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## **SECTION 1 - PLAN SUMMARY**

### **A. Background**

A state-approved, current municipal Conservation, Recreation and Open Space (CROS) Plan is required for eligibility for grants and reimbursements administered through the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA). These aid programs include the state's LAND, PARC and Federal Land and Water Conservation Fund. In the 1980's the Town of Orleans obtained a total of \$1,347,500 from these sources towards the purchase of open space. Since 1990, an additional \$906,000 has been obtained to offset purchase prices on acquisitions. The 2016 CROS Plan is intended to comply with the requirements of EOEEA, as expressed in the Open Space Planner's Workbook. The eligibility of the previous Orleans open space plan (drafted in 1984, updated 1987, 1990, 1994, 1999 and 2006) has expired. The 2016 CROS Plan will allow the Town to re-establish its eligibility for this valuable funding source and be a guide to conserve Orleans' natural resources, preserve its open space and provide ample opportunities for recreation for its citizens.

### **B. Features of the 2016 CROS Plan**

- Includes updated, current information on land use and open space acquisitions.
- Reflects a 2014 opinion survey of residents and compares survey findings with a comparable survey conducted in 1999 and reported in the 2006 CROS plan.
- Details preservation techniques for less-than-fee acquisition, and non-regulatory open space approaches (public education, public tree protection).
- Includes a new section on recreational facilities conditions and needs.
- Recommends long-term programs to respond to the Town's recreation needs.
- Considers new handicapped recreation facilities.
- Consistent with the 2001 Orleans Comprehensive Plan and 2006 Comprehensive Plan Update.
- Sets realistic open space objectives for town agencies to achieve.
- Considers impacts of the Cape Cod Land Bank and the Community Preservation Act.
- Emphasizes cooperative efforts with private partners to protect open space.

### **C. Community Priorities and Vision**

Community priorities for open space and recreation are based on the results of a community survey distributed in 2014. By and large, results from 2014 mirror those from a similar survey conducted in 1999 and reflect a community that is concerned with preserving its rural and scenic character, safe guarding water resources and enjoying a variety of recreational opportunities.

The terms that best describe Orleans, according to residents surveyed, are a “community that has preserved its small town character,” and a “community that encourages preservation and conservation.” In 2014, fewer respondents associated Orleans as a “shopping hub serving surrounding towns,” “small seaside town”, or “resort community,” than was the case in 1999.

The top three priorities for preservation in both 2014 and 1999 were: “open space for water and conservation,” “semi-rural character of town,” and “public access to shore.”

Top three priorities for new recreational facilities that people would like to see constructed are: Conservation areas, Public access to fresh and salt water and shorelines, and bike trails. In 2014 there was relatively less support for neighborhood parks and golf courses, and more support for hiking and skiing areas, town landings and picnic areas, than in 1999.

The highest priority for town action in 2014 was the same as 1999: acquire more open space, improve conservation land with amenities, and provide more parking at beaches.

With this community input as a springboard, the vision guiding the Orleans CROS recognizes that the crossroads quality unique to Orleans extends to its citizenry's health and enjoyment. Very few communities have the mix of natural resources, open uplands, and support facilities that exist in Orleans. Orleans residents have consistently demonstrated vigilance in protecting natural resources, and a willingness to pay the costs of preservation and maintenance.

To many residents, Orleans is a place where residents can drink clean water, breathe clean sea air, walk dense forests, open fields and long beaches, catch and eat healthy fish and fowl, savor remnants of their colonial history, and meet friends through recreational programs and events. Other towns offer many of these necessities and amenities but not all of them in such profusion and proximity. Orleans is a small town, both in area and in character, but its natural and cultural offerings are diverse and interesting.

The CROS vision is that each Orleans resident and visitor will catch a bit of the community vision to be aware of the need to protect and enhance natural resources for the enjoyment of current and future residents.

#### **D. Needs**

In seeking to respond to community needs for open space and recreation, Orleans is working from a strong position of accomplishment:

- Orleans currently has slightly more than 2,522 acres of protected open space land that is owned and managed by a variety of public and private agencies, and by individuals. (Map 7A) These lands account for approximately 17% of the total land area in town.
- The Town of Orleans has more than forty recreation facilities in eight locations. The vast majority of town citizens are satisfied with recreational offerings, but the facilities require ongoing investment in maintenance and repair.
- The facilities meet national recreation standards for the Town's year-round population, and meet standards for swimming, beaches, football and soccer fields for the seasonal population, which swells to 19,000.<sup>1</sup>

In addition to continuing its long-standing program of purchasing land, the Town must forge creative partnerships with public and private agencies or groups to complete its mission of

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<sup>1</sup> Source: Orleans Town Clerk

protection, management, retention and restoration of open space and recreation lands. Land use regulations that protect meaningful open space, bequests of land, and conservation restrictions all should be fully explored and pursued as opportunities to protect open space without use of public funds. Town policies that ensure the long-term retention of town property currently used as open space should be pursued. Finally, long-term investments will be needed to maintain open space and recreation facilities that are vital to the Town's character and the community priorities.

## **E. Goals & Objectives**

The CROS plan has identified the following goals and objectives to meet community needs and priorities.

### **Conservation Goal: Protect and enhance Orleans' fragile environmental resources**

- Protect coastal/saltwater resources;
- Protect freshwater resources;
- Preserve sensitive land-based resources;
- Encourage continuation of self-sustaining renewable resources;
- Mitigate natural hazards of storm flooding and sea level rise;
- Manage open space properties to protect natural resources while encouraging appropriate public use;
- Increase public physical and visual access to water in a manner compatible with environmental protection of the resources;
- Coordinate protection of resources which cross town boundaries.

### **Open Space: Preserve and manage unspoiled natural areas to protect the Town's special places, maintain a healthy natural environment, provide habitat for wildlife, and retain Orleans' rural character**

- Acquire or protect land significant to groundwater protection;
- Protect environmentally sensitive lands;
- Protect water quality of salt and fresh water bodies;
- Protect natural resources of recreational and economic value;
- Protect the Town's scenic resources;
- Protect significant historic and archaeological sites;
- Continue ongoing town action necessary for an effective open space program;
- Coordinate open space protection with adjacent towns and regionally across Cape Cod;
- Provide access to open space for those with varying physical and other abilities.

### **Recreation: Meet residents' recreational needs by making the most of the Town's unparalleled recreational assets**

- Meet local recreation needs through a balanced offering of programs;
- Upgrade recreation facilities as needed to provide better service to residents;
- Upgrade fresh and salt water bathing and boating facilities, with assistance from the Harbormaster and other agencies where appropriate;

- Encourage use of bicycles on safe routes to reduce congestion, conserve energy and improve air quality;
- Provide recreation opportunities for residents with varying levels of ability;
- Coordinate management of recreation resources which cross town boundaries.

## **F. Priority Actions**

The CROS plan is wide-ranging and would take decades to fully implement. This CROS plan update has selected the following priority actions to focus town resources on measurable achievements toward community goals in the next five years:

### **CONSERVATION GOAL – PRIORITY ACTIONS**

- Continue to promote community gardens and agriculture at Sea Call Farm, the Hopkins Lane Lot, and Putnam Farm;
- Amend the Town’s Wetland Bylaw to require greater setback from coastal banks for new construction;
- Draft or revise, and implement management plans for town parcels committed to open space and recreation;
- Design educational displays for self-guided trails at Baker’s Pond, Christian property, John Kenrick Woods, and other properties where public trails exist;
- Collaborate with Orleans Conservation Trust to include its parcels in town-wide open space maps;
- Improve stormwater treatment in proximity to Open Space surface waters. Priorities include Cedar Pond, Uncle Harvey’s Pond, Meadow Bog Pond, Boland Pond, and Route 28 runoff at Tar Kiln Creek.

### **RECREATION GOAL – PRIORITY ACTIONS**

- Install benches, drinking fountains at recreation areas;
- Complete management plans for conservation areas used for passive recreation;
- Select appropriate locations for small neighborhood playgrounds.

### **OPEN SPACE GOAL – PRIORITY ACTIONS**

- Protect well sites by purchasing available abutting property where available if property has protection value;
- Protect significant parcels targeted by this plan. Open Space Committee will continue efforts and negotiations where appropriate;
- Consider opportunities to expand the Skaket Area “Sea Path” Project. Work with State to address erosion at the former Gavigan property;
- Continue land protection efforts;
- Monitor Chapter 61 Lands and be prepared to respond quickly to market availability;
- Cooperate closely with Orleans Conservation Trust to optimize the opportunities for land preservation and schedule annual strategy/goals review and determine opportunities to promote conservation restrictions on key parcels.

## SECTION 2 – INTRODUCTION

### A. Statement of Purpose

Orleans' CROS Plan is intended to provide a framework for decision making by its residents, elected officials and professional staff. The purpose of the plan is to serve as a guide to responsible action to conserve Orleans' natural resources, preserve its open space and provide ample opportunities for recreation for its citizens and visitors.

The 2016 CROS Plan includes updated, current information on land use and open space acquisitions; results of a 2014 opinion survey of residents and a comparison of survey findings with a comparable survey conducted in 1999; recommendations for long-term programs to respond to the Town's recreation needs such as consideration of new handicapped facilities; and emphasis on cooperative efforts with private partners to protect open space.

### B. Planning Process and Public Participation

The *Executive Office of Energy and Environmental Affairs' Open Space Planner's Workbook: A Companion to the Open Space and Recreation Plan Requirements* (revised March 2008) was used as a guide to preparing the plan. The 2016 CROS Plan was developed by the Orleans Open Space Committee, with staff assistance by the Orleans Planning Department and consultant support. The Conservation Commission and the Recreation Department were consulted during the formulation of the plan. The Conservation Administrator, Planning Director, Natural Resources Manager, Water Superintendent and Health Agent were also helpful in the organizing of much information in this plan.

The public process engaged for the development of the 2016 CROS Plan builds on previous outreach efforts. One of the initial tasks in the development of this plan was to conduct a survey to determine residents' attitudes and opinions about open space and recreation. The survey used the same instrument used to gauge residents' opinions in 1999, which provided the basis for the 2006 CROS plan. The decision to survey using the same questions was a deliberate decision by the Town to effectively understand changes in public opinion over time. Detail about survey results is addressed in Section 6, and a copy of the 2014 survey appears in Appendix A. The survey was used in conjunction with interviews of town staff and boards involved with open space and recreation planning and management to gauge town-wide views on open space and recreation needs and opportunities.

The Open Space Committee reviewed and refined the Goals and Objectives, for the 2016 CROS Plan. A draft of the CROS plan was reviewed by the committee, and revised to include committee members' comments, providing additional input into the final document. The Cape Cod Commission provided valuable input on the draft and assisted with the development of maps and figures. The inventory of open space and recreation resources was developed by the Orleans Conservation Administrator.

The 2016 CROS Plan is consistent with the Orleans Local Comprehensive Plan. The Comprehensive Plan, approved in 1999 by the Town and Cape Cod Commission, was amended in 2001, and updated again in 2006.

#### *Environmental Justice*

Orleans contains an Environmental Justice neighborhood, located between the downtown Village Center District and Cape Cod Bay, known to some as West Orleans. 25% of the Orleans year-

round population resides in the neighborhood. The EJ neighborhood is designated based on household income. Orleans has the oldest median residential age in the Commonwealth, and many older residents have lower incomes due to a long period of retirement. Median assessed value of homes in the Environmental Justice neighborhood is \$530,000.

The Town has taken recent steps to provide resources to its EJ area by purchasing open space and establishing parks within the mapped area. In addition, the Environmental Justice neighborhood in Orleans contains *all* of the Town's active recreation areas: Eldredge Park, Orleans Elementary School playground & fields, tennis courts, and Nauset Middle School athletic fields. Recreation programs of the Town, including those for senior residents, are free of charge.

The EJ neighborhood also contains Skaket Beach, Rock Harbor Beach, and the Boland Pond trail network. Orleans residents are entitled to a beach sticker free of charge, so income is not an obstacle to open space access for EJ residents. In addition 4.8 miles (65%) of the Town's designated bike routes, designated in 2012, are located within the EJ neighborhood.

In 2016, the Town of Orleans completed permitting for a community garden on the recently-purchased Putnam property on Rock Harbor Road, within the EJ neighborhood. In addition, the Town's very active Council on Aging facility is located in the EJ neighborhood to provide easy access to services for its clients.

In developing this plan, the Town took affirmative steps to provide additional outreach to its EJ community. Enhanced public outreach for this neighborhood was conducted through contact with the Orleans Senior Center, Snow Library, local grocery stores, and the larger condominium complexes. Notices were also placed in Town Hall and on the Town of Orleans website. The population targeted for outreach is comprised of mostly native English speakers, so materials were not translated into other languages.

On February 25, 2020, a public hearing was held on the CROS Plan specifically to hear comments and concerns of residents in the Environmental Justice neighborhood. 20 residents attended. Public input received at the hearing demonstrated an interest in larger environmental issues beyond open space and recreation. It was felt by attendees that the Town has adequately provided open space and recreation facilities within the EJ neighborhood, but that the Town should be diligent to protect the property and quality of life in the area through careful planning and land use regulation.

## **SECTION 3 - COMMUNITY SETTING**

### **A. Regional Context**

Orleans' extensive and varied coastal shoreline and numerous freshwater ponds are arguably the Town's primary open space and recreational resources. The Town has four distinct tidal shorelines, each with a different allure: the expansive flats that extend at low tide on Cape Cod Bay; the steep bluffs and salt marshes of Town Cove and Nauset Harbor; the long, soft strand of Nauset Beach on the open Atlantic; and the meandering crenellation of Pleasant Bay. Orleans is one of but a few U.S. towns where one can watch the day's sun rise and set over the ocean.

Orleans has always been a crossroads town. Its location at the juncture or "elbow" of Cape Cod's "bare and bended arm" (Map 1) assures its significance in the natural and cultural history of the Cape. Geologically, Orleans represents the true intersection of the Cape Cod Bay Lobe and the South Channel Lobe of the retreating Wisconsin Glacier 15,000 years ago. Prehistorically, the

major trans-cape trails of the native inhabitants merged in Orleans. The very name chosen for this part of the Cape was "Nauset," an Algonquin term meaning "at the place between."

Orleans today continues its crossroads tradition. Located halfway between Hyannis and Provincetown at the confluence of three major highways, Routes 6, 6A and 28, it is considered the Lower Cape's commercial center. This phenomenon has placed extraordinary pressures for growth and development on the Town, commercially and residentially. Orleans' physical beauty and expansive beaches make it a vital seasonal destination, and not simply a gateway to the Outer Cape.

Not surprisingly, the Town has concentrated on water access as its primary open space emphasis over the years, with a focus on beaches, landings, and public boating facilities. Ever concerned about loss of public access to its coastal shoreline, much of the community's aggressive open space acquisition program of the 1980's focused on preservation of shorefront properties. This approach to open space protection continues to garner strong support among voters at Town Meeting.

Orleans is one of the fifteen towns that make up Barnstable County. Orleans shares municipal boundaries with four other communities: Eastham, Chatham, Brewster, and Harwich. Orleans shares Nauset Harbor, Town Cove and Rock Harbor with Eastham; Namskaket Marsh, Baker's Pond and Orleans' main groundwater supply with Brewster; and Pleasant Bay with Harwich, Brewster and Chatham. While overlapping jurisdiction normally leads to fractured natural resource management, Orleans and its neighbors have made great strides in cooperating on resource management ventures with the support of local officials in each respective town. By way of example, Brewster, Orleans and Eastham cooperatively constructed and operated the first multi-town septage treatment plant on the Cape. Orleans appropriated \$1,450,000 and Brewster close to \$1,000,000 dollars to preserve thirty-six acres on the shores of Bakers Pond. Orleans and Chatham have agreed to manage vehicle use on Nauset Beach, which the Towns have shared through mutual covenant for forty years. Orleans is one of several Cape towns hosting the popular Cape Cod Rail Trail, a popular biking and walking trail, though some sections are in need of inter-connection.

Orleans's participation since 1998 in the Pleasant Bay Resource Management Alliance is another important regional environmental effort. The Alliance also includes the Towns of Chatham, Harwich and Brewster, which share Pleasant Bay and its watershed with Orleans. The Alliance promotes technical research, policy development and public education to protect the bay so that it can be used and enjoyed by future residents. A key initiative of the Alliance is a regional watershed-based approach to solving the problem of nutrient enrichment in Pleasant Bay.

Protection of public water supply from the effects of development is a shared regional concern. A large area of undeveloped land in Brewster is located over the zone of contribution to Orleans' public water supply wells. The 2006 CROS Plan cited concerns about continued commercial and residential development in this once sparsely populated area. At that time the area had experienced two decades of expansive growth including an industrial park, two golf courses, and several large residential subdivisions. In response to its own water resources concerns, in 2009 the Town of Brewster adopted a Natural Resource Protection Zone (NRPZ) that substantially reduced the residential development potential of this area. The NRPZ also helped to limit potential impacts on Orleans' public water supply wells.

Dramatic changes in the Nauset barrier beach and inlet system have occurred since the 2006 CROS was approved, and these developments continue to provoke changes in tidal volumes, shoaling, erosion and other resources conditions throughout Pleasant Bay. A storm-induced breach of the Nauset barrier beach north of the previous 1987 inlet in Chatham resulted in the formation of a

second inlet between Pleasant Bay and the Atlantic Ocean. The dual inlet system has resulted in an increased volume of tidal exchange between Pleasant Bay and the Atlantic Ocean. Recent tide data suggest that mean tide range (the difference between low and high tide) is decreasing near the 1987 “south” inlet, most likely due to shoaling. This means the south inlet is not exchanging as much water as it used to. On the other hand, mean tide range at the headwaters of Pleasant Bay in Orleans is not decreasing and may be increasing. This trend more closely reflects the ocean tide range as recorded in Boston and suggests that the newer “north” inlet formed in 2007 is handling tidal exchange more efficiently than the south inlet.

While the effects of the dual inlet system have been more dramatic in Chatham, Orleans too has noticed ecosystem changes. Along the barrier beach, dune washovers during extreme storms and migration of sand via the immediately offshore longshore current continue to change the beach annually. On the interior shoreline of Pleasant Bay, changes in tidal dynamics have increased erosion concerns among property owners and requests for erosion control structures have increased. There are between forty and fifty shoreline erosion protection structures in this area, the vast majority of which are hard Coastal Engineered Structures (CES'). CES's are known to have long-term unintended consequences of diminishing sediment supply to beaches, dunes, and marshes.

Roughly 900 acres of Orleans is within the Cape Cod National Seashore, including uninhabited areas of Nauset Beach and some islands of Pleasant Bay. The Town owns and has primary management responsibility for the Nauset Beach area within the Seashore boundary, and so the presence of the National Park Service is felt less in Orleans than any of the six other Cape Cod National Seashore towns, except Chatham which also mostly owns and manages its portion of the beach within the National Seashore.



Map 1 - Location

## **B. History of the Community**

Orleans' historic settlement laid the foundation for modern land use patterns. (Figures 1 and 2) "Settlement was usually strung out around the harbor and along the roads that led to it with only a moderate commercial and institutional core at the center." This statement, published in a 1987 history of Cape Cod by the Massachusetts Historical Commission, pertained to Cape Cod in general and certainly applied to colonial Orleans. In Orleans' case, the harbor was Rock Harbor, the road was Main Street and the small core was fixed at its junction with County Road (now Cranberry Highway or Route 6A). These linear cores only gradually extended outward over the centuries. Most of Orleans was composed of large, dispersed farms, particularly in South Orleans where the soil was particularly fertile for grain. Through the 1800's, Orleans was the Cape's premier grain-growing town, producing a surplus for trading with Boston.

Trade was conducted out of Rock Harbor, then as now, a marginal port capable of servicing only coastal packets and shallow draft vessels owing to the tidal creek's narrow width and extensive flats. Rock Harbor flourished as the local port through the 18th and 19th century. In the 1800s, salt made in Orleans saltworks was also an important export. The Orleans militia repulsed a British landing force at Rock Harbor during the war of 1812.

Due to their tricky channels, hazardous inlets and distance to maritime trading routes, Pleasant Bay and the Nauset Marsh systems were more important as local subsistence grounds, for finfish, shellfish, fowl, and salt hay, rather than as navigable ports. Snow Shore on Nauset Harbor was lined with fish sheds and flakes where catches were cured for the Boston market.

South Orleans was the area reserved for the Nauset Indians in 1660 as their Potanunquit (or Portanimituc) village. This was one of the three most important tribal settlements on the Cape during the colonial period, according to the Massachusetts Historical Commission.

A small town in area compared to other Cape communities, and always considered a small town based on population, Orleans has consistently had a high density of population relative to other Cape Cod towns. By 1797, when Orleans "hived off" from Eastham and was incorporated, the town had over 1,700 residents. Like most Cape towns, Orleans lost population (down to 1,300 by 1870) due to economic recession and downturn in the maritime professions around the Civil War period. But the completion of the Old Colony Railroad through Orleans by 1864 and its extension down-Cape through the 1870's assured Orleans of growth, servicing railroad trade and, more importantly, summer vacationers.

In the 20th century, vacation homes sprang up throughout Tonset and Nauset Heights and in scattered spots elsewhere. Since 1950, residential development for seasonal visitors, retirees, and residents drawn by Orleans' emerging commercial dominance, has spread throughout the Town. Its most dramatic impacts are perhaps seen on the Barley Neck Farm Fields, where the Town's best agricultural soils have been displaced, and in South Orleans, previously the least developed part of town.

Unlike most Cape towns, Orleans is so interwoven with coastal shoreline that it never had the extensive interior woodlands of other towns, such as Brewster and Eastham. These forests are associated with cheap land and provide areas for future municipal needs. For instance, the backwoods of Brewster in the rapid growth period of the 1980's not only accommodated large

developments, but also provided large land areas for town wellfields, public golf courses, a 1,000-acre conservation area (Punkhorn) and 100-acre industrial park. Orleans will never have this same opportunity for satisfying expansive future municipal needs. In the 1950's, Orleans did assemble the Cape's single largest town wellfield, approximately 500 acres, in its "backwoods" along Route 6, and purchased a second 14-acre wellfield on Quanset Road in 1986. Additional acreage for wellfields appears to be limited. Also, a 1986 "Community Development Plan" for Orleans likewise considered it "impractical" to look for land sufficient to create a future industrial park.

A scarcity of large tracts of vacant land means that Orleans must think small and creatively when it comes to planning, whether for open space or commercial development. Innovative infilling of existing business zones is more appropriate than development of new industrial parks. Likewise, expanding and linking existing conservation areas may be more useful than contemplating large purchases.

### **C. Population Characteristics**

Orleans population growth over the last decade has leveled off following thirty years of expansion (Figure 3). The Town's population effectively doubled between the years of 1970 and 2010 (3,000 to 6,000), an annual growth rate of 2%. Three decades of sustained rapid population growth placed a strain on all municipal services, including the Town's recreational facilities and open space. Orleans population peaked at 6,341 in 2000, declining to 5,877 by 2013<sup>2</sup>. Despite the current interval of stable population, the Town is expected to grow to over 10,000 residents by 2040.



*Fisherman's Landing at Crystal Lake*

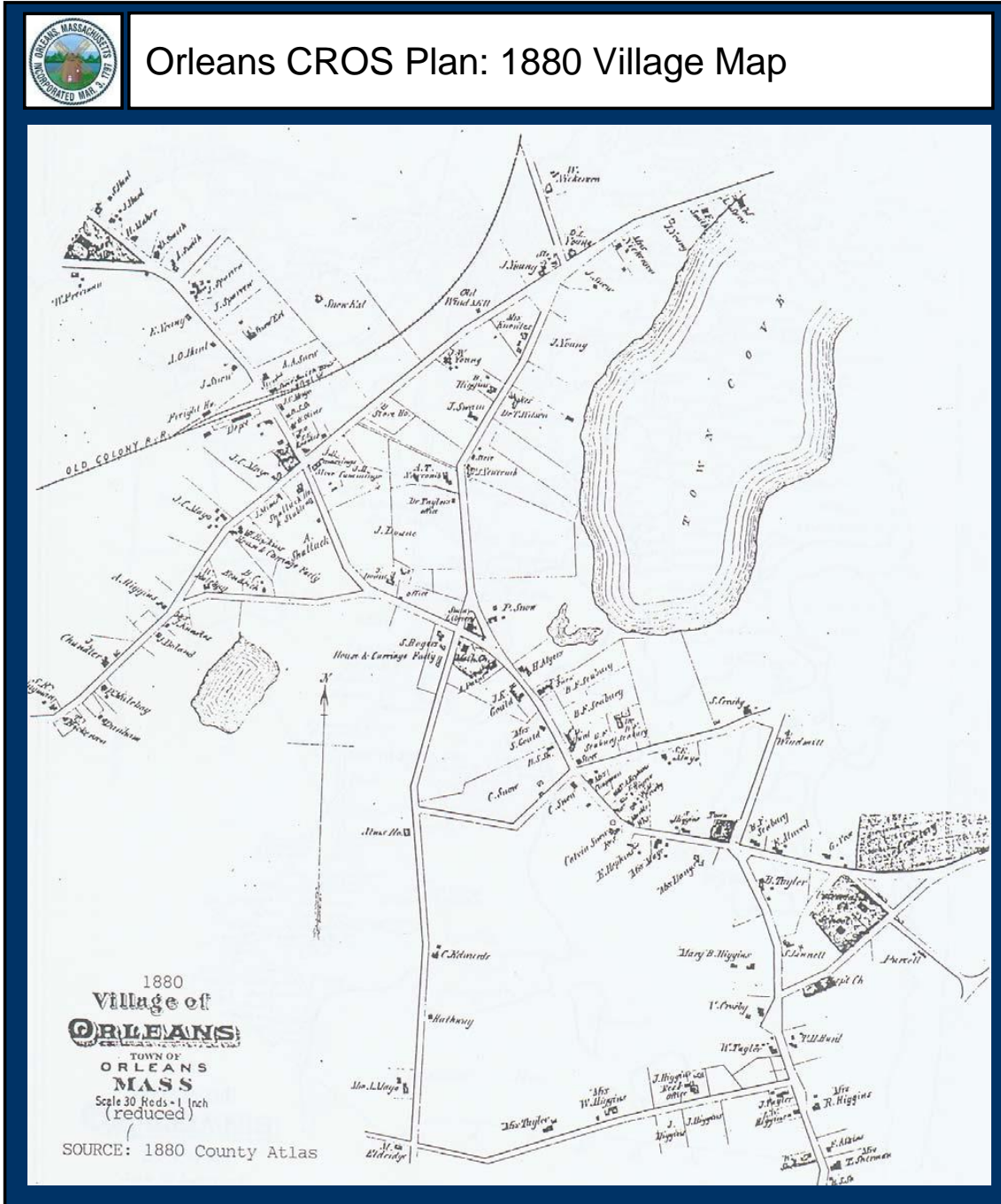
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<sup>2</sup> US Census Community Survey 2013 Estimate reported by StatsCapeCod, [www.statscapecod.org](http://www.statscapecod.org)

Figure 1: 1890 Town Map



Figure 2: 1880 Village Map



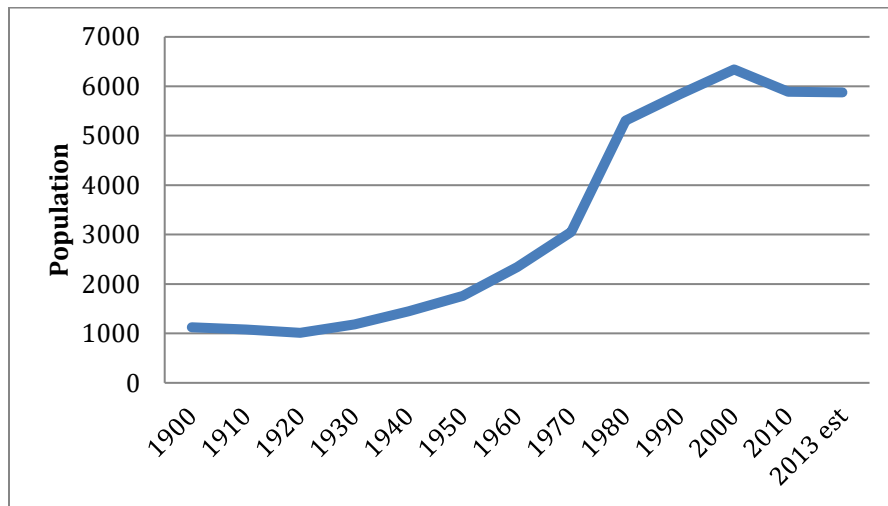
Orleans has a year-round population density of 415 persons per square mile, or .68 persons per acre. This is less than Barnstable County (545 persons/ sq. mi.) or the State (835 persons/ sq. mi.).

Median family income was \$64,861 in 2015, somewhat higher than Barnstable County (\$63,251) but lower than the State (\$68,563).

According to 2015 Census estimates, more than half of the jobs in Orleans re in the lower-paying retail and service sectors. Employment levels are affected by the seasonal economy, with the unemployment rate in 2016 fluctuating monthly between 2.5% in the summer to 6.3% in January.

It has been estimated that the seasonal population is approximately three times the year-round population. From a statistical viewpoint, Orleans has a higher percentage of year-round occupancy than most other Cape Cod towns. U.S. Census figures indicate that in 2010, 51% of homes were occupied all year. Orleans' has a higher retiree population, although the percentage of families with school-age children appears to be diminishing based on school enrollment trends.

Figure 3. Orleans Year-round Population 1900-2013



Data Source: Stats Cape Cod, [www.statscapecod.org](http://www.statscapecod.org)

The majority of the growth in Orleans has been associated with an influx of retirees. With a median age of 62.4 years<sup>3</sup> Orleans' population is the oldest in Massachusetts. There has also been a dramatic shift in wealth of residents, so that per capita income exceeds the state and county averages. However, not all households in the community are affluent. The northeast corner of Orleans bounded by Route 6A and Eldredge Parkway to the south, Cape Cod Bay to the East, Eastham to the north, and Town Cove to the west, is a mapped area of Environmental Justice populations (Map 2). This is considered an area of Environmental Justice because median annual household income in this area is below 65% of the statewide median income. Environmental Justice is based on the principle that all people have a right to be protected from environmental pollution and to live in and enjoy a clean and healthful environment. The CROS plan recognizes

<sup>3</sup> American Community Survey 2011. US Census Bureau

the need for households in this area to have safe and adequate access to a full range of open space and recreational opportunities that otherwise could be limited by income.

While recreational facilities of all types should be expanded to serve residents, particularly those in areas designated for Environmental Justice, Orleans' generally older population places priority on opportunities for passive recreation opportunities such as walking trails, scenic lookouts. The Orleans Local Comprehensive Plan establishes that sidewalks are a public priority. The 1999 Open Space survey and 2005 Planning survey corroborated these findings and emphasized a need for passive recreation over active recreational facilities. Similarly, the 2014 survey indicated that hiking/skiing trails, conservation areas, picnic areas and bike trails were of higher priority than playing fields, tennis courts or children's play areas by a factor of 2 to 1.

The economy of Orleans is still largely dependent upon the tourist trade. The largest employment sectors are wholesale and retail trade, services, and real estate/finance. Many of the jobs in these industries are directly related to the retiree population in the Town. There is a trend in the economy away from tourism and toward an increasing share of support services for retired residents. New home construction and renovation, predominantly for retirees and seasonal residents, is a major component of the local economy.

As stated previously, it is unlikely that industry or other large-scale commercial enterprise will enter the Town or consume huge chunks of open space. New businesses will be accommodated in existing business zones, clustered primarily along Route 6A and in the Orleans Industrial District. Remaining open spaces are more likely to be threatened by residential development.

#### **D. Environmental Justice Areas**

Map 2 shows an Environmental Justice (EJ) Area for most of the portion of Orleans that is west of Route 6A, the Cape Cod Bay side of the town. The EJ category is income, meaning that at least 25% of households in the area have an annual income that is at or below 65% of the statewide median.

The reasons for the designation of an EJ area can be understood as an outgrowth of local demographics. Orleans residents have the highest median age in the Commonwealth at 61.9 years. Many of the town's retirees live on fixed income, which generally do not keep up with inflation over time. However, in terms of property values, the EJ area is not low. Average assessed value of non-condominium properties in the area in FY17 was \$450,000.

The EJ area of Orleans contains 700 condominium units. These are generally smaller units than single family homes, many less than 1,000 s.f. of living area. Many long-time residents have made the choice to leave their home to move into a condominium due to proximity to shops and services, security, and limited property maintenance requirements. The average assessed value of condominium properties in the EJ area in Fy17 was \$260,000.

In its open space protection efforts, the Town of Orleans has successfully provided for the equitable distribution of environmental assets. The EJ area of Orleans contains all of the active recreation areas in the Town, including Eldredge Park, two playgrounds, and all of the local school field spaces. All of these areas are open to the general public except at times when athletic events are scheduled.

Town efforts to increase public open space within the EJ area include the development and protection of the Cape Cod Bay Seapath which runs for 3,000 feet along Cape Cod Bay to Namskaket Creek. Skaket Beach is a premier “bay-side” beach for families, and Rock Harbor serves as a Town park and informal bathing beach.

The Orleans section of the Cape Cod Rail Trail is located entirely within the EJ area of the town.

### **E. Growth and Development Patterns**

If development was once concentrated along a few main roads, it has since spread out to all corners of town. Despite marked growth over the past thirty years, Orleans has sought to retain a "small town" atmosphere that is valued by its citizens. The rural seaside charm is evident in views of historic homes, glimpses of salt ponds and marshes through the trees, and a few cranberry bogs. The building activity of the 1980's and 1990's resulted in the construction of more than 1,300 new single-family homes. Because most of these homes were built on 40,000 square-foot lots or larger, a suburban pattern has emerged in many parts of town. But even in and around neighborhoods there are remaining unspoiled natural areas. These are due primarily to the presence of wetlands and land preserved by the Town and the Orleans Conservation Trust, the Town's largest private landowner.

The zoning classification of Orleans is largely residential (Map 3). The R-40 District, which requires 40,000 square feet of land area per buildable lot, encompasses 90% of the community's upland. A business corridor extends along Route 6A from Brewster to the Eastham rotary. In recent years, the Town has reclassified significant portions of this area from General Business to Limited Business to avoid continued commercial sprawl. Small Rural Business Districts exist in South and East Orleans. The Town has an Industrial District of approximately 100 acres in size that provides numerous support services to residents and businesses.

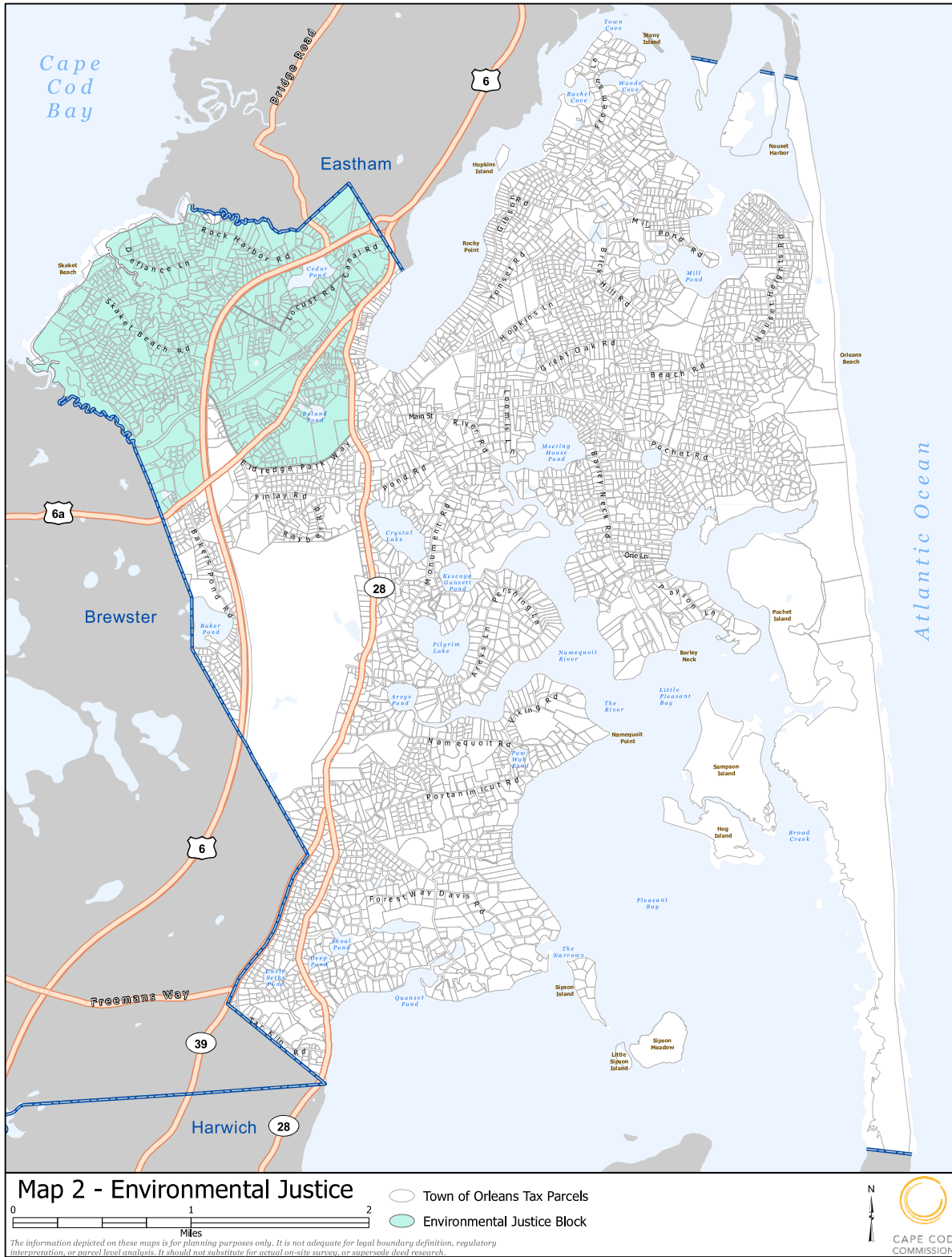
At this time, there is no sewer service in Orleans. All wastewater disposal is accomplished through private on-site septic systems or small treatment facilities. Lack of sewers has not hampered the spread of development, as most upland areas contain Carver coarse sands and pass percolation tests easily. Certain business uses have been curtailed due to state Title 5 requirements for new treatment systems, especially in the Village Center where lot sizes are small.

The major issue associated with sewage disposal in Orleans is the effect of nutrient loading on groundwater and coastal waters. Conventional septic systems effectively remove bacteria and most pathogens from sewage effluent prior to its release through a leaching area. They do not remove nitrogen to significant degree. Nitrogen, primarily in the form of nitrate, passes through the soil and into the groundwater table where it is transported in the path of groundwater flow. Eventually, the groundwater table reaches a place where it flows into and mixes with surface waters of a pond, wetland, or coastal area. Increased amounts of nitrogen in salt water ecosystems causes excessive plant growth and leads to eutrophication of the water body. For this reason, the Town developed a Comprehensive Wastewater Management Plan in 2008, and is now working through an extensive community-based process to finalize implementation and funding strategies. Extensive measures will be required to address the impacts of nutrient loading in ponds and estuaries and protect or restore high water quality throughout the Town.

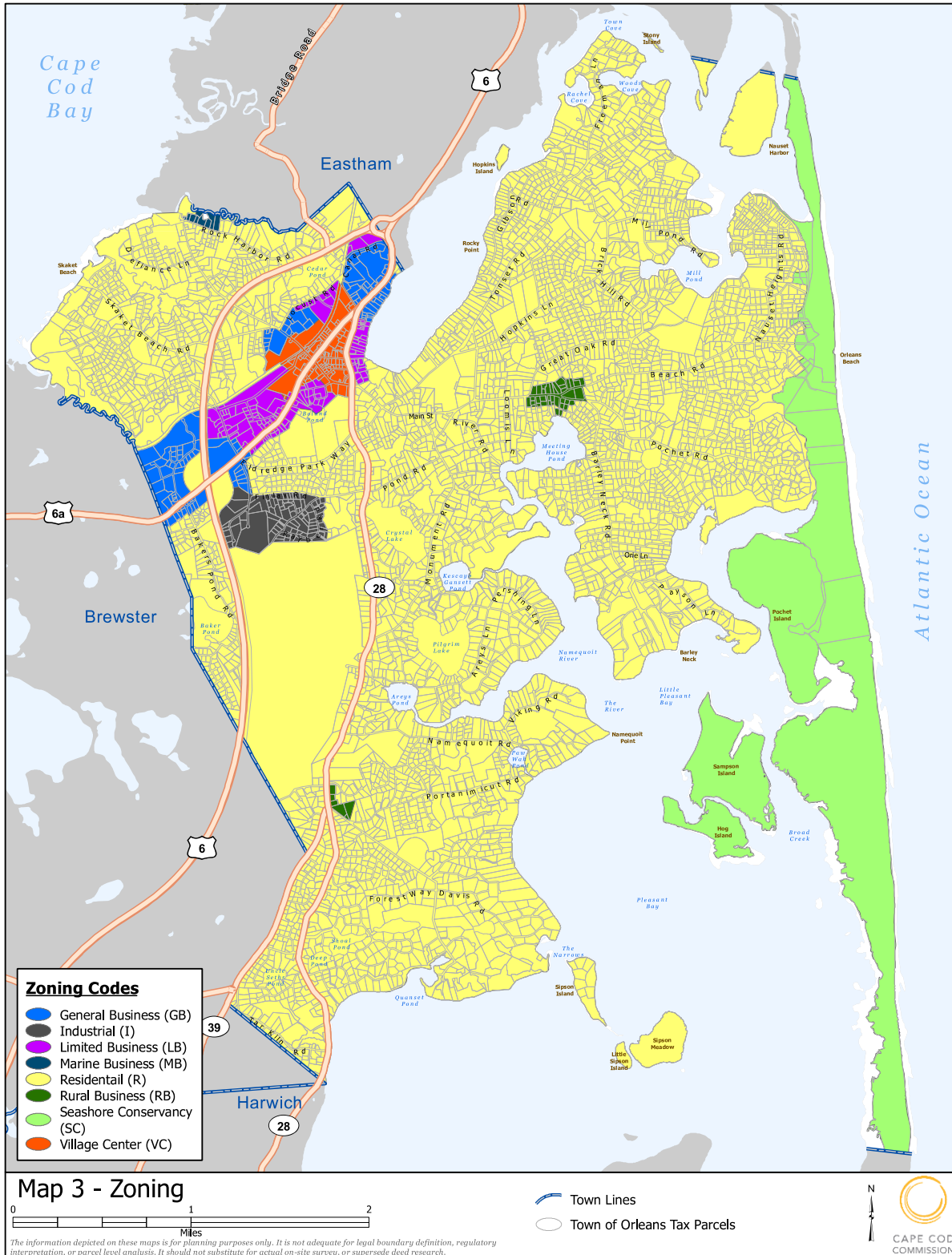
Town water service extends throughout town via more than one hundred miles of mains reaching ninety-eight per cent of buildings in town. Town regulations require new subdivisions to install public water. A 2014 *Water System Asset Management Plan* indicates several actions that should be taken in the future to ensure an adequate supply of water for public needs. The Town currently has eight wells in the public water system. Orleans withdraws its water from the Monomoy Lens, a shallow sandy sole source aquifer. Since there are no other sources available, protection of groundwater quality is of utmost importance.



*Shoreline View in Little Pleasant Bay*



Map 2 – Environmental Justice



Map 3 - Zoning

The existing road network provides access to most areas of the Town. There are approximately one hundred eighteen miles of roads in the Town, of which fifty-three miles are publicly accepted roadway. The Cape Cod Rail Trail runs through the center of Orleans, providing commuting and recreational opportunities. In addition, the Town has designated 7.5 miles of local bike routes, which cross the Town from Rock Harbor to Nauset Beach.

Sidewalks are provided on Eldredge Park Way, providing pedestrian access to Town athletic fields and playgrounds. Pedestrian opportunities abound with the Town's many beaches and open space areas. The Town is bisected by the Cape Cod Rail Trail, a multi-purpose dedicated pathway that runs from the Mid-Cape area to Wellfleet. In addition, the Board of Selectmen have designated several roadways as bike paths, and have increased signs and pavement markings to improve user safety.

Natural gas service is provided through a private utility, although a current moratorium on new natural gas hook-ups is expected to be in effect until 2019. Electric services are readily available through the Cape Light Compact, a multi-town energy consortium, as well as from competitive suppliers.

The Town must assume, therefore, that development will continue to consume remaining open space. The 2004 Orleans build-out analysis, completed by the Planning Department for the Local Comprehensive Plan Update, concludes that over 1,300 new dwelling units could be constructed in Orleans, along with more than three hundred accessory apartments. This would represent a 38% increase in the number of homes. This represents an anticipated build-out based on past growth trends; maximum allowable build-out could be even greater, particularly if new village center zoning under consideration in 2016 is adopted. The effect of either build-out development scenario would severely reduce open space in the community and diminish the semi-rural character that residents now enjoy. Other impacts would include increased traffic congestion, stress on public services, and potential impacts to environmental resources. It is therefore in the best interests of residents that significant efforts to preserve open space be continued to protect strategically targeted areas to the greatest extent possible.

Citizens' strong desire to protect open space has been demonstrated by Town Meeting votes to purchase more than \$15 million worth of conservation and recreation land between 1987 and 2005. The Town received more than \$3 million in state and federal grants, as well as private gifts, towards these purchases. Between 2006 and 2015, the Town spent \$7.8 million to purchase an additional 39.7 acres of open space, including 223 Beach Road to be used for future parking needs at Nauset Beach. The pace of development has increased and some observers would suggest that Cape Cod real estate development will be less prone to a downturn than other regions because of the desirability of seasonal and retirement homes and the finite amount of available space on the Cape. Residents definitely feel their quality of life is being threatened by development, and have expressed a willingness to preserve land from development wherever possible.

Orleans has been one of the more active towns on Cape Cod in educating residents about the benefits of preserving open land. It was one of the first towns to establish an Open Space Committee, by Town Meeting action in 1985. Orleans citizens' consensus for protecting land was reflected in its vote in November 1998 for the Cape Cod Land Bank in which its voters supported it with a 71% plurality, the highest percentage of all fifteen towns on Cape Cod. Furthermore, in

2005 the Town adopted the Community Preservation Act and enabled a Community Preservation Committee that took the place of the Land Bank. The Community Preservation Committee is responsible for disbursing Community Preservation Act funds for open space protection, affordable housing and historic preservation.

## **SECTION 4 - ENVIRONMENTAL INVENTORY AND ANALYSIS**

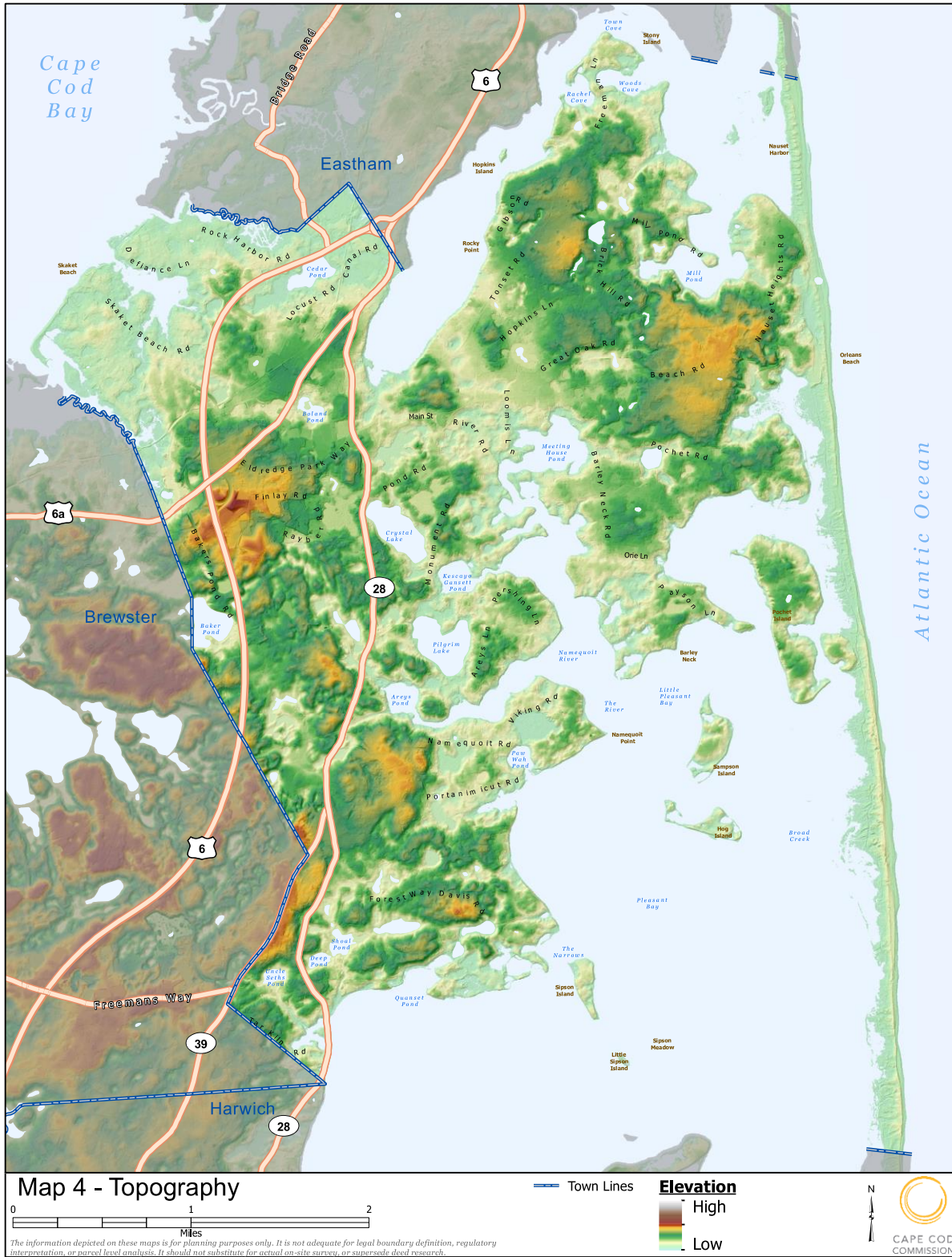
### **A. Geology, Soils, and Topography**

Orleans lies at the confluence of two different glacial lobes: Harwich outwash plain on the west and the south, and the Nauset Heights plain on the east. The Town is generally lower in elevation than other Cape municipalities. The highest ground is along Route 6 (Mill Hill at the Route 6A interchange is 120 feet high). The Cape Cod Bay shoreline is very low and susceptible to coastal flooding and high storm winds. Orleans Center and East Orleans are generally flat at elevations below fifty feet, though there are some steep bluffs toward the saltwater shorelines at Town Cove, Nauset Heights and Pochet and Barley Necks. South Orleans is more irregular, having the characteristic knob and kettlehole landscape found elsewhere on the Cape. (Map 4)

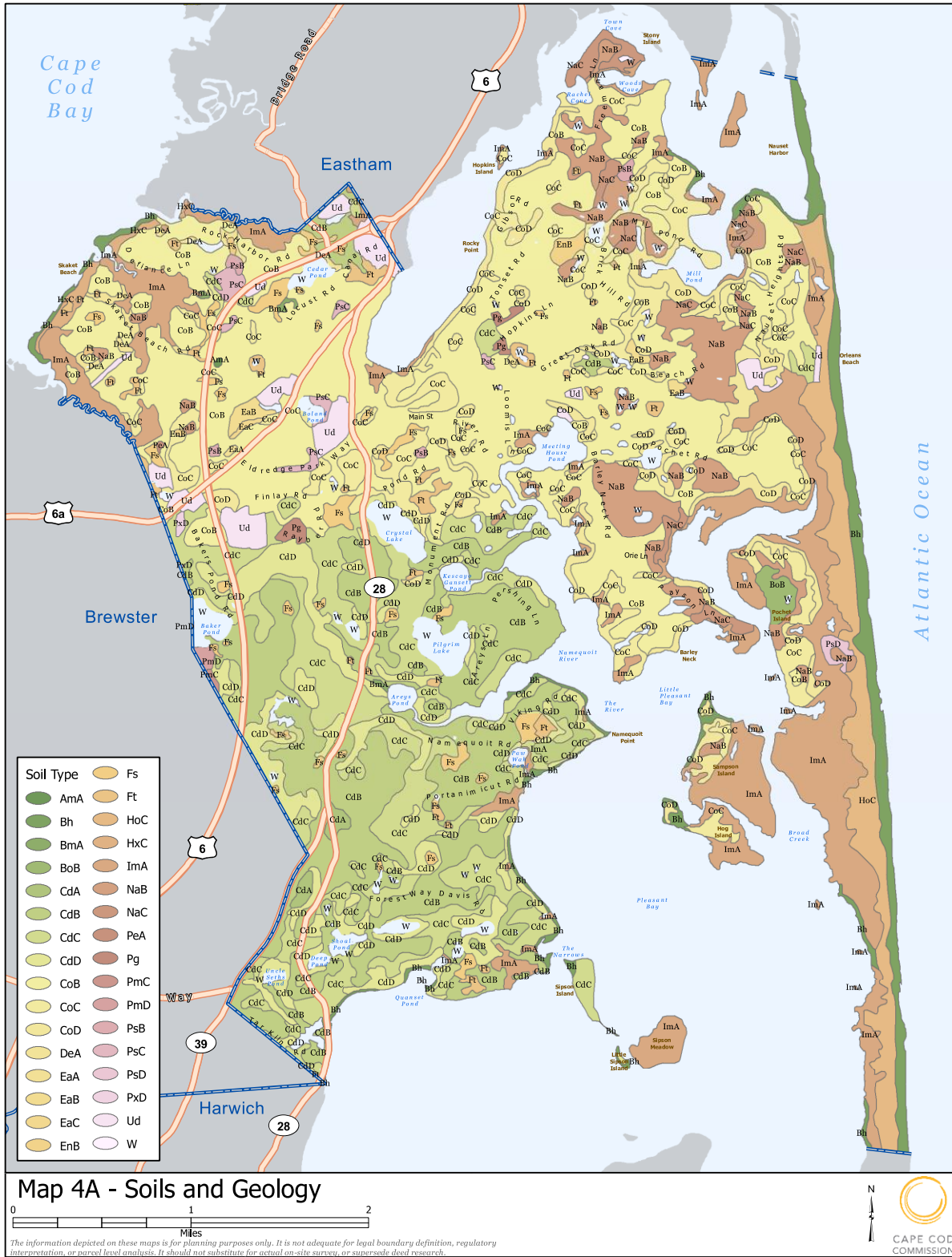
Most of the soil throughout town is derived from glacial deposits, consisting of coarse sands, sandy loams and gravel, with intermittent clay layers in some locations. Topsoil is generally thin and friable. The exception is East Orleans, particularly Barley Neck, Tonset and Nauset Heights where pockets of soil of prime, state or local importance for agriculture are found. Most of these sites have been consumed by residential development in the past thirty years. Peat from organic sources can be found in low areas around bogs, swamps and marshes. Barrier beaches composed of dune sand are extensive at Nauset Spit and Namskaket.

Surficial geology of Orleans determines natural communities and has an influence on human development in the Town. (Map 4A) The Town's sandy soils drain rapidly, which has implications for subsurface sewage disposal under Title 5. The minimum distance to groundwater for a septic system located in fast draining soils is five feet (310 CMR 15.212), which limits development potential on parcels unable to meet the standard. The higher depth to groundwater is required since fast draining soils would otherwise allow contaminants from wastewater to reach the aquifer before biological and chemical cleansing in the soil can occur.

Environmental conditions can limit the development potential of raw land, but cannot be relied on solely to limit growth. The presence of wetlands and jurisdictional setbacks tend to limit but not prevent parcel development. Likewise, soils and topography can be limiting factors, as can be depth to groundwater, but these can be addressed in many cases through engineering. Comprehensive Permits pursuant to MGL Ch. 40B, which allow more dense development of housing for which 25% of the units are deed restricted as affordable, are increasingly sought for environmentally sensitive parcels. For all of these reasons, reliance on constraints imposed by regulations intended to protect the environment is not a viable approach for retaining open space or preserving natural resources in Orleans.



Map 4 - Topography



Map 4A – Soils and Geology

## **B. Landscape Character**

Orleans' natural landscape is defined largely by its coastline and water resources. (Map 5)

The most appealing aspect of Orleans' landscape is its forty-five miles of coastal shoreline. The human eye delights in scenes where land meets water, and it does so in Orleans with dramatic frequency and variety. According to a 1985 Massachusetts Coastal Zone Management study, Orleans has 1,377 acres of salt marsh, second only to Barnstable on Cape Cod. The broad sweep of these "meadows", as the colonists knew them, is breathtaking from the Rail Trail at Namskaket or from boats on Pleasant Bay. The scene at Nauset Beach is bolder, with frequent large waves breaking in a curl down the long beach.

The more intimate shoreline scenes are prized as well, such as the winding, narrow channels of The River or the keyhole harbors at Quanset, Paw Wah, Arey's and Kescayogansett (Lonnie's) Ponds. The large tidal range (ten feet on Cape Cod Bay, three to four feet elsewhere) assures a varied viewing experience from the same location throughout the day.

A 1991 report from the International Countryside Stewardship Exchange found that Cape Cod residents should be encouraged to keep some of their "secret places" secret, so that these quiet, private, open spaces are not overrun by tourists. In order to preserve "secret places," however, the Town must ensure that there are adequate open space facilities, such as beaches, to accommodate the Town's large numbers of visitors.

The Town's aggressive land acquisition campaign of the 1980's and 1990's reflects the community's desire to preserve access to these vistas and views. Three of the most popular purchases—Kent's Point, Paw Wah Point and Sea Call Farm—offer scenic vistas from bluffs overlooking salt water, and each is picturesque. Orleans' many boaters benefit by preserving, as much as possible, the natural qualities of the shoreline they admire from the water. To better preserve the appearance of the shoreline, construction setbacks from bluff tops are required by zoning and a Conservancy District prohibits new non-water dependent structures below the four-foot contour.

The scenic quality of the Orleans' coastline was underscored in the 1983 "Massachusetts Landscape Inventory", conducted by the Department of Environmental Management. That survey classified Nauset Beach as a "Distinctive" landscape (the top category statewide, including only four per cent of the Massachusetts land mass) and the Cape Cod Bay shoreline, Nauset Marsh and most of Pleasant Bay as "Noteworthy" (the second highest ranking, consisting of only five percent of the statewide land mass.)

Slightly more than half of the Pleasant Bay Area of Critical Environmental Concern (ACEC), and a third of its watershed land area, is located in Orleans. The ACEC encompasses five freshwater ponds, including two Great Ponds, which are hydrologically connected to the Bay system. The Bay is a major scenic, ecological and recreational resource area in Orleans. Protection of land within the Pleasant Bay watershed has been a significant focus of the Town and the Orleans Conservation Trust.



Map 5 – Unique Features

From 1995 to 2000 the Orleans Open Space Committee, in cooperation with the Commonwealth, focused its efforts on the acquisition of rights to protect for public use the shoreline on Cape Cod Bay between Namskaket Creek at the Brewster Town line and Orleans' Skaket Beach. Since 1994, the "Sea Path" project involving the Town, Barnstable County and Commonwealth helped to protect an estimated 2,410 feet of shoreline and habitat. Town efforts have contributed significantly to extending the "Sea Path" coastal walking path from Brewster's Nickerson State Park lands toward Eastham and Wellfleet. These acquisitions have been as follows:

- Alemian: a town-acquired Conservation Restriction over 3.97 acres, dunes and upland, with 330' bayfront. A Self-Help Grant of \$156,000 assisted in this purchase.
- Hamilton: 0.91 acres with 355' bayfront, in fee gift to the Town by Community of Jesus.
- Gavigan: 1.00 acre with 350' bayfront with rental cottages in fee by the Commonwealth DEM for \$525,000, coordinated with the Town.
- Gavigan: 1.92 acres off the Bay for wildlife corridor from Bay to interior wetlands and marsh. In fee \$325,000 by the Town.
- Furst: 17.00 acres with 1,375' bayfront and fragile dune and wetlands bordering Namskaket Creek and running north to the Alemian 1994 Conservation Restriction.

The acquisitions listed above have protected almost twenty-five acres, providing safeguards for an important, fragile barrier beach at the southeast corner of Cape Cod Bay and guaranteeing coastal walking opportunities in perpetuity. The most recent acquisition (Furst) received the endorsements of the Town of Brewster, the Cape Cod Commission, and the Association for the Preservation of Cape Cod, the Massachusetts Audubon Society, and the Department of Environmental Management.

## **C. Water Resources**

### 1. Watersheds

Watershed-based planning to preserve the health and quality of Orleans marine waters was just getting underway when the 2006 CROS was approved. Since that time, the Town has devoted significant resources and promoted public involvement in town-wide watershed planning.

The total land area of Orleans is divided among four major marine watersheds that coincide with readily identifiable marine resource areas: Nauset Estuary, Pleasant Bay Estuary, Cape Cod Bay and Atlantic Ocean. The first three watersheds, Nauset, Pleasant Bay and Cape Cod Bay, have been the subject of significant analysis and planning efforts by local, state and regional agencies to address excessive inflows of nutrients from watershed sources into marine waters. Each of these watersheds has been further delineated into subwatersheds of smaller water bodies and other sensitive receptors such as wellheads within the respective major watershed. Total Maximum Daily Loads (TMDLs) for Total Nitrogen have been certified by the US Environmental Protection Agency and Massachusetts Department of Environmental Protection, for multiple subembayments within each major watershed. The TMDLs provide planning targets for reducing the amount of total nitrogen entering these marine waters. The Town has been engaged in a multi-year effort to develop a program to achieve the nutrient reduction targets. A Comprehensive Wastewater Management Plan was adopted by Town Meeting in 2010 and, as previously noted, a community planning effort is underway to refine implementation and funding strategies. Orleans shares its

marine watersheds with surrounding towns, and so planning to address nutrient loading is being undertaken in a regional framework involving all watershed towns as well as state and regional agencies. More information about surface water quality is provided below.

## 2. Wetlands

Wetlands, both fresh and saltwater types, provide supporting habitat for most of Orleans' wildlife. Orleans contains an abundant diversity of wetlands, in type, size and distribution, scattered evenly throughout the Town. (Map 6A)

Orleans has 151 acres of freshwater wetlands, fifteen acres of cranberry bogs and 994 acres of saltwater wetlands. A 1985 Massachusetts Coastal Zone Management Study identified 1,377 acres of salt marsh in Orleans. (This difference in salt marsh acreage figures is due to differences in methodology, not loss of habitat.) Orleans has more salt marsh than any other Cape Cod town except Barnstable, a town four times its size. A salt marsh's high biomass makes it excellent habitat for birds, shellfish, and finfish nurseries.

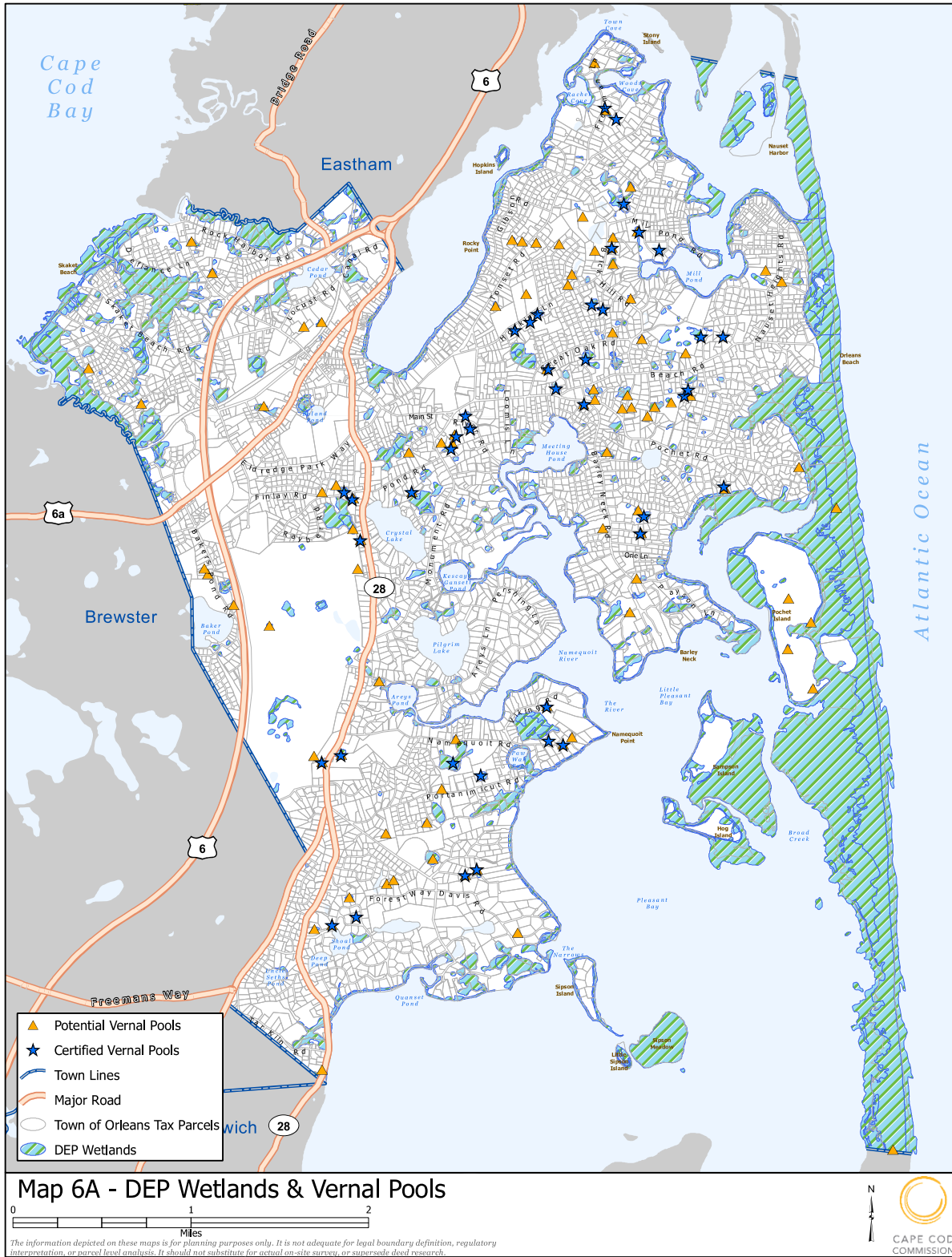
As with Orleans' ponds, most freshwater wetlands are dependent on water table fluctuations, rather than surface runoff, to ensure the soil saturation necessary for wetland plants. Wetlands are found everywhere including land at low elevations, perched locations, close to the water table, and the sand and gravel soils readily transmit groundwater through wetlands. Wetlands play an important role in filtering out contaminants from stormwater and reducing flooding during storms.

Two wetland types not previously mentioned include cedar swamps and vernal pools. The 1990 Critical Habitats Atlas for Cape Cod identifies six separate wetlands dominated by Atlantic White Cedar in Orleans. These forested wetlands are highly acidic and are uncommon throughout the Cape. These areas were once much more extensive before the trees were harvested in earlier centuries as lumber and to make way for agriculture. Most of the swamps are privately owned. The Orleans Conservation Trust owns a six-acre cedar swamp located at the head of Little Namskaket Creek; and the Town owns a 8.9 acre bog (Christian Bog) in South Orleans.

In 1998 the Town participated with the Orleans Conservation Trust in the protection of the 22.5-acre Namequoit Bog in South Orleans. The Trust purchased the Bog, including three upland lots, in a bargain sale for \$185,000. Town Meeting approved the use of \$100,000 of Open Space Land Bank funds to buy a Conservation Restriction from the Trust in order to complete the acquisition. The area is an important recharge area bordering on Pleasant Bay.

At a November 1998 Special Town Meeting approval was received for the acquisition of the 7.85-acre Christian parcel and 8.9-acre bog for protection of mainly the upland habitat and maintenance of a wildlife corridor. The purchase helps to protect an Atlantic white cedar swamp on the property. A Self-Help Grant of \$250,000 was received to aid in the purchase of this valuable piece of open space.

Vernal pools were officially recognized as critical habitat in 1987 when the Massachusetts General Court amended the Wetlands Protection Act to include their protection. These small temporary ponds are crucial breeding grounds for woodland amphibians, such as wood frogs and salamanders. Orleans has forty-one State-certified vernal pools.



Map 6A – DEP Wetlands & Vernal Pools

Orleans also has extensive tidal flats on Cape Cod Bay extending a mile or more from the high tide mark on the shore. The broad tidal flats of Cape Cod Bay are an important recreational resource in the Town. The flats off Skaket are popular for activities ranging from shellfishing to walking to kite flying.

### 3. Groundwater Resources

In 1982 the U.S. Environmental Protection Agency designated all of Barnstable County as a Sole Source Aquifer in recognition of the region's complete reliance on groundwater as its potable water supply. Orleans is served by the Monomoy Lens, one of six discrete components of the aquifer. This lens provides water for the towns of Yarmouth, Dennis, Harwich, Brewster and Chatham as well. Orleans recognizes that inter-town cooperation is needed to manage the quantity and quality of this aquifer, and that uses of land outside town borders may have a direct impact on water quality of the public water supply wells.

Cape Cod receives an annual average of approximately 46 inches of precipitation. Of that amount, about 16 inches reach the water table underground to replenish or "recharge" the aquifer. The freshwater lens in Orleans is most substantial along the Brewster town line between Routes 6 and 28, which is also where the Town's major watershed and public supply wells are located.

The most serious development-related threat to groundwater in Orleans, nitrate pollution, is a non-point source of pollution that is being addressed through comprehensive wastewater planning in Orleans. When nitrogen in the form of nitrates enters groundwater, it does not breakdown, but is carried through the water table, eventually coming out in a water body. The largest watershed source of nitrate form of Nitrogen is onsite septic systems. Town-wide, 97% of wastewater generated is from onsite Title 5 septic systems. Other watershed nitrogen sources include fertilizer, wastewater treatment facilities, landfills, and stormwater. Natural sources include atmospheric deposition, and nitrogen that accumulates in bottom sediments of surface waters. Due to the diffuse nature of its sources, nitrogen is considered a non-point source pollutant. Containing a non-point source pollutant is more difficult than one that is from a point source where the flow of a pollutant from a single outlet needs to be contained.

Nitrates are a known contaminant to drinking water, and at high levels cause human health problems, including so-called "blue baby" syndrome. A 1987 study found that concentrations of nitrate in Orleans' wells were very low and almost undetectable at some points. Local regulations limit the number of bedrooms per acre in the Zones of Contribution (or recharge areas), which should help protect the town water supply from future contamination. Orleans' Zone of Contribution to its major wellfield has among the highest percentage of protected open space of any on Cape Cod. The Town owns 500-acre town water supply recharge area. The Town has continued to acquire land in the Zone of Contribution, and this effort should continue in the future. In addition, the 1800-acre Nickerson State Park in Brewster protects groundwater serving Orleans' wells, as does the Natural Resource Protection District adopted by Brewster.

Orleans' public drinking water supply wells and wellhead protection area is located in South Orleans. (Map 6B) Orleans' wells currently test below the state standard for sodium of 20 parts per million (ppm) and do not pose a health risk for this parameter. A range of 10 to 15 ppm is typical for Orleans' wells and the Cape-wide average is 13 ppm. Concerns have surfaced, however, about the possibility of saltwater intrusion at the Quanset Wellfield (#7) if it is not pumped judiciously.

The recharge area to the municipal water supply provides other benefits besides groundwater protection. It contains five small ponds (Gould Pond and a second unnamed pond nearby, Wash Pond and two seasonal ponds), which support coastal plain pond shore rare plant habitats. The area contains an extensive upland pine/oak forest. Though public recreation is not sanctioned, informal access is used by bicyclists, joggers, hikers and hunters.

#### 4. Salt Water Bodies

As previously discussed, the Town's landscape character and salt water shoreline are the primary focus of outdoor recreational activities and form the background for the Town's tourist-based economy. Popular swimming, fishing, shellfishing, and boating activities are fairly evenly spread throughout the Town's four primary marine areas: Pleasant Bay, Cape Cod Bay, Nauset Harbor/Town Cove, and the Atlantic Ocean.

##### *Beaches*

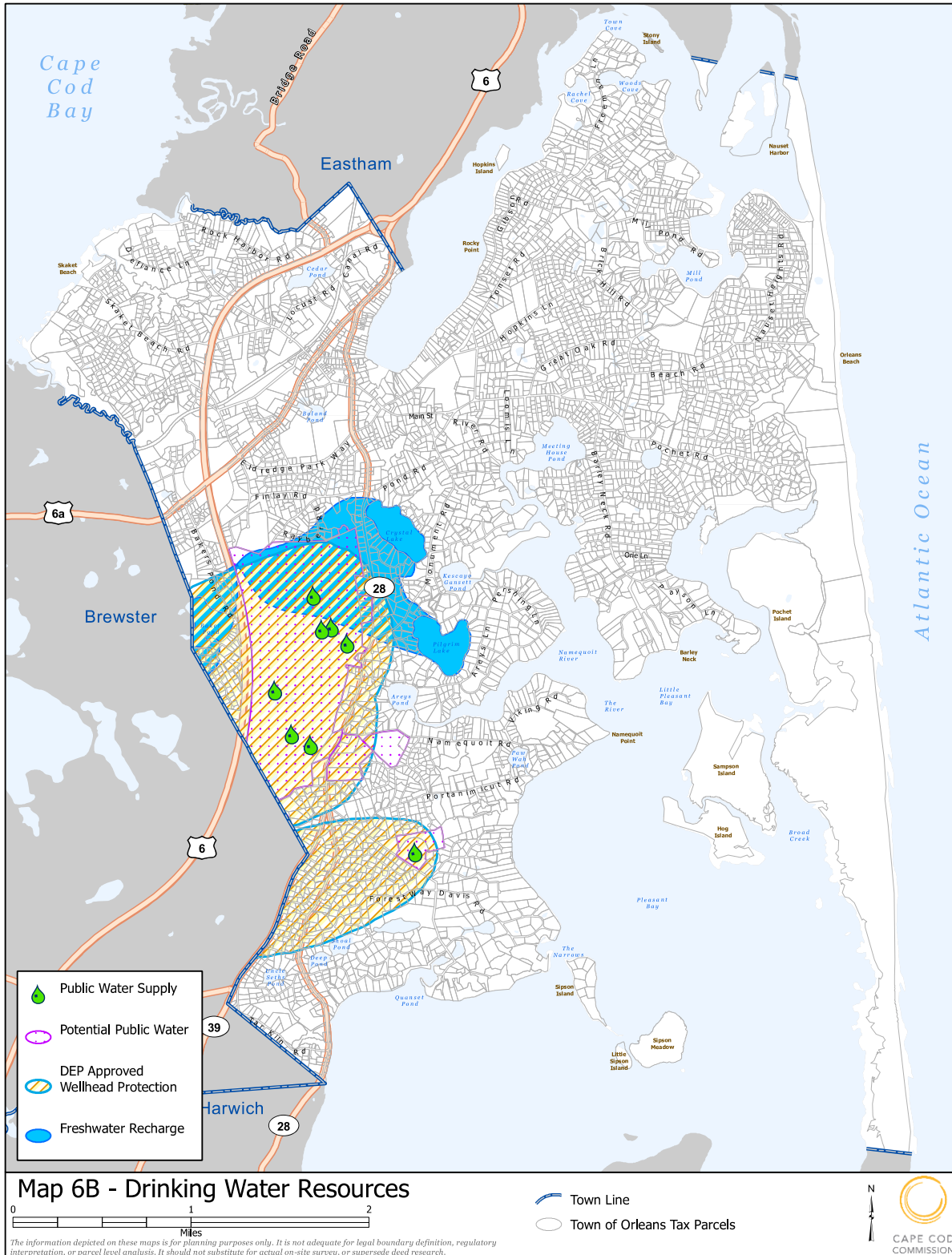
Major town bathing beaches—Nauset and Skaket—offer varied and complementary experiences to beach goers. Nauset Beach is an open ocean beach characterized by heavy surf and is frequented by surfers and others who desire a more dramatic ocean beach setting. Skaket Beach on Cape Cod Bay is more quiescent and offers extensive tidal flats extending from shore due to greater tide range. South Orleans landing on Pleasant Bay provides a popular alternative for beach goers although it is not a designated beach and does not offer lifeguards or facilities.

##### *Fishing and Shellfishing*

Surfcasting for bluefish and striped bass is a popular pastime along Nauset Beach. Recreational fishermen use the town beach as well as more remote areas of the barrier beach accessible by foot or off-road vehicles (ORV). The northern section of Nauset Beach has strict ORV limits imposed to protect nesting piping plovers and rare species of terns, which are also protected on the stretch between the town beach parking lot and the Chatham border. Bottom fishing, especially for flounder and eels, is popular both in Pleasant Bay and Town Cove. Recreational and commercial shellfishing is allowed by permit in Nauset Estuary, Pleasant Bay Estuary and Cape Cod Bay. Permit holders are given a map of areas open for taking of shellfish depending on the year and water quality conditions. For example, Town Cove in Nauset Estuary experiences Red Tide blooms each year.

##### *Town Landings and Mooring Fields*

There are twenty-nine town landings in Orleans providing access to marine waters. Eight of these have ramps for boat launching. The Town has completed the process of having all town landings surveyed, and an improvement program is underway. Most town landings are small, with some only the width of a roadway, and have limited parking. Seasonally, town landings are frequently congested, as they provide the only public access to town mooring fields. Primary mooring fields are located off of landings in Rock Harbor (the only dredged boat basin), Town Cove, Pleasant Bay, and Meetinghouse Pond, while smaller mooring areas are found at Nauset Harbor's Snow Shore and Mill Pond, and the Pleasant Bay salt ponds: Lonnie's, Paw Wah, Quanset and Arey's Ponds. Waiting lists exist for all town moorings locations, with an approximate wait time of eight to ten years. The Town currently maintains forty-three slips for recreational vessels and twelve slips for commercial vessels within Rock Harbor on Cape Cod Bay. There are also three private marinas that offer mooring and dockage in Meetinghouse Pond, Arey's Pond and Town Cove.



Map 6B – Drinking Water Resources

## 5. Surface Water Quality

All of Orleans' waters are generally of high quality, although water quality problems exist in some marine and fresh water bodies. Excessive nutrient loading leading to low dissolved oxygen is the primary concern in estuaries and ponds. TMDLs for Total Nitrogen have been established for Cape Cod Bay, Pleasant Bay and Nauset Estuary. Among freshwater bodies, Cedar Pond has a water quality problem caused partially by an overabundance of droppings from roosting birds. The Town has several comprehensive efforts underway to monitor water quality and is working to address these and other water quality issues of concern through a Comprehensive Water Resource Management Plan.

Water quality data are collected annually throughout Pleasant Bay and Nauset Estuary, and also in several freshwater ponds. These data have supported studies to assess water quality conditions and develop nutrient management plans. For marine waters these studies include the Massachusetts Estuaries Project Technical Reports, statistical trend assessments by the Pleasant Bay Alliance, and work conducted by the Cape Cod Commission in connection with the Section 208 Area-wide Water Quality Management Plan Update. Freshwater monitoring has been undertaken by the Orleans Water Quality Task Force, and Cape Cod Commission's Pond and Lake Stewardship Program. These data and analyses support efforts to achieve TMDLs for total nitrogen in marine waters, address excessive phosphorous and bacterial concentrations in freshwater and, generally, to support the State surface water quality standards.

The Massachusetts Surface Water Quality Standards (314 CMR 4.00) of the Department of Environmental Protection lists all of the marine waters of Orleans as Class SA, the top salt water ranking, meaning they are "designated as an excellent habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation." Class SA waters also have excellent aesthetic value.

All of Orleans' freshwater bodies are considered class B, suitable for "wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation."

State water quality standards also identify a category of Outstanding Resource Waters, which include class SA and B waters. These waters "...are designated for protection as Outstanding Resource Waters under 314 CMR 4.04(3)." For instance, all fresh and marine water bodies within the Pleasant Bay and Cape Cod Bay Areas of Critical Environmental Concern are designated as Outstanding Resource Waters deserving of special protection from pollutant discharges among other concerns. Table 1 shows water quality standards and Outstanding Resource Waters designations as they apply to Orleans waters.

**Table 1 Surface Water Quality Standards and Classifications for Orleans Waters**

Boundary	Class	Qualifier
Namskaket Creek, Little Namskaket Creek, Rock Harbor Creek, Boat Meadow River and Herring River	SA	Outstanding Resource Water
Pleasant Bay and tributaries thereto: Namequoit River, The River, The Horseshoe, the Narrows, Frostfish Cove, Hog Island Creek, and Broad Creek portion of the Pleasant Bay ACEC	SA	Outstanding Resource Water
Quanset Pond, Arey’s Pond, Kescayogannsett Pond, Meetinghouse Pond	SA	Outstanding Resource Water
Pilgrim Lake, Crystal Lake, Uncle Seth’s Pond, Sarah’s Pond, Gould Pond,	B	Outstanding Resource Water

Source: 314 CMR 4.06, Table 26

**6. Fresh Water Bodies**

There are no navigable freshwater rivers or streams in Orleans, though there are small, shallow fresh headwaters of estuarine creeks, such as at Pochet and Namskaket. The Town's primary freshwater resources are its sixty-three ponds and lakes, with a total area of 220 acres. (Table 1) Most of these ponds are small in size, and only four of these ponds are greater than ten acres in size, which classifies them as Great Ponds of the Commonwealth. Great Ponds are considered waters of the Commonwealth protected under the Public Trust Doctrine. As waters of the Commonwealth, Great Ponds provide public access, while other ponds can be owned privately by surrounding landowners and public access can be prohibited. Orleans' Great Ponds are Bakers and Cedar Ponds, and Pilgrim and Crystal Lakes. The Town’s 1987 purchase of one acre at the south end of Crystal Lake (Dickinson Memorial Beach) has provided handicapped access to a small beach there.

Town landings exist at Pilgrim and Crystal Lakes. Not surprisingly, these ponds are some of the more extensively used ponds for recreation, boating, swimming, and fishing. The Recreation Commission sponsors swimming classes at Pilgrim Lake as well as at Meetinghouse Pond, a saltwater estuarine pond, each summer. Massachusetts Division of Fisheries & Wildlife considers Crystal Lake and Baker's Pond as Public Recreational Fisheries and stocks the water bodies with trout each year.

The ponds in Orleans are classic kettlehole ponds, formed as deep depressions in the glacial outwash left by stagnant ice blocks. Water depth in Baker's Pond is nearly fifty feet. Some ponds are connected to marine waters. Crystal Lake, Pilgrim Lake, Gould Pond, Uncle Seth’s, Sarah’s Pond and Meadow Bog all are hydrologically connected to the Pleasant Bay estuary and are part of the Pleasant Bay Area of Critical Environmental Concern. Cedar Pond is connected to the Rock Harbor estuary on Cape Cod Bay. However, the majority of ponds are isolated; that is, they do not drain to the sea, and all ponds are fed primarily from groundwater inflows. The surface level of such ponds is dependent on the fluctuation in the groundwater table, and often expose a wide shore during the summer when the water table is low. These exposed shorelines comprise the unique habitat called "Coastal Plain Pond Shores" which harbor rare and endangered plants, such as Plymouth gentian and long-beaked bald rush. Pond shores of prime importance for rare plants include Baker's, Gould's, Uncle Israel's Ponds and the Old Swamps Pond. Other ponds with

hydrological connections to marine waters such as Cedar Pond and Pilgrim Lake also host important anadromous fish (herring) runs.

**Table 2: Orleans Pond Inventory**

<b>Selected Pond Characteristics, Town of Orleans</b>				
<b>Ponds</b>	<b>Acreage</b>	<b>Depth</b>	<b>Activities</b>	<b>Access</b>
<b>Baker's Pond</b>	<b>28</b>	<b>60</b>	<b>Boating, hunting, swimming, passive rec.</b>	<b>Town beach</b>
<b>Boland Pond</b>	<b>6</b>	<b>20</b>	<b>Passive rec.</b>	<b>School</b>
<b>Cedar Pond</b>	<b>17</b>	<b>10</b>	<b>Passive rec.</b>	<b>Informal</b>
<b>Crystal Lake</b>	<b>36</b>	<b>45</b>	<b>Boating, fishing, swimming</b>	<b>Town ramp &amp; beach</b>
<b>Deep Pond</b>	<b>4</b>	<b>20</b>	<b>none</b>	<b>Private</b>
<b>Gould Pond</b>	<b>6</b>	<b>15</b>	<b>none</b>	<b>Watershed</b>
<b>Old Swamp Pond</b>	<b>6</b>		<b>none</b>	<b>Watershed</b>
<b>Pilgrim Lake</b>	<b>39</b>	<b>30</b>	<b>Boating, hunting, fishing, swimming</b>	<b>Town beach</b>
<b>Sarah's Pond</b>	<b>6</b>	<b>18</b>	<b>none</b>	<b>Private</b>
<b>Shoal Pond</b>	<b>7</b>	<b>6</b>	<b>none</b>	<b>Private</b>
<b>Twinings Pond</b>	<b>8</b>	<b>15</b>	<b>Passive rec.</b>	<b>Private</b>
<b>Uncle Harvey's Pond</b>	<b>6</b>	<b>20</b>	<b>Boating, passive rec.</b>	<b>Cons. Comm.</b>
<b>Uncle Israel Pond</b>	<b>1</b>		<b>none</b>	<b>Private</b>
<b>Uncle Seth's Pond</b>	<b>5</b>	<b>6</b>	<b>none</b>	<b>Private</b>
<b>Wash Pond</b>	<b>1</b>		<b>none</b>	<b>Watershed</b>
<b>Meadow Bog</b>	<b>1</b>	<b>4</b>	<b>fishing</b>	<b>Informal</b>
<b>Ice House Pond</b>	<b>2</b>	<b>20</b>	<b>fishing</b>	<b>Informal</b>

Source: James A. McCann, "An Inventory of the Ponds, lakes, and Reservoirs of Massachusetts: Barnstable County," University of Massachusetts, Amherst, 1969.- Town of Orleans, CCC Bathymetry study: 2005

## 7. Floodplains

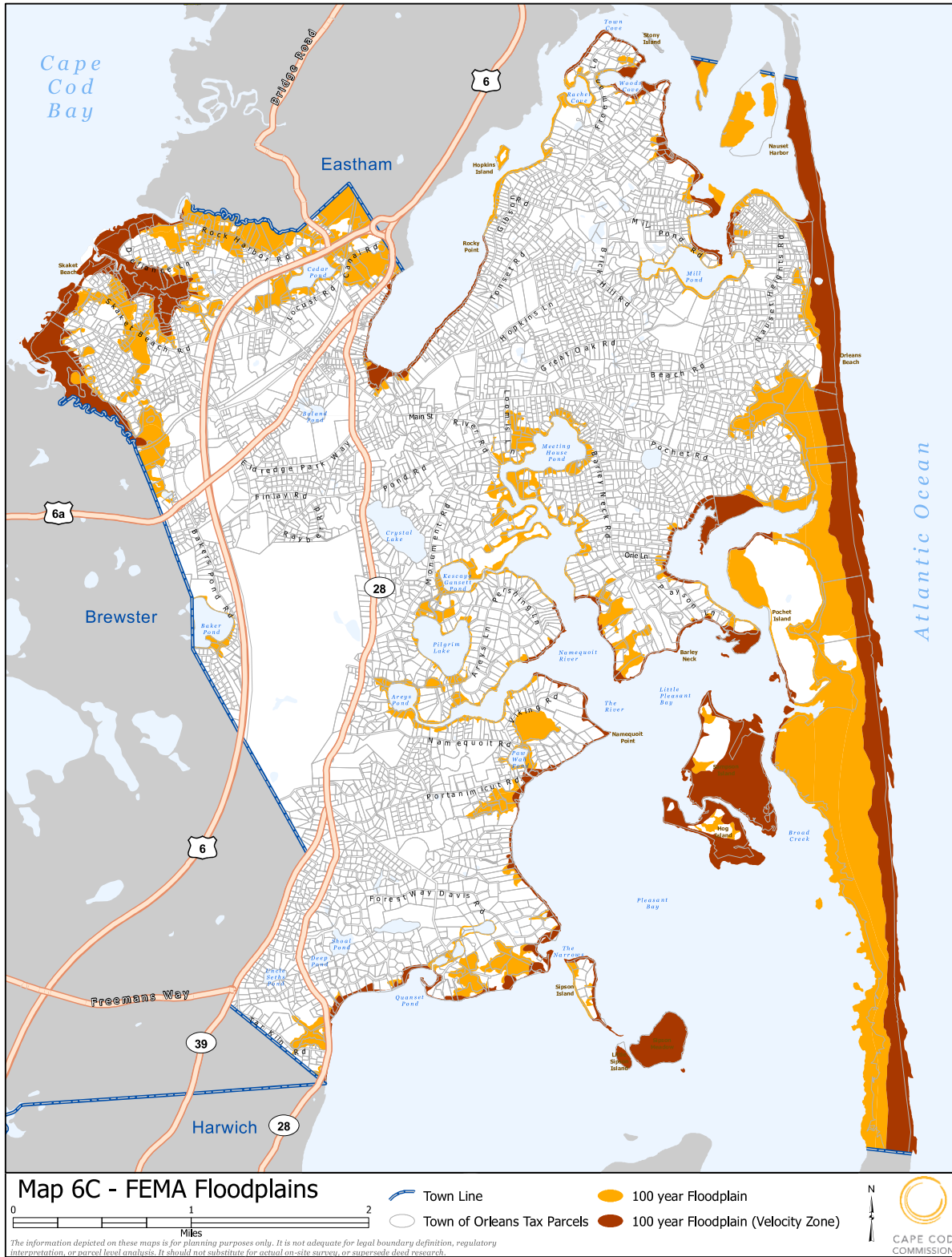
Orleans participates in the Federal Flood Insurance Program, which requires that new shorefront development meet engineering standards for flood-proofing. Flood velocity zones (or V-Zones,) land areas where storm surge or direct wave action occurs, are found along the shore at Skaket, Nauset Harbor, the seaward face of Nauset Beach and most of Pleasant Bay except in the extreme reaches of the River and Pochet tidal flats. (Map 6C) Analysis by the Massachusetts Coastal Zone Management Office found that Orleans has two dwellings at Snow Point, clearly located in the V-

Zone, and probably no more than 5 others are in the V-Zone on Nauset Marsh and Pleasant Bay. The Orleans Conservancy District, a zoning provision that prohibits non-water dependent structures built below the four-foot contours, and the state and local wetlands protection legislation, should help prevent future development in this high hazard area.

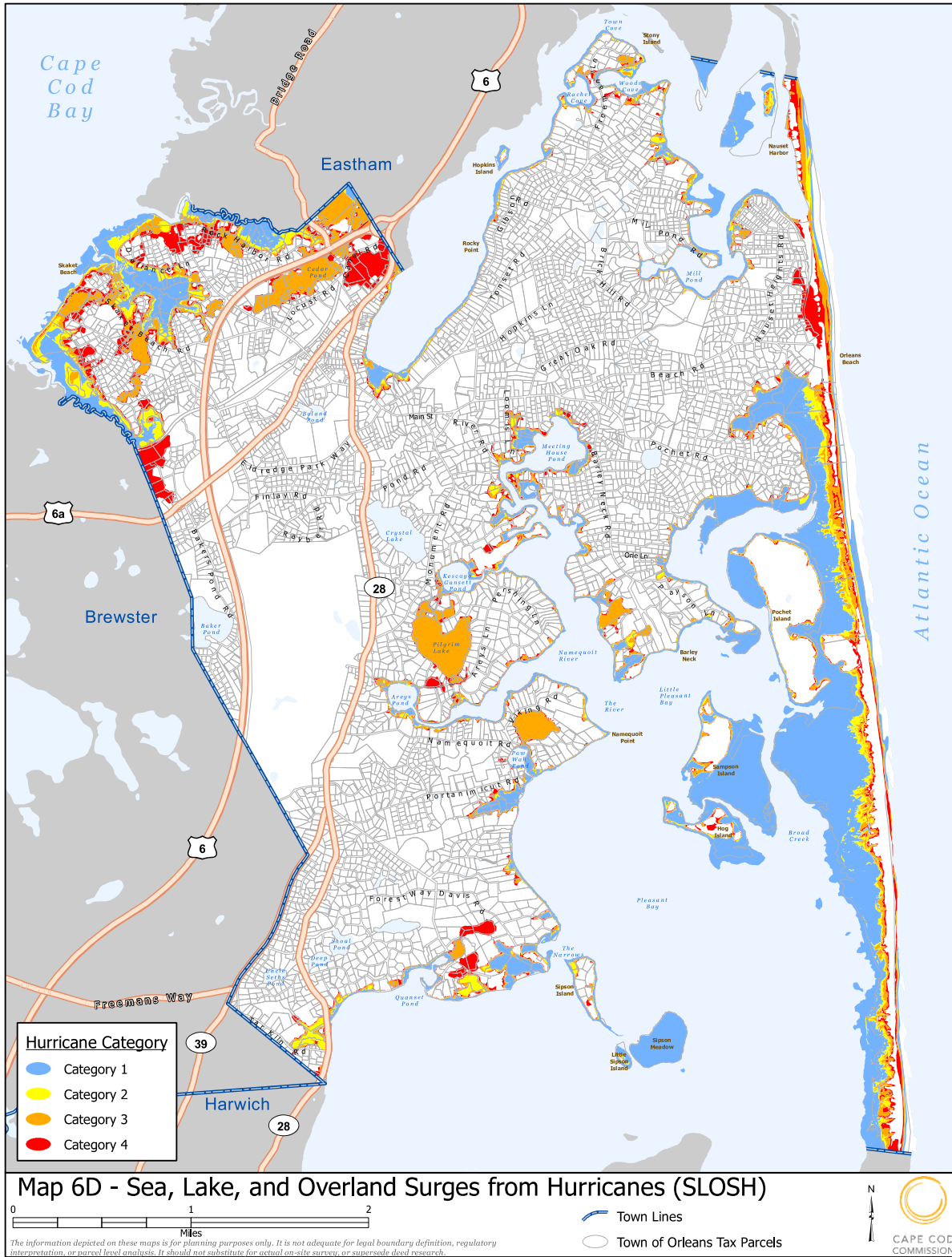
Landward of the velocity zones are other flood prone areas (A-Zones) in which standing waters can be expected during 100-year storm events. These areas, comprising approximately four square miles, consist mostly of salt marshes and shorefront uplands up to about the fifteen-foot contour. All estuarine shorelines in Orleans have some residentially developed areas in the A-Zone. There are some important non-residential activities occurring there as well, such as the Second District Courthouse, the Cranberry Shopping Plaza (built twenty-two years ago on a filled-in cranberry bog), and the Route 6 rotary adjacent to Town Cove. Storm damage in these areas is typically associated with hurricanes. (Map 6D) In 1991, Hurricane Bob caused havoc in Orleans with many fallen trees and some property damage. A greater threat to coastal properties in Orleans is erosion from the intense waves and winds of Northeasters, such as the Great Storm of 1978 and the Halloween Storm of 1991.



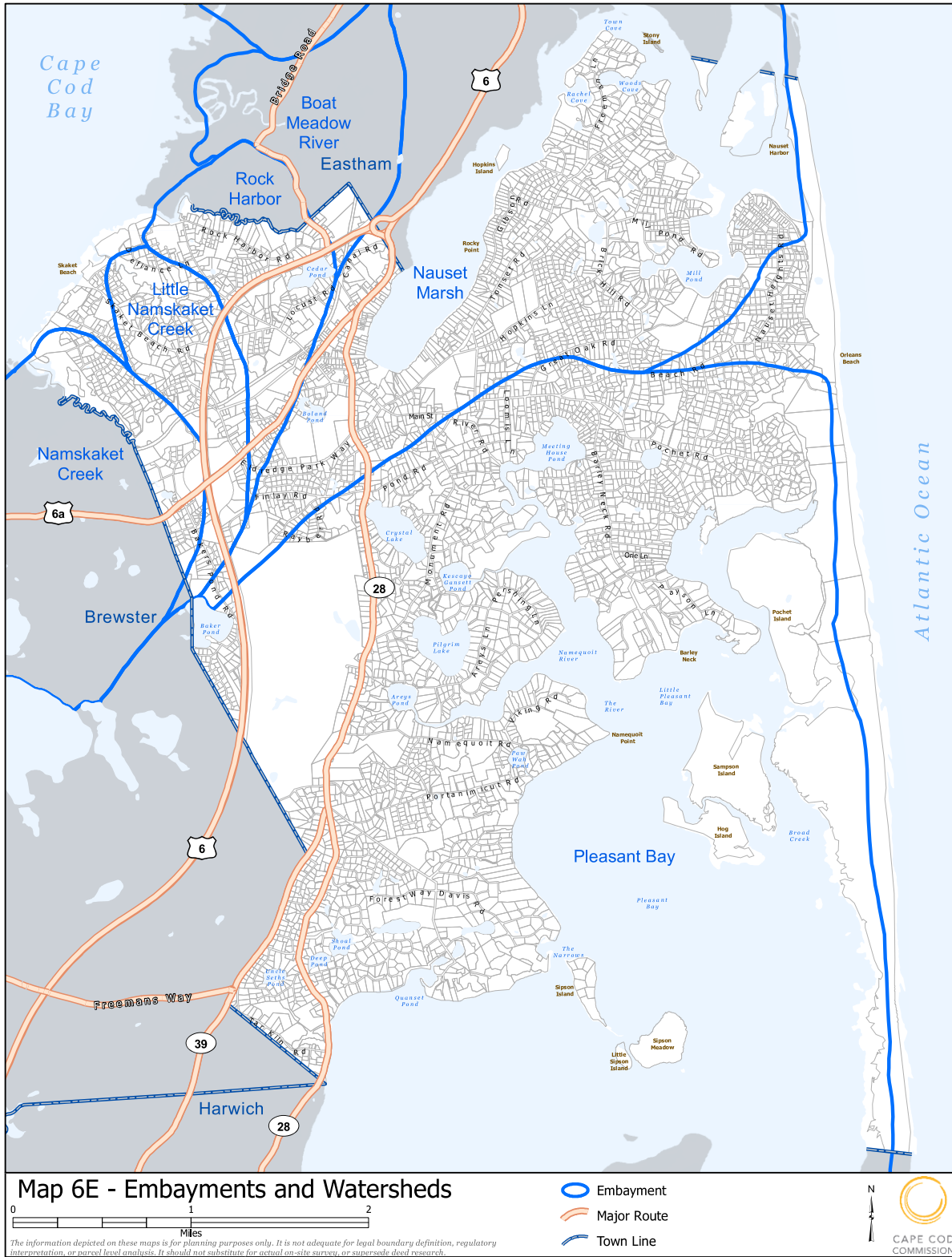
*Gazebo at Nauset Beach*



Map 6C – FEMA Floodplains



Map 6D – Sea, Lake, and Overland Surges from Hurricanes (SLOSH)



Map 6E – Embayments and Watersheds

## D. Vegetation

The growing conditions, temperature, rain fall, soil type, on Cape Cod support several plant communities, some common only to sandplains such as kettle pond shore vegetation with many rare species, sandplain grasslands, white cedar swamps, dunes, and pine-oak forests. Orleans also supports several plant communities associated only with salt water, salt marshes and eel grass communities. These unusual plant communities were altered by the activities of agrarian settlers between 1650-1900 with clearing forests for farmlands and overgrazing livestock and more recently by the introduction of invasive non-native plants and the reduction of native plant habitat in general in exchange for lawns and ornamentals.

Orleans has several kettle ponds such as Crystal Lake with rare sandplain plants such as Plymouth gentian, *Sabatia kennedyana*. Most of the kettle ponds in Orleans except for those in the watershed are developed with the majority of the owners altering the shoreline. Some owners have developed their properties to the extreme, with every plant removed and replaced with structures or invasive plants. Others have only created a walkway into the water. In many cases boats are left to scrape the bottom in the transition zone or in the area that emerges in years with a low water table where the majority of the rare plants grow.

Plants from sandplain grasslands are very rare in Orleans although some deed restrictions are keeping some properties in fields and some homeowners prefer a native grass lawn of little blue stem, *Schizachyrium scoparium*. With the elimination of fires, which reduce the woody growth and encourage the native warm season grasses, fields are largely overgrown, many with red cedars, *Juniperus virginiana*.

Orleans is host to several Atlantic white cedar (*Chamaecyparis thyoides*) swamps, some with only a few trees, as well as the 22.5-acre Namequoit Bog and the 10-acre bog that is partly within the Town-owned former Christian property. Many white cedar swamps were logged for posts and shingles or cleared for agriculture. The red maples, *Acer rubrum*, which prefer the same habitat, are growing in faster than the white cedars.

Orleans has several dune communities that thrive in areas of moving sand such as Nauset spit, a barrier beach. Dune communities are anchored by beach grass, *Ammophila breviligulata* and can withstand harsh growing conditions moving sand, and drought conditions.

The forest type presently common on Cape Cod, Pine-Oak is also drought tolerant and can grow on poor soils. Agrarian practices of the last several centuries left the soil without a protective vegetative cover and the humus and topsoil layers were blown away. By 1900, farming was in decline and farm and grazing land began to succeed to pine-oak forests. Once pine-oak forests have stabilized an area other hardwoods such as Beech and Hickory begin to grow in.

The return of these forests was gradually outstripped by the development in Orleans, which increased the amount of lawns and ornamentals and reduced the area available for native ecosystems. Only a few areas in Orleans such as the watershed property and nearby Bakers pond area support native Pine-Oak woodlands. Without these uncultivated areas there will be no seed source for native flowers and trees.

The Town Tree Warden has catalogued an inventory of 7,100 trees on Town property or within public rights of way. The inventory is used to systematically evaluate and maintain the trees on a rotating basis. Included in the inventory are many non-native species such as Norway and Sycamore Maple, Tree of Heaven, and black locust. Native species include Red Cedar, American Beech, Tupelo, and Pine. The Town has a small number of American Chestnut trees located on Town open space, which are nurtured and maintained by the Tree Warden.

Orleans has several large saltmarshes, such as Rock Harbor Creek and along Nauset Beach. Pockets of cordgrass, *Spartina alterniflora*, the dominant plant in the salt marshes on the Atlantic Coast, grow occasionally along the shorelines. Cord grass reduces wave action and erosion and forms a significant part of the estuarine food web.

Below is a list of NHESP listed Rare, Threatened, and Endangered plant species in Orleans.

Taxonomic Group	ScientificName	CommonName
Vascular Plant	<i>Crocanthemum dumosum</i>	Bushy Rockrose
Vascular Plant	<i>Dichanthelium ovale</i> ssp. <i>pseudopubescens</i>	Commons's Panic-grass
Vascular Plant	<i>Liatris scariosa</i> var. <i>novae-angliae</i>	New England Blazing Star
Vascular Plant	<i>Lipocarpa micrantha</i>	Dwarf Bulrush
Vascular Plant	<i>Persicaria puritanorum</i>	Pondshore Knotweed
Vascular Plant	<i>Sabatia kennedyana</i>	Plymouth Gentian
Vascular Plant	<i>Sagittaria teres</i>	Terete Arrowhead
Vascular Plant	<i>Spartina cynosuroides</i>	Salt Reedgrass
Vascular Plant	<i>Suaeda calceoliformis</i>	American Sea-blite

## E. Fisheries and Wildlife

The theme of Orleans being a crossroads town, appropriate in its geology and geography, extends to its faunal populations and habitats as well. For not only does Orleans have an internal diversity of habitat types, but also it is situated at the juncture of two major wildlife zones: the Virginian and Acadian biogeographic regions. Cape Cod separates the warm Gulf Stream waters of Nantucket Sound (northern edge of the Virginian zone) from the cold Labrador Current waters of Cape Cod Bay (southern edge of the Acadian zone.) Marine species composition, from seaweed to squid to whales, is different between these two sides of Orleans. Orleans' Cape Cod Bay shoreline is also the innermost area listed as critical habitat for the endangered North Atlantic Right Whale.

Orleans contains and is surrounded by important habitat areas. (Figure 4) Orleans' Pleasant Bay and Nauset Marsh are two of only five Cape embayments identified by the US Fish and Wildlife Service as important wintering areas for black ducks, a National Species of Special Emphasis. Many other shorebirds, such as the semi-palmated plover, use Orleans, the most easterly point on Cape Cod, as a stop-over point on the passages north and south along the Atlantic Flyway. The barrier beaches along Nauset are prime nesting habitat for terns and piping plovers, rare and endangered species.

In 1991 Orleans' Nauset Spit was the locale for a precedent-setting wetlands case when the town developed an off-road vehicle management plan to protect nesting piping plovers, a threatened species under federal law. This action was the first use of the state Wetlands Protection Act to regulate recreational vehicle use on barrier beaches. The Town has cooperated with both Massachusetts Division of Fisheries and Wildlife and the National Seashore in monitoring the nesting areas throughout the summer. In 2015 the Town, working closely with federal and state officials, developed a habitat conservation plan to protect plover habitat from incidental take that could result from recreational use of the beach. The management plan calls for dedicated town staff to install symbolic fencing, enforce restrictions on the use of certain areas at certain times by Over-sand Vehicles, monitor the birds and their reproductive success, and implement a variety of other measures designed to protect nesting areas.

## 1. Shellfish

### *Shellfish Habitat and Harvest*

Orleans is annually ranked as having one of the most productive shellfisheries among the 15 towns of Cape Cod. Again, the reason is related to diverse marine habitats and clean growing waters. Softshell and hardshell (quahogs) clams, and blue mussels abound. Pleasant Bay provides extensive habitat for bay scallops, the most valuable shellfish species per pound on Cape Cod, although harvests of scallops bottomed out in recent years, possibly due to environmental factors. Since the 1980's, the Bay has been a more productive area for soft shell clams, quahogs and razor clams. Town Cove/Nauset Harbor produce clams, quahogs, mussels and occasionally scallops. Sea clams are found offshore on the wide flats of Cape Cod Bay. Quahogs are found in the deeper waters where scallops are also found sporadically. Oysters are one major recreational and commercial shellfish species not abundant in Orleans' coastal waters. Orleans has 10,370 acres of productive shellfish habitat. This acreage includes 5,760 acres in Cape Cod Bay plus 1,152 acres in Town Cove and 3,456 in Pleasant Bay. These productive areas include intertidal flats, sub-tidal habitat, and productive eelgrass meadows, necessary for scallop production.

### *Aquaculture and Propagation*

Commercial and recreational shellfishing activity in the Town is strong. In 2015, 1,191 recreational shellfish licenses and 163 commercial shellfish licenses were issued by the Shellfish Constable. The Town has a robust shellfish propagation program for the benefit of the wild shellfishery. In 2015, the Town purchased half a million seed quahogs and 70,000 seed oysters through a state grant. In addition, 60,000 2-inch oysters were provided by the Orleans Pond Coalition in Arey's Pond. There are also 16.75 acres of aquaculture grants located in Pleasant Bay, growing quahogs and oysters.

### *Harmful Algal Blooms (Red Tide)*

Red tide, which is an explosion of dinoflagellate marine algae usually associated with seasonally-warm water, has also resulted in shellfish bed closures periodically, particularly in the Town Cove/Nauset Marsh system. This condition occurred as recently as May 2005, and the system was closed for multiple weeks in the beginning of the summer. As filter feeders, shellfish accumulate the algae's toxin in concentrations dangerous to human consumption, though not to the mollusk. When the algae bloom dissipates, the shellfish become safe to eat again. Shellfishing is an important commercial resource as well as a popular tourist pastime in Orleans. There is always great harvest demand on the shellfish supply. Natural sets of shellfish have been

enhanced through broadcasting purchased seed and, until the late 1980s, quahog seed was cultivated in the town's shellfish lab on Town Cove.

## 2. Fin-fish

Orleans' fresh and salt waters support a variety of marine (striped bass, flounder, menhaden, tautog, mullet, eel and sand sharks), freshwater (pumpkinseed, bass, trout, pickerel), and anadromous (alewife, blueback herring and shad) fish species. The latter group migrates from the bays into Cedar Pond and Pilgrim Lake each spring to spawn.

Amphibians (frogs, toads, salamanders) are found throughout the woods and wetlands of Orleans. Turtles include the rare eastern box turtle and the diamondback terrapin in Pleasant Bay. The Massachusetts Audubon Society maintains a herpetological atlas for Massachusetts, which should be consulted for additional information.

The Friends of Pleasant Bay is sponsoring an update on fisheries habitat and abundance in Pleasant Bay, which is being conducted by the Center for Coastal Studies. The only previous assessment of Pleasant Bay fisheries was completed by Massachusetts Division of Marine Fisheries in 1967.

## 3. Mammals

Upland mammals in Orleans include the common suite: red and gray squirrel, white-tailed deer, raccoon, rabbit, skunk, opossum, shrews, bats, weasels, mice, and voles. In recent years, a new top-of-the-food-chain predator has moved into Orleans to compete with the red fox for territory: the eastern coyote. Sightings of this big predator have increased from rare to almost common. Residents now report coyote sightings routinely.

Wildlife corridors enable animals to migrate to new territories in search of food or breeding grounds. Biologists estimate that undisturbed linear areas of 300 feet in width are necessary for many of these species to feel comfortable for moving undetected. Owing to the dispersal of residential development throughout the town and its continuing saturation, wildlife corridors are fewer and narrower than they once were in Orleans.

The only true trans-town natural corridor is Nauset Spit, which is in the Cape Cod National Seashore and extends from Nauset inlet south into the Town of Chatham. A discontinuous but important corridor might be west-east from Nickerson State Park to Pleasant Bay. The wetland systems along Kescayoganset (Lonnie's) Pond, including Kent's Point, and the Namequoit River leading west from the Bay nearly meet the 500-acre forested town watershed. Route 28 is an impediment. From there this corridor extends to Bakers Pond and on to Nickerson State Park. In 1992 a chain link fence was erected along Route 6 partially to keep wildlife off the highway.

Shorter, intra-town corridors include Namequoit Point (from Viking Camp through Paw Wah Point to the Quanset Wellfield) and the South Orleans pond area (Uncle Seth's, Shoal, Deep, Twinings and Sarah's Ponds). The salt creeks of Cape Cod Bay also provide neighborhood-level corridors.

Below is a list of NHESP listed Rare, Threatened, and Endangered animal species in Orleans.

Taxonomic Group	ScientificName	CommonName
Bird	Asio flammeus	Short-eared Owl
Bird	Charadrius melodus	Piping Plover
Bird	Sterna dougallii	Roseate Tern

Bird	Sterna hirundo	Common Tern
Bird	Sterna paradisaea	Arctic Tern
Bird	Sternula antillarum	Least Tern
Butterfly/Moth	Papaipema sulphurata	Water-willow Borer Moth
Dragonfly/Damselfly	Anax longipes	Comet Darner
Dragonfly/Damselfly	Enallagma recurvatum	Pine Barrens Bluet
Mammal	Eubalaena glacialis	Northern Right Whale
Reptile	Malaclemys terrapin	Diamond-backed Terrapin
Reptile	Terrapene carolina	Eastern Box Turtle

**F. Scenic Resources and Unique Environments**

The aesthetic beauty of Cape Cod's natural resources is of primary importance to residents and visitors. Orleans abounds in beautiful natural scenes, many of which are also environmentally critical areas, such as pond-shores, salt marshes, barrier beaches, embayments and cedar swamps. Local voters have continuously supported the purchase of open space in recent years, in part to preserve scenic areas, such as Kent's Point, Paw Wah Point, Arey's Pond, Eelman's Point and Sea Call Farm, though the substantial purchase of land around Baker's Pond was supported mostly on the basis of water quality protection.

As part of a statewide preservation effort, the Department of Environmental Management (DEM) conducted a survey in 1983 to assess the Commonwealth's scenic landscape inventory. The inventory uses three classes of scenic quality designated as "distinctive," "noteworthy," and "common." Distinctive landscapes include areas of the highest visual quality and include only about 4% of the Commonwealth. "Noteworthy" landscapes consist of somewhat less significant, although still important, visual quality and are limited to only 5% of the Commonwealth. The "common" landscapes comprising 91% of the Commonwealth's landscape, contain smaller sections of scenic quality but do not have the consistently high levels found in distinctive and noteworthy areas. The DEM survey classified Nauset Beach as a distinctive landscape and the Cape Cod Bay shoreline, Nauset Marsh and most of Pleasant Bay as noteworthy.

Other distinctive scenic areas include<sup>4</sup>:

- Vistas of salt water outward from ***Kent's Point, Pah Wah Point*** and ***Sea Call Farm*** (all town-owned).
- Seasonal views of sportfishing and moored vessels, as well as year-round views of Cape Cod Bay from ***Rock Harbor***. This is one of the few areas on the East Coast where one can view the setting sun over the water.
- A range of vistas are accessible from ***Orleans town landings***, including Quanset, Pah Wah and Kescayogansett Ponds. Town landings at the head of Town Cove are centers of fishing, boating and sailing activity characteristic of a seaside community. Snow Shore Landing provides excellent views of Nauset Marsh, the great outer beach and the ocean.

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<sup>4</sup> 2006 LCP chapter 12

- Orleans freshwater *ponds and lakes* offer a wide variety of views. Public access is available to four Great Ponds: Baker’s Pond, Cedar Pond, Pilgrim Lake and Crystal Lake, as well as Uncle Harvey’s Pond in East Orleans.

Table 3 shows the town-designated network of scenic roads under MGL Chapter 40 §15.

**Table 3 Town-designated Scenic Roads**

Arey's Lane	Freeman Lane	Eldredge Park Way
Namequoit Road	Herring Brook Way	Locust Road
Brick Hill Road	Tonset Road	Tar Kiln Road
Portanimitcut Road	Barley Neck Road	Great Oak Road
Shore View Drive	Namskaket Road	River Road
Mill Pond Road	Gibson Road	Defiance Lane
Champlain Road	Snow's Shore Road	Briar Springs Road
Quanset Road	Hopkins Lane	Monument Road
Uncle Harvey's Way	West Road	Pochet Road

In addition to town-designated scenic roads, the Cape Cod Commission has designated seven scenic roadways as local roadways of regional significance: Beach Road, Bridge Road, Eldredge Parkway, Main Street, West Road, Skaket Road and Rock Harbor Road.

Orleans is bordered by water bodies on two sides that have been designated as Areas of Critical Environmental Concern (ACEC). This State designation (M.G.L. c. 21A, Sec. 7) has been accorded to Cape Cod Bay and Pleasant Bay. Cape Cod Bay is a nesting site of endangered species of turtles and birds. The Pleasant Bay ACEC is Cape Cod’s largest estuary and provides breeding and nursery areas for numerous economically important fisheries, as well as important recreational values. Acquiring of open space in these areas helps to protect the integrity of the environment and ensure a healthy natural ecosystem for sustaining important fisheries. Nauset Estuary is afforded special protection under the Orleans Wetlands Protection Bylaw, and also is worthy of land protection efforts.

*Unusual Geologic Features*

Orleans gets its underlying geography from its location at the glacial intersection of the Cape Cod Bay Lobe and the South Channel Lobe of the retreating Wisconsin Glacier 15,000 years ago. The weight of ice created deep depressions in the land surface, and left evidence when it melted. As a result, the Town contains 107 areas of fresh surface water with a total area of 233 acres. Water bodies range in size from less than 100 square feet to 45 acres (Pilgrim Lake). Seventeen of these areas are freshwater kettle ponds of two acres or greater. These water features are an important asset to the natural resources of the town as they provide wildlife habitat, recreational opportunities, and scenic landscapes.

The land features of Orleans that garner the most attention are those of the east-facing outer beach. This area is constantly being changed by wind and sea, and is highly popular. Longshore currents

off Nauset Beach carry sand in a predominantly southerly direction, and the outer beach is retreated westward. A 2016 study by Woods Hole Group documented the annual rate of erosion in proximity to Nauset Beach at 12 feet per year. The area is the subject of significant efforts by the Town to improve coastal resiliency and prepare for relocation of beach support infrastructure, beginning in 2019 with the removal of the beach administration building.

### **G. Cultural Resources**

Orleans is a community rich in cultural resources, as evidenced by many districts and structures of documented historical significance. (Figure 5) The Old King's Highway Regional Historic District (OKHRHD) is the Town's only registered historic district. The OKHRHD provides a means of preserving the original small village atmosphere and style of all Cape Cod towns along Route 6A. Two sites, the French Cable Museum on Route 28 in Orleans Village, and the Meetinghouse Museum at River Road and Main Street, are on the National Register of Historic Places. Three sites, the French Cable Museum, Oak Ridge Prehistoric Site, and Old Kings Highway Historic District, are on the State Register of Historic Places.

In addition, The Orleans Historical Society lists more than 400 buildings that were erected before 1900. Cultural and historic points of interest in Orleans include the following:

- Rock Harbor which served as the commercial and maritime center during its early years and today is a popular boating harbor enticing fishermen from many parts. Local history states that the Orleans Militia repulsed a British landing force at Rock Harbor during the War of 1812.
- The Captain Linnell House is an exact copy of a French Villa. The house was built by Capt. Ebenezer Harding Linnell, captain of the clipper ship, Eagle Wing. The house is now an elegant restaurant.
- The French Cable Station was constructed in 1890 to receive a direct wire from Brest, France. Cable was laid on the floor of the Atlantic Ocean in 1879 and continued in operation until 1959. Today, the station serves as a museum.
- Located on Main Street in East Orleans is the Meeting House, home of the Orleans Historical Society. It was first built as the Universalist Meeting House and contains historical artifacts of Orleans.
- Nauset Beach is a lure for thousands of sunbathers, and also boasts a treasury of historical occurrences. Early explorers landed here, including Gosnold in 1602, Champlain in 1605. The Mayflower passed here in 1620. The Sparrow Hawk was the first recorded shipwreck on the eastern seaboard, December 17, 1626. A German U-Boat shelled the coast of Orleans during World War I, sinking several coal barges.
- Snow's Shore, named for Stephen Snow, a Tonset settler in 1644, was lined with fish sheds and flakes where catches were cured and salted for the Boston market. On Tonset Road, by the Town Cove, is the site of the Hopkins Homestead. Giles Hopkins was a passenger on the Mayflower and settled in Orleans in 1648. The home of Joshua Crosby is located at the end of Tonset Road. He was a quarterdeck gun captain on the U.S.S. Constitution during combat with the H.M.S. Guerriere in the War of 1812.
- The Inn of the Yankee Fisherman, now a restaurant and inn was built by Capt. Aaron Snow in 1875 of lumber and cargo from a Maine schooner wrecked on Nauset Beach. Capt. Snow was

a merchant dealing in coal, grain and lumber which were transported to Orleans in his schooner the Nettie M. Rogers. This was the beginning of H.H. Snow and Sons hardware store.

- The first Cape Cod Canal was called Jeremiah's Gutter, located where the Route 6 rotary now exists, which linked the headwaters of Boat Meadow Creek with Town Cove. This hand-dug route enabled small boats to float from Cape Cod Bay to the eastern, Atlantic shore without having to double the Cape at Race Point. Captain Cyprian Southack, sent by the Governor in 1717 to hunt down Black Sam Bellamy of the shipwrecked pirate vessel Whydah was one of the first users of the Gutter in his fruitless search. The gutter was used during the War of 1812 for American vessels to escape British blockaders, but constant silting caused the canal to finally be abandoned.

## H. Archeological Resources

Pleasant Bay may be the most important archaeological area in Barnstable County. According to archaeologist Fred Dunford of the Cape Cod Museum of Natural History, 10% of all the artifact sites recorded for Barnstable County by the Massachusetts Historical Commission fall within the greater Pleasant Bay area, the highest site density on Cape Cod. Most artifacts date from the Woodland period (beginning 3,000 years before present to 1,500 AD) when the native Nauset and Monomoyick tribes were establishing fixed settlements and farming as well as gathering food resources. Residential development, erosion associated with increased tidal range in the Bay and vandalism by amateur treasure hunters represent the greatest threats to this rich archaeological record.



*Jonathan Young Windmill at Town Cove*

Figure 4: Critical Habitat

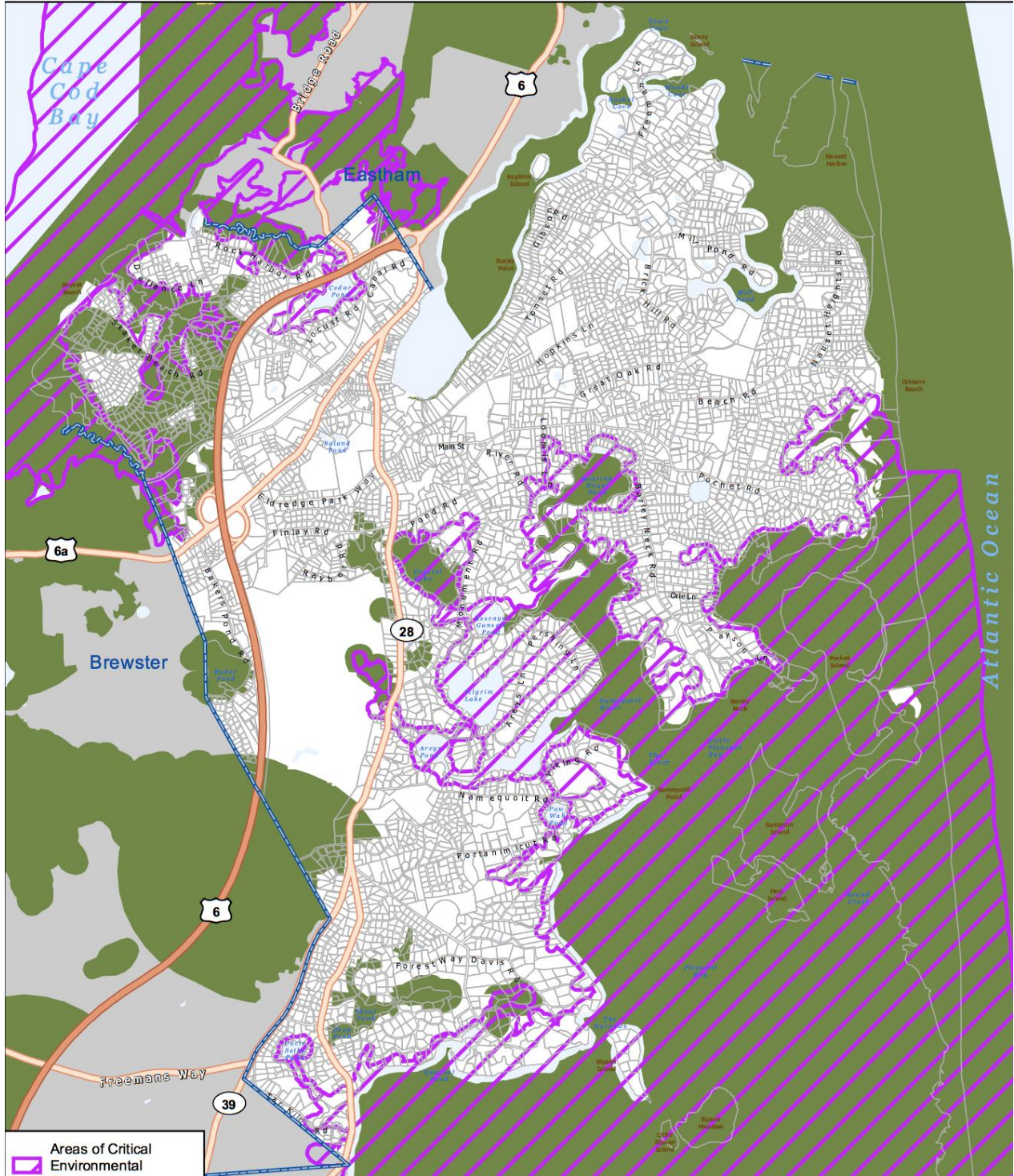


Figure is excerpted from a map prepared by the Cape Cod Commission. Dark green areas represent NEHSP Priority Habitat of Rare Species. Purple crosshatching represents Areas of Critical Environmental Concern.

Figure 5: Historic Resources

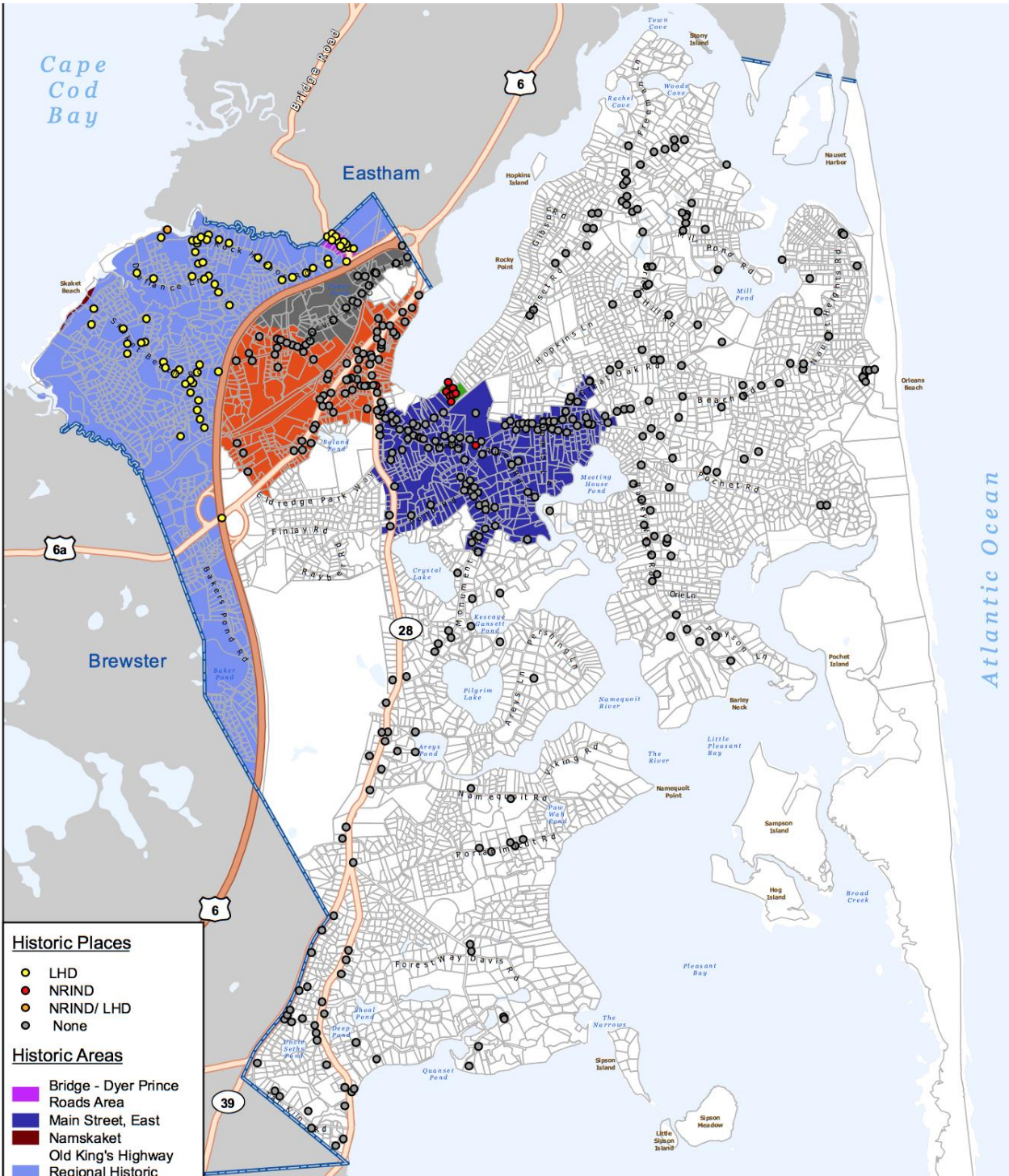


Figure is excerpted from a map prepared by the Cape Cod Commission. Red dots show the location of Orleans Town Center and green dot show location of Sea Call Farm.

## **I. Environmental Challenges**

As noted in previous sections, the impacts of continued residential development are a threat to open space and natural resources in Orleans. Water quality concerns, loss of wildlife habitat and corridors, blockage of scenic views, conversion of agricultural lands and other issues are all influenced by the economic pressure to develop vacant land to meet the demands of community growth. While the Town cannot stop growth, thoughtful, smart growth approach to zoning and diligent permitting can help to guide future growth to areas best suited to accommodate it.

### 1. Solid Waste Management, Landfills and Hazardous Waste

By historical accident, the Orleans Landfill is located adjacent to but outside the Zone of Contribution to the Town's wellfields. The landfill has been closed, and a landfill capping project was completed in 2006. A nutrient-enriched plume from the capped landfill site is being monitored and may require treatment. A permeable reactive barrier demonstration project was installed in 2016 to address the plume. Solid waste from Orleans is transported to SEMASS waste-to-energy plant in Rochester, MA. An active voluntary recycling program helps to reduce the volume of solid waste sent to SEMASS.

Open sewage lagoons at the landfill were closed after the Tri-Town Septage Treatment Plan began operations in 1987. Since that time, the plant has treated septage waste from the Tri-Town district of Orleans, Brewster and Eastham in addition to surrounding towns. Monitoring of nearby Namskaket Creek has so far failed to reveal degradation of the marsh due to septage leachate from the plant. The agreement to operate the Tri-Town plant expires at the end of 2016, and the plant is in need of repairs. The three Boards of Selectmen have been unwilling to fund repairs to the plant, and the Orleans Board of Selectmen voted in 2015 to cease operations and demolish the facility.

Orleans' mix of businesses does not contain industrial activities that generate or store large quantities of hazardous waste. Any hazardous waste that is generated as part of business operations, such as medical waste or photo processing chemicals, is handled by individual businesses. Each year the Barnstable County Extension Service coordinates with regional Departments of Public Works to conduct a series of household hazardous waste disposal days where residents can bring in hazardous materials not usually disposable at the town landfill, such as mercury products, pesticides, and other products or devices containing heavy metals or chemicals.

### 2. Erosion and Sedimentation

As a coastal community, Orleans is subject to the effects of coastal erosion and sediment transport. Coastal erosion is a natural process whereby sediment from a coastal landform such as a bank, dune or beach is transported along shore where it is deposited down-drift, or cross-shore where it moves off shore to form shoals. This ongoing natural process feeds beaches, dunes and salt marshes and is essential for the sustainability of coastal habitat and recreation areas. Also, coastal erosion is essential for storm damage prevention, and the inland migration of coastal landforms and other wetlands. The state Wetlands Protection Act, Orleans Wetlands Protection Bylaw and Conservation Commission regulations seek to protect coastal landforms and processes.

However, in some cases erosion results in a retreat of private or public shoreline property. State and local regulations include measures to allow property owners the ability to manage erosion of

their property, preferably through the use of soft approaches that slow but do not prevent coastal processes.

Ongoing changes in the Pleasant Bay and Nauset estuaries, which share the Nauset barrier beach system, have implications for coastal erosion and land management. The ever-changing Nauset barrier beach and inlet system has resulted in changes in tidal ranges and hydrological conditions throughout Pleasant Bay and the Nauset Estuary. Cape Cod Bay is also prone to erosion effects of winter storms and efforts should be made to protect public beaches for future enjoyment.

In Pleasant Bay, a major coastal storm in 2007 caused a second inlet in the Nauset Barrier Beach to form, augmenting an existing more southerly located breach. The new “North” inlet has since expanded and tide data suggest that it is establishing itself as the dominant of the two inlets between Pleasant Bay and the Atlantic Ocean. The North inlet’s proximity to shoreline areas located in Orleans has resulted in greater erosion pressure and a significant increase in the number of applications from private property owners seeking to fortify the shoreline in Pleasant Bay. However, erosion pressures may abate in time. Over the next several decades, the North inlet is expected to migrate southward, potentially reducing erosion pressures along Orleans shores. Still, the dynamic nature of the system requires careful planning and management to ensure that town landings and public access points are not adversely affected by erosion, or by loss of sediment resulting from a hardening of privately-owned portions of shoreline.

The changes in the Orleans Town beach and the Nauset Inlet side of the barrier beach pose unique problems for the Town of Orleans. Nauset Beach, owned by the Town, is the Town’s most significant public beach. Its 900 car parking area provides significant capacity for residents and visitors alike. Despite having the largest capacity of any parking lot on the lower or outer Cape, it commonly fills up in the summer months. In recent years the Atlantic shoreline directly in front of the Nauset beach parking lot has significantly eroded. According to a 2015 study by the Woods Hole Group, shoreline retreat since 1994 has averaged 12 feet per year. At this time there is approximately 60 feet between the snack shack building and the front face of the coastal dune. In 2010 the Town purchased 5.6 acres of property at 223 Beach Road to provide for future parking needs at Nauset Beach.

### 3. Chronic Flooding

Coastal flooding related to storm events is an ongoing management challenge, particularly in cases where storm events coincide with high tides. Coastal flooding can cause damage at landings, temporarily flood low-lying roadways, and erode public beaches. Fortunately, flooding caused by fast moving coastal storms tends to recede quickly, unlike flooding along some inland river areas, which can take several days to drain.

The Federal Emergency Management Agency (FEMA) produced new Flood Insurance Rate Maps (FIRMS) for the first time in more than twenty years. The new FIRMS, which went into effect in Orleans and across Cape Cod in 2014, adjusted floodplain areas. This had implications for insurance for many property owners. The Town of Orleans provides residents with information about the new FIRMS. In addition, the Orleans zoning bylaw has a Conservancy District designation that seeks to protect persons and property from the hazards of flood and tidal waters which may result from unsuitable development in areas subject to flooding, and to protect ground-, fresh- and marine water resources and the vegetation, fish and wildlife they support.

In recent years, more effort has been undertaken to understand the potential effects of sea level rise. Using the new FEMA flood elevations, the Cape Cod Commission has developed a sea level rise viewer that allows town officials and private property owners to view a range of increases in sea level on shoreline property. Also, the Town is participating as part of the Pleasant Bay Alliance in a coastal resiliency project to understand the effects of sea level rise on the Nauset barrier beach and inland shoreline of Pleasant Bay. It is anticipated that management measures would emerge from this study.

#### 4. New Development

As noted above, Orleans is a highly desirable coastal community that has attracted a significant proportion of retirees, as its high median age demonstrates. It is also a commercial hub of stores and services to meet the needs of Lower Cape towns. These socioeconomic characteristics resulted in decades of development pressure, yielding more than 4,500 single-family homes apartments and condominiums, and nearly two million square feet of commercial facilities.

Growth pressures have not abated. Over the next thirty years the Town projects a potential 38% increase in the number of new dwellings and a potential 80% increase in the amount of commercial space. Continued development of this extent would gobble up available open space, diminish the semi-rural character of the community, contribute more nitrogen-loaded wastewater and add to municipal fiscal pressures. To guard against these outcomes, the Town has been aggressive in acquiring open space, particularly in sensitive resource areas. Likewise, the Town has adopted new zoning to focus economic development into a vibrant mixed-use town center, and is evaluating additional measures to limit commercial expansion.

#### 5. Ground and Surface Water Pollution

Water quality conditions in Orleans are closely tied to land use and development patterns. The impacts to the Town's coastal waters and ponds of nutrient loading from an estimated 780,000 gallons per day of wastewater passing through onsite septic systems, fertilized lawns and stormwater are well documented problems. The Town has recognized the need to take action to ensure that nutrient loading from existing and future development does not adversely affect the fresh water and marine resources of the community. For more than a decade, the Town has devoted significant resources to identifying solutions through a community-based planning process.

- Orleans participated in the Massachusetts Estuaries Program (MEP) for Pleasant Bay (along with Chatham and Harwich), Nauset Estuary, and the Town's three Cape Cod Bay tributaries of Rock Harbor, Namskaket Creek, and Little Namskaket Creek. The MEP technical reports provide foundational information for wastewater planning.
- Using the MEP reports, the Town developed and obtained local and state approval of a Comprehensive Wastewater Management Plan.
- The Orleans Water Quality Advisory Panel was formed in 2014 to develop implementation and financing plans for nutrient management facilities.
- Marine and Fresh Water Quality Task Force provides ongoing stewardship education, technical support and extensive water quality monitoring in the Town's estuaries and ponds.

- Stormwater pollution has been addressed through a comprehensive inventory of stormwater discharges and investment of several hundreds of thousands of dollars in stormwater upgrades. The major focus of treatment design is to be able to treat the "first flush", or dirtiest portion of stormwater runoff before it reaches the bays and ponds. A pilot project for removal of nutrients from stormwater is under evaluation.

Bacterial contamination is a major threat to shellfish resources. Bacterial contamination from stormwater runoff, and wildlife and domestic animal wastes has resulted in periodic closures of shellfish beds. Areas that are permanently closed to shellfishing for water quality reasons include Namskaket Creek, Little Namskaket Creek, Rock Harbor, upper Pochet Inlet, and a small portion of Paw Wah Pond. As discussed below, routine seasonal closure occurs in Nauset Harbor (caused by Red Tide, a Harmful Algal Bloom), and small portions of Town Cove and Meetinghouse Pond near drainage outflows.

## 6. Invasive Species, HABs and Disease

Fast-growing invasive or non-native species can over-run native species, resulting in a monoculture and diminishing biodiversity. Bittersweet, purple loosestrife, Japanese knotweed, and autumn olive are just a few of the invasive plants and shrubs that abound in Orleans and elsewhere on Cape Cod. The local land trust and conservation organizations have worked with local landscape stores to limit sales of these plants to unknowing customers who purchase them for their color and hearty growth potential. Other public education efforts help to inform citizens of the dangers of invasive species. The Orleans Conservation Trust has a comprehensive list of invasive plants, shrubs and trees on their website, and other conservation organizations hold periodic workshops that include information on invasive species.

Less is known about the extent of marine invasive species in Orleans waters. The Pleasant Bay Resource Management Plan calls for the four-town Alliance to work with local officials, Massachusetts Division of Marine Fisheries, Massachusetts Coastal Zone Management, and scientific institutions to study and develop best management practices to address marine invasive species. As a first step, the Alliance hosted a workshop on marine invasive species that could appear in Pleasant Bay waters and urging individuals to report sighting of unusual species.

Harmful Algal Blooms (HAB) in the form of Red Tide pose a more present threat. Red Tide has forced temporary annual closures of shellfishing in Town Cove. Shellfish diseases such as Quahog Parasite Unknown (QPX), which appeared in shellfish aquaculture grants in Pleasant Bay in the 1990's, subsided and is a dormant threat. As with marine invasive species, the Town and its neighbors are able to benefit from expertise from regional governmental and scientific institutions in tracking impacts and developing management responses.

The identification of the purple marsh crab as the cause of salt marsh dieback in the region has assisted in addressing the loss of salt marsh. According to recent studies, increased fishing pressure reduced the number of predators of purple marsh crabs. The crabs like to eat marsh grass at the edge of marsh, such as along mosquito ditches. Knowing the source of die-back will assist in remediation efforts, which could include increasing the population of marsh crab predators.

## 7. Environmental Equity

For the purposes of evaluating environmental equity, a review of the distribution of existing open spaces was conducted to determine if there are underserved areas of the town. The geographic

spread of open space is fairly evenly throughout the town. This is a somewhat surprising finding given the fact that open space acquisitions are often opportunistic when land is made available. The spread of open space around the town is evidence that Orleans values inclusion of all residents and has taken steps to identify and purchase open space in all areas of the community.

## **SECTION 5 - INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST**

### **A. Public and Private Conservation Lands**

Open space lands are important to those who live, work or play in Orleans because they provide the benefits of pristine natural resources people cherish. Open space provides natural buffers between developed neighborhoods, adding to a sense of place on public as well as private lands. They protect vital drinking water, provide habitat for wildlife and plant life, and help to preserve the water quality of coastal estuaries and fresh water ponds. Natural open space areas allow for scenic vistas and provide places for recreation. Furthermore, they enhance the semi-rural seaside character of the Town.

Open space protection can come through a variety of methods such as acquisition, conservation restrictions, easements and regulations designed to preserve natural, cultural and historic resources. Though small in geographic area, the Town's ecological, cultural and recreational blessings are great and we must be vigilant in preserving them.

Orleans currently has slightly more than 2,581 acres of protected open space land that is owned and managed by a variety of public and private agencies, and by individuals. (Map 7A) These lands account for approximately 17% of the total land area in town. The 2006 plan referred to 2,700 acres. The difference in numbers is due to increased accuracy of open space records and GIS capabilities in the Town.

Public open space accounts for 62% of protected open space, and is owned and managed by the Town (1,327.63 acres), state (16.43 acres) or the federal government (252.9 acres).

Private open space accounts for 19% of protected open space. The Orleans Conservation Trust owns 469.28 acres or 98% of land in this category.

Conservation restrictions held by a mix of federal, town and private entities are placed on 516.99 acres, or 20% of protected open space. (Map 7B)

Another category of protected open space is land under Chapter 61 designation for farmland, forest, or recreation. Approximately 444.73 acres or 17% of protected open space is Chapter 61 land. Some Chapter 61 lands also have conservation restrictions, such as Pochet Island, Hog Island and Sampson's Island. (Map 7C)

A detailed matrix explaining the location, size, ownership, management agency, access, and current use of Town Open Space and Recreation Lands can be found in appendices as well as being displayed, by ownership, on the updated Town of Orleans Open Space Map.

Appendix B contains a list of open space and recreation parcels in the Town of Orleans. This matrix details property location, management agency, current use, condition, and degree of protection. Table 4 displays the summary acreage of protected open space owned by the various agencies or trusts responsible for it protection.

**Table 4: Protected Open Space Summary**

Protected Open Space					
	Federal	CCNS		113.90	
	Federal	Pochet Land Trust & CR		139.00	
	State	owned land		16.43	
	Town	Gen'l Municipal		544.97	
		Beaches/Landings	339.61		
		Cemetary	4.56		
		Facilities	180.27		
		Other	20.53		
	Town	Open Space/Conservation		278.47	
	Town	Public Watershed		504.19	
<b>TOTAL PUBLIC OPEN SPACE</b>				<b>1596.96</b>	
	Private	OCT owned land		469.28	
	Private	Orenda OS		7.33	
<b>TOTAL PRIVATE OPEN SPACE</b>				<b>476.61</b>	
	Private	OCT CRs		172	
	Private	Fed CR on Hog & Sampson		176.24	
	Private	MA Audubon CR		2.58	
	Private	Town CRs		27.17	
<b>TOTAL CRs</b>				<b>377.99</b>	
	Private	Ch 61 Forest		24.49	
	Private	Ch 61A Farm		31.68	
	Private	Ch 61 B Rec		73.32	
<b>TOTAL CHAPTER 61 LAND</b>				<b>129.49</b>	
<b>TOTAL</b>	<b>TOTAL PROTECTED OPEN SPACE</b>			<b>2581.05</b>	
Subtotals exceed Total Protected Open Space because subtotals for CRs and Ch 61 Land each contain 139 ac for Pochet Land Trust; Subtotal for Ch. 61 Land also includes 176.24 ac for Hog & Samspon Islands.					

Source: Town of Orleans Planning Department, 2015

Orleans is fortunate to have a variety of beautiful beaches and coastal properties, including more than 800 acres of land fronting the Atlantic Ocean shoreline, a beach on Cape Cod Bay, and fresh water beaches at Pilgrim and Crystal Lakes. Residents, summer residents and tourists use all of these areas extensively year-round. These areas provide the location for most recreational activities

on public lands. The other major town recreation area is Eldredge Park located at the Middle School - Elementary School complex, which contains a variety of playing fields, tennis courts, a playground and a band shell. These facilities are used by the schools during the school year and by the Recreation Commission year-round. Cape Cod Baseball League games, nationally-known as a top-flight collegiate league, are held at Eldredge Park as well as some Nauset Regional High School baseball games and various private league games.

In addition, there are eight other parks in town with a total of 13.7 acres. The largest is 2.2 acres on Town Cove, the site of an accurate replica of the windmills which dotted Orleans' shoreline through the 1800s. Volunteers authentically restored the mill over two years with funds raised by the Orleans Historical Society. Window on the Cove Park provides a second window on Town Cove, primarily for passing motorists. In 1999, Town Meeting voters continued the acquisition process by purchasing a 2.4-acre "Meadow on the Cove" that has frontage on Town Cove. Other small parks, maintained by the Parks Department, are spots of historic interest - cemeteries and war memorials adding to the aesthetics of the Town.

Access to the Town's saltwater bodies is provided by twenty-nine town landings under the jurisdiction of the Selectmen and management by the Harbormaster. Landings are generally small in size, with some only the width of the roadway. They provide different amounts of parking, from one space at Gibson Road, to 15 to 20 spaces at Goose Hummock or Pilgrim Lake/Herring Brook Road and seventy-five spaces at Rock Harbor. Several of the landings provide access to public mooring fields, and ten landings have boat ramps. Issues associated with town landings include maintenance, dinghy storage, seasonal over-crowding, parking spilling over onto adjacent streets, and general upkeep and maintenance of ramps, docks and floats.

Open space protection efforts has a long and productive history in Orleans, beginning with the formation of a town Open Space Committee in 1985 to explore potential open space acquisitions by the Town. Under the auspices of the Open Space Committee, the Town engaged in a relatively large preservation program throughout the late 1980s, purchasing 75.9 acres with Town appropriations of \$7,758,000. Receipt of state grants totaling \$1,512,350 brought the Town's net cost per acre down to \$54,597. In addition, conservation restrictions were placed on another twenty-four acres of land.<sup>5</sup>

The 1990s were also busy with approval of the Land Bank by Orleans voters in November 1998. The Land Bank's twenty-year surtax generated a source of funds that could leverage bonding for larger open space acquisitions. Through the use of Land Bank funds, Orleans preserved 124.6 acres and removed 91 acres from development within the Pleasant Bay watershed.<sup>6</sup>

In May of 2005 the Town of Orleans adopted the Community Preservation Act (CPA) which converted the surtax previously collected under the Land Bank. From 2005 through 2010, the Town preserved 120.4 acres using a combination of CPA funds, state and federal grants, and private contributions.<sup>7</sup>

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<sup>5</sup> Alan McClennen, Jr., Memo to Board of Selectmen, January 9, 2013.

<sup>6</sup> Ibid

<sup>7</sup> Ibid

The full effect of Town efforts over the past thirty years is the protection by purchase or conservation restriction of 411.9 acres of land, much of which is located in resource sensitive areas.

The Orleans Conservation Trust supplements the Town's efforts to acquire open space and to protect its natural resources. The Trust is a private non-profit organization formed in 1970. OCT has protected close to 600 acres of open space through acquisition or conservation restrictions it holds.

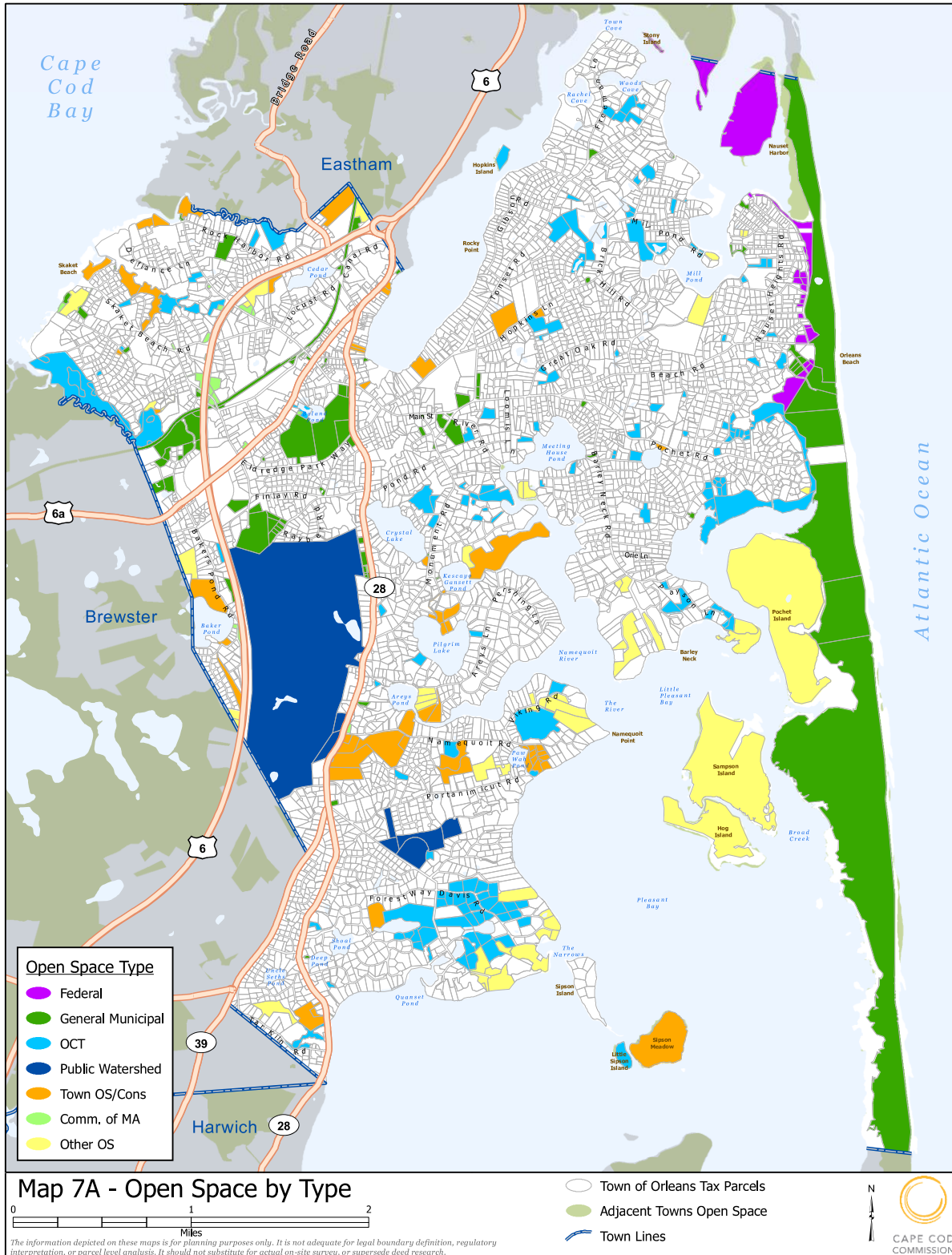
Pochet Island Trust, the only other land trust operating in Orleans, owns Pochet, Sampson and Hog Islands. Total area protected is 377 acres. The islands are within the borders of the Cape Cod National Seashore. The Department of the Interior holds permanent conservation restrictions on all three islands.

The Town has other privately-owned commercial recreation facilities. The Town has a newly renovated bowling center, a public skating rink that services multiple high school and youth hockey leagues, figure skating and public skating opportunities. Summer camps, which were once popular here, have given way to residential subdivision on the land upon which they once stood.

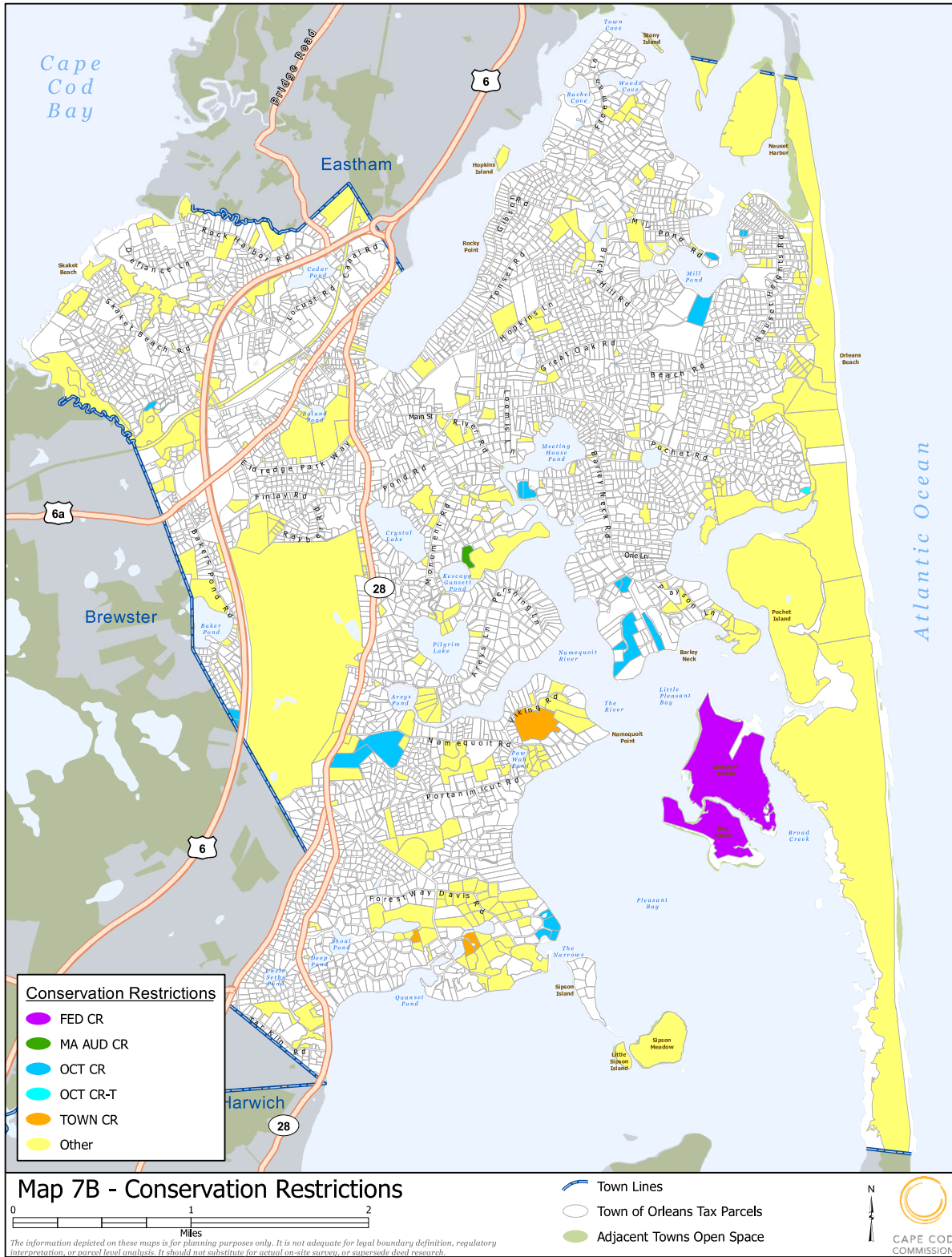
Throughout the summer, private sailing programs are provided by the Orleans Yacht Club on Town Cove and the Namequoit Sailing Association at Frost Fish Cove, as well as Arey's Pond Boat Yard.

By and large, the Town's parks, beaches and facilities are well maintained, in excellent condition and completely accessible for use by the general public. Ongoing maintenance and upgrades continue to improve handicapped access at all public parks and beaches. The grounds of Sea Call Farm have been refurbished into community gardens and the farmhouse is being restored with assistance from the non-profit Friends of Sea Call Farm, with handicapped parking for scenic viewing available.

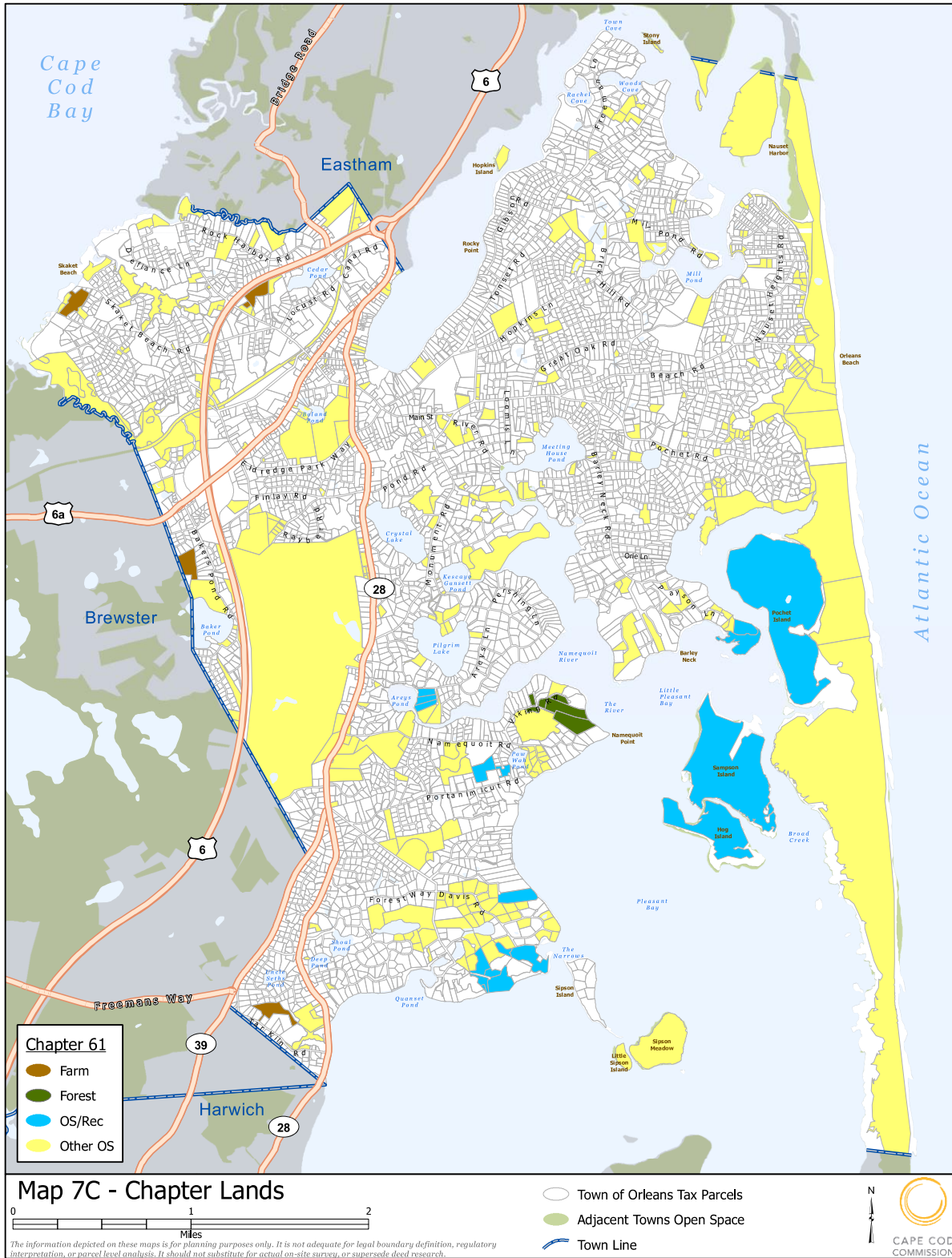
Management plans for public open space parcels have been developed under the supervision of the Conservation Commission with broad public input on the best public use of facilities and protection of natural resources. Management plans are on file for Kent's Point, Baker's Pond, Paw Wah Point, and the John Kenrick Woods. These efforts have been aided by private groups, often composed of citizens who reside near a particular open space area and want to have input into its use. The Orleans Comprehensive Plan recommends developing and maintaining management plans for all significant open space parcels.



Map 7A – Open Space by Type



Map 7B – Conservation Restrictions



Map 7C – Chapter Lands

**B. Recreation Department Programs and Bike Ways**

The Recreation Department offers a wide range of programs year-round. These programs have been expanded in recent years and will continue to grow to meet the needs of the Town's residents. The Recreation Department currently offers the following programs.

**Table 5: Town of Orleans Recreation Programs**

Spring	Summer	Fall	Winter
Finch Skatepark	Finch Skatepark	Lower Cape Recreational Soccer	Lower Cape Recreational Basketball
Instructional Baseball	Summer Program at Orleans Elementary	Nauset Field Hockey	Saturday Youth Basketball
Lower Cape Girls Softball	Youth Tennis Lessons	Senior Tennis	Preschool Movement
Youth Tennis Lessons	Adult Tennis Clinics	Finch Skatepark	
Annual Easter Egg Hunt	Senior Tennis		
Adult Tennis Clinics	Cape Cod Amateur Soccer		
Senior Tennis	Arts and Crafts		
Cape Cod Amateur Soccer	Youth Swim Lessons		

Two modes of transportation that reduce the number of cars on the roads and lessen the impact on infrastructure and the environment are walking and bicycling. Much of the downtown has sidewalks for pedestrians. However, a significant portion of the area is in need of sidewalk improvements. There are no bike lanes other than the Cape Cod Rail Trail.

There is a need to link outlying public parking areas with the downtown village center and to establish walking paths between abutting business properties. It is important to link the three primary villages (E. Orleans, S. Orleans, and the Village Center) for bicycle and pedestrian access. The Cape Cod Rail Trail is part of a designated bicycle path which runs along the former railroad right-of-way and passes through the center of town. A bicycle bridge, and rail trail extension, over Route 6 was completed in 2002 and improved the trail. Because of its location, this bikeway has the potential to connect to several other areas. Most notably is the possibility of connections to South Orleans by constructing an additional bike path through the public watershed. The Orleans Bikeways Committee continues to examine the feasibility and location of such an extension and funds for design may be needed for this to go forward.

The Town’s residents have expressed a desire for additional hiking trails on conservation land and the addition of sidewalks along major streets. Based on the public desire for additional bicycle paths, sidewalks and pedestrian walkways, it is recommended that the appropriate town departments and committees evaluate the feasibility of expanding pedestrian and bicycle facilities.

In 2017, the Town reconstituted its Bicycle & Pedestrian Committee, and charged it to explore recommend improvements safety and accessibility in the town. The committee’s initial work has focused on addressing Rail Trail crossings of public streets, which are especially hazardous in the summer season. The committee has also used the 2010 South Orleans Bike Trail Study to work towards a bikeway connection for South Orleans residents, and a potential looping to the Rail Trail in Chatham.

**C. Inventory of Open Space and Recreation Lands**

There are a variety of recreational facilities and areas available to residents throughout the Town. Most areas are water dependent; they are either beaches or landings, or they otherwise derive their value and attractiveness throughout the water views they offer. Athletic field space is concentrated in the center of town adjacent to the Nauset Regional Middle School, except for a little league field at Town Hall. Map 5, Unique Features, shows major recreational areas in Orleans as well as the Cape Cod Rail Trail and other points of public interest.

*Recreational Potential of Existing Open Space*

Orleans open space has been purchased or preserved using a variety of funding sources. The manner of acquisition dictates limitations on future use of the property. Below is a table of recent open space purchases and the type of uses allowed.

<b>Conservation Commission -- Land Status List</b>					
<b>Property</b>	<b>LAND Grant funds accepted</b>	<b>Deed restricted to Passive Recreation</b>	<b>Conservation Restriction over</b>	<b>TM Article Language on passive</b>	<b>Deed reference to MGL c40 s8C</b>
Baker's Pond	YES	YES	NO	NO	YES
Christian Property	YES	YES	NO	YES	YES
Crystal Lake Beach	YES	NO	NO	NO	YES
Hopkins Lane Gardens	NO	YES	NO	YES	YES*
John Kenrick Woods	NO	YES	YES	YES	YES*
Kent's Point	NO	YES	NO	YES	YES
Paw Wah Point	NO	NO	NO	NO	YES

Sea Call Farm	NO	NO	NO	NO	YES
Meadow on the Cove	NO	YES	NO	YES	YES*
Windmill Park	YES	NO	NO	NO	YES
Window on the Cove	NO	NO	NO	NO	YES*
Peck Property	YES	YES	YES	YES	YES
Pilgrim Lake	NO	NO	NO	NO	YES
Putnam Farm	YES	YES	NO	NO	YES
* MGL 40 8C not specifically mentioned in deed but Conservation, Recreation, and Open space is in deed (40 8C language)					

**D. Removing Barriers to Access and Participation**

The Town of Orleans implements programs and measures designed to enhance opportunities available to individuals with physical or intellectual disabilities, and to remove cost barriers that may prevent participation by Environmental Justice populations.

The Town of Orleans Recreation Department offers a wide array of programming open to participants of diverse physical abilities and ability to pay. Many programs offer skills development for any age group. Most offerings are free for residents of the Town. Information about programs is distributed through town facilities, local cable access channel, and through the Orleans Elementary School and Nauset Regional Middle and High Schools. The Recreation Department also supports and participates in the Massachusetts Special Olympics, which is a program designed to offer expanding opportunities to athletes with intellectual disabilities. The Town of Orleans does not charge its year-round residents or seasonal resident taxpayers to use town beaches and landings.

Highlights of the Town’s efforts to ensure that its most heavily utilized open space properties are accessible to people with physical disabilities include the following:

- A handicapped ramp is installed at the north entrance to Nauset Beach. Beach wheelchairs are available to visitors upon request, and are heavily used.

- A handicapped ramp is installed at Skaket Beach running from the parking lot to beach.
- At Pilgrim Lake, an accessible route platform runs from parking area to the waterfront.
- At Kent's Point Conservation Area, the road is open to visitors with disabilities. There is a handicapped ramp from an ADA parking space to beach.
- At Crystal Lake there is an accessible boardwalk and fishing platform.



*ADA Accessible Boardwalk at Kent's Point*

In January of 2020, an evaluation of accessibility was completed for 19 Town properties using the template provided in the Open Space and Recreation Planner's Handbook. The Town will take action immediately to address accessibility issues at its public playgrounds in FY21, as well as install ADA-compliant hardware on doors and other entry points. Significant capital spending items have been identified for inclusion in its 5-year Capital Improvement Plan.

**SECTION 6. COMMUNITY GOALS**

**A. Description of Process**

In order to find out what the people of Orleans want with respect to conservation, recreation and open space in their town, the Town of Orleans conducted a survey which asked residents how they felt about acquiring additional open space and what improvements they felt were needed at open space and recreation areas. Questions were asked about what residents liked and disliked most about the Town to get information about how residents perceive Orleans now and what the focus of long range planning should be.

The survey used was the same one developed and used by the Open Space Committee in 1999, which reflected input from the Conservation Commission, Local Comprehensive Plan Committee, Recreation, and Conservation Departments. The same survey questions were deliberately used to allow a direct comparison between resident opinions provided in 1999 and those received in 2014. The 2014 survey was available online, and its availability was publicized via the Cape Codder newspaper and several announcements a public meeting. There were 206 surveys returned in 2014.

The profile of the pool of respondents in 1999 and 2014 is strongly similar. The two sets of responses have roughly the same geographic distribution within town, property ownership characteristics, and percentage of respondents with children. Respondents to the 2014 survey tended to have lived in Town longer (reflecting flat population growth and passage of time). Also more households reported being retired or working fulltime in 2014, and fewer semi-retired or working part time. This trend could reflect that fact that people who were working part time in 1999 were employed full time by 2014, and people who were semi retired in 1999 were fully retired by 2014.

A copy of the survey and a comparison of 1999 and 2014 survey results can be found in the appendix.

Table 6 provides comparative highlights of the 1999 and 2014 survey results. The results provide useful insight into the Town’s progress in meeting community open space and recreation needs, and the consistency of many priorities.

**Table 6 Survey Highlights, 1999 and 2014**

Survey Question	Summary of Responses 2014 and 1999
Characteristics that best describe Orleans	A “community that has preserved its small town character,” and “community that encourages preservation and conservation,” were the top two responses in 2014 and 1999. In 2014, far fewer respondents associated Orleans as a “shopping hub serving surrounding towns,” “small seaside town”, or “resort community,” than in 1999.
Top three preservation priorities	The top three priorities in both 2014 and 1999 were: “open space for water and conservation,” “semi-rural character of town,” and “public access to shore.”

Land Bank priorities	Priorities flattened out between 1999 and 2014. The highest weighted priority in 1999, “well fields for drinking water”, went from 31% to 18%, perhaps reflecting success in conserving water supply lands. The highest weighted priority in 2014, “coastal lands”, was weighted the same in 1999. Relatively more weight was given to lower priority items in 2014: “natural habitat” protection, “hiking/biking trails,” and “active recreation” areas.
Support for residential growth policies	“Regulating undeveloped areas,” was the most popular residential growth policy in 1999 and 2014. Fewer respondents in 2014 favor “regulating growth in existing developed areas,” than in 1999, while a greater share favor “encouraging higher growth in the Village Center,” perhaps reflecting the public’s familiarity with smart growth concepts.
Support for housing types to preserve open space	Among the measures supported, support for duplex housing as a way to preserve open space fell sharply. Support for larger than acre zoning grew, while cluster housing and multi unit housing had relatively the same relative popularity.
Measures people would undertake to preserve open space	There was no relative change in responses in 1999 and 2014. “Voting in support of land acquisition,” was by far the top action, followed by “Donate money to buy land.” Actions such as “Donate a conservation restriction,” “Donate land,” or “Rewrite a deed to limit use,” register a small share of affirmative responses, likely do to the fact that most people are not in a position to do these things.
Satisfaction with places for children to play and recreate	By a large margin, most respondents reported they are satisfied or very satisfied with children’s play areas, similar to 1999, but the share of those who indicated they are dissatisfied also grew slightly.
Satisfaction with places for adults	By a large margin, most respondents reported they are satisfied or very satisfied with adult areas, similar to 1999
Priorities for new recreation facilities	<p>Top three priorities for new recreational facilities that people would like to see constructed in 2014 were the same in 1999: Conservation areas, Public access to fresh and salt water and shorelines, and bike trails</p> <p>In 2014 there was relatively less support for neighborhood parks and golf courses, and more support for hiking and skiing areas, town landings and picnic areas, than in 1999</p>
Priorities for town action	The highest priority for town action in 2014 was the same as 1999: acquire more open space, improve conservation land with amenities, and provide more parking at beaches.

**B. Statement of Conservation, Open Space and Recreation Vision**

The crossroads quality unique to Orleans extends to its citizenry's health and enjoyment. Very few communities have the mix of natural resources, open uplands, and support facilities that exist in Orleans. Orleans residents have consistently demonstrated vigilance in protecting natural resources, and a willingness to pay the costs of preservation and maintenance.

Orleans is a place where residents can drink clean water, breathe clean sea air, walk dense forests, open fields and long beaches, catch and eat healthy fish and fowl, savor remnants of their colonial history, and meet friends through recreation programs and events. Other towns offer many of these necessities and amenities but not all of them in such profusion and proximity. Orleans is a small town, both in area and in character, but its natural and cultural offerings are diverse and interesting.

The CROS vision is that each Orleans resident and visitor will catch a bit of the community vision to be aware of the need to protect and enhance natural resources for the enjoyment of current and future residents.

## SECTION 7. ANALYSIS OF NEEDS

### A. Prioritization of Needs

In recognition of Orleans' exceptional natural resources, the Town has been fairly progressive in its approach to preserving important open spaces. A major land acquisition effort in the late 1980s secured several large parcels, and set forth a program for strategically targeting resource protection based on certain criteria. This effort slowed considerably in the early 1990's due to the downturn in the economy. The revived strength in the economy in the late 1990's, and the resulting increased rate of development on Cape Cod has sparked renewed interest in open space preservation. The creation of the Cape Cod Land Bank in 1998 provided a new financial tool for municipalities to purchase and protect land from development. (See Appendix A Survey Results)

The Open Space Committee worked closely with the Board of Selectmen to develop and refine a set of criteria by which potential purchases can be evaluated in terms of responding to community needs. The list consists of nine priorities that reflect needs and opportunities that are important to the community. Properties which fulfill more than one of the evaluation criteria are considered more valuable than properties which meet only one criterion. The list is as follows:

1. Wellfields, aquifers, recharge areas for water  
(Baker's Pond-Brewster, Eastern slope of watershed, Well #7)
2. Coastal Lands (ocean/ pond frontage, beaches, dunes)
3. Natural or Wildlife Preserves (rare species habitat of higher priority)
4. Scenic Vistas and Cultural Landscapes
5. Trails (walking & biking)
6. Recreational Potential (passive or active)
7. Wetlands
8. Forest Lands
9. Agricultural Lands

In addition to outright land purchase, the Town, OCT and other entities have applied innovative approaches to preserving open space, including the following methods:

Fee acquisition (conveying full title to land)

- Donation: immediate or installment: to Town or Orleans Conservation Trust
- Purchase: friendly sale, eminent domain, bargain sale, installment sale
- Bequest
- Tax title transfer

Less-than fee protection (conveying partial rights to property)

- Access easement

- Conservation restrictions
- Lease
- Remainder interest/reserved life estate
- Option/rights of first refusal
- Tax-deferral programs: MGL 61, 61A, 61B
- Differential assessment program: Special Act 797 of 1979

To determine the acquisition technique best suited to a particular parcel targeted for protection, the following circumstances should be evaluated:

A. Needs of the community:

- Is the parcel desirable for access and active use, or resource protection and passive use?
- Are acquisition funds available (cash donations, town appropriation, outside grants?)
- Is the parcel needed immediately or in the future?
- Would the parcel address needs of Environmental Justice populations (i.e., make it easier for people of limited means to access and enjoy a variety of open space and recreation opportunities)?

B. Needs of the landowner:

- Are income tax or property tax advantages, or cash most important for landowner's financial situation?
- Is continued privacy an issue?
- Is the landowner sympathetic to public protection?
- Size and value of parcel
- Is the parcel large enough to protect what needs protection or serve as a linkage?
- Is the entire parcel needed or just a portion?

C. Development pressures:

- Is the parcel likely to be available later if not acquired now?
- Is the real estate market likely to push prices beyond reach or will the market decline in the foreseeable future?
- Can the town relieve land development pressure through advantageous tax policy?

D. Maintenance:

- Can the community manage the property better than current landowner, given expected levels and types of use?
- Does the Town have the money and expertise to manage the parcel?

Using this approach, open space opportunities across the Town have been prioritized. (Map 7D) In general, parcels proposed for active use, such as parks, swimming beaches or boating facilities, should be publicly owned for liability reasons. Resource protection uses may not require public ownership.

### *Needs of Special Groups*

Orleans population demographics lean heavily toward retirees in the winter, with a large influx of seasonal visitors in the summer. For both groups, access to public open space is of great importance. The older segment of the population general has a lower degree of physical mobility. Therefore, heavily visited public spaces such as Nauset Beach, Skaket Beach, Pilgrim Lake, and Kent's Point have been designed to accommodate people with mobility issues.

The Town has experienced a decline in the number of young adults and families since 2010. The trend appears to be tied strongly to the high cost of housing compared to local incomes. External forces such as the second home market and an increase in short-term rental properties have made Orleans less affordable to local employees. Causes and solutions to this issue are beyond the scope of this report. Available open space and access to natural resources, however, are features that attract young families, notwithstanding housing cost trends. The Town's available open spaces and recreation facilities are not causing the problem.

Orleans has considered in the past whether a community center for active recreation is needed. A public survey on the matter is being prepared for distribution in 2019.

## **B. Catalogue of Methods of Open Space Preservation**

### 1. Fee Acquisition

#### *Donation (outright gift of land)*

The landowner gives the entire interest in a property (fee simple title) to the Town or charitable conservation organization, such as the Orleans Conservation Trust. The donor is relieved of future property taxes because ownership is relinquished. The donor may receive income tax deductions amounting to the appraised fair market value of the land. There are no capital gains, brokers' fees, or gift taxes for this gift of property.

The landowner may impose use restrictions on the deed, such as prohibiting motor vehicles, though these limitations may reduce the value of the gift. In order to maximize income tax benefits, the landowner may choose to donate parts of the property in different years or donate undivided interests in the entire property over successive years.

Land donations are the easiest, quickest, and least costly land acquisition methods for the receiving entity. A title exam and hazardous waste survey should be conducted prior to conveyance. For donations to the a municipality warrant articles and deeds specifying conservation use should read, "to be managed under the authority of M.G.L. Chapter 40, section 8C," to ensure the land cannot be devoted to other municipal use. Acceptance of land donations is subject to Town Meeting approval, or Selectmen approval if accepted by the Conservation Commission. Gifts of land to the Orleans Conservation Trust and other private entities do not need municipal approval.

#### *Purchase*

The Town or a land trust may choose to purchase the fee simple title to a property, provided that funding is available. The length of time necessary to complete the transaction depends on

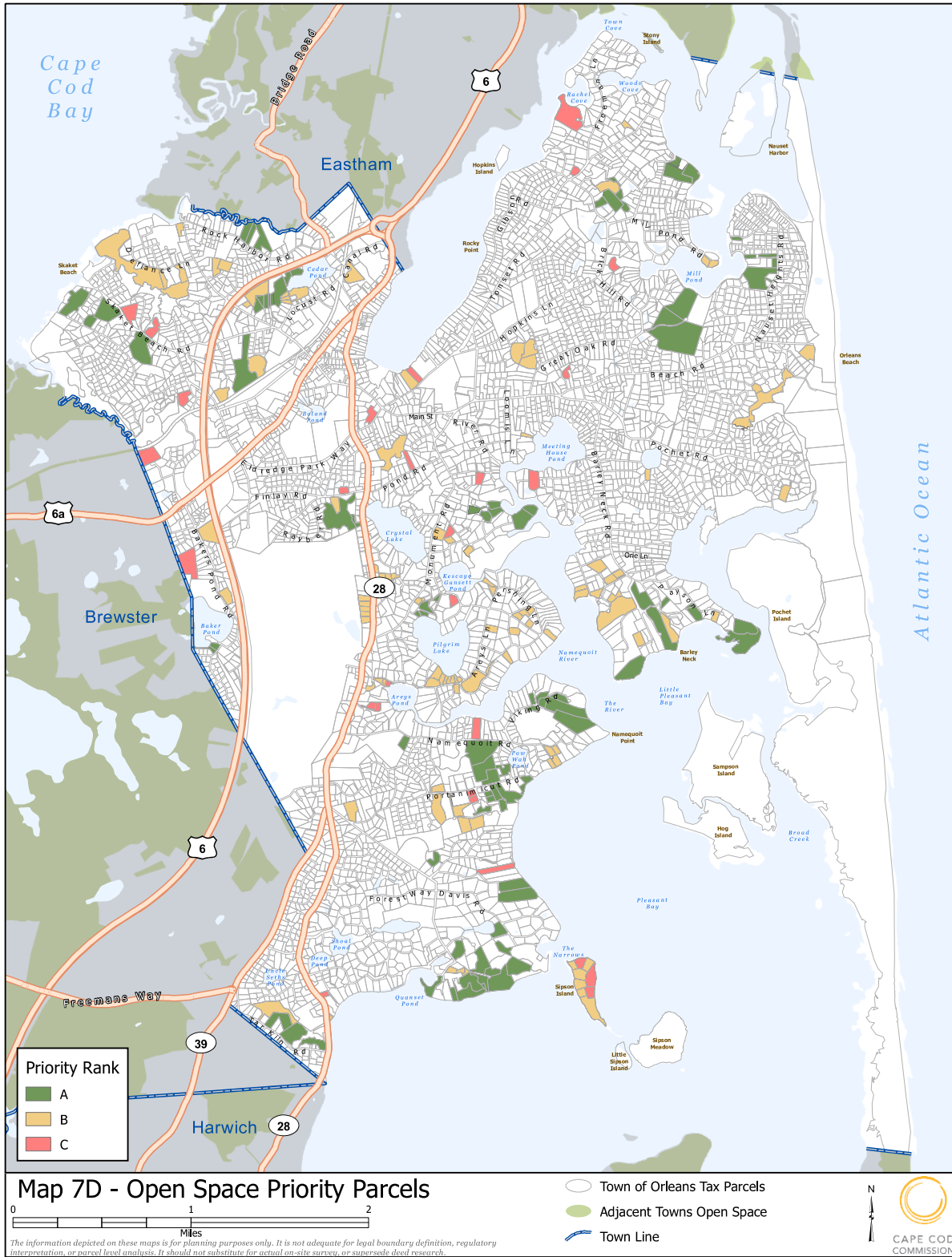
negotiations, title research, appraisals and Town Meeting scheduling. Town Meeting must approve the purchase by a two-thirds majority and, if bonds are issued, a simple majority of a town-wide election is needed to exempt the bonds from the tax levy limit (Proposition 2 1/2).

The Town also has the right to take a property for public purposes by eminent domain.

Compensation in such cases is based a current appraisal. Landowners that feel aggrieved may sue for additional damage awards, as was the case with the Town's taking of the Bakers Pond property.

Where negotiations for purchase of land critical to a public purpose are unsuccessful, eminent domain proceedings may be the only option.

Land purchases can also be structured in installments or at bargain prices to satisfy a landowner's tax needs. A bargain sale is one at a price below fair market value by at least 20 per cent. The difference between appraised value and the sale price should qualify as a tax-deductible gift, which can offset the landowner's capital gains tax on the sale.



Map 7D – Open Space Priority Parcels

### *Bequests (Gifts by Devise)*

Property can be given for public use after the landowner's death if his or her will specifies such a disposition. This technique allows the landowner full use and enjoyment of the land during his or her lifetime, while removing the asset from estate tax obligations at the time of death. There are no income tax or property tax savings using this approach and the community gets no immediate use of the property. There is also no assurance that the landowner's will would not be altered prior to death.

### *Tax Title Transfers*

Tax title properties are parcels acquired by a municipality through foreclosure owing to non-payment of property taxes (M.G.L.c 60). Today, land values are generally high enough to dissuade owners from risking the loss of their land through tax default. In the past, however, many properties were taken through foreclosure.

Once acquired by the community, tax title lands are general purpose municipal lands, usually under the control of the Selectmen. They can be kept, sold by Town Meeting, or transferred to another town agency for a specific use. The Conservation Commission, for example, could request wetlands and parcels with special resource value. Barnstable and Wellfleet have regularly transferred these types of parcels to their Conservation Commissions.

## 2. Less-than-Fee Acquisition

### *Access Easements*

As with easements for drainage, driveways, and utilities, access easements may also be constructed to link open space parcels or to create viewsheds. Unfortunately, landowners often fear the loss of privacy and liability issues associated with public use. If privacy loss results in a reduction in fair market value the Town may lower the tax assessment on the affected parcel accordingly.

Massachusetts General Law (c. 21, s. 17C) protects landowners from liability if they allow public access without charging admission. Access easements granted to the Town must be approved by the Selectmen.

### *Conservation Restrictions (M.G.L. 184 s. 31-33)*

Conservation restrictions are voluntary, yet binding legal agreements between a landowner and the Town or conservation organization, such as the Orleans Conservation Trust. The landowner is offered powerful incentives, through estate tax and federal income tax deductions and property tax relief, to keep the parcels in an undeveloped state. Since authorized in 1969, over 75 acres in Orleans (and 20,000 acres statewide) have been preserved through this technique. The owner keeps control over the land, while the holder of the restriction promises to enforce the terms of protection. The state Secretary of Environmental Affairs and the Selectmen must approve each restriction based on the land's environmental significance or other public benefit.

In 1990 the Orleans Board of Selectmen and Board of Assessors adopted a set of policies, based on work prepared by the town Open Space Committee, which encourage the use of restrictions as a means of preserving natural areas without the Town having to purchase them. Perpetual or temporary restrictions will be considered. Property valuation will be reduced by as much as 90% for lands under permanent restriction.

Appendix B includes listing of all current conservation restrictions in effect in Orleans. Several agreements from the early 1980's have expired since the last CROS update. Note that in addition to the conservation restrictions held by the Orleans Conservation Trust, the National Park Service also holds conservation restrictions over 337 acres of land owned by the Pochet Island Trust.

#### *Lease*

The Town could lease private land for open space needs, such as for a community garden. Leases are effective in their flexibility and "trial-run" aspects. A landowner who is reassured by the community's responsible management of the leased land may be more willing later to cooperate on a more permanent arrangement, such as a donation in fee or conservation restriction.

Leases are recorded in the Registry of Deeds and remain in force until their expiration date, even if the land's title is conveyed. Land leased for public use is typically relieved of property tax obligation. No income or estate tax deduction can be claimed due to the temporary nature of the lease.

#### *Remainder Interest/Reserved Life Estate*

A landowner can give or sell land to a town while retaining the right to live on or use the property for the rest of his or her life. The landowner keeps "a reserved life estate," while transferring the remainder interest to the Town. The landowner receives a charitable deduction for the value of the land minus the value of the life estate (based on IRS actuarial tables) and minus any depreciation. The landowner typically must still pay property taxes and maintenance costs. Reserved life estates are used by elderly landowners who still need their home, but not their land. Benefits to the community include immediate access to the property and knowledge that, eventually, full control will result. The 27-acre Kent's Point parcel near Lonnie's Pond was acquired by the Town in 1988 using this approach.

#### *Options/Rights of First Refusal*

An option is a right, but not an obligation, to purchase a property at an agreed upon price at a specific time. Options allow a town or land trust the time needed to raise funds for a parcel it knows it wants to acquire. Options are particularly useful in times of development pressure and a strong real estate market. They lock in a price and take the land off the market, and allow a town or land trust the time needed to raise funds. The town pays a nominal price for, and records the option. Landowners derive no tax incentives from this technique, but many landowners would prefer to sell their property for conservation than for development.

Rights of first refusal similarly can buy time for the Town to assemble acquisition funds, but are less certain than options. These agreements set neither a purchase price nor an execution date. The Town cannot determine when or if the owner will decide to sell the land, but it gives the public the right to determine the land's fate when that time comes. No tax incentives accrue to the landowner from these agreements; civic cooperation may be the only motivation.

### 3. Property Tax Relief

#### *Current Assessment Programs*

Farms, forest and private recreation lands can receive preferential tax treatment under the current use assessment programs (M.G.L. c.61, 61A, 61B.) These programs enable local assessors to value open lands in their current state rather than at their "highest and best use," which in Orleans would generally be residential or commercial use. It is similar to a conservation restriction program, in that it is employed strictly at the owner's request. This option results in no income tax or estate tax deductions. The property owner must file an annual application, and the Town has an automatic right of first refusal. An advantage of this method is that eligibility criteria and property tax reductions are simple and standard throughout the state:

- c.61 Ten acres of woodland with a state-approved forest management plan; 95% tax reduction plus stumpage fee,
- c.61A Five acres in agricultural production grossing \$500 annually; reduction based on crop type,
- c.61B Five acres used for public recreation or resource protection; 75% reduction.

A disadvantage is that property owners can withdraw from the program at any time, with penalties.

#### *Differential Assessment Programs*

Private retention of open land could be stimulated by Chapter 797 of the Special Acts of 1979, which provides the Selectmen with an option to tax open land at a rate up to 15 percent less than residentially-developed land. The premise is that developed land requires more municipal services and should generate more taxes than open land. The Town's total tax revenue remains the same; more of the burden is simply shifted onto developed properties. The advantage to this program is that it applies indiscriminately throughout the Town; everyone gets a tax break for keeping land undeveloped whether they want it or not. The drawback is that the open space rate reduction of 15 percent is much smaller than the discount offered by other techniques, such as conservation restrictions.

#### 4. Private Conservation Organizations

Land conservation trusts and watershed associations have played major roles in shaping open space protection in Orleans. As private organizations, they can work separately from town government, while pursuing shared goals. As charitable groups recognized by the IRS, they can offer similar tax advantages as the Town to a landowner for gifts of land. Land trusts, such as the Orleans Conservation Trust, are directly involved in acquiring and managing land and conservation restrictions for natural, recreational, scenic or historical qualities. Watershed associations, such as the Friends of Pleasant Bay and Friends of Meetinghouse Pond, are primarily engaged in advocating wise public use, protection of water quality, and research and public education about a particular water resource, but do not actually own land. Both types of groups are supported by public memberships and directed by a board of volunteer citizens.

These organizations do offer some advantages in protection of open space. First, they can work quietly and confidentially with landowners to forge relationships that may result in open space protection, such as a land donation. Second, these groups are an attractive alternative for landowners skeptical about working with governmental bodies. Non-profits are not susceptible to the same type of political pressure to which a town agency may be subjected. Finally, these groups

can be instrumental in performing much of the pre-acquisition work needed for a town to purchase land, including surveys, title exams, appraisals and options.

Founded in 1970, the Orleans Conservation Trust (OCT) is the second oldest land trust on Cape Cod and the largest private landowner in Orleans. Over the years, the Trust has been effective in preserving significant conservation properties, primarily through donations. In 1992, the Trust, protector of over 555 acres in town through ownership or conservation restriction, concluded its first purchase of property, buying Little Sipson's Island in Pleasant Bay with \$150,000 in donations from citizens. Today, OCT owns 469.28 acres of open space, and holds conservation restrictions on 172 acres.

The Friends of Pleasant Bay has filled important research, education and advocacy roles since its founding in 1985. The four-town volunteer group worked to secure the designation of the Bay as a state Area of Critical Environmental Concern (ACEC) in 1987, conducted archeological studies in 1986, completed an inter-town comparative zoning study and a landscape study in 1989. In 1991, the Friends funded the first management plan for a town-owned conservation parcel, the 10-acre Paw Wah Point preserve. The group was also involved in the development of management plans for the Pleasant Bay ACEC and for the Kent's Point Conservation Area.

Both the Friends and the OCT are members of The Compact of Cape Cod Conservation Trusts, which provides them with technical assistance and professional expertise on matters relating to planning, land acquisition and management, and non-profit administration, in addition to linking them to their counterparts across Barnstable County. The Orleans Pond Coalition, and groups such as Friends of Meetinghouse Pond, promote the protection of the Town's fresh and marine waters. The many programs and educational offerings of OPC provide information about land stewardship and sustainable landscaping practices, among other topics.

### **C. SCORP Compliance**

The Town of Orleans, in preparing and evaluating open space and recreation acquisition options, will endeavor to comply with the provisions of the Statewide Comprehensive Outdoor Recreation Plan. The plan focuses on enhancing opportunities for outdoor activities that may take place on recreation and open space lands. One of its main tenets is that enjoyable outdoor activities lean heavily on the quality of the outdoor environment. This plan attempts to set a framework for evaluation of potential acquisition so that progress in Orleans complements the desire for areas where one can find clean air, abundant wildlife, and a general respite from the dizzying pace of modern society. Many of the evaluation criteria adopted by the Orleans Open Space Committee seek to establish areas for passive recreation that are consistent with the goals of the SCORP.

Orleans is committed to providing open space and outdoor recreation opportunities to people with disabilities. The Town has limited resources and cannot make all public lands fully accessible to those with mobility or other limitations. The Town has chosen as an alternative to work diligently to ensure accessibility to a variety of open space types, and has made very good progress in this area since the 1999 and 2006 CROS plans were adopted.

## **D. Summary of Needs**

Orleans is a small town, with great natural beauty. The Town's wonderful views and environment of native plants and wildlife are enjoyed by residents and visitors alike. Many of its natural areas are also important recreational resources. The open space, recreational amenities, and other aspects of protected lands and waters are important to the economic vitality of the community. The purpose of this plan is to identify means by which to protect valuable resources that are vital to the Town.

### 1. CROS Community Survey and 2005 Planning Survey

As discussed in Section 6, an opinion survey conducted in 2014 solicited residents' views on Open Space. Results of the survey were compared with the 1999 survey, which utilized the same survey questions. A copy of the survey form with complete results is included in Appendix A. Based on the results of the survey, the qualities residents like most about Orleans are the small town atmosphere and availability of beaches and boating areas.

Residents describe their town as a community that has worked to preserve its small town character and one that encourages preservation of open space. The three most important reasons cited for protection were open spaces to meet the Town's water and conservation needs, maintain rural character, and provide public access to the shore. These responses are consistent with the findings of the 1999 Orleans resident survey, which also noted protection of drinking water and access to its marine and freshwater resources as high priorities.

The highest priority for town action in 2014 was the same as 1999: acquire more open space, improve conservation land with amenities, and provide more parking at beaches.

The 2014 survey showed that a very high percentage of respondents favored Town-supported land acquisition as a way to preserve open space. "Regulating undeveloped areas," was the most popular residential growth policy. Fewer respondents in 2014 favor "regulating growth in existing developed areas," than in 1999, while a greater share favor "encouraging higher growth in the Village Center," perhaps reflecting public understanding of smart growth concepts.

### 2. National Park and Recreation Standards

Orleans currently meets many of the national recreation standards for its year-round resident population. For the seasonal population of 18,000 the Town meets the standards for swimming beaches, football and soccer fields. As a developing town, Orleans must ensure that its recreational facilities expand to keep pace with demand. Growing leisure time and widespread interest in physical fitness demand fiscal commitment to build and maintain adequate facilities.

### 3. Recreational Facilities Conditions and Needs

The vast majority of survey respondents indicated satisfaction with the number and condition of recreation areas for adults and children in Orleans. However, continued upkeep of these areas is likely to require substantial investment.

The Town of Orleans has more than forty recreation facility components at eight locations. From time to time, these components require re-investment to maintain functionality, safety and accessibility. Investments in recreation improvements often compete for funding provided under

the Massachusetts Community Preservation Act. An evaluation of existing recreation facilities investment needs was undertaken in 2014 to provide the Town with information to plan investments and CPA funding requests in an orderly, sequential manner. Although it is not a facility, the Finch Skate Park at Nauset Middle School, operated by Orleans Together We Can, was also included in the assessment.

Each facility component was visited, observed, and categorized, with improvement needs noted. Buildings were further evaluated by the CA Crowley Engineering, Inc. and Brown, Linqvist, Fenuccio & Raber Architects, Inc. Cost estimates for required improvements were estimated by the consultants and augmented by Town staff.

An assessment of recreational facilities and a summary of recreational building needs are provided in Appendices C and D, respectively. The assessment calls for a total of approximately \$1.3 million in investments over five years. This includes more than \$625,000 in improvements at Nauset Beach, nearly \$60,000 at Skaket Beach, and \$23,000 at Pilgrim Lake. Nauset Beach improvements include \$.5 million to relocate the parking area landward. The planned relocation of parking is a result of increased storminess, which has led to a three-fold increase in the rate of erosion, to 12 ft per year. The Town is taking proactive measures to relocate parking and support facilities landward, to preserve public access at the Town's most famous and appealing natural attraction. Another major investment called for in the assessment is \$400,000 to rebuild the band shell in Eldredge Park, the site of Pops in the Park and numerous community productions. The remaining \$192,000 is indicated for projects including basketball and tennis court resurfacing, fencing of playgrounds, and improvements to make play areas more accessible.

## **E. Management Needs**

Most survey respondents believe the Town is taking good care of most of its open space facilities. Rather than approach management of town open space in an ad hoc manner, comprehensive management plans for many areas have been developed. The plans, developed by the Conservation Commission, involve public processes and best management practices. The resulting plans include handicapped-access, resting benches, picnic tables, scenic overlooks, parking and beach access. Management plans have been produced for Paw Wah Pond, Kent's Point, John Kenrick woods and other town-owned open space.

Accessibility for the disabled is an important consideration when developing and managing facilities. The Town has many examples of how this can be done in an economically responsible and environmentally sensitive manner. Kent's Point was developed with handicapped considerations in mind, making it accessible to ambulatory citizens who may tire easily, by providing benches every 250 feet, rather than paving a lengthy trail for wheelchairs. The Malcolm Dickinson Memorial Conservation and Recreation Area at Crystal Lake was developed to make that popular swimming pond wheelchair accessible by providing a ramp to the water's edge. At Bakers Pond, however, the very high and steep bank to the shore makes this concept unfeasible. A seasonal wooden ramp to cross the beach at Nauset Town Beach for wheelchair swimmers is more practical than at Skaket Beach, with its extreme tide range.

As part of good management practice, recreational opportunities at town-owned facilities should be publicized. Street signs directing motorists to Kent's Point and Paw Wah Pond have been installed.

The Cape Cod Commission Regional Policy Plan supports the promotion of environmental tourism on the Cape as a positive form of economic development. The Town should continue to find creative ways to promote its holdings.

Other management needs involve long-term vigilance, including open space retention. Although state and federal restrictions limit the uses of some town-owned parcels (Sea Call, Kent's Point, the Poor Property, Paw Wah Pond, Bakers Pond and the Dickinson Area), depending on the funding source and method of purchase, some open space properties could be converted to another municipal use. Attempts have also been made by a minority of concerned citizens to sell some Town-owned open space as means of revenue generation for the Town. How the Town manages its open space may influence decisions on the sale of properties, as well as future purchases.

The Town should also consider opportunities to convert existing developed parcels into recreation and open space land where appropriate. An example is the town property at 223 Beach Road, where the former motel buildings are being removed to support long-term parking for Nauset Beach. The Orleans Conservation Trust has led the way in this regard. In 1989 OCT was given a 1.26-acre lot on Champlain Road with the stipulation that the dilapidated house on the parcel be demolished and a field restored. Working in partnership with the Town, which waived expensive fees for disposal of demolition debris, OCT accomplished the task in 1990. In 1992, OCT faced the more daunting task of raising \$150,000 to purchase Little Sipson Island to prevent the old cabin there (swept away in the October 1991 storm) from being replaced by a modern structure.

## **F. Conclusion**

In addition to continuing its long-standing program of purchasing land, the Town must forge creative partnerships with public and private agencies or groups to complete its mission of protection, management, retention and restoration of open space and recreation lands. Land use regulations that protect meaningful open space, bequests of land, and conservation restrictions all should be fully explored and pursued as opportunities to protect open space without use of public funds. Town policies that ensure the long-term retention of town property currently used as open space should be pursued. Finally, long-term investments will be needed to maintain open space and recreation facilities that are vital to the Town's character and the community priorities.

**SECTION 8 – GOALS, OBJECTIVES AND ACTIONS**

The results of the CROS Survey and interviews with town department heads and committee chairmen were key sources for developing the Goals and Objectives of this plan, and the criteria by which properties are judged suitable for acquisition. The charts that follow indicate actions proposed for implementation and the responsible party. It includes goals and the policies of the plan, and the actions to be carried out by various town committees and departments.

<b>Table 7. Goals, Policies &amp; Actions</b>		<b>Responsible Party</b>
<b>CONSERVATION GOAL: PROTECT AND ENHANCE ORLEANS’ FRAGILE ENVIRONMENTAL RESOURCES</b>		
A.	<b>PROTECT ORLEANS’ COASTAL/SALTWATER RESOURCES:</b> Preserve and restore impaired coastal water quality that will enable fishing, shellfishing, swimming and boating to continue for residents to enjoy and as a mainstay of the Town’s tourist economy and support indigenous industries to commercial fishing and shellfishing:	WQTF
1.	Identify, locate and mitigate existing sources of pollution	WQTF
a.	Reduce impact of nitrates from septic systems on coastal water quality	BOH
1)	Use reports of frequent pumping generated by the septic plant to alert Health Department of private system failures.	BOH
2)	Evaluate feasibility of new regulation to require upgrades at sale of property.	BOH
3)	Control nitrate loading of saltwater bodies by zoning similar to that in the watershed with stricter health regulations, consider nitrogen sensitive area designations for areas with impacted water bodies.	BOH
4)	Support town efforts to implement the 2015 consensus agreement to address nutrient loading to surface waters.	BOH
b.	Consider development of local or regional pump-out facilities in Rock Harbor area.	Hrbr Mast
1)	Study need/feasibility of mobile or stationary pump-out station for Pleasant Bay.	Hrbr Mast
2.	Control, to as great an extent possible, the effect of nutrient- and contaminant-bearing road runoff on coastal water quality.	WQTF
a.	Provide adequate drainage for roads and parking areas, which avoids negative impacts on wetlands, surface water bodies or groundwater.	Hwy Dept
1)	Consider amendments to zoning bylaws and subdivision rules and regulations requiring use of drainage systems that remove nutrients.	Planning Dept
b.	Mitigate point sources of contamination from direct discharge of runoff into coastal waters.	Hwy Dept
3.	Preserve salt marsh and other salt water wetlands through local wetlands permitting processes.	Con.Com.
a.	Continue to ensure no net loss of wetlands on any particular property.	Con.Com.
b.	Enforce setback limits from edge of coastal bank of wetland.	Con.Com.

4.	Continue planning to promote economic, aesthetic and environmental quality of town waterways and beaches.	Planning Dept.
a.	Support recommendations of the 1991 Town Cove Park Study to heighten awareness of resource and provide stronger backing for protective regulations.	Planning Dept.
b.	Work with regional, state and community partners to coordinate resource protection in the Pleasant Bay and Nauset Estuary watersheds. State partners include Massachusetts Department of Environmental Protection and Massachusetts Estuaries Project; Regional partners include the Cape Cod Commission and Pleasant Bay Alliance (for the Pleasant Bay watershed), and towns of Eastham and Brewster (for the Nauset Estuary watershed), and local partners include the Orleans Water Quality Advisory Panel, among others	Planning Dept.
<b>B. PROTECT THE TOWN'S FRESHWATER RESOURCES:</b> Preserve the quality of groundwater, ponds and fresh water wetlands which provide drinking water, recreation and wildlife habitat:		
1.	Continue to protect public supply wells from contamination. Limit nitrate and phosphorus loading to expected safe levels in the zones of contribution to public wells and watershed to surface water bodies.	Water Dept.
a.	Review existing fresh surface water quality data and develop a water-quality restoration plan as indicated by the data	WQTF
b.	Prevent contamination of groundwater by nitrates and other hazardous substances. For better protection of groundwater from possible spills, investigate the feasibility of creating a regional program to regulate the handling and storage of hazardous materials, inventory hazardous waste generators, and develop and enforce regulatory controls on storage and use of hazardous waste.	BOH
c.	Develop programs to educate public, particularly owners of waterfront properties, on dangers of over use of fertilizers, failing septic systems, and use of household products containing phosphorous or hazardous chemicals	Cons. Com BOH
d.	Inventory and assess condition of all underground fuel storage tanks. Begin a program of removal of all fuel storage tanks.	BOH
2.	Dispose of septage waste without threatening groundwater resources.	BOH
a.	Continue to engage volunteers in monitoring fresh water bodies for a full suite of nutrient parameters to evaluate pond health, including phosphorus, water clarity, dissolved oxygen, among others.	WQTF
b.	Monitor nitrate levels of groundwater near Tri Town septage treatment facility	WQTF
3.	Preserve fresh water wetlands through local wetlands permitting process.	Con.Com.
<b>C. PRESERVE SENSITIVE LAND-BASED RESOURCES:</b> Protect and preserve the value of lands for wildlife habitat, watersheds to wetlands, protection of groundwater for public drinking water supply,		
		Cons. Com.

	woodlands and forests, archaeological resources, and other historic resources:	
1.	Protect rare and endangered wildlife species.	Cons. Com
a.	Identify rare and endangered wildlife species habitat in areas proposed for subdivision and other new building and protect to the greatest extent possible.	Cons. Com
2.	Preserve other green space for wildlife habitat.	Planning Bd
a.	Review subdivision regulations to encourage cluster subdivisions, buffers around subdivisions, and green strips bordering commercial areas to provide some habitat.	Planning Bd
b.	Require buffers of natural vegetation between resource areas such as wetlands, coastal banks, ponds, etc., and residences.	Con.Com.
c.	Encourage maintenance of land, which is open field or meadow, a disappearing wildlife habitat and aesthetic resource.	Cons. Com
3.	Preserve landscapes and structures significant to history and rural character.	Cons. Com Hist Comm

D.	<b>ENCOURAGE CONTINUATION OF SELF-SUSTAINING, RENEWABLE RESOURCES:</b> Retain and, where environmentally appropriate, expand opportunities for renewable natural resource utilization, such as agriculture, aquaculture and silvaculture:	Cons. Com.
1.	Continue a shellfish resource enhancement program, and work to restore other marine resources, such as herring runs.	Hrbr Mast
2.	Continue to promote community gardens at Sea Call Farm and the Infirmary Lot (Tonset Road), based on successful past experience.	Con.Com.
3.	Preserve town tree plantings through professional program maintenance. Add new plantings as appropriate.	Tree Warden
4.	Encourage use of the 61-A conservation restriction to foster local agriculture.	Cons. Com
E.	<b>MITIGATE NATURAL HAZARDS OF STORM FLOODING AND SEA LEVEL RISES:</b> Promote sound land use principles to prevent acute storms and sea level rise from causing undue threats to public safety and natural resources:	Planning Dept.
1.	Discourage further construction in flood prone or storm vulnerable areas by acquisition or other preservation techniques, state and local wetland regulations, zoning or other available tools.	Planning Dept.
2.	Require greater setback from coastal banks for a new construction.	Con.Com.
3.	Enforce flood district zoning and state building code requirements for construction in flood prone areas.	Bldg.Com.

4.	Evaluate when, how and where coastal erosion can be controlled without adversely affecting marine ecology.	Con.Com.
<b>F. MANAGE TOWN'S OPEN SPACE PROPERTIES TO PROTECT NATURAL RESOURCES WHILE ENCOURAGING APPROPRIATE PUBLIC USE:</b>		
1.	Develop and implement management plans, based on needs for public use and environmental assessments, for town-owned parcels committed to open space, conservation and recreation,	Con.Com.
2.	Consider need to hire additional Parks Department personnel to assist with maintenance of town open space, conservation and recreation areas. Prepare operating budget request with analysis from Park Superintendent for Town Meeting.	Town Admin.
3.	Install signs in prominent locations showing the direction of town beaches, landings and open space.	Hwy Dept.
<b>G. INCREASE PUBLIC PHYSICAL AND VISUAL ACCESS TO WATER IN A MANNER COMPATIBLE WITH ENVIRONMENTAL PROTECTION OF THE RESOURCES:</b>		
1.	Develop plan for locating docks in an environmentally appropriate manner, including potential use of community docks.	Con.Com.
2.	Develop regulations to control residential uses on the water surface, i.e., houseboats.	Hrbr Mast.
3.	Protect and/or acquire additional land that meets this objective.	OSC
<b>H. COORDINATE PROTECTION OF RESOURCES WHICH CROSS TOWN BOUNDARIES: Cooperate with nearby jurisdictions to promote regional protection of groundwater, coastal and surface water quality and migratory wildlife and other natural resources which occur across town boundaries:</b>		
1.	Encourage cooperation between local conservation commissions on regional administration of the State Wetlands Act in order to protect regional groundwater and wetlands.	Con.Com.
<b>OPEN SPACE GOAL: PRESERVE AND MANAGE NATURAL AREAS TO PROTECT THE NATURAL ENVIRONMENT, PROVIDE HABITAT FOR WILDLIFE, AND RETAIN ORLEANS' RURAL CHARACTER</b>		
<b>A. ACQUIRE OR PROTECT LAND SIGNIFICANT TO GROUNDWATER PROTECTION</b>		
1.	Protect the Town's present and future public water supply and its quality by preservation of lands which:	OSC
a.	Abut or expand the Town's well fields or watershed areas	OSC
b.	Are within the zones of contribution for one or more of the Town's public water supply wellfields.	OSC

c.	Are within the Town’s Water resources District as shown on the zoning map	OSC
d.	Would jeopardize the Town’s water supply or quality if inappropriately developed.	OSC
<b>B. PROTECT ENVIRONMENTALLY SENSITIVE LANDS:</b>		
1.	Protect the Town’s ecologically important and environmentally sensitive lands and water bodies by means of acquisition of or protection of lands which:	OSC
a.	Lie within Areas of Critical Environmental Concern (ACEC) designated by the Secretary of Environmental Affairs.	OSC
b.	Lie within Other Areas of Environmental Concern defined as lands that are adjacent to or otherwise outside of the defined ACECs such as fresh and saltwater bodies, beaches (salt and fresh water), wetlands (marshes, swamps, bogs, meadow, ponds and creeks), floodplains and surrounding uplands.	OSC
c.	Provide refuge to federally or state listed endangered or threatened species or species listed as of special concern.	OSC
d.	Have significant indigenous species that provide a strong and diverse genetic pool for the species preservation.	OSC
e.	Provide “wildlife corridors” which allow movement and migration of wildlife.	OSC
<b>C. PROTECT WATER QUALITY OF SALT AND FRESH WATER BODIES:</b>		
1.	Protect the water quality of the Town’s salt and freshwater bodies by acquisition or preservation of lands such as:	
a.	Those which abut marsh and wetlands;	OSC
b.	Watersheds to salt and freshwater bodies;	OSC
c.	Buffer strips of natural vegetation or other lands which could provide for drainage, the filtration of road runoff and other pollutants;	Cons. Com.
d.	Lands, the development of which present an unacceptable risk of increased pollution in the form of road runoff, nutrient loading from septic systems, or the disturbance of the natural landscape or wildlife habitats.	Planning Dept.
<b>D. PROTECT NATURAL RESOURCES OF RECREATIONAL AND ECONOMIC VALUES.</b>		
1.	Protect the Town’s recreational amenities, outdoor educational amenities, and economic resources by acquisition or preservation of lands which:	Parks & Beaches/ OSC
a.	Abut town landings where development would be incompatible with them or with the expansion of access or parking areas.	Parks & Beaches
b.	Would contribute to or provide public places.	OSC

c.	Would promote fishing (finfish and shellfish) by protecting habitat, minimizing pollution, preventing inconsistent uses and expanding access.	Harbormaster
d.	Would promote the Town's farming or agricultural resources such as small farms, cranberry bogs, community gardens, forest resources, such as tree farms and tree harvesting.	OSC
e.	Protect or expand walking and bicycling trails as well as waterway/canoe trails by providing launching or haul-out locations, or land or lands which would provide locations for other activities usually associated with passive recreation as defined by Mass. Division of Conservation Services.	OSC
f.	Provide for expanded recreational and open space facilities in various geographic areas in town presently under-supplied and including lands within subdivision.	OSC
g.	Expand existing public and private conservation, recreation and open space lands.	OSC
<b>E. PROTECT THE TOWN'S SCENIC RESOURCES:</b>		
1.	Acquire or preserve lands:	OSC
a.	Which are defined by the Massachusetts Scenic Landscape Inventory as "noteworthy" and "distinctive."	OSC
b.	Along the navigable waterways or scenic byways that are part of the "Cape Cod" landscape and which protect the rural seaside character of the community. Such byways may be designated by the Town or State as "Scenic Roads".	OSC
c.	Preserve views of the water from the land, views of the land from the water, scenic landscapes and vistas for public enjoyment.	OSC
<b>F. PROTECT SIGNIFICANT HISTORICAL AND ARCHEOLOGICAL SITES:</b>		
1.	Acquire or preserve lands which:	Hist. Com.
a.	Contribute to the unique Cape Cod character of the Town.	Hist. Com.
b.	Contain historical or prehistoric resources.	Hist. Com.
c.	Meet the criteria of the National Register of Historic Places or the Massachusetts Historical Commission.	Hist. Com.
<b>G. CONTINUE ONGOING TOWN ACTION NECESSARY FOR AN EFFECTIVE OPEN SPACE PROGRAM:</b>		
1.	Pursue the preservation and protection of open space through the Town's Open Space Committee (OS).	BOS
2.	Map fragile environmental areas and plan future open space acquisitions for their protection. Where possible, connect open space to create wildlife corridors.	Planning Dept.
3.	Pursue grants for environmental studies, planning, land acquisition and improvements.	Planning Dept.

4.	Improve public access to town-owned land by defining paths and passive recreation on public open space where appropriate.	Parks & Beaches
5.	As land that would provide valuable linkage to open space areas is proposed for subdivision, negotiate with developers for pedestrian easements.	PB
6.	Promote continued town financial commitment to acquisition for public open space. Establish regular commitment in capital budget for land acquisition.	BOS
7.	Acquire or protect land in conformance with land acquisition objectives as described above.	OSC
8.	Maintain and update the Open Space Acquisition list.	OSC
<b>H. COORDINATE OPEN SPACE PROTECTION WITH ADJACENT TOWNS AND REGIONALLY ACROSS CAPE COD.</b>		
1.	Cooperate with nearby jurisdictions to promote protection of regional resources. Seek State funding assistance to create the Namskaket beach conservation/recreation area, and to protect lands in Brewster that are adjacent to the Orleans watershed.	BOS
<b>I. PROVIDE ACCESS TO OPEN SPACE FOR THOSE WITH VARYING PHYSICAL AND OTHER ABILITIES:</b> Ensure that open space is accessible to Environmental Justice populations and residents with a variety of levels of mobility, mindful of site characteristics and financial considerations.		
1.	All residents should live within walking distance of an accessible open space area. Conduct a service area analysis using quarter-mile radius of park parcels. Utilize for Open Space Committee recommendations for new areas.	PB

	<b>RECREATION GOAL: MEET RESIDENTS’ RECREATIONAL NEEDS BY MAKING THE MOST OF THE TOWN’S UNPARALLELED RECREATIONAL ASSETS.</b>	BOS
A.	<b>MEET LOCAL RECREATION NEEDS THROUGH BALANCED OFFERING OF PROGRAMS:</b> Develop and/or expand recreational programs which address the needs of local residents, including those of different age, incomes and abilities, subject to availability of funds.	Parks & Beaches
1.	Develop recreation programs to meet the needs of all residents	Rec. Dept.
2.	Install resting benches along trails in parks and conservation areas.	Parks & Beaches
3.	Maintain extracurricular programs for Middle and High School students.	Rec. Dept.
4.	Continue to provide programming for fall, winter and spring for year-round residents with indoor as well as outdoor programs.	Rec. Dept.
5.	Provide essential professional staff for coordination and servicing programs. Consider additional staff, particularly year-round to provide expanded programs at convenient times.	Rec. Dept.
B.	<b>UPGRADE RECREATION FACILITIES AS NEEDED TO PROVIDE BETTER SERVICE TO RESIDENTS.</b> Develop and/or expand recreation facilities to better meet local recreation needs in a manner in keeping with the rural seaside character of Orleans, subject to availability of funds.	Rec. Dept.
1.	Develop an all-purpose court for tennis/shuffle board/badminton/basketball at Eldredge Park.	Rec.Dept.
2.	Consider developing additional facilities based on “actual needs” described in plan. Complete cost estimates and location recommendations for cited facilities.	Rec.Dept.
3.	Consider staffing needs to provide more opportunities for use of the Community Center as an indoor recreation center.	Rec.Dept.
4.	Complete a cost estimate and feasibility study, and explore use of volunteers from senior center and other locations.	Rec.Dept.
5.	Maintain facilities and equipment to lengthen their life and usefulness and reduce capital costs. Continue maintenance of outdoor playing fields as regional and local recreation resource.	Parks & Beaches
6.	Make sure capital facilities and other equipment are used and maintained, and programs operated so as to protect the safety of the public and ensure the long-term success of programs.	Parks & Beaches
C.	<b>UPGRADE FRESH AND SALT WATER BATHING AND BOATING FACILITIES, WITH ASSISTANCE FROM THE HARBORMASTER AND OTHER AGENCIES WHERE APPROPRIATE.</b>	Parks & Beaches

1.	Explore the idea of a pool at a central location. Conduct a survey for the need for a year-round indoor swimming pool.	Planning Dept.
2.	Complete a management plan for town beaches, landings and boat launching sites, including sea level rise analysis.	Parks & Beaches
3.	Maintain public access to the waterfront. Continue legal research on deeds for town landings to identify precisely, areas owned by the Town. Upgrade and improve town landings.	Hrbr Mast.
4.	Ensure that off road vehicle (ORV) use is compatible with resource protection.	Parks & Beaches
5.	Plan for and purchase land for additional parking and beach access at Nauset Beach, the Town's largest public bathing beach, in response to erosion concerns.	Parks & Beaches

D.	<b>ENCOURAGE USE OF BICYCLES ON SAFE ROUTES TO REDUCE CONGESTION, CONSERVE ENERGY AND IMPROVE AIR QUALITY.</b>	Hwy Dept.
1.	Continue efforts to connect the Rail Trail through Orleans and across Route 6.	Planning Dept.
2.	Develop a plan to connect a bikeway to South Orleans, with a goal of eventually establishing a link to Chatham. Conduct feasibility study and make cost estimate of link.	Hwy Dept., Water Com.
3.	Design, print and distribute a brochure/map promoting safe and attractive walking and bike routes.	Planning Dept.
4.	Install additional bicycle racks at beaches, parks and in commercial areas. Determine highest priority sites through use analysis and available funding.	Parks & Beaches
5.	Explore the feasibility of creating a branch of the bike trail to a picnic area at Namskaket overlook, in cooperation with the Orleans Conservation Trust.	Planning Dept.

E.	<b>PROVIDE RECREATION OPPORTUNITIES FOR RESIDENTS WITH VARYING LEVELS OF ABILITY:</b> Encourage opportunities for year-round public recreation town-wide for all residents and visitors.	Parks & Beaches
1.	Provide trails, parking and other means to ensure good access to recreation areas for all residents.	Parks & Beaches
2.	Ensure that access for residents with special needs complies with or exceeds current applicable federal and state Americans With Disabilities Act (ADA) regulations.	Parks & Beaches
a.	Make facility improvements to the ball fields behind the Elementary School to be fully handicapped accessible.	Parks & Beaches
b.	Make handicapped accessibility improvements to band shell at Eldredge Park.	Parks & Beaches

3.	Upgrade existing programs to meet needs of groups with special needs for mobility.	Rec. Dept.
a.	Complete a user needs study to determine the extent of the population with disabilities and their needs for recreation programs.	Rec. Dept.
b.	Make French Cable Station Museum, Orleans Historical Society and similar buildings wheelchair accessible.	Commission on Disabilities
c.	Add accessible sidewalks wide enough to accommodate wheelchairs at the Town Hall, from the center of town to Tonset Woods, and in other important locations. Eliminate existing obstructions in sidewalks.	Hwy Dept.
F.	<b>COORDINATE MANAGEMENT OF RECREATION RESOURCES WHICH CROSS TOWN BOUNDARIES:</b>	Rec. Dept.
1.	Cooperate with neighboring jurisdictions to promote regional coordination of inter-town resources such as Nauset Beach, Rock Harbor, long-distance bike trails and coastal and surface water quality.	Bikeways Committee

**SECTION 9 – SEVEN-YEAR ACTION PLAN**

The seven-year action program (Map 8) is designed to implement Orleans’ CROS Plan. The action plan directly addresses the conservation and recreation needs of the community as expressed in the analysis of community needs. The Plan calls for a variety of actions that fall into three major categories:

- Expenditure – Strategies involving direct revenue outlays. Expenditure items include land acquisition, development costs, equipment purchases, and miscellaneous expenses.
- Management – Strategies that utilize administrative skills and efforts to manage existing resources more effectively and to develop new programs to address recreation and conservation needs.
- Regulatory – Strategies to more effectively manage and control the use of conservation lands, and to limit adverse effects from human uses. (Includes bylaw amendments and other control strategies).

The Action Plan proposes continued efforts to protect land through acquisition. Priority parcels for open space acquisition are shown on Map 7D. However, should new sites be identified in the future that would further the open space and recreation objectives of this Plan, the Town should evaluate those areas and take appropriate action to protect them. Further, it should be noted that the timetable set for implementation is subject to change. Opportunities for acquiring open space cannot always be anticipated, and the Town must retain the flexibility to be able to act on each opportunity as it arises. The Action Plan has been designed to respond to changing local conditions, and sets out minimum, rather than maximum, efforts the Town wishes to take to pursue open space and recreation objectives over the next seven years. It is also noted that priority parcels for acquisition as well as seven-year action items are within areas mapped for Environmental Justice populations.

**CONSERVATION**

PRIORITY	GOAL	OBJECTIVES	ACTIONS	SCHEDULE
1	D.2	Continue to promote community gardens at Sea Call Farm, the Hopkins Lane Lot, and Putnam Farm. – <b>See Map 8</b>	Work with interested citizens	Ongoing 2017-2023
6	E.3	Require greater setback from coastal banks for new construction – <b>See Map 8</b>	Amend Wetland Bylaw	2021
2	F.1.	Draft or revise, and implement management plans for Town parcels committed to open space and recreation.	Plans completed. Ongoing updates to be coordinated.	Ongoing 2017-2023
4	F.4	Design educational displays for self-guided trails at Baker’s Pond, Christian property, John Kenrick Woods, and other properties where public trails exist. – <b>See Map 8</b>	Develop display for Christian property.  Seek funding for publication	2017

5	F.4	Collaborate with Orleans Conservation Trust to include its parcels in Town-wide open space maps.	Seek OCT cooperation  Continuing mapping effort	Ongoing 2017-2023
3	A.2	Improve stormwater treatment in proximity to Open Space surface waters. – <b>See Map 8</b>	Priorities include Cedar Pond, Uncle Harvey’s Pond, Meadow Bog Pond, Boland Pond, and Rte 28 runoff at Tar Kiln Creek.	2017-2023

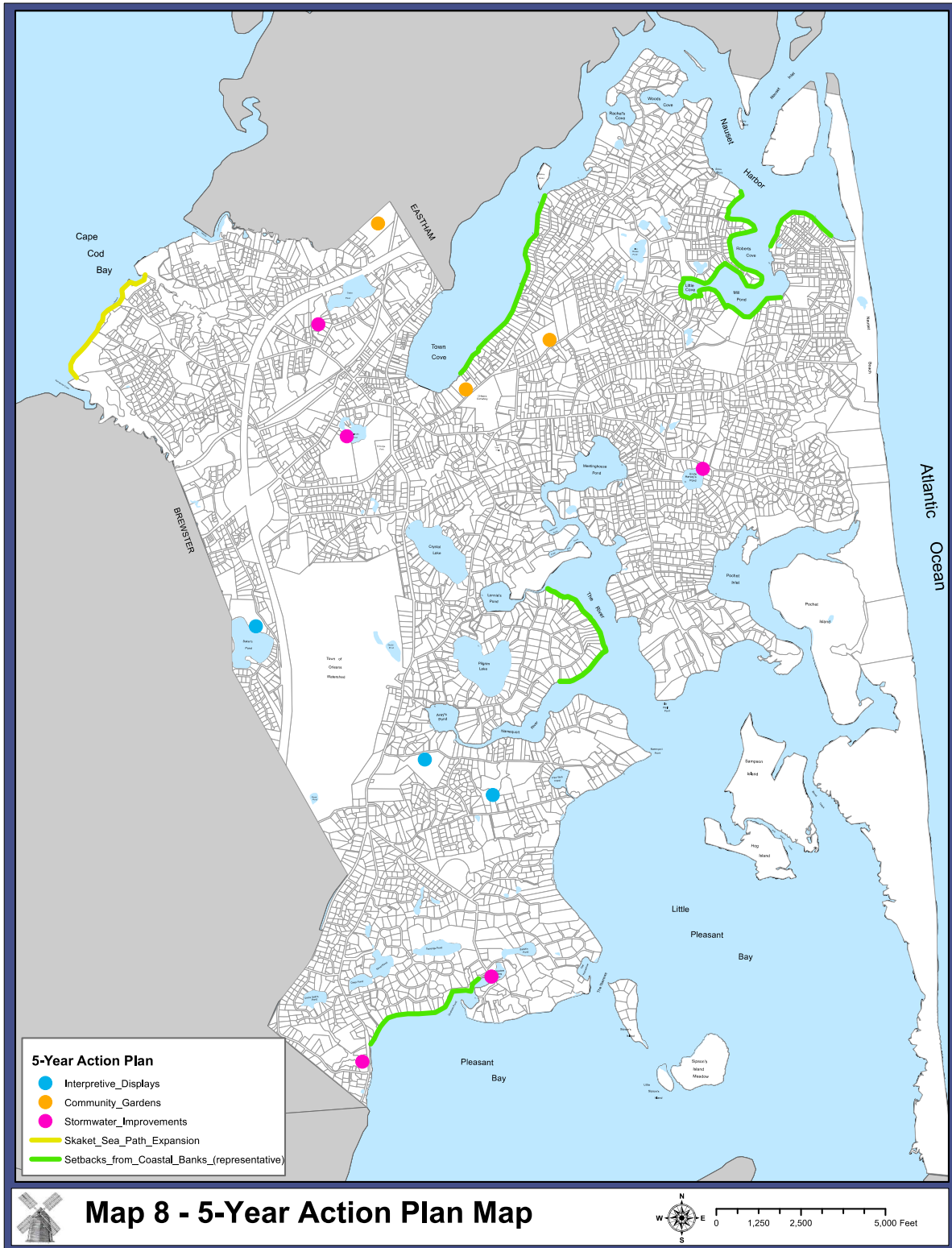
**OPEN SPACE**

PRIORITY	GOAL	OBJECTIVES	ACTIONS	SCHEDULE
2	A.1.a.	Protect well sites	Purchase available abutting property where available if property has protection value.	Ongoing 2017-2023
1	A.1.a.b.c., B.1.e, C.1.a, D1,e.g, E.1,b.(	Protect significant parcels targeted by this plan.	Open Space Committee to continue efforts and negotiations where appropriate.	2017-20
6	B.1.a., C.1.a, D.1.b,e, E.1,a,b, d.	Consider opportunities to complete the Skaket Area “Sea Path” Project. <b>See Map 8</b>	Work with State to clean up Gavigan property rip-rap wall.	2019-23
3	B, C, D, E with 30+ parcels, 80+ acres.	Continue land protection efforts	Approach to owners dependent on available funding/market availability	Ongoing 2017-2023
7		Monitor Chapter 61 Lands	Be prepared to respond quickly to market availability. Begin inquiries.	Ongoing 2017-2023
5	H.1	Cooperate closely with Orleans Conservation Trust to optimize the opportunities for land preservation	Schedule biennial strategy/goals review	2017-2019- 2021-2013

			Determine opportunity for CR promotion on key parcels	
4		Reach out to property owners of priority parcels to create protection opportunities.	Develop a mechanism for contacting owners of priority parcels. Open Space Committee	2017-20

**RECREATION**

PRIORITY	GOAL	OBJECTIVES	ACTIONS	SCHEDULE
2	A.2 B.6.	Install benches, drinking fountains at recreation areas	Parks & Beaches to install	2017-20
1	B.6. Cons F.1	Complete management plans for conservation areas that allow passive recreation usage	Plans adopted, ongoing updates.	Ongoing 2017-2023
3	B.3.	Select appropriate locations for small neighborhood playgrounds	Seek input from residents Identify where appropriate	2022



Map 8 – 5 Year Action Plan

## **SECTION 10 – COMMUNITY LETTERS AND PUBLIC COMMENT**

The draft CROS Plan was posted on the Town of Orleans website on August 30, 2016 and notice of the draft was sent the next day to the chairs of the Planning Board, Board of Selectmen, Conservation Commission, Open Space Committee, Community Preservation Committee, and to the natural resources specialist at the Cape Cod Commission. The notice included an invitation to review and comment on the draft, provided a link to the draft plan on the Town’s website, and also indicated that a limited number of hard copies were available for review. On September 6<sup>th</sup>, an invitation was sent to the same committees inviting them to view a September 13, 2016 presentation of the draft at a public Planning Board meeting. A video tape of yhat presentation is available on the Town’s website.

The only comments received were from a Conservation Commission member, as listed below:

- p. 15 – Identify Water Supply Asset Management Plan
- p. 18 – Mention 2016 downtown zoning work
- p. 24 – Update recent land purchases, including Sparrow, Peck, Hubler, Putnam, and Bevan properties
- p. 30 – Insert brief description of CWMRP process
- p. 46 – Mention landfill nutrient plume
- p. 85 – Include dates of public meetings on CROS<sup>[L]</sup><sub>[SEP]</sub>

In addition to presentation to the Planning Board (September 13, 2016), the draft CROS plan was presented to Open Space Committee (December 9, 2015), Conservation Commission (October 11, 2016), and Board of Selectman (October 19, 2016). Presentations to the Planning Board, Board of Selectmen and Conservation Commission were shown on the local cable access channel and videotaped for viewing on the Town website. Full minutes of all of the public meetings where the plan was discussed are available at the Orleans Town Hall.

Letters of support were obtained from the following Boards, Commissions and Committees:

- Orleans Board of Selectmen (included in this section)
- Orleans Conservation Commission (included in this section)
- Orleans Planning Board (included in this section)
- Orleans Open Space and Land Bank Committee (included in this section)
- Orleans Conservation Trust (included in this section)
- Cape Cod Commission (included in this section)

**APPENDIX A: COMPARISON OF 1999 AND 2014 OPEN SPACE SURVEY RESULTS**

**APPENDIX B: INVENTORY OF CONSERVATION AND RECREATION LANDS**

**APPENDIX C: ORLEANS RECREATION FACILITIES ASSESSMENT**

**APPENDIX D: ORLEANS RECREATION DEPARTMENT BUILDING ASSESSMENT**

**APPENDIX E: ADA/ ACCESSIBILITY**