summary, the principal geologic units in the Village of Bayville, from the surface downward, are:

*Glacial Deposits* - These are the deposits of the terminal moraine created by the last advance of the glacial ice sheet, which form the uplands in the Village of Bayville. Here, as in many other areas on Long Island, these deposits were mined for sand and gravel.

*Undifferentiated Clay Deposits* - These may either be undifferentiated Gardners Clay or Glacial deposits. The Magothy formation, which generally is found in this position in the sediment column on Long Island, is not present in Bayville.

*Lloyd Sand Member* - Below the undifferentiated clay deposits is a unit that is correlated with the Lloyd Sand member of the Raritan Formation. This unit is about 100 feet thick in the Bayville area and is moderately permeable. This unit rests directly on the basement crystalline bedrock floor.

Having determined that the geologic history of the Bayville area is extremely complicated, the USGS may no longer attempt to correlate the individual formations of this area with their approximate counterparts elsewhere on Long Island. Instead, they may reclassify and rename these units to reflect the obvious complexities. The USGS currently is considering a proposal to rename and classify the deposits in this area as the "North Shore Formation".

The new understanding of the sub-surface geology of Bayville may have an important bearing on how much water can be extracted from the deep sand aquifer in this area without causing undesirable impacts. For example, the Bayville aquifer may not correlate or correspond with similar sandy beds found elsewhere on the Island and may therefore warrant management as a separate and independent aquifer. At this point, there is no way of knowing the nature and extent of the correlation and, therefore, the effects of pumping the Bayville deep wells on other supply wells and outpost wells in the area.

## **Surface Geology and Topography**

The low-lying eastern end of the Village of Bayville is a relatively flat surface which generally is 12 feet or less above sea level. Geographers refer to this type of landform as a tombolo, which is a sandy strip of land joining an island to the mainland. This Bayville tombolo is approximately 1.5 miles in length, between Centre Island and the more elevated western portion of Bayville, and ranges from 1,500 to 2,000 feet in width. The Bayville tombolo was formed by the deposition of materials that were eroded from the adjacent upland areas and carried in an east-west direction by long-shore currents, until the connection between Centre Island and the mainland was completed.

The more elevated area at the western end of the Village of Bayville historically has been called Oak Neck. This area is roughly circular in outline and is slightly less than one square mile in area. The highest elevation is approximately 150 feet above mean sea level. The topography of this area is hilly, and has the distinctive characteristics of a terminal moraine formed by a continental glacier. There are a number of overlooks and discontinuous bluffs in this part of the Village, but no continuous ridge or line of bluffs of the type found elsewhere on north shore of the Island. Because most of the incident precipitation infiltrates into the soil rather than running off over the surface, and due to the narrow width of the Village, Bayville lacks significant streams.

The beach along the Long Island Sound side of Bayville averages approximately 150 feet in width. Within the area of extra-territorial jurisdiction extending up to 1,500 feet from the mean high-water line, the water depth drops off to approximately 30 feet. (Note: unless otherwise specified, all water depths reported in this LWRP are in reference to mean low water.)

On the south side, Bayville is bordered by Mill Neck Creek, Oak Neck Creek and Oyster Bay Harbor. The shoreline of Mill Neck Creek and Oak Neck Creek is bordered mostly by areas of tidal marsh. The Oyster Bay Harbor shoreline of the Village is bordered primarily by natural and man-made beaches. The deepest section of Mill Neck Creek lies beneath the Bayville Bridge, where depths in the ten-foot range are encountered. Depths in the inner portion of Mill Neck Creek adjacent to the Village of Bayville generally range from 2 to 3 feet, while Oak Neck Creek generally becomes tidal flat at low water. The depth of Oyster Bay Harbor within the Village's 1,500-foot area of extra-territorial jurisdiction generally ranges from 5 to 10 feet, but attains depths as great as 20 feet in the deepened offshore areas.

The surface geology of Bayville reflects the recent geologic origins and history of the area. The tombolo is mapped and characterized as a well-graded sandy deposit that was transported and deposited by long-shore currents in Long Island Sound. The Oak Neck upland was formed from unsorted materials that were pushed ahead of the advancing glacier and were left behind when the ice sheet receded. The hilly and hummocky topography of this area is characteristic of the glacial terminal moraines on Long Island.

The geologic deposits consist primarily of sandy units. These sediments are highly variable in thickness; in some places they may be over 400 feet. As noted previously, offshore seismic surveys by the USGS Geological survey indicate the existence of deep buried valleys of glacial origin that may have completely eroded through the entire sequence of Cretaceous deposits, all the way to the bedrock floor at a depth of 400 feet. The tidal marshes and beaches along the shoreline are of recent origin, and are still in the process of forming. This marshland was created by the gradual infilling by sediment and decaying vegetation. Some sections of the shoreline have been filled in artificially, with miscellaneous demolition debris and, perhaps, dredge spoil.

### Soils

Soil boundaries were taken from the *Soil Survey of Nassau County* (U.S. Department of Agriculture, Soil Conservation Service, 1987). In general, the soils reflect the nature of the geologic deposits from which they are derived. They also reflect the environment and the topography in which the soils were formed. On the broadest scale, the five principal soil-forming environments in the Village of Bayville are:

- a. Soils that have formed on the tombolo. These soils generally are very rapidly draining and are not very rich in organic material. Because of this poor fertility, this area does not support abundant plant life. Udipsamment soils (i.e., man-made fill and borrow areas) together with reworked urban-land soils predominate in this area. These soils are nearly level to gently sloped (up to 3 percent gradient) and excessively drained, and are composed of coarse-textured sand.
- b. Upland soils, in the more elevated western portion of the Village (Oak Neck). These soils have developed on the glacial moraine, are well drained to excessively drained, and are rich in organic materials. These characteristics allow the soils to support an abundance of natural vegetation. This area generally contains Riverhead and Plymouth soils, which have been substantially modified by development, with slopes generally in the 3 to 15 percent range.
- c. Organic and tidal marsh soils. These are poorly drained and dense soils that are formed by the gradual infilling of the tidal estuary areas in Mill Neck Creek and Oak Neck Creek, due to twice-daily inundation by salt water caused by tidal action. They are generally classified as Ipswich Soils.
- d. Soils that form on steep slopes. These soils have unique characteristics that are derived from their thickness and drainage properties. These are a special classification of soils such as Plymouth, Riverhead and Montauk, which form on slopes ranging from 15 to 35 percent.

- e. Beach soils. These soils were formed by the beach building processes along the land-water interface, and are shown as a separate unit on the soil map.

## 2. Surface Water Resources

### **Surface Waters**

The surface waters in the LWRA are mainly salty and brackish. These include: Mill Neck Creek, Mill Neck Bay, Oak Neck Creek (which is a northerly tributary to Mill Neck Creek), Oyster Bay Harbor, and Long Island Sound. Although there are no significant freshwater bodies within the Village of Bayville, freshwater drainage from watersheds located to the south of the LWRA have had significant impact on the quality of waters that surround the Village of Bayville. This freshwater drainage system is discussed in great detail in the Draft Harbor Management Plan for the Oyster Bay/Cold Spring Harbor Complex (September 1997), and includes the following drainage systems:

- 479-acre Oak Neck watershed;
- 459-acre Factory Pond watershed;
- Kentruck Pond and the 2,715-acre Shu Swamp; and
- Beaver Brook/Beaver Lake watershed.

The Bayville-Centre Island watershed is 830 acres in size, and affects the water quality of Long Island Sound to the north, and Oyster Bay Harbor and its tributary water bodies to the south (including West Harbor, Turtle Cove and Mill Neck Creek). The major water quality problems for these surface waters are caused by contaminant loadings contributed by stormwater runoff, malfunctioning on-lot sanitary systems (i.e., cesspools and septic systems), and other non-point pollution sources).

### **Applicable Water Quality Standards and Related Criteria**

The New York State Department of Environmental Conservation (NYSDEC) monitors water quality of Nassau County coastal waters on a regular basis. This work is carried out by the Department's Bureau of Shellfisheries. The monitoring program focuses on the safety of marine waters for the harvesting of shellfish for human consumption. The monitoring focuses on the measurement of coliform bacteria levels and the potential release of coliform bacteria from such uses as sewage treatment plants, marinas, mooring areas, and anchorages.

The Nassau County Department of Health monitors water quality off public bathing beaches to determine if the waters meet with public health requirements which are based on coliform bacteria concentrations.

### *New York State Shellfishing Harvesting Criteria*

The quality of marine and estuarine waters can be assessed on the basis of a variety of variables, including color, odor, floating and suspended solids, oil, toxic compounds, and other deleterious substances. Water quality classifications in New York State currently are based primarily on three indices: total coliform level, fecal coliform level, and dissolved oxygen concentration.

The primary objective of most on-going water quality monitoring programs in New York State is to prevent human health impacts from exposure to pathogenic bacteria and viruses which can result from either direct contact with contaminated water or the consumption of tainted shellfish. However, the detection of these pathogens is generally a time consuming and tedious undertaking. Consequently, water quality testing typically entails the use of coliform bacteria, which are relatively easy to measure; these bacteria co-occur with the pathogens of primary concern and serve as indicators of the possible presence of those pathogens.

In order to be certified as a shellfish harvesting area, the median total coliform level for any series of samples must be no greater than 70 MPN/100 ml or less (where MPN/100 ml is the most probable number of organisms per 100 milliliters of sample). New York State (2 NYCRR Part 701.20) classifies these certified shellfishing waters as “SA”, which designates the highest level of water quality, and establishes the best intended usage of these waters as shellfish harvesting for market purposes, and primary and secondary contact recreation (Table 1).

**TABLE 1**

**NEW YORK STATE WATER QUALITY CLASSIFICATIONS  
DEFINED ACCORDING TO BEST USAGE**

<b>Freshwater Classification</b>	<b>Best Usage</b>
AA	Source of water supply for drinking, culinary or food processing purposes and any other usages.
A	Source of water supply for drinking, culinary or food processing purposes and any other usages.
B	Primary contact recreation and any other use except as a source of water supply, for drinking, culinary or food processing purposes.
C	The waters are suitable for fishing and fish propagation. The water quality shall be suitable for primary and secondary contact recreation even though other factors may limit the use for that purpose.
D	The waters are suitable for fishing. The water quality shall be suitable for secondary contact recreation even though other factors may limit the use for that purpose. Due to such natural conditions as intermittency of flow, water conditions not conducive to propagation of game fishery, or stream bed conditions, the waters will not support fish propagation.
<b>Saline Classifications</b>	<b>Best Usage</b>
SA	The waters shall be suitable for shellfishing for market purposes and primary and secondary contact recreation.
SB	The waters shall be suitable for primary and secondary contact recreation and any other use except for the taking of shellfish for market purposes.
SC	The waters are suitable for fishing and fish propagation. The waters shall be suitable for primary and secondary contact recreation even though other factors may limit the use for that purpose.
SD	All waters not primarily for recreational purposes, shellfish culture or the development of fish life, and because of natural or man-made conditions cannot meet the requirements of these uses.
<b>Special Classification</b>	<b>Best Usage</b>
I	The waters shall be suitable for secondary contact recreation and any other usage except for primary contact recreation and shellfishing for market purposes.





Dissolved oxygen (DO) levels in the LWRA are not known to become significantly depressed, and there have been no significant occurrences of hypoxia (i.e., occurrences of depressed DO concentrations, generally below 3 ppm). There was one reported hypoxia event in October 1985 of unknown cause that resulted in a fishkill in Mill Neck Creek. However, there generally is sufficient tidal flushing in the Oyster Bay Harbor system to prevent DO deficiencies, due primarily to the large volume of water exchanged during each tidal cycle (the mean tidal range is approximately 7 feet).

In a stormwater sampling program completed in 1993, chemical analyses were performed on water samples from six stormwater outfalls at representative locations around the Oyster Bay Harbor complex. The sampling was carried out immediately after rainfall events in order to measure the first flush effect of storm runoff on surface water quality. A suite of 30 constituents was measured for each sample and the results indicate the following about the dissolved constituents in the stormwater:

- arsenic cadmium, mercury and nickel were not measured at levels exceeding the detection limits for each of these constituents;
- two out of twenty samples showed elevated concentrations of chromium;
- three out of 20 samples were found to be above the 0.1 mg/l detection limit for nitrate;
- one out of twenty samples exceeded the 2.5 mg/l detection limit for petroleum hydrocarbons;
- the remaining 13 constituents - including, copper, lead, zinc, BOD-5, COD fecal coliform, ammonia, nitrate, phosphate, suspended solids, total kjeldahl nitrogen and total nitrogen - generally were found at levels in excess of their respective detection limits; and
- the coliform bacteria levels were generally highest at an outfall discharging street runoff from West Harbor Drive in Bayville, and direct street runoff from the north end of Turtle Cove.

### **Stormwater and Non-Point Source Pollution**

The water quality conditions described in the foregoing sections are largely the product of stormwater discharges from streets and other paved surfaces and by overland runoff. Region-wide, as described in the *Long Island Comprehensive Waste Treatment Management Plan* (also known as the Long Island 208 Study, by the Long Island Regional Planning Board, 1978), these sources contribute the majority of contaminants to coastal waters, and this is true in the Bayville area.

Although there is ample evidence to show that these sources contribute significantly to the coliform bacteria levels in the receiving waters, specific sources in the Village of Bayville have not yet been classified and prioritized. One of the most important goals of this LWRP is to complete this inventory of stormwater and non-point sources, and subsequently implement projects to mitigate the impact to local coastal water quality resulting from these discharges. The Village has accomplished a significant amount of work in this area, and has received broad-based commendation for its efforts. Completed projects have included:

- systems of interconnected drainage rings on Perry Avenue/Bayville Park Boulevard in the western part of Bayville and along Bayville Avenue, which provide subsurface water retention chambers that collect stormwater and allow it to recharge into the shallow subsurface, thereby diverting the “first flush” of stormwater from discharging directly to surface waters; and
- artificial wetland at former Schmitt property, to the southeast of the intersection of Ludlam Avenue and West Harbor Drive, which provides bio-filtration to surface runoff flow prior to discharge to Oyster Bay Harbor.

However, much work remains to be completed in order to achieve the Village’s overall goal of improving water quality to the point that the area available to shellfish harvesting is expanded in the future.

Like many older communities on Long Island, the drainage system in the Village of Bayville originally was designed to effect the rapid removal of stormwater from streets and areas of development in order to prevent flooding. Little thought was given at that time to providing treatment capabilities (i.e., the removal of pollutants prior to discharge to receiving waters), other than for the settlement of coarse-grained sediments to prevent clogging of pipes and other drainage structures. More recently, however, structural improvements have been retrofitted into portions of the Village’s drainage system which prevent the direct discharge of stormwater into the surface waters. This improved system conveys stormwater into the shallow sandy deposits which are present over a large part of the Village.

Although the Village of Bayville does not have a large number of stormwater outfalls, certain local features and conditions contribute to stormwater and non-point pollution of adjacent coastal waters. These include:

- uncontrolled runoff from paved surfaces directly into surface water still occurs in some areas of the Village;
- high levels of coliforms and nutrients are discharged from malfunctioning on-lot sanitary systems and from overflows of these systems in low-lying areas during times of heavy rainfall and flooding;

- hilly topography and steep slopes in the western portion of the Village contribute to a high rate of runoff;
- areas of pavement generate runoff at a much high rate, compared to unpaved areas which allow the infiltration of a larger percentage of incident rainfall; and
- the Village contains areas of very dense development, which magnifies the adverse effects on coastal water quality resulting from problems with on-lot sanitary systems, use of landscaping chemicals and fertilizers, home maintenance involving the use of household hazardous wastes, leakage from parked automobiles, and similar human activities.

In an effort to reduce the impact to local coastal water quality caused by development, a grant was recently awarded to the *Friends of the Bay*, based in Oyster Bay hamlet. Under this grant, which was awarded through the Long Island Sound Study, a program will be developed to educate homeowners in the area regarding the proper maintenance of on-site wastewater treatment systems.

### **3. Groundwater Resources**

Groundwater occurs in two zones in the Village of Bayville. Currently, the sole source of potable water for municipal use is the Lloyd aquifer, which occurs at a depth of approximately 400 feet. The second zone occurs at shallower depth in the Glacial Aquifer, which was the source of supply for one municipal well whose use was discontinued because of saltwater intrusion. The depth of the Glacial Aquifer is highly variable.

The sustainable yield of the Lloyd aquifer has not been determined for the Bayville area. Sustainable yield is the rate at which water can be withdrawn without either: a) exceeding the rate at which water is recharged to the aquifer via the infiltration of precipitation; or b) the rate at which water can be withdrawn without causing significant movement of the underground saltwater-freshwater interface toward the pumping wells. This latter aspect of sustainable yield is particularly important in low-lying coastal communities on Long Island like Bayville, where saltwater intrusion can render wells unusable for potable supply.

Although the safe yield of the Lloyd aquifer in the Bayville area cannot be determined from the current data base, the recent installation of observations wells and follow-up monitoring may provide the necessary information to complete this task. The USGS currently is analyzing the results of their investigation in this area, and is preparing a report that will answer some of these questions. This report is expected to be completed in approximately one year, according to the USGS.

Further monitoring of water levels in the aquifer beneath Bayville will continue over the next few years in order to determine the water level drawdown effects resulting from pumping. The same observation will be used to monitor water quality trends, and to determine any changes

or trends in the levels of chloride in the aquifer. This information will be used in evaluating the likelihood, if any, of saltwater intrusion into Bayville's freshwater supplies.

The total diversion of groundwater from the Lloyd aquifer to the Bayville municipal system amounted to 303,553,773 gallons in 1997, which averages approximately 832,000 gallons per day to the Village from three wells. The three currently-active wells are 1-1 N7620, 1-3 N-8776 and 2-1 N-10144. Aside from one well in Centre Island, there are no other diversions from the Lloyd aquifer anywhere in the vicinity of Bayville. It probably is safe to say that the total amount of water being withdrawn from this unit at present totals approximately one million gallons per day. It also is safe to assume that this diversion will not be increased significantly, or that any new diversion will be allowed from the Lloyd aquifer on the north shore of Long Island.

Available information regarding water levels in Lloyd wells shows no significant trend or decline in response to pumping in recent years. Long-term monitoring shows a net decline in the hydrostatic head of approximately ten feet since the turn of the century. If the results of the current monitoring program show that there has been no further decline in hydrostatic head in response to pumping, it may be concluded that the current rate of pumping from the Lloyd unit is within the sustainable yield of the aquifer in this area and that pumping at the current rate may therefore be continued without interruption, provided that saltwater intrusion does not occur. However, the water available from the Lloyd aquifer clearly is a limited resource, with a finite capacity, and efforts must continue to conserve both the quantity and quality of this important water supply source.

The shallow Upper Glacial aquifer system is considered to be a potential source of water for the Village of Bayville. One of the four existing Village supply wells taps this unit but, as mentioned previously, is not currently in service due to excessive chloride levels. This well, identified as Well 1-2 N-7643, is 218 feet deep and obtains water from a 45-foot screened zone between 167 and 212 feet. The Upper Glacial aquifer is present over a good part of Bayville, and currently is being monitored at a number of locations for water level changes and water quality. While this unit may be an abundant source of water, further work needs to be done to fully evaluate its potential and to determine whether its exploitation would be significantly limited by water quality factors. Based on current understanding, if the Upper Glacial aquifer is used for water supply purposes, it likely would have to be blended with water drawn from the Lloyd unit and would have to be treated to achieve drinking water standards.

#### **4. Wetland Ecology**

There are no designated freshwater wetlands (as designated pursuant to the Freshwater Wetlands Act, New York Environmental Conservation Law, Article 24) in the Village of Bayville. In fact, aside from two artificial drainage sumps which temporarily retain stormwater, there are no significant areas of standing freshwater in the Village. There are local

concentrations of freshwater wetland indicator species such as skunk cabbage, but no sites are known where these types of plants are present in great numbers.

Tidal wetlands are abundant along the shoreline in the Village of Bayville. These features serve as a home and food source for a wide variety of fish and wildlife. Tidal wetlands are the breeding ground for many types of fish found in saltwater. Both shellfish and finfish find protection there as they grow. They are important feeding sources for the widely diverse migratory and wintering bird population that relies on this area. Many of the plants found in these areas are able to absorb deleterious chemicals, thereby removing these pollutants from the harbors and bays. Tidal wetlands also trap fine particles and, thereby, prevent sediment from being transported into the open waters of the harbors and bays. They prevent erosion by holding the shoreline sediment deposits in place, and also absorb waves caused by wind and boat traffic that would otherwise contribute to the erosion process. Tidal wetlands are an important recreational resource, as they form a diverse and interesting ecosystem that attracts naturalists, bird watchers, recreational fishers/fishermen, and researchers.

Tidal wetlands have been inventoried and mapped by the New York State Department of Environmental Conservation (NYSDEC) on 1974 aerial photographs. Tidal wetland boundaries were officially adopted in 1977 when the State's Tidal Wetlands Regulations (6 NYCRR Part 606, adopted pursuant to Article 25 of the Environmental Conservation Law) were promulgated. Tidal wetlands in the Village of Bayville comprise six primary ecological zones:

- **High marsh or salt meadow:** Designated as HM on NYSDEC tidal wetlands maps, this is the uppermost tidal wetland zone, which usually is dominated by salt meadow cordgrass (*Spartina patens*), spike grass (*Distichlis spicata*), and black grass (*Juncas gerardi*). This zone is periodically flooded by spring and storm tides, and is often vegetated by low-vigor smooth cordgrass (*Spartina alterniflora*) and seaside lavender (*Limonium carolinanum*). The upper limits of this zone often include black grass, marsh elder (*Iva frutescens*) and groundsel (*Baccharis halimifolia*).
- **Intertidal Marsh:** Designated as IM on NYSDEC Tidal Wetlands maps, this vegetated zone lies generally between the average high and low tidal elevation, and is usually dominated by smooth cordgrass (*Spartina alterniflora*).
- **Coastal shoals, bars and mud flats:** Designated as SM on NYSDEC Tidal Wetlands maps, this zone includes areas that are exposed at low tide or covered by water to a maximum depth of one foot, and which contain no appreciable rooted vegetation.
- **Formerly-connected tidal wetlands:** Designated FC on NYSDEC Tidal Wetlands maps, this zone includes wetlands that have been wholly or partially blocked from tidal inundations due to the construction of man-made facilities such as dikes or roadways. This zone may support stands of common reed (*Phragmites australis*). In low-lying

areas where daily tidal exchange has been cut off, some of these zones are experiencing a transition, and support vegetation indicative of freshwater wetlands.

- **Littoral Zone:** Designated LZ on NYSDEC Tidal Wetlands, this zone of open water includes shallow bay bottoms with a maximum depth of six feet measured from mean low water elevation. This is a highly productive zone of great value to waterfowl, fish and shellfish.

The locations of mapped tidal wetlands in and adjacent to the Village of Bayville is shown on [Figure 3](#).

## **5. Upland Ecological Environment**

The nature and diversity of the upland vegetative communities in the Village of Bayville are most readily observed in the public parkland known as the Harrison Williams Woods, located along the east side of School Street. This 27-acre property, which was donated to the Village by the estate of Harrison Williams as a forever-wild nature preserve, is the largest upland parcel of open space in the Village. The following summarizes survey information regarding the trees, shrubs and other plants found in Harrison William Woods:

The indicator trees are chestnut oak, scarlet oak and white oak. The indicator undergrowth is comprised of mountain laurel, low blueberry and black huckleberry. Mature chestnut oaks dominate the upland surface. The understory in this area includes young sassafras, black cherry, black oak and some red maple. The shrub layer is chiefly maple leaf viburnum, laurel, black huckleberry and low blueberry.

Non-native trees are reported growing along the west border of the Woods, along School Street. Tree-of-heaven and white mulberry, both native to China, flourish in the sunnier areas, as does wisteria. Proceeding from this area southward and then east along School Street, an open area is noted with smaller trees and more groundcover. Gray birch is noted which reportedly indicates a change from an old field to woodland setting. From this open terrain in an easterly direction and into a sloping area, red oak and laurel reappear (G.E. Lotowyez, May 18, 1977).

Beyond this description of the basic plant ecology, the survey identifies all trees, shrubs and vines that were observed during the survey of the Woods. The remainder of the upland part of Bayville is essentially fully developed, and the majority of native plants have been replaced by ornamental plantings and other landscaping treatments.

## **6. Oyster Bay National Wildlife Refuge**

The Oyster Bay National Wildlife Refuge (OBNWR) includes more than 3,000 acres of submerged land and tidal marsh. The OBNWR is owned and managed by the Fish and

Wildlife Service (FWS) of the U.S. Department of the Interior. The OBNWR covers most of Oyster Bay Harbor, but only a small part lies within the LWRA. The portion of the refuge within the LWRA includes part of Mill Neck Creek and the portion of Oyster Bay Harbor that lies within the Village's 1,500-foot jurisdictional area.

Most species of Long Island's waterbirds have been documented within the OBNWR. Numerous waterfowl species can be observed in the refuge during the winter months, with upward of 7,000 ducks reported during peak use. The most common waterfowl species include black duck, scaup, Canada goose, canvasback, bufflehead, mallard, goldeneye, and merganser.

The portion of the LWRA within the OBNWR is subject to certain regulatory powers that are vested in the FWS. The FWS is charged with the responsibility of protecting and managing wildlife and migratory bird populations within the refuge. Since certain human uses of the harbor complex can adversely affect these ecological resources, the Town of Oyster Bay and the FWS jointly signed a Memorandum of Understanding (MOU) in January 1969. The MOU establishes that fishing, swimming, boating, and other authorized recreational activities may be continued in accordance with the rules prescribed by the Town for related lands and waters under Town jurisdiction, provided that such use is regulated so as to avoid any interference with wildlife, to maintain the quality of the environment and the quality of outdoor recreation, and to preserve the natural beauty of the area.

The Village of Bayville has not entered into a separate, formal MOU with the FWS to address uses within the Village's 1,500-foot area of water surface jurisdiction. Inter-agency discussions are needed to resolve jurisdictional overlap issues of over-water regulation among the Village of Bayville, neighboring Villages, Town of Oyster Bay, and FWS.

## **7. New York State-designated Significant Coastal Fish and Wildlife Habitats**

The New York State Department of State has designated two areas within the LWRA as Significant Coastal Fish and Wildlife Habitats. These are: the Mill Neck Creek Wetlands, including the upper portions of Oak Neck Creek and surrounding tidal wetlands; and Oyster Bay Harbor, which comprises those portions of the harbor that lie outside the boundaries of the OBNWR. The Oyster Bay Harbor habitat area extends into the harbor from the eastern end of the Village of Bayville (i.e., south of West Harbor Drive). These areas are illustrated on [Figure 3](#).

The two New York State-designated habitat areas in the LWRA are described as follows, based on the habitat narratives prepared by the Department of State in 1987. These narratives are planned for updating in the future.

## **Mill Neck Creek Wetlands**

### **Location and Habitat Description**

Mill Neck Creek is a narrow coastal bay that empties into the western side of Oyster Bay Harbor, between Oak Neck and Mill Neck, in the Town of Oyster Bay, Nassau County. The fish and wildlife habitat consists of two wetland areas adjoining Mill Neck Creek, most of which is included in the Oyster Bay National Wildlife Refuge. The two areas are: an approximately 120-acre area northwest of Mill Neck Creek, referred to as Oak Neck Creek; and Beaver Lake, which is an approximately 60-acre freshwater body located south of Mill Neck Creek, outside the Bayville LWRA. Oak Neck Creek is composed of relatively undisturbed salt marsh and tidal creeks draining into Mill Neck Creek. Much of Oak Neck Creek is owned as undeveloped Nassau County parkland (Mill Neck Preserve), bordered by moderately dense residential development on the north and east sides, and by large estates and undeveloped woodlands to the west and south.

### **Fish and Wildlife Values**

The Mill Neck Creek Wetlands are an integral part of the Oyster Bay Harbor ecosystem, which is one of the several major embayments on Long Island Sound. Oak Neck Creek is one of the largest undeveloped salt marshes remaining on the north shore of Long Island. Oak Neck Creek and Beaver Lake are important as resting and feeding areas for Oyster Bay Harbor's wintering waterfowl populations. The Mill Neck Creek area supports regionally significant wintering waterfowl concentrations (November-March). Mid-winter aerial surveys of waterfowl abundance for the ten-year period between 1975 and 1984 indicate average concentrations of approximately 550 birds in this area each year (1,150 in a peak year), including approximately 310 black ducks (650 in a peak year) and 100 Canada geese (440 in a peak year), along with lesser numbers of mallard, scaup, canvasback, bufflehead, common goldeneye, American pigeon, mute swan, red-breasted merganser and oldsquaw. Waterfowl use of Oak Neck Creek and Beaver Lake during winter is influenced in part by the extent of ice cover each year. Concentrations of waterfowl also occur in these areas during the spring and fall migrations (October-November and March-April, respectively).

In addition to waterfowl use, many other fish and wildlife species inhabit the Mill Neck Creek Wetland habitat area. Wintering bald eagles (State-listed endangered species) have been reported using these wetlands on several occasions in recent years. This is one of the few areas on Long Island where eagles have been frequently sighted during mid-winter. These wetlands provide suitable nesting habitat for yellow-crowned and black-crowned night herons, green-backed heron, Canada goose, mallard, black duck, gadwall, fish crow, red-winged blackbird, sharp-tailed sparrow, and possibly least bittern (State-listed species of special concern). The area also is used for feeding by osprey, herons, egrets, shore birds and passerines. Oak Neck Creek serves as nursery and feeding habitat (generally between April and November) for

various marine fish species, such as scup, bluefish, Atlantic silversides, menhaden, winter flounder, and blackfish. This wetland also is important because it contributes organic matter and nutrients to New York State's most significant commercial oyster beds, located in Oyster Bay Harbor.

### **Impact Assessment**

Any activity that would substantially degrade the water quality in the Mill Neck Creek wetlands would affect the biological productivity of this area. All species of fish and wildlife would be adversely affected by water pollution, such as chemical contamination (including food chain effects), oil spills, excessive turbidity or sedimentation and waste disposal. Elimination of open water or wetland areas, through excavation or filling, would result in a direct loss of valuable habitat area. Alteration of tidal patterns in Oak Neck Creek could have major impacts on the fish and wildlife species present. Efforts should be made to maintain high water quality in this area, in order to protect the Oyster Bay Harbor shellfishery.

### **Oyster Bay Harbor**

Oyster Bay Harbor is located on the north shore of Long Island, between Mill Neck and Cove Neck, in the Town of Oyster Bay, Nassau County. The bay is approximately 2,500 acres in size. The fish and wildlife habitat consists of open water and wetland areas extending from the Bayville Bridge on the west to Plum Point on the east, excluding portions contained in the Oyster Bay National Wildlife Refuge (approximately 1,800 acres). Portions of this habitat that are in the National Wildlife refuge were not evaluated. These areas will be evaluated and considered for inclusion in the future.

Most of Oyster Bay Harbor ranges from 6 to 30 feet in depth below mean low water. The mean tidal fluctuation is approximately 7 feet. The bay is bordered by dense residential development and extensive recreational boating facilities with only a few areas of undeveloped salt marsh remaining.

### **Fish and Wildlife Values**

Oyster Bay Harbor is one of several major embayments on Long Island's north shore. This protected coastal bay is important to fish and wildlife throughout the year. Oyster Bay Harbor is the most important waterfowl wintering area (November-March) on the north shore. Mid-winter aerial surveys of waterfowl abundance for the ten year period between 1975 and 1984 indicate average concentrations of nearly 1,600 birds in the bay each year (6,380 in a peak year), including approximately 1,350 scaup (6,230 in a peak year), along with lesser numbers of mallard, Canada goose, common goldeneye, bufflehead, oldsquaw, and red-breasted merganser. Waterfowl use of the bay during the winter is influenced in part by the extent of ice cover each year. Concentrations of waterfowl also occur in Oyster Bay Harbor during spring and fall migrations (March-April and October-November, respectively).

In addition to waterfowl use, Oyster Bay Harbor is a highly productive area for marine finfish and shellfish. The harbor serves as a nursery and feeding area (generally between April and November) for striped bass, scup, summer flounder, blue fish, Atlantic silversides, menhaden, winter flounder, and blackfish. As a result of the abundant fisheries resources in the area, and its proximity to the metropolitan New York area, Oyster Bay Harbor receives heavy recreational fishing pressure, of regional significance. The harbor also is widely renowned as one of the most important oyster-producing areas in New York State.

Oysters are generally found in waters greater than 6 feet deep, with spawning occurring in early summer. Most of the underwater lands in Oyster Bay Harbor are certified for shellfishing and are leased for commercial harvesting (i.e., farming) of this resource. Some recreational collecting of oysters takes place in the area as well. Fiddler crabs, ribbed mussels, and hard clams also are abundant in the area. The hard clam populations provide a commercial and recreational harvest of county-level significance. Salt marsh areas and tidal flats surrounding Oyster Bay Harbor are important for maintaining the biological productivity of this ecosystem.

### **Impact Assessment**

Any activity that would substantially degrade the water quality in Oyster Bay Harbor would affect the biological productivity of this area. All species of fish and wildlife would be adversely affected by water pollution, such as chemical contamination (including food chain effects), oil spills, excessive turbidity or sedimentation, sewage discharges, and waste disposal. It is essential that high water quality be maintained in this area to protect the commercial shellfishery, through control of vessel waste discharges, sewage effluents and upland runoff. Excavation of new navigation channels should be minimized, and maintenance dredging activities should be scheduled in late fall or winter to minimize impacts on most aquatic organisms. Dredged materials should be deposited in upland containment areas. Thermal discharges, depending on the time of year, may have variable effects on use of the area by marine species and wintering waterfowl. Installation and operation of water intakes could have a significant impact on juvenile (and adult, in some cases) fish concentrations, through impingement or entrainment. Construction of shoreline structures, such as docks, piers, bulkheads or revetments, in areas not previously disturbed by development (i.e., natural beach or salt marsh), may result in the loss of productive areas which support fish and wildlife resources of Oyster Bay Harbor.

### **Regionally Important Natural Area**

The Long Island Sound Coastal Management Program (January 1999) identifies Oyster Bay/Cold Spring Harbor as one-of-thirteen regionally important natural areas (RINAs), formally known as *Outstanding Natural Coastal Area* or *ONCA*, along the Long Island Sound coast. This characterization identifies the harbor complex as an environmentally sensitive area where the state's priority is resource protection. The harbor area is a highly productive area for shellfish and is widely renowned as the most important oyster producing area in New York

State. With 85% of the complex open to shellfish harvesting, the Oyster Bay/Cold Spring Harbor RINA is home to the best water quality of all the north shore harbors and embayments.

The Department of State, in cooperation with the Department of Environmental Conservation; the U.S. Fish and Wildlife Service; Nassau and Suffolk Counties; the Towns of Oyster Bay and Huntington; the 14 villages surrounding the harbor complex; and, civic, business, and environmental groups, has prepared a draft natural resources management plan for the Oyster Bay-Cold Spring Harbor RINA watershed. The plan outlines short- and long-term protection and restoration strategies with site-specific recommended actions.

The entire harbor complex is an important wintering area for a variety of waterfowl. Oyster Bay Harbor is characterized by the state as the most important waterfowl wintering area on the north shore of Long Island, while Mill Neck Creek and Oak Neck Creek are noted as being regionally important. The vast wetlands in this area provide important habitat for a variety of nesting birds, including waterfowl. The entire harbor complex is also a highly productive area for marine finfish.

## **8. Flooding and Erosion**

### **Natural Protective Features and Man-Made Shoreline Conditions**

The LWRA includes shorefront property along both Long Island Sound and the Oyster Bay Harbor Complex. This discussion covers these two areas as separate and unique environments.

On the Sound-side of the Village, the shoreline is subject to the substantial wave action during severe storms, especially in the Oak Neck area. Consequently, this section of shoreline historically has been subject to active erosion, and has been hardened by an essentially continuous line of protective structures such as seawalls and groins, for a distance of about a mile from the western edge of the Village. Over the long term, the Long Island Sound shoreline of the Village also has been reshaped by long-shore currents, which carry coarse-grained sediments along the shoreline, in a generally eastward and westward direction away from the Oak Neck headland. As noted previously, this long-shore transport process was responsible for the creation of the tombolo that forms the low-lying, eastern end of the Village.

The eastern end of the Village's Long Island Sound shoreline either is unprotected, or is protected by natural or soft protective features such as artificial sand dunes, wetlands, grass-stabilized areas, and the like.

A well developed and continuous beach, varying in width to approximately 150 feet, which extends along the full length of the Long Island Sound shoreline, may be the most important natural protective feature in the Village. Although the beach itself is subject to erosion, it tends to buffer and absorb some of energy of waves and tidal currents that otherwise would tend to erode areas on the landward side of the beach.

On the south side of the Village of Bayville, the shoreline environment to the east of the Bayville Bridge benefits from natural protective features, such as tidal marshes and wetlands, and relatively shallow waters. These features limit the maximum height and damaging force of waves, thereby moderating shoreline erosion. Aside from the boat ramp at West Harbor Beach, there are no hardened features (e.g., bulkheads, revetments, and seawalls) along this entire stretch of Oyster Bay Harbor. West Harbor Drive has been raised above normal flood elevations and, therefore, may prevent the intrusion of seawater into the Village from the Harbor-side.

West of the Bayville Bridge along Mill Neck Creek, the Village's shoreline has been hardened by bulkheads and other structures associated with marina and oyster farming activities. Most of the private homes and lots that border on Mill Neck Creek in this area are subject to storm-related waves and currents, and the wave action generated by vessel wakes. Almost all of these residential properties have been reinforced and hardened in one way or another by the individual homeowners, which has abated erosion. Further to the west, in the Oak Neck Creek area, the shoreline is protected and buffered by natural tidal marsh grasses and other vegetation, and is not subject to significant erosion.

### **Flood-Prone Areas**

The Village of Bayville includes areas that have been designated by the Federal Emergency Management Agency (FEMA) as susceptible to potential flood damage. Coastal flooding in this area can be caused by a variety of different meteorological events, such as extreme waves and flood surges from Long Island Sound generated by northeast storms ("nor'easters"), from storm surges in Oyster Bay Harbor, and from heavy rains.

FEMA has prepared Flood Insurance Rate Maps (FIRMS) to delineate areas that are flood-prone. FEMA has classified flood zones into several general categories, based on the degree of susceptibility to potential flood damage. Three general flood zones define the limit of the 100-year flood within the Village of Bayville (where the 100-year flood has a probability of occurring once in every 100 years, on average, or a one percent probability in any given year; the one percent flood is projected to become more frequent in the future due to rising sea level), as summarized below:

**Zone VE:** encompasses the land area that would be inundated by water to a specified depth (termed the "base flood elevation") and would be subject to breaking waves of three feet or greater in height during the 100-year storm.

**Zone AE:** encompasses the land area that would be inundated by water to a specified depth (i.e., the base flood elevation) during the 100-year storm, but would not be subject to significant wave action.

**Zone X (shaded):** encompasses the land area between the limits of 100-year flood and 500-year flood, and certain areas subject to 100-year flooding with average depth less than one foot, or where the contributing drainage area is less than one square mile.

**Zone X (unshaded):** encompasses the land area that is subject to minimal flooding only.

Figure 3 depicts the portions of the LWRA that lie within the 100-year flood plain (i.e., Zones VE and AE). In general, Zone VE in the Village occurs as narrow bands along the shoreline in areas that are exposed to open waters; primarily on Long Island Sound, but also at the north end of Oyster Bay Harbor. Zone AE typically is found in the low lying areas landward of Zone VE. Small areas of land in Zone X (shaded) are present in the LWRA. Most of the upland area in the Village lies outside the limits of the 500-year flood plain, in Zone X (unshaded).

Base flood elevations along the Village's shoreline range from 17 feet on the Long Island Sound frontage, to 15 feet directly along the shoreline on Oyster Bay Harbor, and 12 feet in the Mill Neck/Oak Neck Creek areas.

There are several areas in Bayville that are subject to flooding as a result of rainfall/runoff events. These are low lying areas, some with unique topographic configurations that tend to inhibit natural drainage or otherwise cause water to be retained on the land surface. Some flood prone areas are caused by flaws in the stormwater drainage systems.

The Village of Bayville completed a "Floodplain Management and Hazard Mitigation Plan" in December 1998, which was prepared under a grant from the New York State Emergency Management Office (SEMO) pursuant to the guidelines of the federal National Flood Insurance Program (NFIP). The following is a summary of relevant information taken from that report.

The primary objective of the plan is to identify measures that can be taken to reduce flood losses, thereby reducing the cost of flood insurance to the municipal government and private property owners in the Village. The plan also satisfies the requirements and standards of the Community Rating System (CRS), as provided under the NFIP, to earn credit points under that system to effect a reduction in flood insurance costs for homeowners and businesses in Bayville.

The plan was developed through the efforts of the Floodplain Management Task Force, which was comprised of local officials, representatives from SEMO, and professional planners and engineers. The Task Force coordinated with other agencies having jurisdiction or interest in floodplain management planning in the Village of Bayville, including the U.S. Army Corps of Engineers, U.S. Geological Service, New York State Office of Parks, Recreation and Historic Preservation, Division of Coastal Resources in the New York State Department of State, New York State Department of Environmental Conservation, New York State Department of Transportation, Sea Grant Extension Program, Nassau County Soil and Water Conservation Service, Nassau County Emergency Management Office, Nassau County

Department of Public Works, and Nassau County Division of Data Processing (for Geographic Information System mapping).

The plan characterizes the causes of flooding problems in the Village, and identifies factors that exacerbate the severity of flooding. Areas of frequent flooding are identified as follows: "president streets" area (i.e., Washington, Adams, Jefferson, Madison), directly to the west of the Bayville Bridge; Bay Beach and Bayville Avenue, east end (Ludlam/Bayville Avenue and Sound Beach drainage areas); Bayville Avenue, west end and Tides Motel; Bayville Park Boulevard, south of Bayville Avenue; Hickory Road area; and Washington/Shore Road on Mill Neck Bay. Flooding in these areas causes water to enter basements on low-lying properties, standing water that limits the movement of emergency vehicles along emergency thoroughfares, and frequently prevents residents from reaching their homes.

Flood insurance policies are in effect for more than 700 homes in the Village, with a total insured value of \$89 million. More than 80 properties were found to have submitted significant claims in the floodplain, totaling over \$7.6 million. Most of these claims were submitted for damages incurred during 11 storms, primarily "nor'easters", between 1978 and 1996. Flooding from these storms mostly have resulted from inundation of coastal waters from Long Island Sound, although high tides in Mill Neck Creek and Oyster Bay Harbor also are significant contributors to flooding.

The goals of the plan, as developed during a September 1998 meeting of the Task Force, included: provide "flood-free" roadways, to allow the passage of vehicles during frequent flooding and the passage of emergency vehicles during severe storms; improve the stormwater drainage system, through proper maintenance and capital projects, to increase the effectiveness and efficiency of this system; reduce frequent local flooding by providing additional subsurface storage capacity; provide for increased property protection; provide for coastal flood protection and erosion control; reduce flood insurance premiums; provide flood awareness and emergency planning; improve accuracy of flood information; and limit development in the floodplain and retain undeveloped areas for the siting of flood control measures, through ongoing acquisition of open spaces.

Based on the goals enumerated above, and the inventory and analysis of existing conditions and historical flooding patterns, the Task Force formulated a series of recommendations for directly reducing flooding and high surface water levels in flood-prone areas in the Village. The recommendations also include measures to improve the Village's CRS ranking score, so as to effect a reduction in flood insurance premiums for Village homeowners and businesses. Those recommendations that have not already been implemented, and which are still considered feasible and desirable, are described in Section 2.3.10.A of this LWRP.

## **Erosion Hazard Areas**

The Village of Bayville has 2.6 miles of shoreline on Long Island Sound which is in a Coastal Erosion Hazard Area (CEHA), as designated by the New York State Department of Environmental Conservation pursuant to the Coastal Erosion Hazard Areas Act of 1981 (Article 34 of the Environmental Conservation Law). In 1992, pursuant to the powers granted under Part 505, the Village adopted a local coastal erosion management law. The Village's law (Chapter 20, Coastal Erosion Hazard Area) is more restrictive than the minimum requirements established in Part 505 of the State Code, and has expanded the regulated area to include the Village's harbor-side shoreline.

The State-designated CEHA map is based on the presence of natural protective features, which includes nearshore areas, beaches, dunes and bluffs. The Village expanded the regulated area to include its southerly shoreline, as delineated on a "Supplementary Map of Erosion Control Areas on the Bay Shorefront" adopted by the Village at the time the local law was enacted in 1992. This bay-side erosion hazard area, which is depicted on [Figure 3](#) in this LWRP, comprises a 50-foot wide zone extending landward from the mean high water line, but not beyond the ten-foot elevation contour or beyond building structures or improved rights-of-way. In June 1999, NYSDEC's Bureau of Flood Protection issued a written statement which found "the Village to be properly administering and enforcing the Village's Local Coastal Erosion Management Program" and concluded that no further action was needed by the Village at this time with regard to this program.

## **9. Scenic Resources**

One of the most valuable natural resources available to the residents in the Village of Bayville is the beautiful scenic views of the surrounding environment. Almost all of the Village's boundaries continuously abut surface waters - Long Island Sound to the north, and Mill Neck/Oak Neck Creek and Oyster Bay Harbor to the south.

From the Village's southern shore, east of the Bayville Bridge, the expanse of Oyster Bay Harbor in its beautiful natural setting can be viewed, as well as the historic Bayville Bridge to the west. This striking view of open waters, bordered by wetlands and dotted with boats during the warmer months, is accessible from various locations, including the Village-owned West Harbor Memorial Beach.

Vistas of Mill Neck Creek wetlands, as well as the Village's Creek Beach, can be seen from the Village's southern shore, west of the Bayville Bridge. The expansive marshes in Nassau County's Mill Neck Preserve, with its abundant avian population, can be viewed at the western end of Oak Neck Creek.

From the Bayville Bridge, looking west, one can see a picturesque view of the F.M. Flower and Sons shellfish facility, with clam boats nearby, and various boats moored in the Creek. The wetlands and open spaces, both to the east and west of the bridge, provide interesting vistas.

From the northern shore of Bayville, which includes the Village's Soundside Beach, the Town's Ransom Beach, and several waterfront restaurants within the Village, one can view the open waters of Long Island Sound.

Perhaps the most important scenic resource on the inland portion of the Village is Harrison Woods, where residents can walk the paths and enjoy the flora and fauna of the area. Other points of visual interest are the older/architecturally-appealing structures and sites throughout the Village.

## **C. Land and Water Uses and Zoning**

### **1. Existing Land Use**

The Long Island Sound Coastal Management Program (January 1999) identifies the Village of Bayville as a focal point for commercial, recreational, and cultural activities within the region, and as a community which historically has contained concentrations of water-dependent businesses. As shown on [Figure 2](#), this variety of land uses remain in the Village of Bayville, including residential, commercial, recreational and undeveloped open spaces. This discussion presents issues and problems relating to land and water uses in the Village, along: (1) Long Island Sound, and (2) Oyster Bay Harbor and Mill Neck/Oak Neck Creek.

#### **Long Island Sound**

The beach along the northern shore of Bayville is one of the major assets of the community. There are public beaches, as well as a number of beaches with access restricted to nearby residents. This is an excellent swimming area, and an attractive location for walking and viewing the Sound. This view from the beach is highly valued by the community.

At one time, a ferry landing was located to the north of the current Bayville Bridge site. However, there are no boating facilities in this area at the present time, aside from some scattered moorings. Although a number of the most notable restaurants in Bayville overlook the Sound, this area is mainly developed for residential uses, and there is very little undeveloped or open area on the north side of Bayville. The beach serves as a partial buffer to waves and storm surges from the Sound. Seawalls and groins have been constructed along parts of this shoreline, especially at the western end of the Village, to harden the shoreline and protect individual homes and lots.

Some of the specific issues and conflicts that are known to this area include:

- conflicting approaches to erosion control;
- questions of access and use of the beaches;
- potential problems deriving from existing and potential stormwater discharges from Bayville into the Sound;
- potential problems arising from the use of on-lot septic systems for servicing large commercial establishments near the beach; and
- the interest in some quarters in the creation of barriers to flooding from the direction of the Sound and conflicts that probably would arise because of lost views and limitations on access.

### **Oyster Bay Harbor and Mill Neck/Oak Neck Creek**

The shoreline on the south side of Bayville includes Oyster Bay Harbor in the area to the east of the Bayville Bridge, and the Mill Neck/Oak Neck Creek system in the area to the west of the bridge. The low-lying area bordering Oyster Bay Harbor has a relatively open and uncongested shoreline, which is characterized by extensive tidal wetlands and the artificial fill that underlies West Harbor Beach. Most of the storm drainage in this area seeps into the ground and, therefore, does not discharge to the surface waters directly. Some overflow from existing storm drains may occur during heavy rainfall events and direct discharges may occur from paved surfaces.

The shoreline of Mill Neck Creek is developed for commercial uses near the Bayville Bridge, and for residential uses and very limited marina and boating uses elsewhere. The upland area adjacent to Oak Neck Creek is mainly undeveloped open space.

Issues and conflicts between competing uses that may exist in this part of the LWRA include:

- known discharges from failing on-lot sanitary systems (e.g., The Birches subdivision);
- stormwater drainage from the Adams Avenue stormwater outfall;
- stormwater drainage and suspected sanitary waste discharges from other adjacent residential areas surrounding Oak Neck Creek;
- potential impacts caused by inadequately treated wastewater discharges from commercial uses at the head of Oak Neck Creek;
- mooring field "creep", into areas that previously have not been occupied by moorings, caused by an increased number of boats vying for limited space in the harbor;
- local shoreline erosion;
- flooding from the direction of Oyster Bay Harbor and Mill Neck Creek;
- encroachments into bordering tidal marshes due to land development; and
- potential impacts caused by freshwater discharges into this area from the watersheds to the south, outside the Bayville LWRA, particularly through the Beaver Lake system at the south end of Mill Neck Creek.

## **Water-Dependent and Water-Enhanced Uses**

Water-dependent uses contribute significantly to the economic vitality and public enjoyment of the coastal zone. A water-dependent use is an activity that requires a location on, in, or adjacent to the water because such activity requires direct access to the water body and which involves, as an integral part of the activity, the use of water in order to function or exist. A water-enhanced use does not require a waterside location, but derives a benefit from being situated on the water which the public can enjoy. Restaurants are a good example of a water-enhanced use, because the public can enjoy vistas of the waterfront area while dining.

Water-dependent (WD) and water-enhanced (WE) uses are major contributors to the Bayville economy and to the quality of life of the community. Examples of these two types of uses are listed as follows:

- Beaches (WD)
- Marinas (WD)
- Moorings and docks (WD)
- Boat and canoe/kayak rentals (WD)
- Aquaculture and commercial fishing facilities (WD)
- Restaurants (WE)

For boaters, there is a public marina at Creek Beach. A privately-owned commercial facility, the Bridge Marina, is located on Village-owned land just west of the Bayville Bridge. There also are four docks: one at Creek Beach, one at West Harbor Beach, and two at the Bridge Marina. The two public boat mooring areas are at Creek Beach and West Harbor Beach. The Bridge Marina also has its own boat mooring area. Swimming beaches include West Harbor, Soundside, and Ransom. For boat maintenance there is the Bridge Marina, and Twin Harbor Marine on Ludlam Avenue near Bayville Avenue. The facilities of the Flower Oyster Company are another important water-dependent use that is located within the LWRA.

## **2. Surface Water Uses**

There are a wide variety of surface water uses in Bayville LWRA, most of which have been discussed in other parts of this text. The following is a listing of the principal uses of the surface waters surrounding the Village, illustrated on [Figure 2](#).

## **Marinas**

There are two marinas in the Village: the privately-owned Bridge Marina, which is located on Village-owned land immediately to the west of the Bayville Bridge; and Creek Beach Marina, which is a public facility in Mill Neck Creek.

## **Mooring, Anchorage Areas and Boat Rentals**

The Village of Bayville has two designated mooring areas in its waters, neither of which is organized into a grid. The mooring area at Creek Beach is located to the west of the Bayville Bridge, in Mill Neck Creek. The West Harbor Beach mooring area is located at the north end of Oyster Bay Harbor. Access to the mooring areas is gained through the parking lots at the two beaches, with dinghies or rafts stored at those locations for over-water transport.

Small fishing boats, kayaks and canoes can be rented at the Bridge Marina.

## **Shellfish Farming**

The Frank M. Flower and Sons, Inc. nursery and office facilities are located on Mill Neck Creek, to the west of the Bayville Bridge.

## **Swimming**

Public swimming beaches in the Village of Bayville include West Harbor, Soundside, and Ransom Beaches.

All roads leading to Long Island Sound within the Village of Bayville are private, except for Merrit Lane which is owned by the Village. Since the use of these private roads is restricted to local residents, the beaches at the ends of these roads are not readily accessible to the public. Therefore, these road-end beaches effectively function as private beaches, although no formal beach associations control these locations.

## **Fishing**

Shorefront fishing is available from all of the swimming beaches in the Village, as well as Creek Beach. Additionally, fishing access is available at the Village-owned land located at the end of Merrit Lane.

### **3. Zoning**

Chapter 80 (Zoning) of the Code of the Village of Bayville regulates land uses and the construction of all property improvements in the Village. The original zoning law, enacted in 1937, allowed high residential densities because the Village functioned largely as a summer

colony at that time, with bungalows crowded along and near the waterfront. Subsequently, the residential character of the community changed to year-round occupancy, increasing the demands on resources and infrastructure. In response to this dramatic alteration in the overall character of land use in the Village, the “Comprehensive Plan for Development and Zoning Improvements for the Incorporated Village of Bayville, New York, for the Prevention of Harm to its Surrounding Surface Water Groundwater Resources and the Public’s Environment” was issued in September 1985.

The Comprehensive Plan identified a number of conditions associated with overly-dense development which contribute to environmental degradation and detract from the quality of life in the Village. These conditions include: the intensified demand that an increased population places on public services, particularly Village services and the drinking water system; increase in the Village’s overall susceptibility to flood damage, due to further construction in the flood plain; potential degradation of the quality of adjacent coastal waters, caused by the construction of additional on-lot sanitary systems which would increase the incidence of sewage overflows in times of flooding and higher groundwater levels; adverse effects on groundwater quantity and quality due to increased pumpage and increased development; potential impairments to important natural resources, including wetlands and shellfish beds; and magnified fire hazard associated with increased development density.

During the analysis phase of the Comprehensive Plan, it was determined that the residential land use density in many areas of the Village was much less than was permitted under the zoning law that was in place at that time. This, combined with the fact that the Village already was experiencing certain problems under existing development densities, as enumerated above, raised substantial concern regarding the likelihood that these problems would be exacerbated if significant new development occurred in the Village. Consequently, the Comprehensive Plan concluded that a decrease in the allowable development density was necessary, with the maximum generally being the existing (1985) density, but with the allowable density actually decreased below existing levels in special problem areas.

In response to the issues highlighted above, the Village Board incorporated the following amendments into the zoning law: minimum lot sizes were increased for new construction; the commercially-zoned strip along Bayville Avenue, extending a distance of 100 feet on either side, was changed to residential zoning; and any existing nonconforming, commercial establishment in a residential district that is not actively used for commercial purposes for any period of ten consecutive months loses its legal non-conforming status, such that uses established thereafter are required to be in full conformance with the current residential zoning. These changes have helped the Village retain its character as a quiet, residential community, with complimentary water-related activities. Presently, the Village is almost completely developed, and is making efforts to maintain the land use character in the community that initially attracted its residents.

The existing zoning in the Village is shown on [Figure 6](#).

## **Other Land Development Controls**

### **Village Controls**

A number of other chapters of the Village Code also regulate land use, directly or indirectly. Direct regulations are those that specifically control construction or alterations of structures or property. Indirect regulations are those which control the use of structures and property.

#### **Direct Regulations**

- Chapter 12 (Building Construction) regulates construction under the New York State Building Code.
- Chapter 13 (Building Construction Administration) regulates the construction, alteration, repair, and removal and demolition of buildings and structures.
- Chapter 20 (Coastal Erosion Hazard Area) regulates use and development in areas that are subject to coastal flooding and erosion. This serves to protect human life, natural resources, structures, and erosion protection facilities. This law prohibits development in erosion-prone nearshore areas, controls any excavation or filling that would diminish erosion protection, prevents steepening of slopes, prohibits use of motorized vehicles in the regulated area, and regulates erosion protection structures.
- Chapter 27 (Flood Damage Protection) regulates property uses in the flood plain. This includes requirements that the lowest floor in new or substantially modified structures located in flood-prone areas be raised above the base flood elevation. This law also controls such matters as the proper design of structures to withstand flood hazards (with stricter standards applying to structures in Zone VE, due to the potential for wave impact damage), alteration of flood plains, and construction of flood barriers.
- Chapter 61 (Sewage Disposal Systems, Individual) regulates the construction of individual sewage disposal systems, and requires provision for stormwater disposal.
- Chapter 66 (Subdivision of Land) regulates the subdivision of land in conformance with the Village's Comprehensive Plan for Development and Zoning Improvements and other applicable laws and regulations.

#### **Indirect Regulations**

- Chapter 7 (Beaches) regulates the use of beaches, including swimming, fishing, parking, boating, and hours of operation.
- Chapter 9 (Boats and Docks) regulates moorings, hazards to navigation, boat operation, time of use, vessel sanitation, commercial vessels, and excursion boats.

- Chapter 24 (Environmental Conservation Commission) established an Environmental Conservation Commission to advise the Village Board, the Zoning Board of Appeals, and other Village Boards and Commissions on matters affecting preservation, development, and use of natural and man-made features and conditions relating to the environment.
- Chapter 24A (Environmental Quality Review) carries out the requirements of the New York State Environmental Quality Review Act (SEQRA) for the Village.

### **Land Development Controls by Other Agencies**

- The U.S. Army Corps of Engineers (Corps) has responsibilities for coastal erosion and flood control.
- The Corps regulates all waters of the United States, including most freshwater wetlands within the State.
- The New York State Department of Environmental Conservation's responsibilities include administration of the permit program for activities undertaken within or adjacent to tidal wetlands, administration of the permit program for wastewater discharges (known as the State Pollution Discharge Elimination System, or SPDES), regulation of hazardous materials and spill cleanup oversight, and coastal erosion control.
- The New York State Department of State is responsible for implementing the State's Coastal Management Program, mitigating coastal erosion and flooding, and overseeing local waterfront development.
- The New York State Emergency Management Office is responsible for flood management and flood hazard mitigation.
- The Nassau County Department of Health has jurisdiction over approval of subdivisions of more than five houses and individual on-site sewage disposal systems, regulates hazardous material storage (including container storage areas, and underground and aboveground tanks) through a permit system that applies to all facilities that exceed certain volume storage thresholds, and is an involved agency during hazardous substance spills in the coastal waters of the LWRA.
- The Nassau County Department of Public Works is charged with the responsibility of maintaining West Shore Road and the Bayville Bridge, which provide a vital transportation link to the Village of Bayville.

## **Water Surface Controls**

### **Village Controls**

- Chapter 7 (Beaches) regulates the use of beaches, including swimming, fishing, boating, and hours of operation.
- Chapter 9 (Boats and Docks) regulates moorings, hazards to navigation, boat operation, time of use, vessel sanitation, commercial vessels, and excursion boats.

### **Water Surface Controls by Other Agencies**

- The U.S. Army Corps of Engineers exercises regulatory authority over actions undertaken within the waters of the United States (e.g., dredging, and the placement of fill and structures such as docks and bulkheads); permits generally are required for such actions.
- The U.S. Department of the Interior, Fish and Wildlife Service, administers the Oyster Bay National Wildlife Refuge; permits are required for most activities in the refuge.
- The United States Environmental Protection Agency has jurisdiction over all wastewater and stormwater discharges to surface waters; permits are required for such discharges.
- The United States Coast Guard has jurisdiction over the cleanup of any water quality accidents which occur in offshore surface waters.
- The New York State Department of State is responsible for implementing the New York State Coastal Management Program, including waterfront revitalization and harbor management; and, using the consistency review process to examine projects and activities of federal agencies for compliance with the State's Coastal Management Program and with approved Local Waterfront Revitalization Programs.
- The New York State Department of Environmental Conservation has wide ranging responsibilities, including: the implementation and enforcement of the provisions of the National Shellfish Sanitation Program, to ensure that harvested shellfish resources are safe for human consumption; administration of the permit program for activities undertaken within or adjacent to tidal wetlands; administration of the permit program for the SPDES program, relating to discharges to surface waters; and regulation of hazardous materials and spill cleanup oversight, including those that occur in coastal waters.
- The New York State Office of General Services is the administrator of the Public Trust, pursuant to the Public Lands Law.

- The New York State Emergency Management Office has responsibilities for flood control and hazard mitigation.
- The Nassau County Department of Health regulates the waters at public beaches, surface water pollution, and cleanup of water quality accidents.
- The Town of Oyster Bay enforces vessel activity and other water use regulations in Village waters, and shellfish harvesting requirements on Town-owned underwater lands.

Each incorporated Village in the State of New York, pursuant to Section 46-a of the New York State Navigation Law, has the authority to regulate the over-water uses of vessels up to 1,500 feet from the shore. In some locations, the 1,500-foot area of jurisdiction for the Villages of Lattingtown, Mill Neck Creek, and Centre Island overlap the boundaries of the Village of Bayville's 1,500-foot area of jurisdiction. The Village's corporate boundary generally follows along the mean high water line on the foreshore. However, this boundary extends offshore a distance of approximately 300 feet into Mill Neck Creek in the vicinity of Creek Road. Additionally, the Village boundary lies offshore in Oak Neck Creek. The Village has full regulatory jurisdiction under the Village Code within the water areas delineated by this boundary, similar to what applies to the upland area.

The Town of Oyster Bay holds proprietary rights over Town-owned underwater lands within Oyster Bay Harbor, including those that lie adjacent to the Village of Bayville. Therefore, the Village of Bayville will be coordinating its LWRP with these three Villages and with the Town of Oyster Bay.

In addition, since most activities within the Oyster Bay National Wildlife Refuge - which includes portions of Oak Neck Creek, Mill Neck Creek, Mill Neck Bay, and Oyster Bay Harbor - are regulated by the U.S. Department of the Interior, Fish and Wildlife Service, the Village also will coordinate activities with that agency.

#### **4. Public Access and Recreation**

##### **Public Trust Doctrine and Underwater Land Ownership**

###### **Public Trust Doctrine**

When New York attained Statehood, it succeeded the King of England in ownership of all lands not already granted away, including all rights and title to the navigable waters and the soil under them. The State owns title to the vast stretches of foreshore and submerged lands along Long Island Sound, and all underwater lands not otherwise conveyed by patents or grants. The State holds title to these tidelands and submerged lands in its sovereign capacity in trust for the use and enjoyment of the public, under the Public Trust Doctrine. The New York State Office of General Services is the administrator of the Public Trust, pursuant to the Public Lands Law.

Public trust lands means those lands below navigable waters, with the upper boundary normally being the mean high water line. Public trust lands, waters, and living resources are held in trust by the State (or by the trustees of the individual towns) for the people to use for walking, fishing, commerce, navigation, and other recognized uses of public trust lands. When the foreshore is covered by tides the public may use the water covering the foreshore and underwater lands for boating, bathing, fishing, recreation and other lawful purposes. When the tide is out the public may pass over the foreshore as a means of access to reach the water for these purposes, may travel along the foreshore, and may lounge and recline on foreshore lands, provided that such activity does not cause impairment of habitat areas.

State title to the public foreshore and submerged lands, and the power of disposition, is incident and part of its sovereignty which cannot be surrendered, alienated, or delegated, except for some public purpose or some reasonable use for the public benefit, and without impairing public rights in the remaining lands and water. Inherent in the nature of public trust lands is that they support diversified and important ecosystems without which many public rights, including fishing, swimming and the like, would be impossible to enjoy. The public interest demands the preservation and conservation of this vital natural resources against pollution, overuse, destruction and infringement by others, whether public or private.

It is in the public interest that State, Town and other governmental ownership of public trust lands be maintained and when possible, recovered from private ownership. Where full public ownership no longer exists, the application of the Public Trust Doctrine requires that any remaining rights of the public to use such lands should be preserved and protected for present and future enjoyment.

Occupation of public trust lands by littoral and riparian owners for purposes of gaining access to navigable waters should be undertaken in a reasonable manner which does not unnecessarily interfere with the public's right of passage upon and use of the waters overlying such lands, and other public trust purposes. Considerations of public safety, resource protection and the need for access at a given location may be utilized as factors in determining the level and types of access to be provided. Public use of publicly-owned foreshore and underwater lands, and lands immediately adjacent to the shore shall be discouraged only where such use would be inappropriate for reasons of public safety, military security, or the protection of coastal resources.

Physical access to trust lands often is hindered by natural features, development conditions, or land ownership patterns along the shoreline. The presence of high bluffs, for example, will effectively block land-side access to the adjacent beach. In some areas, the intertidal portion of trust lands have been entirely eliminated, as has occurred where bulkheads extend into the littoral zone. In some cases where public lands are present at the shore front, perpendicular access to trust lands is limited by residency restrictions, such as are typically applied to municipally-owned parklands. In other areas, lateral access along the public foreshore is obstructed by docks, groins, and similar structures.

## **Underwater Land Ownership**

The land and title to all common lands and land beneath creeks, streams, harbors, and bays in the Nassau County portion of the Oyster Bay/Cold Spring Harbor Complex were originally conveyed to the Town of Oyster Bay through the Andross Patent in 1677. Chapter 157 of the New York Laws of 1920 confirmed the Town's ownership of all common lands in the Town, and placed these lands under the authority and control of the Oyster Bay Town Board.

In 1968, the ownership of more than 3,000 acres of underwater land in the Oyster Bay/Cold Spring Harbor Complex, 17 acres at Mill Pond and vicinity (in Oyster Bay hamlet), and 90 acres at Frost Creek (adjacent to Stehli Beach) were transferred to the U.S. Department of Interior (administered by the U.S. Fish and Wildlife Service) for the establishment of the Oyster Bay National Wildlife Refuge. The Refuge includes areas within the Bayville LWRA, such as Mill Neck Creek and Oak Neck Creek, and the northwestern corner of Oyster Bay Harbor (just east of the Bayville Bridge). The Town has retained ownership of all lands outside the Refuge that were originally in its ownership.

Over the years, the Town has issued underwater land leases for shellfish aquiculture and harvesting in Oyster Bay Harbor and Mill Neck Creek. Presently 1,830 acres throughout the harbor complex are leased to Frank M. Flower and Son Company, including areas within the Bayville LWRA.

Many of the Town-issued leases exist on bottom lands that are owned by the U.S. Fish and Wildlife Service as part of the OBNWR. When the Town of Oyster Bay conveyed these lands to the federal government, the conveyance was subject to, and the Town retained authority over:

- Existing leases and agreements, including leases for piers and shellfish, and renewals of leases and agreements covering the same; and
- Permits for the taking of shellfish and other products, and the right to fix and receive revenue for such agreements.

These leases, agreements, permits, and renewals, were to continue in perpetuity, provided that they were compatible with the use of these lands as a wildlife refuge.

The Village of Bayville owns approximately 12 acres of underwater land on the north side of Mill Neck Creek, extending about 300 feet offshore and along 1,800 feet of Village shoreline. This area is excluded from the OBNWR.

The State of New York owns all of the underwater land from the mean high water line out to the New York-Connecticut line, on the Long Island Sound side of the LWRA. The Office of

General Services is the State of New York's administrator for the Long Island Sound underwater, from mean high water to the Connecticut-New York line.

### **Village Recreational Resources**

Residents enjoy much public access to the natural resources of Bayville. Soundside Beach on Long Island Sound is easily accessible for swimming, picnicking, and fishing. At West Harbor Beach, on Oyster Bay Harbor, there is swimming, boat launching, fishing, tennis, bocci, and a ballfield. Boating facilities with associated moorings, and a comfort station, are available to residents at Creek Beach on Mill Neck Creek. There also are privately owned boating facilities with associated moorings in the LWRA.

Harrison Williams Woods provides public access for walking and enjoying the natural setting of this forever-wild preserve that is widely used by the community. This 16-acre, Village-owned parkland represents the natural upland ecology of the area, and has been extensively inventoried and is actively maintained on a voluntary basis by community groups. The Bayville Garden Club has identified the major plants in the Woods, and the Boy Scouts have marked the trail system. The trails on the site have been damaged by trail bikes, which has diminished the attractiveness of the facility for other users. The Village regards the Woods as a critical recreational resource, and recognizes that the maintenance of the vegetative communities on this site is important for preserving one of the few remaining areas of the Village's natural vegetative setting.

Other Village-owned recreational facilities are: the Community Center (where Senior Citizens and teen groups have social meetings); basketball and volley ball courts near the Community Center; the ice skating rink behind the Village Hall; Bayville Commons, a public open space at the intersection of Ludlum Avenue and Bayville Road; and the woodlands and wetlands on the former Schmitt property.

### **Town Recreational Resources**

The public has access to four Town of Oyster Bay Beaches within the Village of Bayville and vicinity: Ransom Beach in Bayville on Long Island Sound, at the west end of the Village; Stehli Beach west also on the Sound, just west of the Village line; and Centre Island Beach, including frontage on both the Sound and Oyster Bay Harbor, just east of the Village Line. Stehli Beach and both of the Centre Island Beaches are in unincorporated areas of the Town of Oyster Bay.

### **Federal Recreational Resources**

The Oyster Bay National Wildlife Refuge (OBNWR), which encompasses portions of Oyster Bay Harbor, Mill Neck Creek and Oak Neck Creek, is accessible via the water, by boat. From Bayville, boats can be launched from Creek Beach or West Harbor Beach, or from the

commercial Bridge Marina facility. The OBNWR is one of the most actively used water-side recreational facilities in the Village. The recent addition of kayak and canoe rental and instructional facilities at the Bridge Marina provides ready access to the sheltered waters and wetlands of the Mill Neck/Oak Neck Creek area. This opens additional opportunities for bird watchers and other naturalists in an area with an abundant wildlife populations, including occasional sightings of rare avian species like the osprey and the bald eagle. As indicated previously, there are beautiful views of the Refuge from Village Beaches and from other locations on the Harbor-side shoreline.

### **Private Recreational Resources**

The LWRA contains a number of beaches that are accessible only to local homeowners via private roads, some of which are owned by associations or developments. These are described in Section 2.3.2.

Across Bayville Avenue from Ransom Beach, there are a string of small restaurants and an amusement park facing the water, as well as a large restaurant immediately east of the beach with a panoramic view of the Sound, and another large restaurant with panoramic views near the Soundside Beach, which are open to the public.

## **5. Cultural Resources**

### **Local History**

Bayville has had a long and interesting history. Highlights of this history are summarized below.

Shellfish harvesting started with the Matinecock Indians, who were the earliest inhabitants of the area that is now Bayville. This important use of local marine resources has continued to this day, through the activities of Frank M. Flower and Sons, Inc. (founded in 1887), independent baymen, and local residents. A detailed history of shellfishing in Bayville can be found in the Bayville Historical Museum, located in the Village Complex on School Street.

Asparagus farming was a thriving industry in Bayville from 1825 to 1900, as is also documented by memorabilia in the Bayville Historical Museum.

As families settled in the Bayville area, there was a need to establish facilities to educate their children. To satisfy that need, the first school, a one-room, wood-frame schoolhouse, was built in 1851. As the local population grew, a second school building, containing two classrooms, was constructed in 1895 on School Street. In 1931, a third school was built on Mountain Avenue, which was followed by the construction of a Primary School in 1961. There now are two public schools in Bayville, an Intermediate School and the Primary School, both on Godfrey Avenue, south of the Village Hall.

The Bayville Bridge is historically important, since it greatly enhanced roadway access to Bayville. As noted previously, the original land-side access to Bayville was from the west, via a circuitous route that passes through Locust Valley, Lattingtown and Glen Cove. In 1898, the first drawbridge constructed of wood was erected to connect Bayville to Mill Neck, thereby providing a shorter access route to the south via Oyster Bay hamlet. In 1904, an iron truss bridge was installed. A third bridge was built in 1922, and a fourth bridge in 1938. In 1991, the bridge was completely reconstructed.

The first Bayville Library was established in a candy store at Merrit Lane and Bayville Avenue in 1903. The library was moved to a home on Library Lane in 1908, and then to its present location on School Street in 1956.

There are two historic churches in Bayville. The Old Village Church was built in 1859 on Bayville Avenue and Merrit Lane. The Old Village Church structure is still standing, but currently is a private residence. In 1909, St. Gertrude's Roman Catholic Church was erected on the corner of School Street and Bayville Avenue.

Other sites of local historic importance include: the Bayville Cemetery, which was established in 1860; and the building that housed the first telephone in the 1890s, which at that time was the O.H. Perry General Store.

At one time, a number of ferries and passenger boats operated on the Long Island Sound side, carrying passengers between Bayville and various destinations. From the Ferry Landing dock at Reinhart's Beach, which operated from 1920 to 1937, one could travel by ferry to Rye, New York, and Stamford, Connecticut. Around the late 1800s, residents could commute by boat to New York City from the Oak Neck Steamboat Wharf at the end of Madison Avenue. Between 1906 and 1915, a water taxi landing was present in the vicinity of the northerly end of the Bayville Bridge, with service to the Oyster Bay Railroad Station. In addition to these facilities, the Godfrey Dock, a privately-owned pier, was constructed on Mill Neck Creek in the 1890s.

The first Bayville Post Office was constructed in 1877 at the present location of St. Gertrude Roman Catholic Church. The Post Office later was relocated to its present site on Bayville Avenue, near Ludlum Road.

The Bayville Police Department was established in 1920 on Perry Avenue. However, in 1962 the Village force was disbanded, and its responsibilities were transferred to Nassau County. Presently, there is a small police booth on Bayville Avenue and Ludlum Avenue, which serves the Nassau County Police Department.

The first Bayville Fire Department building was constructed in 1923 on Bayville Avenue near Ludlum Avenue, and was rebuilt in 1929.

Other structures important to the history of the Village that are still standing include the: American Legion Building (constructed in 1957); United Cerebral Palsy and Jones Manor Facilities, which originally was the Clarkson Estate, then the P.W. Rouse Estate, then the Oyster Bay Hospital between 1961 and 1967; Joseph A. Physioc House, built in 1850s; and George W. Patterson Mansion, built in 1920, and presently the Rectory of St. Gertrude's Roman Catholic Church.

In 1926, Harrison Williams purchased an estate along School Street. Twenty-four years later, 27 acres of this estate were donated to the Village. The Village Complex was developed on the portion of this property on the west side of School Street, while the land to the east of School Street was dedicated as the forever-wild Harrison Williams Woods.

The Village acquired West Harbor Beach in the 1950s, and purchased Soundside Beach in 1986.

The first centralized Village water system was constructed in 1965 on School Street, consisting of a well, water tower, and distribution piping. A second well was later installed at this site. A third well was installed on Godfrey Avenue in 1970, and a fourth well at West Harbor Beach in 1984.

The Village is located within the Long Island North Shore Heritage Area, which encompasses the entire north shore of the Island, north of Route 25A. A State-designated planning commission, working with local leaders and citizens, is charged with drafting a management plan to develop, preserve and promote the area's unique natural and cultural resources. The plan is due to be completed by July 2002, and must be reviewed by the Commissioner of Parks, Recreation and Historic Preservation.

There are no structures, sites or areas in the Village of Bayville that are locally designated or nominated to be on, or determined to be eligible for inclusion on, the National or State Registers of Historic Places.

### **Protection and Preservation of Resources**

All publicly-owned resources of local historic importance are maintained by the Village. These include the Village Complex, Harrison Williams Woods, the Bayville Historical Museum, and the Bayville Cemetery. Important privately-owned historic resources are maintained by churches, institutions (e.g., the United Cerebral Palsy and Jones Manor facilities), and individual private owners.

### **Archeological Resources**

In 1974, a Native American campsite was discovered at the corner of Arlington Lane and Shore Road, in the vicinity of Mill Neck Creek. Skeleton fragments and other artifacts that

were uncovered at this site were tested by the Garvey Museum via radiocarbon dating, and were determined to be from the early 1500s.

The New York State Office of Parks, Recreation and Historic Preservation (OPRHP) has determined that the Bayville coastal area has multiple site sensitivity, and is suspected of containing archeological resources. These resources remain threatened by development and other actions. The OPRHP recommends that a "Phase 1 Survey" be conducted at all proposed development sites, unless prior ground disturbances can be documented.

Shipwrecks have been found in the waters along the waterfront, and it is likely that this area contains significant remains of piers, wharves, docks, and ships.

## **6. Infrastructure**

### **Public Water Supply**

The Village of Bayville was served mostly by individual wells until 1920. Two private systems (i.e., the Godfrey System and the Carr System) also were in operation, serving some nearby residents. The Locust Valley Water System started supplying water to Bayville residents after 1920, and operated until 1930. In the 1930s, the Village of Bayville acquired ownership of the distribution system within its boundaries, and in 1964 the Bayville Water District was formed.

The Village water system consists of: two wells and an elevated 600,000-gallon water tank, located on School Street; one well on Godfrey Avenue; one well at West Harbor Beach; and a distribution system. One of the wells, which drew water from the Glacial Aquifer, currently is out of operation. The three active wells, each rated at 1,000 gallons per minute, pump water from the Lloyd aquifer.

The older distribution pipes, acquired from the Locust Valley Water System, are composed of cast iron. In the 1950s, some asbestos-cement pipes were installed, but were removed in the 1980s. The most recently installed pipes in the distribution system are ductile iron composition. Since the mid-1960s, these pipes have been installed with cement linings. About 10 years ago, a water leak detection survey found that approximately 12 percent of the total water volume pumped by the system could not be accounted for. The Bayville Water Department, as required by the New York State Department of Environmental Conservation, adopted a water conservation program, as of June 30, 1987. These measures include restrictions on watering of lawns and increase in water rates, as well as an education program to inform residents of voluntary measures that should be taken to reduce water consumption.

There are 305 hydrants and about 2,500 water meters in the Village's water system. About 30 percent of the meters are installed at the curb, and the remainder are located inside buildings.

Most of the service connections are copper, but a few still are lead. The lead connections are being replaced with copper at a rate of about 12 connections per year.

The Village's yearly total pumpage of water has ranged from 300 to 332 million gallons per year during the last few years. The high-water level in the elevated storage tank is 99 feet from ground level, which is equivalent to a pressure of 45 pounds per square inch (psi) in the distribution system at that point. The highest pressure in the distribution system at ground level is 100 psi.

The Fire System is rated as Class ISO 4 by the Insurance Services Organization, which is considered a good rating by that organization (1 is the best rating, 10 the poorest). The rating is based mostly on the adequacy of the water system and the effectiveness of the Fire Department. The residential fire insurance rates for Classes 1 to 8 do not change significantly, if at all.

The water in the Village system is slightly corrosive, and sodium hydroxide is routinely added to raise the pH in order to decrease the acidity of the water and protect the pipes from corrosion.

### **Wastewater Disposal**

There are no wastewater treatment plants in the Village of Bayville. Presently, all sewage is handled by on-site individual subsurface sewage disposal systems. In some areas of the Village, sanitary overflows may occur during heavy rainfalls or major storms which raise the groundwater levels, especially where the soils have poor permeability.

Approximately 50 residences at the north end of the unincorporated community of Locust Valley (just outside the Bayville LWRA) on the west shore of Oak Neck Creek, adjacent to the Mill Neck Preserve, are known to be suffering from chronically malfunctioning sanitary systems. Because of high groundwater elevations in this area, the subject development (known variously as "The Birches", "Continental Villas", and "Davis Park") had been releasing poorly treated sewage into the creek. In an effort to address this problem, the Nassau County Department of Health (NCDH) installed a chlorine contact chamber, through which the wastewater from approximately one-half of the affected homes is conveyed for disinfection prior to discharge into the creek. However, this device has not achieved satisfactory results, and sewage contamination of the creek continues to occur. Consequently, NCDH signed a Consent Order with the New York State Department of Environmental Conservation in May 1999 to install a sewage treatment package plant to replace the chlorine contact chamber. The County has received a grant under the New York State Clean Water/Clean Air Environmental Quality Bond Act for construction of the new facility, and the design phase of the project currently is under way. The selected technology is a Chromoglass package treatment plant, which is expected to be operational within two years, according to the NCDH.

In addition to the above-noted problem in the Davis Park community, there are a number of other known or suspected non-point sources of contamination in Oak Neck Creek. These include: the individual on-site sanitary systems serving the waterfront homes in the low-lying area on the east side of the creek, and commercial facilities at the head of the creek, both of which lie within the Village of Bayville; a stormwater outfall that carries septic flow at the end of Meleny Road, in the Davis Park area; another discharge containing wastewater at the end of Hernan Avenue, which also is located in the unincorporated area on the west side of the creek, outside the Bayville LWRA; and tidal exchange with the southerly arm of Mill Neck Creek, which receives outflow from the Beaver Lake system. The Village has proposed to undertake further investigations to assess the importance of each of these contaminant sources to water quality conditions in the Mill Neck/Oak Neck Creek system, and to determine whether other significant sources may also be contributing to this problem, through a number of pending grant applications.

### **Roadways, Traffic Circulation, Parking and Public Transportation**

The main road through Bayville is Bayville Avenue, which leads westward through Lattingtown, Locust Valley, and Glen Cove, and eastward to Centre Island. From Bayville Avenue, one can turn south on Ludlum Avenue, travel over the Bayville Bridge to Shore Road in the Village of Mill Neck, and continue on to Oyster Bay hamlet. Both Bayville Avenue and Ludlum Avenue are Nassau County roadways.

West Harbor Drive is a Town of Oyster Bay roadway. The Village of Bayville has jurisdiction over Mountain Avenue, Godfrey Avenue, Creek Road, Perry Avenue, School Street, and Merrit Lane. All other roads in the Village are privately-owned or owned by associations.

During most of the year, traffic operations generally are acceptable in the Village, since the main roadways (i.e., Bayville Avenue and Ludlum Avenue) pass entirely through, and out of, Bayville, and can readily accommodate normal flows. However, traffic congestion often occurs in the summer, especially on holiday weekends. The Village has addressed this seasonal problem by restricting traffic into Bayville during the highest volume periods, using measures such as the institution of temporary one-way restrictions on Bayville Avenue.

Although the roadway system in the Village generally is adequate with respect to existing traffic flows, except during certain summertime peak periods, traffic disruption often occurs as a result of recurring flooding problems (see Section 2.2.8.B). Passenger car travel is interrupted on a regular basis along some of the roadways in low-lying areas of the Village due to the accumulation of stormwater runoff and/or coastal waters inundating the land surface. During severe storm events, the depth and extent of flooding in some areas is particularly severe, creating a public safety hazard by blocking the passage of emergency vehicles.

Parking is available at all public facilities, at commercial sites, and along most streets. In addition, public parking is available at the Bayville Commons.

The nearest railroad stations are at Locust Valley to the west and Oyster Bay to the southeast, both on the Oyster Bay Line of the Long Island Railroad (LIRR). However, Hicksville Station, which is located on to the south Route 106 on the LIRR's Main Line, has more frequent trains, and is used by most commuters from Bayville. Syosset Station on the Port Jefferson Line also is used by some Bayville commuters; and, on weekends, some Bayville residents use Manhasset Station on the Port Washington Line.

At one time, the Hendrickson Bus Company operated a bus from Bayville to a nearby train station, but this was abandoned due to economic infeasibility. Presently, there is bus service which carries local residents to shopping areas. The Village purchased a bus in August 1999, using grant monies, and has instituted service through Bayville to train stations and shopping centers on Fridays and Saturdays.

### **Storm Drainage Systems**

The Village is served by a Nassau County stormwater drainage system, which serves Bayville Avenue and Ludlam Avenue. This system directs stormwater into a network of pipes that are designed to allow seepage to occur through slotted and perforated sections. As originally designed and constructed in the 1950s, this system had no outlet to Mill Neck Creek, and was designed to discharge all stormwater to the ground. An outfall from this drainage network subsequently was added at the end of Adams Avenue, which allows some of the stormwater to be directed into Mill Neck Creek. There also are a few drainage channels that have outlets in the wetlands on the south side of Bayville. A portion of the stormwater from this system is directed to County-owned recharge basins, which presently are overgrown with vegetation, thereby decreasing their storage capacity.

The existing stormwater drainage system in the Village is not adequate to handle heavy rainfalls and, as a result, flooding occurs in certain areas, including the "president streets" area, the east and west ends of the Village, and other low-lying areas. Much of the system is unable to discharge during high tides, when the outfalls become submerged under coastal waters. Many of the pipes have not been properly maintained and, as a result, are clogged with accumulated sediment.

A "Floodplain Management and Hazard Mitigation Plan" was completed by the Village in December 1998, which addresses the problems identified above, as discussed in detail in Section 2.2.8.B.

### **Solid Waste Disposal**

Residential solid waste is collected by Village vehicles and delivered to the City of Glen Cove transfer station. Commercial solid waste is collected by private carters, and disposed at facilities selected by the respective carters. A hazardous waste collection program is offered by the Town of Oyster Bay, which is available to Bayville residents.

### **Electric Power and Gas**

Electric power is supplied by the Long Island Power Authority (formerly LILCO). Natural gas is available in areas of the Village where gas transmission mains are located.

### **Telephone and Cable**

Telephone service is available from the Verizon (formerly Bell Atlantic Company). Cable service is provided by the Cablevision Company.

### **Harbor Area Support Facilities**

In keeping with its location as a waterfront community, the Village of Bayville has a variety of facilities supporting the harbor area. For boaters, there is a public marina at Creek Beach, in Mill Neck Creek; and a private facility, the Bridge Marina, located immediately to the west of the Bayville Bridge. There are four docks, one at Creek Beach, one at West Harbor Beach, and two at the Bridge Marina. Public boat mooring areas are located at Creek Beach and West Harbor Beach. The Bridge Marina also has its own mooring area. Boat maintenance needs are served at the Bridge Marina, and Twin Harbors, on Ludlum Avenue near Bayville Avenue.

Swimming and fishing activities in Bayville take place at Creek Beach (fishing only), West Harbor Beach, Soundside Beach, Village-owned land on the Sound at Merrit Lane (fishing only), and the Town's Ransom Beach. In addition, one can also swim and fish at other nearby Town facilities, just outside the LWRA, including: Stehli Beach, on the Sound, to the west; and at the Centre Island Beaches, on the Sound and on the Harbor, to the east.

## **7. Vessel Usage of Waterways**

Oyster Bay Harbor is heavily used by both recreational and commercial water craft. The high density of use has caused conflicts and problems with respect to waterway usage, including boat dockage, mooring and anchorage, and navigation. Many of these issues are discussed below.

### **Navigation**

Waterway hazards and obstructions within the navigable waters of Oyster Bay Harbor include shoals and sand bars. Abandoned vessels are also hazards to navigation, and removal is difficult since they are often not registered, which makes it difficult to trace the owner so that the costs of removal may be assigned to the responsible party. The Town of Oyster Bay's

program for mooring registration creates a record of resident vessels, but is not useful for obtaining ownership information on transient vessels. Floating debris often is generated as a result of storms and tides, or ice damage to structures. The Town is responsible for removing navigation hazards within Town waters, and in the past has performed this task in Village waters at the Village's request. The Town of Oyster Bay places and maintains the vast majority of navigational aids in LWRA waters, including areas within the Village's jurisdiction. The responsibility of placing and maintaining these navigation aids, including the channel marker buoys in Mill Neck Creek and a 5-mile-per-hour sign on a buoy near the Bayville Bridge, presently lies within the Town. Navigation aids on the Bayville Bridge, including lights and 5-mile-per-hour signs, are maintained by Nassau County.

Perhaps the most pressing navigation problem in Oyster Bay Harbor is the proliferation of recreational moorings and floats. Improperly located moorings and floats, even if these devices are themselves situated outside navigation channels, may cause vessels to extend into the channels, creating a hazard for boat traffic. Bulkhead and dock extensions require a U.S. Army Corps of Engineers permit. A number of docks have been extended without this permit. Although the floats themselves do not cross into channels, boats docked at these floats can extend into channels.

### **Jurisdiction**

Jurisdiction with respect to over-water vessel uses within Oyster Bay Harbor and Mill Neck Cove is divided among the Town and the Villages. Except in those areas where the Village's corporate boundary extends out into the water, the Village has no authority to regulate structures seaward of mean high water. However, the Village does have the authority to regulate the use, speed, operation, anchoring, and mooring of vessels up to 1,500 feet from the shore, pursuant to Section 46-a of the Navigation Law. As discussed previously, the Village of Bayville's 1,500-foot area of extra-territorial jurisdiction extends into areas of potential jurisdiction of the Villages of Lattingtown, Mill Neck Creek, and Centre Island - in some locations.

### **Dredging and Dredge Spoil Disposal**

Dredging in the Bayville LWRA is regulated by the U.S. Army Corps of Engineers and the New York State Department of Environmental Conservation. Dredging activity taking place on Town of Oyster Bay-owned underwater lands, including areas within the Village jurisdiction, is also subject to the proprietary rights of the Town. Similar rights pertain to the U.S. Department of the Interior for areas within the Oyster Bay National Wildlife Refuge. Dredging in the Bayville LWRA, when it does occur, is carried out by private contractors, and is not performed on a regular schedule.

There are no federal channels in the Bayville LWRA. Consequently, the U.S. Army Corps of Engineers is not responsible for maintaining channels in this area, and the Village must

undertake any dredging work in public channels and basins as may be required. Progressive shoaling in the area of the public marina at Creek Beach is creating problems for deeper draft vessel at lower stages of the tide, and maintenance dredging is needed to make full use of this important public recreational facility. However, the high cost of dredging and dredged material disposal has prevented the Village from proceeding with this work. An application has been submitted to New York State to funding to undertake dredging in the vicinity of Creek Beach, which would alleviate the navigational problem in this area.

Dredging of channels and basins serving private marinas and yacht clubs has been performed over the years by those private entities benefitting from the dredging.

### **Moorings**

A significant area of the waterways in the LWRA is dedicated to moorings. Although moorings represent an important water surface use in the LWRA, the actual number of moorings in Mill Neck Creek and Oyster Bay Harbor was not known until recently. With the mooring permit process in place it is now known that there are approximately 150 moorings in total, with 100 moorings at the Creek Beach facility and 50 moorings at West Harbor Beach.

In an effort to help avoid conflicts and navigational hazards resulting from overcrowded mooring areas, the Village instituted a mooring permit program - approximately 20 years ago. Prior to this program, moorings were installed on a first-come, first-served basis. The Village mooring permit program was implemented for two reasons: (1) to serve as a means of identifying the owner of a mooring and the boat it serves, and (2) to provide mooring space to residents before non-residents, when space is limited. There is a fee of \$50.00 per year plus \$1.50 per foot of boat length for Village residents. There is an additional fee of \$25.00 for dingy rack rental. Since the program's inception, the Village has been able to accommodate all those who have applied for permits, both residents and non-residents alike. The program is administered by the Village Administrator's Office.

The Village mooring permit program creates a level of control that is a vast improvement over the previous unregulated situation. The information that is provided on the permit application allows the Village to resolve conflicts between parties vying for the same mooring spot (permit files are used to determine which party established a mooring first) and to notify owners of boats damaged by the fire, storm or other events.

### **Vessel Restrictions**

The Town of Oyster Bay employs harbormasters and bay constables to enforce laws on waterways. Town harbormasters and bay constables are authorized to enforce all State and local laws regulating vessels. The Nassau County Police Marine Bureau also enforces State and local laws.

As noted previously - pursuant to Section 46-a of the State Navigation Law, the Village of Bayville has the authority to regulate the use, speed, operation, anchoring, and mooring of vessels on waters to a distance of 1,500 feet from the shore.

In accordance with Section 130.17(3) of the New York State Town Law, the Town of Oyster Bay has the authority to regulate vessels upon waters within its municipal boundary, but not within 1,500 feet from the mean high water line adjacent to incorporated villages.

The Village entered into an agreement with the Town of Oyster Bay for the Town to provide harbormaster services, which includes the establishment of a pattern for anchorage and mooring in that part of the Oyster Bay Harbor Complex under the Village's jurisdiction, and to provide regulatory oversight and policing of all anchorages and moorings. This agreement was adopted by Village Board Resolution in 1997.

As discussed previously, the underwater lands in Oyster Bay Harbor and Mill Neck/Oak Neck Creek are owned primarily by the Town of Oyster Bay and the U.S. Department of the Interior (Fish and Wildlife Service); the Village of Bayville owns approximately 12 acres of underwater land on the north side of Mill Neck Creek. These agencies have proprietary rights to control the use of their lands.

A coordinated, inter-municipal approach is needed to address the overlapping jurisdictions among neighboring Villages, the Town of Oyster Bay, and the U.S. Fish and Wildlife Service. The Village of Bayville will make appropriate amendments to the Village Code to establish regulations governing the Village's area of water surface jurisdiction once the coordination process has been completed.

## **8. Commercial and Recreational Shellfish Harvesting and Finfishing**

### **Commercial Fishing**

The commercial fishery in the Bayville LWRA consists predominantly of shellfish harvesting within the Oyster Bay Harbor Complex. The coastal waters within this water body are a productive shellfish growing area, especially for oysters and hard clams.

Oyster and clam farming is performed on a large scale in the LWRA by Frank M. Flower and Sons, Inc. Oyster and clam seed nurturing occurs at the company's hatchery on Mill Neck Creek, within the Village of Bayville. The company stocks and harvests from leased shellfish beds in Oyster Bay Harbor and elsewhere in this area. The harvesting operation is based at the Oysterman's Dock in Oyster Bay hamlet.

Sites on the waterfront for baymen to access the commercial fishery resource (i.e., vessel mooring areas, and facilities to load equipment and unload product) are considered to be an important component of the Bayville waterfront. The Village contains an ample number of such sites, both private and public, for these purposes. Presently, there are several locations

throughout the area from which commercial fishermen can access their vessels, including: Frank M. Flower and Sons, Inc. (oysters and clams), the Bridge Marina (lobsters and clams), Creek Beach (clams), and West Harbor Beach (clams). These facilities are illustrated on [Figure 2](#).

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### **Recreational Fishing**

Fishing occurs from recreational boats launched at local ramps or marinas and from local beaches. Transient boaters also frequent the waters in the Bayville LWRA.

Varieties of fish typically caught in the Oyster Bay Complex include striped bass, snapper, bluefish, fluke, flounder, weakfish, blackfish, and eel. Recreational shellfishing requires a permit which is available only to Town of Oyster Bay residents, and can be obtained from the Town Clerk for a fee of \$5.00. Clams, oysters and mussels are the primary species of shellfish sought by local recreational fishermen.

## **9. Summary of Issues**

Initially, seven broad issues were identified for special consideration in this LWRP, as listed below:

1. Coastal Flooding\*
2. Coastal Erosion\*
3. Water quality\*
4. Habitat restoration\*
5. Stormwater flooding
6. Failure of on-lot sanitary systems
7. Restoring shellfishing in areas that currently are closed

The seven original issues were reviewed and examined by the LWRP Committee, which selected four of these issues (as identified by asterisks above) for more detailed analysis, with the ultimate goal of identifying opportunities for actions to preserve and enhance important coastal resources and resolve problems related to these issues.

Subsection A through D, below, provide a detailed analysis of the four critical issues. Section 2.3.10 presents a corresponding discussion of the opportunities that exist for addressing these issues.

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### **Coastal Flooding**

Flooding during heavy storms is one of the foremost issues facing Bayville. The Village has endured numerous major flooding events over the years, including those that accompanied severe storms in the fall of 1992. Therefore, the control of storm-generated street runoff and coastal flooding is one of Bayville's highest priorities, as endorsed by the LWRP Committee.

Flooding affects the Village and its residents in a variety of different ways. Public safety is threatened if inundation of the low-lying section of Bayville Avenue in the eastern portion of the Village prevents the passage of emergency vehicles. Additionally, groundwater levels often rise during severe flooding events, posing potential public health impacts due to the overflow of wastewater from subsurface sanitary systems. The community also is impacted by flooding as a direct result of physical damages to development, as well as secondary effects such as the interruption of business activities. Residents in flood-prone areas are affected economically, even if they are able to avoid flooding, through higher flood insurance premiums.

Flooding impacts the environment, as well. The quality of adjacent surface waters is adversely impacted by elevated pathogen levels, which are correlated with heavy rainfall events, due both to runoff and discharges from flooded sanitary systems. Flooding also can damage sensitive habitat areas, although these effects generally are temporary, and typically are reversed after a period of recovery.

The soils at the extreme west end of the Village consist of organic and tidal marsh material, which is poorly drained, and may not be suitable for subsurface sanitary systems. In 1999, the Nassau County Health Department denied an application for construction of such a system for a commercial establishment in that area, because of failure to meet design requirements.

It is reported that the soils in the eastern end of the Village, in the tombolo area between the Oak Neck upland and the Centre Island Village line, are very rapidly draining. However, because of low ground elevations and gentle slopes, the eastern portion of the Village is particularly susceptible to flooding at times of heavy rains and coastal storms.

The soils on the glacial moraine in the Oak Neck area, where higher ground elevations occur, are very well drained, and generally are not subject to flooding. However, the topography of this area directs the stormwater runoff from the upland area toward Bayville Avenue, and from there into the "president streets" area, contributing to the flooding there.

When heavy rainfalls occur, much of the runoff ends up in adjacent coastal waters, thereby contributing to the degradation of those water bodies, especially Oyster Bay Harbor and Mill Neck/Oak Neck Creek. This is especially true during the early stages of a major rainfall, when contaminants that have accumulated on the land surface are washed rapidly to receiving water by the "first flush" of runoff.

### **Coastal Erosion**

Another significant impact from heavy rainfalls and storms is the loss of waterfront beaches and private land due to erosion. Within the Village of Bayville, erosion has occurred along the shoreline of Mill Neck Creek, as well as on Long Island Sound. Although the U.S. Army Corps of Engineers is planning to perform further studies regarding protection from major

storms in the flood plain, it will be a few years before the initiation of such studies and even longer before the implementation of possible mitigation measures.

The scope of this LWRP includes actions that should be taken to address coastal erosion in the Village. The benefits deriving from flood protection go beyond the immediate and obvious issue of reducing property damages. Erosion also increases the loadings of sediment that may clog and overburden the Village's stormwater drainage systems.

### **Water Quality**

Oyster Bay Harbor is certified for shellfish harvesting by the New York State Department of Environmental Conservation (NYSDEC), based on frequent water quality testing results that conform to State shellfish sanitation standards. In contrast, Mill Neck Creek is uncertified for shellfish harvesting because water quality consistency fails to meet those standards, except during a few months in the winter when harvesting is permitted due to seasonal improvements in water quality.

An inadequately treated point-source septic discharge causes degradation of water quality in Oak Neck Creek and the contiguous sections of Mill Neck Creek. There is a pending NYSDEC Consent Order requiring the installation of a sewage treatment package plant to replace the existing chlorine contact chamber at this location. The Nassau County Department of Health expects that this plant will be operational within two years. However, this action will not eliminate all of the sources of pathogen contamination emanating from development in this area. While more investigative work is needed to arrive at the proper remedies, this location clearly is one of the most important sources of coliform bacteria in the LWRA. This issue was selected as one of the leading concerns by the Village.

Further investigation is required to pinpoint the location and significance of the other point and non-point sources of contamination, especially pathogens which adversely affect the availability of shellfish beds for harvesting. A new surfacewater sampling program currently is being conducted by *Friends of the Bay*, an environmental group based in Oyster Bay hamlet, in order to identify and determine the effects of specific sources of contamination by septic wastes in Mill Neck Creek and Oak Neck Creek.

### **Habitat Restoration**

The coastal waters and associated wetlands along the south side of the Village of Bayville either have been incorporated into the Oyster Bay National Wildlife Refuge under the ownership of the U.S. Fish and Wildlife Service, or have been classified by the New York State Department of State as part of a Significant Coastal Fish and Wildlife Habitat. These designations identify these areas as an important ecological resource, which is specially targeted for preservation and, as feasible, restoration.

Over the years, marine habitats in the LWRA and elsewhere throughout the region, have been degraded by human actions in the coastal zone, including development of adjacent upland areas and certain in-water activities. Direct impacts have resulted from the historical filling of wetlands. Indirect impacts have been caused by discharges of contaminated stormwater and inadequately treated sanitary wastewater. Although current environmental regulations have virtually halted further direct losses of habitat, there was a considerable net decrease in the most valuable habitat areas (i.e., vegetated wetlands) prior to the enactment of those requirements. Furthermore, indirect impacts persist, especially with respect to water quality impairments. With this in mind, the LWRP Committee concluded that habitat restoration is an important issue, for which solutions should be actively pursued. Habitat restoration seeks to reverse the adverse effects of human actions in the coastal zone, thereby enhancing the value of these areas for fish and wildlife populations and, ultimately, for human recreational enjoyment.

## **10. Summary of Opportunities**

With the completion of the LWRP, the Village of Bayville is in a better position to implement viable solutions to some long-standing engineering and environmental problems which have threatened the long-term safety and environmental quality of the community. As outlined in Section 2.3.9 above, the LWRP Committee identified four major issues - flooding, erosion, water quality, and habitat restoration - which are the focus of this program. The following discussion examines opportunities for resolving these issues.

### **Coastal Flooding**

High intensity storms (i.e., hurricanes and nor'easters) are among the most serious and damaging events in Bayville. These storms cause inundation of the low-lying areas in the Village due to tidal surges from Long Island Sound and the harbor complex, and inadequate drainage of stormwater from the land surface. Such events occur relatively frequently, are extremely costly, and endanger human health and safety. The Village has demonstrated, through their past efforts, including drainage improvement projects, that the damaging effects of flooding from extreme precipitation events and tidal surges can be lessened.

Past projects that have contributed beneficially to the reduction of flooding in the Village of Bayville include:

- **Perry Avenue/Bayville Park Boulevard interconnected drainage rings in the western part of Bayville.** This is a system of subsurface water retention chambers that collect stormwater and allow it to recharge into the shallow subsurface. Water quantities that exceed the capacity of the recharge structure are conveyed via an overflow structure to down-gradient recharge structures.

- **Bayville Avenue interconnected drainage ring system.** Similar in design and purpose to Perry Avenue facilities, this project covered the area between School Street and the "president streets".
- **Artificial wetlands at former Schmitt property.** This facility captures and stores excess stormwater, thereby allowing sediments to settle and preventing the discharge of these materials into marine surface waters south of Bayville.
- **First Street project.** This is a stormwater collection and discharge system, which is designed to control the outflow of water into the marine surface waters at the east end of the Village.
- **Adams Avenue outfall.** A tidal gate has been installed on the outfall at the end of Adams Avenue, which prevents the back-flow of coastal waters into the drainage system, while still allowing the discharge of stormwater into marine surface waters south of Bayville.

Flood control and stormwater management will provide a variety of benefits to the Village of Bayville, in such areas as water quality improvement, habitat restoration, mitigation of sanitary system failures, and a number of related environmental, waterfront, and engineering issues. Some of the specific benefits and justifications associated with these project opportunities include:

- 1) There is a broad base of support for flood control projects in the Village. The Village experienced a number of damaging storms in recent years, which have been very costly to Village residents. In addition, the Village completed a Floodplain Management Study in 1999, in which specific plans were developed for addressing the stormwater problem.
- 2) The soils and upland geology/topography in most of the Village are favorable for the types of stormwater control measures that are proposed and described in Section IV of this LWRP.
- 3) The types of stormwater control measures proposed in this LWRP provide a corollary benefit of reducing the loadings of contaminants to adjacent coastal waters caused by non-point discharges, especially with respect to the "first flush" of runoff from the land surface in the early stages of rainfall events.
- 4) The New York State Department of Environmental Conservation is exercising its recently established authority to reduce the impact of non-point sources on surface water quality, thereby providing another incentive for improved stormwater management.

- 5) The successful, but limited, results of stormwater management projects in Bayville that rely on discharge to the ground provide encouragement for additional projects of this type in the future.
- 6) Bayville Avenue is a Federal Aid roadway, which is eligible for New York State Department of Transportation-supported funding. This roadway, and its associated storm sewer, could serve as a principal right-of-way for improvements to the Village's storm drainage system.
- 7) Bayville has a reasonably stable water table elevation, which is sufficiently deep in the higher-elevation portions of the Village to accommodate the storage of stormwater.
- 8) Improvements to the Village's stormwater drainage system will benefit the important commercial shellfish habitat in the adjacent waters of Oyster Bay Harbor and Mill Neck/Oak Neck Creek; this habitat is very sensitive to degraded water quality, and is closely monitored by environmental agencies.
- 9) The water quality enhancements resulting from stormwater improvement projects will benefit the local shellfishing industry based in the Oyster Bay Harbor Complex, which is highly valued by the State of New York and the local community.
- 10) The Bayville community is centered around water-dependant and water-related recreational values. These values would be enhanced by floodwater control projects that would improve the quality and appearance of coastal waters, thereby making this area more inviting as a recreational resource.

The flood control/stormwater management opportunities that are recommended by this LWRP for further action are as follows:

- Expand the system of interconnected drainage rings that has been installed on Perry Avenue and Bayville Park Boulevard, so that this system covers a larger area in western Bayville.
- Control and eliminate the overflow of inadequately treated sanitary wastewater into Oak Neck Creek.
- Elevate the top of the berm structure on the south side of Bayville, to the west of the Bridge Marina, in order to prevent the tidal inundation of adjacent low-lying areas.
- Extend the interconnected drainage rings along Bayville Avenue throughout the Village.
- Install a "duckbill" tide gate at the Adams Avenue outfall, which will serve the dual purpose of preventing the backflow of coastal waters onto the land surface and allowing

the settlement of sediments and associated contaminants from terrestrial floodwaters prior to discharge to adjacent receiving waters. The tide gate will be designed in such way to minimally constrict tidal flow. It is further proposed that a series of portable emergency pumps be procured, to be placed into operation by the Nassau County Department of Public Works whenever needed to alleviate incidents of flooding along Bayville Avenue in the low-lying easterly portion of the Village. This proposed system of portable pumps, which supersedes a prior proposal to install two permanent pumping stations in the vicinity of Adams Avenue and Shore Avenue, would provide emergency stormwater drainage at times when flooding in the project area is exacerbated by the effects of high tide. One or more permanent discharge pipes would have to be installed, to which the proposed pump system would be connected, in order to convey flood waters off the land surface and into adjacent coastal waters.

### **Coastal Erosion**

Coastal erosion is an important issue with respect to both environmental and public safety considerations. Such erosion causes the breaching of natural and artificial protective structures, and may thereby lead to the loss of life and property. The beaches on the Long Island Sound side of Bayville, in particular, have been affected by significant erosion. Attempts have been made to counteract and remediate damaged areas, through the construction of an artificial dune at one location, and the planting of grasses and other vegetation in other unstable areas. Erosion along the bay, on the south side of Bayville, has occurred at points where tidal marsh areas have been breached, exposing the shoreline directly to waves, tidal action, and boat wakes.

Erosion in upland areas can contribute to the accumulation of sediment in the stormwater structures (i.e., piping, catch basins, etc.), a circumstance which has increased the municipal burden to maintain these systems. Erosion also increases the turbidity of stormwater discharged to adjacent coastal waters, thereby causing deterioration of water quality and related environmental impacts.

There have been a number of earlier projects in the Village directed at reducing erosion which, although limited in scope, have been successful. Some of these projects, which are described briefly below, will serve as models for the erosion control opportunities that are recommended for future action:

- The Soundside Beach erosion control project on Long Island Sound included the planting of beach grasses to reduce erosion and the construction of an artificial sand dune. The planting of the beach grasses was accomplished by volunteers. The artificial dune building was completed with the assistance of grant funding provided by the NYS Department of State.

- A second beach stabilization project was carried out on the Long Island Sound beaches along The Boulevard, in the "president streets" area. This work was limited to the planting of beach grasses and was carried out by volunteers.
- The Mill Neck Creek shoreline stabilization project was a beach replenishment effort at the foot of Washington Avenue, to repair coastal erosion damage that had occurred in this area.

Erosion control provides a number of benefits that contribute to the maintenance of critical recreational assets in the community, and serves to protect human life and the environment. Some of the specific benefits and justifications associated with project opportunities for erosion mitigation include:

- 1) Erosion poses a safety hazard because of the possible breaching of structures that protect the Village from flooding.
- 2) Erosion contributes to the turbidity of stormwater discharges, thereby reducing the quality of surface waters.
- 3) Erosion adversely affects and reduces the viability of both aquatic and terrestrial habitats.
- 4) Excessive erosion diminishes scenic values and, as a result, reduces the recreational potential of the Village.
- 5) The residual sediments from erosion accumulate in stormwater drainage structures, increasing cost incurred by the Village and other agencies to maintain these structures.
- 6) Erosion contributes to sedimentation in the creeks and harbors, thereby impacting navigation and use of mooring areas and other boating facilities.
- 7) Erosion reduces the depth of water at bathing beaches, decreasing their suitability for swimming.

Based on the importance of the erosion issue to the health and safety of the Bayville community and the vitality of local habitats, the following project opportunities are recommended for implementation as part of this LWRP:

- Complete an evaluation of the of the Soundside Beach artificial sand dune, and investigate possible locations for similar dunes along the Long Island Sound shore of the Village.
- Identify potential locations for artificial wetlands along the southerly shoreline of Bayville. Such wetlands could serve a number of purposes, including the retention of stormwater in order to reduce sediment discharges into the harbor complex. These

wetlands also may serve as recreational resources (e.g., nature study, bird watching, and similar passive activities), and may provide additional fish and wildlife habitat.

- Complete the evaluation of the use of gabions to stabilize the shoreline on the south side of Bayville. Select a trial location for this application and evaluate the results.
- Repair and replant areas along the south shore of Bayville where gaps have formed in the existing line of marsh vegetation. These vegetative gaps allow high intensity waves to reach the shore and cause damaging erosion.
- Although it is beyond the boundary of the LWRA, the area of extreme beach erosion at the Centre Island police booth should be repaired. Any further erosion in this area could result in the complete breaching of the peninsula at this point, which would cut off Centre Island from the mainland and result in a disruption of normal traffic flow in this part of Bayville.

### **Surface Water Quality**

By improving the quality of surrounding marine surface waters, the Village of Bayville will benefit by: having maintained or increased swimming and fishing opportunities; restoring critical habitats; and restoring water quality to the point where closed shellfishing areas may be re-opened. Also, the overall health and welfare of the community would be improved by eliminating or reducing the levels of health-threatening pathogens and chemical contaminants.

Improvements to water quality will be accomplished by the stormwater management and recharge concepts discussed in the preceding subsection. Water quality enhancement also will be aided by the retention of stormwater in artificial wetlands, and by eliminating non-point pollution sources such as discharges from malfunctioning on-lot sanitary systems.

Examples of current and past projects that have beneficially improved water quality in the Bayville area include the following actions:

- The Village of Bayville has played an important role in eliminating the discharge of point source wastewater into Mill Neck Creek from the Birches subdivision, in the unincorporated community of Locust Valley. While the actual source is outside of the Bayville LWRA, the discharge affects the quality of marine surface waters in the LWRA. At this time, work is proceeding on the design and installation of an state-of-the-art wastewater treatment plant to serve 218 homes in the area.
- The Village has actively pursued and developed an interconnected system of drainage rings and has completed an artificial wetland on the former Schmitt property. These projects have contributed to the improvement of water quality by reducing the loadings of contaminants delivered to receiving waters in the first-flush of stormwater runoff.

- *Friends of the Bay*, a local environmental group, is playing an active role in monitoring, sampling, analyzing, and reporting on the results of marine surface water testing which is being carried out in the harbors and bays along the south side of Bayville. This work is being undertaken in support of a number of local programs, including this LWRP.
- *Friends of the Bay* also is involved in public education programs concerned with the maintenance of domestic sanitary systems and the monitoring of critical shoreline areas for evidence of non-point discharges.

The favorable results of efforts to manage and improve surface water quality are well documented, and recommendations of this LWRP are justified and fully supported by the following considerations:

- 1) There is available land and the potential for public property ownership that would support the creation of constructed wetlands for the retention of stormwater before it is discharged into adjacent coastal waters.
- 2) There is general agreement that constructed wetlands would provide improvements in water quality by reducing turbidity and pathogen loadings.
- 3) There is a need to manage and maintain on-lot sanitary systems. This could be accomplished through local laws.
- 4) There may be places in the Village where the water table is too close to the surface to accommodate conventional on-lot wastewater treatment systems. New designs and concepts may be needed in these areas.
- 5) The New York State Department of Environmental Conservation generally encourages the implementation of non-point pollution control measures, and would look favorably on any actions by the Village of Bayville to improve surface water quality by mitigating non-point sources.
- 6) The elimination of highly contaminated point sources, of the type that has been identified and partly remedied in the Birches (Davis Park) subdivision, will provide further water quality improvement.

Specific water quality improvement projects, and/or topics that are recommended in this LWRP for further consideration include:

- Expanding the non-point source reduction program by identifying and eliminating or correcting areas of malfunctioning or overflowing on-lot sanitary systems.

- Providing training and raising public awareness regarding the maintenance of on-lot sanitary systems, and the need to upgrade systems and provide more advanced technologies in certain critical areas.
- Identifying areas of high groundwater, where special sanitary system designs may be needed and where system maintenance schedules may have to be upgraded.
- Undertaking a more active and aggressive water quality monitoring program in the marine waters south of Bayville.
- Purchasing land and constructing artificial wetlands at appropriate locations, as was done on the former Schmitt property, in order to provide open space areas for the natural retention of stormwater.

### **Habitat Restoration**

Restoration of fish and wildlife habitats is another important action which will render a number of benefits to the natural resource base and community of Bayville. The flooding control and water quality preservation/enhancement considerations listed in the preceding subsections will contribute to stable and thriving habitats.

Bayville has played an active role in the management and restoration of local aquatic and terrestrial habitats. Prime examples of this initiative include the shellfish aquaculture industry that is centered in Bayville, and the current efforts that are being made to improve the Harrison Williams Woods.

Examples of current or recent habitat restoration projects in the Village of Bayville include:

- Development of the former Schmitt property to preserve and protect woodlands and shore areas, and to install an artificial wetland for environmental benefit and recreational value.
- Grass planting on the Village's Long Island Sound beaches by local citizen groups to stabilize this environment and to preserve existing terrestrial habitats.
- Activities by the Frank M. Flowers and Sons shellfish farming operation, which have helped to maintain a healthy marine environment in support of their business.
- The siting of nesting towers in the Oak Neck Creek area to attract ospreys to this area.
- The restoration of the Harrison Williams Woods to make this area a more attractive recreational resource, and to maintain terrestrial habitats that sustain local flora and fauna.

The expected benefits of the habitat restoration program advocated by this LWRP include:

- 1) The restoration of water quality, through such measures as stormwater control projects and artificial wetland creation, may improve habitat conditions which, in turn, may improve shellfishing and recreational fishing prospects. Water quality restoration also may allow the opening of an area of more than 70 acres for shellfishing that presently is closed to this activity.
- 2) Restoration and/or preservation of tidal wetlands and habitats protect important feeding areas for fish and wintering waterfowl. Wetlands also protect the shoreline from the effects of wave action, thereby reducing shoreline erosion.
- 3) Beach stabilization and erosion control, through the planting and preservation of beach flora, protect an important natural habitat which otherwise may require expensive and problematic shoreline hardening protective measures.

Project opportunities that will result in the improvement of aquatic and terrestrial habitats, as well as rendering environmental and health and safety benefits to the Village of Bayville, include:

- Expected improvements in marine water quality in the waters south of Bayville - through the elimination of point source discharges of wastewater from locations like the Birches subdivision, or the reduction of non-point pollution from malfunctioning on-lot sanitary systems - may make it possible to restore shellfishing in an area of more than 70 acres that now is closed to this activity. As the shellfish habitat is improved, and perhaps expanded, as a result of the habitat restoration initiative, further water quality benefits may be realized through the augmented water filtering capabilities of expanded shellfish populations.
- Based on the favorable results of the new water quality monitoring program that is being carried out by *Friends of the Bay*, it may subsequently be possible to expand the available shellfishing area by seeding. As this work proceeds, water quality monitoring results will be evaluated to determine whether the expanded shellfish populations provide a further water quality benefit by their water filtering function. It is proposed that these studies and monitoring actions be undertaken as the referenced projects unfold.
- The proposed restoration of the recreational trail system in the Harrison Williams Woods will result in the preservation of a natural terrestrial environment which comprises an important upland habitat for the native flora and fauna of this area. A number of enhanced habitat values will be derived from this project, including the preservation and protection of a natural area.