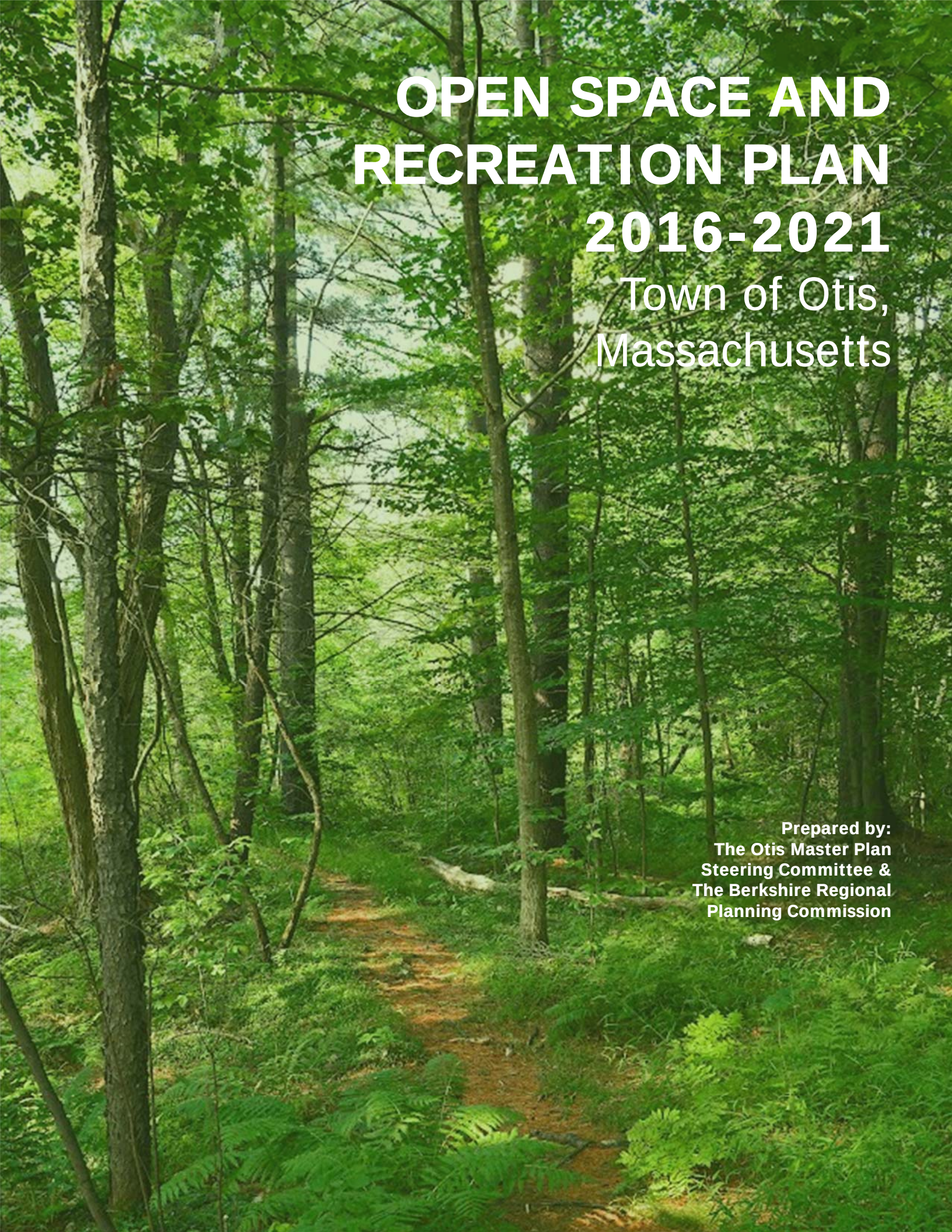


A photograph of a forest path with tall trees and green foliage. The path is a narrow, dirt trail winding through a dense forest. The trees are tall and slender, with green leaves. The ground is covered in green ferns and other low-lying plants. The lighting is soft, suggesting a shaded forest environment.

OPEN SPACE AND RECREATION PLAN 2016-2021

**Town of Otis,
Massachusetts**

**Prepared by:
The Otis Master Plan
Steering Committee &
The Berkshire Regional
Planning Commission**

OPEN SPACE AND RECREATION PLAN

2016-2021

Town of Otis,
Massachusetts

ACKNOWLEDGEMENTS

The Planning Process and Plan Creation Was Spearheaded by The Following:

Otis Master Plan Steering Committee

Terry Cook (Planning Board)

Geoff Geane (Zoning Board of Appeals)

Larry Gould (Building inspector, Chair of Energy Committee, Smart Growth Committee)

Terry Gould (Chair of Zoning Board of Appeals, Finance Board, Smart Growth Committee)

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Town Boards and Departments

Parks and Recreation Commission

Historical Commission

Other Entities

Otis Reservoir Property Owner's Association

Knox Trail Sno-Riders

Big Pond Association

Citizens of Otis

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SECTION 1: PLAN SUMMARY

The 2016 Otis Open Space and Recreation Plan (OSRP) was developed to comprehensively examine the town's open space and recreation needs and identify goals and objectives to help guide future decision making and investment. Otis' previous OSRP was last completed in 2004 and expired in 2009. Among the major accomplishments of the 2004 plan was the creation of the town beach on Big Pond. The 2016 Otis OSRP lays out similar goals and objectives for the town to accomplish by 2019, at which point the plan will expire and the town will no longer be eligible to compete for certain state conservation and recreation grants.

Overall, this Open Space and Recreation Plan helps to answer three questions related to open space and recreation within the town:

- 1.What do we have?
- 2.What do we want?
- 3.How do we get there?

What do we have?

Section 3: Community Setting

Otis is a primarily residential community located in the southern Berkshire Highlands. Otis's population is projected to increase by about 300 residents over the next 15 years. Moreover, the population of Otis is growing older. As of 2010, the median age of an Otis resident was just over 48. While in the past the pace of development was very rapid in Otis, it has slowed in recent years.

Section 4: Environmental Inventory and Analysis

The town has an abundance of natural resources including extensive forest, wetlands, several "Great Ponds", and wildlife habitats. Otis' location near the headwaters of the Farmington River and at the western edge of the Cobble Mountain Reservoir Watershed mean that land use and other activities in the town can have a direct impact on the water quality of Hartford, CT and Springfield, MA. The town is also home to several priority natural communities, which are rare environments that often contain rare or en-



OTIS OPEN SPACE AND RECREATION PLAN AT A GLANCE

What Do We Have?

The Otis OSRP takes stock of existing conditions in the town related to the community, its environmental resources and lands of conservation and recreation interest.

What Do We Want?

The plan provides an analysis of town open space and recreation needs, makes recommendations, and sets goals and objectives based on this assessment.

How Do We Get There?

The OSRP's 5-year action plan outline specific actions the town's will take to achieve its goals. The action plan suggests leadership and provides a timeline for completion of each action.



dangered species. Otis also has many unique features and cultural resources including historic buildings and monuments.

Section 5: Inventory of Lands of Conservation and Recreation Interest

Roughly 1/3 of all land in Otis is protected in some way. The town has extensive state owned land in the form of State Forest and Wildlife Management Areas (WMA's). Other protected lands are privately owned or held by land trusts and other conservation organizations. Some Otis residents have also chosen temporary conservation protections through the Commonwealth's Chapter 61 program which reduces taxes in exchange for managing land through forestry, agriculture, or recreation. Many of the lands identified in this section contribute significantly to the character of the town, as well as provide space for recreation.

What do we want?

Section 6: Community Vision

This section details the components of the public process that were used to draft the OSRP and broadly defines the goals of the plan derived from this process.

Section 7: Analysis of Needs

Section 7 provides an analysis of the town's natural resource, recreation and management needs including the need for protect the towns water and natural resources and the ongoing management of Otis Pond.

Section 8: Goals and Objectives

This section reiterates the goals defined in Section 6 and provides more details objectives that will be completed to achieve those goals.

How do we get there?

Section 9: 5-Year Action Plan

This section outlines the specific actions that will needs to addressed to meet each objective and meet each goal. The action plan suggests leadership roles that town departments, boards and committees can take to help complete each action and provides a time table for completion of each action.

SECTION 2: INTRODUCTION

2A STATEMENT OF PURPOSE

The 2016 Otis OSRP update was completed as part of work to create the Town's Master Plan. This OSRP is an update of plans created in 1990 and 2004. This plan was developed to comprehensively examine the town's open space and recreation needs and identify goals and objectives to help guide future decision making and investment. Major accomplishments of the 2004 OSRP include the development of the town beach on Big Pond.

2B PLANNING PROCESS AND PUBLIC PARTICIPATION

This Open Space and Recreation Plan update was completed by the town of Otis in combination with the creation of its town Master Plan. The Berkshire Regional Planning Commission, based in Pittsfield, was hired by the town to work with the appointed Master Plan Steering Committee (MPSC) on plan development. In February 2015, members were appointed to the Master Plan Steering Committee. These members included:

Terry Cook (Planning Board)

Geoff Geane (Zoning Board of Appeals)

Larry Gould (Building inspector, Chair of Energy Committee, Smart Growth Committee)

Terry Gould (Chair of Zoning Board of Appeals, Finance Board, Smart Growth Committee)

Jim Kauffman (Zoning Board of Appeals)

Harold Kobrin (MPSC Chair and Chair of Planning Board)

Edward Partyka (Zoning Board of Appeals)

Charles Schwartz

Craig Westcott

Berkshire Regional Planning Commission staff:

Thomas Matuszko (Assistant Director)

Eammon Coughlin (Planner)

Berkshire Regional Planning Commission staff updated the town's Open Space and Recreation Plan from a plan previously completed in 2004 and which expired in 2009.



INTRODUCTION AT A GLANCE

History

The 2016 Otis OSRP is an update of plans created in 1990 and 2004. Major accomplishments of the 2004 OSRP include the development of the town beach on Big Pond.

Purpose

The 2016 Otis OSRP was completed as part of work to complete the town's Master Plan, and was developed to comprehensively examine the town's open space and recreation needs.

Public Process

The OSRP public process included a public survey, meetings of the MPSC, and two public forums.



This Open Space and Recreation plan included a multi-part public process that helped to inform its creation.

Master Plan Steering Committee Meetings

The Otis Master Plan Steering Committee (MPSC) met 11 times from March to December 2015. The committee reviewed draft chapters and appendix sections of the Master Plan as well as the updated OSRP.

Master Plan Survey

A survey was created by the Master Plan Steering Committee to gain public input. The survey was created through the online survey website surveymonkey.com and was available from April 24th, 2015 until June 1st, 2015. Due to the popularity of the survey, it was re-opened online for an additional week from June 9th until June 16th, 2015. Paper copies of the survey were available at town hall for those without internet access. The survey was open to all year-round and seasonal Otis residents, as well as second homeowners. A section of the survey was dedicated to questions specific to the Open Space and Recreation and included both open-ended and closed-ended questions to inform the plan. Overall there were 179 responses to the survey. Based on information from the 2010 Census, about 5% of the Town's year-round population responded to the survey. Additionally, many seasonal residents and second homeowners responded. A complete copy of the Master Plan survey results can be found in the Master Plan Appendix. Survey questions and responses relating to the Open Space and Recreation Plan can be found in the appendix of this document.

Public Forums

Two public forums were held by the Otis MPSC. The first public forum was held on June 18, 2015. The second was held on November 9, 2015. The first public forum was intended to gather information. The second was focused on presenting initial recommendations for public response. The public forums were advertised through flyers posted around town, on the town website, and on the community events page of the Berkshire Eagle.

SECTION 3: COMMUNITY SETTING

3A REGIONAL CONTEXT

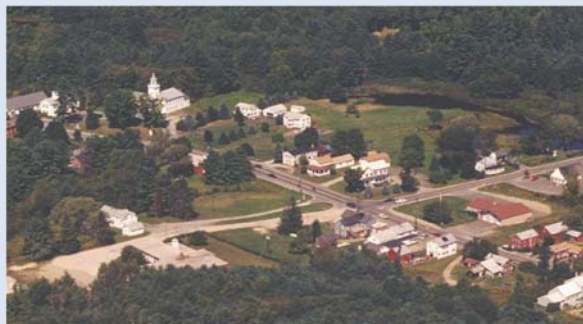
Otis is located in the southwest corner of Massachusetts, in Berkshire County. Becket borders the town to the North; Monterey and Tyringham to the West; Sandisfield and Tolland to the South; and Blandford (part of Hampden County) to the East. The town's location and elevation in the Berkshire highlands put it at the headwaters of the Farmington River and near the Cobble Mountain Reservoir. The Farmington River is the major source of drinking water for the city of Hartford, Connecticut (population 125,000). The Cobble Mountain Reservoir is the drinking water supply for the City of Springfield, MA (population 150,000). A portion of the outstanding resource water (ORW) area surrounding this reservoir is located in the northeast corner of town.

The town has a total land area of 38.07 square miles (24,367.91 acres) that includes many water bodies and is mostly forested. The town's significant water resources, as well as a ski area, provide for year-round tourism, which has become Otis's primary economic base. The Farmington River and the Otis Reservoir are the most important natural resources that Otis shares with its immediate neighbors and other municipalities. The recreational opportunities available in Otis also make this rural southern Berkshires town an attractive destination for second and seasonal homes.

Otis has two distinct topographical regions. These include sharp ridges and deeply eroded streams, west of the Farmington River, and the plateau that expands to the East, where Otis Reservoir, Big Pond and Benton Pond are located (Otis OSRP, 1991). This topography has determined the location of much of the town's development and its settlement patterns, which are generally limited due to slope and shallow depth to bedrock. In the lowlands, wetland areas and water resources have helped to shape development patterns. However, areas around the village center, are suitable for most development, and have supported a mix of housing and commercial development.

3B HISTORY OF THE COMMUNITY

Otis was incorporated as a town in June 13, 1810. The town was named after Harrison Gray Otis, who was a



COMMUNITY SETTING AT A GLANCE

Regional Context

Otis is located in the Berkshire highlands at the headwaters of the Farmington River Watershed and the Cobble Mountain Reservoir, important sources of drinking water for two large regional cities.

History of the Community

Farming and lumber were once crucial components of the Otis economy. Today, recreation and tourism are important aspects. Regionally, the town is known as the "outdoor playground of the Berkshires"

Population

As of 2010, the population of Otis was 1,612 year-round residents. Over half of all housing in town is listed for seasonal or recreational use. The median age of an Otis resident is 48.3 years.

Growth and Development Patterns

Historically, growth has been most dense in Otis Center Village and around the town's water resources. Today, most housing development occurs on relatively large lots away from the water. New housing construction has slowed in recent years.



speaker of the House of Representatives and known as the “Urban Federalist” (Otis OSRP 1991). In 1838, common and previously unincorporated land, known as the “East Eleven Thousand Acres”, was added to the original territory that comprised the town. The original settlement was mainly influenced by the “Great Road”, the Boston- Albany turnpike, also known as Knox Trail, or Indian Trail. This transportation route was historically one of the most important through the region.

Farming and lumbering, especially pine and hemlock, had been the town’s major industry before shifting to a seasonal and tourism-based economy. The West Branch of the Farmington River had provided an important source of waterpower to run the wheels of early mills, and later, for a couple of factories. The number of mills in Otis grew from four in 1829 to 22 in 1885 (Otis OSRP 1991).

The creation of Otis’s mills and industry shaped not only the town’s economy, but the landscape we see today. In particular, the creation of Otis Reservoir (which is almost a history unto itself) remade large portions of the town to suit industrial needs. Samuel Watkins Collins and the Collins Company were based in what is now Canton, Connecticut. The Collins Company was a major producer of high quality metal goods during the American Civil War. During the Civil War, the company was hindered by difficulties in finding workers as well as low water flows from the Farmington River that impacted the company’s metal forging operations. After the war ended, the company decided to examine the creation of a dam and reservoir that would help to ensure year-round water flows needed for its industrial operations.

After extensive surveying and study, it was determined that the area around three existing ponds; Rand Pond, Messenger Pond, and Little Pond had the appropriate topography for construction of a dam. Water from these ponds flowed into the Fall River, as it does from Otis Reservoir today.

The Collins Company purchased land around what is now the Otis Reservoir and created a separate company, the Farmington River Water Power

Company to manage this land as well as the future dam. The dam was constructed to raise the water level 26 feet above the original elevation of the ponds and control the amount of water flowing into the West Branch of the Farmington River. When flows were low and more water was needed by the Collins Company’s operations in Connecticut, they would send a telegraph to the dam operator who would use a horse to raise gates to release more water into the Fall River. Control of the dam was maintained by the Farmington River Water Power Company until 1966.

Beyond the creation of the Otis Reservoir, many of the town’s buildings, particularly around the town’s village centers, provided Otis with its small town New England atmosphere, still visible and enjoyed by residents and visitors today. Berkshire Regional Planning Commission completed an inventory in 1983 that identified local structures of historic value. Structures inventoried include the Congregational Church, the St. Paul’s Episcopal Church, Harmony Hall (currently the town’s Recreation Center), Otis Library, the Knox Trail Inn, a number of old cemeteries, and a variety of landmarks along the Knox Trail, among other significant buildings (BRPC 1979).

The Otis Congregational Church is located on Route 23 & Route 8. This building is presently owned by the Town of Otis Church Society. Dating back to 1813—1814, it conserves the original design of a federal meetinghouse. The construction of this building accompanied the unification of the towns of Loudon and Bethlehem, into what was later named Otis. On June 5, 1810, members of the church from both towns met, and voted to consider all members of each as members of a United Church (BRPC 1979).

The St Paul’s Episcopal Church is located on Route 23 & Route 8. Owned by the Protestant Episcopal Society of Otis, it dates back to 1828- 1829. According to historic records, this building was one of the earliest churches of the Anglican Faith in the County. It is unique, as it is the earliest surviving gothic revival building in the Berkshires. It is rendered in wood with Gothic arched windows, designed to have the look of leaded glass (BRPC 1979).

Table 3.1 - Otis Population Characteristics 2000-2010*Source: 2000 and 2010 US Census, 2006-2010 U.S. Census American Community Survey**

Year	2000	2010
Total Year-Round Population	1,365	1,612
Age (total for each age range and % of total population)		
Under 5 years	54 (3.96%)	68 (4.22%)
5 to 9 years	86 (6.30%)	69 (4.28%)
10 to 14 years	101 (7.40%)	74 (4.59%)
15 to 19 years	84 (6.15%)	80 (4.96%)
20 to 24 years	50 (3.66%)	56 (3.47%)
25 to 34 years	125 (9.16%)	145 (9.00%)
35 to 44 years	258 (18.90%)	211 (13.09%)
45 to 54 years	234 (17.14%)	321 (19.91%)
55 to 59 years	92 (6.74%)	149 (9.24%)
60 to 64 years	88 (6.45%)	147 (9.12%)
65 to 74 years	118 (8.64%)	186(11.54%)
75 to 84 years	62 (4.54%)	78(4.84%)
85 years and over	13 (.95%)	28(1.74%)
Median Age	42.3	48.3
Households	567	708
Average Household Size	2.4	2.28
Minority Population (%)	2.2%	2.4%
Median Household Income (Note: Mass. Median Household Income was \$64,509 in the 2006-2010 ACS)	\$51,488	\$63,750*
Unemployment Rate	3.3%	7.6%
Families below poverty level (%)	4.6%	8.2%
Mean travel time to work (Minutes)	—	27.4
Population Density (residents/square mile) Based on town area of 38.07 sq. miles)	35.85	42.34

Similarly, the Original Otis Town Hall, or Harmony Hall, dates back to 1849. This is a two and a half story Greek Revival style public building that fulfilled the need for a new school and a community meeting place in one building. At that time, the Center School District had decided to buy land and build a new school house. In the meantime, a group of citizens submitted a proposal to combine the two projects. Finally, in November 3rd, 1849, the School District voted to approve this last idea, and later gave birth to this building, originally named “Harmony Hall” (BRPC 1979).

Among other historic buildings, the Knox Trail Inn,

supplements the structures mentioned above.

Originally named the East Otis Hotel, it dates back to 1820. Located on Route 23 in East Otis, this is a one and a half story Federal House, with a symmetrical nine window front. Examples of similar historic value are illustrated by the Ida Hall House and Store, Squire Seymour’s Store, and S. H. Norton’s Store, among other buildings (BCRPC 1979).

Beyond these architectural structures, the Knox Trail stands as one of the most important historic landmarks in town. A marker was built in June 30th, 1928, on the East side of Route 23. As inscribed on the monument, General Henry Knox



TABLE 3.2- Population Growth in Otis from 2010 to 2030

Source: Donahue Institute, University of Massachusetts - Amherst

Year	U.S. Census 2010	Projection 2015	Projection 2020	Projection 2025	Projection 2030	Projected 2010-2030 Change
Population	1612	1726	1829	1914	1980	368

passed through this place in the winter of 1775- 1776 to deliver the train of artillery from Fort Ticonderoga to General George Washington in Cambridge (BRPC 1979). According to historic records, travel was difficult through this territory. The first highway was opened by General Amherst's army when it marched from Boston to Albany in 1759 (Humason 1974). Nevertheless, the main road between Boston and Albany began as a foot path used by the early explorers in the late 1600's. This was the earliest roadway laid to travel between the two states, and has been also referred to as the "Barrington Road" (Otis OSRP, 1991).

Among other sites of historic value, it is important to consider the Civilian Conservation Camps (CCC) located in West Otis. This facility hosted over 100 men during the Depression Era (Wingate 2004).

Otis's spectacular water resources attracted significant development during the 20th century as locations for homes, camps, and cabins. Development has historically been most dense around Big Pond, Otis Reservoir, and Benton Pond. However, there are many other bodies of water in the town (See Table 4.1). In total, there are eight state listed "Great Ponds" within the town, more than any other town in Berkshire County. Additionally, Otis Reservoir is the county's largest recreational body of water.

Otis' ponds and the Otis Reservoir, combined with the supply of state-owned recreation land, including 2 state parks (and a small portion of a third) and 3 wildlife management areas, have helped to earn Otis the reputation of being the "outdoor playground of the Berkshires" (Otis Conservation Commission, 2015).

3C POPULATION CHARACTERISTICS

The town's population saw substantial increases between 1790 and 1850, growing from 605 to 1,224. This accompanied the industrial development

experienced at that time, which ceased towards the end of the century. In 1890, the population decreased to 583, and kept decreasing until it reached 359 in 1950. This population decline, which devastated much of the region, was linked to the failure of a proposed railroad.

Given the important recreational opportunities that the town's natural resources provide, there was intense growth in the second half of the 20th Century. From the population low point in 1950, Otis's population reached 1,073 in 1990 and climbed to 1,612 in 2010 (U.S. Census, 2010). See Table 3.1 -Otis Population Characteristics 2000-2010. Current population density in Otis is around 42 residents per mile², up from 35 residents in the year 2000.

It is also important to note that Otis is one of only a handful of Berkshire towns that are projected to grow over the next 15 years. The Donahue Institute at UMASS Amherst projects that Otis will increase by 368 year-round residents by 2030. See Table 3.2 for population growth in 2010 to 2030.

Overall, the 2010 Census breaks the population composition down as follows: 1,573 White, 2 Black, 9 Asian, 4 American Indian/ Alaskan Native, 20 Multiracial, and 4 people of other racial or ethnic backgrounds. The largest portion of the population is in the 45 to 64 age bracket at 38.2% (U.S. Census, 2010). Please refer to Table 3.6—Population ethnic distribution in Otis. The rest of the population is: 25.5% are 20 to 44, 38.3% are 45-64 18.1% are under 19 and 18.1% are 65 over. Please refer to Table 3.7 - Population age distribution in Otis.

Otis' largest employers speak to the importance of outdoor and seasonal recreation to the town economy. Information on the 25 largest employers in Otis is available from the Mass. Executive Office of Labor and Workforce Development (2016). Of the five employers in Otis that employ between 50 and 99

Table 3.3 - Otis Land Use 1971-1999*Source: Mass. GIS Land Use 1951-1999, 2015*

Category	1971 (Acres)	% of Total Acres	1985 (Acres)	% of Total Acres	1999 (Acres)	% of Total Acres	% Change in acres (1971-1999)
Agriculture	333.19	1.37%	329.71	1.35%	267.65	1.10%	-19.67%
Commercial	40.62	0.17%	48.74	0.20%	50.12	0.21%	18.95%
Forest	20078.26	82.40%	19692.52	80.81%	19433.45	79.75%	-3.21%
Industrial	2.67	0.01%	5.923	0.02%	8.33	0.03%	67.91%
Institutional	17.31	0.07%	35.854	0.15%	34.06	0.14%	49.17%
Mining / Waste Disposal	37.19	0.15%	37.84	0.16%	49.15	0.20%	24.32%
Recreation	185.22	0.76%	202.32	0.83%	206.21	0.85%	10.18%
Residential	890.44	3.65%	1224.26	5.02%	1439.01	5.91%	38.12%
Transportation	82.85	0.34%	84.217	0.35%	84.22	0.35%	1.62%
Vacant	199.31	0.82%	205.70	0.84%	278.56	1.14%	28.45%
Water	1439.11	5.91%	1439.11	5.91%	1438.80	5.90%	-0.02%
Wetland	1061.63	4.36%	1061.62	4.36%	1078.24	4.42%	1.54%
Total	24367.83	100.00%	24367.83	100.00%	24367.84	100.00%	

*Transportation category includes large divided highways or areas like airports and docks. Smaller roadways have not been calculated.

**Vacant land category includes abandoned agriculture, areas like power lines, or areas of no vegetation.

workers, all but one (Farmington River School) are either summer camps or associated with the Otis Ridge Ski area. Other notable industries and employers in town include municipal government, several construction firms, and the Williams stone quarry.

As of 2010, 662 people were employed in the town, leaving a 7.6% unemployment rate. However, this has fallen to 6.1% as of 2013 (U.S. Census ACS 2009-2013). Median household income has declined slightly in recent years, from \$63,750 in 2010 to \$59,271 in 2013.

The mean travel time to work for Otis residents was over 27 minutes in 2010. "Journey to work" commuting data available from the 2006-2010 American Community Survey indicates that as many as 236, or 40% of, employed Otis residents work within the town. This figure includes workers who commute within the town as well as those who are self-employed or work from home. Another 37%, travel to the towns of Lee, Great Barrington, Becket and

Tolland, as well as the cities of Pittsfield and Westfield for employment. The remaining 22% travel to a variety of destinations in Massachusetts, Connecticut and metropolitan areas such as New York City, NY and Philadelphia, PA.

Context and Demographics of Environmental Justice Populations

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 " (Mass. Executive Office of Energy and Environmental Affairs, 2015). Conceptually, environmental justice recognizes that some of the most highly polluted and undesirable areas to live have tended to contain populations of low-income, minority, foreign-born, and non-English speaking residents. Additionally, these populations have tended to have reduced or limited access to open space. In Massachusetts, these populations have been mapped in each municipality based on census information. Because these populations have historically been underserved in terms of open space



and recreation access and opportunities, they should be a crucial factor in future decision-making regarding these issues.

Currently there are no environmental justice populations within the town of Otis (see Map 2—Environmental Justice Populations). However, there is an environmental justice population within the town of Becket, immediately to the north. The designation of this population in Becket is based on income, meaning that 25% or more of households within one area of the community earn 65% or less than the Massachusetts median household income.

3D GROWTH AND DEVELOPMENT PATTERNS

Patterns and Trends

While still a rural town, Otis has seen a shift away from agriculture and lumber harvest toward residential living. While the town is mostly forested, residential housing is the primary land use, far exceeding other commercial or industrial uses.

Infrastructure Transportation Systems

U.S. Route 8 links Otis to Becket, Pittsfield and North Adams. The Massachusetts Turnpike (Interstate 90) passes along the northeastern border of the town. There is no regional transit or rail service offered in town. The nearest public bus stop is located on the Berkshire Regional Transportation Authority (BRTA) route in Great Barrington. The nearest passenger rail service is available in Pittsfield or Springfield. The nearest airports are Bradley International, located in Hartford, CT or Albany International located in Albany, NY.

Pedestrian Facilities

Otis has roughly a half mile of sidewalks that run through Otis Center Village along Route 8. These sidewalks allow for pedestrian travel throughout the village center and also help to connect the town's two park areas, as well as the town recreation center and a short walking trail, the Farmington River Walk.

Table 3.4 - Otis Land Use 2005

Source: Mass GIS Land Use 2005

Land Use Category	Acres	Percent of Total Land
Agriculture	234.66	0.96%
Commercial	49.46	0.20%
Forest	18533.84	76.14%
Industrial	6.26	0.03%
Institutional	17.73	0.07%
Mining / Waste Disposal	55.46	0.23%
Recreation	112.48	0.46%
Residential	824.76	3.39%
Transportation	55.43	0.23%
Vacant	185.74	0.76%
Water	1493.78	6.14%
Wetland	2773.14	11.39%
Total	24342.73	100.00%

*Institutional category Includes town owned facilities as well as cemeteries.

**Vacant category includes abandoned agriculture, areas like power lines and areas of no vegetation, as well as brushland and successional environments not dense enough to be classified as forest.

***Wetland category includes both forested and non-forested wetlands.

Bicycle Facilities

Otis has limited bicycle facilities beyond its existing roadways. Strava is a mobile application used by runners and cyclists that allows them to track exercise time and engage in challenges with other Strava users. Strava maintains a "heat map" which shows physical locations where the application is used (Strava 2015). The map gives a relative indication of which areas are popular for exercise, and which are not. The heat map can provide a snapshot of the places most frequented by Strava users. Based on the heat map for Otis, Route 8, Route 23 and Algerie Road are the most popular areas where Strava users choose to bicycle. The heat map also indicates that Ed Jones, Stebbins, and Reservoir road are frequented by Strava users.

Water Supply Services

As defined by the Massachusetts Department of Environmental Protection, public water systems are defined as those supplies having 15 or more connections, or regularly serving an average of at least 25 people daily, at least 60 days a year. Public water systems can be either Community Water Systems (CWS) or Non-Community Water systems (NCWS). Non-community water systems are either Transient Non-Community Systems (TNC), or Non Transient Non-Community Systems (NTNC). TNC Systems typically serve at least 25 different people, for at least 60 days a year, such as at a restaurant or campground. On the other hand, NTNC Systems serve at least 25 of the same people each day, at least 6 months a year, such as a workplace that provides water to its employees. All of the public water systems in Otis are of the TNC or NTNC type.

According to Mass. GIS, there are 43 public water supply wells in Otis (see Table 3.5). These wells serve town and public buildings, restaurants, and places of business. Additionally, they include many shared well systems around Big Pond and Otis Reservoir (see Map 6 –Water Resources). These public drinking water wells are all surrounded by interim well-head protection areas (IWPA), which provide a 500' buffer around the well-head for TNC systems and a 750' buffer around NTNC systems.

Sewer Services

The vast majority of homes in Otis are serviced through on-site septic systems. However, in 1998 the town developed a small community sewer system and trickling filter treatment plant for the village center. This was a response to the failure of 68 private septic systems near the village center. The sewer system consists of approximately 6,500 feet of collection lines that run under Route 8. The system provides wastewater treatment for roughly 70 residences, Town Hall, the Recreation Center, the Farmington River School and the local Post Office. The system is designed to treat up to 30,000 Gallons Per Day (GPD). In 2014, average daily flows totaled 7,800 GPD, meaning the facility has excess capacity to treat additional wastewater (Keith O'Neill, Personal Communication 2015).

Table 3.5 - Public Drinking Water Wells in Otis, MA

Source: Mass GIS Public Water Supplies 2014

SOURCE_ID	SITE_NAME	TYPE
1225006-01G	KNOX TRAIL INN LLC	TNC
1225011-01G	OLDE OTIS INN	TNC
1225012-03G	BERKSHIRE SPORTS ACADEMY	TNC
1225028-01G	OTIS MUNICIPAL BUILDING	TNC
1225017-05G	KLONDIKE CAMPGROUND	TNC
1225022-01G	DCR TOLLAND STATE FOREST	TNC
1225014-02G	MOUNTAIN VIEW CAMPGROUND INC.	TNC
1225043-01G	LION HILL ROAD ASSOCIATION	TNC
1225022-05G	DCR TOLLAND STATE FOREST	TNC
1225017-01G	KLONDIKE CAMPGROUND	TNC
1225009-02G	CAMP OVERFLOW	TNC
1225031-01G	GATE ISLAND WATER SUPPLY	TNC
1225017-06G	KLONDIKE CAMPGROUND	TNC
1225009-05G	CAMP OVERFLOW	TNC
1225014-01G	MOUNTAIN VIEW CAMPGROUND INC.	TNC
1225014-03G	MOUNTAIN VIEW CAMPGROUND INC.	TNC
1225029-01G	J & D MARINA & CAMPGROUND	TNC
1225039-01G	BERKSHIRE HILLBILLIES	TNC
1225003-01G	LAUREL RIDGE CAMPING AREA	TNC
1225022-02G	DCR TOLLAND STATE FOREST	TNC
1225046-01G	MAPLEWOOD 1850 HOUSE	TNC
1225009-03G	CAMP OVERFLOW	TNC
1225007-01G	COZY SPRUCE RESTAURANT	TNC
1225034-01G	OTIS POULTRY FARM INC.	TNC
1225029-02G	J & D MARINA & CAMPGROUND	TNC
1225041-01G	KATIES COUNTRY STORE	TNC
1225017-02G	KLONDIKE CAMPGROUND	TNC
1225040-01G	FARMINGTON RIVER REG. ELEM. SCHOOL	NTNC
1225022-03G	DCR TOLLAND STATE FOREST	TNC
1225013-01G	OTIS RIDGE SKI AREA	TNC



Table 3.5 - Public Drinking Water Wells in Otis, MA—Continued

1225013-01G	OTIS RIDGE SKI AREA	TNC
1225034-02G	OTIS POULTRY FARM INC.	TNC
1225045-01G	OTIS WOODLANDS CLUB, INC.	TNC
1225042-01G	WESTFIELD CAMPING CLUB	TNC
1225017-03G	KLONDIKE CAMPGROUND	TNC
1225033-01G	HALLS STORE	TNC
1225019-01G	OTIS RIDGE SKI CAMP	TNC
1225017-07G	KLONDIKE CAMPGROUND	TNC
1225036-01G	FARMINGTON RIVER DINER	TNC
1225044-01G	PAPAS HEALTHY FOOD AND FUEL	TNC
1225017-04G	KLONDIKE CAMPGROUND	TNC
1225009-04G	CAMP OVERFLOW	TNC
1225016-01G	CAMP BONNIE BRAE	TNC

TNC = Transient Non-Community Well, 25 or fewer people daily, such as at a camp or restaurant.

NTNC = Non-Transient Non-community Well, regularly serves 25 or more people daily for more than 6 months of the year, but not year-round.

Note: Public well data is from 2014. Business names and well ownership may have changed.

In 2014, the town applied for a grant through the Massachusetts Executive Office of Housing and Economic Development (EOHED) MassWorks infrastructure program. The grant would have funded construction of a sewer line to connect the Otis Ridge Ski area to the town's wastewater treatment plant. The grant outlined several benefits that would have been realized had expansion been funded, including improvements to water quality and development of medium to high density housing around the ski area.

Long-term Development Patterns

The density of development around the town's water resources (Big Pond, Otis Reservoir, etc.) has historically been the highest. Additionally, housing development in Otis' two village centers has historically been relatively dense. However, new development in the village centers has been minimal. In recent years, development has been almost exclusively focused on residential parcels with relatively large lot sizes that are located away from

Otis' ponds, shoreline areas, and village centers.

Since 2009, the number of building permits for new residential structures has slowed. Anecdotally, there has been a shift away from new construction, with increased focus on renovations, additions, and other alterations to existing structures (Larry Gould, Personal Communication, 2015).

State Aerial Photography Analysis

The state, via the University of Massachusetts - Amherst's Resource Mapping - Land Information Systems Lab in the Department of Natural Resources Conservation, conducted an aerial photography analysis of land use in 1971, 1985, and 1999. While 1999 data is fairly dated at this point, this analysis still presents the best picture of the development footprint of Otis and how it has changed over that 28 year period.

Additionally, it is important to note that a similar land use inventory was conducted by the state in 2005. However, a change in methodology makes comparison of the 2005 data with the 1971-1999 data statistically impossible. Prior to 2005, land use data was derived manually, from analysis of aerial photography. After 2005, these processes became automated. Additionally, the state began to integrate existing data sets into its analysis. Land use from 1971-1999 as well as the 2005 analysis have been included in this report. However, these data sets should not be compared in such a way to determine land use trends between 1999-2005. For example, 1999 land use data indicates 1078 acres of wetland, while 2005 data indicates 2773 acres of wetland. In reality, those additional wetland acres always existed within Otis, but were previously classified as forest. In 2005, wetland extents determined from on the ground field work were integrated into land use data. Previously, wetland extents were mapped from aerial photography, which made the determination of forested wetland areas difficult to determine.

Land Use Change 1971-1999

Between 1971 and 1999, residential acreage increased more than any other land use category, growing from 890.44 acres (3.65% of all land) to 1439.01 acres (5.91% of all land), See Table 3.3 for Otis land use 1971-1999. Institutional uses, which includes town

owned properties and buildings, as well as schools and cemeteries increased from 17.31 to 34.06 acres (an increase of 96.74%). Industrial uses increased from 2.67 acres to 8.33 acres, a minimal acreage increase but amounting to a change of 211.59%. Agricultural acreage decreased the most over the 28 year period from 1971-1999, changing from 333.19 to 267.65 acres, or a decrease of 19.67%.

Land Use 2005

While available land use data from 2005 should not be compared with earlier data to determine trends, it does provide the most recent “snapshot” of land use within Otis. The 2005 data does not paint a substantially different portrait of the town that earlier data provides. Forest cover remains the prevalent land use, extending across 18,533.84 acres or 76.14% of the town. The 1493.78 acres (6.14%) of water and 2773.14 acres (11.39%) of wetland that cover the town speaks to the extent of Otis’s amazing water and natural resources. Residential land use remains the primary “man-made” use within the town at 824.76 acres or 3.39% of all land (See Table 3.4). Commercial uses cover 49.46 acres, or .2%, of all land within the town. These areas include town businesses. Additionally, BRPC cross checked this land use with aerial photography. The town highway garage, as well as the MassDOT maintenance garage have been classified under the commercial category, likely a result of the automated land use classification process. Finally industrial land use is the smallest of any “man-made” category. Industrial land use covers just 6.26 acres, or .03%, of all land within the town. BRPC checked these use areas against aerial photography. The majority of these areas appear to be sand pits or contractor staging and equipment storage areas. These are cleared areas with heavy equipment clearly visible. Additionally, an area that now appears to be a small trailer park along Route 23 was classified as industrial. In 2005 aerial photography, this area was cleared and heavy equipment was visible.

Remaining Buildable Land

An analysis of remaining buildable land within the town of Otis can be created by subtracting areas that have already been developed, permanently protected state and other conservation lands, wetlands (100 foot buffer around all wetland areas), river protection

areas (200 foot buffer around rivers), and slopes greater than 25%. What remains are areas that could be used for new construction. Based on this analysis, 7,150.8 acres (29.34%) of buildable land remain within the town. Another 2,297 acres (9.42%) remain on land that is partially constrained for development, and include areas located in floodplain or on slopes between 15 and 25% (see Map E—Buildable Land). This analysis only estimates remaining buildable acreage. It does not examine remaining buildable road frontage which would be needed to access these areas or account for new road construction and extensive subdivision that would be needed for development within these areas.

Table 3.6 - Population Ethnic Distribution in Otis
Source: 2010 U.S. Census

- white
- Black or african american
- american indian or alaska native
- asian
- some other race
- Two or more races

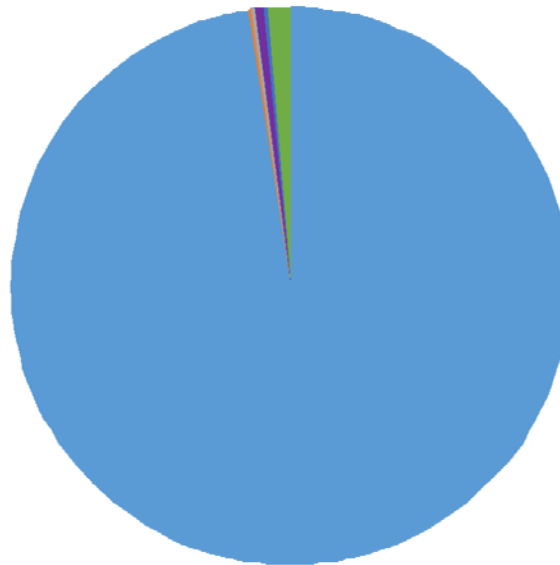


Table 3.7 - Population Age Distribution of Otis Residents
Source: 2010 U.S. Census

- 19 and under
- 20-44
- 45-64
- 65 and older



SECTION 4: ENVIRONMENTAL INVENTORY AND ANALYSIS

4A GEOLOGY, SOILS, AND TOPOGRAPHY

Geological formations

As the Otis Land Use Plan explains, the present topographic features have been determined by two different phenomena, the first of which is geological erosion. The actions of climate and water on the ancient Appalachian Mountains over time have created steep hills and extended river valleys. The other phenomenon consists of glacial formations that left behind large deposits of sand and gravel, or glacial till that covers most of the bedrock (BRPC 1986). Both the depth and consistency of the till vary. In the upland hills, the depth of this layer can be only a few feet, and is often covered with poorly sorted gravel and boulders. Along the river valleys, its depth can reach up to 25 feet of well-sorted sand and gravel of recognized commercial quality (BRPC 1986). Please refer to Map 4 - Soils and Geological Features Map.

General soil associations

General soil associations determine a unique natural landscape, having a distinct pattern of soils, relief, and drainage. Typically, an association consists of one or more major soils and some minor soils (SCS 1988). According to the Soil Survey completed for Berkshire County in 1988 by the Soil Conservation Service, Turnbridge-Lyman-Peru is the predominant major association soil type in Otis; this is true also for 51% of the total area of the county. This association is defined by the survey as being “moderately deep, shallow and very deep, well drained, gently sloping to very steep, loamy soils formed in glacial till derived from schist, gneiss, and granite (Soil Conservation Service 1988).

Detailed characteristics of soil units

As the Berkshire Soil Survey explains further, general associations are made up by other specific soil types that could be present in other associations; the proportion of the different soil types creates different topographic characteristics (SCS 1988). Turnbridge soils, representing 23% of the soils in the town, are moderately steep, well drained and medium textured. On the other hand, approximately 20% is made up of the Lyman soil type, which is shallow, excessively



ENVIRONMENTAL INVENTORY AND ANALYSIS AT A GLANCE

Watersheds

Otis is located at the headwaters of the Farmington River and the Cobble Mountain Reservoir, important drinking water supplies for the cities of Hartford, CT and Springfield, Ma.

Surface Water

Otis is widely known for its water resources, particularly recreational water bodies like Big Pond, the Otis Reservoir, and the Farmington River.

Wildlife Habitat

Otis has extensive areas identified in the Bio-Map2 project as either critical natural landscape or core habitat.



Figure 4.1—Otis’ water resources are an important draw for seasonal and summer residents, and contribute greatly to year-round residents’ quality of life . Photograph credit Craig Westcott.

drained, medium textured, and gently sloping to very steep. A third important fraction (15%) is made up of Peru soils, which are very deep, moderately well drained and medium textured. Being either gently or strongly sloping, they are often found in concave areas and on lower slopes. Finally, to a minor extent, there are also poorly to very poorly drained Pillsbury soils, very deep, well- drained Marlow soils, Berkshire soils, and some scattered areas of rock outcrops on hillsides and ridges (SCS 1988).

4B LANDSCAPE CHARACTER

Like much of Berkshire County, Otis is characterized by having a very diverse topography. Steep hills, numerous water bodies, and expansive wetlands provide Otis with a unique natural scenic quality. The town can be described as having two distinctive topographical regions.

West of the Farmington River, sharp ridges and deeply eroded streams define the landscape from the river itself until the Town of Monterey. Sites along these ridges provide great views over the surrounding territory. However, there are negative impacts that result from building on them: Among other issues, septic systems do not function properly when sited in

sloping areas, steeply sloping land is often more difficult to maintain, and storm water runoff may cause erosion, while simultaneously carrying nutrients and pollutants into lakes and streams (BRPC 1986).

East of the Farmington River a broad plateau defines much of the town’s topography. Numerous depressions provide a variety of different water bodies and unique environments, such as the Otis Reservoir, Big Pond, and the Otis State Forest Wetlands (BRPC 1986). In general, this land is considered to have the best combination of physical and chemical characteristics for producing agricultural products. Nevertheless, prime agriculture soils are a rapidly disappearing resource in the Commonwealth and therefore warrant special consideration by the Town (Town of Otis OSRP 1991).

Suitability for septic systems is often a major limiting factor for development in Otis. All of the soils in town have severe limitations for septic systems. Soils in the upland area have poor drainage, large stones, steep slopes, and/ or shallow bedrock, while soils in the river valley have poor filtration capacity.

4C WATER RESOURCES

All of Otis' water resources, its ground water, streams, lakes, and well water, are intricately connected; negative impacts on any of these items will affect the quality of down-stream resources, and the system as a whole. Planning efforts should focus on ways to manage the impact of land use over the entire watershed; the total land area that drains into a particular water body (Town of Otis OSRP 1991). Please refer to Map 6— Water Resources.

The town's territory expands over three major watersheds. Toward the Northeast corner of town (between Algeria Road and Lee- Westfield Road) it drains into the Westfield River Basin. To the West (west of Kingsbury Mountain and south to Hayes Pond) it drains into Hop Brook, and ultimately into the Housatonic River Basin. Finally, the majority of Otis drains into the Farmington River Watershed. The west branch of the Farmington River originates at Hayden Pond, and consequently runs south- eastward through Otis Center heading toward Connecticut. Within these three large watersheds there are numerous smaller drainage basins such as the Cone, Benton, Dimmock, and Wheeler Brook watersheds (Town of Otis OSRP 1991).

Within these watersheds Otis hosts a variety of water bodies. A variety of ponds and lakes are considered to be a very important quality of Otis' scenic natural landscape. These water bodies provide the town with a variety of recreational opportunities, and in consequence, have attracted seasonal residents and day- use visitors for many years. In this regard, it is important to mention Otis Reservoir, Big Pond, and Benton Pond, among the most important sites (Town of Otis OSRP 1991). Please refer to Table 4.1—Water Resources in Otis, MA.

Watersheds

Otis lies within three watersheds, the Farmington River Watershed (FRW), the Housatonic River Watershed (HRW) and the Westfield River Watershed (WRW). The majority of the town lies within the FRW. The northeast corner of the town is located within the WRW and the western portion of town is located within the HRW. Otis's position at the headwaters of the Farmington River is regionally important. The

Farmington River is the primary water supply for Hartford, Connecticut and other towns within the Farmington River Valley. The Farmington River Watershed Association (FRWA), the non-profit group that helps to address issues of water quality within the watershed, estimates that the river supplies drinking water to 600,000 people (FRWA 2003). The Cobble Mountain Reservoir is the drinking water supply for the City of Springfield, MA (population 150,000). A portion of the outstanding resource water (ORW) area surrounding this reservoir is located in the eastern portion of town. Cobble Mountain Reservoir and Springfield Reservoir are located within the nearby Westfield River Watershed.

Farmington River

The U.S. Department of the Interior identified the West Branch of the Farmington River and its tributaries in Massachusetts as a potential resource to include in the National Wild and Scenic River Program. Today, 14 miles of the river, from Colebrook to Canton, Connecticut are federally designated as a Wild and Scenic River. Its nomination in the late 1980s and early 1990s emphasized the fact that the characteristics of this corridor are "unique and irreplaceable resources and are both of high quality and limited in extent in the Northeastern U.S." (USNPS 1985) Scenically, this river's corridor is the most important landscape in Otis. Most people's impression of the town is formed by their view of the river and its valley while they drive along Route 8, the major North-South road in town (BCRPC 1986).

This branch of the river has very high water quality. The State Department of Engineering placed an anti-degradation standard on the watershed, under the Massachusetts Clean Water Act, thus requiring a special variance from the department in order to receive permits for discharging waste into the river or its tributaries. This applies to new commercial/ industrial facilities as well as any town sewage treatment plant. Non-point sources of pollution on adjacent lands can harm the water quality of the Farmington River. Non- point sources may include septic systems, salt runoff, sediment runoff from logging operations and unpaved roadways, and residential development (BCRPC 1997).

Currently, the Farmington River in Otis is listed on the



Table 4.1 - Water Resources in Otis, MA			
Source: Mass GIS MassDEP List of Integrated Waters, 2012			
Name	Approximate Acreage	Impairment Status (Y/N)	Cause of Impairment
1. Benton Pond*	63.00	Y	Eurasian Water Milfoil, <i>Myriophyllum Spicatum</i>
2. Big Pond*	331.00	Y	Dissolved Oxygen Mercury in Fish Tissue
3 Church Hill Pond	20.00	N	
4. Watson Pond* (Also known as Creek Pond)	49.00	Not Assessed	
5. Curtin Pond	4.00	N	
6. Dimmock Brook Pond	62.00	Not Assessed	
7. West Haley Pond* (Also known as Tucker-Haley Pond or Haley Pond)	17.00	N	
8. Hayden Pond	36.00	Not Assessed	
9. Hayes Pond*	49.00	Not Assessed	
10. Horseshoe Pond	13.00	N	
11. Larkum Pond*	19.00	N	
12. Mud Pond 1 (near Long Mountain WMA)	5.00	N	
13. Mud Pond 2 (South of I-90)	5.00	N	
14. Otis Reservoir*	1065.00	Y	Mercury in Fish Tissue
15. Quarry Pond	6.00	N	
16. Royal Pond	8.00	N	
16. Shaw Pond	23.00	Y	Dissolved Oxygen Eurasian Water Milfoil
17. Upper Spectacle Pond	72.00	Y	Dissolved Oxygen
18. White Lily Pond*	27.00	Not Assessed	
19. Whiting Pond	5.00	N	
*Denotes state designated "Great Pond". It is not known why other ponds in Otis larger than 10 acres in size are not listed as Great Ponds.			

Table 4.1 - Water Resources in Otis, MA—Continued			
Source: Mass GIS MassDEP List of Integrated Waters, 2012			
Stream Name	Approximate Length (Miles)	Impairment Status (Y/N)	Cause of Impairment
1. Cone Brook	1.75	N	
2. West Branch Farmington River	10.15	Y	Lack of a Coldwater Assemblage
3. Benton Brook	4.00	N	
4. Stream on Curtin Pond	1.66	N	
5. Stream from Hayes Pond	1.83	N	
6. Spectacle Pond Brook	1.54	N	
7. Dimmock Brook	6.18	Not Assessed	
8. Wheeler Brook	1.40	N	
9. Fall River	.88	N	

EPA's 303(d) list of impaired waterways due to the "lack of a coldwater assemblage". This means that certain fish and macroinvertebrate (mollusks, worm, insect species, etc) are impaired or were not found within the waterway. There are many potential causes of this impairment including high water temperatures due to a lack of tree cover or other issues. Additionally pollution due to stormwater runoff, nutrients, or acid deposition can impair coldwater species assemblages.

Given the drainage limitations derived from the characteristics of the soil, septic systems can become a source of pollution. As the Land Use Plan clearly explains, they can fail because of their location, improper siting, exceeding a systems' capacity, or poor maintenance. In 1980, Otis adopted a 100 foot buffer zone around surface waters to prevent the nitrogen/ nitrates and phosphorus from infiltrating toward these water bodies (BCRPC 1986; Town of Otis OSRP 1995). Another water quality concern is caused by undersized septic systems. Systems can become

undersized when summer cottages and camps that have been built for seasonal use become repurposed for year-round use.

Surface water runoff can become another source of pollution. Storm water can carry nutrients, silt, and toxic substances into lakes and streams. The Otis land Use Plan emphasized the fact that road salt could be a non-point source of pollution. This was studied further through The Farmington River Watershed Road Salt Review, a study prepared for the Executive Office of Environmental Affairs by the Department of Landscape Architecture and Regional Planning at the University of Massachusetts, Amherst. This document was prepared as a response to on-going local concerns regarding salt content in drinking water. It was intended to serve as a resource document for assessing the impact of road salt on the Farmington River and drinking water wells within the watershed (Mattos 2002). For more information on this issue please refer to the Farmington River Watershed Road Salt Review and Section 4G—Environmental Challenges.

Big Pond

Big Pond is the second largest body of water in Otis at 331 acres. The shoreline of Big Pond is some of the most densely settled in Otis. Large wetland areas extend around the northern edge of the pond and are listed as core habitat by the BioMap2 project. Big Pond is also home to the Otis Town Beach, which is located at the end of Great Woods Road. As of 2012, Big Pond is listed on the EPA's 303(d) list of impaired waters due to the presence of Mercury (Hg) in fish tissue and low dissolved oxygen levels. The publicly accessible boat launch on Big Pond is located at the end of Latimer Hill Road in Otis. A local group known as the Big Pond Association acts as an advocate for the pond and the residents around it.

As with many lakes and ponds in Massachusetts, water levels are controlled via a dam which was constructed by the Commonwealth in 1974. Boards located within the dam are removable and allow the water level in the pond to be lowered or raised by up to 18". A yearly drawdown of the pond occurs in October and is approved via an order of conditions from the Town of Otis.

Big Pond and the homeowners and residents that surround it are represented by the Big Pond Association whose mission is to "preserve, protect, monitor, maintain and enhance the environmental, aesthetic, recreational and economic values of Big Pond and its watershed and to provide education with respect thereto." The Big Pond Association participates in a variety of management activities including funding yearly testing for water quality, and management and monitoring of invasive species.

The Big Pond Association conducts yearly water quality testing, and in 2004 received a \$50,000 grant from the Massachusetts Department of Conservation and Recreation to conduct a diagnostic and feasibility study that comprehensively examined water quality within the lake. The Big Pond Association has partnered with DCR on its "Weed Watcher" program. Weed Watcher works to educate volunteers to monitor water bodies for invasive species. Additionally the Big Pond Association has a active and dedicated group of volunteers who monitor the public boat launch and work with recreational boaters to ensure that invasive species don't make their way into the pond. Luckily, Big Pond has thus far avoided colonization by invasive species such as Zebra Mussel (*Dreissena polymorpha*) and Eurasian Milfoil (*Myriophyllum Spicatum*). However, some invasive species such as Purple Loosestrife (*Lythrum salicaria*) have been noted around the shoreline of the pond. The Big Pond Association organizes regular volunteer events to remove this species and others from the shoreline.

Otis Reservoir

The Otis Reservoir is located within the boundaries of the Towns of Otis, Tolland and small portion of Blandford. Otis Reservoir is the Commonwealth's largest recreational body of water at over 1000 acres in size. The reservoir was created in the 1800's by the construction of a dam on the Fall River to provide additional flow during low river volumes. This helped to support mills and industry along the nearby Farmington River (see Section 3B: History of the Community). Beginning in the early 20th century, the Reservoir became a destination for seasonal and summer residents who built cottages along the shore. Today, the neighborhoods around Otis Reservoir are the densest in town, especially along the western



shore. Otis Reservoir is currently listed on the EPA's 303(d) list of impaired water ways due to high levels of Mercury (Hg) in fish tissue.

Water levels are controlled in the Reservoir by the dam that leads to Fall River. An annual draw down of the Reservoir occurs during October. Water levels in the reservoir are lowered by approximately 10 feet. This drawdown is thought to help control invasive species in the lake, particularly aquatic plants such as Eurasian Milfoil (*Myriophyllum Spicatum*), which is exposed to freezing temperatures during the drawdown. Additionally, the drawdown has some recreation benefits, as it means that many dock owners do not need to remove their docks from the Reservoir during winter for fear of ice damage. The conservation commissions of the towns of Otis, Tolland and Blandford review and approve the order of conditions for the yearly drawdown of the reservoir, which is performed by DCR.

Otis Reservoir and the property owners that surround it are represented by the Otis Reservoir Property Owners Association (ORPOA). ORPOA conducts regular water quality testing in Otis Reservoir, funded through dues it collects from members. Additionally, ORPOA conducts management activities, such as the removal of invasive species.

Much of Otis Reservoir is contained within Tolland State Forest. This area contains the public boat launch for Otis Reservoir. Boat launching is also available through Camp Overflow, a private campground on the western shore of the reservoir. However, the launch is only available to campground guests. As much of the land surrounding Otis Reservoir is owned by DCR, this organization conducts active management around the reservoir. In the Fall of 2015, DCR will begin implementing a treatment plan to control *Phragmites australis* (also known as Common Reed) on approximately 40 sites (2.39 acres in total) around the reservoir.

In the mid-2000's BRPC was also involved with several projects on Otis Reservoir as part of the Otis Reservoir Lake and Watershed Protection Initiative. This project was a collaboration between BRPC, the Town of Otis, ORPOA, the Farmington River Watershed Association (FRWA) and the Big Pond Association. The project

Table 4.2 - Wetlands in Otis, Ma

Source: Source: Mass. GIS Wetlands 2009

Wetland Type	Acres	% of all wetlands
Bog	122.87	4.44%
Deep Marsh	231.89	8.37%
Shallow Marsh		
Meadow of Fen	483.11	17.44%
Shrub Swamp	489.77	17.68%
Wooded Swamp		
Coniferous	875.98	31.63%
Wooded Swamp		
Deciduous	292.49	10.56%
Wooded Swamp		
Mixed Trees	273.76	9.88%
Total	2769.87	100.00%

examined the feasibility of installation of a boat washing station and subsurface screen (to prevent fish loss) at Otis Reservoir. The project concluded that these two elements were not feasible and they were not installed. However, the project successfully implemented improvements to the public boat launch at Big Pond through the installation of pre-cast concrete planks to replace the existing gravel launch. Additionally, BRPC established two vegetative buffers comprised of native plantings at private residences on Otis Reservoir. Vegetative buffers are plantings of shrubs, trees and perennials that intercept stormwater runoff and help to reduce soil erosion. Vegetative buffers are recommended as a Best Management Practice (BMP) to minimize the impacts of development near water bodies and replace existing lawns. Vegetative buffers also provide more potential wildlife habitat than mowed grass or lawn.

Aquifer Recharge Areas

Otis' groundwater resources are located in the gneissic bedrock beneath the town along existing fault lines. The Land Use Plan explains how most wells will yield only enough for domestic supplies, while they could yield from 50 to 100 gallons per minute near these fault lines (BCRPC 1986). In a geological survey of the Eastern Berkshires completed by Emerson in

1968, two major faults were identified in Otis. One of them runs along Tyringham Road in West Otis down to the Clam River in Sandisfield, and another one is located near the center of town. Formations of water soluble limestone offer another potential source of large drinking water yields. Caverns located near Otis Center and Shaw Pond are an indicator of potential groundwater from this .

The other primary ground water resource is beneath the Farmington River Valley. These are shallow deposits, approximately 60 feet, which are probably connected to both the river and the water in the underlying bedrock. As stated before, these deposits might be vulnerable to pollution associated with road salt or other contaminants such as from buried gas tanks (BCRPC 1986).

As stated in the Land Use Plan, predicting recharge areas is very difficult without a detailed hydrological study. In the case of Otis, recharge might be happening from water infiltration in the upland areas of its three watersheds. In unconfined aquifers recharge occurs through water entering the unconsolidated deposits, via the streams and wetlands near them (BCRPC 1986).

Flood Hazard Areas

Flooding occurs when the volume of water within a given stream or river exceeds the channel's capacity. The flood plain is considered the land area adjacent to a waterbody that is subject to recurring inundation. Flooding often occurs in the spring, due to snow melt and during large storm events. Floods often occur at predictable intervals. The frequency with which a flood of a given size occurs is called the "recurrence interval". For example, the "100-year flood" is the flood event that has a 1% chance of happening within a given year. The 10-year flood is the flooding event that has a 10% chance of recurrence in a given year.

Otis has extensive areas of 100-year floodplain, which is labeled as "Zone A" on Federal Emergency Management Agency (FEMA) flood insurance rate maps. Beginning in the west of town, areas of the 100-year floodplain extend around Spectacle Pond Brook and the portion of Upper Spectacle Pond located within the town. The area of the 100-year floodplain begins just south of Route 23 or Great Barrington

Road. Another area of 100-year flood plain encompasses the length of Benton Brook, beginning near Giles Road and extending south to the town boundary with Sandisfield.

The 100-year flood plain extends along the entire length of the West Branch of the Farmington River in Otis, from Shaw Pond in the north, through Otis Center and south to Sandisfield.

Further east, a small portion of 100-year flood plain extends around Dimmock Brook, from just near the intersection of Becket and Gibbs Road south to near the intersection of Gibbs Road and Blandford Road / Route 23.

Finally, in the western portion of town, the 100-year floodplain extends around wetland areas north of Big Pond near Lee-Westfield Road and moves south around the entirety of Big Pond and its outlet. The floodplain ends near an area just north of Blandford Road / Route 23 and Reservoir Road. Immediately south of this intersection, the floodplain begins again and encircles the area around Otis Reservoir south to the town's boundary with Tolland.

It is important to note that Otis has a Floodplain Overlay District as a component of its zoning. The Otis' FPOD helps to regulate development within the 100-year floodplain. Allowed uses include forestry, agriculture, and outdoor recreation. Buildings existing prior to the adoption of the FPOD are also allowed.

The Berkshire County Hazard Mitigation Plan, prepared for the Town of Otis and other Berkshire County towns in 2012 notes that there are a total of 2,395.9 acres of 100-year floodplain within the town. This amounts to 9.8% of the total town. Based on additional analysis, 56.7 acres (2.3%) of the floodplain are developed. Currently, there are 8 commercial buildings (22.2%) and 167 residential buildings (11.1 %) within the floodplain.

Wetlands

As the Otis Land Use Plan identified, there are two geological types of wetland in Otis. Perched wetlands occur in the upland areas as a consequence of soil hardpans and shallow bedrock, where water is unable to infiltrate the soil. Wet forest environments are



Table 4.4 - Threatened, Endangered and Special Concern Species Sighted in Otis MA

Source: Source: Mass DFG -Town Species Viewer 2015

Type	Species Name	Common Name	Status	Sighting Date
Bird	<i>Ammodramus henslowii</i>	Henslow's Sparrow	E	Historic
Bird	<i>Accipiter striatus</i>	Sharp-shinned Hawk	SC	1978
Vascular Plant	<i>Panicum philadelphicum</i> ssp. <i>gattingeri</i>	Gattinger's Panic-grass	SC	1978
Vascular Plant	<i>Carex lenticularis</i>	Shore Sedge	T	1985
Vascular Plant	<i>Juncus filiformis</i>	Thread Rush	E	1994
Dragonfly/Damselfly	<i>Gomphus descriptus</i>	Harpoon Clubtail	E	1996
Vascular Plant	<i>Rhododendron maximum</i>	Great Laurel	T	1997
Vascular Plant	<i>Arceuthobium pusillum</i>	Dwarf Mistletoe	SC	1998
Vascular Plant	<i>Symphyotrichum prenanthoides</i>	Crooked-stem Aster	SC	2004
Mussel	<i>Alasmidonta varicosa</i>	Brook Floater (Swollen Wedge-mussel)	E	2007
Mussel	<i>Strophitus undulatus</i>	Creeper	SC	2007
Reptile	<i>Glyptemys insculpta</i>	Wood Turtle	SC	2008
Fish	<i>Notropis bifrenatus</i>	Bridle Shiner	SC	2011

E=Endangered, T=Threatened, SC=Special Concern Species

found on sloping hillsides, where the accumulation of water in depressions between hillsides reaches the point where soil can only support marsh vegetation. These depressions often have streams that are sometimes connected to bedrock aquifers; although the amount of water in these wetlands is seasonally dependent. A second type of wetland occurs in sand and gravel deposits along the Farmington River. Unlike the previous type, these wetlands are connected to deeper aquifers and the river, and therefore have a constant year- round flow (BCRPC 1986).

From these two broad geological categories of wetland, seven wetland types based on vegetation can be found within the town and total over 2700 acres. Data included in Table 4.2 in this appendix is derived from the interpretation of aerial photography which is

then field checked by the Massachusetts Department of Environmental Protection (DEP). These data come from the most recent wetlands update which was performed in 2009.

Wetlands perform important functions for both humans and wildlife. Wetlands are the most productive ecosystems on the planet, when measured by the amount of biomass or living biological tissue they help to produce. Wetlands serve as habitat for a wide variety of plant and animal species and often function as critical nursery and breeding areas. The benefits to humans provided by wetlands and other natural environments are sometimes referred to as "ecosystem services". Valuable ecosystem services provided by wetlands include water purification, flood storage and control, and shoreline stabilization. Water

speed and flow is greatly reduced in a wetland compared to the open water of a stream or river. This causes suspended sediments to fall out of the water column, thus enhancing downstream water quality. Wetlands also help to remove harmful pollutants as well as nutrient pollution from water resources. During flooding, wetlands act as a “sponge” that helps to absorb excess water. Wetlands also help to reduce erosion by acting as a buffer that helps to protect the shorelines of rivers, lakes and other bodies of water.

Wooded coniferous swamps extend across 875 acres and comprise 31.63% of wetland areas within the town. Coniferous swamps in Otis are most likely the Hemlock (*Tsuga canadensis*) or Red Spruce (*Picea rubens*) type. Bog areas in Otis have the least acreage (122 acres) and comprise 4.44% of all wetlands in the town. Bogs are a type of wetland characterized by acidic waters, peat deposits and sphagnum moss. Due to the extreme acidic nature of bog environments, bogs are often home to many unique plant and animal species such as pitcher plants (*Sarracenia purpurea*). The majority of Otis’ wetland areas are located immediately north of Big Pond. Other large wetland areas include the area immediately south of Church Hill Pond, around Dimmock Brook Pond, and south of Hayden Pond. For a map of Otis’ wetland areas, please refer to Map F—Vegetation, Fisheries, and Wildlife.

4D VEGETATION

BioMap2 is a statewide mapping project that combines 30 years of rare species and natural community data from the NHESP with wildlife species and habitat assessments that were conducted as part of the Division of Fisheries and Wildlife’s 2005 State Wildlife Action Plan (SWAP). Additionally, BioMap2 data integrates the Nature Conservancy’s assessment of large, connected and intact ecosystems across the state. (NHESP, 2012).

BioMap 2 has two primary components, Core Habitat and Critical Natural Landscape. Core habitat includes “areas that are critical for the long term persistence of rare species and other species of conservation concern” (NHESP, 2012). According to BioMap2, Core Habitat is found on 5,115 acres in Otis or around 20% of the land in town.

Critical Natural Landscape identifies large contiguous landscape blocks that have been minimally impacted by development. The BioMap2 report for the Town of Otis notes that “if protected, these areas will provide habitat for wide-ranging native species, support intact ecological processes, maintain connectivity among habitats, and enhance ecological resilience to natural and anthropogenic disturbances in a rapidly changing world” (NHESP, 2012). Critical natural landscape comprises 15,535 acres or 63% of all land within the town.

Large areas of core habitat have been identified around Long and Kingsbury Mountain on the western side of town. A portion of this area of core habitat is permanently protected as part of the Long Mountain Wildlife Management Area. Additional core habitat follows the length of the Farmington River corridor as it flows through town. Smaller areas extend around Whiting pond and in low lying areas near Church Hill Pond south to Dimmock Brook Pond. Additionally a large area of core habitat coincides with the extensive wetland areas north of Big Pond. Core habitat areas with Otis comprise 5,115 acres, or 20% of all land within the town. Core habitat areas are not mutually exclusive from areas of critical natural landscape. In general, core habitats are located within areas of critical natural landscape.

For additional information, a copy of the town’s BioMap2 report is included as appendix D of this Open Space and Recreation Plan.

Forests

Otis’ forests are part of the Hemlock/ Northern Hardwood Forest Biome vegetation zone, defined by the Society of American Foresters (BRPC 1986). There is also an important number of Eastern White Pine (*Pinus strobus*) trees, which are abundant in Massachusetts, and have an important commercial value. There is also Red Pine, Red Spruce, Beech, and Yellow Birch, among other tree types. Finally, there are Sugar and Red Maples, also very important species for commercial activities, both for lumber and syrup, not to mention their tourism value during the fall foliage season.

Public Shade Trees

Public shade trees are defined as trees located within the public right of way, and are regulated by



Massachusetts General Law Chapter 87. Chapter 87 outlines the authorities of the town's Tree Warden, establishes procedures for cutting or removing public shade trees, and sets penalties for violations. The Tree Warden is responsible for the cutting and maintenance of trees along town-owned roads, and in general, cannot do so without first holding a public hearing. However, trees below the size of 1 1/2 inches are exempt from this requirement. If an objection is made to the proposed cutting, approval must be sought from the Town's Select Board before the cutting can proceed.

In the case of designated Scenic Roads, the town's Planning Board must approve any cutting after a public hearing. Trees located along state highways are the jurisdiction of MassDOT, and do not require a public hearing to be cut. Moreover, while Chapter 87 sets limits on the cutting of public shade trees, the regulation does not inhibit a municipality from cutting or removing trees that endanger public safety, or for the purposes of widening a road.

Public shade trees are important in Otis, particularly in defining the town's rural and scenic character.

Priority Natural Communities

Natural communities are "assemblages of species that occur together in space and time. These groups of plants and animals are found in recurring patterns that can be classified and described by their dominant physical and biological features" (NHESP Natural Communities, 2015). Globally rare natural communities, or those with limited local distribution, are considered priority natural communities. Of the 3 priority natural communities found in Otis, all are classified by NHESP as "S3", meaning they are vulnerable communities with typically 21-100 sites or few remaining acres in the state.

Level Bog

Level bog natural communities are found in Mud Pond (just south of I-90) in Otis. Level bogs are primarily dominated by shrubs and are highly acidic environments. Some small stunted coniferous trees, such as tamarack (*Larix laricina*) and black spruce (*Picea mariana*) may occur throughout them. Level bogs usually receive little or no streamflow.

Carnivorous plant species such as Pitcher plant (*Sarracenia purpurea*) and Sundews (*Drosera rotundifolia* and *D. intermedia*) are often found in these environments. Additionally, these bog communities may be home to rare insect and animal species such as the Jefferson Salamander (*Ambystoma jeffersonianum*) and the Ebony Boghaunter dragonfly (*Williamsonia fletcheri*) (NHESP, 1999 Level Bog Fact Sheet).

Acidic Shrub Fen

Acidic shrub fen natural communities are acidic, shrub dominated peatlands. They are generally less acidic and therefore less nutrient deprived than shrub fens. They are typically found along the margins of ponds. In Otis, this natural community is found along the edge of Horseshoe Pond, and is the second largest example of this natural community in the state. Some rare species associated with Acidic shrub fens include Spotted Turtle (*Clemmys guttata*) and several rare insect species (NHESP, 1999 Acid shrub fen Fact Sheet).

High Energy Riverbank

These natural communities are located near fast moving water, where the land is constantly disturbed by erosion and sedimentation. They are usually sandy or rocky and have sparse vegetation that can include prairie grasses, low shrubs or small perennials. These environments may provide habitat for migrating shorebirds such as Spotted Sandpiper (*Actitis macularius*) or Killdeer (*Charadrius vociferus*), and also provide breeding habitat for some rare insect species (NHESP, 2006).

4E FISHERIES AND WILDLIFE

General Inventory

Otis hosts a great variety of wildlife species. The list of species present in Otis includes white-tailed deer, blue heron, fox, snowshoe hare, porcupine, ruffed grouse, otter, raccoon, beaver, mink, muskrat and turkey, among a variety of waterfowl (BRPC 1986). The Otis Land Use Plan identified Hayden Pond, the wetlands North of Big Pond, White Lilly Pond, Hayes Pond, and the land adjacent to the Farmington River, as the most valuable areas for wildlife in Otis (BRPC 1986). Moreover, BioMap2 has identified significant

wildlife habitats and other natural environments in the town. Please refer to Section 4D—Vegetation and Map F—Vegetation, Fisheries and Wildlife. Additionally, the State of Massachusetts stocks Trout yearly in the Farmington River, Big Pond, and Otis Reservoir.

Vernal Pools

Vernal pools are a unique type of wetland and wildlife habitat, and are sometimes known as autumnal or ephemeral pool or temporary woodland ponds. Vernal pools are shallow depressions that are seasonally flooded with water. They can vary greatly in size. During summer months, vernal pools are usually dry. However, spring snow melt and rain transform these areas into rich wildlife habitat. Vernal pools are protected by the Wetlands Protection Act. However, they must be certified prior to gaining protected status. Not every depression that fills with water can be considered a vernal pool.

Vernal pools are certified by the state Natural Heritage and Endangered Species Program (NHESP). Certification involves the documentation of the potential vernal pool's physical characteristics, including the lack of a permanently flowing outlet for water and evidence that the pool dries out during the year. Additionally, certification involves the documentation of wildlife species that commonly use vernal pools. While the NHESP uses aerial photography to help identify vernal pools, they also rely extensively on reporting of potential vernal pools from citizens and landowners.

Due to the fact that vernal pools dry partially or completely during the summer months, fish are prevented from permanently establishing themselves. This makes vernal pools important breeding habitat for amphibian and invertebrate species that would otherwise face extensive predation from fish species. Species that rely on vernal pools for breeding habitat include frogs, salamanders, toads, as well as some insect species, such as dragonflies or small fairy shrimp (NHESP, 2015)

Within Otis, there are 10 certified vernal pools, and another 36 areas that have been identified as potential vernal pools, but have not been certified as such (See Map F, Vegetation, Fisheries and Wildlife).

Rare, Threatened, and Endangered Species

According to data from the Massachusetts NHESP, twelve endangered, threatened, or special concern species have been sighted in Otis since 1978. The additional sighting of Henslow's Sparrow (*Ammodramus henslowii*) in Otis is a historical record from some of the earliest species inventories conducted in the commonwealth during the late 1800's. Some of the species that have been sighted are associated with wetlands or water resources, such as the small fish species, Bridle Shiner (*Notropis bifrenatus*), the Wood Turtle (*Glyptemys insculpta*), and Brook Floater (*Alasmidonta varicose*), a mussel species. Please refer to Table 4.4 - Threatened, Endangered and Special Concern Species Sighted in Otis MA. Additionally, please refer to Section 4D—Vegetation for a discussion of BioMap2 identified core habitat and critical natural landscape in Otis.

Wildlife Corridors

The 2016 Regional Transportation Plan, prepared by BRPC provides an analysis of wildlife crossing areas in Berkshire County and Otis.

The Berkshires' rural and undeveloped environment is ideal for a diverse ecosystem where some species of animals move significant distances. Unfortunately, our road system fragments these habitats and creates physical barriers to animal movement. There are two significant resources that are poised to help us better understand opportunities to minimize those barriers. The Nature Conservancy (TNC) and the Berkshire Environmental Action Team (BEAT) each have undertaken valuable studies that can help with prioritizing projects and policies that enhance the safe passage of wildlife across the regions roads. TNC analyzed land cover and a TNC/UMass-Amherst model called Critical Linkages to prioritize locations for ensuring connectivity. These priority locations will provide the greatest benefit to wildlife when barriers are removed or mitigated and are also critical for maintaining a permeable landscape of habitat protection and management.

The Nature Conservancy "Critical Linkages"

The TNC analysis developed a system of nodes, linkages, and links to analyze wildlife crossing areas in



Berkshire County. Nodes are defined as areas with a high conservation value for animal habitat. Examples of nodes include core forests and vernal pools. Links are paths or connections between habitat nodes. Linkages are portions of roadways that separate habitat nodes where links cross. Ideally wildlife passage structures would be constructed at priority linkages. Essentially, the researchers created a gravity model that ranked nodes, links, and linkages on their relative importance. The resulting outputs divided links and linkages into priority tiers with 1 being the highest. TNC also analyzed specific linkages along Route 23 and US 7 to collect species specific data and incorporate information on animal-vehicle collisions into a more site specific project development process.

Berkshire Environmental Action Team Stream Crossing Survey

The Berkshire Environmental Action Team's (BEAT) volunteers, interns, and partners are surveying Berkshire County stream crossings as part of a project organized by the University of Massachusetts, The Nature Conservancy, and the Massachusetts Division of Ecological Restoration (formerly Riverways). BEAT is a partner with The Housatonic Valley Association and the Hoosic River Watershed Association to survey stream crossings in Berkshire County. The information is entered into a UMass database that includes culvert details and photos of the inlet and outfall. The culvert evaluation specifically indicates whether the culvert is an impairment to aquatic or terrestrial animal movements. This detailed culvert information can help BRPC and local communities estimate financial needs and prioritize culvert replacements.

New standards ensure that culverts will not create artificial waterfalls that hinder aquatic migration. Also, they should be open-bottomed wherever possible so the substrate within the culvert matches the substrate of the streambed. Culverts must be wider than the actual streambed. Specifically, culverts must be 1.2 times the width of the streambed. This extra width, which will be dry except in times of very high water, provides a path for non-aquatic wildlife such as raccoons, mink, porcupines, and in some of the larger waterways, deer and bear. There are also other guidelines within the new regulations. The idea is that a fish swimming upstream should not notice any

difference in the stream when it swims under the road, other than a passing shadow. The additional culvert capacity also helps prevent washouts and associated disruption and expense.

Based on data gathered as part of the critical linkages and stream crossing survey, there are two segments of roadway in Otis that have been identified as priority areas for wildlife crossing improvements. The first is the portion of I-90 that passes through town. The second is a portion of Route 23 near the intersection of Cold Spring and Tyringham Road in the southwest corner of town.

4F SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

The Town of Otis hosts an important system of natural resources and recreational opportunities. Topographic features like the sequence of high hills that develop throughout the town, the Farmington River Valley, and a great variety of streams and ponds. Natural waterfalls provide a dynamic sequence of scenic quality. The different ecosystems that develop throughout these lands host an important amount of core habitat and supporting natural landscape for a great variety of plant and animal communities.

These natural resources are combined with an important list of historic sites. Structures like the Congregational Church, St Paul's Episcopal Church, the previous Town Hall (currently the recreation center), the McManus Store, the Otis Library, or the East Otis School, represent unique landmarks of important community value (BCRPC 1979). Other historic sites, like the portion of the Knox Trail that passes through Otis, CCC camps, rail road foundations along the Farmington River, the trolley line, and several old cemeteries, constitute a unique opportunity to develop an extensive system of both educational and recreational activities. Please refer to Map 5 - Unique Features Map and to Table 4.5- Unique features in Otis, MA.

4G ENVIRONMENTAL CHALLENGES

Non-point source pollution represents the most important environmental challenge in Otis. This is might be caused by mal-functioning septic systems,

and road salt runoff, among other sources. The Town of Otis has already devoted a great deal of attention to this concern and is determined to continue ongoing efforts to reduce the impacts of potential sources, among other issues.

According to the Farmington River Watershed Action Plan, the Otis' Boards of Selectmen and Health identified two areas of septic problems. The first one is located in Otis Village Center, at the intersections of Route 8 and 23. The second located around Otis Reservoir and nearby ponds (BRPC 1997).

Consequently, to correct the problem in the center of town, a small sewer system was installed in 1998. Please refer to Sewer Services in Section 3-Community Setting. On the other hand, the town's Zoning By- Law has included a special provision that focuses on stream and pond protection. Through this zoning regulation, the town restricts the construction of on-lot subsurface sewage disposal systems, such as septic tanks, cesspools, leaching fields, or drainage systems for wastewater, within 100 feet of the high shoreline of any water body in town (Town of Otis OSRP 1995).

In the case of structures duly recorded before the effective date of the By- Law, the Board of Health may authorize the construction or installation of such disposal systems at a reduced distance, but not below the minimum setback in the State Environmental Code. Furthermore, through Title 5, the Board of Health provides inspection of septic systems to verify the compliance of all standards.

In regard to road salt runoff, the town has been cooperating with state agencies and the regional commission to determine whether or not this constitutes a source of pollution in Otis. This is the case with the Farmington River Watershed Road Salt Review, prepared for the Massachusetts Executive Office of Environmental Affairs in 2002. This study revealed elevated sodium concentrations in the town's drinking water wells. Nevertheless, the report identified that further information was required to located whether this was caused by road salt, by malfunctioning septic systems nearby, or other causes.

The Town of Otis recognizes the importance of

protecting its natural resources from any non-point source of pollution. Therefore, it will continue ongoing efforts to control potential sources such as defective septic systems and/or road salt. In consequence, it is committed to maintain the zoning regulations that focus on this regard, continue the current inspections performed by the Board of Health, and cooperate with other parties in the development of further water quality studies.

Unpaved Roads and Non-Point Source Pollution

Unpaved or dirt roads are a major source of non-point source pollution such as sediment, or soil particles that are suspended in water. Sediment from unpaved roads is one of the main contributors to water quality problems in the Farmington River Watershed in Massachusetts. (BRPC 1997). Non-point source pollution is distinguished from point source pollution, which refers to pollution that has a particular entry site such as a factory's smokestack or pipe. With the decline of point source pollution problems due to the Clean Water Act of 1972, nonpoint source pollution has become a growing concern. Nonpoint source (NPS) pollution, unlike pollution from sewage treatment plants and industrial discharge pipes, comes from many diffuse sources.

Sediment can cause water quality issues for both humans and wildlife. Sediment can affect the aesthetic quality of recreation areas, as well as accumulate in drainage structures, causing them to fail. Moreover, sediment pollution and the related process of erosion can destroy critical infrastructure such as roads and culverts. Additionally, sedimentation can cause dams and reservoirs to fill in at an accelerated rate. In aquatic habitats, sediment can cause harm to fish gills and cause spawning areas to fill in. Small organisms that live in stream and lake beds may be suffocated as sediment accumulates over them. This can lead to a breakdown in the aquatic food chain (BRPC 2004).

Proper maintenance of unpaved roads can help to address issues of NPS pollution by sediment. Many of the possible maintenance actions include those that are already performed by the town as part of routine road maintenance to prevent road failure or to address issues such as dust. In general,



Table 4.5 - Unique Features in Otis, MA

Source: Town of Otis Open Space and Recreation Plan 2004

ID #	List of features	Public Access	Recreation use
1	Benton Pond	Yes	Fishing, swimming, canoeing.
2	Big Pond	Yes	Fishing,
3	CCC camps	Yes	Historic heritage visit
4	Church Hill Pond	NA	NA
5	Curtin Pond	No	NA
6	Congregational Church	Yes	Historic heritage visit
7	Dimmock Brook	NA	NA
8	East Otis School	Yes	Historic heritage visit
9	Farmington River	Yes	NA
10	Watson Pond	Yes	NA
11	Haley Pond	No	NA
12	Hayden Pond	NA	NA
13	Hayes Pond	Yes	
14	Horseshoe Pond	No	
15	Knox Trail	Yes	Historic heritage visit, hiking, biking
16	Larkum Pond	No	
17	McManus Store	Yes	Historic heritage visit
18	Mud Pond 1	No	NA
19	Mud Pond 2	No	NA
20	Old cemeteries	Yes	Historic heritage visit
21	Otis Library	Yes	Historic heritage visit
22	Otis Reservoir	Yes	Swimming, picnic, boating
23	Otis Skate Park	Yes	Skateboarding, rollerblading, biking
24	Quarry Pond	No	NA
25	Royal Pond	No	NA
26	Old Trolley Line	Yes	Historic heritage visit, recreation/walking
27	Shaw Pond	Yes	NA
28	St. Paul's Episcopal Church	Yes	Historic heritage visit
29	Thomas Brook Waterfalls	NA	NA
30	Harmony Hall (Rec. Center)	Yes	Historic heritage visit, recreation
31	Upper Spectacle Pond	Yes	Canoeing
32	Waterfalls at Brook Falls	Yes	Scenic quality
33	Waterfalls at Otis Reservoir	Yes	Scenic quality
34	Watson Pond	No	NA
35	White Lilly Pond	Yes	NA
36	Whiting Pond	NA	NA

communities wishing to address sediment pollution should work to fix existing drainage and erosion problems on their unpaved roads, such as managing ditches to ensure they have adequate gravel or vegetative cover or installing check dams to reduce water velocity. Road grading and shaping, which are usually performed yearly by towns, can also help to maintain the road crown which can reduce erosion and therefore sediment pollution. While these routine maintenance activities can help to address sediment pollution, implementation of BMP's specific to sediment reduction can provide extra water quality protections particularly in ecologically sensitive areas or where sediment issues could degrade recreational water resources.

BRPC has been involved with several studies of the Farmington River Watershed, including the development of a watershed wide action plan in 1997 to address issues of non-point source pollution, the creation of a system of Best Management Practices (BMPs) for unpaved roads in 2001, and community level assessments of possible improvements to address sediment pollution from unpaved roads in 2004. This last report included a 5-year action plan for the Town of Otis with recommendations for yearly ditch inspection and preventative maintenance, dust control, and potential road rehabilitation.

Road Salt Contamination

Road Salt (Sodium Chloride or NaCl) can be a major contaminant of groundwater due its use as a de-icer for roadways. Drinking water contaminated by Sodium Chloride can exacerbate high blood pressure (hypertension) and damage organs. Additionally, high levels can harm fish, amphibians, and other aquatic species. However, road salt is not the only potential contributor of Sodium Chloride to drinking water. Septic systems, as well as water softening systems can both lead to elevated Sodium Chloride concentrations in drinking water.

Prior to 1993, Sodium Chloride was a regulated contaminant with a maximum level of 20 milligrams/Liter (mg/L) established by the U.S. Environmental Protection Agency (EPA). After 1993, the EPA stopped regulating Sodium Chloride as a contaminant. Today the EPA lists Sodium Chloride on its "contaminant candidate list", which includes chemicals that are not

subject to any current drinking water regulations. The EPA issues non-enforceable guidance levels for the level of Sodium Chloride in water at the level of 20mg/L, which was developed based on individuals with restricted sodium intake. Additionally it recommends that levels not exceed 30-60mg/L. Around this concentration level, water becomes noticeably salty in taste.

Beginning in the late 1980's and early 1990's, some Otis residents began to notice problems with elevated sodium concentrations in public and private wells along Route 8. Testing was conducted on approximately 20 wells at the request of the town's Planning Board. Many of the wells were found to have sodium chloride concentrations in excess of 20 mg/l. In 1991, the town began working with the Massachusetts Highway Department (Now MassDOT) and the Massachusetts Department of Environmental Protection (DEP) to address issues of potential well contamination.

Based on information provided by the town, the Mass. Highway Department (MHD) decided to conduct an in depth investigation. However, the investigation was limited to wells that belonged to residents with a documented sodium restricted diet, or wells that had contamination levels in excess of 250mg/L. Most of the wells were never replaced by MHD due to the presence of bacterial contamination, and potential contamination from the municipal salt storage area. In the end, only two of the seven wells tested were replaced by MHD in 1994, which included MHD's own well at their maintenance facility and the well of a resident on a sodium restricted diet. Another well was replaced by a resident without funding or reimbursement by MHD. Additional testing of wells along Route 8 was most recently completed in 2001 (Mattos, 2002). For the most part, testing in 2001 revealed that Sodium levels had declined significantly since the first round of testing in the early 1990's.

Salt contamination remains an ongoing issue for the town. The drinking water well that currently serves the town Recreation Center, Library, and the Otis Congregational Church, is planned to be replaced due to salt contamination. As of the time of this writing, the town is coordinating with state agencies to negotiate the new well's location.



MassDOT has had policies in place for some time to address potential well contamination. MassDOT will conduct an investigation of a private water supply if:

- A resident is on a documented sodium restricted diet of less than 1,000 mg/d and the sodium concentration in the water supply exceeds 20 mg/l, or;
- A resident is on a documented sodium restricted diet of less than 2,000 mg/d and the sodium concentration in the water supply exceeds 40 mg/l, or;
- The chloride concentration in a domestic supply well exceeds 250 mg/l.

Possible actions based on the investigation include:

- Construction of a replacement well
- Connection to a public water supply
- Installation of a water treatment system
- Denial of the salt complaint
- Highway drainage modifications or improvements
- Designation of a reduced salt zone (typically reserved for Municipal Water Supplies)

Possible reasons for denial of the complaint include:

- The water is not potable due to non-highway related contamination,
- It is determined that poor well construction allows surface contamination to readily enter the well,
- MassDOT is not the primary source of salt contamination to the water supply, or
- The well is located too close to a septic system, as outlined in the state's Title V code.

For additional information on well contamination in Otis, please refer to the Farmington River Watershed Road Salt Review, prepared by Michael Mattos for the Massachusetts Executive Office of Environmental Affairs.

For additional information on potential contaminated well replacement, please refer to the MassDOT Salt Remediation program, available at <https://www.massdot.state.ma.us/highway/Departments/EnvironmentalServices/SaltRemediationProgram/PrivateWells.aspx>.

Water Quality and Management of Water Bodies

In addition to the possible non-point source contamination from unpaved roads and road salt listed previously, management of the town's water bodies, including its Great Ponds remains an ongoing issue. Currently, there are several organizations working to address issues of water quality both in the town and regionally.

The Otis Reservoir Property Owner's Association (ORPOA) represents the landowners around Otis reservoir and helps to fund various projects including yearly cleanups and management of invasive species around the reservoir. In addition to ORPOA, DCR owns much of the land around the southern portion of Otis Reservoir. This organization will begin implementing an invasive species management plan around the reservoir in the Fall of 2015 to remove areas of *Phragmites australis*, or Common Reed).

Another organization in town is the Big Pond Association, focused on the town's second largest body of water. Big Pond is listed as an impaired waterbody in the EPA's 303(d) list due to low dissolved oxygen levels and mercury found in fish tissue.

In 2004, the Big Pond Association received a grant from the Division of Conservation and Recreation to conduct a diagnostic feasibility study to help understand and address possible threats to the pond and its watershed.

According to the presentation "Protecting Big Pond" given by Dr. Ken Wagner in July 2014, invasive species and high levels of phosphorus accumulating in Big Pond are also important management issues.

Shoreline Development

Otis' water resources have attracted significant residential development. The neighborhoods and communities that surround Big Pond as well as Otis Reservoir are the most dense in the entire town, even more dense than Otis Center Village. Development puts pressure on these natural resource areas by fragmenting existing wildlife habitat and upland areas that help to support these sensitive water environments. The entire shoreline of Otis Reservoir is listed as "core habitat" as identified by the BioMap2

project that supports the Bridle Shiner (*Notropis bifrenatus*). This small fish is listed as a species of special concern in Massachusetts. Likewise, much of the northern shoreline of Big Pond is listed as core habitat due to the extensive wetland area found there. Additionally, this dense residential development places potential pollutant sources much closer to these water resources. Otis' centralized sewer system serves approximately 70 residences, municipal, and other public buildings in Otis Center Village. None of the communities surrounding Big Pond or Otis Reservoir are connected to this system, meaning that individual septic systems provide for wastewater treatment in these areas. Septic systems can contribute nutrient pollution in the form of excess Nitrogen and Phosphorus to waterways. Excess nutrients can have a profound impact on water bodies through a process known as eutrophication. During eutrophication, excess nutrients encourage the growth of algae and aquatic plants, which in turn depletes oxygen from the water column and can lead to the death of fish and other aquatic organisms. Additionally, malfunctioning or inadequately designed septic systems may introduce harmful bacteria to water bodies, which can impact human health and the potential for recreation.

Hazardous Waste and 21E Sites

Massachusetts General Law Chapter 21E, the state superfund law, was enacted in 1983 and created the state waste site cleanup program. Contaminated sites are regulated through this portion of MGL and are often referred to as "21E sites". Those responsible for cleaning up contaminated sites (potentially responsible parties or PRPs) hire licensed site professionals (LSPs) to oversee most cleanups, with some oversight from the Mass. Department of Environmental Protection (DEP) to ensure compliance with the cleanup program.

In Otis, there is only one 21E site, Terranova's Market, located on North Main St. This site was formerly a gas station. It was classified as a Tier 1A site in 2000.

Landfills and Dumping Sites

Information from the Mass. Executive Office of Energy and Environmental Affairs indicates that there are three inactive landfills and dumping sites in Otis. These include a dumping site for construction and

demolition debris located at the MassDOT garage along Route 8. This area was closed in 2013. Additionally, a MassDOT landfill for municipal solid waste was located near the I-90 Turnpike. Finally, the Town had a wood waste landfill along West Center Road that was closed and capped in 1999. No further information about these sites was readily available or discussed by the Otis Master Plan Steering Committee. Currently all municipal solid waste in Otis is collected at the Transfer Station on West Center Road, where it is then transported to regional landfills.

Environmental Equity

The town has been exploring the development of a playground area and neighborhood park in East Otis, but has not yet arrived at a final location. The creation of a town owned recreation area in this portion of town would help to create greater environmental equity, and would comprise a significant investment in recreation facilities for this town neighborhood.

SECTION 5: INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST

Open space is defined as land that has not been developed for residential, commercial or industrial uses and includes publicly and privately owned land. Open space often has particular interest to conservation or recreation and includes:

1. Land which contributes to the public water supply
2. Forests, fields, and agricultural lands
3. Wetlands
4. Rivers, streams, and lakes
5. Parks and other recreation lands
6. Wildlife or animal habitats
7. Land which preserves scenic views or town character

Open space is important as it provides space for human recreation, as well as providing critical habitat for animal species. Where open space is abundant, it creates and shapes rural character as well as cherished scenic views and other features. Open space also provides other benefits in the form of “green infrastructure” such as wetlands that mitigate floodwaters and contribute to greater water quality.

As described in previous chapters, Otis has an abundance of natural resources including forest, as well as wetlands, water resources and wildlife habitat (See Chapter 9-Natural and Cultural Resources, as well as the Otis Open Space and Recreation Plan). Moreover the town has a wealth of recreation opportunities that are created by its abundant natural resources, which has led the town to be called the “outdoor playground of the Berkshires” by some.

In total, protected lands in the town of Otis extend across 8114.16 acres, or 33.3% of all land within the town (see Table 5.1—Protected Land in Otis, MA and Tables 5.2-5.4).

Land in Otis is protected in a variety of ways and with varying degrees of protection. Conservation and recreation lands in the Town of Otis are protected by four entities, the town, the commonwealth of Massachu-



CONSERVATION AND RECREATION LANDS AT A GLANCE

Protected Lands

Roughly 1/3 of all land in Otis is protected in some way.

State Owned Lands

Over 5700 acres of land in Otis, or around 23% of all acreage in the town is owned by the state.

Chapter 61 Lands

Over 1300 acres in Otis, or around 5.5% of the town is privately owned land in Chapter 61, a program that reduces property taxes in exchange for land conservation.

Town Owned Property

The Town of Otis owns several large parcels of land around Great Woods Road and between Route 8 and West Center Road.

setts, local land trusts and private landowners.

Land is considered under permanent protection if it is owned by the state or a local land trust. It may also be permanently protected if the land is subject to a conservation restriction. Within the Town of Otis, many privately owned properties are considered to be under permanent protection due to conservation restrictions held by local land trusts.

Areas under limited protection include other town-owned parcels such as town owned lands between Route 8 and West Center Road that have been considered as site for the creation of the town's "100-Acre Park". Additionally, the town owns multiple parcels of land along Great Woods Road.

Areas under Chapter 61 (A, or B) tax reduction programs are considered to have temporary protections, as they are privately owned.

All privately owned lands without conservation restrictions or not enrolled in Chapter 61 are considered to be unprotected.

Privately Owned Parcels

Privately owned conservation lands in Otis with permanent levels of protection comprise 211.88 acres or 0.87% of all land within the town. These include three privately owned parcels with conservation restrictions held by the Berkshire Natural Resource Council. It should be noted, that unless otherwise stated, private parcels should be considered off limits to public access.

Chapter 61, 61A, and 61B Lands

Chapter 61 is a state program that allows private landowners to manage their properties for forestry (Chapter 61), agricultural (Chapter 61A), or recreational purposes (Chapter 61B) in exchange for reduced taxes. Parcels in the program for the purposes of forestry must be at least 10 acres in size and must have an approved 10-year management plan in place. Once enrolled in chapter 61, the town where the property is located acquires a right of first refusal should the land be put up for sale. This right of first refusal can also be assigned by the town to a land trust or state agency. Chapter 61 lands are not considered permanently pro-

Table 5.1 - Protected Land in Otis, MA			
Source: MASS GIS, 2015			
Protected Land Category	Acres	% of Protected Land	% of Total Land (24367.91 Acres)
Conservation Organization	93.29	1.15%	0.38%
Municipal			
<i>Town of Otis</i>	266.65	3.29%	1.09%
<i>City of Springfield</i>	245.00	3.02%	1.01%
Land Trust	148.31	1.83%	0.61%
Private	211.88	2.61%	0.87%
State	5788.24	71.34%	23.75%
Subtotal	6753.37	83.23%	27.71%
Chapter 61 lands	1360.79	16.77%	5.58%
Total	8114.16	100.00%	33.30%

tected, as landowners can remove their property from the program at any time. However, the owner must pay a penalty tax if the property is withdrawn from chapter 61. Chapter 61 properties are privately owned and should be considered off limits to public access without the landowner's permission. Chapter 61 properties in Otis total 1360.79 acres, or 5.58% of all land in Otis (See Table 5.1 and 5.3). While these properties certainly contribute to the town's rural character and scenic beauty, they currently offer no public access or recreation opportunities.

Public and Non-Profit Parcels

Public and non-profit lands contribute significantly to the open space and recreation opportunities within town. In total, these areas cover 6,541 acres, or 26.8% of all land within the town.

State Owned Parcels

State owned parcels comprise 5,788 acres of land within Otis, or 23.75% of all land within the town. These parcels are composed of two major state forests, (Otis State Forest and Tolland State Forest) and a portion of a third (Beartown State Forest). However,



Figure 5.1—Long Mountain Wildlife Management Area (WMA) was created by the Commonwealth in 2013 from former timber company lands. The WMA is around 900 acres in size. Photograph credit Craig Westcott.

there is no access to Beartown State Forest from Otis. The nearest access is in Monterey. Additionally, Otis is home to three state owned Wildlife Management Areas (WMA). These areas are managed by the Department of Fish and Game primarily as wildlife habitat and public access is allowed.

Otis State Forest

Recreation opportunities at Otis State Forest include multiuse trails, hunting, and fishing along streams and at Upper Spectacle Pond. Otis State Forest is comprised of several large blocks scattered through out town. Access to the large tract near Upper Spectacle Pond is available from Route 23. The large block in the eastern side of town can be accessed from Church Hill Road. Otis State forest land houses the public boat launch for Upper Spectacle Pond (although it is located within the town of Sandisfield). Additionally, a small portion of Otis State Forest included the public boat launch for Big Pond, located near Latimer Hill

Road in Otis.

Tolland State Forest

Tolland State Forest is one of the major public access points for Otis Reservoir. Recreation opportunities include several multi-use trails, a beach area and public boat launch, day-use area, campground, hunting, and fishing. Off-highway motorcycle use is also allowed in Tolland State Forest.

Long Mountain WMA

This WMA is located between Dimmock and West Center Road and West of Stebbins Road. This is one of the Commonwealth's most recently created WMAs and was purchased by the state from the Lyme Northern Timber Fund in 2013. Much of this WMA is located within land identified in the BloMap2 project as "core habitat" and is considered valuable wildlife habitat for rare species.



Figure 5.2—The Farmington River Walk is a short walking path that can be accessed from the parking lot behind the Saint Mary of the Lakes Church at 72 North Main Road in Otis.

Otis and Farmington River WMAs

Otis and Farmington River WMAs are used primarily for hunting, fishing and other passive activities such as birdwatching, walking and hiking. Portions of the Farmington River WMA cover both banks of the Farmington River just south of Hayden Pond near Route 8, providing pristine conditions for fishing. Informal walking and hiking trails are located throughout both WMA areas. Access is available from pull-off areas on Route 8, as well as Ed Jones, Merritt, and Johnson Roads.

Conservation Organization Owned Parcels Izaak Walton Field

Izaak Walton field is a permanently protected 93.29 acre parcel located north of Otis Center Village along Route 8. Access is from Tannery Road. The property is owned by the Izaak Walton League of America, a conservation organization with a focus on water quality and access for fishing. Izaak Walton was an English Writer best known for his book “The Compleat Angler”, considered to be one of the first guides on the art and science of fishing or angling. The property abuts the eastern bank of the Farmington River. The property also contains a small baseball diamond, which was constructed by local volunteers. During the summer, concerts and other town events are held at Izaak Walton Field.

Municipally Owned Parcels

Municipally owned parcels of conservation or recreation interest total 511.65 acres in Otis, or 2.1% of all land within the town. This includes 245 acres of land owned by the City of Springfield in the northeast corner of town which is held to protect the public drinking water supply to Cobble Mountain Reservoir located in the towns of Russel and Blandford (Slate, 2008). There is no public access to these drinking water protection lands.

Town of Otis Owned Parcels

The remaining 266.65 acres of municipally owned land are controlled by the Town of Otis. These include 139.39 acres in 3 parcels between Route 23 and West Center Road near Otis Center Village. In the past, the town has had plans to develop these parcels as “100-Acre Park”. Recent planning the Otis Parks and Recreation Commission has centered on the development of trails throughout the parcels, and the possible integration of benches, accessible pathways and other features to make the park (or a portion of it) focused on the needs of Otis’ older residents (Robert Rosen, Personal Communication 2015).

The adoption of the Community Preservation Act (CPA) by the town was intended as the funding mechanism by which the town would begin to create 100-Acre Park. The CPA is an optional surcharge on property taxes of 1-3% that can be used by towns to fund projects in the areas of affordable housing, historic



Figure 5.3—Otis Ridge is a 9-run ski area located along Route 23, and has been in operation since 1946. Photograph credit Craig Westcott

preservation, or open space and recreation. However, the adoption of the CPA failed to pass at the 2014 Otis town meeting.

Additionally, the town owns 111.79 acres north of Great Woods Road. These parcels were acquired by tax lien and were originally part of a proposed housing subdivision. Some parcels in this area have already been auctioned off by the town. There has been some talk of possibly using this area as a town park, due to the proximity of these parcels to the town beach; however, there has been no formal planning. The town has also discussed the potential sale of these parcels to help create affordable or low cost building lots for residential development (Chris Morris, Personal Communication, 2015).

The current level of use of the town-owned Great Wood Road and “100-Acre Park” parcels is unknown. These areas may be used informally for recreation, but there are no existing facilities or programming.

Town Cemeteries

The Town of Otis owns and manages 8 cemeteries scattered throughout town that total 9.8 acres. Six of these cemeteries are listed in the Massachusetts Historical Commission’s (MHC) Massachusetts Cultural Resource Information System (MACRIS) database. The largest cemetery is the Otis Center Cemetery located near the intersection of Routes 23 and 8 in Otis Center. While the terrain of this cemetery is steep, it contains paved roadways, and could be used to extend a possible walking loop through the village center. See the Otis Master Plan for more information on Cultural Resources in Otis.

Big Pond Town Beach

The Otis Town Beach is located at the end of Great Woods Road along the northwest shore of Big Pond. Creation of the town beach was one of the major accomplishments of Otis’ 2005 Open Space and Recreation Plan. The beach is open to Otis residents and their guests only. Town transfer station permits function as town beach parking permits. Canoes and kayaks may be launched from the town beach; however,

launching of power boats is not allowed. A small playground is also located in this area. For more information on the town beach and beach regulations, please visit: http://www.townofotisma.com/Pages/OtisMA_Rec/townbeach

Other Recreation Areas and Facilities

Town Hall Park

Town Hall Park is located immediately behind Town Hall at 1 North Main Road in Otis. As its name implies, it is town-owned. This area contains a gazebo, shade structure, playground equipment, and the town's skate park. The Otis Skate Park is paved and contains several ramps, rails and quarter pipes that can be used by skateboarders, inline skaters, or BMX bikes. Safety equipment, including helmets and pads, is required of all Skate Park users. Meetings with the Otis Parks and Recreation Commission identified the possibility of using this area as an ice skating rink during the winter. For more information on the Otis Skate Park, please visit: http://www.townofotisma.com/Pages/OtisMA_Rec/PLAYGROUNDS/skatepark

Firehouse Park

This small town-owned park area is located adjacent to the Main Road Fire Station and was constructed during improvements to Otis Center Village that included the installation of sidewalks. The park contains benches, pathways, and tree and shrub plantings.

Farmington River Walk

Access to this short walking path is located behind the Saint Mary of the Lakes Church (72 North Main Road in Otis) immediately north of the Otis Recreation Center in Harmony Hall. This path is approximately 1/4 of a mile long and is comprised of a loop that begins at the church parking lot, runs along the bank of the Farmington River and connects back to the parking lot (See Figure 5.2).

Farmington River School

The Farmington River School is owned by the Farmington River School District and serves the communities of Otis and Sandisfield. The school has several recreational fields and a playground that are available for use outside of school operating hours and during summer break.

Otis Recreation Center (Harmony Hall)

The Otis Recreation Center is located in Harmony Hall. The center is a well used public asset and includes a gym with weight lifting equipment, a cardio room (including treadmills) and a large second floor which contains pool tables and computers for use by Otis residents. The center holds many classes and programs for Otis residents. Non-residents can use the Recreation Center facilities and attend classes for a small fee.

Current Recreation Center Activities and Programs:

Bingo
Chair Yoga
CPR Training
Golf Clinic
Health Screening
Swing Dance
Letterboxing
Movie night
Pilates
Qi Gong
Tai Chi
Volleyball
Yoga
Passes to area attractions

Otis Ridge Ski Area

Otis Ridge is a private 9-run ski area located northwest of Otis Center Village along Route 23. Otis Ridge has been operating since 1946 (see figure 5.3). The ski area is home to the Grouse House, a local restaurant, and in the warmer months sells flowers.

Camp Overflow

Camp Overflow is a privately owned campground located on the western shore of Otis Reservoir. Camp Overflow also contains walking trail, horseshoe pits, a volleyball court, a basketball court, and two playground areas. A boat launch is available to campground guests.

Mountain View Campground

Mountain View Campground is a privately owned campground located south of Otis Center Village along Route 8. The campground contains camping areas for RV's and tents and has a swimming pool for guests.



Table 5.2 - Inventory of Lands of Conservation and Recreation Interest

Source: Mass. GIS Open Space, 2015, Otis Town Assessor 2015

Site Name	Owner	Owner Type	Primary Purpose	Public Access	Level of Protection	Interest	Acres	Total Parcels
Beartown State Forest	DCR	State	C&R	Full	Permanent		166.31	2
Becket Quarry	Becket Land Trust	Land Trust	C&R	Full	Permanent		15.10	1
Cobble Mountain Reservoir	City of Springfield	Municipality	Water Protection	None	Permanent		245.00	5
Farmington River Access	Department of Fish and Game	State	C&R	Full	Permanent		1.01	1
Farmington River Access	Department of Fish and Game	State	C&R	Full	Permanent		3.63	1
Farmington River WMA	Department of Fish and Game	State	C&R	Full	Permanent		1578.86	9
Private	Private	Private	C&R	None	Permanent	CR - BNRC	83.59	1
Private	Private	Private	C&R	None	Permanent	CR - BNRC	51.75	1
Private	Private	Private	C&R	None	Permanent	CR - BNRC	76.54	1
Long Mountain WMA	Department of Fish and Game	State	C&R	Full	Permanent		906.94	6
McLellan Reservation	The Trustees of Reservations	Land Trust	C&R	None	Permanent		133.22	1
Otis Cemetery	Town of Otis	Municipality	Historic	Full	Limited		7.06	5
Otis State Forest	DCR	State	C&R	Full	Permanent		2662.79	41
Otis WMA	Department of Fish and Game	State	C&R	Full	Permanent		94.28	2
Izaak Walton Field	Izaak Walton League of America, Inc.	Conservation Organization	C&R	Unknown	Permanent		93.29	1
Tolland State Forest	DCR	State	C&R	Full	Permanent		374.41	12

Table 5.3 - Chapter 61, 61a, and 61B Properties in the Town of Otis, Ma

Site Name	Owner	Owner Type	Primary Purpose	Public Access	Level of Protection	Interest	Acres	Total Parcels
Unknown	Private	Private	Conservation	None	Chapter 61		2.08	1
Unknown	Private	Private	Conservation	None	Chapter 61		61.63	1
Unknown	Private	Private	Conservation	None	Chapter 61		65.80	1
Unknown	Private	Private	Conservation	None	Chapter 61A		11.18	1
Unknown	Private	Private	Conservation	None	Chapter 61		155.94	1
Unknown	Private	Private	Conservation	None	Chapter 61B		1.00	1
Unknown	Private	Private	Conservation	None	Chapter 61B		1.09	1
Unknown	Private	Private	Conservation	None	Chapter 61B		1.11	1
Unknown	Private	Private	Conservation	None	Chapter 61B		0.91	1
Unknown	Private	Private	Conservation	None	Chapter 61B		0.88	1
Unknown	Private	Private	Conservation	None	Chapter 61A		10.90	1
Unknown	Private	Private	Conservation	None	Chapter 61		181.81	1
Unknown	Private	Private	Conservation	None	Chapter 61		189.96	1
Unknown	Private	Private	Conservation	None	Chapter 61		40.12	1
Unknown	Private	Private	Conservation	None	Chapter 61		44.69	1
Unknown	Private	Private	Conservation	None	Chapter 61		50.98	1
Unknown	Private	Private	Conservation	None	Chapter 61		37.70	1
Unknown	Private	Private	Conservation	None	Chapter 61		82.35	1
Unknown	Private	Private	Conservation	None	Chapter 61		45.68	1
Unknown	Private	Private	Conservation	None	Chapter 61		86.08	1
Unknown	Private	Private	Conservation	None	Chapter 61		17.12	1
Unknown	Private	Private	Conservation	None	Chapter 61		271.78	1



Table 5.4 - Conservation and Recreation Lands Owned by the Town of Otis, MA

Source: Otis Assessor, Mass. GIS Open Space 2015

Site Name	Owner	Manager	Current Use*	Public Access	Condition	Universal Access	Level of Protection	Recreation Potential	Zoning	Acres
100 Acre Park	Town of Otis	None	None	Full	Undeveloped	None	Limited	Potential Town Park	Village/Residential	15.28
100 Acre Park	Town of Otis	None	None	Full	Undeveloped	None	Limited	Potential	Village/	21.92
100 Acre Park	Town of Otis	None	None	Full	Undeveloped	None	Limited	Potential	Village/	105.19
Town Cemetery	Town of Otis	Maintenance Dept.	Historic	Full	Good	None	Limited	N/A	Residential	0.91
Town Cemetery	Town of Otis	Maintenance Dept.	Historic	Full	Good	None	Limited	N/A	Residential	1.29
Town Cemetery	Town of Otis	Maintenance Dept.	Historic	Full	Good	None	Limited	N/A	Residential	1.34
Town Cemetery	Town of Otis	Maintenance Dept.	Historic	Full	Good	None	Limited	N/A	Residential	1.45
Town Cemetery	Town of Otis	Maintenance Dept.	Historic	Full	Good	None	Limited	Potential Walking Loop	Village	2.07
Town Cemetery	Town of Otis	Maintenance Dept.	Historic	Full	Good	None	Permanent	N/A	Residential	1.35
Town Cemetery	Town of Otis	Maintenance Dept.	Historic	Full	Good	None	Permanent	N/A	Residential	1.05
Town Cemetery	Town of Otis	Maintenance Dept.	Historic	Full	Good	None	Permanent	N/A	Residential	0.37
Town Beach	Town of Otis	Maintenance Dept.	Recreation	Full	Good	Some	Limited	Town Beach	Residential	2.63
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.11
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.19
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.22
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.45
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.74
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.81
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.85
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.89
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.91
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.93
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.96
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	0.96

*Where "current use" is listed as none, this indicates an undeveloped town owned parcel. These areas may be used informally for recreation.

Table 5.4 - Conservation and Recreation Lands Owned by the Town of Otis, MA—Continued

[illegible]



Table 5.4 - Conservation and Recreation Lands Owned by the Town of Otis, MA—Continued

Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.12
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.14
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.16
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.18
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.22
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.22
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.23
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.30
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.34
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.34
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.34
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.34
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.35
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.41
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.44
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.45
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.52
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.54
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.60
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.61
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.64
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.65
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.72
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.77
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.79
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.82
Great Woods Road Parcels	Town of Otis	None	None	Full	Undeveloped	None	Limited	Limited	Residential	1.85

Table 5.4 - Conservation and Recreation Lands Owned by the Town of Otis, MA—Continued										
Great Woods Road Parcels	Town of Otis	None	None	Full	undeveloped	None	Limited	Limited	Residential	1.89
Great Woods Road Parcels	Town of Otis	None	None	Full	undeveloped	None	Limited	Limited	Residential	1.90
Great Woods Road Parcels	Town of Otis	None	None	Full	undeveloped	None	Limited	Limited	Residential	2.30
Great Woods Road Parcels	Town of Otis	None	None	Full	undeveloped	None	Limited	Limited	Residential	2.49
Great Woods Road Parcels	Town of Otis	None	None	Full	undeveloped	None	Limited	Limited	Residential	4.09
Great Woods Road Parcels	Town of Otis	None	None	Full	undeveloped	None	Limited	Limited	Residential	5.70
Great Woods Road Parcels	Town of Otis	None	None	Full	undeveloped	None	Limited	Limited	Residential	20.11

SECTION 6: COMMUNITY VISION

6A DESCRIPTION OF PROCESS

This Open Space and Recreation Plan was developed through a robust public process that included the elements described below.

Master Plan Steering Committee

This Open Space and Recreation Plan update was completed as part of the development of the Otis Master Plan. The Otis Master Plan Steering Committee (MPSC) met 11 times from March to December 2015. The committee reviewed draft chapters and appendix section of the Master Plan as well as the updated OSRP.

Public Survey

A survey was created by the Master Plan Steering Committee to gain public input. The survey was created through the online survey website survey-monkey.com and was available from April 24th, 2015 until June 1st, 2015. Due to the popularity of the survey, it was re-opened online for an additional week from June 9th until June 16th, 2015. Paper copies of the survey were available at town hall for those without internet access. The survey was open to all year-round and seasonal Otis residents, as well as second homeowners. A section of the survey was dedicated to questions specific to the Open Space and Recreation and included both open-ended and closed-ended questions to inform the plan. Overall, there were 179 responses to the survey. Based on information from the 2010 Census, about 5% of the Town's year-round population responded to the survey. Additionally, many seasonal residents and second homeowners responded. A complete copy of the Master Plan survey results can be found in the Master Plan Appendix. Survey questions and responses relating to the Open Space and Recreation Plan can be found in the appendix of this document.

Stakeholder Interviews

BRPC conducted several stakeholder interviews as part of the OSRP development process. These interviews helped to gather basic information for the plan as well as identify ongoing and proposed work to help draft



COMMUNITY VISION AT A GLANCE

Public Process

The OSRP public process included regular meetings of the Otis MPSC, a public survey, stakeholder interviews, and two public forums.

OSRP Goals

- Goal 1: Water Resources are Protected
- Goal 2: Natural Resources are Protected
- Goal 3: Residents and Visitors are aware of Otis' Open Space and Recreational Opportunities
- Goal 4: The Town's Recreation Opportunities Meet Community Needs

the goals and objectives of this OSRP. Among the stakeholders interviewed were members of the Otis Parks and Recreation Commission, the Otis Historical Commission, members of the Otis Reservoir Property Owners Association (ORPOA), and the Big Pond Association.

Public Forums

Two public forums were held by the Otis MPSC. The first public forum was held on June 18, 2015. The second was held on November. The first public forum was intended to gather information. The second was held on November 9, 2015 and focused on presenting initial recommendations for public response.

During the first public forum, participants discussed the possibility of creating 100-Acre park on town owned land, among other topics related to Open Space and Recreation.

During the second public forum, participants were introduced to the goals and objectives and actions of the Master Plan and Open Space and Recreation Plan. Participants were asked to mark the goals, objectives, and action items of the plan that they felt were most important with a sticker.

6A STATEMENT OF OPEN SPACE AND RECREATION GOALS

Goal 1: Water Resources are Protected

Goal 2: Natural Resources are Protected

Goal 3: Residents and Visitors are aware of Otis' Open Space and Recreational Opportunities

Goal 4: The Town's Recreation Opportunities Meet Community Needs



SECTION 7: ANALYSIS OF NEEDS

7A SUMMARY OF RESOURCE PROTECTION NEEDS

General

Otis residents and visitors value the town's rural character, open space, and recreation opportunities. As part of the public survey that was developed to inform the town's Master Plan and Open Space and Recreation Plan, survey respondents answered some general questions about aspects of life in Otis. The top five aspects of life in Otis that were chosen by survey respondents include elements related to open space and recreation and are as follows:

- Peace and quiet (88%)
- Being close to the water (84%)
- Natural and scenic beauty (83%)
- Being close to nature and wildlife (82%)
- Small town atmosphere (74%)

Overall, survey respondents thought it was important to protect a variety of open space types. The open space types that respondents felt were most important to protect include:

- Forests (96%)
- Wildlife Habitat (91%)
- Waterfront areas (90%)
- Open space for drinking water needs (89%)
- Open space for recreational needs (81%)

Need for Water Quality Management

Due to its unique location in the Berkshire highlands, Otis has a direct impact on the water quality of both Springfield, MA and Hartford, CT. Otis is located at the headwaters of both the Farmington River and portions of the watershed of the Cobble Mountain Reservoir are located at the eastern portion of the town.

It is recommended that the town continue to enforce its existing regulations to help maintain water quality for both the Farmington River Watershed and Cobble Mountain Reservoir. These include the Wetlands Protection Act which is administered through the town's Conservation Commission as well as Title V

(related to septic systems and wastewater) which is regulated by the Board of Health. Continued enforcement of existing regulations through these two entities will help to maintain water quality in the town's lakes, ponds, and rivers.

The construction of a sewer system in Otis Center Village in 1998 helped to address the issue of multiple failing septic systems in the area. In 2014, the town applied for a grant to expand sewer service to the Otis Ridge Ski area. Economic development and improved water quality were two reasons listed for possible sewer expansion in the town's application. It is recommended that the town reapply for funding to expand sewer within the town given that the WWTP has excess capacity. The town should also continue to identify areas for possible sewer expansion, including more densely populated areas around East Otis, Otis Reservoir and Big Pond. While these projects would be a significant undertaking, and would not be feasible or practical without substantial grant funding, they could help to improve overall water quality within the town and for downstream locations within the watershed.

Moreover, the town's multiple lakes and ponds including the state's largest recreational body of water, Otis Reservoir, and several other Great Ponds are both important natural and recreational resources. As of 2012, 5 of the town's 19 bodies of water are listed as impaired. There are several organizations working to address water quality issues around town including the Otis Reservoir Property Owners Association, the Big Pond Association, and the Benton Pond Association. The Lakes and Ponds Association of Western Massachusetts (LAPA-West) also serves as an umbrella organization for these smaller entities and is helping to create a network of water quality stewards in the region. Regionally, the Farmington River Watershed Association helps to address issues within the watershed.

The town should work to support these existing organizations and their ongoing efforts to improve water quality. The town could also help to provide a

venue and forum for these organizations to collaborate and to educate residents, second homeowners and visitors about best management practices and ongoing projects.

Additionally, the town has worked to address other water quality issues related to salt contamination from roadways (See Section 4), and in the past both public and privately owned wells have had to be replaced due to salt contamination. The town should continue its efforts to address this issue. Furthermore, the town could work to adopt best management practices for its unpaved dirt roads. Unpaved roadways are a major source of non-point source pollution that has been examined within the Farmington River watershed. Adopting and implementing BMP's for these roadways could be another avenue to improve water quality within the town.

7B SUMMARY OF COMMUNITY'S NEEDS

General

Survey respondents indicated that they participate in a variety of recreational activities during the year. The top recreational activities identified are based on respondents indicating that they participated at least once a year and include:

- Walking (73%)
- Swimming (56%)
- Gardening (55%)
- Boating (52%)
- Canoeing/Kayaking (39%)

The fact that three out of the five most participated in activities in Otis are related to water based recreation reinforces that importance of the town's extensive water resources.

Need for Greater Promotion of Existing Recreation Opportunities

In addition to outdoor recreation opportunities, the town has a well used recreation center housed in Harmony Hall. The recreation center contains fitness equipment, has publicly accessible computers as well as game and pool tables. The recreation center houses some daily recreation classes and events, however many are held at other locations in town

including town hall and the Farmington River School. According the survey, the most highly rated programs and services offered by the recreation center includes its pass program, Yoga instruction and the center's cardio and weight training rooms. The pass program involves free or discounted price tickets and passes to local events, attractions and recreation areas. The passes are generally limited to a few per day and are distributed on a first come, first serve basis.

Despite the fact that the recreation center programs are well attended, many survey respondents were unaware of program offerings, and some were even unaware of the recreation center altogether. This was especially true of seasonal residents and second homeowners who responded to the survey. On the whole, this group reported participating in recreation center programs at a lower rate than Otis residents.

Moreover, many survey respondents were unaware of state owned recreation areas including the three WMAs within the town. Nearly a third of all survey respondents reported that they had never heard of the town's WMAs and over 40% reported that they had never used these areas for recreation.

The town should work to promote its existing recreation opportunities, both through the town website and through its other communications. This could mean more actively promoting both town recreation resources, as well as those on state owned land.

Needs for Children and Seniors

The Otis Recreation Center provides a critical recreation facility for both senior citizens and children in the community. The town should continue to invest in the recreation center as it provides a space for children to gather after school as well as providing indoor recreation opportunities for young and old alike. The town has invested much in recent years in playground facilities for children, especially in Town Hall Park, and has been exploring developing other playground areas in town to address gaps, such as in East Otis.

Given the variety of recreation opportunities available in Otis, and the changing demographics of the town (and region) toward an older populace, communities



should consider developing age friendly recreation areas and options that are universally accessible, allowing anyone from age 8 to age 80 to enjoy the great outdoors that the Berkshires offers. A universally accessible town recreation area was discussed as part of planning for “100-Acre Park”, however the creation of this recreation area never came to fruition. See additional discussion later in this section.

Maintenance and Development of Recreation Opportunities to Meet Community Needs

There are two small parks in Otis Center Village. One is located near the fire department building and the other is located directly behind town hall. Town Hall Park, as it is known, contains a skate park as well as a playground area and gazebo. In discussions with the Otis Parks and Recreation Commission, members identified that the skate park is in need of repaving. Additionally, they identified the possibility of updating existing playground equipment and possibly establishing a new playground area elsewhere in town, possibly in East Otis.

Moreover, the existing Town Beach area on Big Pond contains some play equipment and functions as a park area in addition to providing access to the water. Meetings with the Otis Parks and Recreation Commission identified possible improvements at the Town Beach, including installing changing rooms or restrooms. Additionally, the Americans with Disabilities Act (ADA) self-evaluation conducted as part of OSRP development identified ways to improve ADA access at the beach, including designated ADA parking and possible installation of accessibility mat along the beach area. Accessibility mat, also known by the trade name “mobi-mat”, provides an ADA accessible surface that allows for disabled persons to cross sandy areas. Additionally, it has the benefit of keeping sand out of shoes and sandals. The nearby Towns of Lenox and Richmond are working to install accessibility mat on their town beach areas. Moreover, the town may wish to consider other improvements to the Town Beach to develop this area as a local park, such as upgrading or improving existing play equipment there.

The town has an abundance of municipally owned land. Some of this land between Route 8 and West

Center Road has long been discussed as a possible location for a town park (100-Acre park). In conversations with the town recreation committee, members indicated that there is still some desire to pursue creation of a park in this area, but lack of funding is a major barrier. Additionally, they mentioned the possibility of integrating age friendly elements into a future design to create a park that would be universally accessible. Given the town’s changing demographics, these features might be warranted. Committee members also discussed the possibility of creating 100-Acre park at the June 2015 public forum. However, while this possible recreation area has been a thought for many years, it is currently a low priority for the town to undertake. The town should first reevaluate its needs for this area based on previous planning efforts. Secondly, the town should work to engage in a further public process, perhaps through a workshop or public forum to evaluate if there is still a need to implement recreation improvements for this area. If a clear need emerges from the public process, the town should plan to implement improvements to the 100-Acre Park area.

Moreover, members of the town’s historical commission have been actively working to turn the Knox Trail into a multi-season multi-use trail. Currently the trail is mostly used by snowmobilers during the winter. For more information and goals and objectives related to the Knox Trail, please refer to the Otis Master Plan.

The Otis OSRP and the Statewide Comprehensive Outdoor Recreation Plan (SCORP)

The Massachusetts SCORP is a broad and far-reaching examination of recreation needs across the state of Massachusetts. There are many similarities between the goals, objectives and identified needs of the SCORP and of the Otis OSRP. One of the action items in this plan is to work to mark and reestablish existing trails throughout town. In doing so, the town will be helping to advance the first goal of the SCORP, related to increasing the availability of all types of trails. Additionally, the town will reach out to existing conservation and waterbody organizations to examine potential issues relating to the town’s water resources. In doing so, the town will help to advance the second goal of the SCORP, related to water based recreation.

Additionally, several action items related to the town beach on Big Pond will also help to advance this goal. Finally, by working to establish a playground in East Otis (as well as Town Hall Park), the town will be investing in neighborhood recreation areas. Currently East Otis is without a town-owned park, so a playground in this area will help to provide greater recreation equity for town residents.

7C MANAGEMENT NEEDS, POTENTIAL CHANGE OF USE

The recreation center's 20+ programs are currently managed by only one part time staff member, the recreation program supervisor. The town should work to recruit additional volunteers to help manage recreation programs, should the need to expand these programs be identified.

At the time of this writing in the summer of 2015, the town is considering the possible creation of a combined highway and fire department building. This would free up a large space within the existing fire department building. There has been some discussion of possibly relocating the recreation center to the current fire department building if this plan were to move forward. The Otis recreation center is currently located in Harmony Hall, one of the oldest buildings in town. The town has identified that Harmony Hall is in need of some repairs and the relocation of the Recreation Center to the fire department building could help to provide more space for its activities as well as provide a more adequate location for heavy exercise equipment than is currently available in the historic Harmony Hall building. The town should continue to investigate its combined highway and fire department building and relocate the recreation center if it finds this necessary and useful.

SECTION 8: GOALS AND OBJECTIVES

These Open Space and Recreation goals, objectives, and actions items were compiled from the work of the Otis Master Plan Steering Committee, the 2015 Open Space and Recreation Survey, the June 18th, 2015 public forum, the analysis of the data contained in earlier sections of this OSRP and goals identified in the 2004 Otis OSRP.

GOAL 1: WATER RESOURCES ARE PROTECTED

GOAL 2: NATURAL RESOURCES ARE PROTECTED

GOAL 3: RESIDENTS AND VISITORS ARE AWARE OF OTIS' OPEN SPACE AND RECREATIONAL OPPORTUNITIES

- Promote Otis' Open Space and Recreation areas.

GOAL 4: THE TOWN'S RECREATION OPPORTUNITIES MEET COMMUNITY NEEDS

- Continue to Provide High Quality Recreation Programming Through the Otis Recreation Center.
- Investigate the possible creation of "100-Acre Park" on town owned land between Route 8 and West Center Road.
- Continue to improve town parks.
- Continue to improve the Big Pond Town Beach.
- Continue the Ongoing Process to Develop the Knox Trail as a Four-season Multi-use Trail.



OTIS OPEN SPACE AND RECREATION GOALS AND OBJECTIVES AT A GLANCE

Goal 1: Water Resources are Protected

Goal 2: Natural Resources are Protected

Goal 3: Residents and Visitors are aware of Otis' Open Space and Recreational Opportunities

Goal 4: The Town's Recreation Opportunities Meet Community Needs

SECTION 9: 5-Year Action Plan

The 5-year action plan lists the specific actions that are needed to implement the goals and objectives described in Sections 6 and 8. For a visualization of the 5-year action plan, please refer to Map 8: Action Plan Map.

OPEN SPACE AND RECREATION	Suggested Leadership	Other Participants	Schedule	Potential Funding
Goal 1: Water Resources are Protected.				
Continue ongoing septic and water quality testing by the Board of Health and others to examine water quality in Otis.	BOH	Con. Com.	Ongoing	General
Continue to enforce existing environmental regulations to protect drinking water resources.	Con. Com.	BOH, BOS	Ongoing	General
Reach out to local conservation and water body groups (Watson Pond Association, ORPOA, Big Pond Association, etc.) to investigate potential issues such as invasive species and boating, etc.	Con. Com.	BOS	1-3 Years	General
Investigate sewer expansion in Otis Village Center to utilize the excess capacity in the WWTP. Investigate development of a new wastewater treatment system in East Otis. Examine potential alternative or ecological treatment systems.	Smart Growth	Planning	5+ Years	Grants, Raise and Appropriate
Goal 2: Natural Resources are Protected.				
Continue to enforce existing environmental regulations to protect Otis' natural resources.	Con. Com.	BOS	Ongoing	General
Goal 3: Residents and Visitors are Aware of Otis' Open Space and Cultural Resources and Recreational Opportunities.				
Objective: Promote Otis' open space and recreation areas.				
Improve the portion of the website dedicated to promoting Otis' open space and recreation areas and opportunities.	Staff	Parks	1-3 Years	General
Work with existing organizations, volunteers, and the state to mark and reestablish trail systems in town.	Parks	DCR, Vol.	1-3 Years	General
Organize and promote guided and interpretive trail walks, tours, and similar events at town recreation areas.	Parks	DCR, Vol.	1-3 Years	General
Goal 4: The Town's Recreation Opportunities Meet Community Needs.				
Objective: Continue to provide high quality recreation programming through the Otis Recreation Center.				
Work to recruit additional volunteers to manage recreation programs.	Parks	Vol.	Ongoing	General
Poll Rec. Center users about possible improvements to Rec. center programs and amenities.	Parks	Vol.	1-3 Years	General
Objective: Investigate the possible creation of "100-Acre Park" on town-owned land between Route 8 and West Center Road.				
Hold a public forum / workshop on the possible creation of 100-Acre Park.	Parks	BOS	1-3 Years	General
Work to implement recommendations from the forum if identified.	Parks	BOS	3-5 Years	Potential PARC Grant



Objective: Continue to improve town parks.				
Examine development of a temporary ice skating rink on the Skate Park.	Parks	Maint.	1-3 Years	Raise and Appropriate, Grants
Identify a location for and establish a playground area in East Otis.	Parks	BOS	1-3 Years	Potential PARC Grant
Repave the Skate Park.	Maint.	Parks	3-5 Years	Potential PARC Grant
Install horseshoe pits at Town Hall Park. Install picnic tables, and benches at Town Hall Park. Improve landscaping.	Parks	Maint.	3-5 Years	Potential PARC Grant
Improve ADA accessibility at Town Hall Park.	Parks	Maint.	3-5 Years	Potential PARC Grant
Objective: Continue to improve the Big Pond town beach.				
Identify and install improvements at the town beach.	Parks	Maint.	Ongoing	Potential PARC Grant
Improve ADA accessibility at the town beach.	Parks	Maint.	3-5 Years	Potential PARC Grant
Examine installation of permanent restrooms and changing facilities at the town beach.	Parks	BOS, Maint.	5+ Years	Potential PARC Grant
Objective: Continue the ongoing process to develop the Knox Trail as a four-season multi-use trail.				
Continue ongoing work to develop the Knox Trail through work with public and private landowners.	Hist. Comm.	Vol.	Ongoing	General

List of Abbreviations:

Town Admin.—Town Administrator

BOH—Board of Health

BOS—Board of Selectmen

Con. Com.—Conservation Commission

Hist. Comm.—Historical Commission

HWY—Highway Department

Maint.—Maintenance Department

Parks—Parks and Recreation Commission

Vol.—Volunteers

SECTION 10: PUBLIC COMMENTS



Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114



Tel: (617) 626-1000
Fax: (617) 626-1181

June 27, 2016

Eammon Coughlin
Berkshire Regional Planning Commission
1 Fenn Street, Suite 201
Pittsfield, MA 01201

Re: Open Space and Recreation Plan

Dear Mr. Coughlin:

Thank you for submitting Otis's Open Space and Recreation Plan to this office for review for compliance with the current Open Space and Recreation Plan Requirements. I am pleased to write that the plan is approved. This final approval will allow Otis to participate in DCS grant rounds through May 2021.

Congratulations on a great job. Please call me at (617) 626-1171 if you have any questions or concerns about the plan.

Sincerely,

A handwritten signature in black ink that reads "Melissa Cryan".

Melissa Cryan
Grant Programs Supervisor



Town of Otis



Selectmen's Office
Town Hall, One North Main Road, Otis, MA 01253-0237
(413) 269-0100 x209

February 9, 2016

Mr. Tom Matuszko
Mr. Eammon Coughlin
Berkshire Regional Planning Commission
1 Fenn Street Suite 201
Pittsfield, MA 01201

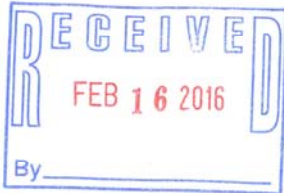
Dear Tom & Eammon,

This is to formally notify you that the Town of Otis Planning Board presented the official version of the Open Space and Recreation Plan to the Otis Select Board on January 12, 2016. After reviewing the Plan as presented, the Otis Select Board voted to accept the plan at tonight's Select Board meeting.

Sincerely,

Roberta Sarnacki
Chairman, Otis Select Board

RS/ld



Town of Otis

Planning Board

Town Hall, One North Main Road, Otis, MA 01253-0237
(413) 269-0100 x209



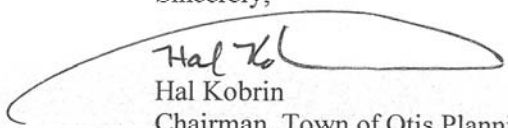
February 8, 2016

Mr. Tom Matuszko
Mr. Eammon Coughlin
Berkshire Regional Planning Commission
1 Fenn Street Suite 201
Pittsfield, MA 01201

Dear Tom & Eammon,

This is to formally notify you that the Town of Otis Planning Board reviewed the final draft of the Open Space and Recreation Plan at their January 11, 2016 Planning Board meeting. At that meeting, the Planning Board unanimously reviewed and approved the final draft as the official version of the Open Space and Recreation Plan. The Town of Otis Planning Board also unanimously voted to present the official version to the Select Board on January 12, 2016.

Sincerely,



Hal Kobrin

Chairman, Town of Otis Planning Board

HK/ld

**BERKSHIRE REGIONAL PLANNING COMMISSION****1 FENN STREET, SUITE 201, PITTSFIELD, MASSACHUSETTS 01201**

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SHEILA IRVIN, Chair
KYLE HANLON, Vice-Chair
MARIE RAFTERY, Clerk
CHARLES P. OGDEN, Treasurer

NATHANIEL W. KARNS, A.I.C.P.
Executive Director

February 16, 2016

Melissa Cryan, Grants Manager
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Dear Ms. Cryan:

The Berkshire Regional Planning Commission (BRPC) has reviewed the draft *Open Space and Recreation Plan 2016-2020 for the Town of Otis, Massachusetts* (OSRP). There are several aspects of the plan that are consistent with the *Sustainable Plan for the Berkshires*, the region-wide plan for Berkshire County. A few of the highlights are listed hereafter.

- The need to protect and maintain the quality of Otis Reservoir and Big Pond as both natural and recreational resources. Both of these lakes are relatively free of aquatic invasive non-native plants that plague many of the county's waterbodies, making them regional recreational assets.
- The desire to investigate the creation of new public parks. Establishing a public park at the 100-Acre Park site will bring outdoor recreational access closer to the residents in the center of the town.
- The need to improve access to recreational opportunities to people of all abilities. Otis, like most Berkshire County communities, has an aging population, and it will be important to be able to offer outdoor recreational facilities that are accessible to seniors.

We note that the OSRP utilized natural resource GIS data from Natural Heritage and Endangered Species Program (NHESP) and BioMap2. These have resulted in very informative maps that display where future protection efforts would be most beneficial for state Species of Concern. We note the inclusion of NHESP's planning document, *Conserving the Biodiversity of Massachusetts in a Changing World (2012)* in the plan. Attaching this report in an appendix is a convenient way to publicize the document and ensure its use in future open space planning.

The BRPC commends the Town of Otis for its planning efforts and encourages the town to continue to pursue opportunities to protect the region's scenic character, natural resources and quality of life.

Sincerely,

Nathaniel Karns, AICP
Executive Director



Division of Fisheries & Wildlife

Jack Buckley, *Director*

June 22, 2015

Eammon Coughlin, Planner
Berkshire Regional Planning Commission
1 Fenn Street, Suite 201
Pittsfield, MA 01201

Re: Open Space Plan; 15-34372, Town of Otis

Dear Mr. Coughlin:

Thank you for contacting the Natural Heritage and Endangered Species Program regarding the update for the Open Space and Recreation Plan for Otis. Enclosed is information on the rare species, priority natural communities, vernal pools, and other aspects of biodiversity that we have documented in Otis. The town is encouraged to include this letter, species list, appropriate maps, and the BioMap2 town report in the Open Space and Recreation Plan.

Based on the BioMap2 analysis and information discussed below, NHESP recommends land protection in the BioMap2 cores or protecting lands adjacent to existing conservation land – or, best, a combination of both when feasible. All of the areas discussed below are important for biodiversity protection in Otis.

Enclosed is a list of rare and uncommon species and natural communities known to occur or have occurred in Otis. This list and the list in BioMap2 differ because this list and discussion include all of the uncommon aspects of biodiversity in Otis that NHESP has documented and BioMap2 focused on occurrences with state-wide significance and included non-MESA listed species of conservation interest from the 2005 State Wildlife Action Plan (SWAP). A new SWAP is in preparation and the species of conservation interest has expanded this year to include plants, both ones listed in MESA, and several that are on the Watch List as there is insufficient information for them to be listed, but our current data indicate these are very uncommon. In addition, the NHESP database is constantly updated and the enclosed list may include species of conservation interest identified in town since BioMap2 was produced in 2010, while species which have been delisted from MESA and are not included in the 2015 SWAP as a species of conservation concern are not included on this list.

In early 2013, we sent each town copies of its *BioMap2* Town Report which were developed to provide local biodiversity information to assist in conservation efforts at the town or regional level. We encourage inclusion of the town BioMap2 report and fact sheets on its components in the OSRP: they are available from <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/land-protection-and-management/biomap2/biomap2-town-reports.html>. The BioMap2 components relevant to Otis are BioMap2 Core Habitats for Species of Conservation Concern, and Forest, Vernal Pool, Aquatic and Wetland Cores, and, in Critical Natural Landscape (CNL), Landscape Block and Upland Buffers of Aquatic and Wetland Cores. The components are described in full in the BioMap2 summary report.

<http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/land-protection-and-management/biomap2/biomap2-overview-and-summary.html>

[Please note that all of NHESP's web addresses have changed; web addresses in publications from before June 2013, including inside the BioMap2 report, will not work properly.]



Natural Heritage & Endangered Species Program

1 Rabbit Hill, Westborough, MA 01581 Tel: (508) 389-6360 Fax: (508) 389-7891
An Agency of the Department of Fish & Game
<http://www.mass.gov/nhesp>



NHESP letter re. Otis Open Space & Recreation Plan

June 22, 2015

Page 2 of 5

I encourage you to download species, natural community, and BioMap2 fact sheets from our website to include in the OSRP with the species list and BioMap2 discussion:

<http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/mesa-list/list-of-rare-species-in-massachusetts.html> and for some delisted species:

<http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/mesa-list/non-listed-species-of-conservation-interest.html>

and natural communities:

<http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/natural-communities/>

Otis is one of the towns with town wide maps showing areas forested in the 1830s, areas of possible Primary Forest, most of which were untilled woodlots and wooded pastures (areas shown in transparent gray blue on the attached map). Such lands have greater biodiversity than areas that have been tilled. These are not Old Growth, they have been harvested and pastured, but the ground may not have been tilled. Harvard Forest digitized maps from the 1830s that the Massachusetts legislature mandated that the Towns make. Otis' map exists and shows areas that were forested in the 1830s. NHESP GIS staff took those data and combined them with information from MassGIS' landcover datalayer made from 1999 aerial photos. Although a great deal will have gone on in those areas in the time between the map dates, some areas that were forested in both times won't ever have been tilled, disturbed or reshaped. Surveys of the soil structure in the individual sites are necessary to determine whether those sites are Primary Forest. The importance of primary forest is that such sites retain more native biodiversity than sites that have been tilled: soil fauna and flora, microorganisms and plants that reproduce primarily vegetatively contribute to the higher biodiversity. In addition, a variety of species of wildflowers are more common in untilled forests than previously tilled lands. The areas of 1830s forest on private land would be good targets for conservation acquisition to maintain the biodiversity of the town and region. The Harvard Forest website contains information on the 1830s forest datalayer and copies of papers with discussion of the information. (See Harvard Forest. 2002. 1830 Map Project. Harvard Forest Archives, Petersham, MA and B. Hall, G. Motzkin, D. R. Foster, M. Syfert, and J. Burk. 2002. Three hundred years of forest and land-use change in Massachusetts, USA. *Journal of Biogeography* 129: 1319-1135.)

The uncommon species and the uncommon natural communities in Otis have a mix of habitat preferences, with most needing wetlands, usually with surrounding uplands, and only a few prefer uplands.

Henslow's Sparrows (Endangered) inhabit open fields where vegetation is comprised of a dense growth of grass, weeds, or clover. Some scattered shrubs may be present but extensive shrubby growth makes fields unsuitable. Wet meadows are most often the preferred habitat, although drier areas may be selected.

There are multiple records Wood Turtles (Special Concern) in Otis. These turtles nest in sandy upland areas and are susceptible to becoming road kill when they move among parts of their habitats. Loss of only a few adults annually can cause populations to decline because of turtles having low replacement rates due to low nest and juvenile survivorship. Protecting unfragmented forests with imbedded wetlands enhances the habitats of all these species and others, as well as protecting water quality. Streams and rivers are habitat for Wood turtles, preferably with long corridors of undeveloped, connected uplands extending on both sides of the waterways.

The Farmington River supports numerous rare species. Bridle Shiners (Special Concern) are small (<5 cm) minnows that are found in schools swimming in and out of vegetation along the edges of open, clear water in lakes and ponds and slack areas of streams and rivers. They feed on small insects and other aquatic animals.

Rare dragonflies are also known from this river. The Harpoon Clubtails (Endangered) are dragonflies that inhabit clear, cold streams with intermittent sections of rocks and rapids.

There are three uncommon freshwater mussels known from Otis. Brook Floaters, also known as Swollen Wedgemussel, (Endangered) are small freshwater mussels that inhabit streams and rivers with low to moderate water velocities, stable substrates, low nutrients and good water quality. They are currently known from only four water bodies in the state, one of which is in Otis. Creepers (Special Concern) are freshwater mussels that inhabit low-gradient reaches of small to large rivers with sand or gravel substrates; cool to warm-water with diverse fish assemblages best support Creepers. Triangle Floaters (MESA delisted, 2015 SWAP Species of Conservation Concern) are freshwater mussels commonly found in low-gradient river reaches with sand and gravel substrates and low to moderate water velocities, although they are found in a wide range of substrate and flow conditions.

Otis has twelve uncommon plant species, four of which have not been observed recently. Thread Rush (Endangered), a grass-like perennial, is restricted to springy, wet to moist soils along pondshores and in wetlands. Shore Sedge (Threatened) is restricted to wet, sandy or gravelly beaches of cold ponds and lakes,

or to the exposed rock cobble on islands of large rivers. Great Laurel (Threatened), a member of the Heath family, is an evergreen shrub or small tree that grows up to 10 m high. It is a plant of moist woods, swamps, and the edges of ponds. A member of the Christmas Mistletoe family, Dwarf Mistletoe (Special Concern) is a very small fleshy shrub, usually no more than 0.8 inch tall that parasitizes conifer trees. In Massachusetts, Dwarf Mistletoe occurs in peatlands varying from kettlehole peat bogs to spruce-fir-birch headwater swamps, generally on the branches of black spruce (*Picea mariana*). Gattinger's Panic-grass (Special Concern), a member of the Grass family, is a slender, hairy, herbaceous, annual grass with yellow-green leaves. Gattinger's Panic-grass grows in open fields, roadsides, rock or clay ledges, cliff tops, and wet clay on receding shores. Crooker-stem Aster (Special Concern) is a perennial herbaceous plant that occurs in open to semi-open conditions along rich rivers, streams, and seeps and along open and semi-open roadsides in the areas of rich streams. Gentianella quinquefolia (Watch List) may be observed in dry or moist calcareous soil, meadows and open woods, in open disturbed soil as in old roads and trails. Narrowleaf Bur-reed (Watch List) has an elongate stem, and its floating leaves are rounded on back. It may be found in cool acidic ponds. Floating Bur-reed (Watch List) is a northern aquatic plant with long (a meter or more), narrow, floating leaves that grows in relatively shallow, cold, acidic to neutral, clean quiet water of lakes and ponds. Shining Ladies'-tresses (Watch List) are a diminutive white flowered orchid with a bright yellow basal petal found in moist disturbed soils, such as wet meadows, pastures, seeps, and moist pond margins. Northern Yellow-eyed Grass (Watch List) is not a grass at all, but has long linear leaves. Its yellow flowers may be observed in open sphagnum bogs and tamarack swamps.

Natural Communities are recurring assemblages of plants and animals in similar chemical, moisture, geological, and topographic environments. In Massachusetts, the types are defined in the *Classification of Natural Communities of Massachusetts*, available on the NHESP website <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/natural-communities/>. Occurrences of uncommon types – called Priority Natural Communities – are considered to be priority for conservation. All types of natural communities provide important habitat for common and uncommon species and support the biodiversity of the town. NHESP keeps track of documented occurrences of Priority Types of Natural Communities; a complete list of these is on the NHESP website. Exemplary examples of more common types of natural communities are also documented in the NHESP database.

All of the Priority Natural Communities in Otis are ranked as Vulnerable (S3). The locations of these Priority Natural Communities are illustrated in purple on the attached map. Acidic Shrub Fens are shrub-dominated acidic peatlands found primarily along pond margins. These wetland communities experience some groundwater and/or surface water inputs, but do not have calcareous seepage. The Acidic Shrub Fen in Otis is the second largest known in the state and contains an interesting, unusual component of more northern bog plant species. It is partially protected by the Farmington River WMA. Two Level Bogs are known to occur in Otis. Level bogs are dwarf-shrub peatlands, generally with pronounced hummocks and hollows in sphagnum moss. These wetland communities are very acidic and nutrient-poor because the peat isolates them from nutrients in groundwater and streams. One of these Level Bogs, partially protected by Otis State Forest on the northern Town boundary, is one of the best of its kind in the state, due to its diversity of species and habitats, its well developed sphagnum layer, and its relatively extensive buffer of natural vegetation. The other one found in western Otis, is of moderate quality, but is found within a beautiful, isolated pond with high scenic value, and is partially protected by the Long Mountain WMA. Several High-energy Riverbank communities have been recorded along the southern reach of the Farmington River in Otis. High-Energy Riverbank communities are sparse, open graminoid communities found on cobble and sand deposits along fast-flowing rivers that experience severe flooding and ice scour. These examples of High-Energy Riverbank are in good condition, with natural processes of flood and scour that perpetuate the community, but are not well buffered on one side of the river.

DFW's Fisheries section has identified environmentally sensitive streams throughout Massachusetts that provide important habitat for native cold water fisheries (CFR, Coldwater Fisheries Resources). Buffers along these streams that maintain shade and filter inflowing sediments are important for maintaining their water – and habitat – quality. Culverts in the CFRs should be evaluated for passage fish and macro-invertebrates, and maintained to allow movement of fish, turtles, and other aquatic species. Identification of CFRs is based on fish samples collected by staff biologists and technicians with new streams sampled and evaluated yearly. Otis has many stream segments that have been identified as CFRs, shown on the enclosed map. Many of Otis's CFR streams coincide with BioMap2 Cores and CNLs, emphasizing the importance of these areas for protecting all aspects of biodiversity. More information on describing the CFRs is available from <http://www.mass.gov/eea/agencies/dfg/dfw/wildlife-habitat-conservation/coldwater-fish-resources-cfr.html>. The table below lists the CFRs in Otis:



NHESP letter re. Otis Open Space & Recreation Plan

June 22, 2015

Page 4 of 5

Saris/Palis	Waterbody Name	Watershed	Towns
3107125	Clam River	Farmington	Sandisfield, Otis
3107300	Miner Brook	Farmington	Otis
3107325	Fall River	Farmington	Otis
3107350	Wheeler Brook	Farmington	Otis
3107375	Benton Brook	Farmington	Otis, Sandisfield
3107400	Dimmock Brook	Farmington	Otis
3107425	Cone Brook	Farmington	Otis

Otis has 11 Certified Vernal Pools (CVPs) and 41 Potential Vernal Pools (PVPs) (identified from aerial photographs, needing verification on the ground). In addition, areas of swamps will provide habitat for vernal pool species. Otis's vernal pools are shown on the included map. Locations of PVPs are available as a datalayer from MassGIS at <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/pvp.html>. Clusters of vernal pools provide particularly good habitat for species that depend on vernal pools for habitat. The clusters mean that there are alternate habitats if something happens to one pool, and slightly different conditions in each may provide different habitats for pool dependent species. There are clusters of potential vernal pools scattered around town, as well as individual pools. Certification of PVPs provides extra protection to these wetlands and the species that use them.

The BioMap2 Core areas and Contributing Natural Landscape are particularly valuable in ecological terms, and important to the conservation of a variety of species. Completing conservation protection of unprotected land in those areas would enhance the viability of these special areas - size and continuity of open space is particularly important for supporting wildlife populations. Preventing habitat fragmentation is vital in protecting the ecosystem, for the rare species on the enclosed list, as well as for additional common species. Some polygons of both aspects of BioMap2 extend into other municipalities which then provide opportunities to protect large unfragmented areas that will provide the best opportunities to limit further species loss from the Town and region. The BioMap2 Core and CNL polygons are available from MassGIS:

<http://www.mass.gov/mgis/biomap2.htm>. There is also an interactive application to see the broad outlines of the polygons in each Town that is linked from the NHESP website. BioMap2 is more up to date than BioMap and Living Waters, which it replaces.

BioMap2 and the original BioMap and Living Waters projects are focused on conservation and intended to be planning tools. They include non-regulated components of biodiversity and include broader areas than do the regulatory maps that NHESP also produces.

Estimated Habitat maps are created for use under the Wetlands Protection Act and Priority Habitat maps for use under the Massachusetts Endangered Species Act. These two sets of maps are created for regulatory use, shown in the *Natural Heritage Atlas* (the 2008 Atlas, the 13th edition is the current version). Note that Estimated Habitat is a complete subset of Priority Habitat: that is, Estimated Habitat shows a subset of all the species' habitats shown in Priority Habitat. These data layers are available from MassGIS, requiring access to some form of GIS to view them, at <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/layerlist.html#ConservationRecreation>

Town commissions and boards are encouraged to request the assistance of the Natural Heritage and Endangered Species Program in reviewing any project proposed in the habitat areas of the regulatory areas of the maps in the *Natural Heritage Atlas*.

Management and monitoring of conservation lands become important as acquisition and protection are accomplished. All wetlands particularly need to maintain their natural water regime, including normal fluctuations and connections with the uplands and other wetlands. Water quantity and quality are ongoing issues for wetlands. Another aspect of managing conservation lands that is important in many areas is controlling invasive non-native species that alter the habitat and occupy space that native species would otherwise use. We strongly recommend monitoring conservation land, and removing non-native species before they become a problem and impact native species.

Please note that this evaluation is based on the most recent information available in the Natural Heritage database, which is constantly being expanded and updated through ongoing research and inventory. Should new rare species information become available, this evaluation may need to be reconsidered.

Please do not hesitate to contact me at (508) 389-6390 or by email at karro.frost@state.ma.us if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Karro A. Frost', with a stylized flourish extending from the end.

Karro A. Frost

NHESP Conservation Botanist

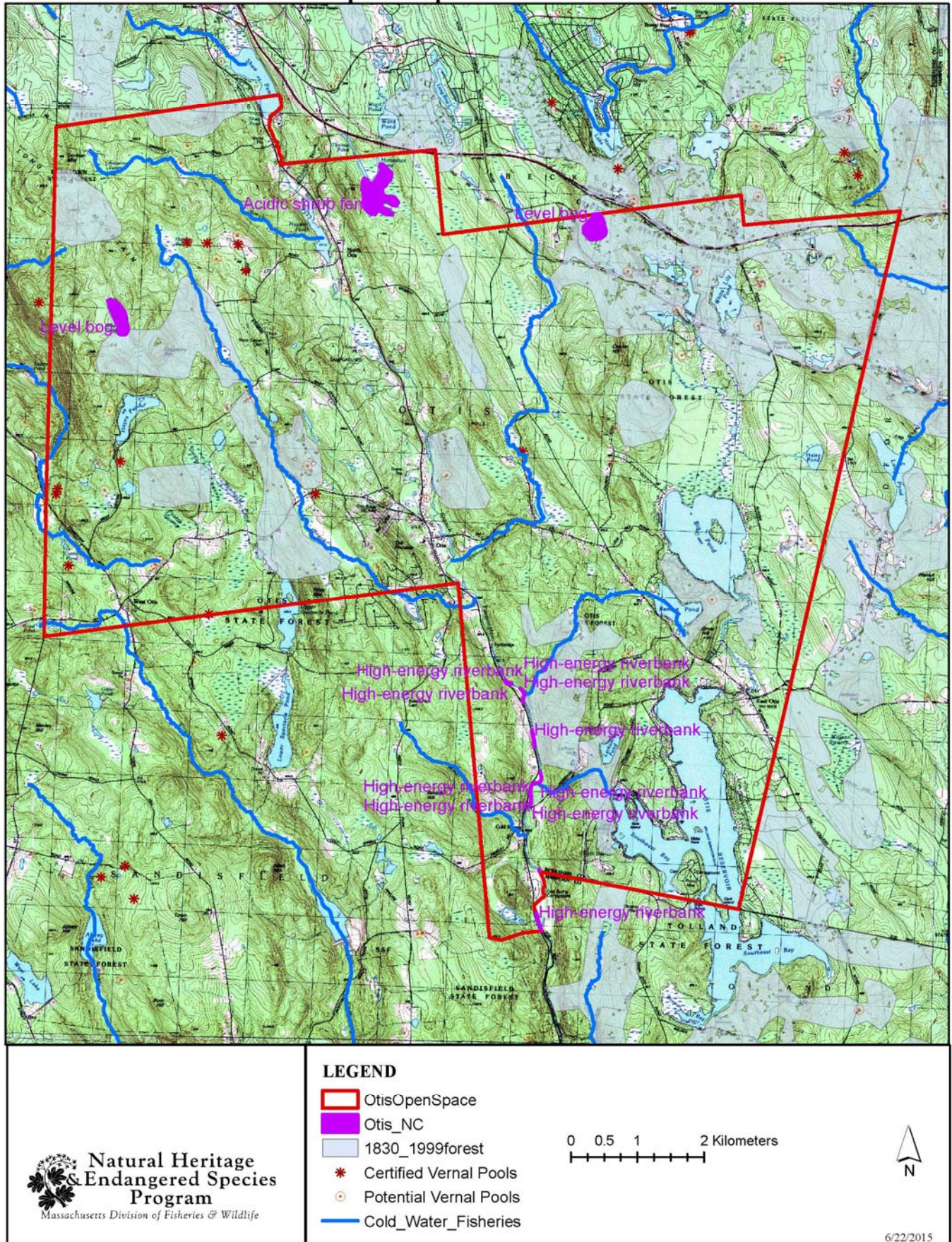
cc: Melissa Cryan, EOEAA, DCS



Town of Otis Rare Species and Community List 2015

Ecological Group	Scientific Name	Common Name	MESA	Last_obs
Bird	<i>Ammodramus henslowii</i>	Henslow's Sparrow	E	Pre-1900
Dragonfly/Damselfly	<i>Gomphus descriptus</i>	Harpoon Clubtail	E	1996
Fish	<i>Notropis bifrenatus</i>	Bridle Shiner	SC	2011
Mussel	<i>Alasmidonta undulata</i>	Triangle Floater	species	2007
Mussel	<i>Alasmidonta varicosa</i>	Brook Floater (Swollen Wedgemussel)	E	2007
Mussel	<i>Strophitus undulatus</i>	Creeping	SC	2007
Reptile	<i>Glyptemys insculpta</i>	Wood Turtle	SC	2008
Vascular Plant	<i>Arceuthobium pusillum</i>	Dwarf Mistletoe	SC	1998
Vascular Plant	<i>Carex lenticularis</i>	Shore Sedge	T	1985
Vascular Plant	<i>Gentianella quinquefolia</i>	Stiff Gentian	WL	1997
Vascular Plant	<i>Juncus filiformis</i>	Thread Rush	E	1994
Vascular Plant	<i>Panicum philadelphicum ssp. gattingeri</i>	Gattinger's Panic-grass	SC	1978
Vascular Plant	<i>Rhododendron maximum</i>	Great Laurel	T	1997
Vascular Plant	<i>Sensitive Species of Conservation Concern</i>		E	2014
Vascular Plant	<i>Sparganium angustifolium</i>	Narrowleaf Bur-reed	WL	1989
Vascular Plant	<i>Sparganium fluctuans</i>	Floating Bur-reed	WL	1989
Vascular Plant	<i>Spiranthes lucida</i>	Shining Ladies'-tresses	WL	1992
Vascular Plant	<i>Symphyotrichum prenanthoides</i>	Crooked-stem Aster	SC	2004
Vascular Plant	<i>Xyris montana</i>	Northern Yellow-eyed Grass	WL	1993
Other Ecological	Certified Vernal Pools	11 pools certified		
Natural Community		Acidic Shrub Fen	S3	
Natural Community		High-energy Riverbank	S3	
Natural Community		Level Bog	S3	
Natural Community		Level Bog	S3	

Town of Otis Open Space and Recreation Plan





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OPEN SPACE AND RECREATION PLAN

2016-2021

Town of Otis,
Massachusetts

A photograph of two young boys at a skate park. The boy on the left is wearing a dark blue t-shirt, dark pants, and a black helmet with a red stripe. He is holding a skateboard with a colorful graphic deck. The boy on the right is wearing a light grey t-shirt, light-colored shorts, and a black helmet. He is looking down at something in his hands. The background shows green trees and a clear sky. The entire image has a green tint.

APPENDICES to the Otis OPEN SPACE AND RECREATION PLAN

A: Maps

B: Americans with Disabilities Act (ADA) Self Evaluation

C: Public Survey Results

D: BioMap2 Report

OPEN SPACE AND RECREATION PLAN 2016-2021

**Town of Otis,
Massachusetts**

APPENDIX A: MAPS

Map 1—Regional Context

Map 2—Environmental Justice Populations

Map 3— Zoning

Map 4— Soils and Geologic Features

Map 5—Unique Features

Map 6—Water Resources

Map 7—Inventory of Lands of Conservation and Recreation Interest

Map 8— Action Plan Map

Map A—Historic

Map C—Current Land Use

Map D—Infrastructure

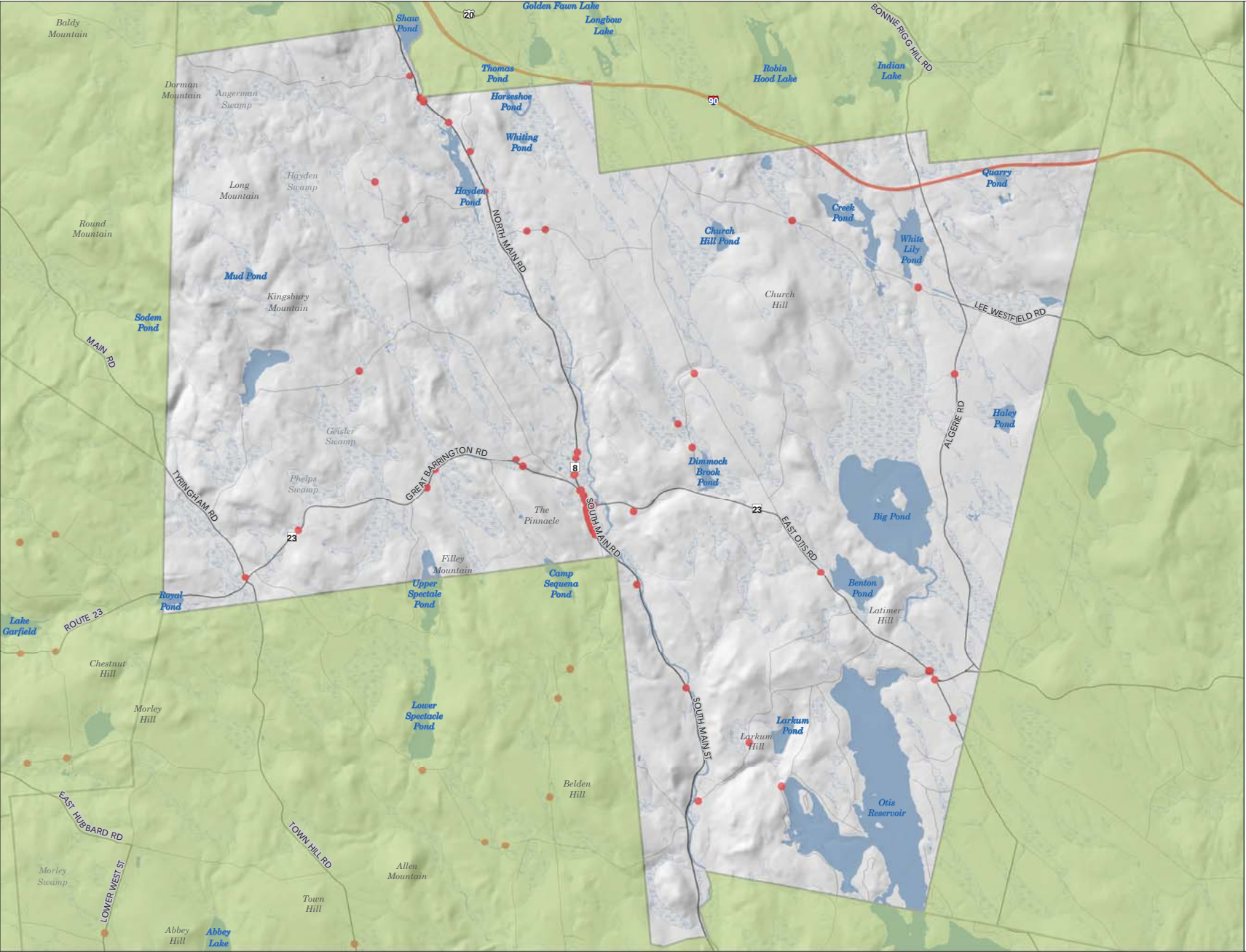
Map E—Remaining Buildable Land

Map F—Vegetation, Fisheries, and Wildlife

Note: Map numbering and lettering conventions are based on requirements for this plan found in the Open Space Recreation Planner's Workbook. Map B is considered optional, and has not been included in this document.

Town of Otis Open Space and Recreation Plan

Map A: Historic Resources



- Historic Properties (MACRIS)
-  Towns
-  Interstate
-  Major Road
-  Minor Road
-  Local Road
-  Stream
-  Wetland
-  Open Water

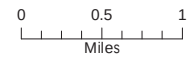


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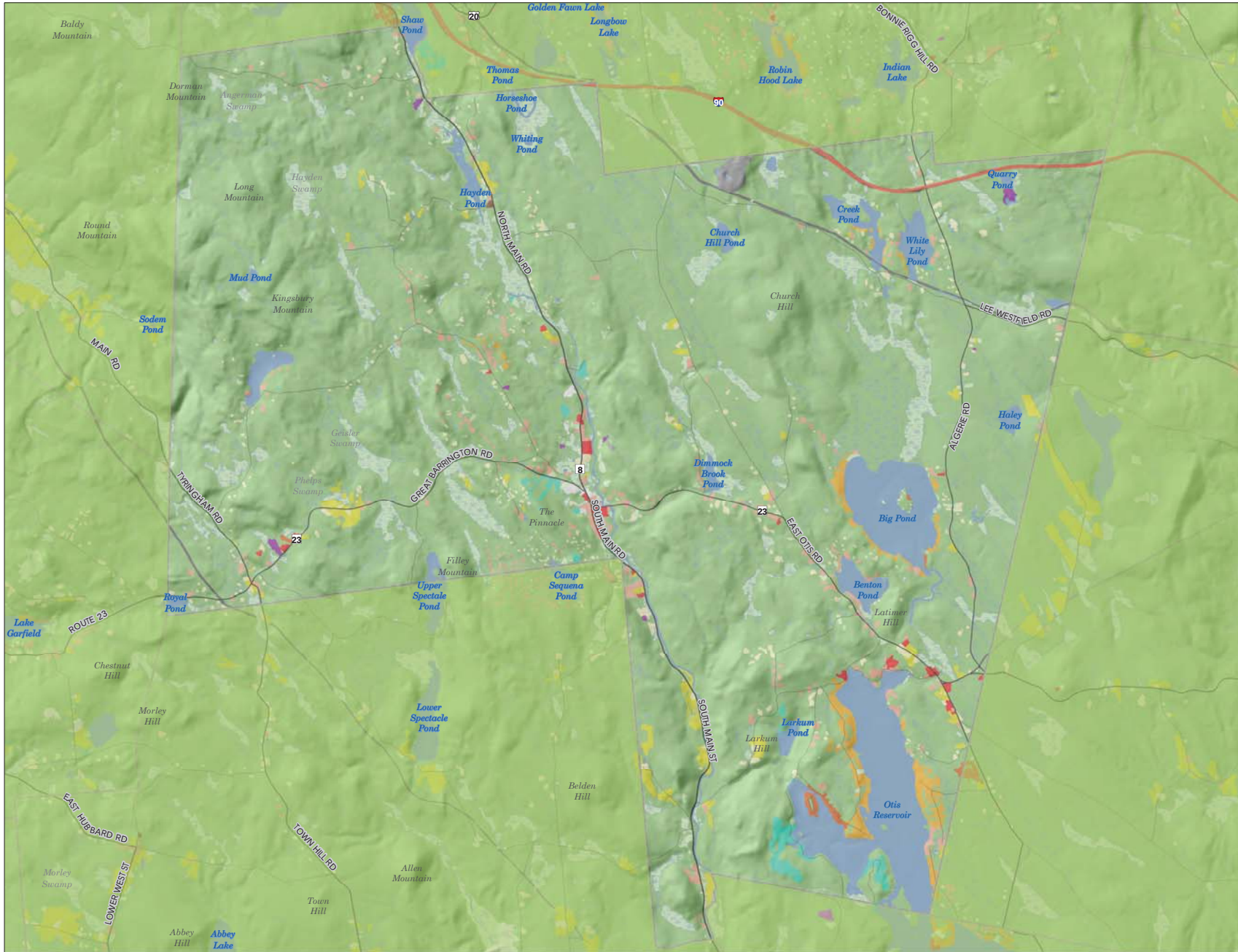
Town of Otis Open Space and Recreation Plan

Map C: Current Land Use
(2005)

- Agriculture
- Forest
- Commercial
- Industrial
- Mining
- Multi-Family Residential
- High Density Residential
- Medium Density Residential
- Low Density Residential
- Very Low Density Residential
- Recreation
- Open Land
- Urban Public/Institutional
- Utilities / Transportation
- Water
- Towns
- Interstate
- Major Road
- Minor Road
- Local Road
- Stream
- Wetland
- Open Water

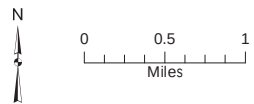


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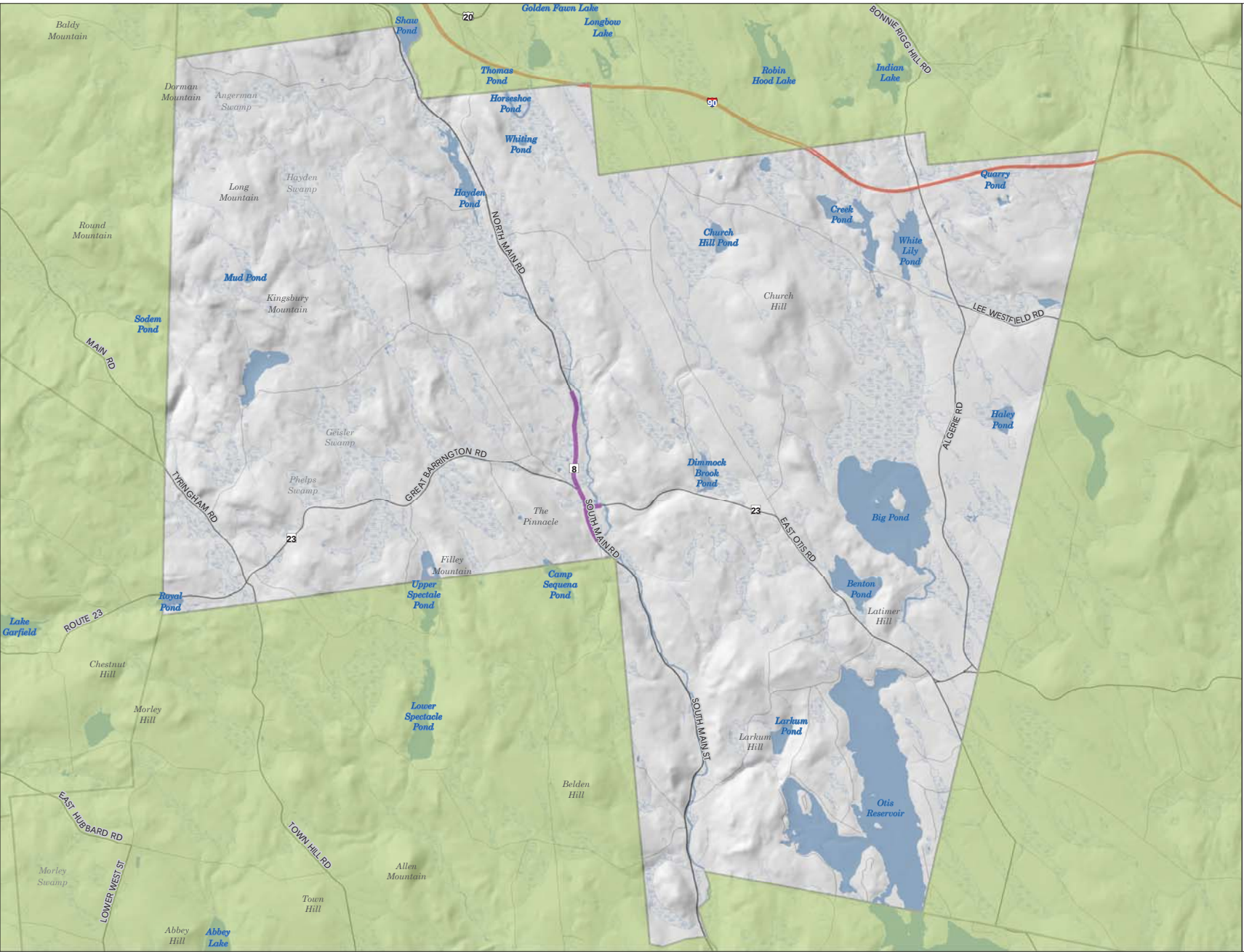


Town of Otis Open Space and Recreation Plan Map D: Infrastructure

-  Wastewater
-  Towns
-  Interstate
-  Major Road
-  Minor Road
-  Local Road
-  Stream
-  Wetland
-  Open Water

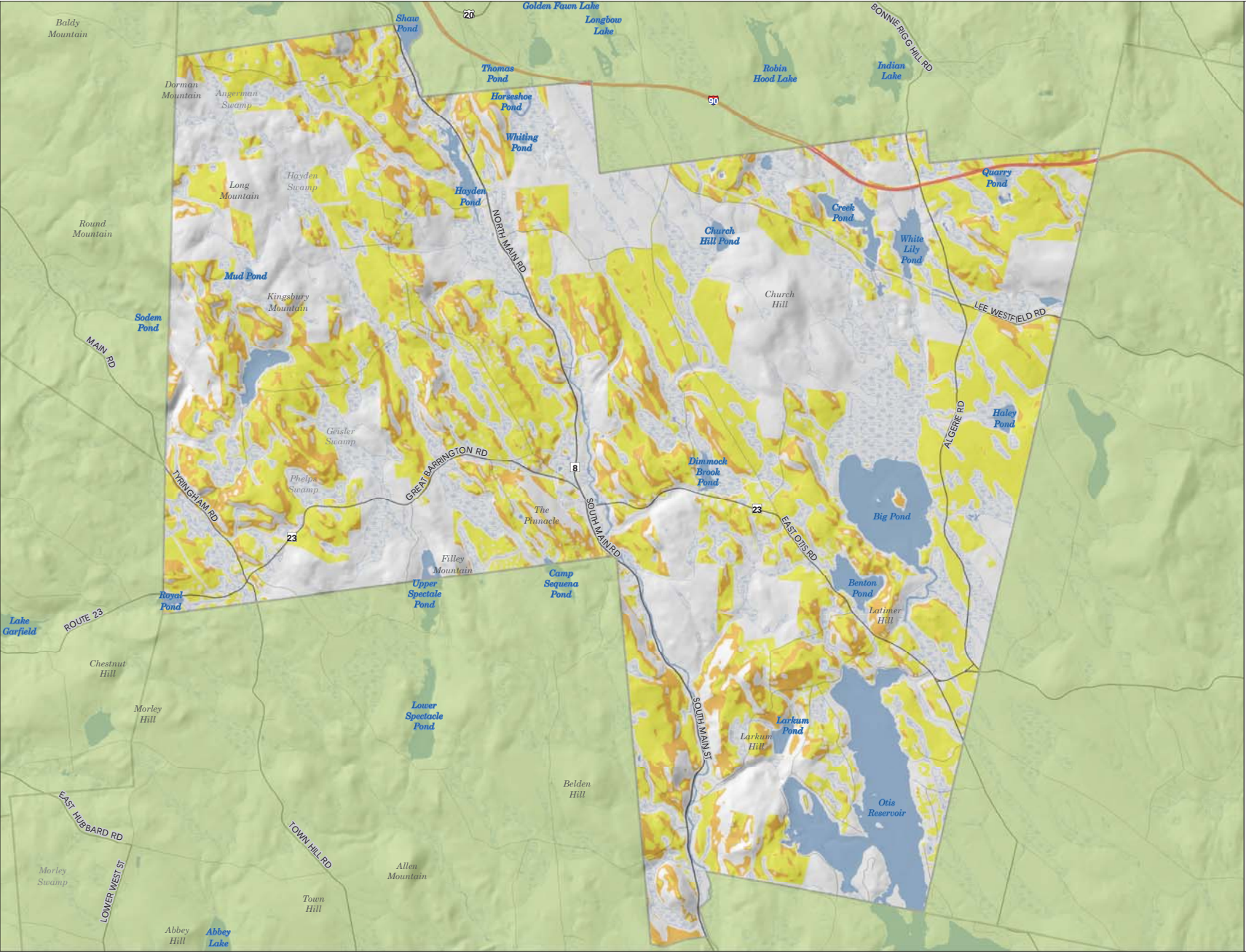


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Town of Otis Open Space and Recreation Plan

MAP E:
Remaining
Buildable Land



- Partially Constrained Land
- Buildable Land
- Towns
- Interstate
- Major Road
- Minor Road
- Local Road
- Stream
- Wetland
- Open Water

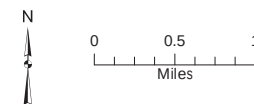


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Town of Otis Open Space and Recreation Plan

Map F: Vegetation and Fisheries and Wildlife

- Certified Vernal Pool
- Potential Vernal Pool
- NHESP Priority Habitats of Rare Species
- BioMap2 Core Habitat
- Natural Communities
- Agriculture
- Forest
- Towns
- Interstate
- Major Road
- Minor Road
- Local Road
- Stream
- Wetland
- Open Water



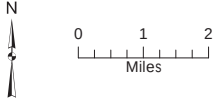
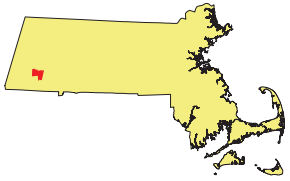
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Town of Otis
Open Space and
Recreation Plan
Map 1: Regional Context

- Towns
- Interstate
- Major Road
- Minor Road
- Major Watersheds
- Protected Land

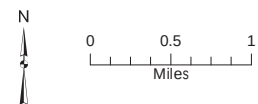


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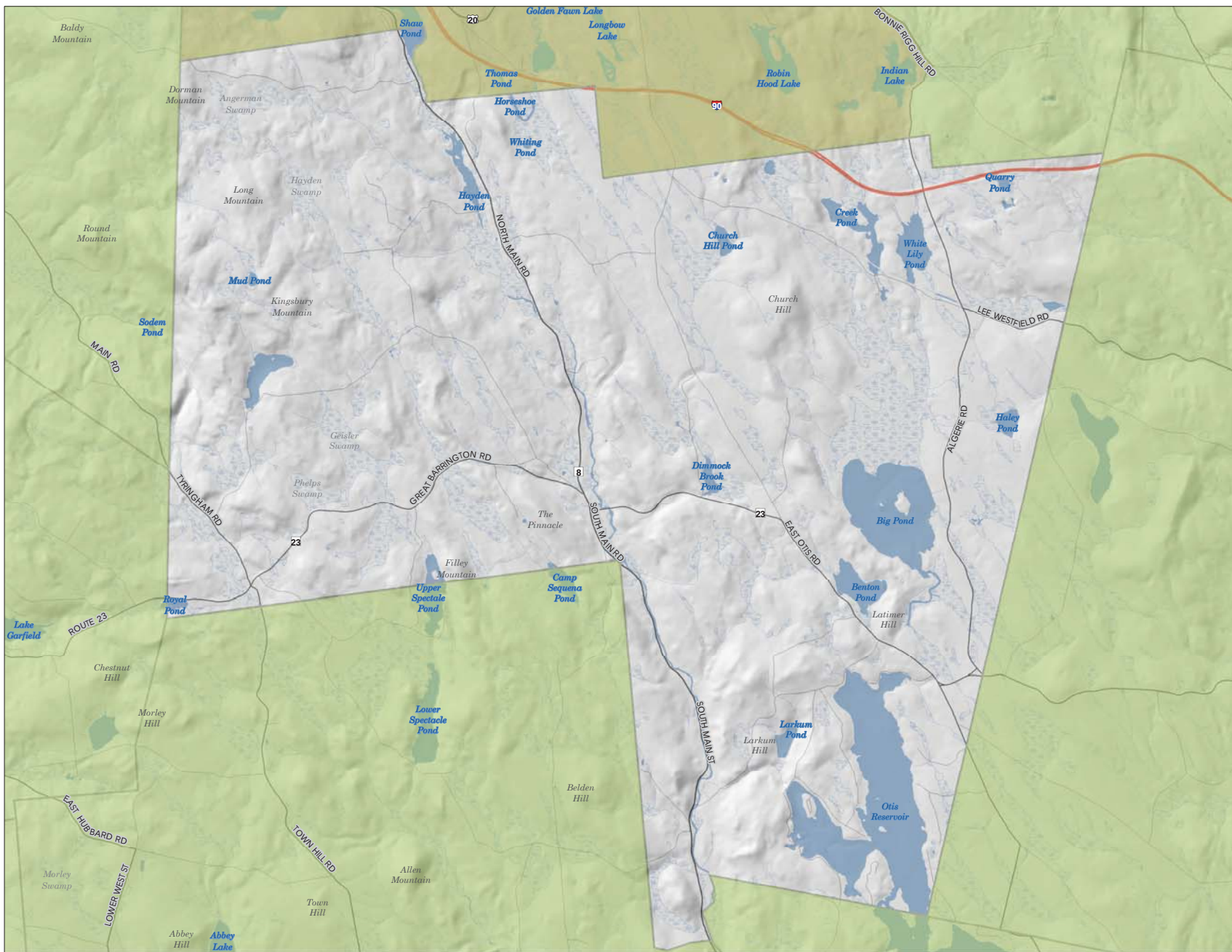
Town of Otis Open Space and Recreation Plan

Map 2: Environmental Justice Populations

-  Towns
-  Interstate
-  Major Road
-  Minor Road
-  Local Road
-  Stream
-  Wetland
-  Open Water
-  Environmental Justice



This map was created by the Berkshire Regional Planning Commission and is intended for general planning purposes only. This map shall not be used for engineering, survey, legal, or regulatory purposes. MassGIS, BRPC or the municipality may have supplied portions of this data.



Town of Otis

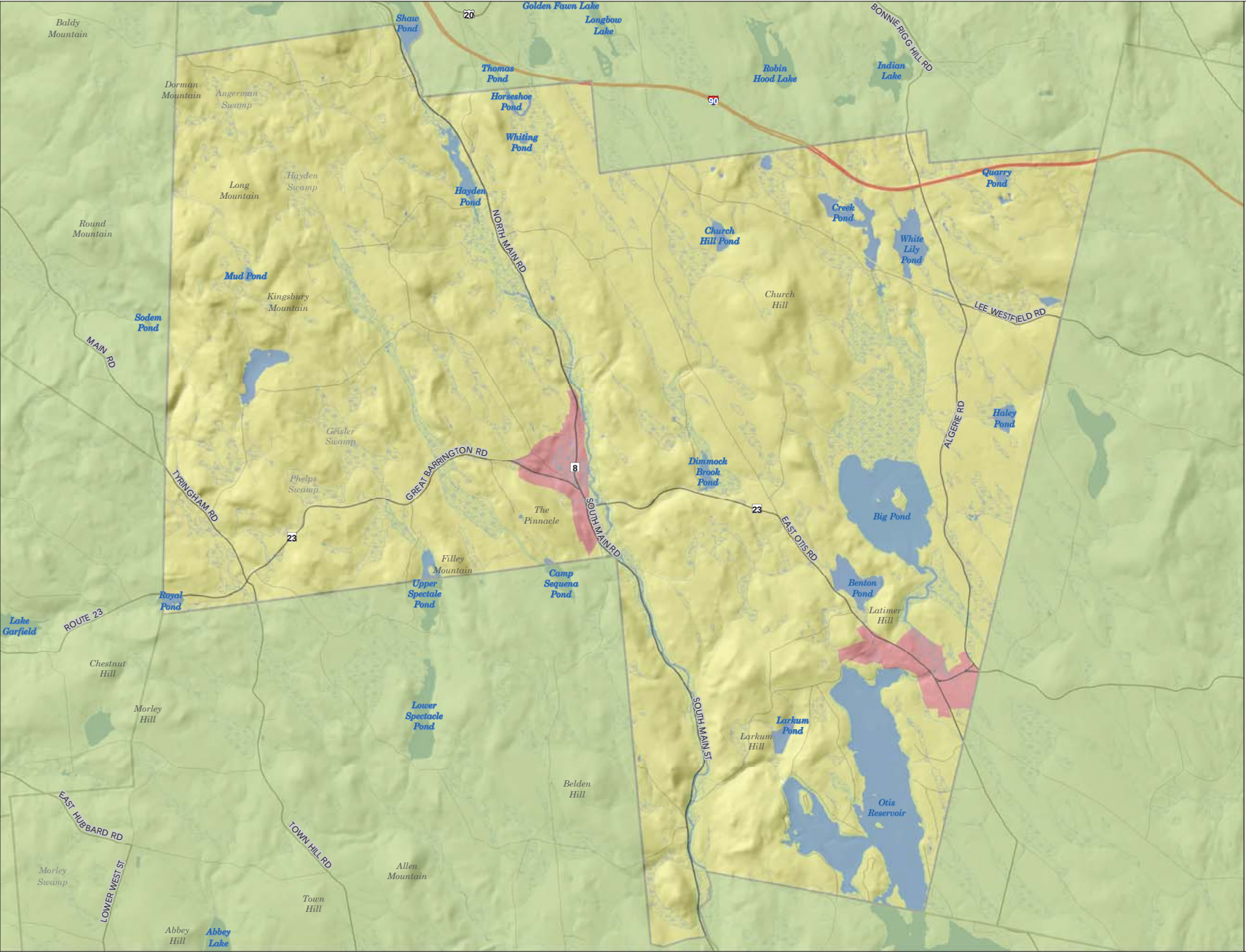
Open Space and Recreation Plan

Map 3: Zoning

- Zoning**
- R-40
 - V-1
 - Floodplain Overlay District
 - Towns
 - Interstate
 - Major Road
 - Minor Road
 - Local Road
 - Stream
 - Wetland
 - Open Water

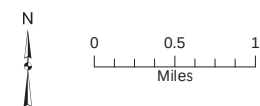


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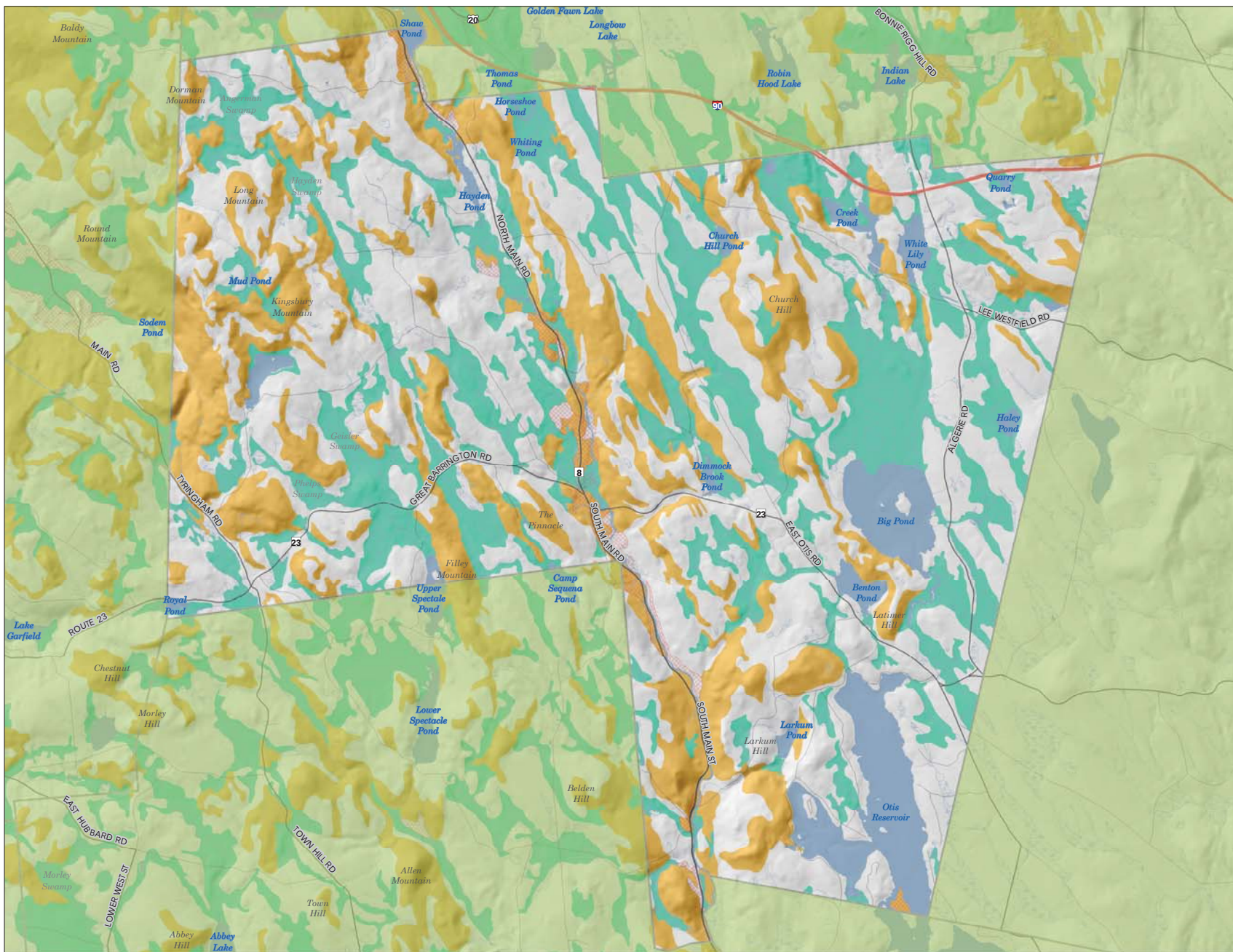


Town of Otis Open Space and Recreation Plan Map 4: Soils and Geologic Features Map

-  Prime Agricultural Soils
-  Excessively Drained Soils
-  Poorly Drained Soils
-  Towns
-  Interstate
-  Major Road
-  Minor Road
-  Local Road
-  Stream
-  Wetland
-  Open Water



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Town of Otis Open Space and Recreation Plan

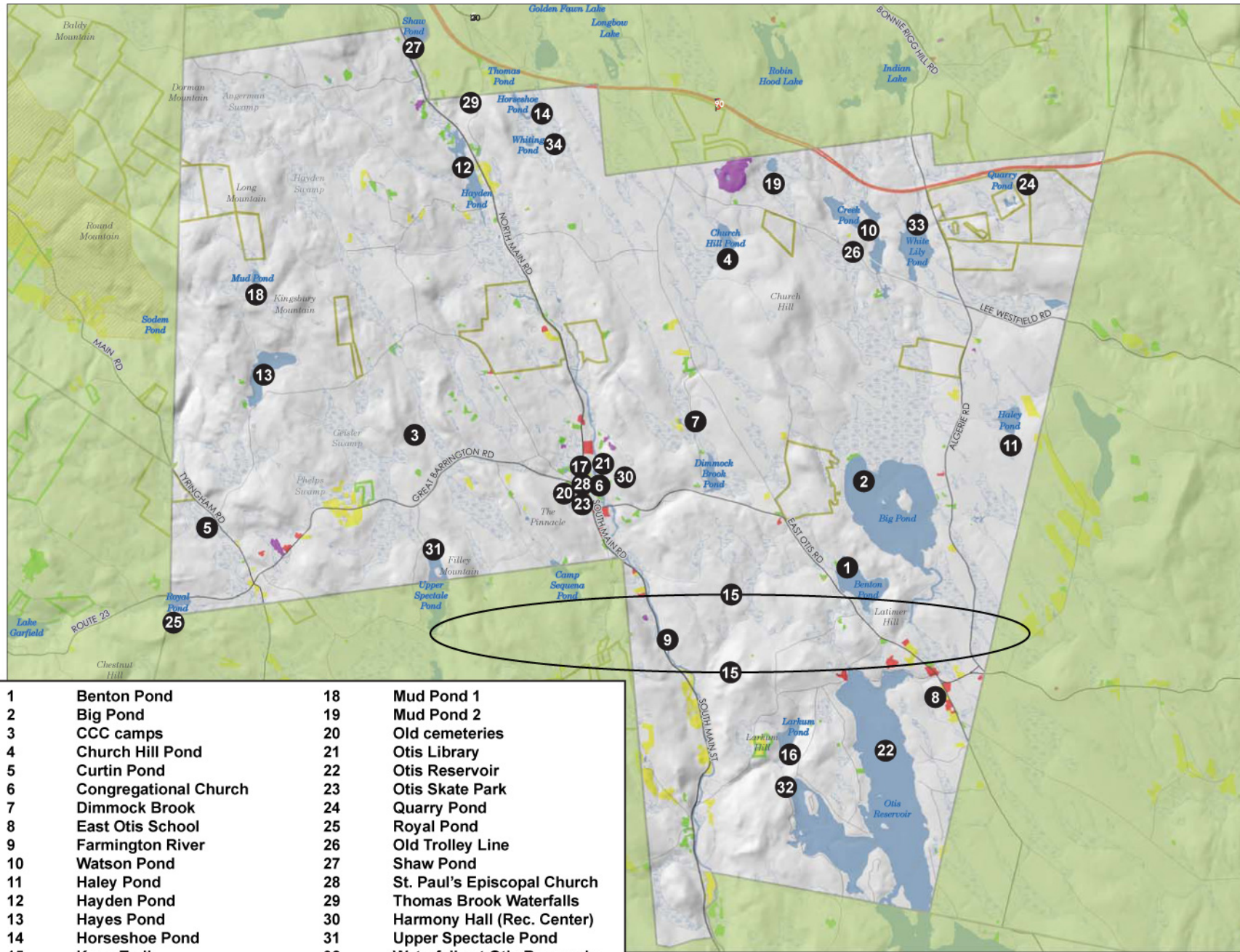
Map 5: Unique
Features Map

- Chapter 61
- Chapter 61A
- DCR Scenic Landscapes
- Open Land
- Agricultural Land
- Commercial Land
- Industrial Land
- Towns
- Interstate
- Major Road
- Minor Road
- Local Road
- Stream
- Wetland
- Open Water

0 0.5 1
Miles



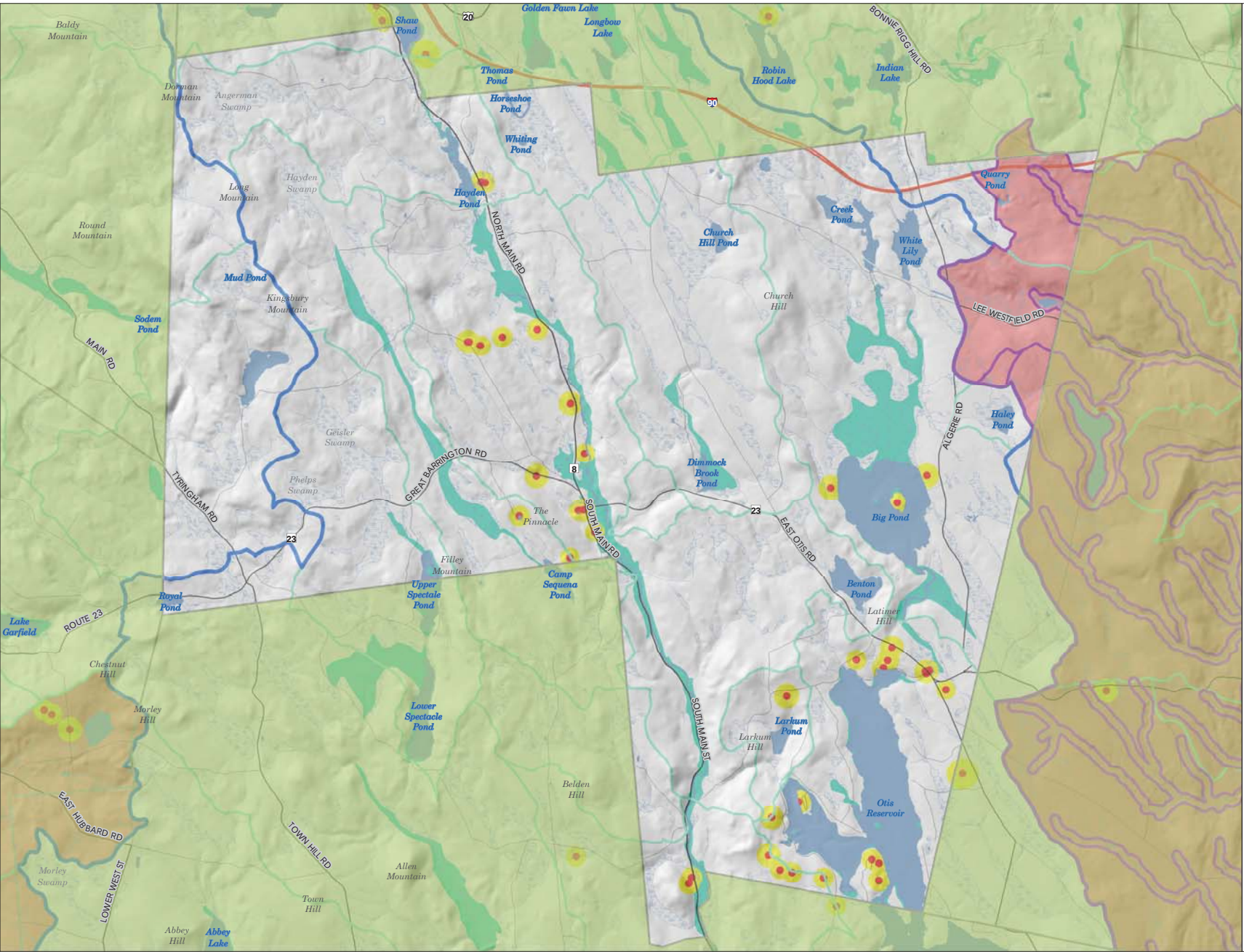
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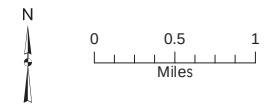
1	Benton Pond	18	Mud Pond 1
2	Big Pond	19	Mud Pond 2
3	CCC camps	20	Old cemeteries
4	Church Hill Pond	21	Otis Library
5	Curtin Pond	22	Otis Reservoir
6	Congregational Church	23	Otis Skate Park
7	Dimmock Brook	24	Quarry Pond
8	East Otis School	25	Royal Pond
9	Farmington River	26	Old Trolley Line
10	Watson Pond	27	Shaw Pond
11	Haley Pond	28	St. Paul's Episcopal Church
12	Hayden Pond	29	Thomas Brook Waterfalls
13	Hayes Pond	30	Harmony Hall (Rec. Center)
14	Horseshoe Pond	31	Upper Spectacle Pond
15	Knox Trail	32	Waterfalls at Otis Reservoir
16	Larkum Pond	33	White Lily Pond
17	McManus Store	34	Whiting Pond

Town of Otis Open Space and Recreation Plan

Map 6: Water Resources



- PWS
- Interim Wellhead Protection Area
- Surface Water Protection Zone
- Outstanding Resource Waters
- FEMA 100yr Floodplain
- Watersheds
- Subwatersheds
- Towns
- Interstate
- Major Road
- Minor Road
- Local Road
- Stream
- Wetland
- Open Water

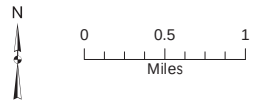


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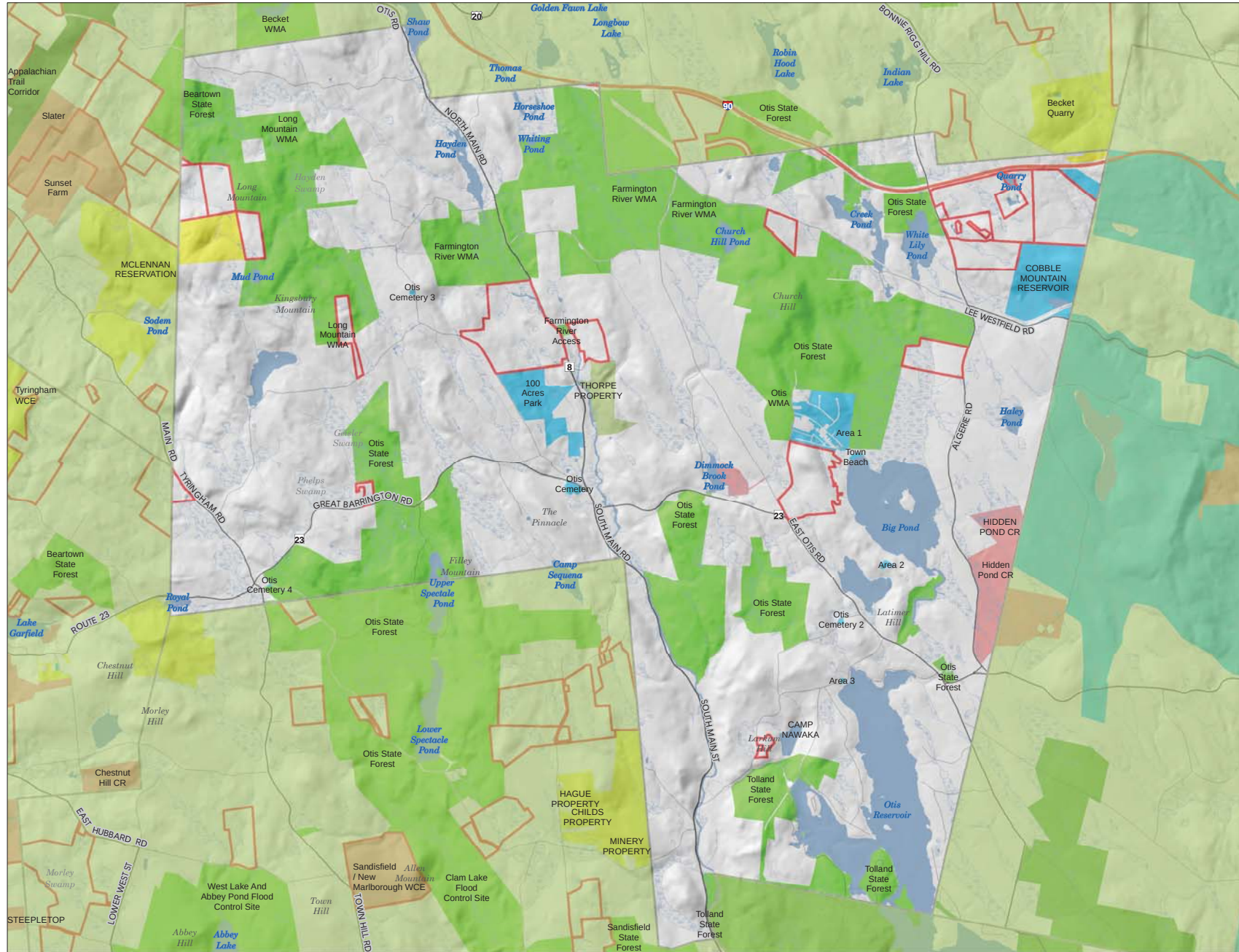
Town of Otis Open Space and Recreation Plan

Map 7: Inventory of Land
of Conservation and
Recreation Interest

- Federal
- State
- Municipality
- Conservation Organization
- Land Trust
- Private
- Chapter 61, 61A, 61B
- Towns
- Interstate
- Major Road
- Minor Road
- Local Road
- ~ Stream
- Wetland
- Open Water



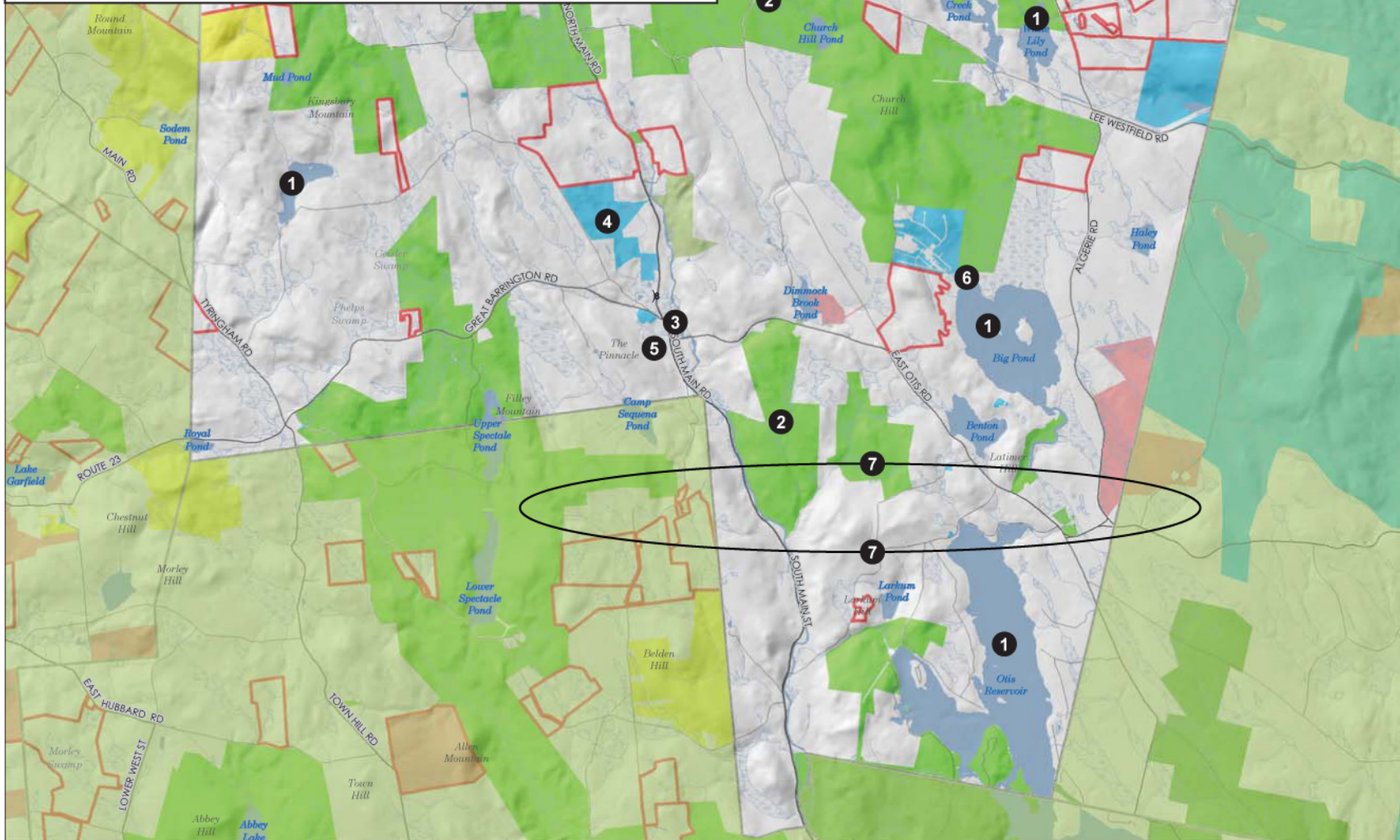
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- 1 Existing water resources continue to be protected.
- 2 Existing natural resources continue to be protected.
- 3 Otis Rec. Center - Users to be polled regarding possible improvements. Continue to recruit volunteers to help manage programs.
- 4 100-Acre Park area - Additional public process needed to identify possible improvements.
- 5 Town Hall Park - Continued general and accessibility improvements.
- 6 Town Beach - Continued general improvements. Examination of possible restrooms or changing facilities.
- 7 Knox Trail - Continued work to create a 4-season multi-use trail.

Town of Otis Open Space and Recreation Plan

Map 8. Action Plan Map



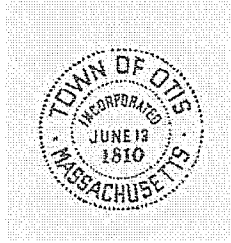
- Federal
- State
- Municipality
- Conservation Organization
- Land Trust
- Private
- Chapter 61, 61A, 61B
- Towns
- Interstate
- Major Road
- Minor Road
- Local Road
- Stream
- Wetland
- Open Water

0 0.5 1
Miles



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APPENDIX B: AMERICANS WITH DISABILITIES ACT (ADA) SELF EVALUATION



Building Commissioner
Town of Otis
1 North Main Rd
PO Box 237
Otis, MA 01253
413-269-0100 x 110
bldginspotis@gmail.com

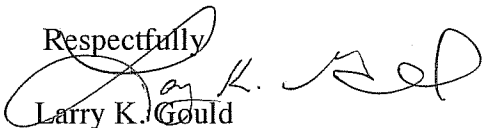
January 7, 2016

To Whom It May Concern:

The Town of Otis is committed to providing access to its facilities and programs to all citizens, including those with disabilities. To confirm this commitment, the Town has appointed building commissioner, Larry Gould as its ADA Coordinator. In this role, Larry Gould is responsible for ensuring the Town's compliance with the ADA, investigating complaints related to accessibility and recommending ways to address complaints.

The Town of Otis does not discriminate on the basis of disability, and public notice of this policy has been in town hall and in five locations throughout town.

Respectfully


Larry K. Gould

Building Commissioner
Zoning Enforcement Officer
ADA Coordinator



Town of Otis Grievance Procedure under The Americans with Disabilities Act

This Grievance Procedure is established to meet the requirements of the Americans with Disabilities Act of 1990 ("ADA"). It may be used by anyone who wishes to file a complaint alleging discrimination on the basis of disability in the provision of services, activities, programs, or benefits by the Town of Otis. The Town's Personnel Policy governs employment-related complaints of disability discrimination.

The complaint should be in writing and contain information about the alleged discrimination such as name, address, phone number of complainant and location, date, and description of the problem. Alternative means of filing complaints, such as personal interviews or a tape recording of the complaint, will be made available for persons with disabilities upon request.

The complaint should be submitted by the grievant and/or his/her designee as soon as possible but no later than 60 calendar days after the alleged violation to:

Larry Gould
Building Commissioner /ADA Coordinator
1 North Main Rd. Otis

Within 15 calendar days after receipt of the complaint, Larry Gould or his designee will meet with the complainant to discuss the complaint and the possible resolutions.

Within 15 calendar days of the meeting, Larry Gould or his designee will respond in writing, and where appropriate, in a format accessible to the complainant, such as large print, Braille, or audio tape. The response will explain the position of the Town of Otis and offer options for substantive resolution of the complaint.

If the response by Larry Gould or his designee does not satisfactorily resolve the issue, the complainant and/or his/her designee may appeal the decision within 15 calendar days after receipt of the response to the Board of Selectmen.

Within 15 calendar days after receipt of the appeal, the Board of Selectmen will meet with the complainant to discuss the complaint and possible resolutions. Within 15 calendar days after the meeting, the Board of Selectmen will respond in writing, and, where appropriate, in a format accessible to the complainant, with a final resolution of the complaint.

All written complaints received by Larry Gould or his designee, appeals to the Board of Selectmen, and responses from these two offices will be retained by the Town of Otis for at least three years.

Otis does not discriminate on the basis of disability in admission to, access to, or in the operation of its programs, services or activities. The Town of Otis does not discriminate on the basis of disability in its hiring or employment practices.

This notice is provided as required by Title II of the Americans with Disabilities Act (ADA) of 1990.

Questions, concerns, complaints or requests for additional information regarding the ADA may be forwarded to Otis designated ADA coordinator.

Larry Gould
Building
Commissioner /
ADA Coordinator
1 North Main Rd. Otis
413-269-100 x110
bldginspotis@gmail.com

Individuals who need auxiliary aids for effective communication in programs and services of Otis are invited to make their needs and preferences known to the ADA coordinator.

This notice is available in large print, and audiotape from the ADA coordinator.

Program applicants, members of the general public, employees, job applicants, and others are entitled to participate in and benefit from all town programs, activities, and services without regard to disability.

Copies of this notice are available upon request in alternate print format such as large print, audiotape, and computer disk. The Town's grievance procedure, self-evaluation, as well as ADA policies, practices and procedures are also available upon request.

Contact:

Larry Gould
ADA Coordinator
413-269-0100 x 110
1 North Main Rd. Otis

The Town of Otis is proud to be an equal opportunity employer and applicants are considered for all positions without regard to race, color, creed, religion, sex, national origin, age sexual preference, or the presence of a non-job related medical condition or handicap .

Larry Gould
ADA Coordinator

PROGRAM ACCESSIBILITY

In developing the Open Space and Recreation Plan, the Master Plan Steering Committee discussed the town's recreation programs and lands inventory. Otis maintains all of its recreation facilities and programs open to the general public and accessible to individuals with disabilities. The Town Hall, Recreation Center, and Library are accessible to those with limited mobility.

Otis ADA Open Space and Recreation Transition Plan

A. Inventory of Open Spaces and Recreation Areas

Otis Town Beach



The Otis Town Beach provides plenty of parking spaces, but none were designated for disabled access.



From the parking lot to the beach, there was no accessible path. The addition of accessibility mat or “mobi-mats” that lead to the water could help to improve ADA accessibility, particularly over areas of sand.



The playground area located in the Otis Town Beach Park lacks safety surfacing around the perimeter.

Otis Fire House Park



Overall, the Otis Fire Station Park provided accessible paths. There was some pavement cracking and uneven surfaces that may need to be corrected in the future. In addition, the park benches did not provide an accessible space adjacent to existing benches. In the future, the town might consider adding one of these to improve accessibility.

Otis Town Hall Park



In order to reach the equipment in the Town Hall Park, one would have to walk over a grassy slope. No accessible route was available. Also shown above is a curb that encircles the skate park portion of the park. This curb limits access from the grass to the skate park.



In the skate park, there also was significant ponding. An additional repaving may be necessary to create an even safe surface.

B. Transition Plan

Otis Town Beach

Physical Obstacles	Actions to Be Taken	Date to Be Completed	Responsible Party
No ADA Designated Parking Spots	Designate ADA parking spots with appropriate signage	2019	Maintenance
Create Accessible Pathway to Beach Area	Add Mobi-Mats to create accessible path from parking	2019	Maintenance
Lack of Safety Surfacing Around Playground	Add safety surfacing around equipment	2019	Maintenance

Otis Fire House Park

Physical Obstacles	Actions to Be Taken	Date to Be Completed	Responsible Party
Bumps and Cracks in Paved Paths	Repave walkways or fix cracking and heaving	2019	Maintenance
No Wheelchair Access for Benches	Add additional concrete platform to the side of the benches	2019	Maintenance

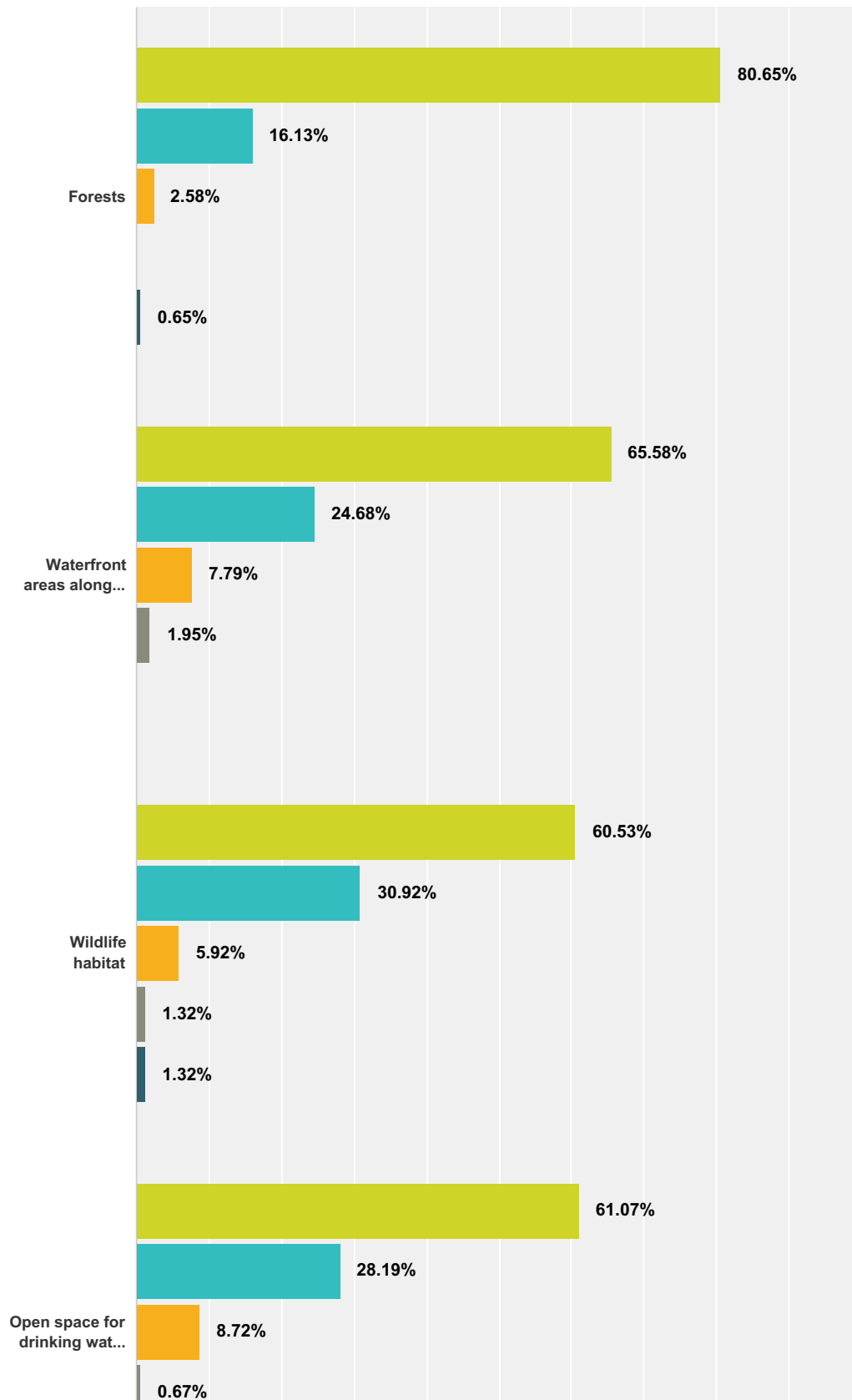
Otis Town Hall Park

Physical Obstacles	Actions to Be Taken	Date to Be Completed	Responsible Party
No Accessible Path to Equipment	Create an accessible pathway through equipment areas	2019	Maintenance
Curb Encircling Skate Park	Remove curb or create flush transition	2019	Maintenance

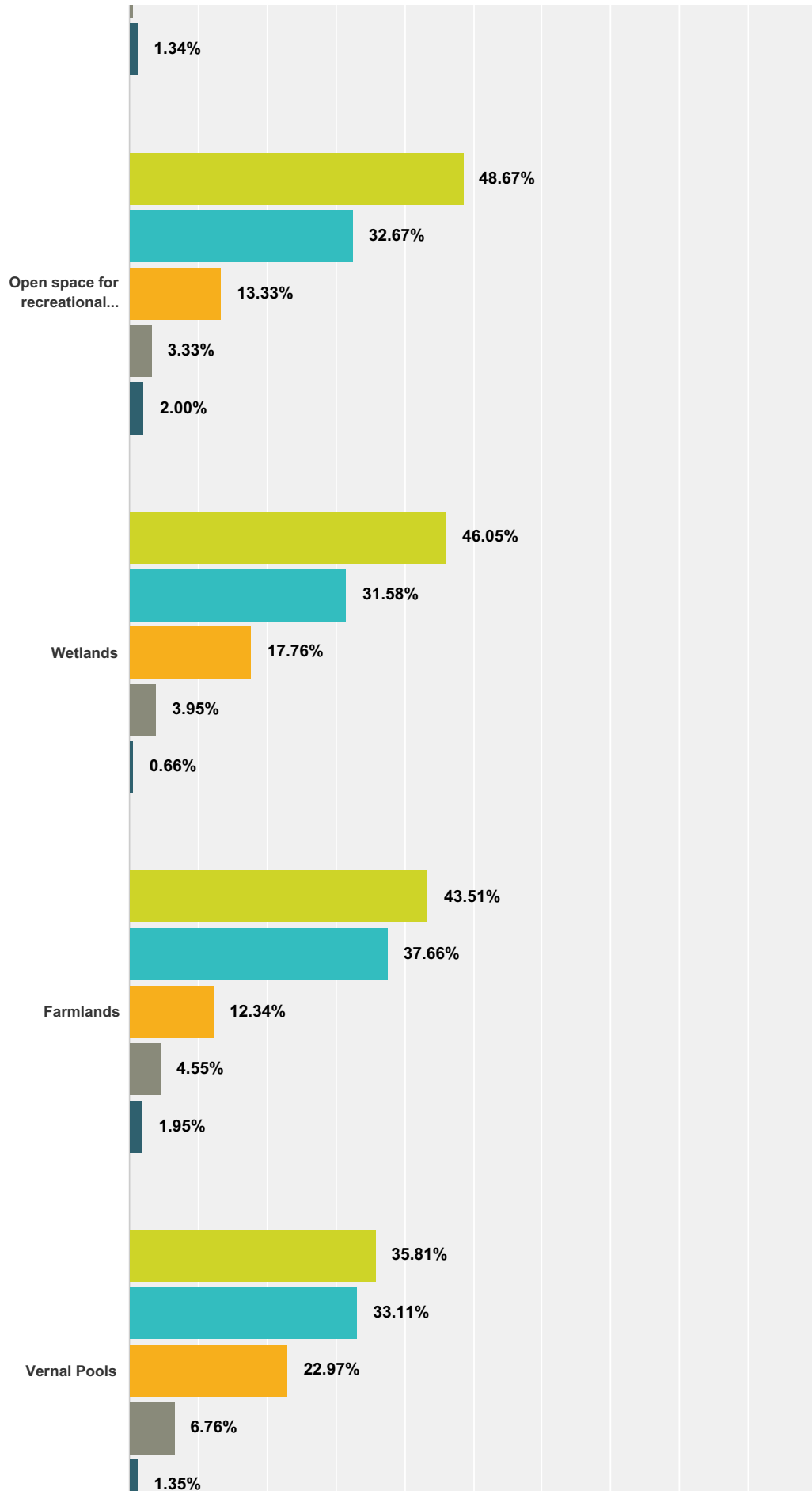
APPENDIX C: PUBLIC SURVEY RESULTS

Q4 How important is it to conserve the following types of open space?

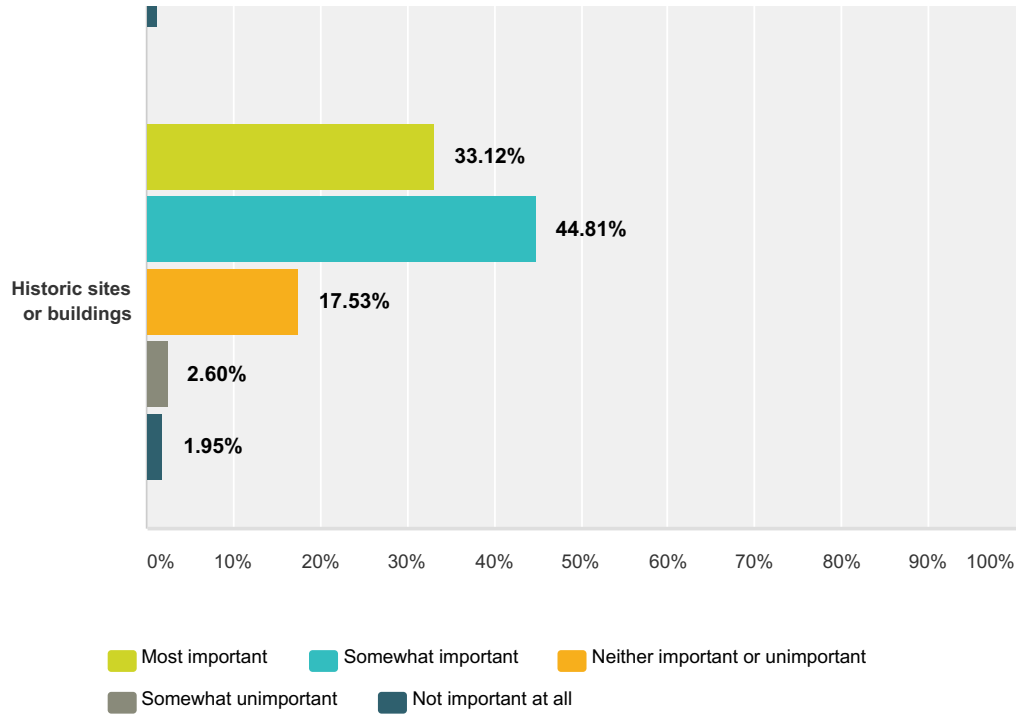
Answered: 156 Skipped: 23



Otis Master Plan Survey



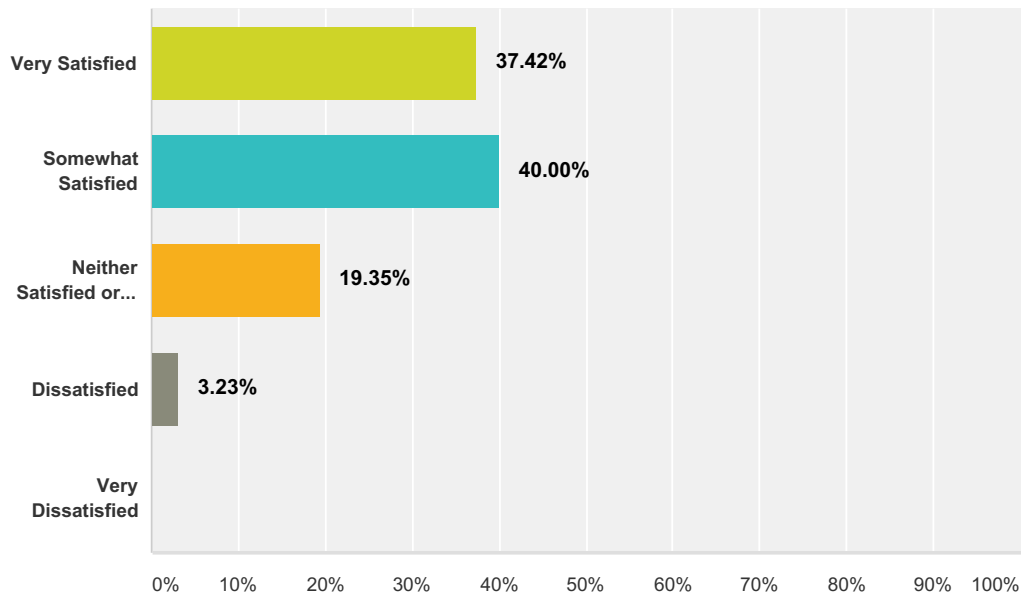
Otis Master Plan Survey



	Most important	Somewhat important	Neither important or unimportant	Somewhat unimportant	Not important at all	Total
Forests	80.65% 125	16.13% 25	2.58% 4	0.00% 0	0.65% 1	155
Waterfront areas along rivers, ponds and lakes	65.58% 101	24.68% 38	7.79% 12	1.95% 3	0.00% 0	154
Wildlife habitat	60.53% 92	30.92% 47	5.92% 9	1.32% 2	1.32% 2	152
Open space for drinking water needs	61.07% 91	28.19% 42	8.72% 13	0.67% 1	1.34% 2	149
Open space for recreational needs	48.67% 73	32.67% 49	13.33% 20	3.33% 5	2.00% 3	150
Wetlands	46.05% 70	31.58% 48	17.76% 27	3.95% 6	0.66% 1	152
Farmlands	43.51% 67	37.66% 58	12.34% 19	4.55% 7	1.95% 3	154
Vernal Pools	35.81% 53	33.11% 49	22.97% 34	6.76% 10	1.35% 2	148
Historic sites or buildings	33.12% 51	44.81% 69	17.53% 27	2.60% 4	1.95% 3	154

Q5 How satisfied are you with existing recreation areas in Otis?

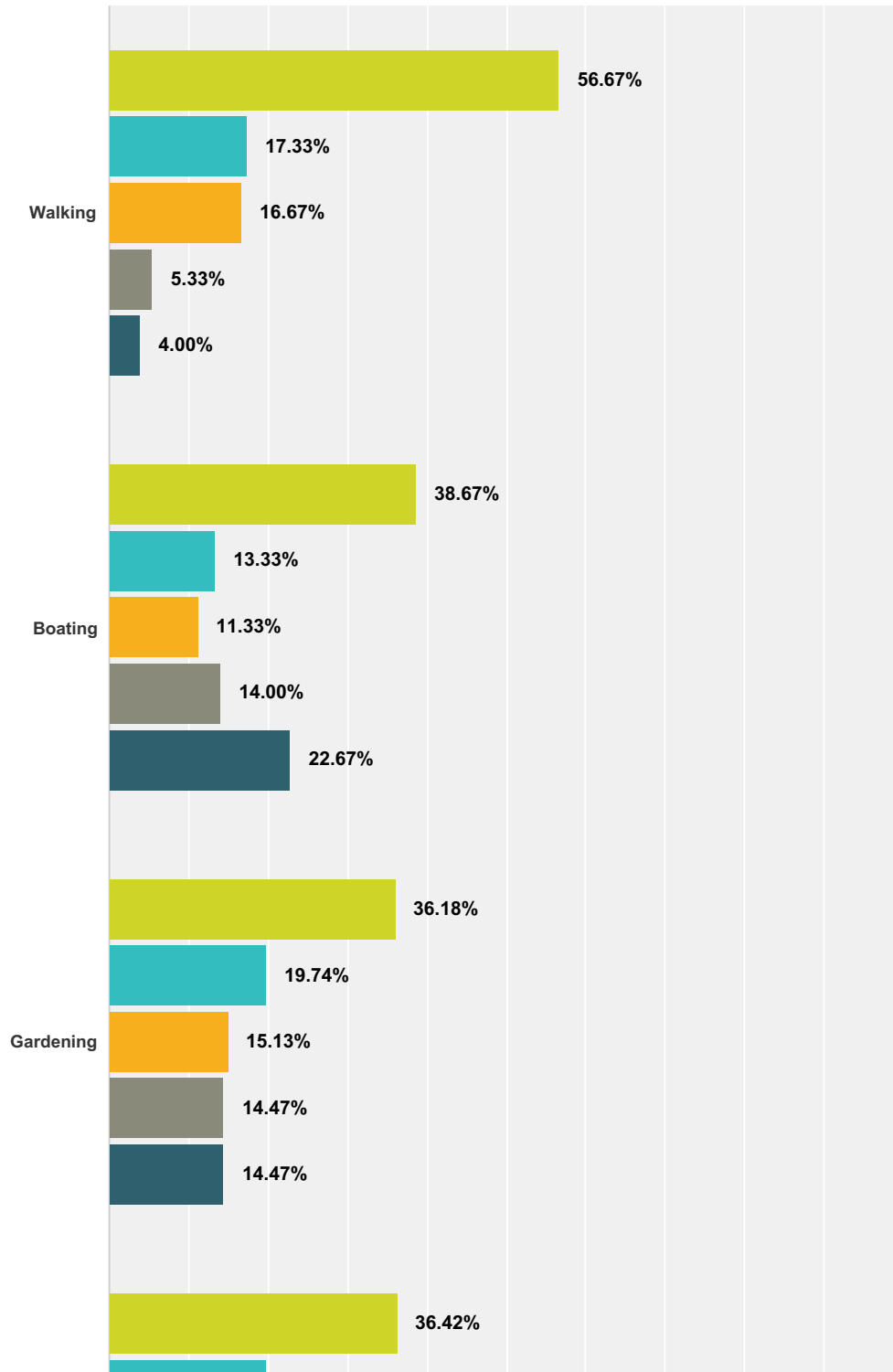
Answered: 155 Skipped: 24



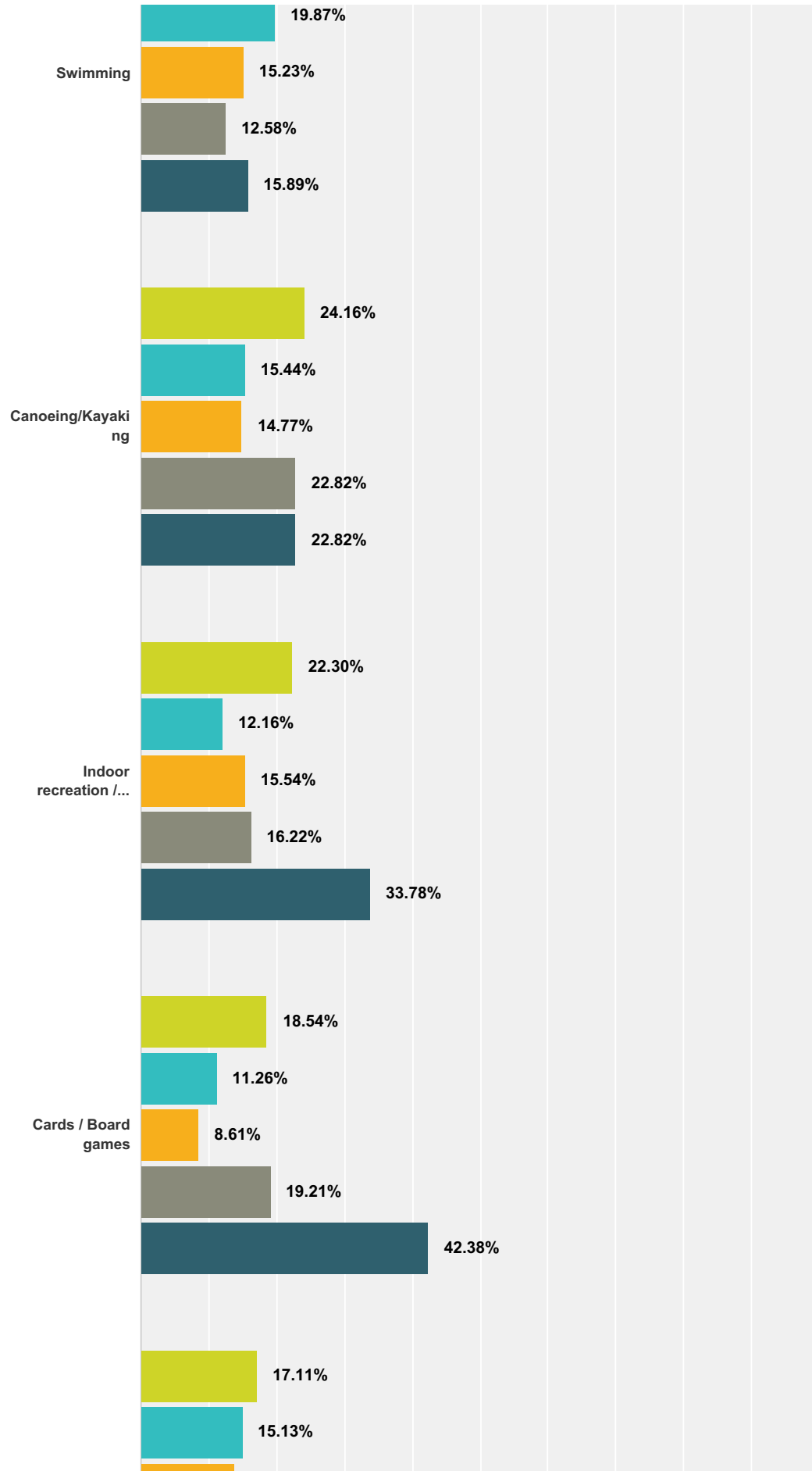
Answer Choices	Responses	
Very Satisfied	37.42%	58
Somewhat Satisfied	40.00%	62
Neither Satisfied or Dissatisfied	19.35%	30
Dissatisfied	3.23%	5
Very Dissatisfied	0.00%	0
Total		155

Q6 How often do you participate in each of these recreational activities in Otis per year? For winter or summer activities, please indicate the number of times per season that you participate. (Answer all items)

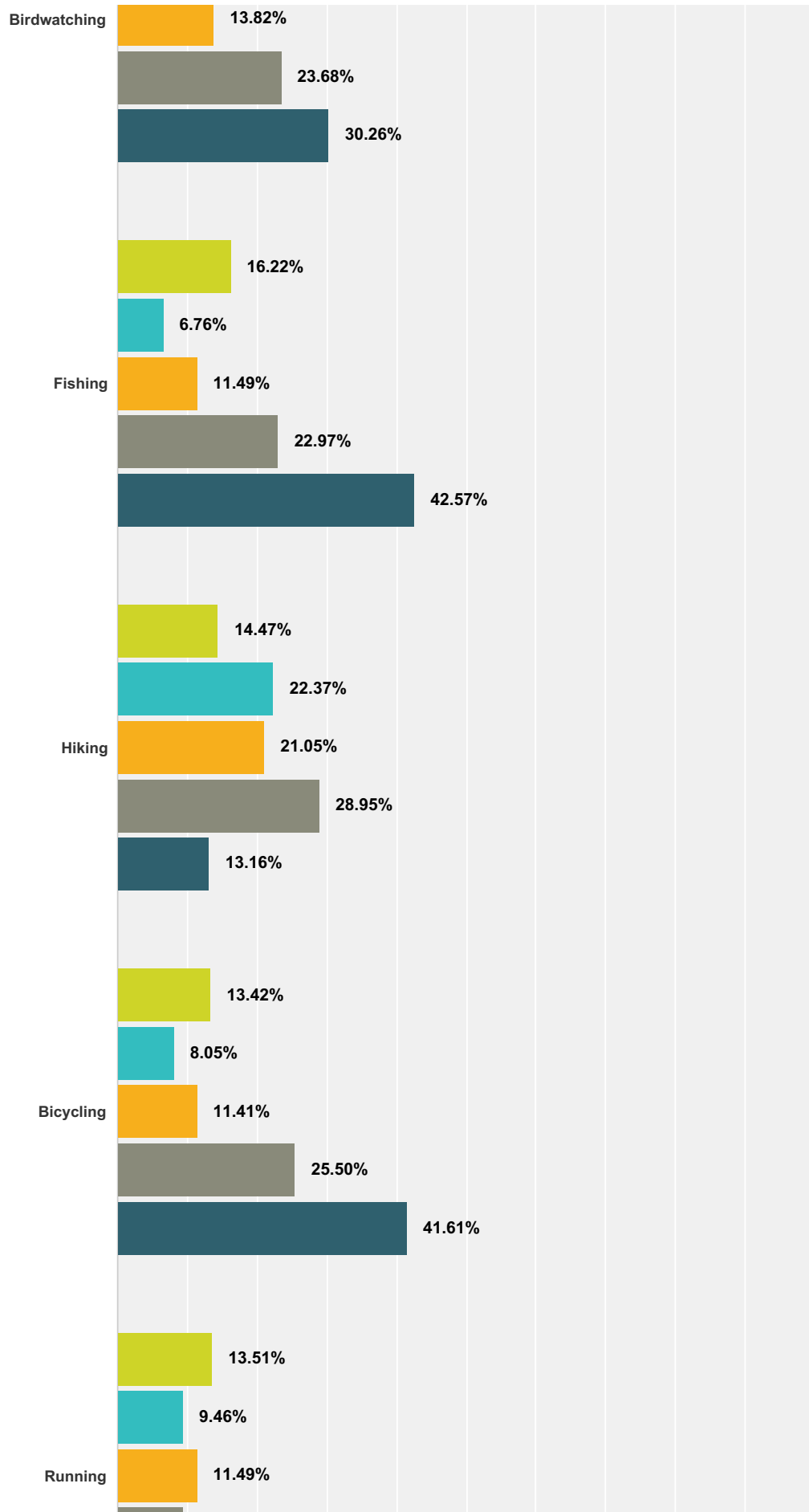
Answered: 156 Skipped: 23



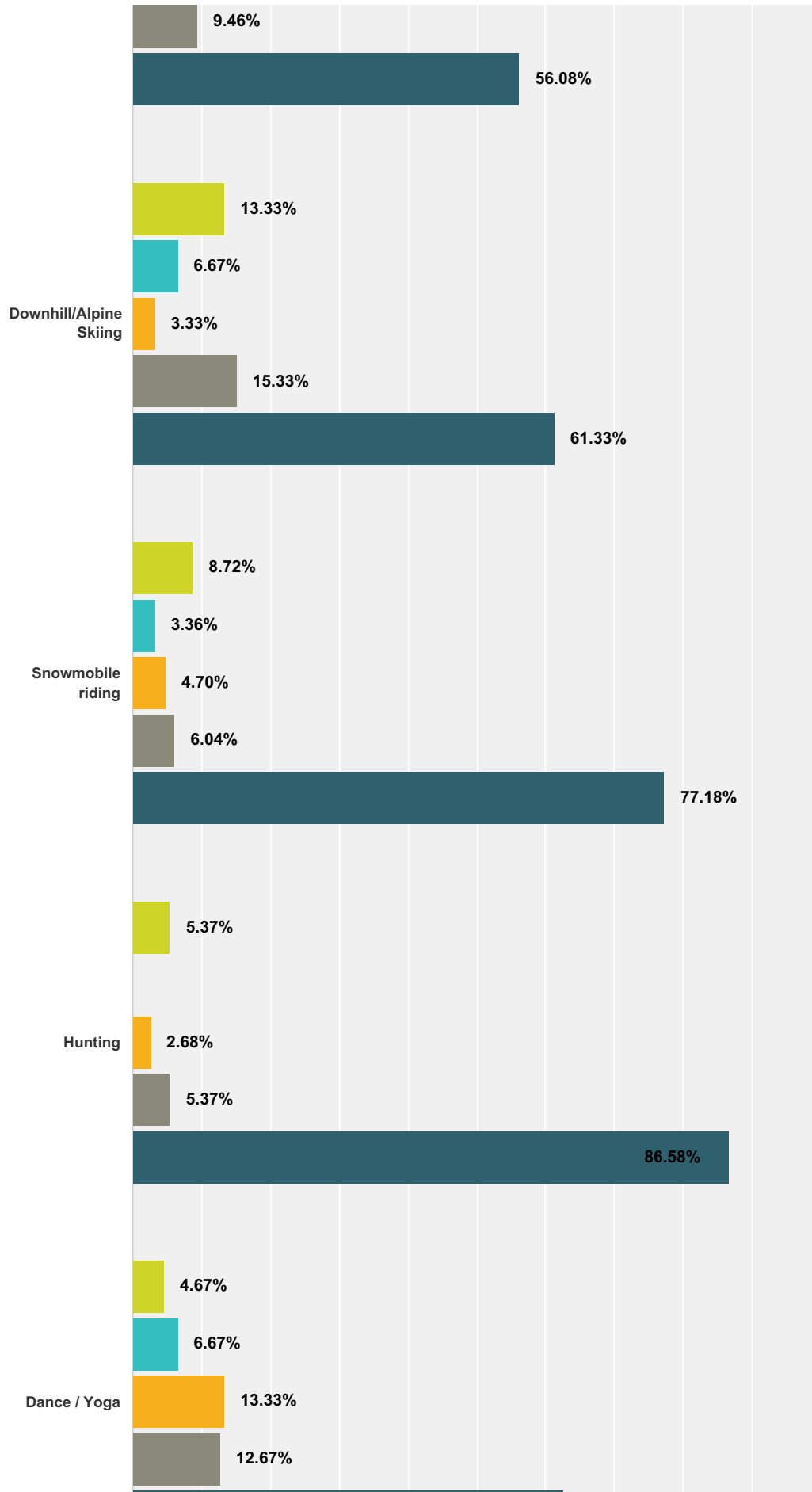
Otis Master Plan Survey



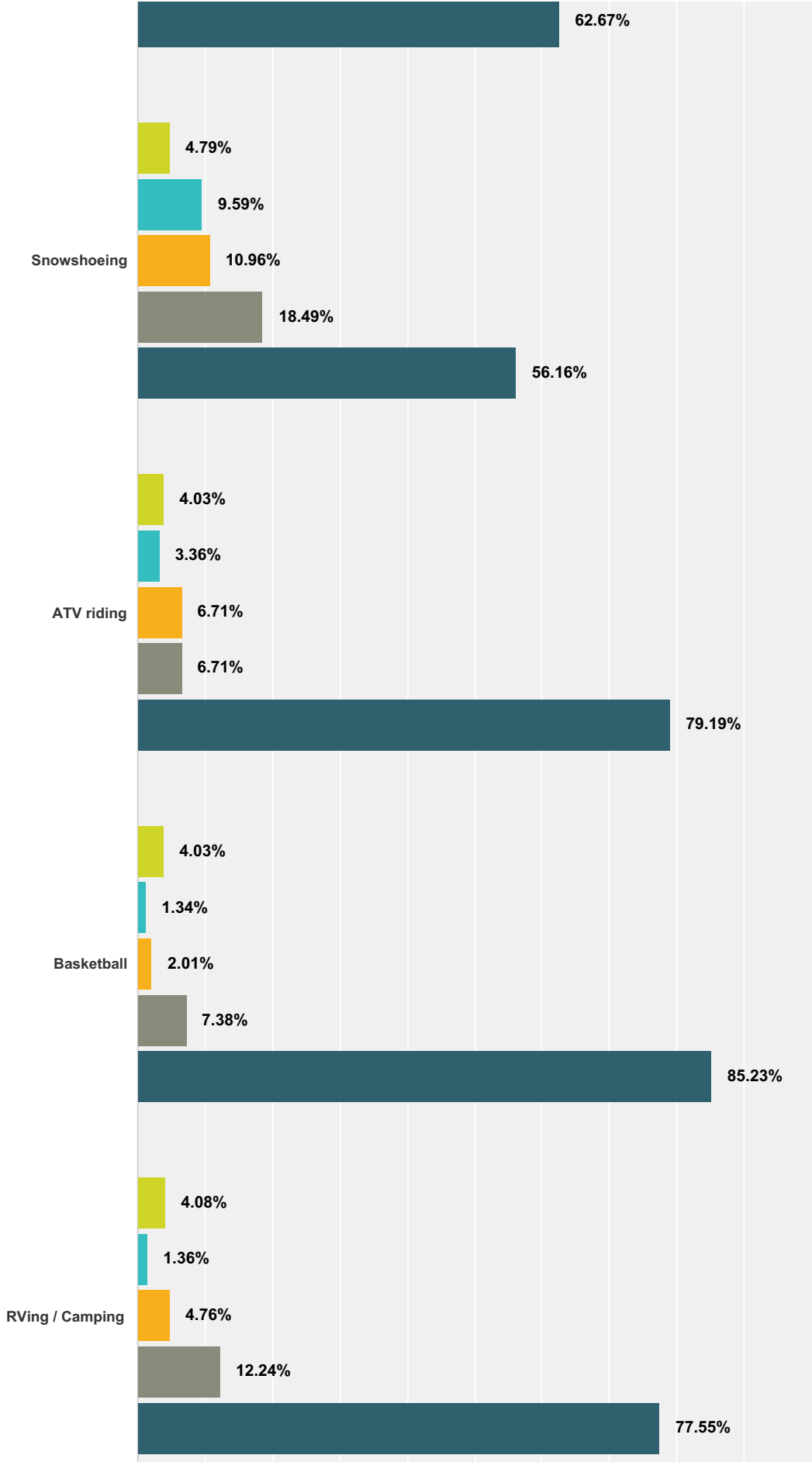
Otis Master Plan Survey



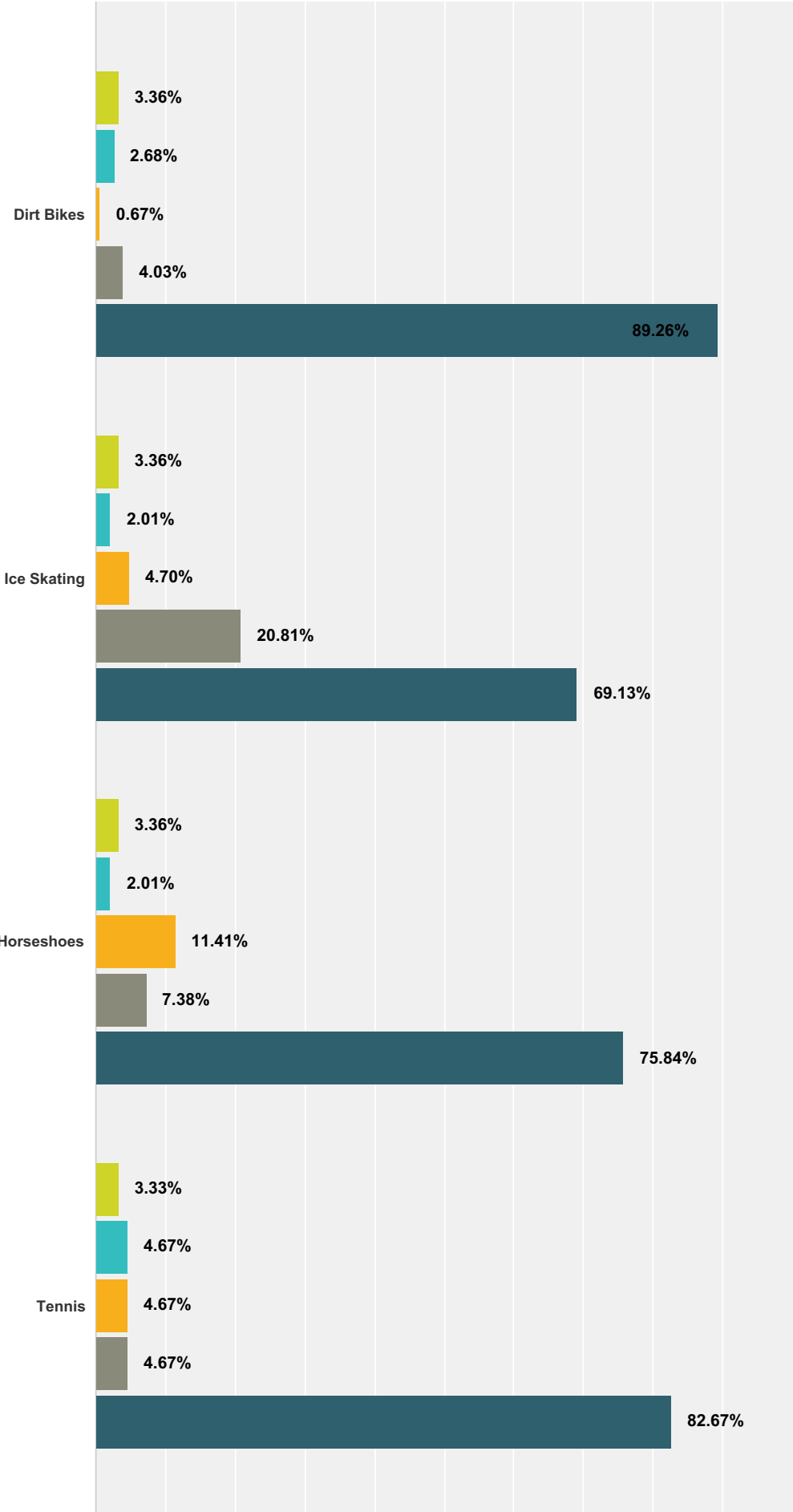
Otis Master Plan Survey



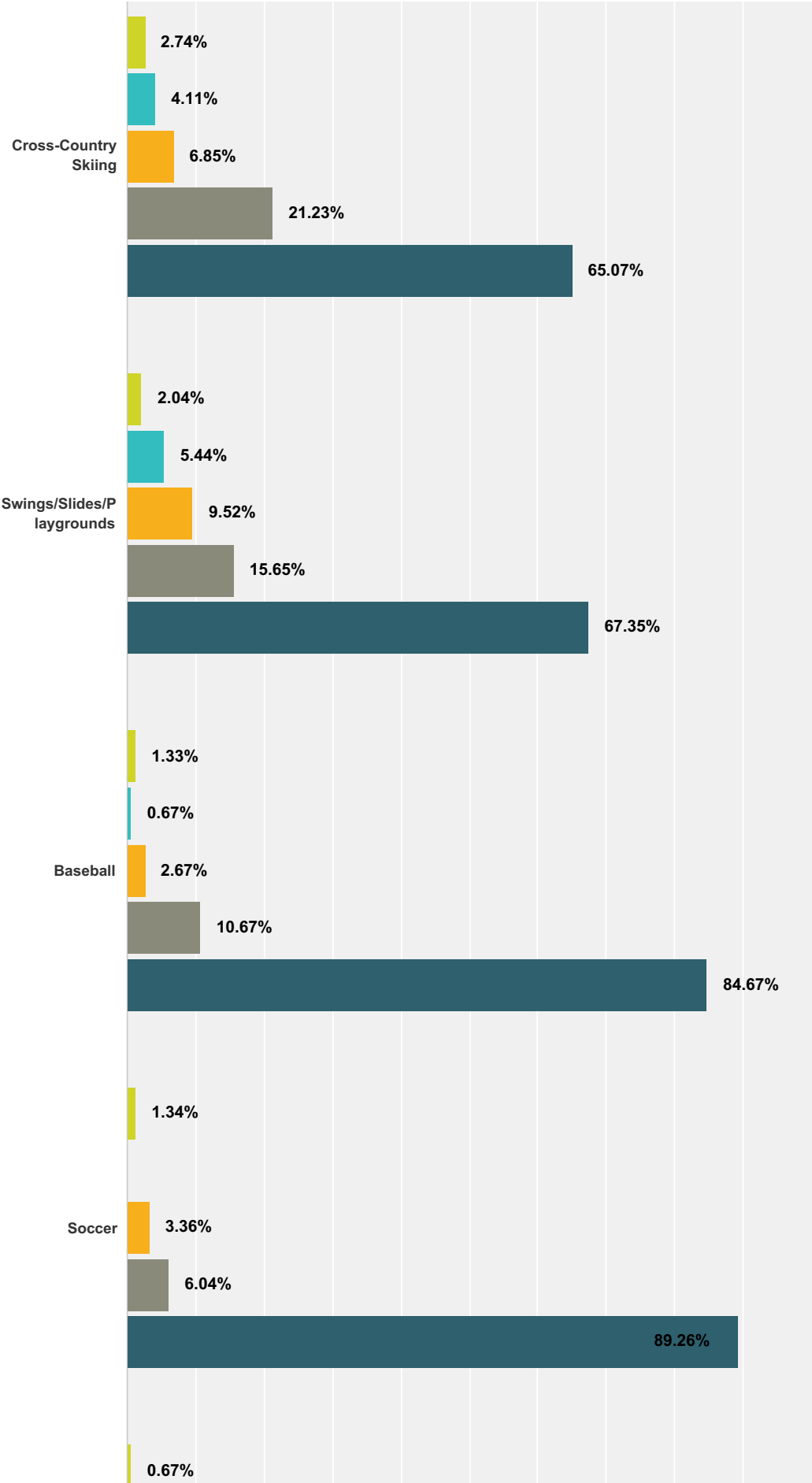
Otis Master Plan Survey



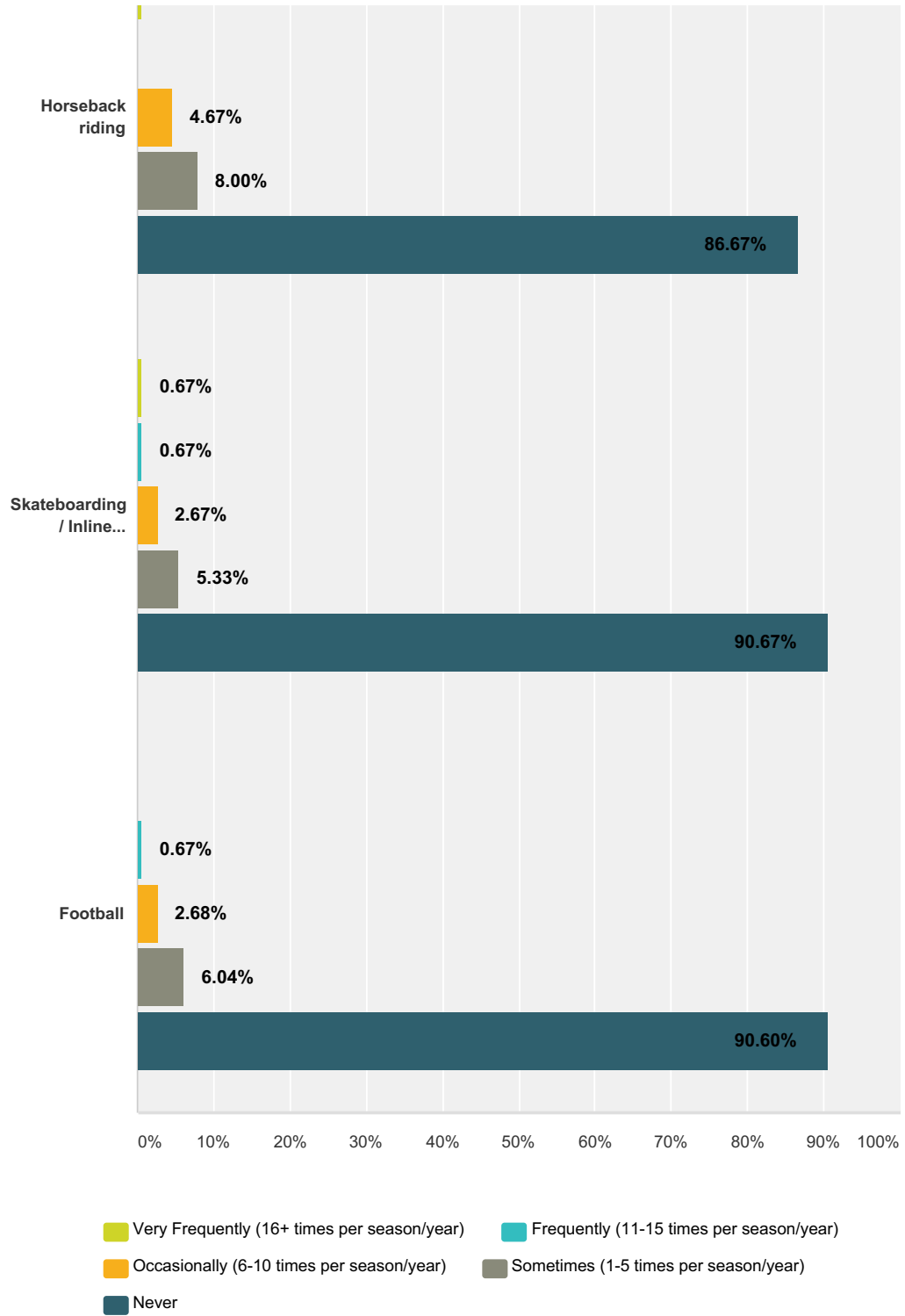
Otis Master Plan Survey



Otis Master Plan Survey



Otis Master Plan Survey



	Very Frequently (16+ times per season/year)	Frequently (11-15 times per season/year)	Occasionally (6-10 times per season/year)	Sometimes (1-5 times per season/year)	Never	Total
Walking	56.67% 85	17.33% 26	16.67% 25	5.33% 8	4.00% 6	150
Boating	38.67% 58	13.33% 20	11.33% 17	14.00% 21	22.67% 34	150
Gardening	36.18% 55	19.74% 30	15.13% 23	14.47% 22	14.47% 22	152

Otis Master Plan Survey

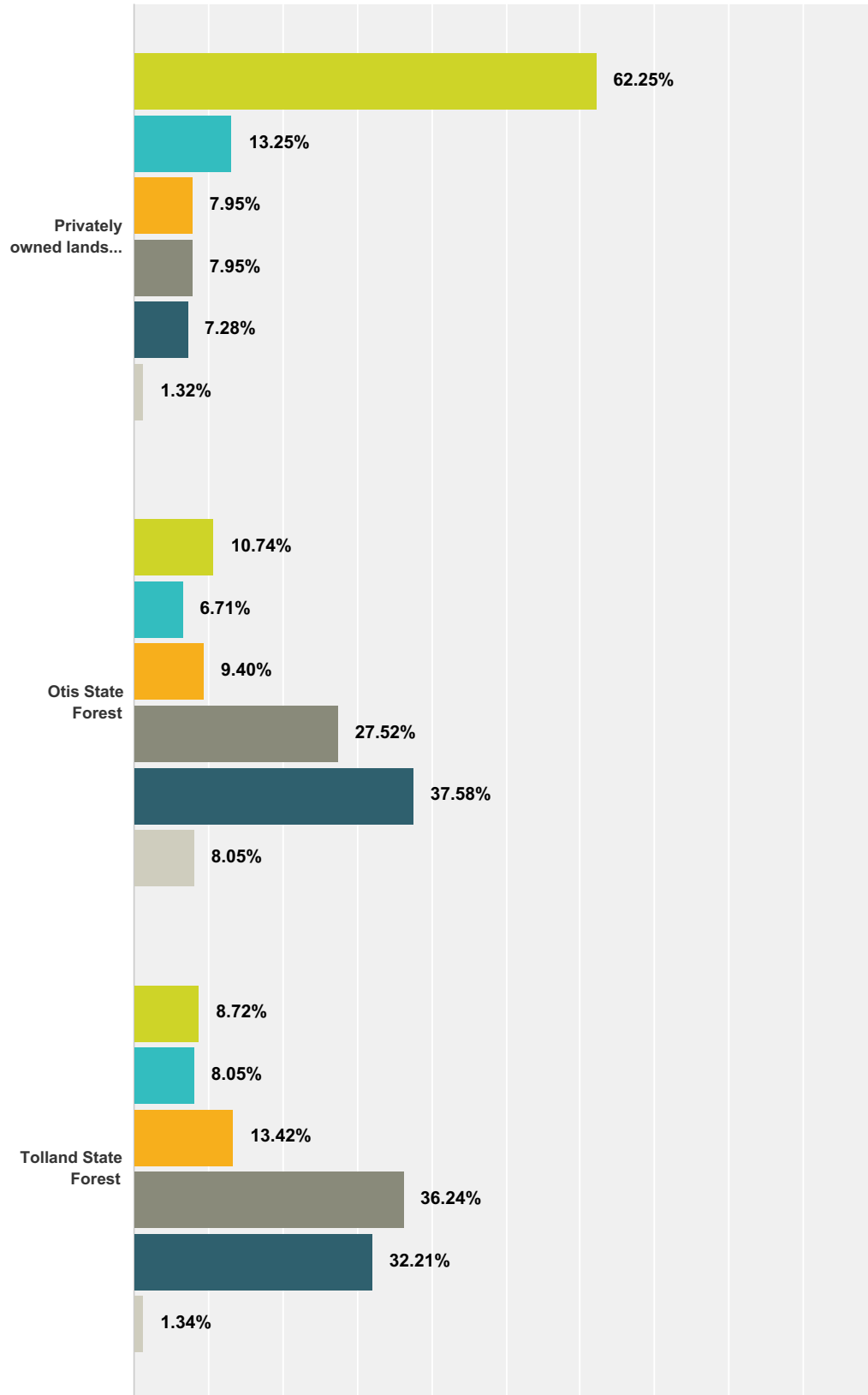
Swimming	36.42% 55	19.87% 30	15.23% 23	12.58% 19	15.89% 24	151
Canoeing/Kayaking	24.16% 36	15.44% 23	14.77% 22	22.82% 34	22.82% 34	149
Indoor recreation / Fitness activities	22.30% 33	12.16% 18	15.54% 23	16.22% 24	33.78% 50	148
Cards / Board games	18.54% 28	11.26% 17	8.61% 13	19.21% 29	42.38% 64	151
Birdwatching	17.11% 26	15.13% 23	13.82% 21	23.68% 36	30.26% 46	152
Fishing	16.22% 24	6.76% 10	11.49% 17	22.97% 34	42.57% 63	148
Hiking	14.47% 22	22.37% 34	21.05% 32	28.95% 44	13.16% 20	152
Bicycling	13.42% 20	8.05% 12	11.41% 17	25.50% 38	41.61% 62	149
Running	13.51% 20	9.46% 14	11.49% 17	9.46% 14	56.08% 83	148
Downhill/Alpine Skiing	13.33% 20	6.67% 10	3.33% 5	15.33% 23	61.33% 92	150
Snowmobile riding	8.72% 13	3.36% 5	4.70% 7	6.04% 9	77.18% 115	149
Hunting	5.37% 8	0.00% 0	2.68% 4	5.37% 8	86.58% 129	149
Dance / Yoga	4.67% 7	6.67% 10	13.33% 20	12.67% 19	62.67% 94	150
Snowshoeing	4.79% 7	9.59% 14	10.96% 16	18.49% 27	56.16% 82	146
ATV riding	4.03% 6	3.36% 5	6.71% 10	6.71% 10	79.19% 118	149
Basketball	4.03% 6	1.34% 2	2.01% 3	7.38% 11	85.23% 127	149
RVing / Camping	4.08% 6	1.36% 2	4.76% 7	12.24% 18	77.55% 114	147
Dirt Bikes	3.36% 5	2.68% 4	0.67% 1	4.03% 6	89.26% 133	149
Ice Skating	3.36% 5	2.01% 3	4.70% 7	20.81% 31	69.13% 103	149
Horseshoes	3.36% 5	2.01% 3	11.41% 17	7.38% 11	75.84% 113	149
Tennis	3.33% 5	4.67% 7	4.67% 7	4.67% 7	82.67% 124	150
Cross-Country Skiing	2.74% 4	4.11% 6	6.85% 10	21.23% 31	65.07% 95	146
Swings/Slides/Playgrounds	2.04% 3	5.44% 8	9.52% 14	15.65% 23	67.35% 99	147
Baseball	1.33% 2	0.67% 1	2.67% 4	10.67% 16	84.67% 127	150
Soccer	1.34% 2	0.00% 0	3.36% 5	6.04% 9	89.26% 133	149

Otis Master Plan Survey

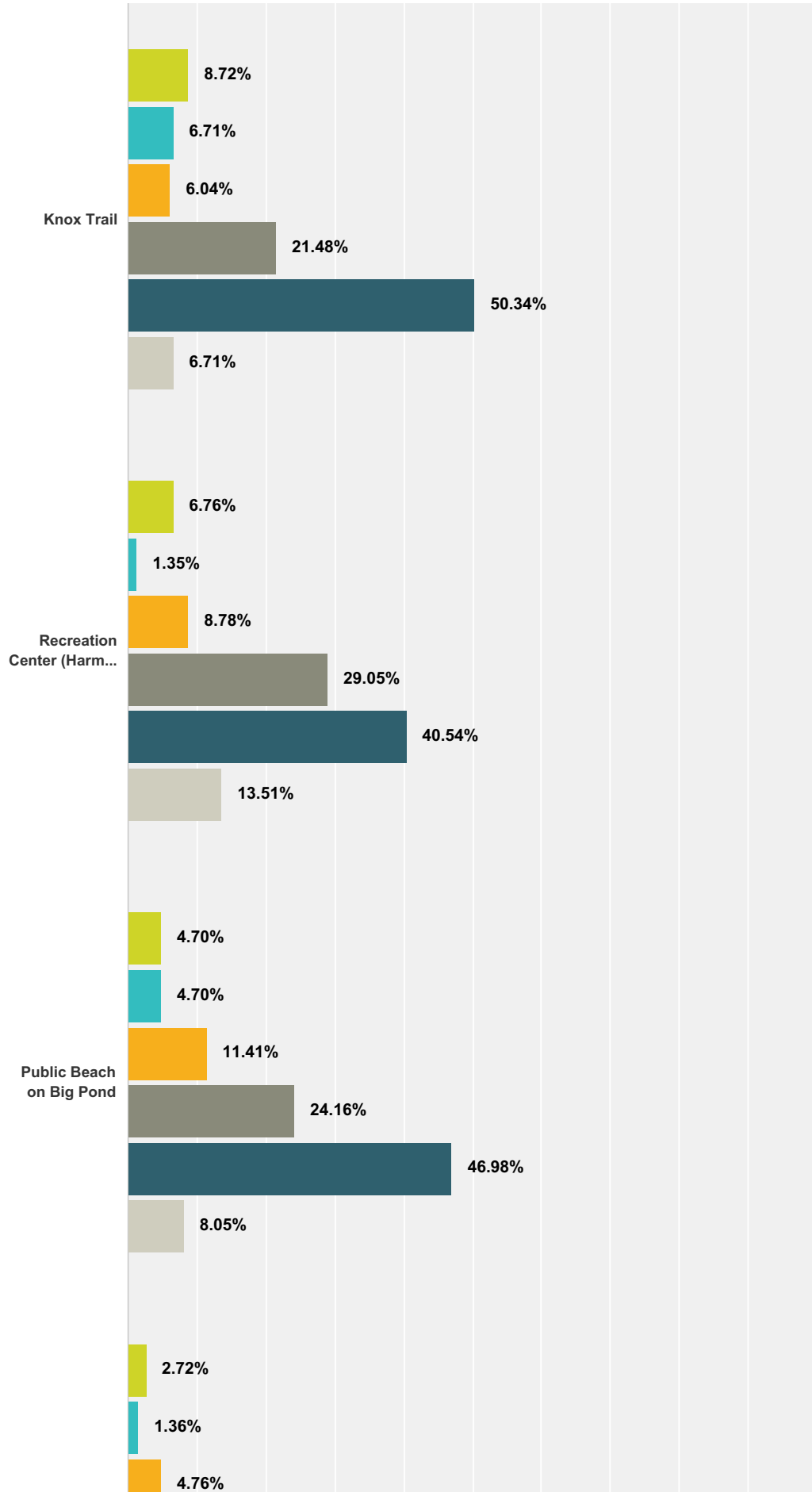
Horseback riding	0.67% 1	0.00% 0	4.67% 7	8.00% 12	86.67% 130	150
Skateboarding / Inline Skating / Rollerblading	0.67% 1	0.67% 1	2.67% 4	5.33% 8	90.67% 136	150
Football	0.00% 0	0.67% 1	2.68% 4	6.04% 9	90.60% 135	149

**Q7 How often do you use the following recreation areas / amenities per year?
(Answer all items)**

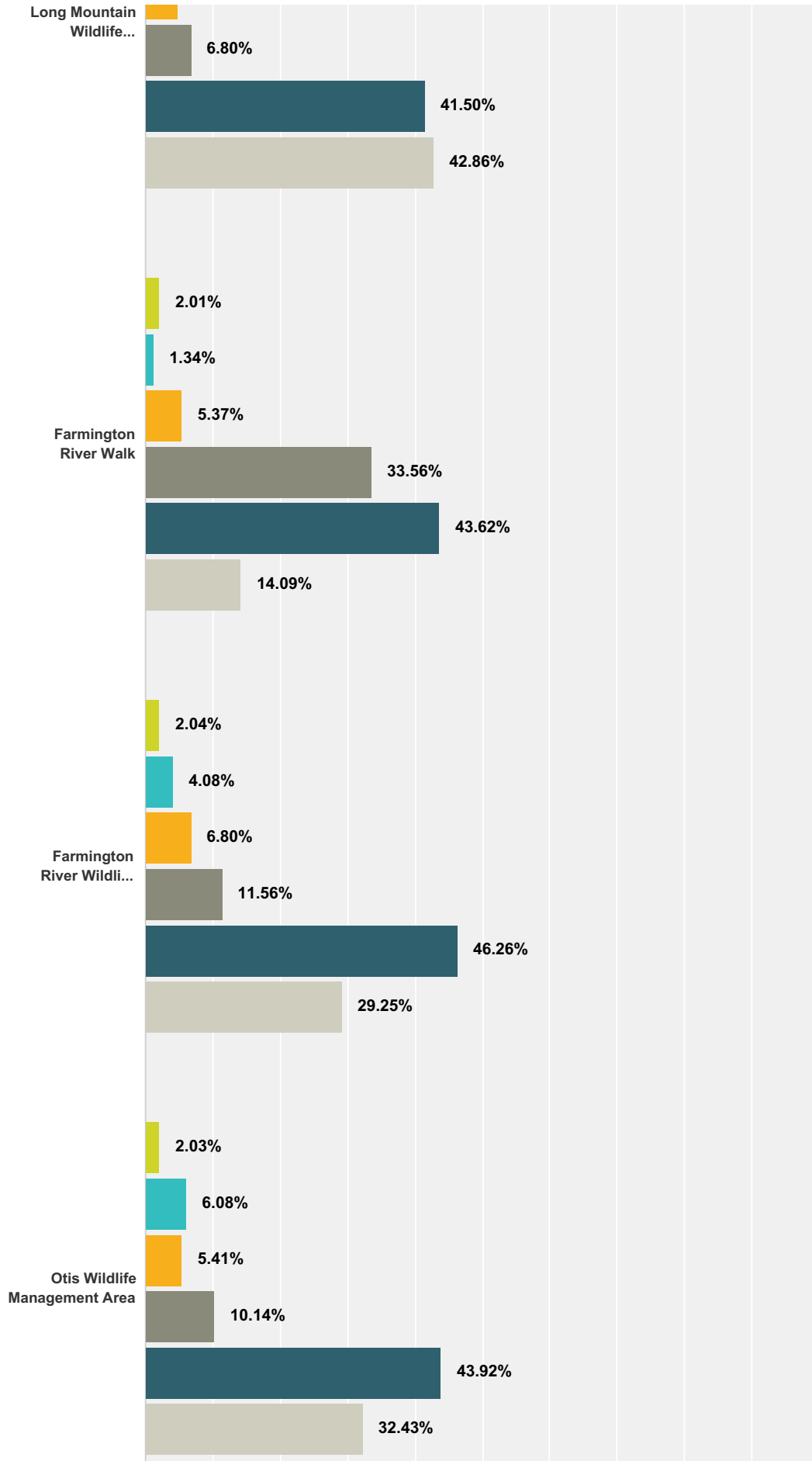
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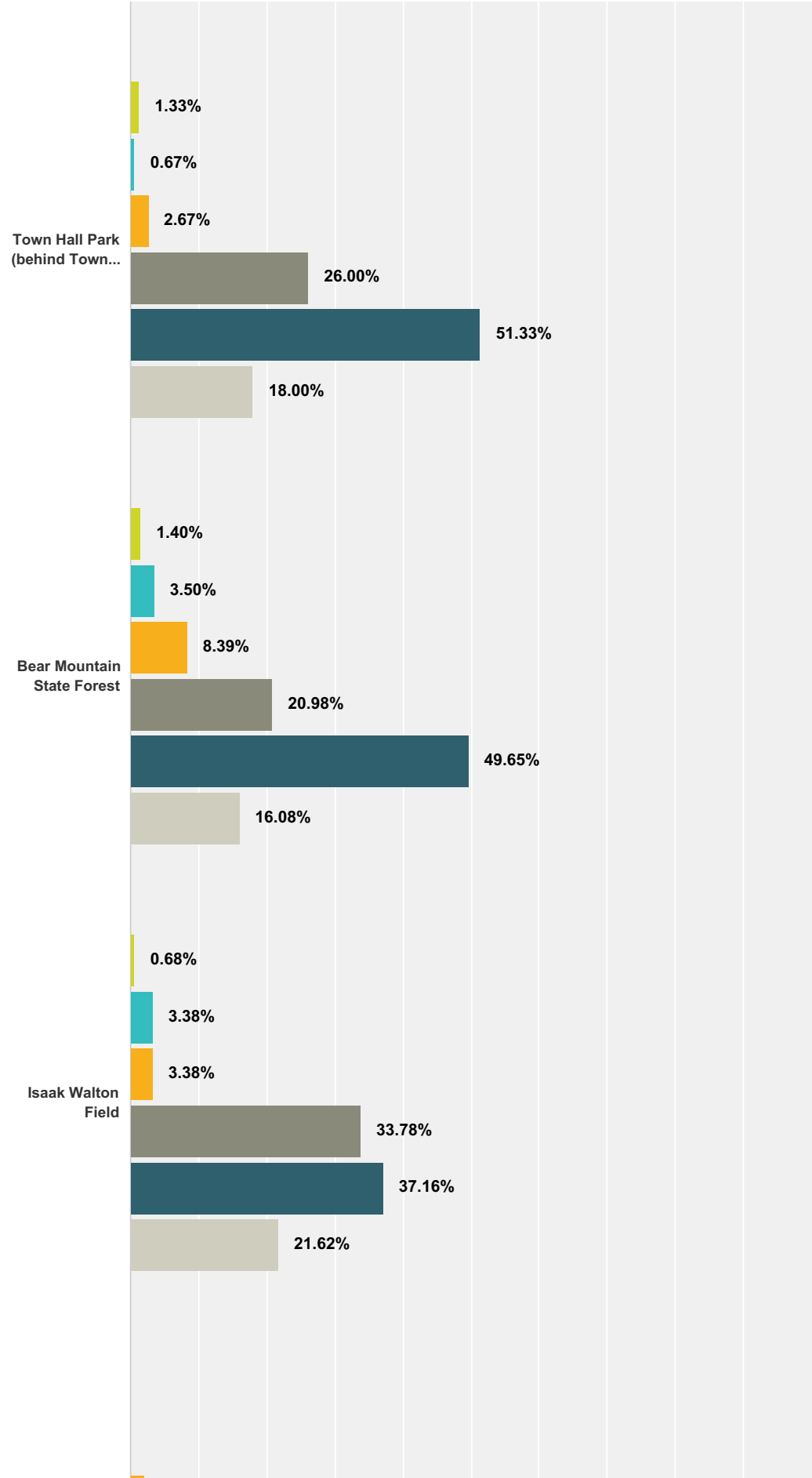
Otis Master Plan Survey



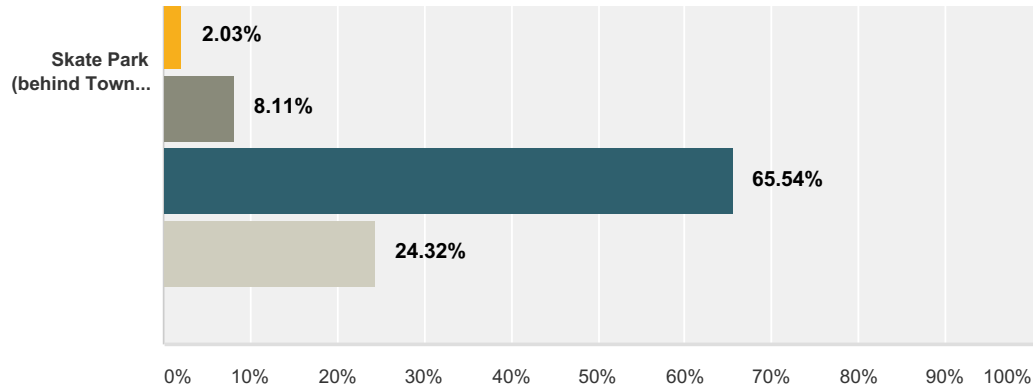
Otis Master Plan Survey



Otis Master Plan Survey



Otis Master Plan Survey

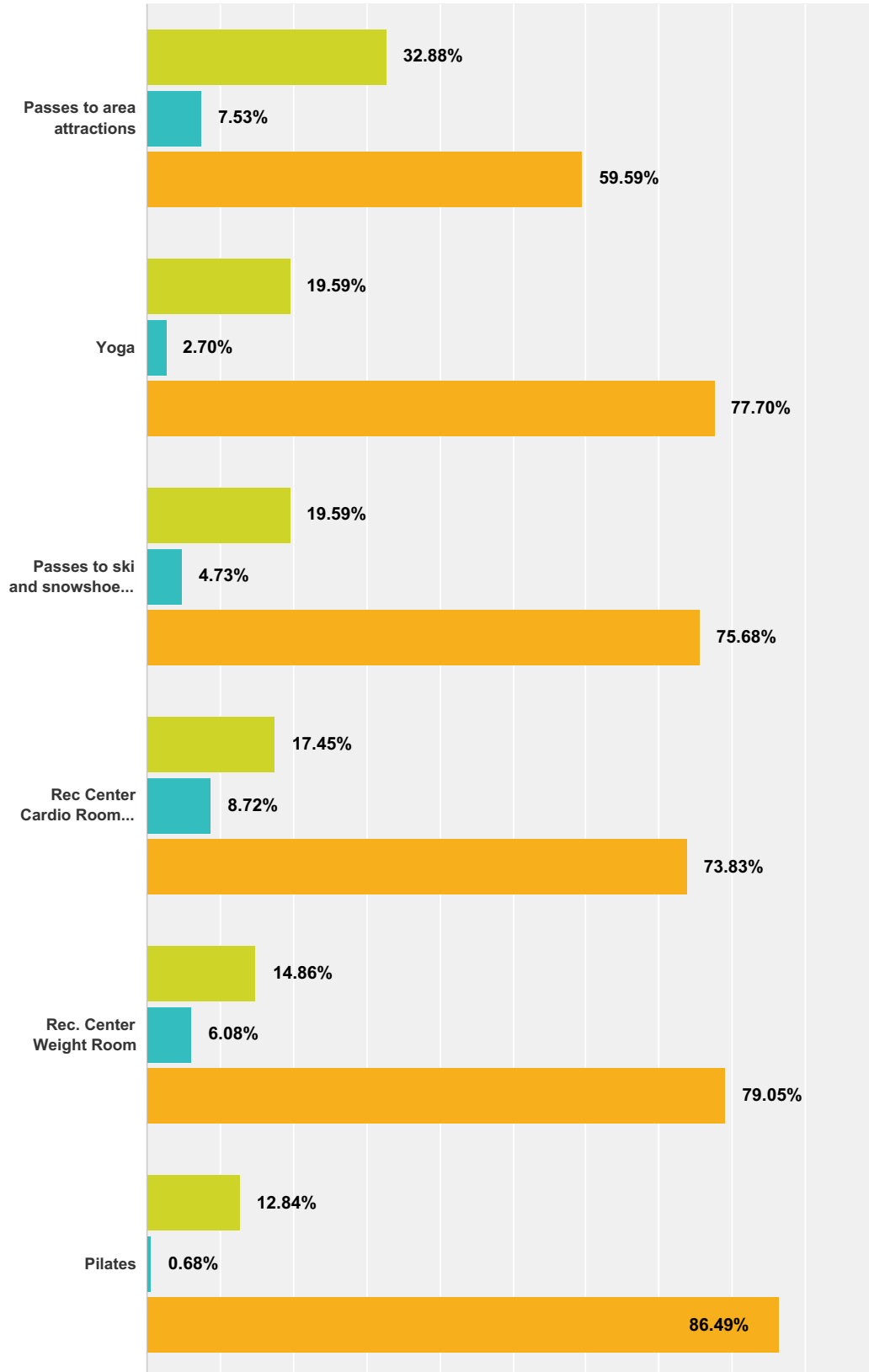


■ Very Frequently (16+ times)
 ■ Frequently (11-15 times)
 ■ Occasionally (6-10 times)
 ■ Sometimes (1-5 times)
 ■ Never
 ■ Haven't heard of it

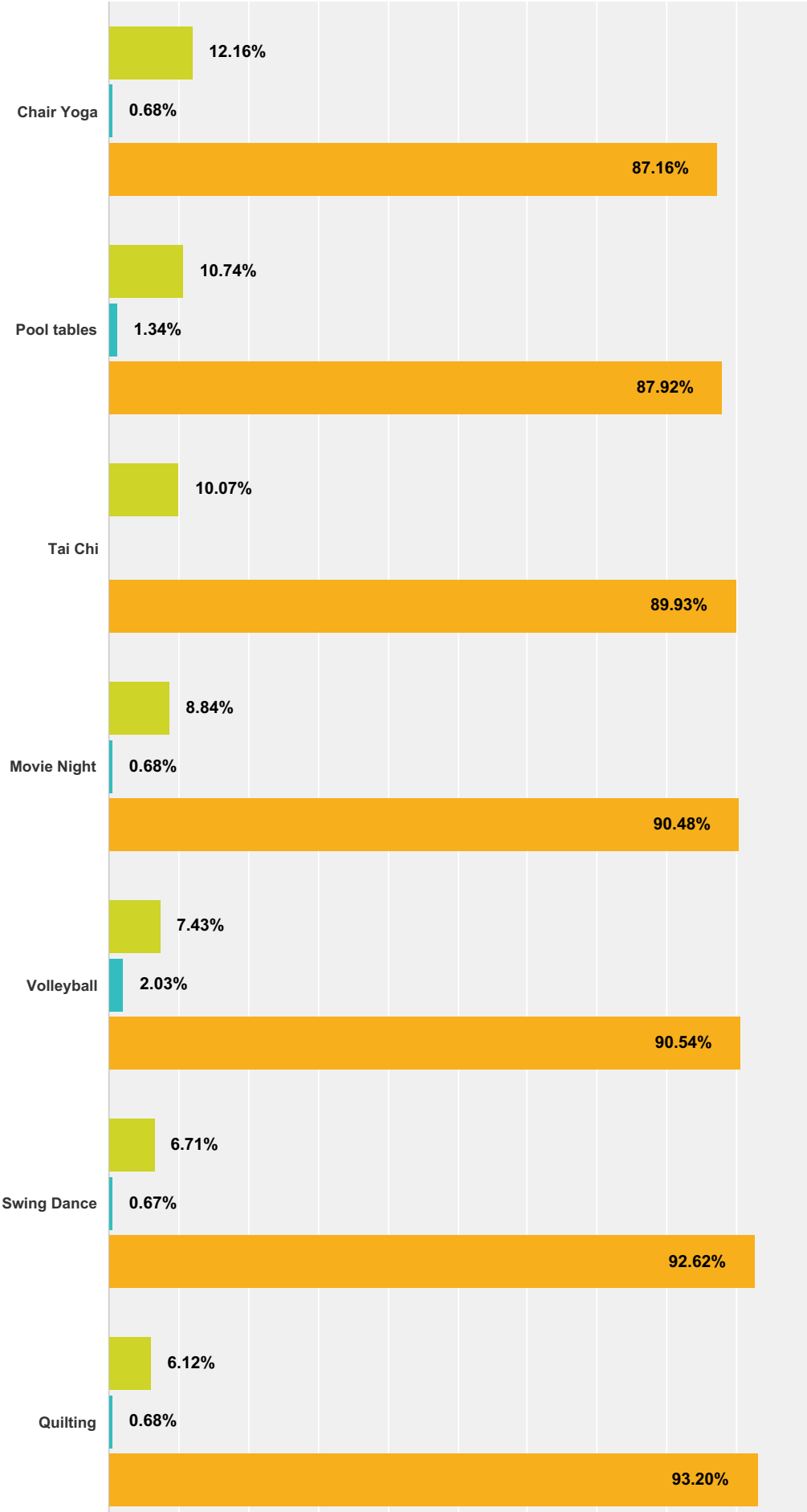
	Very Frequently (16+ times)	Frequently (11- 15 times)	Occasionally (6- 10 times)	Sometimes (1-5 times)	Never	Haven't heard of it	Total
Privately owned lands (your land or a friend, neighbor, or relative's land)	62.25% 94	13.25% 20	7.95% 12	7.95% 12	7.28% 11	1.32% 2	151
Otis State Forest	10.74% 16	6.71% 10	9.40% 14	27.52% 41	37.58% 56	8.05% 12	149
Tolland State Forest	8.72% 13	8.05% 12	13.42% 20	36.24% 54	32.21% 48	1.34% 2	149
Knox Trail	8.72% 13	6.71% 10	6.04% 9	21.48% 32	50.34% 75	6.71% 10	149
Recreation Center (Harmony Hall)	6.76% 10	1.35% 2	8.78% 13	29.05% 43	40.54% 60	13.51% 20	148
Public Beach on Big Pond	4.70% 7	4.70% 7	11.41% 17	24.16% 36	46.98% 70	8.05% 12	149
Long Mountain Wildlife Management Area	2.72% 4	1.36% 2	4.76% 7	6.80% 10	41.50% 61	42.86% 63	147
Farmington River Walk	2.01% 3	1.34% 2	5.37% 8	33.56% 50	43.62% 65	14.09% 21	149
Farmington River Wildlife Management Area	2.04% 3	4.08% 6	6.80% 10	11.56% 17	46.26% 68	29.25% 43	147
Otis Wildlife Management Area	2.03% 3	6.08% 9	5.41% 8	10.14% 15	43.92% 65	32.43% 48	148
Town Hall Park (behind Town Hall)	1.33% 2	0.67% 1	2.67% 4	26.00% 39	51.33% 77	18.00% 27	150
Bear Mountain State Forest	1.40% 2	3.50% 5	8.39% 12	20.98% 30	49.65% 71	16.08% 23	143
Isaak Walton Field	0.68% 1	3.38% 5	3.38% 5	33.78% 50	37.16% 55	21.62% 32	148
Skate Park (behind Town Hall)	0.00% 0	0.00% 0	2.03% 3	8.11% 12	65.54% 97	24.32% 36	148

Q8 How would you rate the following programs offered by the Otis recreation center (Harmony Hall)? (Answer all items)

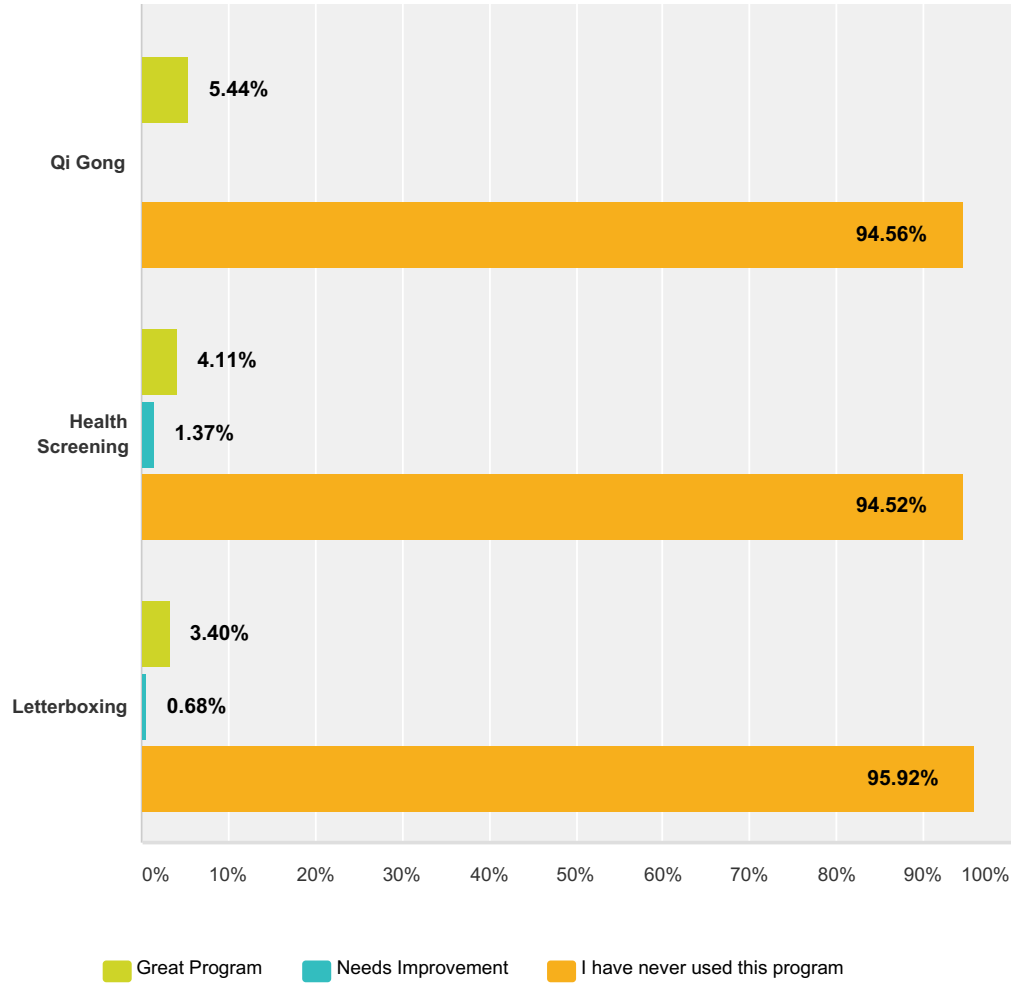
Answered: 152 Skipped: 27



Otis Master Plan Survey



Otis Master Plan Survey



	Great Program	Needs Improvement	I have never used this program	Total
Passes to area attractions	32.88% 48	7.53% 11	59.59% 87	146
Yoga	19.59% 29	2.70% 4	77.70% 115	148
Passes to ski and snowshoe areas	19.59% 29	4.73% 7	75.68% 112	148
Rec Center Cardio Room (treadmills, etc)	17.45% 26	8.72% 13	73.83% 110	149
Rec. Center Weight Room	14.86% 22	6.08% 9	79.05% 117	148
Pilates	12.84% 19	0.68% 1	86.49% 128	148
Chair Yoga	12.16% 18	0.68% 1	87.16% 129	148
Pool tables	10.74% 16	1.34% 2	87.92% 131	149
Tai Chi	10.07% 15	0.00% 0	89.93% 134	149
Movie Night	8.84% 13	0.68% 1	90.48% 133	147

Otis Master Plan Survey

Volleyball	7.43% 11	2.03% 3	90.54% 134	148
Swing Dance	6.71% 10	0.67% 1	92.62% 138	149
Quilting	6.12% 9	0.68% 1	93.20% 137	147
Qi Gong	5.44% 8	0.00% 0	94.56% 139	147
Health Screening	4.11% 6	1.37% 2	94.52% 138	146
Letterboxing	3.40% 5	0.68% 1	95.92% 141	147

#	Other (please specify)	Date
1	Not generally available when up on weekends	6/10/2015 5:44 AM
2	fine the way it is	6/3/2015 10:50 AM
3	Restore Basketball nets behind rec center	5/30/2015 11:28 AM
4	library	5/17/2015 9:11 AM
5	I didn't know the passes were available - perhaps more advertising?	5/7/2015 9:57 AM
6	weight room could use a universal weight machine	5/5/2015 1:03 PM
7	I learned MJ	4/29/2015 4:26 PM
8	Gingerbread House Workshop	4/27/2015 1:19 PM
9	I like the various workshops they offer	4/27/2015 9:02 AM
10	Did Zumba for a year loved it , miss it	4/26/2015 11:58 AM
11	clarrk museum	4/22/2015 5:03 PM

Otis Master Plan Survey

Q9 What additional programs would you like to see offered at the Otis Recreation Center (Harmony Hall)?

Answered: 61 Skipped: 118

#	Responses	Date
1	Children nature education programs, clinics for group sports so there is more community interaction- from poker to ice hockey	6/10/2015 5:44 AM
2	Tennis Courts, ice skating rink	6/9/2015 6:01 PM
3	The following would be great: a self defense course, a martial arts class, mixed martial arts. The yoga tends to be geared toward a lower-impact style - a higher-intensity class would be appreciated.	6/9/2015 9:14 AM
4	i do not participate	6/3/2015 11:01 AM
5	none	6/3/2015 10:50 AM
6	none for me	6/3/2015 10:29 AM
7	hours when open to be posted town wide (not just electronically, not everyone is so equipped.)	6/3/2015 9:25 AM
8	none / computer classes for novice	6/3/2015 9:00 AM
9	save money	6/3/2015 8:51 AM
10	Tennis	5/30/2015 11:28 AM
11	None	5/30/2015 11:17 AM
12	more yoga	5/28/2015 9:13 AM
13	lectures	5/27/2015 2:13 PM
14	less	5/23/2015 2:00 PM
15	Spin class	5/15/2015 8:38 PM
16	Horseshoes competition outdoor concerts	5/14/2015 8:57 PM
17	Ping pong tables, martial arts	5/14/2015 8:46 PM
18	Many programs I didn't know about. Pool tables are great.	5/12/2015 6:24 PM
19	None	5/11/2015 11:21 AM
20	none	5/11/2015 10:18 AM
21	Better publicity to seasonal residents	5/8/2015 5:21 PM
22	A class on Rebounders	5/7/2015 9:57 AM
23	acting	5/6/2015 1:33 PM
24	stretching class	5/5/2015 1:03 PM
25	Aerobics class	5/2/2015 5:33 PM
26	More elipticals and other working equipment in the Cardio Room; and possibly a place that isn't a pass through - so that if you are really working up a sweat, people aren't walking through the room to gawk at you	5/2/2015 10:50 AM
27	none	5/1/2015 5:54 PM
28	Golf class, oil painting class	5/1/2015 12:35 PM
29	non exercise programs	5/1/2015 11:58 AM
30	more weight machines	4/30/2015 11:48 AM
31	None that I can think of	4/30/2015 11:41 AM
32	Never tried, but should try exercise equipment	4/29/2015 4:46 PM

Otis Master Plan Survey

33	I have not been, but will go after taking this survey.	4/28/2015 1:13 PM
34	Book club	4/28/2015 8:01 AM
35	dinner socials	4/27/2015 3:31 PM
36	senior exercise in summer, beginner level	4/27/2015 2:12 PM
37	Don't know	4/27/2015 9:02 AM
38	Exercise	4/26/2015 5:52 PM
39	contra dancing	4/26/2015 3:06 PM
40	Zumba	4/26/2015 11:58 AM
41	Bridge instruction for intermediate players Conversational Spanish group	4/25/2015 8:30 PM
42	Dancing	4/25/2015 6:37 PM
43	I would like to see Pilates as a permanent program	4/25/2015 1:24 PM
44	n/a	4/25/2015 10:29 AM
45	Yoga that is more suitable for middle-aged people with an instructor whose classes are not challenging to the point of painful.	4/24/2015 1:08 PM
46	Personal trainer and a certified person to show how to properly use equipment.	4/24/2015 10:06 AM
47	Ballroom dancing	4/23/2015 6:24 PM
48	Massage clinic	4/23/2015 4:35 PM
49	0	4/23/2015 4:28 PM
50	water skiing on Otis Reservoir	4/23/2015 4:25 PM
51	watercolor painting writing	4/23/2015 2:01 PM
52	Arts and crafts. Mosaics, stained glass, basket making, etc.	4/23/2015 2:01 PM
53	More one day workshops	4/23/2015 1:35 PM
54	More art classes. Different yoga style	4/23/2015 1:31 PM
55	I think there are too many programs that are geared toward summer residents....	4/23/2015 1:14 PM
56	Young adult programs to meet people	4/23/2015 6:32 AM
57	None	4/22/2015 10:53 PM
58	Kickboxing	4/22/2015 8:12 PM
59	None	4/22/2015 8:05 PM
60	Better marketing and letting people know about it	4/22/2015 7:53 PM
61	n/a	4/22/2015 5:03 PM

Otis Master Plan Survey

Q10 What is Otis' single greatest open space need? (List only one)

Answered: 67 Skipped: 112

#	Responses	Date
1	Other Dog Park	6/15/2015 4:48 PM
2	Other grocery store	6/11/2015 11:22 AM
3	Other Recreational activities	6/10/2015 5:44 AM
4	Water Issues otis resvoir	6/9/2015 6:01 PM
5	Athletic Fields Full court basketball court	6/9/2015 10:26 AM
6	Nothing to be left alone	6/3/2015 11:01 AM
7	Other none	6/3/2015 10:50 AM
8	Other tennis / town pool	6/3/2015 10:29 AM
9	Other more seating	6/3/2015 9:17 AM
10	Nothing doesnt need more, keep the town small	6/3/2015 9:00 AM
11	Other save money	6/3/2015 8:51 AM
12	Other Low Cost Housing	5/30/2015 11:28 AM
13	Other To be left alone	5/30/2015 11:17 AM
14	Nothing none	5/28/2015 9:13 AM
15	Farmington River Walk extending the Farmington River Walkway	5/27/2015 2:13 PM
16	Water Issues Spectical Pond Area	5/23/2015 3:58 PM
17	Nothing None	5/23/2015 2:00 PM
18	Biking / Improvements Bike trails	5/15/2015 8:38 PM
19	Water Issues more patrol on water	5/14/2015 8:57 PM
20	Hiking / Trails More hiking trails with scenic views	5/14/2015 8:46 PM
21	Other Away from the water, more space between properties.	5/12/2015 6:24 PM
22	Hiking / Trails Marked Trails	5/12/2015 10:34 AM
23	Maintain Existing Undeveloped for wildlife	5/11/2015 11:21 AM
24	Water Issues a good marina	5/11/2015 10:18 AM
25	Park / Town Green Dog play park	5/8/2015 5:21 PM
26	Maintain Existing Keep the current open spaces undeveloped	5/7/2015 9:57 AM
27	Water Issues protect rivers, streams , lakes and ponds	5/6/2015 7:21 PM
28	Park / Town Green town green	5/6/2015 1:33 PM
29	Don't Know I do not know	5/5/2015 1:03 PM
30	Otis Reservoir town beach access on the reservoir	5/2/2015 10:50 AM
31	Hiking / Trails trail work	5/2/2015 9:06 AM
32	Biking / Improvements bike trails, but the terrain is not conducive to a good, FLAT trail	5/2/2015 9:06 AM
33	Don't Know don't know	5/1/2015 5:54 PM
34	Nothing there is no need for additional open space	5/1/2015 5:18 PM

Otis Master Plan Survey

35	Park / Town Green Playscape or Children.	5/1/2015 11:25 AM
36	Hiking / Trails more trails	4/30/2015 11:48 AM
37	Don't Know ?	4/30/2015 11:41 AM
38	Hiking / Trails Public park with walking trails and outdoor fields for sports.	4/28/2015 8:01 AM
39	Nothing otis is fine like it is	4/27/2015 3:31 PM
40	More Open Space preserve open space (woods , farms, etc	4/27/2015 2:12 PM
41	Park / Town Green A Pavillion for weddings, parties, craft fairs etc.	4/27/2015 1:19 PM
42	Don't Know Don't know	4/27/2015 9:02 AM
43	Park / Town Green parks	4/27/2015 8:54 AM
44	Forests Forest for wildlife	4/26/2015 11:58 AM
45	Park / Town Green Town green opposite post office	4/25/2015 10:04 PM
46	Athletic Fields running/walking track	4/25/2015 8:30 PM
47	Water Issues canoe/kayak access to lakes	4/25/2015 10:29 AM
48	Hiking / Trails marked walking/hiking trail paths	4/24/2015 1:08 PM
49	Hiking / Trails Trails	4/24/2015 10:06 AM
50	Water Issues Enforcement of speed limits on lake	4/24/2015 8:55 AM
51	Prevent Clearcutting Not clear cutting land of trees	4/23/2015 7:26 PM
52	Otis Reservoir Water Issues Preserve the purity of the Reservoir	4/23/2015 6:24 PM
53	Farmington River Walk cleared/maintained river walk trail	4/23/2015 4:35 PM
54	Water Issues drinking water	4/23/2015 4:28 PM
55	Don't Know do not know	4/23/2015 2:01 PM
56	Don't Know ?	4/23/2015 2:01 PM
57	Otis Reservoir Preservation of Otis Reservoir	4/23/2015 1:53 PM
58	Park / Town Green An actual town center open air structure	4/23/2015 1:40 PM
59	Forests State Forests	4/23/2015 1:35 PM
60	Maintain Existing keep what we have working	4/23/2015 1:14 PM
61	Park / Town Green 100 acre park	4/23/2015 8:42 AM
62	Forests forest	4/23/2015 6:44 AM
63	Hunting hunting areas	4/22/2015 11:23 PM
64	Water Issues Free boat launching for residents	4/22/2015 8:12 PM
65	Nothing nothing	4/22/2015 8:05 PM
66	Nothing n/a	4/22/2015 5:03 PM
67	Water Issues Property owners water rites	4/22/2015 4:36 PM

Otis Master Plan Survey

Q11 What is Otis' single greatest recreation need? (List only one)

Answered: 80 Skipped: 99

#	Responses	Date
1	Biking / Improvements Bike Lanes	6/15/2015 4:48 PM
2	other ice rink	6/11/2015 11:22 AM
3	other Programs to use our open areas while interacting with our fellow residents	6/10/2015 5:44 AM
4	Water Issues Otis reservoir filled by May 1st, Tennis Courts	6/9/2015 6:01 PM
5	other Sports teams	6/9/2015 10:26 AM
6	Water Issues A town beach for residents on Otis Reservoir.	6/9/2015 9:14 AM
7	Biking / Improvements bike trail	6/3/2015 11:07 AM
8	Don't Know / Nothing good as is	6/3/2015 11:01 AM
9	Tennis Courts tennis	6/3/2015 10:29 AM
10	Mini-Golf mini golf and go carts	6/3/2015 9:00 AM
11	Don't Know / Nothing save money	6/3/2015 8:51 AM
12	Don't Know / Nothing none	5/30/2015 11:17 AM
13	Don't Know / Nothing none	5/28/2015 9:13 AM
14	Don't Know / Nothing no response	5/27/2015 2:13 PM
15	Water Issues A full reservoir	5/25/2015 9:56 PM
16	Hiking / Improvements More Walking trails	5/23/2015 3:58 PM
17	Don't Know / Nothing nothing	5/23/2015 2:00 PM
18	Biking / Improvements a bike path and/or sidewalks	5/20/2015 5:29 PM
19	Tennis Courts tennis court	5/18/2015 9:33 PM
20	Hiking / Improvements More hiking trails	5/15/2015 8:38 PM
21	Playgrounds A swing set	5/14/2015 8:46 PM
22	Don't Know / Nothing I don't know.	5/12/2015 6:24 PM
23	Don't Know / Nothing Don't know	5/11/2015 11:21 AM
24	Water Issues a good marina	5/11/2015 10:18 AM
25	Biking / Improvements An easily accessible trail which could be paved or crushed stone, which would be easy for walking, biking (not on the street) and wheelchair access. If it was paved, it would be perfect for rollerblading. currently drive all the way to the Mall, to use the Ashiwiltuck Trail.	5/8/2015 6:37 PM
26	Water Issues Canoe/kayak water access	5/8/2015 5:21 PM
27	Don't Know / Nothing none that I can think of	5/7/2015 9:57 AM
28	Athletic Fields/Facility athletic center for children and adults	5/6/2015 7:21 PM
29	Water Issues water	5/6/2015 1:33 PM
30	Tennis Courts Tennis Court	5/6/2015 9:12 AM
31	Playgrounds better playground	5/5/2015 1:03 PM
32	Water Issues town beach access with boat launch on the reservoir	5/2/2015 10:50 AM
33	Athletic Fields/Facility soccer fields/facility	5/2/2015 9:06 AM

Otis Master Plan Survey

34	Park / Gathering Area permanent meeting , concert spot	5/1/2015 6:44 PM
35	Don't Know / Nothing don't know	5/1/2015 5:54 PM
36	Don't Know / Nothing there is no need	5/1/2015 5:18 PM
37	Water Issues more public access to waterways	5/1/2015 11:58 AM
38	Athletic Fields/Facility Youth sports opportunities.	5/1/2015 11:25 AM
39	Water Issues J and D	5/1/2015 9:06 AM
40	Tennis Courts tennis court	4/30/2015 4:43 PM
41	Tennis Courts tennis court	4/30/2015 11:48 AM
42	Don't Know / Nothing None.	4/30/2015 11:41 AM
43	Walking / Improvements Safe places to walk/ W.Center Rd needs work	4/29/2015 4:46 PM
44	Skiing skiing	4/27/2015 3:31 PM
45	Water Issues ban personal watercraft " sea-doos" from reservoir	4/27/2015 2:12 PM
46	Accessibility Issues Hiking / Improvements Walking / Improvements Senior / challenged persons walking-hiking trails	4/27/2015 1:42 PM
47	Biking / Improvements Bike Paths	4/27/2015 1:19 PM
48	Hiking / Improvements Hiking Trails	4/27/2015 9:02 AM
49	More Maintenance help cleaning parks and trails	4/27/2015 8:54 AM
50	Tennis Courts tennis courts	4/26/2015 3:06 PM
51	Indoor Rec. Activities Indoor activities for the long winters	4/26/2015 11:58 AM
52	Water Issues Limit power boats on reservoir	4/25/2015 10:04 PM
53	Biking / Improvements safe bike trail	4/25/2015 8:30 PM
54	Biking / Improvements Safe biking treiles	4/25/2015 6:37 PM
55	Don't Know / Nothing n/a	4/25/2015 10:29 AM
56	Indoor Rec. Activities restorative yoga and/or more dance movement classes	4/24/2015 1:08 PM
57	Indoor Rec. Activities An appropriate Rec Center.	4/24/2015 10:06 AM
58	Tennis Courts Public tennis court	4/24/2015 8:55 AM
59	Water Issues Regulation of day users and residents on the Reservoir	4/23/2015 6:24 PM
60	Restaurants restaurants	4/23/2015 5:48 PM
61	Biking / Improvements bike path	4/23/2015 4:35 PM
62	Don't Know / Nothing 0	4/23/2015 4:28 PM
63	Indoor Rec. Activities Pool indoor/outdoor swimming pool	4/23/2015 3:44 PM
64	Water Issues More affordable dock space and easier lake access.	4/23/2015 2:01 PM
65	Water Issues The Reservoir. Would like to see stocked with more fish.	4/23/2015 2:01 PM
66	Water Issues Preservation of Otis Reservoir	4/23/2015 1:53 PM
67	Education / Interpretive Birdwatching, foraging, tree & plant identification and other walking groups	4/23/2015 1:40 PM
68	Indoor Rec. Activities Larger Indoor Fitness Area's	4/23/2015 1:35 PM
69	Indoor Rec. Activities A real gym	4/23/2015 1:31 PM
70	simplify what we are offering	4/23/2015 1:14 PM
71	Park / Gathering Area 100 acre park	4/23/2015 8:42 AM
72	Indoor Rec. Activities more snowmobile trails	4/23/2015 6:44 AM
73	Park / Gathering Area a new spraypark/playground for kids	4/22/2015 11:42 PM

Otis Master Plan Survey

74	Water Issues Limit boats on Reservoir	4/22/2015 10:53 PM
75	Pool Community pool	4/22/2015 8:12 PM
76	Don't Know / Nothing nothing	4/22/2015 8:05 PM
77	Water Issues harbor master	4/22/2015 7:43 PM
78	Mini-Golf Mini golf	4/22/2015 6:59 PM
79	Don't Know / Nothing n/a	4/22/2015 5:03 PM
80	Water Issues Property owners water rites	4/22/2015 4:36 PM

APPENDIX D: BIOMAP2 REPORT



BioMap2

CONSERVING THE BIODIVERSITY OF
MASSACHUSETTS IN A CHANGING WORLD

Otis

Produced in 2012

This report and associated map provide information about
important sites for biodiversity conservation in your area.

**This information is intended for conservation planning, and is
not intended for use in state regulations.**



Natural Heritage
& Endangered Species
Program
Massachusetts Division of Fisheries & Wildlife

The Nature
Conservancy 
Protecting nature. Preserving life.™



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Critical Natural Landscape Summaries





Introduction

The Massachusetts Department of Fish & Game, through the Division of Fisheries and Wildlife's Natural Heritage & Endangered Species Program (NHESP), and The Nature Conservancy's Massachusetts Program developed *BioMap2* to protect the state's biodiversity in the context of climate change.

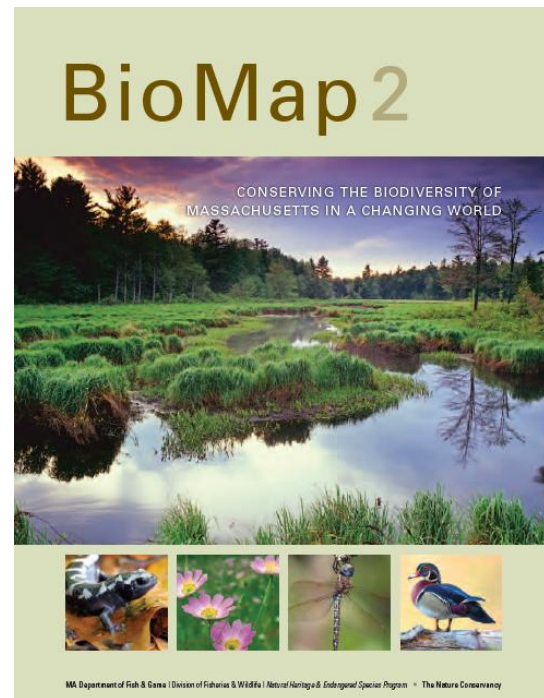
BioMap2 combines NHESP's 30 years of rigorously documented rare species and natural community data with spatial data identifying wildlife species and habitats that were the focus of the Division of Fisheries and Wildlife's 2005 State Wildlife Action Plan (SWAP). *BioMap2* also integrates The Nature Conservancy's assessment of large, well-connected, and intact ecosystems and landscapes across the Commonwealth, incorporating concepts of ecosystem resilience to address anticipated climate change impacts.

Protection and stewardship of *BioMap2* Core Habitat and Critical Natural Landscape is essential to safeguard the diversity of species and their habitats, intact ecosystems, and resilient natural landscapes across Massachusetts.

What Does Status Mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act (MESA), M.G.L. c.131A, and its implementing regulations 321 CMR 10.00. Rare species are categorized as Endangered, Threatened or of Special Concern according to the following:

- Endangered species are in danger of extinction throughout all or a significant portion of their range or are in danger of extirpation from Massachusetts.



Get your copy of the *BioMap2* report! Download from www.mass.gov/nhesp or contact Natural Heritage at 508-389-6360 or natural.heritage@state.ma.us.

- Threatened species are likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range.
- Special Concern species have suffered a decline that could threaten the species if allowed to continue unchecked or occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become Threatened in Massachusetts.

In addition NHESP maintains an unofficial watch list of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated by any law or regulations, but they can help to identify





ecologically important areas that are worthy of protection. The status of natural communities reflects the documented number and acreages of each community type in the state:

- Critically Imperiled communities typically have 5 or fewer documented good sites or have very few remaining acres in the state.
- Imperiled communities typically have 6-20 good sites or few remaining acres in the state.
- Vulnerable communities typically have 21-100 good sites or limited acreage across the state.
- Secure communities typically have over 100 sites or abundant acreage across the state; however, excellent examples are identified as Core Habitat to ensure continued protection.

In 2005 the Massachusetts Division of Fisheries and Wildlife completed a comprehensive State Wildlife Action Plan (SWAP) documenting the status of Massachusetts wildlife and providing recommendations to help guide wildlife conservation decision-making. SWAP includes all the wildlife species listed under the Massachusetts Endangered Species Act (MESA), as well as more than 80 species that need conservation attention but do not meet the requirements for inclusion under MESA. The SWAP document is organized around habitat types in need of conservation within the Commonwealth. While the original BioMap focused primarily on rare species protected under MESA, *BioMap2* also addresses other Species of Conservation Concern, their habitats, and the ecosystems that support them to create a spatial representation of most of the elements of SWAP.

***BioMap2*: One Plan, Two Components**

BioMap2 identifies two complementary spatial layers, Core Habitat and Critical Natural Landscape.

Core Habitat identifies key areas that are critical for the long-term persistence of rare species and other Species of Conservation Concern, as well as a wide diversity of natural communities and intact ecosystems across the Commonwealth. Protection of Core Habitats will contribute to the conservation of specific elements of biodiversity.

Critical Natural Landscape identifies large natural Landscape Blocks that are minimally impacted by development. If protected, these areas will provide habitat for wide-ranging native species, support intact ecological processes, maintain connectivity among habitats, and enhance ecological resilience to natural and anthropogenic disturbances in a rapidly changing world. Areas delineated as Critical Natural Landscape also include buffering upland around wetland, coastal, and aquatic Core Habitats to help ensure their long-term integrity.

The long-term persistence of Massachusetts biological resources requires a determined commitment to land and water conservation. Protection and stewardship of both Critical Natural Landscapes and Core Habitats are needed to realize the biodiversity conservation vision of *BioMap2*.

Components of Core Habitat

Core Habitat identifies specific areas necessary to promote the long-term persistence of rare species, other Species of Conservation Concern, exemplary natural communities, and intact ecosystems.

Rare Species

There are 432 native plant and animal species listed as Endangered, Threatened or Special Concern under the Massachusetts Endangered Species Act (MESA) based on their rarity, population trends, and threats to survival. For





Table 1. Species of Conservation Concern described in the State Wildlife Action Plan and/or included on the MESA List and for which habitat was mapped in *BioMap2*. Note that plants are not included in SWAP, and that marine species such as whales and sea turtles are not included in *BioMap2*.

Taxonomic Group	MESA-listed Species	Non-listed Species of Conservation Concern
Mammals	4	5
Birds	27	23
Reptiles	10	5
Amphibians	4	3
Fish	10	17
Invertebrates	102	9
Plants	256	0
Total	413	62

BioMap2, NHESP staff identified the highest quality habitat sites for each non-marine species based on size, condition, and landscape context.

Other Species of Conservation Concern

In addition to species on the MESA List described previously, the State Wildlife Action Plan (SWAP) identifies 257 wildlife species and 22 natural habitats most in need of conservation within the Commonwealth. *BioMap2* includes species-specific habitat areas for 45 of these species and habitat for 17 additional species which was mapped with other coarse-filter and fine-filter approaches.

Priority Natural Communities

Natural communities are assemblages of plant and animal species that share a common environment and occur together repeatedly on the landscape. *BioMap2* gives conservation

priority to natural communities with limited distribution and to the best examples of more common types.

Vernal Pools

Vernal pools are small, seasonal wetlands that provide important wildlife habitat, especially for amphibians and invertebrate animals that use them to breed. *BioMap2* identifies the top 5 percent most interconnected clusters of Potential Vernal Pools in the state.

Forest Cores

In *BioMap2*, Core Habitat includes the best examples of large, intact forests that are least impacted by roads and development, providing critical habitat for numerous woodland species. For example, the interior forest habitat defined by Forest Cores supports many bird species sensitive to the impacts of roads and development, such as the Black-throated Green Warbler, and helps maintain ecological processes found only in unfragmented forest patches.

Wetland Cores

BioMap2 used an assessment of Ecological Integrity to identify the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Aquatic Cores

To delineate integrated and functional ecosystems for fish species and other aquatic





Species of Conservation Concern, beyond the species and exemplary habitats described above, *BioMap2* identifies intact river corridors within which important physical and ecological processes of the river or stream occur.

Components of Critical Natural Landscape

Critical Natural Landscape identifies intact landscapes in Massachusetts that are better able to support ecological processes and disturbance regimes, and a wide array of species and habitats over long time frames.

Landscape Blocks

BioMap2 identifies the most intact large areas of predominately natural vegetation, consisting of contiguous forests, wetlands, rivers, lakes, and ponds, as well as coastal habitats such as barrier beaches and salt marshes.

Upland Buffers of Wetland and Aquatic Cores

A variety of analyses were used to identify protective upland buffers around wetlands and rivers.

Upland Habitat to Support Coastal Adaptation

BioMap2 identifies undeveloped lands adjacent to and up to one and a half meters above existing salt marshes as Critical Natural Landscapes with high potential to support inland migration of salt marsh and other coastal habitats over the coming century.

The conservation areas identified by *BioMap2* are based on breadth and depth of data, scientific expertise, and understanding of Massachusetts' biodiversity. The numerous sources of information and analyses used to

Legal Protection of Biodiversity

BioMap2 presents a powerful vision of what Massachusetts would look like with full protection of the land most important for supporting the Commonwealth's biodiversity. While *BioMap2* is a planning tool with *no regulatory function*, all state-listed species enjoy legal protection under the [Massachusetts Endangered Species Act \(M.G.L. c.131A\)](#) and its implementing regulations ([321 CMR 10.00](#)). Wetland habitat of state-listed wildlife is also protected under the [Wetlands Protection Act Regulations \(310 CMR 10.00\)](#). The *Natural Heritage Atlas* contains maps of [Priority Habitats](#) and [Estimated Habitats](#), which are used, respectively, for regulation under the Massachusetts Endangered Species Act and the Wetlands Protection Act. For more information on rare species regulations, and to view Priority and Estimated Habitat maps, please see the [Regulatory Review](#) page at <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/>.

BioMap2 is a conservation planning tool that does not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the BioMap2 vision is fully realized, we must continue to protect our most imperiled species and their habitats.

create Core Habitat and Critical Natural Landscape are complementary, and outline a comprehensive conservation vision for Massachusetts, from rare species to intact landscapes. In total, these robust analyses define a suite of priority lands and waters that, if permanently protected, will support Massachusetts' natural systems for generations to come.





Understanding Core Habitat Summaries

Following the Town Overview, there is a descriptive summary of each Core Habitat and Critical Natural Landscape that occurs in your city or town. These summaries highlight some of the outstanding characteristics of each Core Habitat and Critical Natural Landscape, and will help you learn more about your city or town's biodiversity. You can find out more information about many of these species and natural communities by looking at specific fact sheets at www.mass.gov/nhesp.

Additional Information

For copies of the full *BioMap2* report, the Technical Report, and an [interactive mapping tool](#), visit the *BioMap2* [website](#) via the Land Protection and Planning tab at www.mass.gov/nhesp. If you have any questions about this report, or if you need help protecting land for biodiversity in your community, the Natural Heritage & Endangered Species Program staff looks forward to working with you.

Contact the Natural Heritage & Endangered Species Program

By phone 508-389-6360
By fax 508-389-7890
By email natural.heritage@state.ma.us
By Mail 100 Hartwell Street, Suite 230
West Boylston, MA 01583

The GIS datalayers of *BioMap2* are available for download from MassGIS at www.mass.gov/mgis.



**Natural Heritage
& Endangered
Species Program**

Massachusetts Division of Fisheries and Wildlife
1 Rabbit Hill Road, Westborough, MA 01581
phone: 508-389-6360 fax: 508-389-7890

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.



Town Overview

Otis lies on the border of the Berkshire Highlands/Southern Green Mountains and the Lower Berkshire Hills Ecoregions. The Berkshire Highlands Ecoregion is an area drained by the Deerfield, upper Westfield, Hoosic, and Housatonic Rivers. Lakes and ponds are relatively abundant. This ecoregion has deep soils that support northern hardwoods and spruce-fir forests. The Lower Berkshire Hills Ecoregion is similar to the Berkshire Highlands Ecoregion, with its common northern hardwoods, but lacks spruce-fir and harbors transition hardwoods. Lakes and ponds are relatively abundant.



Otis at a Glance

- Total Area: 24,353 acres (38.1 square miles)
- Human Population in 2010: 1,612
- Open space protected in perpetuity: 6,283 acres, or 25.8% percent of total area*
- BioMap2 Core Habitat: 5,115 acres
- BioMap2 Core Habitat Protected: 1,614 acres or 31.5%
- BioMap2 Critical Natural Landscape: 15,535 acres
- BioMap2 Critical Natural Landscape Protected: 4,833 acres or 31.1%.

BioMap2 Components

Core Habitat

- 4 Exemplary or Priority Natural Community Cores
- 1 Forest Core
- 14 Wetland Cores
- 9 Aquatic Cores
- 1 Vernal Pool Core
- 14 Species of Conservation Concern Cores**
 - 2 reptiles, 1 fish, 1 insect, 2 mussels, 5 plants

Critical Natural Landscape

- 5 Landscape Blocks
- 14 Wetland Core Buffers
- 8 Aquatic Core Buffers

* Calculated using MassGIS data layer "Protected and Recreational Open Space—March, 2012".

** See next pages for complete list of species, natural communities and other biodiversity elements.

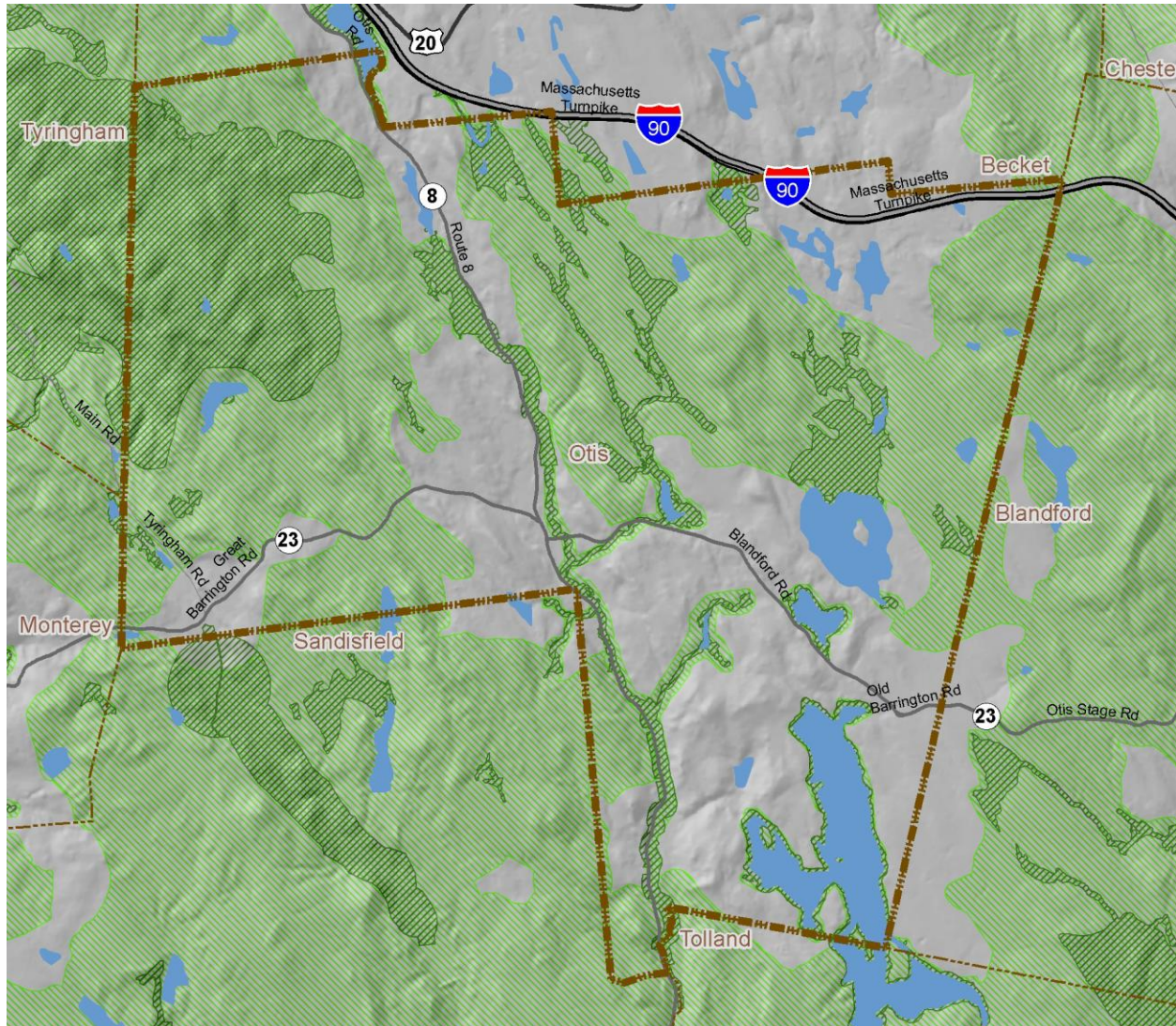




BioMap2

Conserving the Biodiversity of Massachusetts in a Changing World

BioMap2 Core Habitat and Critical Natural Landscape in Otis

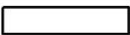


BioMap2 Core Habitat



BioMap2 Critical Natural Landscape

1 Mile



Natural Heritage
& Endangered
Species Program

Massachusetts Division of Fisheries and Wildlife

1 Rabbit Hill Road, Westborough, MA 01581

phone: 508-389-6360 fax: 508-389-7890

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.



**Species of Conservation Concern, Priority and Exemplary Natural Communities,
and Other Elements of Biodiversity in Otis**

Mussels

[Brook Floater \(Swollen Wedgemussel\)](#), (*Alasmodonta varicosa*), E
[Triangle Floater](#), (*Alasmodonta undulata*), Non-listed SWAP species

Insects

Dragonflies

[Harpoon Clubtail](#), (*Gomphus desertus*), E

Fishes

[Bridle Shiner](#), (*Notropis bifrenatus*), SC

Reptiles

Smooth Green Snake, (*Opheodrys vernalis*), Non-listed SWAP

Spotted Turtle, (*Clemmys guttata*), Non-listed SWAP

Plants

[Dwarf Mistletoe](#), (*Arceuthobium pusillum*), SC

[Shore Sedge](#), (*Carex lenticularis*), T

[Thread Rush](#), (*Juncus filiformis*), E

[Great Laurel](#), (*Rhododendron maximum*), T

[Crooked-stem Aster](#), (*Symphotrichum prenanthoides*), SC

Priority Natural Communities

[Acidic Shrub Fen](#), S3

[Level Bog](#), S3

[High-energy Riverbank](#), S3

Other BioMap2 Components

[Forest Core](#)

[Aquatic Core](#)

[Wetland Core](#)

[Vernal Pool Core](#)

E = Endangered

T = Threatened

SC = Special Concern

S1 = Critically Imperiled communities, typically 5 or fewer documented sites or very few remaining acres in the state.

S2 = Imperiled communities, typically 6-20 sites or few remaining acres in the state.

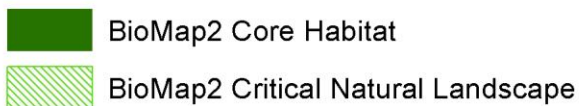
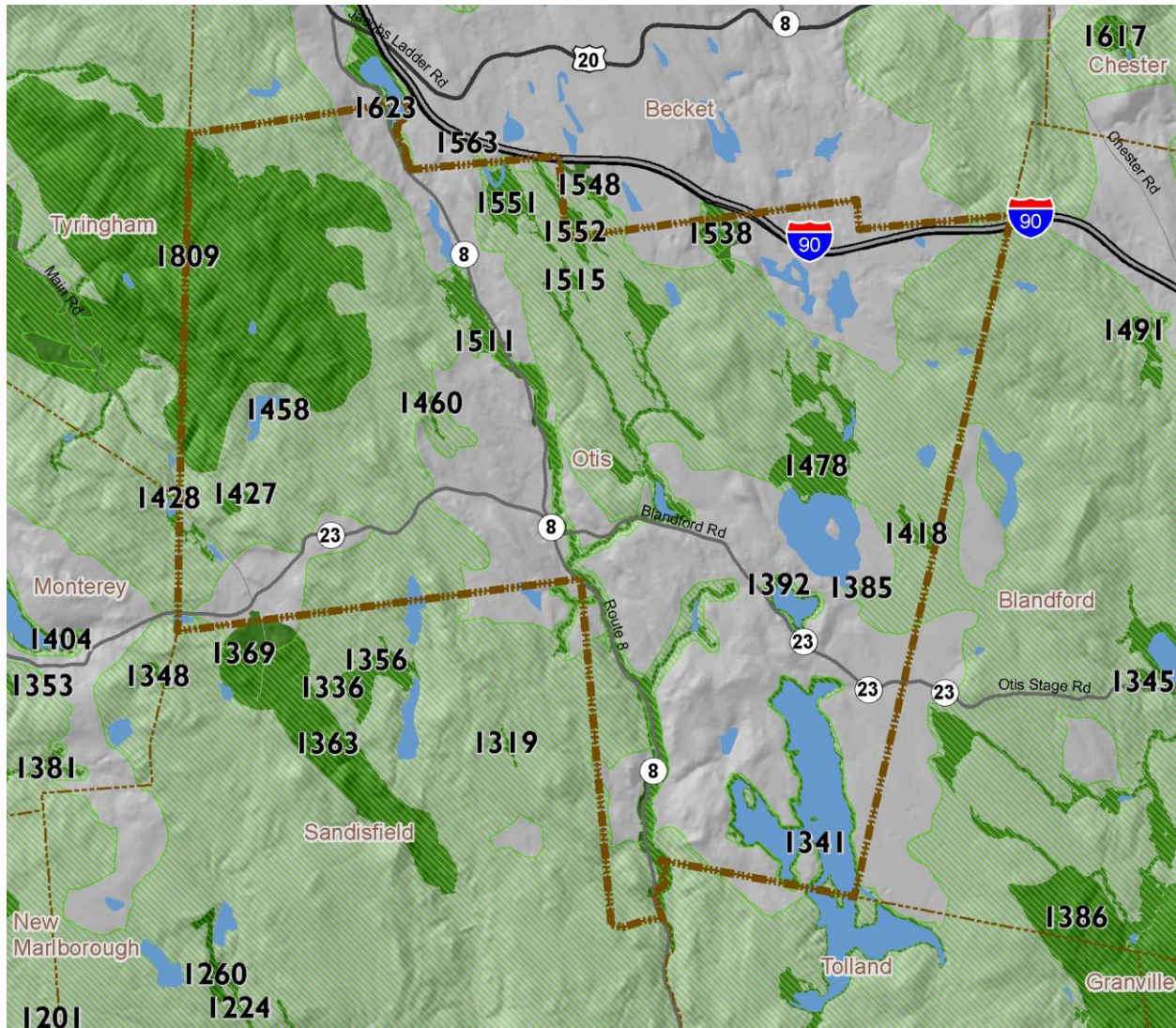
S3 = Vulnerable communities, typically have 21-100 sites or limited acreage across the state.



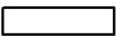


BioMap2 Core Habitat in Otis

Core IDs correspond with the following element lists and summaries.



1 Mile



Natural Heritage
& Endangered
Species Program

Massachusetts Division of Fisheries and Wildlife

1 Rabbit Hill Road, Westborough, MA 01581

phone: 508-389-6360 fax: 508-389-7890

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.

Elements of BioMap2 Cores

This section lists all elements of BioMap2 Cores that fall *entirely or partially* within Otis. The elements listed here may not occur within the bounds of Otis.

Core 1341

Aquatic Core

Species of Conservation Concern

Bridle Shiner

Notropis bifrenatus

SC

Core 1363

Priority & Exemplary Natural Communities

Hemlock Ravine Community

Species of Conservation Concern

Ocellated Darner

Boyeria grafiana

SC

Zebra Clubtail

Stylurus scudderi

Non-listed SWAP

Spotted Turtle

Clemmys guttata

Non-listed SWAP

Wood Turtle

Glyptemys insculpta

SC

Core 1369

Species of Conservation Concern

Spotted Turtle

Clemmys guttata

Non-listed SWAP

Core 1385

Aquatic Core

Core 1392

Aquatic Core

Species of Conservation Concern

Bridle Shiner

Notropis bifrenatus

SC

Core 1418

Wetland Core

Core 1427

Wetland Core

Core 1428

Wetland Core



**Core 1458**

Aquatic Core

Species of Conservation Concern

Great Laurel

Rhododendron maximum

T

Core 1460

Wetland Core

Core 1478

Wetland Core

Aquatic Core

Species of Conservation Concern

Shore Sedge

Carex lenticularis

T

Core 1511

Wetland Core

Aquatic Core

Priority & Exemplary Natural Communities

High-energy Riverbank

S3

Species of Conservation Concern

Crooked-stem Aster

Symphyotrichum prenanthoides

SC

Brook Floater (Swollen Wedgemussel)

Alasmidonta varicosa

E

Triangle Floater

Alasmidonta undulata

Non-listed SWAP

Harpoon Clubtail

Gomphus desertus

E

Bridle Shiner

Notropis bifrenatus

SC

Core 1513

Wetland Core

Core 1514

Wetland Core

Core 1515

Wetland Core

Core 1538

Aquatic Core

Priority & Exemplary Natural Communities

Level Bog

S3

Species of Conservation Concern

Dwarf Mistletoe

Arceuthobium pusillum

SC





Thread Rush	<i>Juncus filiformis</i>	E
Core 1546		
Wetland Core		
Core 1548		
Species of Conservation Concern		
Smooth Green Snake	<i>Opheodrys vernalis</i>	Non-listed SWAP
Core 1551		
Wetland Core		
Priority & Exemplary Natural Communities		
Acidic Shrub Fen		S3
Species of Conservation Concern		
Dwarf Mistletoe	<i>Arceuthobium pusillum</i>	SC
Core 1552		
Wetland Core		
Core 1563		
Wetland Core		
Core 1623		
Aquatic Core		
Species of Conservation Concern		
Bridle Shiner	<i>Notropis bifrenatus</i>	SC
American Bittern	<i>Botaurus lentiginosus</i>	E
Core 1809		
Forest Core		
Wetland Core		
Aquatic Core		
Vernal Pool Core		
Priority & Exemplary Natural Communities		
Calcareous Forest Seep Community		S2
Calcareous Sloping Fen		S2
Deep emergent marsh		
Level Bog		S3
Major-river Floodplain Forest		S2
Rich, Mesic Forest Community		S3
Small-river Floodplain Forest		S2
Species of Conservation Concern		





Andrews' Bottle Gentian	<i>Gentiana andrewsii</i>	E
Bristly Black Currant	<i>Ribes lacustre</i>	SC
Bur Oak	<i>Quercus macrocarpa</i>	SC
Downy Wood-mint	<i>Blephilia ciliata</i>	E
Dwarf Scouring-rush	<i>Equisetum scirpoides</i>	SC
Fen Sedge	<i>Carex tetanica</i>	SC
Frank's Lovegrass	<i>Eragrostis frankii</i>	SC
Great Blue Lobelia	<i>Lobelia siphilitica</i>	E
Hairy Wood-mint	<i>Blephilia hirsuta</i>	E
Hitchcock's Sedge	<i>Carex hitchcockiana</i>	SC
Intermediate Spike-sedge	<i>Eleocharis intermedia</i>	T
Long-leaved Bluet	<i>Houstonia longifolia</i>	E
Long-styled Sanicle	<i>Sanicula odorata</i>	T
Pale Green Orchis	<i>Platanthera flava</i> var. <i>herbiola</i>	T
Purple Clematis	<i>Clematis occidentalis</i>	SC
Smooth Rock-cress	<i>Boechera laevigata</i>	SC
Tuckerman's Sedge	<i>Carex tuckermanii</i>	E
Woodland Millet	<i>Milium effusum</i>	T
Creeper	<i>Strophitus undulatus</i>	SC
Triangle Floater	<i>Alasmidonta undulata</i>	Non-listed SWAP
Ostrich Fern Borer Moth	<i>Papaipema</i> sp. 2 nr. <i>pterisii</i>	SC
Dion Skipper	<i>Euphyes dion</i>	T
Arrow Clubtail	<i>Stylurus spiniceps</i>	Non-listed SWAP
Brook Snaketail	<i>Ophiogomphus aspersus</i>	SC
Skillet Clubtail	<i>Gomphus ventricosus</i>	T
Stygian Shadowdragon	<i>Neurocordulia yamaskanensis</i>	SC
Zebra Clubtail	<i>Stylurus scudderi</i>	Non-listed SWAP
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	SC
Marbled Salamander	<i>Ambystoma opacum</i>	T
Northern Leopard Frog	<i>Rana pipiens</i>	Non-listed SWAP
Wood Turtle	<i>Glyptemys insculpta</i>	SC
Bridle Shiner	<i>Notropis bifrenatus</i>	SC
Longnose Sucker	<i>Catostomus catostomus</i>	SC
American Bittern	<i>Botaurus lentiginosus</i>	E
King Rail	<i>Rallus elegans</i>	T
Sedge Wren	<i>Cistothorus platensis</i>	E
Sora	<i>Porzana carolina</i>	Non-listed SWAP





Core Habitat Summaries

Core 1341

A 1,282-acre Core Habitat featuring Aquatic Core and a Species of Conservation Concern.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

Bridle Shiners are small (<5 cm) minnows that are found in clear water in slack areas of streams and rivers and are also found in lakes and ponds.

Core 1363

A 777-acre Core Habitat featuring Priority Natural Communities and Species of Conservation Concern.

Hemlock Ravine Communities are evergreen forests made up primarily of hemlocks, with dense, nearly closed canopies that cast deep shade so that very few plants grow below. They occur on moist, north-facing slopes, or along north-facing ravines. This excellent but small example of Hemlock Ravine community is in a very rocky area on the edge of a gorge. Mostly open understory with patches of young trees growing around tip-ups and large downed logs.

Ocellated Darners are dragonflies whose nymphs inhabit clear, shallow, rocky, swift-flowing streams and large, rocky, poorly vegetated lakes. Adults also inhabit nearby uplands, often forests with mixed coniferous and deciduous trees.

The Zebra Clubtail dragonfly inhabits sand-bottomed streams and small rivers with riffles as larvae. Adults feed over the same streams. Surrounding upland forests provide protection while adults reach sexual maturity.

Strong populations of Spotted Turtles in good habitat - large, unfragmented, protected open space - continue to be of interest for the conservation of this species. This small, dark-colored turtle with yellow spots on its carapace inhabits a variety of wetlands year-round and nests in nearby uplands during spring. Road and collection are the primary conservation concerns.

Wood Turtle habitat is streams and rivers, preferably with long corridors of undeveloped, connected uplands. They also use fields and early succesional habitat extending up to 500 meters on both sides of the waterways. Mowing and roads are the primary causes of mortality. Collection is also a conservation concern.

Core 1369

A 186-acre Core Habitat featuring a Species of Conservation Concern.

Strong populations of Spotted Turtles in good habitat - large, unfragmented, protected open space - continue to be of interest for the conservation of this species. This small, dark-colored turtle with yellow spots on its carapace inhabits a variety of wetlands year-round and nests in nearby uplands during spring. Road and collection are the primary conservation concerns.





Core 1385

A 7-acre Core Habitat featuring Aquatic Core.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

Core 1392

An 88-acre Core Habitat featuring Aquatic Core and a Species of Conservation Concern.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

Bridle Shiners are small (<5 cm) minnows that are found in clear water in slack areas of streams and rivers and are also found in lakes and ponds.

Core 1418

A 39-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 1427

A 22-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

The Wetland Core occurs on mid-elevation mafic bedrock (rich in minerals like iron and magnesium), one of the least common ecological settings for Wetland Cores in the state.

Core 1428

A 35-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

The Wetland Core occurs on mid-elevation mafic bedrock (rich in minerals like iron and magnesium), one of the least common ecological settings for Wetland Cores in the state.





Core 1458

A 3-acre Core Habitat featuring Aquatic Core and a Species of Conservation Concern.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

Great Laurel, a member of the Heath family, is an evergreen shrub or small tree that grows up to 10 m high. It is a plant of moist woods, swamps, and the edges of ponds.

Core 1460

A 14-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

The Wetland Core occurs on mid-elevation slate, one of the least common ecological settings for Wetland Cores in the state.

Core 1478

A 408-acre Core Habitat featuring Wetland Core, Aquatic Core, and Species of Conservation Concern.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

The 393-acre Wetland Core is the 2nd largest in this ecoregion and among the largest 20% of Wetland Cores statewide.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

In Massachusetts, Shore Sedge appears to be restricted to wet, sandy or gravelly beaches of cold ponds and lakes, or to the exposed rock cobble on islands of large rivers.

Core 1511

A 954-acre Core Habitat featuring Wetland Core, Aquatic Core, Priority Natural Communities, and Species of Conservation Concern.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.





A 66-acre Wetland Core and an 87-acre Wetland Core are among the largest 20% of Wetland Cores in this ecoregion.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

High-Energy Riverbank communities are sparse, open graminoid communities found on cobble and sand deposits along fast-flowing rivers that experience severe flooding and ice scour. This example of High-Energy Riverbank is in good condition, with natural processes of flood and scour that perpetuate the community, but is not well buffered on one side of the river.

Crooked-stem Aster is a perennial herbaceous plant that occurs in open to semi-open conditions along rich rivers, streams, and seeps and along open and semi-open roadsides in the areas of rich streams.

The Brook Floater, a medium-sized freshwater mussel, is found in small to medium-sized streams with moderate to slow flow. These streams have stable substrates such as rough sand, cobble, and gravel; rooted aquatic vegetation is usually present.

Triangle Floaters are freshwater mussels commonly found in low-gradient river reaches with sand and gravel substrates and low to moderate water velocities, although they are found in a wide range of substrate and flow conditions.

Harpoon Clubtails are dragonflies that inhabit clear, cold streams with intermittent sections of rocks and rapids.

Bridle Shiners are small (<5 cm) minnows that are found in clear water in slack areas of streams and rivers and are also found in lakes and ponds.

Core 1513

A <1-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 1514

A <1-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.





Core 1515

A 15-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 1538

An 89-acre Core Habitat featuring Aquatic Core, Priority Natural Communities, and Species of Conservation Concern.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

Level Bogs are dwarf-shrub peatlands, generally with pronounced hummocks and hollows in sphagnum moss. These wetland communities are very acidic and nutrient-poor because the peat isolates them from nutrients in groundwater and streams. This example of Level Bog is one of the best of its kind in the state, due to its diversity of species and habitats, its well developed sphagnum layer, and its relatively extensive buffer of natural vegetation.

A member of the Christmas Mistletoe family, Dwarf Mistletoe is a very small fleshy shrub, usually no more than 0.8 inch tall, that parasitizes conifer trees. In Massachusetts, Dwarf Mistletoe occurs in peatlands varying from kettlehole peat bogs to spruce-fir-birch headwater swamps, generally on the branches of black spruce (*Picea mariana*).

In Massachusetts, the Thread Rush has typically been found in wet, acidic, nutrient-poor sandy or peaty substrates along bog margins, pond shores, and in marshes.

Core 1546

A <1-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 1548

A 54-acre Core Habitat featuring a Species of Conservation Concern.

A small to medium-sized snake, adult Smooth Green Snakes are 14-20 inches long with a uniform light green back and yellow to white venter. The Smooth Green Snake is found in moist open or lightly forested habitat where grasses and shrubs are abundant (edges of marshes, wet meadows, fields, and forest edges or open forests, grasslands, blueberry barrens, pine barrens) and prefers to forage on the ground with activity in the daytime. Smooth Green Snake overwinter in rodent burrows, ant mounds and rock crevices, either singly or communally.





Core 1551

A 121-acre Core Habitat featuring Wetland Core, Priority Natural Communities, and a Species of Conservation Concern.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

The 118-acre Wetland Core is among the largest 20% of Wetland Cores statewide and in this ecoregion.

Acidic Shrub Fens are shrub-dominated acidic peatlands found primarily along pond margins in the eastern and central part of the state. These wetland communities experience some groundwater and/or surface water inputs, but no calcareous seepage. This example of Acidic Shrub Fen is the second largest known in the state and contains an interesting, unusual component of more northern bog plant species.

A member of the Christmas Mistletoe family, Dwarf Mistletoe is a very small fleshy shrub, usually no more than 0.8 inch tall, that parasitizes conifer trees. In Massachusetts, Dwarf Mistletoe occurs in peatlands varying from kettlehole peat bogs to spruce-fir-birch headwater swamps, generally on the branches of black spruce (*Picea mariana*).

Core 1552

A 65-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

The 65-acre Wetland Core is among the largest 20% of Wetland Cores in this ecoregion.

Core 1563

A 6-acre Core Habitat featuring Wetland Core.

Wetland Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Core 1623

A 182-acre Core Habitat featuring Aquatic Core and Species of Conservation Concern.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

Bridle Shiners are small (<5 cm) minnows that are found in clear water in slack areas of streams and rivers and are also found in lakes and ponds.





American Bitterns are heron-like birds that nest primarily in large cattail, tussock or shrub marshes and are very sensitive to disturbance.

Core 1809

An 11,464-acre Core Habitat featuring Forest Core, Wetland Core, Aquatic Core, Vernal Pool Core, Priority Natural Communities, and Species of Conservation Concern.

The middle reach of the Housatonic River runs through a large *BioMap2* Core Habitat that stretches east-west from West Stockbridge to Otis. Forty species of rare and uncommon plants and animals inhabit this Core Habitat, including the globally rare Skillet Clubtail dragonfly and Ostrich Fern Borer Moth. The Housatonic here supports four more rare and uncommon species of dragonflies (a hotspot for riverine dragonflies state-wide), as well as Longnose Suckers, Triangle Floater and Creeper freshwater mussels, and several rare plants. An important tributary to the Housatonic in this Core Habitat, Hop Brook, with its adjacent calcareous marshes, supports a diverse array of rare and specialized plants, as well as the Endangered American Bittern. At the upstream end of Hop Brook in this Core is a Forest Core, covering much of Long Mountain. Further downstream on the Housatonic, the Core stretches along part of Mohawk Brook, a Forest Core, and a stretch of the Williams River, to reach another Forest Core on Maple Hill. The part of the Core in the vicinity of Mohawk Brook and Glendale is home to one of the best populations of Jefferson Salamander in the state. Wood Turtles live along the slow stretch of the Williams River below Maple Hill. The rich, calcareous bedrock of Maple Hill itself supports the state's only known population of the Endangered Downy Wood-mint, along with five other rare plants.

Calcareous Forest Seeps are found on wet slopes, where calcium-rich groundwater seeps out of the earth. The overstory here is similar to the surrounding forest, but many typical calcareous wetland ferns, shrubs, and other plants occur as well. This large example of Calcareous Forest Seep is very significant, and has great species diversity as well as a rare plant species. It is threatened by trampling from a nearby hiking trail, as well as by an exotic species.

Calcareous Sloping Fens are open, sedge-dominated wetlands occurring on slight to moderate slopes where there is calcareous groundwater seepage. They tend to be "hot spots" for uncommon species, often containing multiple state-listed species. This small example of a Calcareous Sloping Fen is recovering well from past human disturbances, and is associated with a larger complex of calcareous wetlands.

Deep Emergent Marshes are graminoid wetlands occurring on saturated soils that are seasonally flooded. They generally form in broad, flat areas bordering slow rivers or along pond margins, and often grade into shrub swamps. Despite the presence of invasive exotic species, this extensive example of Deep Emergent Marsh is in excellent condition with high plant species diversity, and is an important area for several of Massachusetts' rare birds.

Level Bogs are dwarf-shrub peatlands, generally with pronounced hummocks and hollows in sphagnum moss. These wetland communities are very acidic and nutrient-poor because the peat isolates them from nutrients in groundwater and streams. This example of Level Bog is of moderate quality, and is found within a beautiful, isolated pond with high scenic value.

Major-River Floodplain Forests are dominated by silver maple. This community is found along the floodplains of large rivers. The soils here are enriched with nutrients brought by annual floods, resulting





in a diversity of plants and insects. This example of Major-River Floodplain Forest is of moderate size but is in poor condition, with many exotic invasive species present.

Rich, Mesic Forests are a variant of northern hardwood forests, dominated by sugar maple with a diverse herbaceous layer that includes many spring wild flowers, in a moist, nutrient-rich environment. This Core has two examples of Rich, Mesic Forest in good condition, with exceptional species diversity. One is threatened by trampling from hikers, as well as by several exotic invasive species that have taken hold.

Small-River Floodplain Forests are silver maple/green ash forests occurring on alluvial soils of small rivers and streams. They occur on small tributaries of the Connecticut and Nashua Rivers and along some small rivers of eastern Massachusetts. This example of Small-River Floodplain Forest, though small, is in excellent condition and is well buffered by natural vegetation.

Forest Cores are the best examples of large, intact forests that are least impacted by roads and development. Forest Cores support many bird species sensitive to the impacts of roads and development and help maintain ecological processes found only in unfragmented forest patches.

Wetlands Cores are the least disturbed wetlands in the state within undeveloped landscapes—those with intact buffers and little fragmentation or other stressors associated with development. These wetlands are most likely to support critical wetland functions (i.e., natural hydrologic conditions, diverse plant and animal habitats, etc.) and are most likely to maintain these functions into the future.

Aquatic Cores are intact river corridors within which important physical and ecological processes of the river or stream occur. They delineate integrated and functional ecosystems for fish species and other aquatic Species of Conservation Concern.

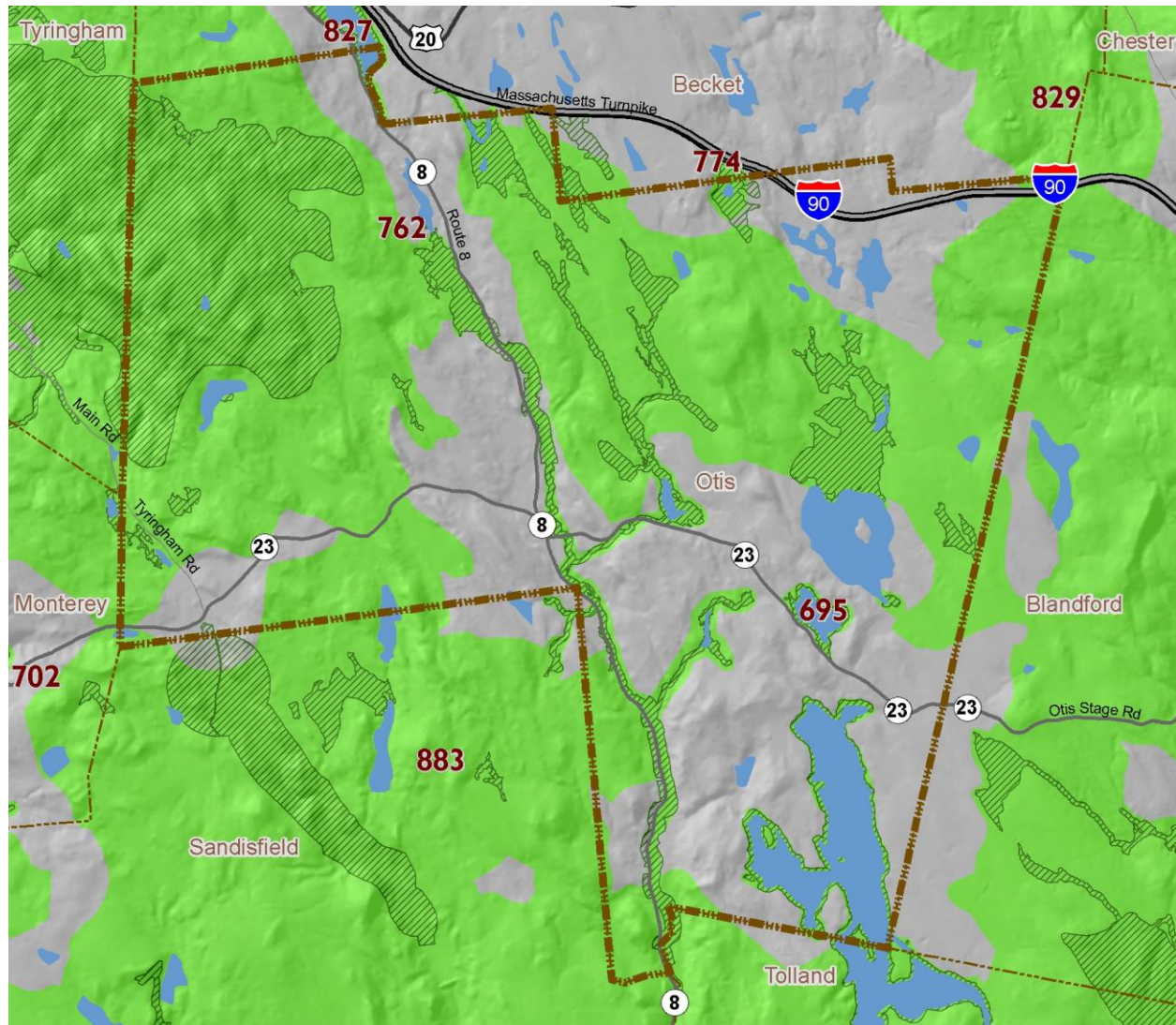
Vernal pools are small, seasonal wetlands that provide important wildlife habitat, especially for amphibians and invertebrate animals that use them to breed. *BioMap2* identifies the top 5 percent most interconnected clusters of Potential Vernal Pools in the state.





BioMap2 Critical Natural Landscape in Otis

Critical Natural Landscape IDs correspond with the following element lists and summaries.



BioMap2 Core Habitat



BioMap2 Critical Natural Landscape

1 Mile



Natural Heritage
& Endangered
Species Program

Massachusetts Division of Fisheries and Wildlife

1 Rabbit Hill Road, Westborough, MA 01581

phone: 508-389-6360 fax: 508-389-7890

For more information on rare species and natural communities, please see our fact sheets online at www.mass.gov/nhesp.



Elements of BioMap2 Critical Natural Landscapes

This section lists all elements of BioMap2 Critical Natural Landscapes that fall *entirely or partially* within Otis. The elements listed here may not occur within the bounds of Otis.

CNL 695

Aquatic Core Buffer

CNL 761

Wetland Core Buffer

CNL 762

Wetland Core Buffer

CNL 774

Aquatic Core Buffer

Wetland Core Buffer

CNL 827

Aquatic Core Buffer

CNL 829

Aquatic Core Buffer

Landscape Block

Wetland Core Buffer

CNL 883

Aquatic Core Buffer

Landscape Block

Wetland Core Buffer





Critical Natural Landscape Summaries

CNL 695

A 119-acre Critical Natural Landscape featuring Aquatic Core Buffer.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

CNL 761

A <1-acre Critical Natural Landscape featuring Wetland Core Buffer.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

CNL 762

A <1-acre Critical Natural Landscape featuring Wetland Core Buffer.

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CNL 774

An 84-acre Critical Natural Landscape featuring Aquatic Core Buffer and Wetland Core Buffer.

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CNL 827

A 247-acre Critical Natural Landscape featuring Aquatic Core Buffer.

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CNL 829

An 11,547-acre Critical Natural Landscape featuring Aquatic Core Buffer, Wetland Core Buffer and Landscape Block.

A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

Landscape Blocks, the primary component of Critical Natural Landscapes, are large areas of intact predominately natural vegetation, consisting of contiguous forests, wetlands, rivers, lakes, and ponds, as well as coastal habitats such as barrier beaches and salt marshes. Pastures and power-line rights-of-way, which are less intensively altered than most developed areas, were also included since they provide habitat and connectivity for many species. Collectively, these natural cover types total 3.6 million acres across the state. An Ecological Integrity assessment was used to identify the most intact and least fragmented areas. These large Landscape Blocks are most likely to maintain dynamic ecological processes such as buffering, connectivity, natural disturbance, and hydrological regimes, all of which help to support wide-ranging wildlife species and many other elements of biodiversity.

In order to identify critical Landscape Blocks in each ecoregion, different Ecological Integrity thresholds were used to select the largest intact landscape patches in each ecoregion while avoiding altered habitat as much as possible. This ecoregional representation accomplishes a key goal of *BioMap2* to protect the ecological stages that support a broad suite of biodiversity in the context of climate change. Blocks were defined by major roads, and minimum size thresholds differed among ecoregions to ensure that *BioMap2* includes the best of the best in each ecoregion.

This largely forested Landscape Block is 11,436 acres and is among the largest 20% of all Blocks across Massachusetts. These large forested landscapes provide invaluable wildlife habitat and other ecosystem values such as clean drinking water and absorbing carbon from the atmosphere.

CNL 883

A 179,293-acre Critical Natural Landscape featuring Aquatic Core Buffer, Wetland Core Buffer and Landscape Block.





A variety of analyses were used to identify protective upland buffers around wetlands and rivers. One, the variable width buffers methodology, included the most intact areas around each wetland and river, by extending deeper into surrounding unfragmented habitats than into developed areas adjacent to each wetland. Other upland buffers were identified through the rare species habitat analysis. In this way, the conservation of wetland buffers will support the habitats and functionality of each wetland, and also include adjacent uplands that are important for many species that move between habitat types.

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